Worksheet
Determination of NEPA Adequacy (DNA)
U.S. Department of the Interior
Bureau of Land Management

Office: Burns District Bureau of Land Management - Three Rivers Resources Area and Steens Mountain Cooperative Management and Protection Area
Tracking Number (DNA #): DOI-BLM-OR-B070-2015-0009-DNA
Case File/Project Number: Riddle Mountain and Kiger Herd Management Area files.
Proposed action Title: Kiger and Riddle Mountain Herd Management Areas Wild Horse Gather
Location/Legal Description: East of Diamond, Oregon. Kiger HMA approximately 1.5 miles east and Riddle Mountain HMA approximately 13 miles east. See attached Maps A - C.

A. Description of the Proposed Action and Applicable Project Design Features

The Bureau of Land Management (BLM) proposes to gather wild horses from the Riddle Mountain and Kiger Herd Management Areas (HMA), as well as those horses that have left the HMA to surrounding lands. This proposed action tiers to the Kiger and Riddle Mountain HMAs Wild Horse Gather Environmental Assessment (EA) DOI-BLM-OR-B050-2011-0006-EA (2011 Gather EA) which stated in the Reasonably Foreseeable Future Actions (RFFA) section, "Over the next 10 to 20 year period, RFFAs include gathers about every 4 years to remove excess wild horses in order to manage population size within the established AML [Appropriate Management Level] range" (p. 41).

The gather is designed to re-establish the wild horse populations of the Riddle Mountain and Kiger HMAs to the low end of their respective AMLs. The helicopter drive method (as discussed on pages 5, 18, and 19 of the 2011 Gather EA) would be used to capture wild horses and would take approximately one week, depending on weather conditions. The gather would be initiated following issuance of a BLM Decision on this DNA. The decision would be issued at least 31 days prior to the start of the gather and would be posted on the Burns District website, http://www.blm.gov/or/districts/burns/index.php.

The estimated gather start date is proposed for anywhere between the last week of July through the first two weeks of August, depending on the schedule of the gather contractor. The rationale for a late July–early August gather date includes: BLM Manual 4720.41 prohibits the use of helicopter drive trapping of horses during peak foaling season (March 1–June 30); by August, foals would be big enough to safely travel to the trap site; the HMAs are accessible by vehicles in August; Burns District has always tried to avoid helicopter gathers in September because these HMAs are high use areas for hunting; the August gather gives the Burns Corrals Facility staff adequate time to prepare the horses for the upcoming adoption; and scheduling the outdoor adoption event prior to the onset of winter weather provides safer conditions for adopters hauling horses home.

The AMLs for Riddle Mountain and Kiger HMAs are 33 to 56 horses and 51 to 82 horses, respectively. The May 6, 2014, census of these HMAs counted 56 adult horses and 10 foals in Riddle Mountain HMA and 108 adult horses and 22 foals in Kiger HMA. With an average annual population growth rate of 20 percent, by summer 2015 there would be approximately 67 adult horses and 14 foals in Riddle Mountain HMA and 130 adult horses and 26 foals in Kiger HMA.

The proposed action includes gathering the estimated population on the range, removing excess horses, selecting horses that fit the characteristics of the Kiger Mustang (as described in the 1996 Riddle Mountain and Kiger Wild Horse HMA Plan), and returning those horses to the range to re-establish the low ends of the respective HMAs' AMLs following the gather. In August 2015, approximately 73 wild horses would be gathered from Riddle Mountain HMA, with approximately 48 excess wild horses removed. Approximately 141 wild horses would be gathered from the Kiger HMA, with approximately 105 excess wild horses removed.

Excess horses would be removed using a selective removal strategy. Selective removal criteria for the HMAs include: (1) First Priority: Age Class - Four Years and Younger; (2) Second Priority: Age Class - Eleven to Nineteen Years; (3) Third Priority: Age Class - Five to Ten Years; and 4) Fourth Priority: Age Class - Twenty Years and Older (which should not be removed from the HMA unless specific exceptions prevent them from being turned back to the range). The BLM Manual 4720 - Removal of Excess Wild Horses and Burros Section 4720.33 specifies some animals that should be removed irrespective of their age class. These animals include, but are not limited to, nuisance animals and animals residing outside the HMA or in an area of an inactive Herd Area (HA). Horses are territorial creatures who establish home ranges. If these home ranges happen to be outside an HMA boundary, it is anticipated the horses would return to that home range even after being gathered. Therefore, animals found outside the HMAs would not be returned to the range unless it is necessary to keep them in the herd to return the population to the low end of AML.

Captured wild horses would be released back into the HMAs under the following criteria:

- Riddle Mountain HMA - Low AML would be reestablished and consist of 16 mares and 17 stallions to form a 50/50 sex ratio.
- Kiger HMA - Low AML would be reestablished and consist of 25 mares and 26 stallions to form a 50/50 sex ratio.
- Horses in both HMAs would be selected to maintain a diverse age structure and exemplify physical and conformation characteristics that would perpetuate the desirable features of the Kiger Mustang. These characteristics, as derived from the 1996 Riddle Mountain and Kiger Wild Horse HMA Plan, include:

    - Color - dun, red dun, grulla, claybank and variations.
    - Markings - Primitive markings including but not limited to dorsal stripe; leg bars; cobwebbing, or face mask; chest, rib, and arm bars; mottling/shadowing along neck, arm, and thigh; shoulder stripe and shadow; dark ear trimming; bi-colored manes and tails; or dark hooves. Minimal to no white markings.

- Conformation: Spanish mustang-type conformation - Not coarse or heavy-boned; light to moderately muscled; muscles in hip and thigh should be long and smooth; well-defined withers typically higher than the hind end; deep girth; low set tail; medium-sized feet; hooked ear tips; and medium-size head that tapers slightly from jaw to muzzle (fine muzzles) (head profile can be straight, concave or slightly convex).
- Size - 13–15 hands.
- Weight - 750–1,000 pounds.

Project Design Features

- Trap sites would be selected within the pastures and areas where horses are located to the greatest extent possible and would follow the appropriate Wilderness Study Area (WSA) guidance set forth in BLM Manual 6330 Section 1.6(C)10(iii) (p. 1-36), for Riddle HMA.
- Trap sites and temporary holding facilities would be located in previously used sites or other disturbed areas whenever possible. These areas would be seeded with a seed mix appropriate to the specific site if bare soil exceeds more than 10 square yards per location. The seed applied on sites within WSA would be a mix of native species while sites outside WSA would be seeded with a mix of desirable, non-native species. Undisturbed areas identified as trap sites or holding facilities would be inventoried, prior to being used, for cultural and botanical resources. If cultural or special status botanical resources were encountered, these locations would not be utilized unless they could be modified to avoid affecting these resources.
- Trap sites and temporary holding facilities would be surveyed for noxious weeds prior to gather activities. Any weeds found would be treated using the most appropriate methods. All gather activity sites would be monitored for at least two years post-gather. Any weeds found would be treated using the most appropriate methods, as outlined in the 1998 Burns District Weed Management EA, or subsequent documents.
- All vehicles and equipment used during gather operations would be cleaned before and following implementation to guard against spreading of noxious weeds.
- Efforts would be made to keep trap and holding locations away from areas with noxious weed infestations.
- Gather sites would be noted and reported to range and weed personnel for monitoring and/or treatment of new and existing infestations.
- An agreement would be in place between private landowners and BLM for any traps located on private land. Surveys for cultural resources would be conducted on trap sites located on private land.
- Maintenance may be conducted along roads accessing trap sites and holding facilities prior to the start of gather operations to ensure safe passage for vehicles hauling equipment and horses to and from these sites. Any gravel required for road maintenance is to be certified weed-free gravel. Road maintenance conducted within the Steens Mountain Cooperative Management and Protection Area (CMPA) boundary would be done in accordance with the Steens Mountain Travel Management Plan (TMP) (2007). A required 30-day notice of road maintenance on Maintenance Level 2/Maintenance

Intensity 1 (ML2/MI1)[1] roads within the Steens Mountain CMPA would be placed on the Burns District BLM website, http://www.blm.gov/or/districts/burns/index.php, as a press release.

- Gather and trapping operations would be conducted in accordance with the Standard Operating Procedures (SOP) described in the Wild Horse and Burro (WH&B) Gathers: Comprehensive Animal Welfare Policy (Instruction Memorandum (IM) 2013-059) which was created to establish policies and procedures to enable safe, efficient, and successful WH&B gather operations while ensuring humane care and treatment of all animals gathered (Appendix A).
- An Animal and Plant Health Inspection Service (APHIS) veterinarian would be onsite during the gather, as needed, to examine animals and make recommendations to BLM for care and treatment of wild horses.
- Decisions to humanely euthanize animals in field situations would be made in conformance with BLM policy outlined in IM 2009-041: Euthanasia of Wild Horses and Burros for Reasons Related to Health, Handling and Acts of Mercy (Appendix B).
- Data, including sex and age distribution, would be recorded on all gathered horses (removed and returned). Additional information such as color, condition class information (using the Henneke (1983) rating system), size, disposition of animals, and other information may also be recorded.
- Excess animals would be transported to BLM's Oregon Wild Horse and Burro Corral Facility where they would be prepared (freeze marked, vaccinated, and dewormed) for adoption, sale (with limitations), or long-term pasture.
- Hair samples would be collected to assess genetic diversity of the herd, as outlined in Washington Office (WO) IM 2009-062 (Wild Horse and Burro Genetic Baseline Sampling) (Appendix C). Hair samples would be collected from a minimum of 25 percent of the post-gather population.
- Public and media management during helicopter gather and bait trapping operations would be conducted in accordance with WO IM 2013-058 - Wild Horse and Burro Gathers: Public and Media Management (Appendix D). This IM establishes policy and procedures for safe and transparent visitation by the public and media at WH&B gather operations, while ensuring the humane treatment of wild horses and burros.

Monitoring

The BLM Contracting Officer's Representative (COR) and Project Inspectors (PI) assigned to the gather would be responsible for ensuring contract personnel abide by the contract specifications and the gather SOPs outlined in IM 2013-059 (Appendix A).

[1] ML2/MI1: The scope of activities described within ML2/MI1 includes: maintaining drainage, which can include grading to prevent/minimize erosion; correcting drainage problems; and protecting adjacent lands. Brushing can be performed if route bed drainage is being adversely affected and contributing to erosion. For further detail on these maintenance categories refer to BLM Manual 9113 - Roads Manual (MI1) and Andrews/Steens RMP/ROD 2005, Appendix M-2 (ML2).

B. Land Use Plan (LUP) Conformance

- Steens Mountain Cooperative Management and Protection Area Record of Decision (ROD) and Resource Management Plan (RMP), August 2005.
- Three Rivers RMP, ROD, and Rangeland Program Summary, September 1992.

The proposed action is in conformance with the LUP, even though it is not specifically provided for, because it is clearly consistent with the following LUP decisions (objectives, terms, and conditions):

Steens Mountain CMPA ROD/RMP (2005)

> (p. RMP-50)
> **Goal:** Manage and maintain healthy wild horse herds in established HMAs at AMLs to maintain a thriving natural ecological balance between wild horse populations, wildlife, livestock, vegetation resources, and other resource values. Enhance and perpetuate the special or rare and unique characteristics that distinguish the respective herds.
>
> **Objective 3.** Maintain/adjust AMLs and yearlong forage allocations for each HMA.
>
> **Management Direction**
> "...Wild horse numbers are managed through gathering, removal, and other approved methods of population control...Wild horse numbers are normally reduced to the low end of the AML range when gatherings are conducted."
>
> (p. RMP-51)
> **Management Direction** (continued)
> "A diverse age structure and sex ratios ranging from 40 to 50 percent female and 50 to 60 percent male will be maintained. Wild horses returned to the HMA after a gather will possess representative characteristics of the herd's conformation, size, color, and unique markings. New animals from other HMAs will be introduced when needed to increase diversity of the genome or maintain herd characteristics."

Three Rivers RMP/ROD (1992)

> (p. 2-43)
> **Objective and Rationale**
>
> **WHB 1:** Maintain healthy populations of wild horses within the Kiger ... and Riddle Mountain Herd Management Areas (HMAs) ...
>
> **Rationale:** Wild and Free-Roaming Horse and Burro Act of 1971 requires BLM to manage wild free-roaming horses and burros under multiple-use in a manner that is designed to achieve a thriving natural ecological balance on public lands.

Allocation/Management Action - WHB 1.1: Continue to allocate the following acres and AUMs in active HMAs:

Kiger HMA	36,618 ac.	984 AUMs
Riddle Mountain HMA	28,021 ac.	672 AUMs

(p. 2-45)
Objective and Rationale

WHB 3: Enhance and perpetuate the special or rare and unique characteristics that distinguish the respective herds in the RA [Resource Area].

Rationale: Color, type, distinctive markings, size and weight of members of the various herds are characteristic of the historic background of those herds. It is highly desirable to retain this cultural/historical linkage.

Allocation/Management Action - WHB 3.1: Limit any releases of wild horses or burros into an HMA to individuals which exhibit the characteristics designated for that HMA.

C. Identify applicable National Environmental Policy Act (NEPA) documents and other related documents that cover the proposed action.

List by name and date all applicable NEPA documents that cover the proposed action.

- Kiger and Riddle Mountain Herd Management Areas Wild Horse Gather Environmental Assessment (EA) DOI-BLM-OR-B050-2011-0006-EA (May 3, 2011). (Hereafter referred to as 2011 Gather EA).

List by name and date other documentation relevant to the proposed action (e.g., biological assessment, biological opinion, watershed assessment, allotment evaluation, and monitoring report).

- Kiger and Riddle Mountain Herd Management Area Plan Evaluation and Kiger Mustang Area of Critical Environmental Concern Review (2014).
- Kiger and Riddle Mountain HMAs Inventory (May 6, 2014).
- Kiger and Riddle Mountain Genetics Analyses by E. Gus Cothran of Texas A&M University (2012).
- North Steens 230-kV Transmission Line Project Final Environmental Impact Statement (October 2011) and Record of Decision (December 28, 2011). - This is a relevant document as wild horses are discussed in cumulative effects in Section 4 below.
- Happy Valley Allotment Management Plan (AMP) DOI-BLM-OR-B050-2009-0053-EA (September 2011). Two pastures within the Happy Valley Allotment are within the Kiger HMA. The intent of this AMP is to maintain wild horse populations within AML to achieve rangeland health standards.
- Burnt Flat Allotment Evaluation (2001) - Objective 1: Maintain all seral stages in current status to provide a diversity of habitat types and conditions and forage requirements during the next 5–6 years. Management actions needed to address the objective and

conform to the guidelines: … Gather wild horses when numbers exceed AML (p.12-13). The intent of this AMP is to maintain wild horse populations within AML to achieve rangeland health standards.

- Oregon Department of Fish and Wildlife (ODFW). *Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat* (April 2011).
- Greater Sage-Grouse Interim Management Policies and Procedures, BLM IM 2012-043, (December 2011).
- BLM. *A Report on National Greater Sage-Grouse Conservation Measures*. BLM National Technical Team on Greater Sage-Grouse (December 2011).
- Greater Sage-Grouse Allotment Candidate Conservation Agreement (CCA) for Oregon BLM Rangeland Management. Home Ranch Limited Liability Corporation (LLC) - Smyth-Kiger Allotment Harney County, Oregon. Under the Greater Sage-Grouse Programmatic Candidate Conservation Agreement for Oregon BLM Rangeland Management Allotment CCA Tracking Number: DOI-BLM-OR-B050-2014-0001-CCA (May 2014). The purpose for this CCA is to promote grazing practices that reduce or eliminate threats to sage-grouse on the enrolled allotment and to ensure grazing practices that are neutral or beneficial to sage-grouse can likely continue unaffected if the species is listed in the future. The conservation measures identified in this CCA are expected to benefit sage-grouse through maintenance, enhancement, and rehabilitation of sage-grouse populations and their habitats and by reducing threats causing direct and indirect mortality.
- Smyth-Kiger Allotment Management Plan, DOI-BLM-OR-05-025-027-EA (November 2008) - Management Objectives: In order to maintain a natural ecological balance, achieve rangeland health standards and achieve resource objectives outlined in the AMP, (wild) horse numbers must be maintained between 41 and 71 animals (low and high AMLs) within Smyth-Kiger Allotment (p. 9). No decision was issued on this AMP however the intent to maintain wild horse populations within AML is clear.
- Final Vegetation Treatments Using Herbicides on BLM Lands in Oregon Environmental Impact Statement (EIS)(July 2010) and ROD (October 2010) - This EIS supports the need to maintain the wild horse populations of Kiger and Riddle Mountain HMAs within AML. Page 273, "Loss of native and other non-invasive vegetation and declining ecosystem health on public lands due to noxious weeds and other invasive vegetation has contributed to reductions in the ability of public lands to support wild horses and burros. The wild horses and burros themselves have caused some of these changes. The increased demand for multiple uses on public lands has further affected vegetative communities, affecting the land's ability to sustain current levels of wild horse use. Restoring ecosystem processes and balancing wild horse use and rangeland health reduces invasive plant spread and helps create and/or maintain plant communities resistant to disturbance. However, even with treatment, noxious weeds and other invasive plants would continue to spread. BLM would continue to manage wild horses within AMLs to attain rangeland health standards" (EIS, July 2010).
- Kiger Mustang Area of Environmental Concern Management Plan (March 3, 1996). Page 2 states, "The primary management objective for which this [Area of Critical Environmental Concern] ACEC is to perpetuate and protect the dun factor color and conformation characteristics of the wild horses present in the Kiger and Riddle Mountain Herd Management Areas." The selection criteria for return animals in the proposed action

of this DNA are designed to perpetuate and protect the dun factor and conformation of the original Kiger and Riddle Mountain horses.

- Annual herd and habitat monitoring:

    - Kiger HMA
      Since 2012 wild horses have been congregating in Wood Camp Pasture of Kiger HMA. Upwards of 50 horses have been observed residing in this pasture on multiple occasions (e.g. May 6, 2014 Inventory = 61 adults and 13 foals in Wood Camp pasture) since 2012. On May 7, 2014, one attempt to move some of the bands into an adjacent pasture was minimally successful with one band of 16 adults and 4 foals moved into Ruins Pasture. Range use monitoring indicates heavy utilization and wild horse wallows in horse use areas of Kiger HMA (Figures 1 and 2).

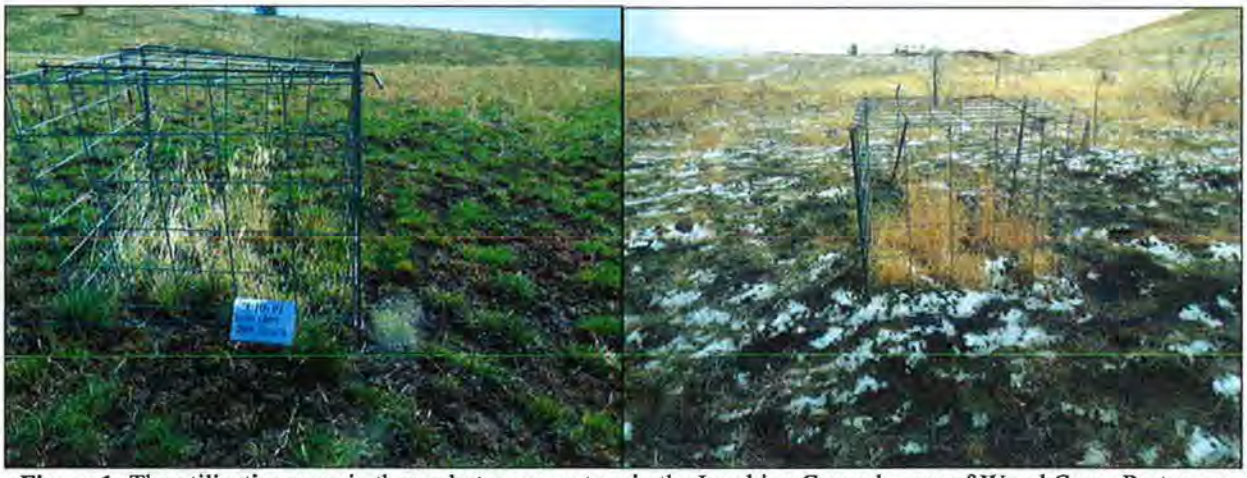

Figure 1: The utilization cage in these photos was set up in the Lambing Grounds area of Wood Camp Pasture, a known wild horse use area. Horses have been congregating in this area for the past three years and hindering the successful establishment of a 2011 fire rehabilitation seeding. The photo on the left shows 2013/early 2014 livestock and wild horse use while the photo on the right shows 2014 use on December 16, 2014. These photos were taken following livestock grazing so it is difficult to distinguish the utilization level from horses specifically. However, a utilization study conducted on December 16, 2014, shows heavy and severe use in several of the known wild horse use areas of the pasture while other areas of the pasture received only non-use to light utilization.

Figure 2: Wallows created by wild horses as evidenced by the tracks and droppings present, April 2014.

- Riddle Mountain HMA
  Drought conditions since 2012 have caused horses from Riddle Mountain HMA to drift outside the boundaries in search of water. Wild horse sign has been observed across a portion of Oregon Department of State Lands (ODSL) property and across private property to the north of the HMA in 2013 and 2014 (On May 6, 2014, during an inventory flight, four horses were observed in this area) as water sources dried up across the north half of the HMA. In 2013 and 2014 horses also travelled west into an adjacent BLM allotment for water and highly palatable forage. Drought conditions are anticipated to persist as well as the movement of horses outside the HMA boundary in search of the resources they need. The wild horse population exceeding AML only exacerbates the "nuisance animal" problem.

D. NEPA Adequacy Criteria

1. Is the new proposed action a feature of, or essentially similar to, an alternative analyzed in the existing NEPA document(s)? Is the project within the same analysis area, or if the project location is different, are the geographic and resource conditions sufficiently similar to those analyzed in the existing NEPA document(s)? If there are differences, can you explain why they are not substantial?

The new proposed action is the same as the proposed action analyzed in the 2011 Gather EA (p. 6) with two exceptions; (1) the new proposed action does not include gelding of some of the return stallions, (2) the 2011 Gather EA proposed to remove 120 excess horses while the 2015 proposed action includes removing 156 excess horses.

As compared to the 2011 Gather EA's proposed action, the 2015 proposed action estimates the need to remove 36 additional horses between the two HMAs in order to achieve the low end of

AML. Rangeland monitoring, as identified in Section C above, indicates the need to return the wild horse populations to the low end of AML. Following the 2011 gather, the population remaining in each HMA was the low end of the respective AMLs, as it would be in 2015. The impacts to the herd would be the same, as the populations would be reduced to the same amounts of horses as in 2011. The removal of 36 additional horses would accelerate improvements in range condition in order to continue to achieve resource objectives and rangeland health standards. The 2011 Gather EA analyzed the direct and indirect effects of the gather, transport, and short-term holding on the individual horses (p. 18). The effects would be the same in 2015, except 36 additional horses would be affected. The same safety precautions would be taken for these additional horses as those discussed in the Affects Common to Action Alternatives (2 and 3) Section in the 2011 Gather EA (p. 18) and those incorporated into IM 2013-059 (Appendix A).

The proposed action covers the same geographic analysis area as the 2011 Gather EA (Appendix C - HMA Maps) as the HMA boundaries have not changed.

Resource conditions discussed in the 2011 Gather EA have changed, mainly in the Kiger HMA, with additional implementation of the Five Creeks Rangeland Restoration Project (OR-06-027-022). The 2011 Gather EA described (p.9) current (then) resource conditions from partial implementation of the Five Creeks Project. The project has been successful at restoring rangeland conditions across a large portion of the HMA. There has been a decrease in juniper cover allowing an increase in desirable grasses and forbs. The reduction in juniper cover is providing areas where desirable shrubs can re-establish. Juniper is still present within the HMA in quantities and distribution adequate for effective cover for wild horses. Nevertheless, despite the improvements in habitat conditions in the HMA, the same wild horse issues are currently occurring as identified in the 2011 Gather EA (p. 2, Purpose and Need for Action). Issues include wild horse numbers over AML, wild horse concentrations causing resource damage, and poor distribution causing heavy utilization in certain portions of the HMAs.

The Smyth Creek Riparian Corridor fence was constructed in October of 2012 following the March 2011 Decision to authorize the construction of this project as analyzed in the Smyth-Kiger Allotment Management Plan EA-OR-05-025-027. The fence line crosses the Ruins Pasture of the Kiger HMA. It was constructed with wild horse movement in mind and has three 250 to 500-foot creek crossings within its three-mile stretch to allow wild horses to move freely during gather operations.

2. Is the range of alternatives analyzed in the existing NEPA document(s) appropriate with respect to the new proposed action, given current environmental concerns, interests, and resource values?

The 2011 Gather EA fully analyzed three alternatives and considered but eliminated five alternatives from detailed analysis (p. 4, Alternatives Including the Proposed Action). Since the 2011 Gather EA, BLM engaged in scoping and prepared an EA for public comment regarding gathering horses in the South Steens HMA. Issues raised during that scoping period revolved mostly around using bait and/or water trapping alone in place of helicopter gathers and increasing the use of fertility control vaccination.

The use of bait/water traps alone was eliminated from detailed consideration on page 8 of the 2011 Gather EA. The rationale presented in the 2011 Gather EA included; (1) the gather area is too large to make it a feasible method, (2) abundant water sources make it almost impossible to restrict horse access to only selected water trap sites, and (3) vehicle access for safe transport of captured horses is limited (p. 8). These conditions have not changed since 2011.

The use of fertility control vaccination, specifically Porcine Zona Pellucida (PZP), was considered but eliminated from detailed analysis in the 2011Gather EA (p. 7). "While the current policy requires the use of fertility control on herds with an annual growth rate of greater than 5 percent, the demand for horses from the Kiger and Riddle herds has been at or near 100 percent since 1986" (2011 Gather EA, p. 8). "Due to the small herd size, popularity, and adoptability, PZP contraceptives will not be considered for these herds" (2011 Gather EA, p.1). Since 2011, there have been no new techniques developed for gathering wild horses nor are any new fertility control vaccinations approved and available for use.

The alternatives analyzed in the 2011 Gather EA continue to be an appropriate range of alternatives given the current environmental concerns, interests, and resource values.

Because fertility control for population management is a rising concern related to wild horse management, further discussion follows as to why Burns District BLM is not proposing to use PZP on the Riddle Mountain and Kiger wild horse herds. It is BLM policy to apply fertility control as a component of all gathers unless there is a compelling management reason not to do so (IM 2009-090, Population-Level Fertility Control Field Trials: Herd Management Area Selection, Vaccine Application, Monitoring and Reporting Requirements). The primary objective of the field trials described in this IM is to evaluate the effects of PZP immunocontraceptive vaccine treatment on wild horse population growth rates. The IM identifies where application of fertility control will have the greatest beneficial impact, including HMAs where the post-gather herd size is estimated to be greater than 50 animals. The use of fertility control, specifically PZP, was not analyzed in the 2011 Gather EA due to the small herd size, popularity, and adoptability of the Kiger horses (p. 1). The new proposed action also does not include the application of fertility control treatment, specifically PZP, for the following reasons:

- AML for Riddle Mountain HMA is 33 to 56 horses while AML for Kiger is 51 to 82 horses. Fertility control will have the greatest beneficial impact where post-gather herd size is estimated to be greater than 50 animals (Appendix E: IM 2009-090, Population-Level Fertility Control Field Trials: Herd Management Area (HMA) Selection, Vaccine Application, Monitoring and Reporting Requirements).
- The proposed timing of this gather is August. The protocol for effective PZP contraception calls for the initial treatment of each species to be consistent with its seasonal pattern of reproduction. The peak breeding period for wild horses is May and June, and the peak foaling period is April and May. The first inoculation (primer) must be given 1–2 months prior to breeding activity and the second inoculation 2–6 weeks later but no later than 1–2 weeks prior to the onset of breeding activity (http://www.sccpzp.org/protocol/). This timing would require BLM to hold the mares at the Burns Corral Facility until March 2016 before the first inoculation could be applied.

- The genetics of the Kiger and Riddle Mountain herds trend for loss of genetic variability (Cothran, 2012, Genetics Analyses for Kiger and Riddle Mountain HMAs). The 2013 National Academy of Sciences review of the BLM WH&B Program states, "At the population level, removing females even temporarily from the breeding pool [by treating with PZP] is likely to reduce the effective population size and genetic diversity of the population" (p. 108). This review also specifically recognized the Kiger herd (which includes both the Kiger and Riddle Mountain HMAs) as a herd where maintenance of optimal genetic diversity is needed due to the strong associations with Spanish bloodlines (p. 169).
- The "Kiger" horses, as they are commonly known, have had an almost 100 percent adoption rate since 1986 (2011 Gather EA, p. 1). The adoption rate of the horses gathered in 2011 was also 100 percent.

3. Is the existing analysis valid in light of any new information or circumstances (such as, rangeland health standard assessment, recent endangered species listings, updated lists of BLM-sensitive species)? Can you reasonably conclude that new information and new circumstances would not substantially change the analysis of the new proposed action?

The existing analysis is still valid for the following reasons:

- There have been no new rangeland health standards assessments since 2011 for the three livestock grazing allotments that make up the Kiger and Riddle Mountain HMAs. Range monitoring since 2011 indicating the need for the proposed action is discussed in Section C above.
- There are no new fertility control vaccinations available and approved for use on wild horses since the 2011 Gather EA. Refer to Section D.2, above, for a discussion on why the fertility control vaccination PZP is not being considered for use in the new proposed action.
- There were no endangered species or their habitat affected by the proposed action of the 2011 Gather EA and there are still no listings within the project area.
- Greater Sage-Grouse are on BLM's sensitive species list. Sage-grouse, as a special status species (SSS), and their habitat were analyzed in the 2011 Gather EA starting on p. 29. There have been several updates to management direction for sage-grouse since March 2010 when the U.S. Fish and Wildlife Service (USFWS) published its decision on the petition to list the Greater Sage-Grouse as "Warranted but Precluded." (75 Fed. Reg. 13910, 2010). In 2011, BLM Instruction Memorandum (IM 2012-043), Greater Sage-Grouse Interim Management Policies and Procedures, was released with the purpose of providing interim conservation policies and procedures to the BLM field officials to be applied to ongoing and proposed authorizations and activities that affect the Greater Sage-Grouse and its habitat. The direction of the IM ensures that interim conservation policies and procedures are implemented when field offices authorize or carry out activities on public land while the BLM develops and decides how to best incorporate long-term conservation measures for Greater Sage-Grouse into applicable LUPs. The direction of the IM also promotes sustainable Greater Sage-Grouse populations and conservation of its habitat, while not closing any future options before the planning

process can be completed. Specific policy and procedures for WH&B in sage-grouse preliminary priority habitat (PPH) were provided for on page 14 of the IM:

- Manage WH&B population levels within established AML.
- Wild horse HMAs will receive priority for removal of excess horses.
- Wild horses and burros remaining in HMAs, where the AML has been established as zero, will receive priority for removal.
- When developing overall workload priorities for the upcoming year, prioritize horse gathers except where removals are necessary in non-PPH to prevent catastrophic herd health and ecological impacts.

IM 2012-044, BLM National Greater Sage-Grouse Land Use Planning Strategy, directed BLM to refine (PPH) and Preliminary General Habitat (PGH) to analyze actions within PPH to conserve Greater Sage-Grouse habitat functionality, or where possible, improve habitat functionality, and analyze actions within PGH that provide for major life history function (e.g., breeding, migration, or winter survival) in order to maintain genetic diversity needed for sustainable Greater Sage-Grouse populations. Table 1 displays the acreages of PGH and PPH within Kiger and Riddle Mountain HMAs.

Table 1: Acreages of PGH and PPH within the Kiger and Riddle Mountain HMAs

HMA	Total HMA Acres	PGH Acres (% of HMA)	PPH Acres (% of HMA)
Kiger	30,305	27,788 (92%)	2064 (7%)
Riddle Mountain	32,687	1,458 (4%)	29,896 (91%)

Regardless of the official designation of sage-grouse habitat and the guidance for management of their habitat in IM 2012-043, the effects are expected to be the same under the new proposed action as those analyzed for sage-grouse and their habitat on page 30 of the 2011 Gather EA. "Direct impacts to sage-grouse are not expected..." (2011 Gather EA, p. 30).

4. Are the direct, indirect, and cumulative effects that would result from implementation of the new proposed action similar (both quantitatively and qualitatively) to those analyzed in the existing NEPA document?

The North Steens 230-kV Transmission Line Project ROD was signed on December 28, 2011, by Secretary of the Interior Ken Salazar in Washington D.C. The ROD contains a right-of-way (ROW) grant decision under Title V of the Federal Land Policy and Management Act (FLPMA). The BLM's decision was to issue new ROW grants to Echanis, LLC (Echanis) for a 230-kV overhead electric transmission line, new and existing access roads, overland access routes, and temporary tensioning sites. The Final Environmental Impact Statement (FEIS) was made available on October 21, 2011. On March 16, 2012, the BLM issued a ROW to Echanis, LLC for the North Steens Transmission Line Project. All of the wind farm developments and portions of

the transmission line are on private land, but were analyzed in the FEIS as a connected action under NEPA. The transmission line crosses 4.46 miles of the Kiger HMA; no part of the project is in Riddle Mountain HMA. The EIS looked at effects to wild horses (Section 3.12.3) and stated that primary effects would be from construction and operation of the transmission line and access roads, including periodic maintenance inspections and repairs. Permanent effects include loss of vegetation that could have been consumed or used as refuge by wild horses. Temporary effects include vegetation damage and/or increased risk of fire due to heavy equipment operation. The EIS did not discuss indirect effects during wild horse helicopter gathers. To date no construction has begun on the transmission line, however, if construction were to begin during the summer of 2015, there would be direct effects to the proposed action with construction equipment in the general area of the gather operations. This would be mitigated by coordinating the timing and area of gather operations with the construction operation schedule to avoid impediments to either project. Once the transmission line is in place it would be an obstacle for a helicopter pursuing wild horses. However, the alignment of the transmission line would be on the far westerly side of the Kiger HMA in an area where BLM horse observation data indicate horses do not frequent. There would be no measurable cumulative effects on the proposed gather from the transmission line as the amount of acres required to accommodate the new line would be approximately 81.1 acres within the HMA while the total acreage of both HMAs combined is 55,245 acres.

Currently, a Comprehensive Recreation Plan (CRP) for the Steens Mountain CMPA EA is being developed by the BLM, which may affect some resources; however, this document is subject to change based on public comments in future NEPA analysis and subsequent administrative remedies. The CRP EA covers approximately 21 percent of the Kiger HMA and approximately 78 percent of the Riddle Mountain HMA, but the projects proposed have no measurable effect on the ability to gather wild horses as the only proposals within the HMA boundaries include closures of roads and historic routes which would not be used during gather operations. Therefore, this plan is not being considered an RFFA or included as a cumulative impact.

The new proposed action would have the same effects as those analyzed in the 2011 Gather EA. Cumulative effects of the proposed action would be the same as those analyzed beginning on page 40 of the 2011 Gather EA as there are no new or reasonably foreseeable future actions that would have a measurable effect on resources.

5. Are the public involvement and interagency review associated with existing NEPA document(s) adequate for the current proposed action?

A copy of the original 2011 Gather EA was mailed to 81 interested publics on March 16, 2011, for a 30-day public comment period. In addition a public notice was posted in the Burns Times-Herald newspaper on March 16, 2011. The EA was also posted on the Burns District website on the same date. No public comments pertaining to the EA were received.

The 2011 Gather EA stated, "Reasonably Foreseeable Future Actions (RFFAs) include gathers every 4 years to remove excess wild horses and burros in order to manage population size within the established AML range" (p. 24). This statement allowed readers to anticipate the new proposed action to take place in 2015.

The proposed 2015 gather has been discussed with Oregon Department of Fish and Wildlife (ODFW) who submitted a letter to the Burns District BLM expressing their support for ongoing efforts to address the excess horse issues in the Riddle Mountain and Kiger HMAs.

The members of the Steens Mountain Advisory Council (SMAC), which includes a Burns Paiute Tribal Representative, will be mailed a letter of availability of the DNA for comment. This Council has been supportive of maintaining AML in these HMAs in the past.

Discussions regarding the proposed action have taken place with adjacent landowners and several Kiger Mustang interest groups.

A BLM interdisciplinary team (IDT) meeting was held on December 9, 2014, to review the 2011 Gather EA and its adequacy for the current proposed action.

This DNA will be posted on the Burns District BLM Planning website, www.blm.gov/or/districts/burns/plans/index.php, and sent to our current Burns District wild horse and burro interested publics list and the SMAC for a 30-day public review and comment period. A news release will also be sent to the local newspaper, the Burns Times-Herald.

A decision for this proposed action would be issued following the 30-day comment period. This decision would be issued 31 to 76 days prior to the proposed gather start as is policy in IM 2010-130 – Wild Horse and Burro Gather Decisions.

Before the proposed 2015 gather, a public notice would be posted on the Burns BLM District Home Newsroom page at http://www.blm.gov/or/districts/burns/newsroom/index.php.

E. Interdisciplinary Analysis:

Identify those team members conducting or participating in the NEPA analysis and preparation of this worksheet.

Specialist Signature and Date: Andrew J Daniels 5-1-15
Andrew Daniels, Wildlife Biologist

Specialist Signature and Date: Breanna O'Connor 5-4-15
Breanna O'Connor, Riparian Specialist

Specialist Signature and Date: 5.1.2015
Caryn Burri, Botanist

Specialist Signature and Date: Lesley Richman 5/1/2015
Lesley Richman, Weed Specialist

Specialist Signature and Date: Scott P. Thomas May 1, 2015
Scott Thomas, Archaeologist

Specialist Signature and Date: 5/1/15
Tara Mclain, Lands and Realty Specialist

Specialist Signature and Date: 5/1/2015
Thomas Wilcox, Wilderness Specialist

Specialist Signature and Date: 5/1/2015
Travis Miller, Rangeland Management Specialist

Specialist Signature and Date: 5/1/15
Rob Sharp, Supervisory Wild Horse and Burro Specialist

F. Others Consulted:

Identify other individuals, agencies, or entities that were consulted with as part of completing the NEPA analysis.

Section 7 consultation was not conducted as there are no threatened or endangered (T&E) species in the project area.

Section 404 consultation was not conducted as the proposed action would have no effect on the Clean Water Act.

Tribal Consultation - Burns BLM District does not pursue formal tribal consultation regarding wild horse gathers for the following reasons: (1) The herds in the HMAs are really a construct of BLM through herd management plans and not necessarily horses that are remnants of tribal horses in this area; (2) There has been no word of concern from any tribal member about horses or horse gathers in the 20 years the District Archeologist has been employed at Burns BLM; (3) Horse gathers are very temporary in their nature and effects and do not leave lasting visual effects. The SMAC includes a Tribal Representative. Each council member will be mailed a letter of availability of the DNA for comment.

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H. Conclusion

Based on the review documented above, I conclude that this proposal conforms to the applicable land use plan and that the NEPA documentation fully covers the proposed action and constitutes BLM's compliance with the requirements of the NEPA.

Project Lead: Lisa Grant — 5-1-15
Lisa Grant, Wild Horse and Burro Specialist — Date

NEPA Coordinator: Holly Orr — 5/4/15
Holly Orr, Planning and Environmental Coordinator — Date

Responsible Official: Rhonda Karges — 5/4/2015
Rhonda Karges — Date
Field Manager,
Andrews/Steens Resource Area

Responsible Official: Richard Roy — 5/4/15
Richard Roy — Date
Field Manager,
Three Rivers Resource Area

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240
http://www.blm.gov

January 23, 2013

In Reply Refer To:
4710 (NV934) P

EMS TRANSMISSION 01/30/2013
Instruction Memorandum No. 2013-059
Expires: 09/30/2014

To: All Field Office Officials (except Alaska)

From: Assistant Director, Renewable Resources and Planning

Subject: Wild Horse and Burro Gathers: Comprehensive Animal Welfare Policy

Program Area: Wild Horse and Burro (WH&B) Program

Purpose: The purpose of this Instruction Memorandum (IM) is to establish policy and procedures to enable safe, efficient, and successful WH&B gather operations while ensuring humane care and treatment of all animals gathered.

Policy/Action: The Bureau of Land Management (BLM) is committed to the well-being and responsible care of WH&B we manage. At all times, the care and treatment provided by the BLM and our Contractors will be characterized by *compassion and concern* for the animal's well-being and welfare needs. Effective immediately, all State, District, and Field Offices must comply with this IM for all gathers within their jurisdiction.

This IM is part of a package of IMs covering various aspects of managing WH&B gathers.

- IM No. 2013-060, Wild Horse and Burro Gathers: Management by Incident Command System
- IM No. 2013-058, Wild Horse and Burro Gathers: Public and Media Management
- IM No. 2013-061, Wild Horse and Burro Gathers: Internal and External Communicating and Reporting

Roles and responsibilities of all gather personnel are covered in IM No. 2013-060, Wild Horse and Burro Gathers: Management by Incident Command System.

The goal of this IM is to ensure that the responsible and humane care treatment of WH&B remains a priority for the BLM and its Contractors at all times. Our objectives are to use the best available science, husbandry, and handling practices applicable for WH&B and to make improvements whenever and wherever possible, while meeting our overall gather goals and objectives in accordance with current BLM policy, standard operating procedures, and contract requirements.

The Lead Contracting Officer's Representative (Lead COR) is the primary party responsible for promptly addressing any actions that are inconsistent with the expectations set forth below. The Lead COR may delegate responsibility to an alternate COR. The responsibilities of a BLM Project Inspector are assigned by the Lead COR and are limited to performing on-the-job government inspection of work accomplished by the Contractor.

The Lead COR has authority to *suspend* gather operations if he/she believes actions contrary to the humane treatment expectations are taking place or that an unsafe condition exists. The Lead COR will promptly notify the Contractor if any improper or unsafe behavior or actions are observed, and will require that such behaviors be promptly rectified and eliminated. Any observed problems shall be reported at the end of each day. The Lead COR and Incident Commander (IC), through coordination with the Contracting Officer (CO) shall, if necessary, ensure that corrective action has been taken to prevent those behaviors or actions from occurring again and all follow-up and corrective actions shall be reported as a component of the Lead COR's daily reports.

Based on past experience with WH&B gathers and the need to adapt some gather practices to specific local conditions, the following information will be discussed with all gather personnel before gather operations begin and shall be incorporated as management's expectations that is included as an appendix to the documentation supporting the gather and made available on BLM's website. Humane care and handling of WH&B during gather operation is always the primary concern. During the pre-work conference facilitated by the Lead COR, expectations for the humane treatment and care of WH&B during gather operations will be discussed. They include the following expectations:

1. The Lead COR will ensure that the gather helicopter(s) will not be operated in a manner where, for any reason, the helicopter could reasonably be expected to come into contact with a WH&B. In cases when it is necessary during gather operations, hovering by the helicopter over the WH&B is acceptable.

2. Handling aids (including body position, voice, flags, paddles and electric prods) will be used in a manner that is consistent with domestic livestock handling procedures. Flags and paddles will be used as signaling and noise making devices first, with only light contact of the flag or paddle end allowed when necessary. Animals will not be whipped or beaten with these or any handling aids. Flagging and paddles will be used strategically and in a manner that avoids desensitizing the WH&B. While it may be necessary on occasion to use a hand or foot to safely move a WH&B, the Lead COR will ensure that kicking or hitting of WH&B does not occur.

3. Electric prods (hotshots) will not be routinely used on WH&B, but rather should only be used as a last resort when WH&B or human safety is in jeopardy or other aids have been tried and are not working. When used, electric prods will only be used to shock animals, not to tap or hit animals. Similarly, electric prods will not be applied to injured or young animals, nor will they be applied to sensitive areas such as the face, genitals, or anus.

4. Gates can be used to push WH&B but will not be used in a manner that may be expected to catch legs. Gates and doors will not be slammed or shut on WH&B.

5. Only the Lead COR will identify and request the Contractor to pursue and capture a single WH&B. Pursuing a single WH&B should be a rare event and not standard practice. If the animal is identified as a stud, further pursuit should be abandoned unless for management purposes (such as public safety, nuisance animals, or animals outside HMA boundaries or on private lands) it is necessary to capture the animal.

6. The Lead COR will ensure every effort is made to prevent foals from being left behind or orphaned in the field. If a foal has to be dropped from a group being brought to the trap because it is getting too tired or cannot keep up, the pilot will relay to the Lead COR and ground crew the location of the foal and a description of the mare to facilitate "pairing-up" at temporary holding. In this case, the Contractor will provide trucks/trailers and saddle horses for the retrieval of the foal and transport the foal to the gather site or temporary holding. If the helicopter is needed to locate and capture the foal, retrieval of the foal should occur prior to another band being located and driven to the trap. The method of capture will be directed by the Lead COR.

7. The Lead COR will ensure that if during the gather any WH&B (including foals or horses that may be aged, lame, injured or otherwise appear weak or debilitated) appear to be having difficulty keeping up with the group being brought in, the Contractor will accommodate the animals having difficulty to allow for rest before proceeding, drop those animals from the group, or drop the entire group. It is expected that animals may be tired,

sweaty and breathing heavily on arrival at a trap, but they should not be herded in a manner that results in exhaustion or collapse.

8. The need to rope specific WH&B will be determined by the Lead COR on a case-by-case basis.

9. While gathering, a WH&B may escape or evade the gather site while being moved by the helicopter. If there are foals in the band and an animal that has evaded capture has been identified as a mare that might have one of these foals, the Contractor may make multiple attempts to move the mare by the helicopter to the gather site for capture prior to roping or other alternative for capture. In these instances, animal condition and fatigue will be evaluated by the Lead COR on a case-by-case basis to determine the number of attempts that can be made to capture the animal. Animals will not be pursued to a point of exhaustion or distress.

10. Mares and their dependent foals will be separated from other animals at the temporary holding facility and moved to a designated BLM preparation facility. The Lead COR will ensure that any foals that are not weaned and have been maintained with their mares at temporary holding will be transported with their mares to the BLM preparation facilities as soon as practical.

11. The Lead COR will ensure that all sorting, loading or unloading of WH&B will be performed during daylight hours.

12. All handling pens, including the gates leading to the alleyways, should be covered with a material which serves as a visual barrier (plywood, burlap, plastic snow fence, etc.) and should be covered a minimum of 1 foot to 5 feet above ground level for burros and 2 feet to 6 feet for horses. Perimeter panels on the holding corrals should be covered to a minimum height of 5 feet for burros and 6 feet for horses. Those panels attached to and leading directly into the trailers from the trap will be covered with a material which serves as a visual barrier. Padding should be installed on the overhead bars of all narrow gates used in single file alleys leading or leaving the squeeze chute set up. Screening will be placed on all division gates in the sorting area and solid fencing placed on panels from the working chute to the semi-trailers in an effort to decrease outside stimuli.

13. When dust conditions within or adjacent to the trap or holding facility so warrant, the Contractor shall be required to wet down the ground with water.

14. When possible (e.g., soil conditions allow) and as needed (e.g., the WH&B are unwilling to step up), the Lead COR should request that the Contractor will have the trailer floor at ground level to ease the loading of WH&B at the gather site.

15. If the pilot is moving WH&B and observes an animal that is clearly injured or suffering, the animal should be left on the range and its location noted. The BLM Lead COR with veterinary assistance from an Animal Plant Health Inspection Service or locally licensed veterinarian will then go to the identified location as promptly as possible so that any animal that cannot make it to the trap will be inspected to determine the problem. The Lead COR will then decide on the most appropriate course of action.

16. Injuries that required veterinary examination or treatment, deaths and spontaneous abortions that occur will be noted in gather reports and statistics kept by the Lead COR.

17. At the discretion of the Lead COR, if a WH&B is injured or in distress during gather operations and the animal is within the wings or first corral of the trap, gather operations may be temporarily suspended if necessary to provide care for the animal and subsequent removal. Such actions should take place prior to the trapping of additional animals whenever possible.

18. The Contractor shall provide animals held in facilities with a continuous supply of fresh clean water at a minimum rate of 10 gallons per animal per day. Pens containing more than 50 animals will have water provided in at least two separate locations of the pen (i.e. opposite ends of the pen). Animals held for 10 hours or more in the traps 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. If the task order notes that weed free hay is to be used for this gather the Contractor will provide certified weed free hay in the amounts stated above. The Contractor will have to have documentation that the hay is certified weed free. An animal that is held at a temporary holding facility after 5:00 p.m. and on through the night, is defined as a WH&B 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.

19. When extreme environmental conditions exist (such as temperature) during a gather, the overall health and well-being of the animals will be monitored and the Lead COR will adjust gather operations as necessary to protect the animals from climatic and gather related health issues. The Lead COR should be equipped to take air temperatures periodically throughout the day to help with the monitoring of environmental conditions at the gather site. There may be days when the Lead COR determines that gather operations must be suspended or ceased based on temperatures or other environmental conditions.

20. The rate of movement and distance the animals travel shall not exceed limitations set by the Lead COR who will 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 may travel will take into account the different factors listed above and other concerns relevant to individual HMAs. With foals, pregnant mares, or horses that are weakened by body condition, age or poor health, the appropriate herding distance and rate of movement will be determined on a case-by-case basis considering the weakest or smallest animal in the group and the range and environmental conditions present. The maximum gather distance will depend on the specific animal and environmental conditions on the day of the gather and direct dialogue with the pilot/ Contractor and Lead COR to provide important information as to numbers, number of foals, locations distance and/or overall animal and/ or environmental conditions. The trap locations will be moved closer to horse locations whenever possible to minimize the distance the animals need to travel.

21. The Lead COR or IC should be available to provide a short briefing to any members of the public that may be present at the end of daily operations, including the preliminary tallies on the total number of animals captured by sex, number of foals, and any incident that required medical attention or euthanasia. This briefing should occur at temporary holding corral after all animals have been sorted, fed and watered and allowed to settle. The public should be clearly informed that such preliminary tallies may change after all the information is processed from the day's gather and that the final results of the day's gather will be posted to the appropriate BLM website.

22. The Lead COR should ensure that holding alleys will not be overcrowded at temporary holding facilities. If there is a risk of overcrowding, gates should remain open to allow animals to move back out of the alley and be reloaded. If an animal falls in the alley no other animals should be moved through the alleyway until the animal stands on its own or the alleyway is clear.

23. The Lead COR should ensure that animals will not be left in alleyways for any extended period of time (greater than 30 minutes). If personnel are not present at the temporary holding corrals to sort animals, the horses should be placed into a holding pen until such time as they can be sorted and placed into the appropriate pen.

24. Bait/water trapping: All traps will be checked a minimum of once every 24 hours when the traps are "set" to capture without human presence (trip trigger traps, finger traps, etc.). All handling procedures outlined above in this document apply to bait trapping to the extent applicable.

Again, at all times, the care and treatment provided by the BLM and our Contractors should be characterized by *compassion and concern* for the animal's well-being and welfare needs. The IC will ensure that everyone involved in gather operations receives a copy of these expectations prior to the start of the gather and the Lead COR and all BLM employees present shall ensure that gather operations are conducted in compliance with these expectations.

Timeframe: This IM is effective immediately.

Budget Impact: Unit costs for conducting gathers as a result of this interim guidance are not expected to increase significantly when compared to existing costs.

Background: The BLM is committed to the humane treatment and care of WH&B through all of the phases of its WH&B program. To ensure a clearer statement of its expectations and greater consistency in the program, the development of a Comprehensive Animal Welfare Policy has been undertaken. In addition to the standard operating procedures (SOP) for capture operations, SOPs for management on the range, capture operations, short- and long-term holding facilities, transportation, and adoption will be developed.

Manual/Handbook Sections Affected: None

Coordination: This IM was coordinated among WO-200, WO-260, WO-600, WO-610, WO-LE, WH&B State Leads, WH&B Specialists, State External Affairs Leads, public affairs and law enforcement staff in the field.

Contact: Any questions regarding this IM can be directed to Joan Guilfoyle, Division Chief, Wild Horse and Burro Program (WO-260) at 202-912-7260.

Signed by:
Edwin L. Roberson
Assistant Director
Renewable Resources and Planning

Authenticated by:
Robert M. Williams
Division of IRM Governance,WO-560

Last updated: 02-01-2013

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240
http://www.blm.gov

December 18, 2008

In Reply Refer To:
4730/4700 (260) P

EMS TRANSMISSION 12/19/2008
Instruction Memorandum No. 2009-041
Expires: 09/30/2010

To: All Field Officials (except Alaska)

From: Assistant Director, Renewable Resources and Planning

Subject: Euthanasia of Wild Horses and Burros for Reasons Related to Health, Handling and Acts of Mercy

Program Area: Wild Horses and Burros

Purpose: This policy identifies requirements for euthanasia of wild horses and burros for reasons related to health, handling and acts of mercy.

Policy/Action: Final decisions regarding euthanasia of a wild horse or burro rest solely with the authorized officer (43 CFR 4730). It is understood that there will be cases where this decision must be made in the field and cannot always be anticipated. Appropriate wild horse and burro personnel at facilities and in the field should be delegated as the authorized officer regarding euthanasia of wild horses and burros. Euthanasia will be carried out following the procedures described in the 4730 Manual. The death record should specify that euthanasia was performed and the reason that it was performed in the appropriate Wild Horse and Burro automated data system. These systems are the Wild Horse and Burro Information System (WHBIS) or the Wild Horse and Burro Program System (WHBPS).

A Bureau of Land Management (BLM) authorized officer will euthanize or authorize the euthanasia of a wild horse or burro when any of the following conditions exist:

(1) Displays a hopeless prognosis for life;

(2) Is affected by a chronic or incurable disease, injury, lameness or serious physical defect (includes severe tooth loss or wear, club foot, and other severe acquired or congenital abnormalities);

(3) Would require continuous treatment for the relief of pain and suffering in a domestic setting;

(4) Is incapable of maintaining a Henneke body condition score (see Attachment 1) greater than or equal to 3, in its present environment;

(5) Has an acute or chronic illness, injury, physical condition or lameness that would not allow the animal to live and interact with other horses, keep up with its peers or maintain an acceptable quality of life constantly or for the foreseeable future;

(6) Where a State or Federal animal health official orders the humane destruction of the animal(s) as a disease control measure;

(7) Exhibits dangerous characteristics beyond those inherently associated with the wild characteristics of wild horses and burros.

When euthanasia will be performed and how decisions will be made and recorded in a variety of circumstances is described below.

Euthanasia in field situations (includes on-the-range and during gathers):

(A) If an animal is affected by a condition as described in 1-7 above that causes acute pain or suffering and immediate euthanasia would be an act of mercy, the authorized officer must promptly euthanize the animal.

(B) The authorized officer will report actions taken during gather operations in the comment section of the daily gather report (Attachment 2). Documentation will include a brief description of the animal's condition and reference the applicable criteria (including 1-7 above or other provisions of this policy). The authorized officer will release or euthanize wild horses and burros that will not tolerate the handling stress associated with transportation, adoption preparation or holding. However, the authorized officer should, as an act of mercy, euthanize, not release, any animal which exhibits significant tooth loss or wear to the extent their quality of life would suffer.

(C) If euthanasia is performed during routine monitoring, the Field Manager will be notified of the incident as soon as practical after returning from the field.

Euthanasia at short-term holding facilities:

Ideally, no horse or burro would arrive at preparation or other facilities with conditions that require euthanasia. However, problems can develop during or be exacerbated by handling, transportation or captivity. In these situations the authority for euthanasia will be applied as follows:

(A) If an animal is affected by a condition as described in 1-7 above that causes acute pain or suffering and immediate euthanasia would be an act of mercy, the authorized officer must promptly euthanize the animal.

(B) If an animal is affected by a condition as described in 1-7 above, but is not in acute pain, the authorized officer has the authority to euthanize the animal, but should first consult a veterinarian. As an example, if the animal has a physical defect or
deformity that would adversely impact its quality of life if it were placed in the adoption program or on long-term holding, but acute suffering is not apparent, a veterinarian should be consulted prior to euthanasia.

(C) If the authorized officer concludes, after consulting with a veterinarian, that a wild horse or burro in a short-term holding facility cannot tolerate the stress of transportation, adoption preparation, or long-term holding then the animal should be euthanized.

Euthanasia at long-term holding facilities:

This section sets euthanasia policy for the BLM at long-term holding (LTH) facilities including those that may be added in the future.

The BLM Wild Horse and Burro (WH&B) Specialist responsible for oversight of the LTH facility (the Project Inspector) and the LTH contractor will evaluate all horses and their body condition throughout the year. During the year if any animal is affected by any of the conditions listed in 1-7 above, the contractor or other person authorized by the Project Inspector must euthanize that animal. Once a year a formal body condition evaluation as well as a formal count of all horses at long-term holding facilities will be conducted. The action plan for the formal evaluation is as follows:

1. All animals will be inspected by field observation to evaluate body condition and identify animals that may need to be euthanized to prevent a slow death due to deterioration of condition. This evaluation will be based on the Henneke body condition scoring system. The evaluation team will consist of a BLM WH&B Specialist and a veterinarian acceptable to BLM.

The evaluations should be conducted in the fall (September through November) to identify horses with body condition scores of 3 or less.

2. Animals with a body condition score less than 3 will be euthanized in the field soon after the evaluation by the authorized officer or a designated representative such as the contractor. Horses with a score of 3 will remain in the field and will be re-evaluated by the contractor and the Project Inspector for that contract in 60 days to see if their condition is improving, staying the same or declining. Those that are declining in condition will be euthanized as soon as possible after the second

evaluation.

3. Euthanasia will be carried out with a firearm by the authorized officer or a designated representative. Field euthanasia does not require that the animals are gathered which would result in increased stress and could cause injury to the horse being euthanized or other horses on the facility.

4. Documentation for each animal euthanized will include sex, color, and freeze/hip brand (if readable). Copies of all documentation will be given to the contractor and retained by the BLM.

5. Arrangements for carcass disposal for euthanized animals will be in accordance with applicable state and county regulations.

Euthanasia of Unusually Dangerous Animals:

Unusually aggressive wild horses or burros can pose an unacceptable risk of injury when maintained in enclosed spaces where some level of handling is required. When a horse or burro is unusually dangerous, it is reasonable to conclude that an average adopter could not humanely care for the animal as required by the regulations (e.g., provide proper transportation, feeding, medical care, and handling 43 CFR 4750.1). The BLM cannot solve the problem by removing unusually dangerous animals from the adoption system and placing them in a LTH facility because this resolution also poses significant risk of injury, both to animals in transport, and to BLM personnel and LTH operators.

When deciding to euthanize an animal because it is unusually dangerous, the authorized officer, in consultation with a veterinarian, extension agent, humane official, or other individual acceptable to the authorized officer, must determine that the animal poses a significant and unusual danger to people or other animals beyond that normally associated with wild horses and burros. The authorized officer must document the aspects of the animal's behavior that make it unusually dangerous.

Euthanasia of a Large Number of Animals for Reasons Related to Health, Handling and Acts of Mercy

When the need for euthanasia of an unusually large number of animals is anticipated, the likely course of action should be identified and outlined in advance whenever possible. When field monitoring and pre-gather planning identify an increased likelihood that animals may need to be euthanized during a gather, this should be addressed in the gather plan. In an on-the-range or facility situation where a gather is not involved, advanced planning should also be done whenever possible. Arrangements should be made for a USDA Animal and Plant Health Inspection Service (APHIS) or other veterinarian to visit the site and consult with the authorized officer on the euthanasia decisions. This consultation should be based on an examination of the animals by the veterinarian. It should include a detailed, written evaluation of the conditions, circumstances or history of the situation and the number of animals involved.

Where appropriate, this information should be specific for each animal affected. During this planning stage, it is critical that the Authorized Officer include the State Office WH&B Program Lead; appropriate State Office, District Office, and Field Office Managers; the WH&B National Program Office (NPO); and any contractors that may be involved.

A euthanasia plan of action will include practical considerations including: (1) who will destroy the affected animals, (2) what method of euthanasia will be used, and (3) how carcasses will be disposed of. A communications plan for internal and external contacts (including early alerts to State, National Program and Washington Offices) should be developed in advance or concurrently while addressing the situation at hand. The communications plan should address the need for the action, as well as the appropriate messages to the public and the media. This will include why animals are being euthanized and how the action is consistent with BLM's responsibilities and policy.

Timeframe: This policy is effective upon issuance.

Budget Impact: Implementation of these actions would not result in additional expenditures over present policies.

Manual/Handbook Sections Affected: No manual or handbook sections are affected.

Background: The authority for euthanasia of wild horses or burros is provided by the Wild Free-Roaming Horses and Burros Act of 1971, Section3(b)(2)(A) 43 CFR4730.I and BLM Manual 4730, *Destruction of Wild Horses and Burros and Disposal of their Remains*.

Decisions to euthanize require that BLM evaluate individual horses or burros affected by injury, physical defect, chronic or incurable disease, severe tooth loss, poor condition or old age. BLM should consider the animal's ability to survive the stress of removal and/or its probability of surviving on the range if released or transported to a BLM facility, adoption or long-term holding. Humane, long-term care of these animals requires periodic evaluation of their condition to provide for their well-being. These evaluations will, at times, result in decisions that will require euthanasia.

Coordination: This document was coordinated with the Wild Horse and Burro Specialists in each affected state and the National Program Office.

Contact: Questions regarding this memorandum should be directed to Lili Thomas, Wild Horse and Burro Specialist, Wild Horse and Burro National Program Office, at (775) 861-6457.

Signed by:
Edwin L. Roberson
Assistant Director
Renewable Resources and Planning

Authenticated by:
Robert M. Williams
Division of IRM Governance,WO-560

2 Attachments
1 – Henneke body condition (1 p)
2 – Gather Summary Report (2 pp)

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240
http://www.blm.gov

January 15, 2009

In Reply Refer To:
4710 (260) P

EMS TRANSMISSION 01/15/2009
Instruction Memorandum No. 2009-062
Expires: 09/30/2010

To: All Field Officials (except Alaska)

From: Assistant Director, Renewable Resources and Planning

Subject: Wild Horse and Burro Genetic Baseline Sampling

Program Area: Wild Horse and Burro Program

Purpose: This Instruction Memorandum (IM) establishes program guidance and policy for the collection of genetic baseline information for wild horse and burro populations. This data will be beneficial to authorized officers and field specialists that are responsible for herd management decisions.

Policy/Action: The Wild Free-Roaming Horses and Burros Act requires that horses and burros on public lands be managed in a manner that achieves and maintains thriving ecological balance. Maintenance of such a balance frequently requires that wild horse populations be kept small. When population size is too small, it will inevitably lead to decreased genetic variation and possible inbreeding. However, it is possible to manage small populations in a manner that will minimize the loss of variation and inbreeding and if necessary, counteract the loss. The first step in this process is an assessment of the current genetic status of the population that will be followed by periodic monitoring assessments.

Genetic marker analysis can provide information about both the past and the future of a population. Because gene markers are passed from one generation to the next, they can tell us something about the ancestry of a population. Also, because demographics can affect the distribution of genetic markers within a population, these markers can often be used to interpret past populational characteristics. In the same way, current demographic conditions can be used to make predictions about the future level of variability of gene markers.

Prior to 2006, blood samples from wild horses and burros were collected during gather operations and analyzed by Dr. Gus Cothran (University of Kentucky) for establishing baseline genetic data. With Dr. Cothran's move to Texas A&M University, this analysis is now being done using hair samples. A new baseline does not need to be established through hair analysis if blood analysis has already been completed. Unless there is a previously recognized concern regarding low genetic diversity in a particular herd, it is not necessary to collect genetic information at every gather. Typical herds should be sampled every ten to 15 years (two to three gather cycles). Following processing, a sample of DNA will be preserved (frozen) for each horse tested. A report on the analysis of the population will be provided by Dr. Cothran. Reports are to be kept on file at local Field Offices and also at the National Program Office. Attachment 1 contains the instructions for collecting, handling, and shipping of the hair samples.

While it is preferred to collect the hair samples from horses or burros that are released back to the herd management area (HMA), samples may also be collected from removed horses if necessary. In complexes or HMAs where separate breeding populations are thought to exist, each group of animals in a distinct population should be sampled separately. Do not mix samples from different horses or different breeding populations. Mixing samples from non-interbreeding herds can give misleading estimates of genetic variation. Minimum sample size is 25 animals or 25% of the post-gather population, not to exceed 100 animals per HMA or separate breeding population. Samples should be collected from males and females in the same approximate ratio as the population. Animals of any age

class may be sampled. Burros should be sampled in the same manner as horses.

The data will be compared to similar data from both domestic and other wild horse/burro populations. The primary value of this initial data is a baseline against which future samples can be compared to identify genetic drift and any narrowing of diversity through inbreeding. In the short term, genetic diversity can be determined, rare alleles indentified and historic origins of and relationships among herds can be implied.

Timeframe: This IM is effective upon issuance.

Budget Impact: Costs associated with implementation of this IM will include the Bureau of Land Management (BLM) labor for collection of samples as well as sample processing and analysis at Texas A&M University. It is anticipated that costs for processing each sample will be $25-30 per sample while the analysis and reporting is estimated at $300 per report.

Background: The BLM has been collecting genetic health information about its wild horse and burro populations since the early 1990's. To date, approximately 75% of the 199 HMAs that BLM administers have been tested and many have been retested. Based on this data, inbreeding is apparently rare in wild horse populations. Most wild horse herds that have been sampled exhibit moderate levels of genetic heterozygosity. Based on this analysis, approximately 12.5% of the herds tested have heterozygosity levels (observed heterozygosity (Ho)) below the assumed critical level of .310. These are herds that could begin to show inbreeding effects. Approximately 15% of the herds tested are within just 2% heterozygosity (.330) of the critical level. A population that is maintained at less than 100-120 adult animals may begin to lose variation fairly quickly. The herds that are just above the critical threshold level could drop very quickly. Only a very small number (approximately 5) of the 199 HMAs have exhibited characteristics possibly attributable to inbreeding, such as cataract blindness, dwarfism, parrot-mouth, or club-foot deformities. Thus, there does not appear to be any immediate cause for concern about inbreeding depression in wild horse herds.

Manual/Handbook Sections Affected: These monitoring requirements will be incorporated into 4710 handbook. This policy is consistent with the Strategic Research Plan – Wild Horse and Burro Management.

Coordination: The requirements outlined in this policy have been evaluated by the Wild Horse and Burro Research Advisory Team, reviewed by Field Specialists and coordinated with the National Wild Horse and Burro Advisory Board.

Contact: Questions concerning this policy should be directed to Alan Shepherd, Wild Horse and Burro Research Coordinator, at the Wyoming State Office (307) 775-6097.

Signed by:
Edwin L. Roberson
Assistant Director
Renewable Resources and Planning

Authenticated by:
Robert M. Williams
Division of IRM Governance,WO-560

1 Attachment
1- Genetics Data Collection Instructions (2 pp)

BUREAU OF LAND MANAGEMENT

Print Page

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240
http://www.blm.gov

January 23, 2013

In Reply Refer To:
4710 (WO 260) P

EMS TRANSMISSION 01/30/2013
Instruction Memorandum No. 2013-058
Expires: 09/30/2014

To: All Field Office Officials (except Alaska)

From: Assistant Director, Renewable Resources and Planning

Subject: Wild Horse and Burro Gathers: Public and Media Management

Program Area: Wild Horse and Burro (WH&B) Program

Purpose: The purpose of this Instruction Memorandum (IM) is to establish policy and procedures for safe and transparent visitation by the public/media at WH&B gather operations, while ensuring the humane treatment of wild horses and burros.

Policy and Action: Effective immediately, all State, District, and Field offices must comply with the new policy of this IM for all gathers within their jurisdiction. This policy establishes the procedures for safe and transparent visitation by the public/media at WH&B gather operations.

This IM is part of a package of forthcoming IMs covering aspects of managing wild horse and burro gathers, including:

- IM No. 2013-060, Wild Horse and Burro Gathers: Management by Incident Command System;
- IM No. 2013-061, Wild Horse and Burro Gathers: Internal and External Communicating and Reporting;
- IM No. 2013-059, Wild Horse and Burro Gathers: Comprehensive Animal Welfare Policy

The BLM's on-site Core Gather Team (CGT) consists of four individuals: an Incident Commander (IC), Lead Contracting Officer's Representative (Lead COR), Lead Public Affairs Officer (Lead PAO), and Lead Law Enforcement Officer (Lead LEO). Specific roles and responsibilities of each of these core positions and all other personnel, including Contracting Officer (CO), are addressed in IM No. 2013-060, Wild Horse and Burro Gathers: Management by Incident Command System.

National Policy Regarding Access for Public and Media Observation of Gather Operations

- Every gather day is considered a public observation day unless the Agency Representative/Authorizing Officer (AR/AO) has made a decision to temporarily close or restrict access on public lands due to availability of gather observation sites, safety concerns or other considerations relevant to individual gather observations. Gather operations involve some level of inherent risk due to both the nature of working with wild animals, and risks associated with normal helicopter operations. Risks are highest near the trap-site area. The BLM generally allows members of the public an opportunity to safely view gather operations from designated observation areas near the trap-site and at temporary holding facilities, but they must be escorted to those areas by BLM personnel. If a trap-site space will not safely accommodate public/media observation, then alternative viewing opportunities will be discussed and resolved prior to gather operations beginning in a given area.
- If the best location for gather facilities are on private lands or if access across private lands is necessary to access gather facilities on the public lands, prior to the start of the gather operations, BLM will make every effort to obtain permission from private landowners to allow for public ingress/egress through or to host the public/media visitation on the private lands. If permission cannot be obtained and public access limitations exist, this will be announced as soon as determined. Every effort should be made in locating gather facilities to minimize such access limitations.
- The IC should work to ensure that the public/media have opportunities to safely observe gather activities at the trap-site and temporary holding facilities when practicable. The IC should also work to ensure that gather safety is maintained at all times and that the public/media's presence at the gather is successful.
- The Lead COR coordinates the selection of the public/media-designated observation area(s) with the other members of the CGT and the Contractor to select the location that provides the best viewing of activities while also providing for the safety of the public/media, gather staff, Contracting staff and the animals. All trap-site observation areas will be selected prior to the beginning of operations and before the arrival of public/media observers.
- Decisions and changes to agreed upon start times for gather operations will be fully coordinated and communicated between the CGT and the Contractor, through the Lead COR. The Lead PAO will work closely with the CGT to make necessary coordination of planned daily public/media meeting times and locations to get public/media into designated observation areas prior to daily trapping activities, and at designated observation areas at temporary holding and shipping areas. Opportunities for the public/media to visit temporary holding facilities and view the shipping activities should also be provided to the extent practicable.
- The IC will ensure that decisions made and actions taken regarding public/media access to the trap-site, temporary holding facilities and other sites during the gather operations are in conformance with the standards found in existing guidance and that may be identified in IM. 2013-059, Wild Horse and Burro Gathers: Comprehensive Animal Welfare Policy.
- The Lead PAO serves as the liaison between the CGT and the public/media and is responsible for conducting media interviews and managing public/media visits including facilitating the movement of public/media during all aspects of gather operations.
- The Lead PAO will endeavor to provide stock B-roll footage of gather operations to the media upon request, resources permitting.
- The Lead LEO ensures safety by addressing public actions that may pose a safety or operational threat to the gather, including the immediate removal from the gather of individuals exhibiting unsafe or disruptive behavior. The IC is responsible for having any public/media exhibiting unsafe or disruptive behavior removed from the gather area immediately after consultation with the Lead LEO. Instances of unsafe or disruptive behavior will be immediately addressed.
- Any disruptive behavior or interference with the gather operation by any member of the public/media, such that the safety, health, and welfare of animals or people is threatened, will result in the *suspension* or *shutting down* of the gather operation until the situation is resolved and safety is restored. The authority to *suspend* gather operations lies with the Lead COR. The authority to fully *shut down* gather operations lies with the CO. Specific authority for the enforcement of these concerns may be addressed by LEOs with the enforcement of 43 CFR 8365.1-4 (*Public health, safety and comfort*); and, if applicable when closure order exists, 43 CFR 8364.1(d) (*Violation of Court Order or Restriction Order*).

- A LEO will be available at all times when the public/media are present within the gather operations area and at temporary holding/shipping areas. Exceptions to this will be determined by the CGT.
- The on-site veterinarian may be asked by the IC or COR to help BLM with technical questions or information regarding animal health, condition, or welfare; but at no time shall an on-site or Animal and Plant Health Inspection Service (APHIS) veterinarian be asked or allowed to address or directly answer questions from the public/media. Requests directed to APHIS about their participation in gathers should be referred to APHIS Legislative and Public Affairs Media Coordinators.
- The trap-site and temporary holding areas are designated as safety zones and only essential personnel will be allowed inside these safety zones during gather operations or while animals are in the trap or temporary holding areas. Essential personnel will normally consist of the Lead COR, Project Inspector (PI), and on-site veterinarian. When other BLM personnel (such as the CGT, BLM videographers, and BLM photographers) have a need to be in in the safety zone on a limited basis, they are authorized as temporary essential personnel for that purpose.
- Where appropriate, the AR/AO may grant access to non-BLM personnel, such as Comprehensive Animal Welfare Policy Auditors and National WH&B Advisory Board Members, to the safety zone on a limited basis, as temporary essential personnel.
- The IC, State Director, and the WH&B Division Chief will jointly decide who constitutes temporary essential personnel in cases otherwise not described.
- Unofficial passengers (public/media, etc.) are not authorized to travel in government-owned vehicles in accordance with BLM Handbook G-1520-3 Fleet Management, Chapter 1. § III (B).
- The public/media are prohibited from riding or placing equipment in the helicopters contracted for a gather. The National Gather Contract Attachment 1 §C.9.d states "under no circumstances will the public or any media or media equipment be allowed in or on the gather helicopter while the helicopter is on a gather operation." The placement of public/media cameras or recording equipment on panels, gates and loading equipment including trucks and trailers are also prohibited.
- The minimum distance between the public/media and the helicopter operations shall be established in accordance with "Guidance regarding distance of helicopter operations from persons and property during Wild Horse and Burro gather operations" issued by the BLM Fire and Aviation Directorate on June 14, 2011, as required by Federal Aviation Administration (FAA) regulations. However, within those constraints, the locations that will provide the best unobstructed view of the gather operations should be identified for public/media observation opportunities as described below.
- The minimum distance between the public/media and non-essential personnel and the perimeter of the temporary holding facility should be established for the gather during the pre-work conference with the Contractor and prior to any public/media presence. This viewing distance should result in minimal disturbance to the wild horses and burros held in the facility and should be flexible based on observed animal behavior and response. The CGT may consider the use of elevated viewing such as a flatbed trailer or hillside in those cases where the observation location is at a greater distance from the gather operation.
- The CGT retains the discretion to provide additional viewing opportunities at the trap-site on a case-by-case basis after the Lead COR has determined that no helicopter or loading activities will occur for a minimum of 30 minutes or gather operations have concluded for the day, so long as the animals that might be observed have settled down and such additional opportunities can be provided in a manner that will not result in increased stress to the gathered horses or interference with the gather activities. The Lead COR will get the concurrence of the CGT and Contractor of such additional opportunities prior to offering it to the public/media.

Timeframe: This IM is effective immediately.

Budget Impact: Unit costs for conducting gathers for removals and population growth suppression efforts have increased as a result of the staffing necessary for internal and external reporting associated with increased transparency. The budget impacts of visitation that occurs during WH&B gathers include substantial unplanned overtime and per diem expense. While limiting the number of BLM staff attending the gather to essential personnel may reduce gather costs, it should not be at the expense of the safety of the animals, gather personnel, or members of the public/media.

Background: The BLM has a longstanding policy of allowing public/media to view WH&B gathers. Advance planning helps ensure the safety of the animals, staff, Contractor personnel, and the public/media. The number of public/media interested in viewing gathers has increased in recent years, though interest varies from one HMA to another as well as State to State. In response to this, the BLM has implemented an Incident Command System to safely and appropriately manage the larger numbers of public/media.

A high degree of interest from the public/media to observe WH&B gathers is expected to continue. Strong communications and coordination among the on-site CGT will allow for safety and flexibility regarding the selection of observation areas for viewing trap-sites and the temporary holding facilities.

Manual/Handbook Sections Affected: None

Coordination: This IM was coordinated among WO-200, WO-260, WO-600, WO-610, WO-LE, WH&B State Leads, WH&B Specialists, State External Affairs Leads, public affairs, and law enforcement staff in the field.

Contact: Any questions regarding this IM can be directed to Joan Guilfoyle, Division Chief, Wild Horse and Burro Program (WO-260) at 202-912-7260, or Jeff Krauss, Division Chief, Public Affairs (WO-610) at 202-912-7410.

Signed by:
Edwin L. Roberson
Assistant Director
Renewable Resources and Planning

Authenticated by:
Robert M. Williams
Division of IRM Governance, WO-560

Last updated: 02-01-2013

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240

March 12, 2009

In Reply Refer To:
4710 (260) P

EMS TRANSMISSION 03/17/2009
Instruction Memorandum No. 2009-090
Expires: 09/30/2010

To: All Field Officials (except Alaska)

From: Assistant Director, Renewable Resources and Planning

Subject: Population-Level Fertility Control Field Trials: Herd Management Area (HMA) Selection, Vaccine Application, Monitoring and Reporting Requirements

Program Area: Wild Horse and Burro Program

Purpose: The purpose of this Instruction Memorandum is to establish guidance for population-level fertility control field research trials. The primary objective of these trials is to evaluate the effects of a single year or 22-month Porcine Zona Pellucida (PZP) immunocontraceptive vaccine treatment on wild horse population growth rates while expanding the use of these tools in the field.

Policy/Action: This policy establishes guidelines for selecting HMAs for population-level fertility control treatment, vaccine application, and post-treatment monitoring and reporting. It is the policy of the Bureau of Land Management (BLM) to apply fertility control as a component of all gathers unless there is a compelling management reason not to do so.

HMA Selection

Managers are directed to explore options for fertility control trials in all HMAs or complexes when they are scheduled for gathers. Further, an alternative outlining implementation of a fertility control treatment under a population-level research trial shall be analyzed in all gather plan environmental assessments (EA's). Attachment 1 contains the Standard Operating Procedures (SOPs) for the implementation of the single-year and 22-month PZP agents, which should be referenced in the EA.

Fertility control should not be used in a manner that would threaten the health of individual animals or the long-term viability of any herd. In order to address the latter requirement, managers must evaluate the potential effects of fertility control on herd growth rates through use of the Jenkins Population Model (WinEquus). Fertility control application should achieve a substantial treatment effect while maintaining some long-term population growth to mitigate the effects of potential environmental catastrophes.

Fertility control will have the greatest beneficial impact where:

1. Annual herd growth rates are typically greater than 5%.
2. Post-gather herd size is estimated to be greater than 50 animals.
3. Treatment of at least 50% of all breeding-age mares within the herd is possible using either application in conjunction with gathers or remote delivery (darting). A maximum of 90% of all mares should be treated and our goal should be to achieve as close as to this percentage as possible in order to maximize treatment effects.

Fertility control should not be dismissed as a potential management action even if the above conditions are not met. Regardless of primary capture method (helicopter drive-trapping or bait/water trapping), managers should strive to gather horses in sufficient numbers to achieve the goals of the management action, such as selective removal and fertility control treatment. After decisions are made to apply fertility control, historical herd information, remote darting success (if employed) and post-gather herd demographic data must be reported to the National Program Office (NPO). See the Reporting Requirements section on page four.

Vaccine Application and Animal Identification at Gather Sites Using the 22-Month Vaccine

Once an HMA has been selected as a population-level field trial site, the NPO will designate a trained applicator to administer the vaccine during the scheduled gather. The applicator will be responsible for securing the necessary vaccine from the NPO, transporting all application materials and freeze-marking equipment to the gather site, administering the treatment, and filing a treatment report with the NPO. See Attachment 1 for SOP for Population-level Fertility Control Treatments.

All treated mares will be freeze-marked with two 3.5-inch letters on the left hip for treatment tracking purposes. The only exception to this requirement is when each treated mare can be clearly and specifically identified through photographs. The treatment letters will be assigned and provided by the NPO after the gather and fertility control application is approved by the authorized officer. A different first letter is assigned for each fiscal year starting with fiscal year 2004 and the letter "A." The second letter of the freeze-mark is specific to the application.

Each BLM State Office (SO) is responsible for coordinating with the State Brand Inspector on the use of the identified two-letter freeze-mark. Based on this coordination, possible alternatives or additions to this marking policy are listed below:

1. Use of the adult or foal size angle-numeric BLM freezemark on the neck while recording each treatment product and date with the individual horse's freezemark number.
2. Registration of the BLM fertility control hip mark.
3. Use of a registered brand furnished by the State.
4. Use of the same hip freeze-mark for all fertility control treatments within that State's jurisdiction plus an additional freeze-mark on the neck to differentiate between treatments within the State.
5. Use of the NPO assigned freeze-mark plus additional freeze-mark on the neck to differentiate between treatments within the State.

As an example, the Nevada State Brand Inspector requires that an "F" freeze-mark be applied to the left neck along with the two-letter hip mark assigned by NPO.

Regardless of how the mares are marked, the marks must be identified in the fertility control treatment report in order to track when the mares were treated and the treatment protocol used.

Mares may be considered for re-treatment during subsequent gathers. All re-treatments will consist of the multi-year vaccine unless specifically approved by the NPO. Any re-treated mares must be re-marked or clearly identifiable for future information.

Vaccine Application and Animal Identification Using Remote Delivery (Darting)

Remote delivery of the one year vaccine by a trained darter/applicator will be considered and approved only when (1) application of the current 22-month PZP agent is not feasible because a gather will not be conducted, and (2) the targeted animals can be clearly and specifically identified on an on-going basis through photographs and/or markings. No animals should be darted that cannot be clearly and positively identified later as a treated animal. To increase the success rate of the darting and to insure proper placement of the vaccine, darting should occur along travel corridors or at water sources. If necessary, bait stations using hay or salt may be utilized to draw the horses into specific areas for treatment. The applicator will maintain records containing the basic information on the color and markings of the mare darted and her photographs, darting location, and whether the used darts were recovered from the field. See Appendix 1 for SOP for Population-Level Fertility Control Treatments.

Post-treatment Monitoring

At a minimum, the standard data collected on each treated herd will include one aerial population survey prior to any subsequent gather. This flight will generally occur 3 to 4 years after the fertility control treatment and will be conducted as a routine pre-gather inventory funded by the Field Office (FO). The flight should be timed to assure that the majority of foaling is completed, which for most herds will require that flights be scheduled after August 1st. In addition to pre-gather population data (herd size), information on past removals, sex ratio, and age structure (capture data) will be submitted to the NPO after the first post-treatment gather.

The following standard data will be collected during all post-treatment population surveys:

1. Total number of adult (yearling and older) horses observed.
2. Total number of foals observed.

These data are to be recorded on the Aerial Survey Report form (Attachment 4). In planning post-treatment population surveys, the new population estimation techniques being developed by U.S. Geological Survey (USGS) are strongly recommended. In general, however, it is not necessary that anyone try to identify treated and untreated mares and specifically which mares have foaled during aerial surveys.

To obtain more specific information on vaccine efficacy, some HMAs may be selected for intensive monitoring beginning the first year after treatment and ending with the first gather that follows treatment. These surveys should be completed annually within the same month for consistency of the data. Selection will be based on the proportion of treated mares in the herd, degree of success with vaccine application, degree to which HMA selection criteria are met, and opportunities for good quality data collection. This determination will be made by the WH&B Research Advisory Team and the NPO in consultation with the appropriate Field Office (FO) and State Office (SO). HMAs selected for intensive monitoring will be identified in that specific State's Annual Work Plan. Washington Office 260 (WO260) will provide funding for the annual surveys in those HMAs selected for intensive monitoring.

Field Office personnel may conduct more intensive on-the-ground field monitoring of these herds as time and budget allow. These data should be limited to: 1) the annual number of marked and unmarked mares with and without foals and 2) foaling seasonality. These data, generated for FO use, should be submitted to the NPO to supplement research by the USGS.

Reporting Requirements

1) When an HMA is selected for fertility control treatment, the HMA manager will initiate and complete the appropriate sections of the Gather, Removal, and Treatment Summary Report (Attachment 2) and submit the report to the NPO. At the conclusion of the gather and treatment, the HMA manager will complete the remainder of the Gather, Removal, and Treatment Summary Report and submit it to the NPO within 30 days. The NPO will file and maintain these reports, with a copy sent to the National WH&B Research Coordinator.

2) Following treatment, the fertility control applicator will complete a PZP Application Report and PZP Application Data Sheet (Attachments 3 & 4) and submit it to the NPO that summarizes the treatment. The NPO will maintain this information and provide copies of the reports to appropriate FOs and USGS.

3) Managers are required to send post-treatment monitoring data (Aerial Survey Report, Attachment 5) to the NPO within 30 days of completing each aerial survey. Any additional on-the-ground monitoring data should be sent to the NPO on an annual basis by December 31st.

4) During the next post-treatment gather (generally 4 to 6 years after treatment), the manager will complete a new Gather, Removal, and Treatment Summary Report with pertinent information and submit the report to the NPO. Completion of this report will fulfill the requirements for monitoring and reporting for each population-level study. A possible exception would be if mares are treated (or re-treated) and the HMA is retained as a population-level study herd.

The USGS will analyze all standard data collected. The results of these analyses along with other research efforts will help determine the future use of PZP fertility control for management of wild horse herds by the BLM.

Timeframe: This Instruction Memorandum is effective upon issuance.

Budget Impact: Implementation of this policy will achieve cost savings by reducing the numbers of excess animals removed from the range and minimizing the numbers of less adoptable animals removed. The costs to administer the one-year PZP agent include the labor and equipment costs for the applicator and assistant of roughly $4,000/month and the treatment cost of approximately $25 per animal. The costs to administer the 22-month PZP agent include the capture cost of about $1,000 per animal treated (under normal sex ratios it requires two horses, one stud and one mare, to be captured for each mare treated) and the PZP vaccine is approximately $250 per animal. The budgetary savings for each foal not born due to fertility control is about $500 for capture, $1,100 for adoption prep and short-term holding, $500-1,000 for adoption costs, and approximately $475 per year for long-term holding of animals removed but not adopted. For each animal that would have been maintained at long term holding for the remainder of its life after capture, the total cost savings is about $13,000. Any additional FO-level monitoring will be accomplished while conducting other routine field activities at no additional cost.

Population-level studies will help to further evaluate the effectiveness of fertility control in wild horse herds. Recent research results showed that application of the current 22-month PZP contraceptive appears capable of reducing operating costs for managing wild horse populations. Application of a 3-4 year contraceptive, when developed, tested, and available, may be capable of reducing operating costs by even more (Bartholow, 2004).

Background: The one-year PZP vaccine has been used with success on the Pryor Mountain and the Little Book Cliffs Wild Horse Ranges. The 22-month PZP vaccine has been administered to 1,808 wild horse mares in 47 HMAs since fiscal year 2004. This formulation has been shown to provide infertility potentially through the third year post-treatment as determined by a trial conducted at the Clan Alpine HMA in 1999. The intent of the ongoing population-level fertility control trials is to determine if the rate of population growth in wild horse herds can be reduced through the use of the currently available 22-month time-release PZP vaccine, applied within a 3-4 year gather and treatment cycle. Monitoring data collected over the next few years are essential to determine the effectiveness of the vaccine when applied on a broad scale as well as its potential for management use.

PZP is classified as an Investigational New Animal Drug and some level of monitoring will continue to be required until such time as the Food and Drug Administration (FDA) or the Environmental Protection Agency (EPA) either reclassify the vaccine or provide some other form of relief.

Manual/Handbook Sections Affected: The monitoring requirements do not change or affect any manual or handbook.

Coordination: The requirements outlined in this policy have been evaluated by the National Wild Horse and Burro Research Advisory Team, coordinated with the National Wild Horse and Burro Advisory Board, and reviewed by Field Specialists.

Contact: Questions concerning this policy should be directed to Alan Shepherd, WH&B Research Coordinator at the Wyoming State Office in Cheyenne, Wyoming

at (307) 775-6097.

Reference: Bartholow, J.M. 2004. **An economic analysis of alternative fertility control and associated management techniques for three BLM wild horse herds.** Fort Collins, CO: U.S. Geological Survey. Open-File Report 2004-1199. 33 p.

Signed by:
Edwin L. Roberson
Assistant Director
Renewable Resources and Planning

Authenticated by:
Robert M. Williams
Division of IRM Governance,WO-560

5 Attachments
1- Standard Operating Procedure for Population0level Fertility Control Treatments (2 pp)
2- Gather Removal, and Treatment Report (3 pp)
3- PZP Application Report (1 p)
4- PZP Application Data Sheet (1 p)
5- Aerial Survey Report (1 p)

Genetic Analysis of the Riddle Mountain HMA, OR009

E. Gus Cothran

March 29, 2012

Department of Veterinary Integrative Bioscience
Texas A&M University
College Station, TX 77843-4458

The following is a report of the genetic analysis of the Riddle Mountain HMA, OR009.

A few general comments about the genetic variability analysis based upon DNA microsatellites compared to blood typing. The DNA systems are more variable than blood typing systems, thus variation levels will be higher. Variation at microsatellite loci is strongly influenced by allelic diversity and changes in variation will be seen in allelic measures more quickly that at heterozygosity, which is why more allelic diversity measures are calculated. For mean values, there are a greater proportion of rare domestic breeds included in the estimates than for blood typing so relative values for the measures are lower compared to the feral horse values. As well, feral values are relatively higher because the majority of herds tested are of mixed ancestry which results in a relatively greater increase in heterozygosity values based upon the microsatellite data. There are no specific variants related to breed type so similarity is based upon the total data set.

METHODS

A total of 21 samples were received by Texas A&M University, Equine Genetics Lab on November 15, 2011. DNA was extracted from the samples and tested for variation at 12 equine microsatellite (mSat) systems. These were *AHT*4, *AHT*5 *ASB*2, *ASB*17, *ASB*23, *HMS*3, *HMS*6, *HMS*7, *HTG*4, *HTG*10, *LEX*33, and *VHL*20. These systems were tested using an automated DNA sequencer to separate Polymerase Chain Reaction (PCR) products.

A variety of genetic variability measures were calculated from the gene marker data. The measures were observed heterozygosity *(Ho)* which is the actual number of loci heterozygous per individual; expected heterozygosity *(He),* which is the predicted number of heterozygous loci based upon gene frequencies; effective number of alleles *(Ae)* which is a measure of marker system diversity; total number of variants *(TNV)*; mean number of alleles per locus (*MNA*); the

number of rare alleles observed which are alleles that occur with a frequency of 0.05 or less (*RA*); the percent of rare alleles (*%RA*); and estimated inbreeding level *(Fis)* which is calculated as 1-*Ho/He*.

Genetic markers also can provide information about ancestry in some cases. Genetic resemblance to domestic horse breeds was calculated using Rogers' genetic similarity coefficient, *S*. This resemblance was summarized by use of a restricted maximum likelihood (RML) procedure.

RESULTS AND DISCUSSION

Variants present and allele frequencies are given in Table 1. No variants were observed which have not been seen in horse breeds. Table 2 gives the values for the genetic variability measures of the Riddle Mountain HMA herd. Also shown in Table 2 are values from a representative group of domestic horse breeds. The breeds were selected to cover the range of variability measures in domestic horse populations. Mean values for feral herds (based upon data from 126 herds) and mean values for domestic breeds (based upon 80 domestic horse populations) also are shown.

Mean genetic similarity of the Riddle Mountain HMA herd to domestic horse breed types are shown in Table 3. A dendrogram of relationship of the Riddle Mountain HMA herd to a standard set of domestic breeds is shown in Figure 1.

Genetic Variants: A total of 66 variants were seen in the Riddle Mountain HMA herd which is below the mean for feral herds and well below the mean for domestic breeds. Of these, 21 had frequencies below 0.05 which is a high percentage of variants at risk of future loss. Allelic diversity as represented by *Ae* is low for feral herds as is *MNA*.

Genetic Variation: Observed heterozygosity in the Riddle Mountain HMA herd is well below the feral mean as is *He*. *Ho* is a slightly higher than *He*. Differences such as this can indicate a recent reduction in population size, within the past few generations, but this [is] not possible to confirm by DNA data alone. In comparison to horses sampled in 2009, heterozygosity levels have declined considerably while *Ae* is slightly reduced (despite a much smaller sample size in 2009) and the proportion of rare alleles has increased. This all indicates a loss of diversity.

Genetic Similarity: Overall similarity of the Riddle Mountain HMA herd to domestic breeds was about average for feral herds. Highest mean genetic similarity of the Riddle Mountain HMA herd was with the Old World Iberian breeds followed closely by the Light Racing and Riding breeds then the Oriental and Arabian breeds. As seen in Fig. 1, however, the Riddle Mountain HMA herd clusters a pony breed on the branch that has some Old World Iberian breeds and Oriental breeds. These results indicate a herd with mixed origins with no clear indication of primary breed type. As with most trees involving feral herds, the tree is somewhat distorted.

SUMMARY

Genetic variability of this herd is lower than the feral average but not critically so. However, in comparison, the horses from this herd tested in 2003 and 2009 (both years had small sample sizes) had greater diversity levels than in 2011. All evidence points to a recent reduction in population size that has led to a reduction in genetic variability. Genetic similarity results suggest a herd with mixed ancestry with some Spanish influence possible.

RECOMMENDATIONS

Current variability levels are high enough that no action is needed at this point but the herd should be monitored closely due to the trend for loss of variability. This is especially true if it is known that the herd size has seen a recent decline. Populations that consist of less than 100 individuals are at high risk of loss of variability and this can occur rapidly at low population numbers. It should be noted that the Riddle Mountain herd is genetically very close to the Kiger herd but different enough that exchange of a few individuals among these herds could restore variability levels.

Table 1. Allele frequencies of genetic variants observed in Riddle Mountain HMA feral horse herd.

VHL20										
I	J	K	L	M	N	O	P	Q	R	S
0.025	0.025	0.000	0.275	0.150	0.275	0.175	0.050	0.025	0.000	0.000

HTG4									
I	J	K	L	M	N	O	P	Q	R
0.000	0.000	0.175	0.025	0.625	0.000	0.000	0.175	0.000	0.000

AHT4										
H	I	J	K	L	M	N	O	P	Q	R
0.175	0.000	0.750	0.025	0.000	0.000	0.000	0.050	0.000	0.000	0.000

HMS7									
I	J	K	L	M	N	O	P	Q	R
0.000	0.000	0.075	0.650	0.250	0.025	0.000	0.000	0.000	0.000

AHT5									
I	J	K	L	M	N	O	P	Q	R
0.050	0.100	0.325	0.000	0.050	0.375	0.025	0.000	0.075	0.000

HMS6									
I	J	K	L	M	N	O	P	Q	R
0.000	0.000	0.000	0.025	0.275	0.050	0.100	0.550	0.000	0.000

ASB2										
B	I	J	K	L	M	N	O	P	Q	R
0.000	0.000	0.000	0.100	0.000	0.175	0.200	0.150	0.000	0.375	0.000

HTG10												
H	I	J	K	L	M	N	O	P	Q	R	S	T
0.000	0.000	0.000	0.250	0.000	0.075	0.000	0.475	0.025	0.050	0.125	0.000	0.000

HMS3											
H	I	J	K	L	M	N	O	P	Q	R	S
0.000	0.175	0.000	0.000	0.000	0.400	0.150	0.050	0.175	0.000	0.050	0.000

ASB17															
D	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
0.000	0.025	0.000	0.000	0.350	0.000	0.000	0.000	0.100	0.250	0.000	0.000	0.000	0.275	0.000	0.000

ASB2															
G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
0.000	0.000	0.025	0.125	0.575	0.075	0.000	0.000	0.000	0.000	0.000	0.000	0.150	0.025	0.025	0.000

LEX33											
F	G	K	L	M	N	O	P	Q	R	S	T
0.125	0.000	0.075	0.350	0.300	0.150	0.000	0.000	0.000	0.000	0.000	0.000

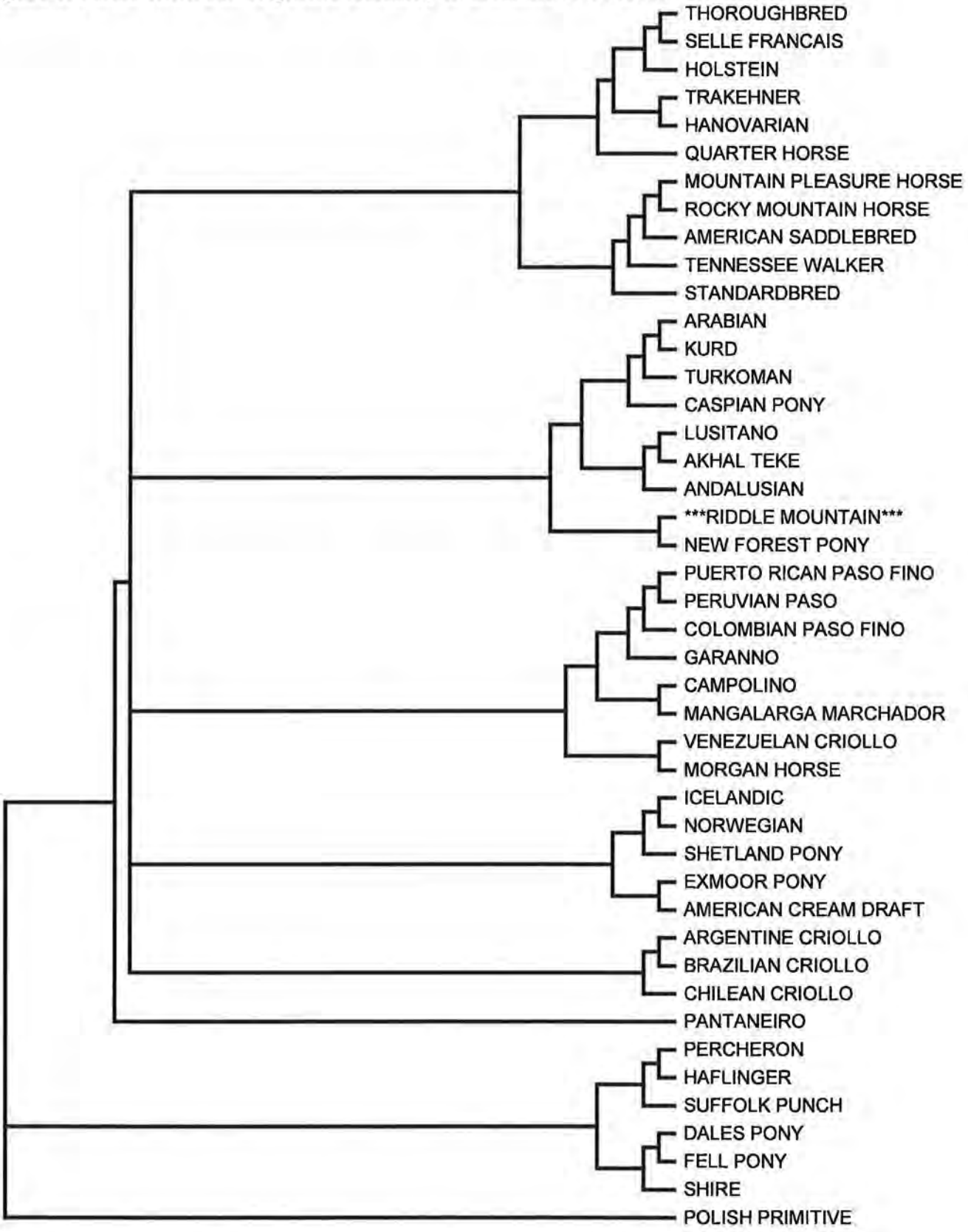
Table 2. Genetic variability measures.

	N	*Ho*	*He*	*Fis*	*Ae*	*TNV*	*MNA*	*Ra*	*%Ra*
RIDDLE MTN OR	**21**	**0.679**	**0.657**	**-0.034**	**3.21**	**66**	**5.50**	**21**	**0.318**
Cleveland Bay	47	0.610	0.627	0.027	2.934	59	4.92	16	0.271
American Saddlebred	576	0.740	0.745	0.007	4.25	102	8.50	42	0.412
Andalusian	52	0.722	0.753	0.041	4.259	79	6.58	21	0.266
Arabian	47	0.660	0.727	0.092	3.814	86	7.17	30	0.349
Exmoor Pony	98	0.535	0.627	0.146	2.871	66	5.50	21	0.318
Friesian	304	0.545	0.539	-0.011	2.561	70	5.83	28	0.400
Irish Draught	135	0.802	0.799	-0.003	5.194	102	8.50	28	0.275
Morgan Horse	64	0.715	0.746	0.041	4.192	92	7.67	33	0.359
Suffolk Punch	57	0.683	0.711	0.038	3.878	71	5.92	13	0.183
Tennessee Walker	60	0.666	0.693	0.038	3.662	87	7.25	34	0.391
Thoroughbred	1195	0.734	0.726	-0.011	3.918	69	5.75	18	0.261
Feral Horse Mean	126	0.716	0.710	-0.012	3.866	72.68	6.06	16.96	0.222
Standard Deviation		0.056	0.059	0.071	0.657	13.02	1.09	7.98	0.088
Minimum		0.496	0.489	-0.284	2.148	37	3.08	0	0
Maximum		0.815	0.798	0.133	5.253	96	8.00	33	0.400
Domestic Horse Mean	80	0.710	0.720	0.012	4.012	80.88	6.74	23.79	0.283
Standard Deviation		0.078	0.071	0.086	0.735	16.79	1.40	10.11	0.082
Minimum		0.347	0.394	-0.312	1.779	26	2.17	0	0
Maximum		0.822	0.799	0.211	5.30	119	9.92	55	0.462

Table 3. Rogers' genetic similarity of the Riddle Mountain HMA feral horse herd to major groups of domestic horses.

	Mean *S*	Std	Minimum	Maximum
Light Racing and Riding Breeds	0.723	0.021	0.691	0.748
Oriental and Arabian Breeds	0.715	0.018	0.692	0.740
Old World Iberian Breeds	0.728	0.021	0.707	0.759
New World Iberian Breeds	0.702	0.033	0.651	0.741
North American Gaited Breeds	0.704	0.030	0.669	0.734
Heavy Draft Breeds	0.632	0.046	0.582	0.685
True Pony Breeds	0.644	0.028	0.614	0.680

Figure 1. Partial RML tree of genetic similarity to domestic horse breeds.



Appendix 1. DNA data for the Riddle Mountain HMA, OR herd.

AID	VHL20	HTG4	AHT4	HMS7	AHT5	HMS6	ASB2	HTG10	HMS3	ASB17	ASB23	LEX3	LEX33
56718	NO	MP	JK	LM	JK	MP	KM	KK	MM	MN	KL	LM	KK
56719	LN	MM	JJ	LL	JN	MP	NQ	KK	IM	IR	KL	LM	KK
56720	JL	MM	HJ	LL	JK	MP	MN	OQ	MN	IR	JK	NN	LR
56721	MP	MM	JJ	KL	KQ	LM	OQ	OR	IP	IR	KS	LL	LO
56722	LO	MP	JJ	LM	KN	PP	MQ	KO	MM	IN	KK	LL	KR
56723	NO	MP	HJ	LM	IN	PP	MQ	OO	MP	IR	KS	LL	KK
56724	LN	KK	HJ	KM	NN	PP	QQ	OR	NO	IN	IS	KN	KQ
56725	MN	MM	JJ	LL	KK	MP	NO	KO	NN	RR	KU	MN	LO
56726	LM	MP	HJ	LL	KN	OP	QQ	KO	MR	IN	JK	FL	OR
56727	NO	KP	JO	LN	IN	PP	MN	MO	MP	IN	JS	FL	KL
56728	MN	MM	HH	LL	KO	OP	NQ	MO	NR	II	JK	FM	OR
56729	IN	MM	JO	LM	NN	MO	KK	KR	IP	MR	LT	MM	KR
56730	JL	MM	HJ	LL	JK	MP	MN	OQ	MN	IR	JK	NN	LR
56731	NO	LM	JJ	LL	JM	PP	QQ	MO	MN	FI	KS	MM	KQ
56732	LN	KP	JJ	LM	NN	PP	MN	OO	MP	NN	KS	FF	KR
56733	LO	KP	HJ	LM	KN	MP	OQ	OQ	MP	IR	JK	LL	KR
56734	LQ	KM	JJ	LM	MN	NP	MQ	OO	IM	IN	KK	MM	KO
56735	LM	KM	JJ	LM	KN	MP	OQ	OR	IO	MN	KK	KK	KQ
56736	LM	MM	JJ	LL	KK	MO	KO	KR	IM	MR	KK	NN	QQ
56737	NO	MM	JJ	LM	KN	MP	NQ	KO	MM	IN	KK	MM	KQ
56738	LP	MM	JJ	KL	QQ	MN	NO	OP	IP	RR	KK	LL	LO

Genetic Analysis of the
Kiger HMA, OR010

E. Gus Cothran

March 29, 2012

Department of Veterinary Integrative Bioscience
Texas A&M University
College Station, TX 77843-4458

The following is a report of the genetic analysis of the Kiger HMA, OR010.

A few general comments about the genetic variability analysis based upon DNA microsatellites compared to blood typing. The DNA systems are more variable than blood typing systems, thus variation levels will be higher. Variation at microsatellite loci is strongly influenced by allelic diversity and changes in variation will be seen in allelic measures more quickly that at heterozygosity, which is why more allelic diversity measures are calculated. For mean values, there are a greater proportion of rare domestic breeds included in the estimates than for blood typing so relative values for the measures are lower compared to the feral horse values. As well, feral values are relatively higher because the majority of herds tested are of mixed ancestry which results in a relatively greater increase in heterozygosity values based upon the microsatellite data. There are no specific variants related to breed type so similarity is based upon the total data set.

METHODS

A total of 40 samples were received by Texas A&M University, Equine Genetics Lab on November 15, 2011. DNA was extracted from the samples and tested for variation at 12 equine microsatellite (mSat) systems. These were *AHT*4, *AHT*5 *ASB*2, *ASB*17, *ASB*23, *HMS*3, *HMS*6, *HMS*7, *HTG*4, *HTG*10, *LEX*33, and *VHL*20. These systems were tested using an automated DNA sequencer to separate Polymerase Chain Reaction (PCR) products.

A variety of genetic variability measures were calculated from the gene marker data. The measures were observed heterozygosity *(Ho)* which is the actual number of loci heterozygous per individual; expected heterozygosity *(He),* which is the predicted number of heterozygous loci based upon gene frequencies; effective number of alleles *(Ae)* which is a measure of marker system diversity; total number of variants *(TNV)*; mean number of alleles per locus (*MNA*); the

number of rare alleles observed which are alleles that occur with a frequency of 0.05 or less (*RA*); the percent of rare alleles (*%RA*); and estimated inbreeding level *(Fis)* which is calculated as 1-*Ho/He*.

Genetic markers also can provide information about ancestry in some cases. Genetic resemblance to domestic horse breeds was calculated using Rogers' genetic similarity coefficient, *S*. This resemblance was summarized by use of a restricted maximum likelihood (RML) procedure.

RESULTS AND DISCUSSION

Variants present and allele frequencies are given in Table 1. No variants were observed which have not been seen in horse breeds. Table 2 gives the values for the genetic variability measures of the Kiger HMA herd. Also shown in Table 2 are values from a representative group of domestic horse breeds. The breeds were selected to cover the range of variability measures in domestic horse populations. Mean values for feral herds (based upon data from 126 herds) and mean values for domestic breeds (based upon 80 domestic horse populations) also are shown.

Mean genetic similarity of the Kiger HMA herd to domestic horse breed types are shown in Table 3. A dendrogram of relationship of the Kiger HMA herd to a standard set of domestic breeds is shown in Figure 1.

Genetic Variants: A total of 70 variants were seen in the Kiger HMA herd which is just below the mean for feral herds and below the mean for domestic breeds. Of these, 17 had frequencies below 0.05 which is about average for the percentage of variants at risk of future loss. Allelic diversity as represented by *Ae* and *MNA* is slightly below the average for feral herds.

Genetic Variation: Observed heterozygosity in the Kiger HMA herd from 2011 is well below the feral mean while *He* is only slightly lower than average. *Ho* is lower than *He*.

Differences such as this can indicate recent inbreeding through a reduction in population size, within the past few generations, but this not possible to confirm by DNA data alone. Heterozygosity and other variability values calculated from the Kiger HMA in 2009 were significantly higher than just three years later which shows that there is something greatly different in the herd now. Sample size from 2009 was just above half what the 2011 number was but sample size alone would not cause what is being seen as lower values are usually associated with lower sample size. Horses tested in 2002 had *Ho* levels very similar but slightly higher than did those from 2009. The 2002 horses were one that had been adopted and were part of the Kiger Mestino Registry.

Genetic Similarity: Overall similarity of the Kiger HMA herd to domestic breeds was about average for feral herds. Highest mean genetic similarity of the Kiger HMA herd was with Old World Iberian breeds, followed closely by the Oriental and Arabian breeds. As seen in Fig. 1, the Kiger HMA herd clusters with the South American Pantaniero breed in the branch with the main Old World Iberian breeds and Oriental breeds. These results indicate a herd with mixed origins with no clear indication of primary breed type but there does appear to be some Spanish blood based upon the 2011 sample. Evidence of Spanish influence has not been as apparent as it now is but there has been some suggestion of Spanish heritage with past testing including blood typing. As with most trees involving feral herds, the tree is somewhat distorted.

SUMMARY

Genetic variability of this herd in general is near average however, heterozygosity is considerably lower than horses sampled from this HMA in 2009. The picture for allelic diversity is not so clear because the 2009 sample was only 12 animals and allelic numbers are strongly associated with sample size. In comparison the horses typed in 2002, allelic numbers are

reduced even though sample size is higher in 2011. The proportion of rare alleles is lower in 2011 which is suggestive of loss of allelic diversity. The data suggests that this herd has seen a recent loss of population size which would increase the risk to genetic diversity. Genetic similarity results suggest a herd with mixed ancestry and some Spanish heritage.

RECOMMENDATIONS

Current variability levels are high enough that no action is needed at this point but the herd should be monitored closely due to the trend for loss of variability. This is especially true if it is known that the herd size has seen a recent decline. Populations that consist of less than 100 individuals are at high risk of loss of variability and this can occur rapidly at low population numbers. It should be noted that the Riddle Mountain herd is genetically very close to the Kiger herd but different enough that exchange of a few individuals of these herds could restore variability levels.

Table 1. Allele frequencies of genetic variants observed in Kiger HMA feral horse herd.

VHL20

I	J	K	L	M	N	O	P	Q	R	S
0.125	0.013	0.000	0.138	0.200	0.348	0.063	0.038	0.075	0.000	0.000

HTG4

I	J	K	L	M	N	O	P	Q	R
0.000	0.000	0.100	0.125	0.687	0.038	0.000	0.050	0.000	0.000

AHT4

H	I	J	K	L	M	N	O	P	Q	R
0.100	0.025	0.587	0.188	0.000	0.000	0.025	0.075	0.000	0.000	0.000

HMS7

I	J	K	L	M	N	O	P	Q	R
0.000	0.000	0.025	0.462	0.300	0.150	0.063	0.000	0.000	0.000

AHT5

I	J	K	L	M	N	O	P	Q	R
0.000	0.150	0.250	0.025	0.075	0.325	0.162	0.000	0.013	0.000

HMS6

I	J	K	L	M	N	O	P	Q	R
0.000	0.000	0.000	0.000	0.237	0.087	0.213	0.463	0.000	0.000

ASB2

B	I	J	K	L	M	N	O	P	Q	R
0.000	0.013	0.000	0.050	0.000	0.200	0.250	0.038	0.000	0.449	0.000

HTG10

H	I	J	K	L	M	N	O	P	Q	R	S	T
0.000	0.000	0.000	0.225	0.063	0.100	0.000	0.337	0.087	0.038	0.125	0.025	0.000

HMS3

H	I	J	K	L	M	N	O	P	Q	R	S
0.000	0.125	0.000	0.000	0.000	0.200	0.150	0.000	0.462	0.000	0.063	0.000

ASB17

D	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
0.000	0.050	0.000	0.000	0.188	0.000	0.000	0.000	0.200	0.075	0.000	0.000	0.000	0.487	0.000	0.000

ASB2

G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
0.000	0.000	0.000	0.350	0.449	0.038	0.000	0.000	0.000	0.000	0.000	0.000	0.150	0.013	0.000	0.000

LEX33

F	G	K	L	M	N	O	P	Q	R	S	T
0.300	0.000	0.138	0.112	0.213	0.150	0.087	0.000	0.000	0.000	0.000	0.000

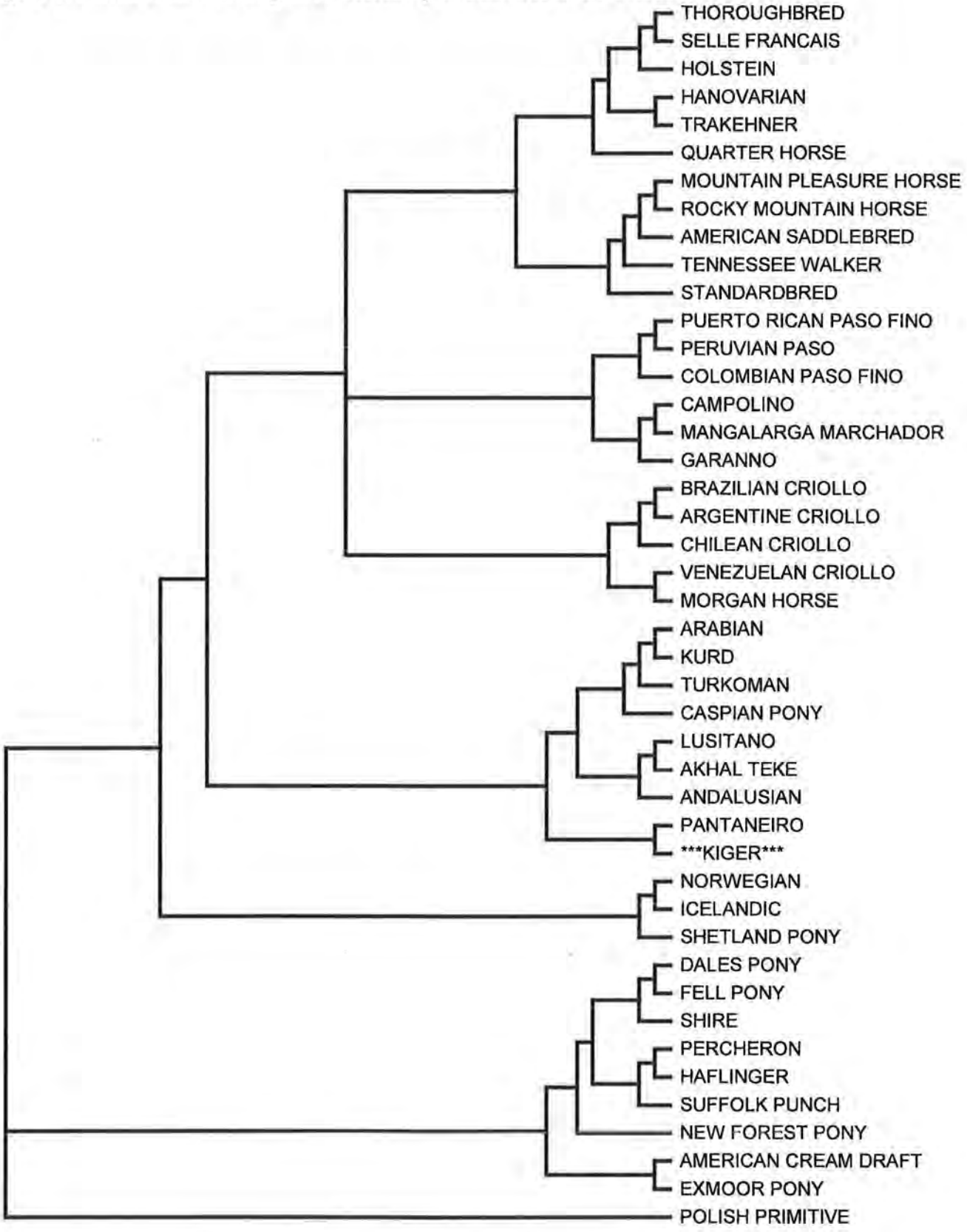
Table 2. Genetic variability measures.

	N	*Ho*	*He*	*Fis*	*Ae*	*TNV*	*MNA*	*Ra*	*%Ra*
KIGER OR 2011	**40**	**0.671**	**0.695**	**0.034**	**3.54**	**70**	**5.83**	**17**	**0.243**
Cleveland Bay	47	0.610	0.627	0.027	2.934	59	4.92	16	0.271
American Saddlebred	576	0.740	0.745	0.007	4.25	102	8.50	42	0.412
Andalusian	52	0.722	0.753	0.041	4.259	79	6.58	21	0.266
Arabian	47	0.660	0.727	0.092	3.814	86	7.17	30	0.349
Exmoor Pony	98	0.535	0.627	0.146	2.871	66	5.50	21	0.318
Friesian	304	0.545	0.539	-0.011	2.561	70	5.83	28	0.400
Irish Draught	135	0.802	0.799	-0.003	5.194	102	8.50	28	0.275
Morgan Horse	64	0.715	0.746	0.041	4.192	92	7.67	33	0.359
Suffolk Punch	57	0.683	0.711	0.038	3.878	71	5.92	13	0.183
Tennessee Walker	60	0.666	0.693	0.038	3.662	87	7.25	34	0.391
Thoroughbred	1195	0.734	0.726	-0.011	3.918	69	5.75	18	0.261
Feral Horse Mean	126	0.716	0.710	-0.012	3.866	72.68	6.06	16.96	0.222
Standard Deviation		0.056	0.059	0.071	0.657	13.02	1.09	7.98	0.088
Minimum		0.496	0.489	-0.284	2.148	37	3.08	0	0
Maximum		0.815	0.798	0.133	5.253	96	8.00	33	0.400
Domestic Horse Mean	80	0.710	0.720	0.012	4.012	80.88	6.74	23.79	0.283
Standard Deviation		0.078	0.071	0.086	0.735	16.79	1.40	10.11	0.082
Minimum		0.347	0.394	-0.312	1.779	26	2.17	0	0
Maximum		0.822	0.799	0.211	5.30	119	9.92	55	0.462

Table 3. Rogers' genetic similarity of the Kiger HMA feral horse herd to major groups of domestic horses.

	Mean *S*	Std	Minimum	Maximum
Light Racing and Riding Breeds	0.738	0.017	0.715	0.755
Oriental and Arabian Breeds	0.742	0.020	0.710	0.767
Old World Iberian Breeds	0.743	0.021	0.722	0.778
New World Iberian Breeds	0.731	0.037	0.674	0.786
North American Gaited Breeds	0.734	0.023	0.702	0.764
Heavy Draft Breeds	0.670	0.035	0.623	0.714
True Pony Breeds	0.681	0.026	0.649	0.712

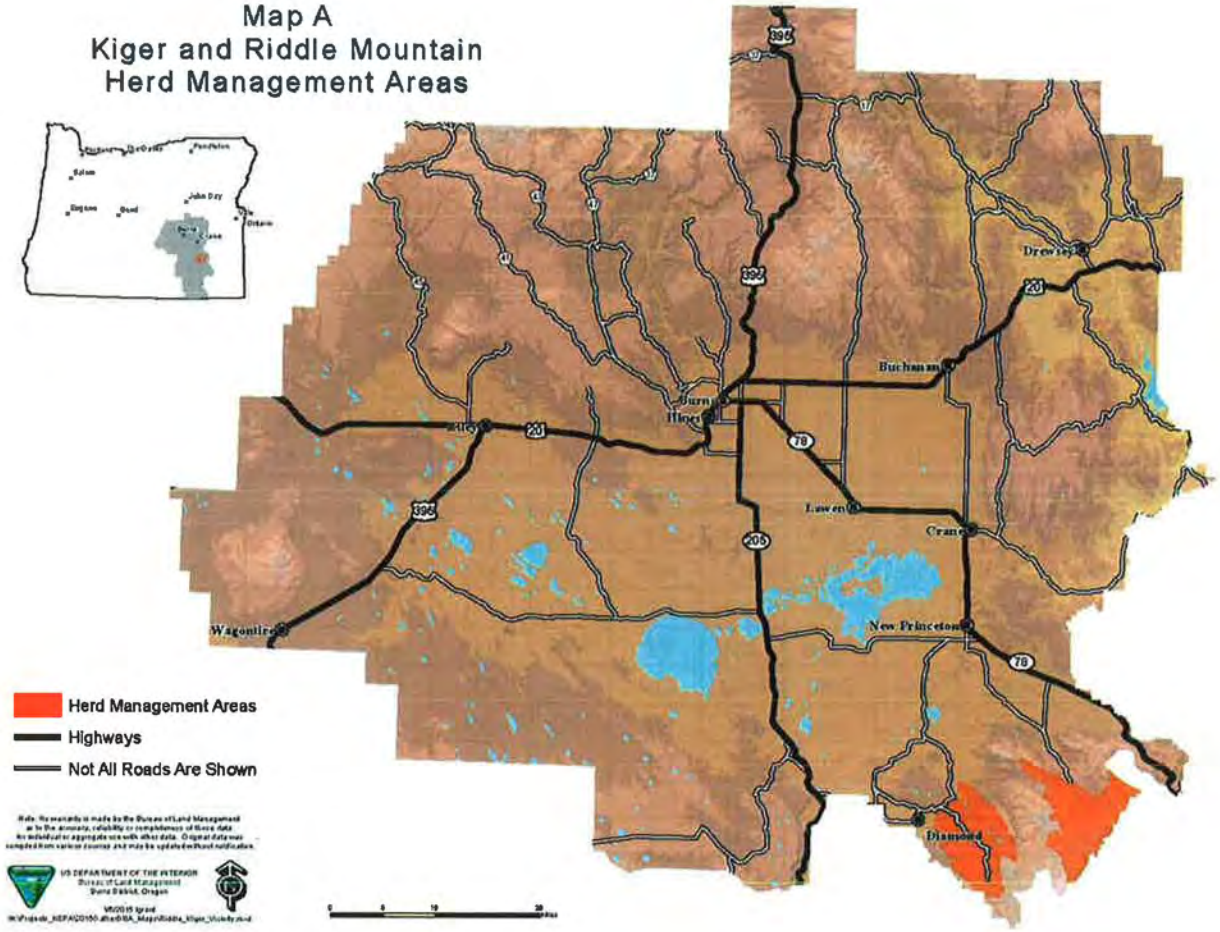
Figure 1. Partial RML tree of genetic similarity to domestic horse breeds.



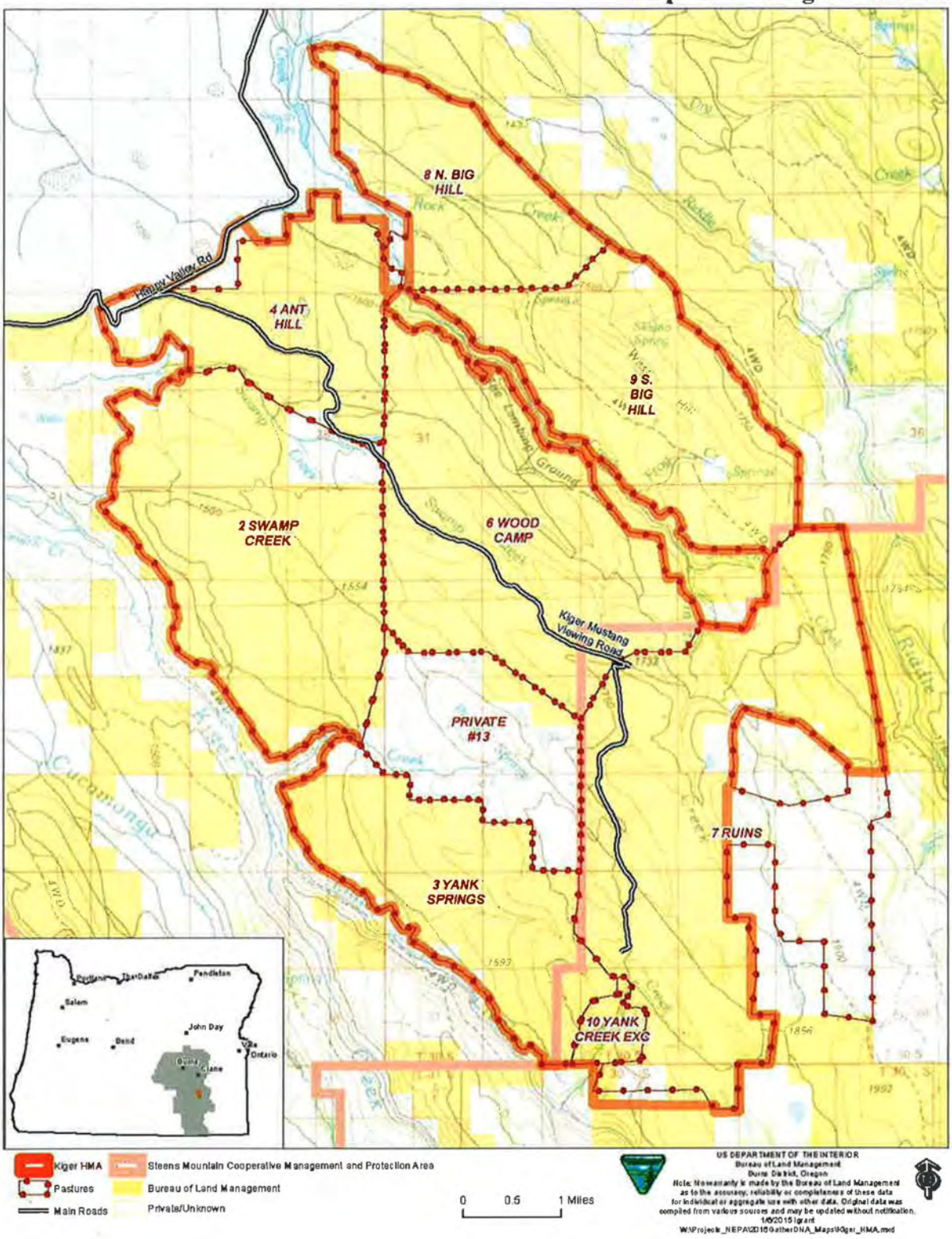
Appendix 1. DNA data for the Kiger HMA, OR herd.

AID	VHL20	HTG4	AHT4	HMS7	AHT5	HMS6	ASB2	HTG10	HMS3	ASB17	ASB23	LEX3	LEX33
56661	IL	KM	HJ	LO	KK	PP	NN	MR	NP	RR	JJ	FF	LO
56662	MN	MM	JO	LL	NN	MP	QQ	KM	MP	MM	KS	FF	QR
56663	NN	MM	KK	LM	MN	PP	NQ	OO	PP	IR	JS	MN	KK
56664	IM	MM	JJ	LN	NN	MO	OQ	KR	PP	IM	SS	FL	OR
56665	NN	MM	HK	LM	JO	PP	KQ	KM	PP	RR	JL	FM	OR
56666	MN	KM	HJ	LM	JO	NP	MN	KM	IP	IR	KK	FO	OR
56667	IN	MM	JK	LN	NN	OP	OQ	OR	PR	IR	JS	LM	LO
56668	MN	MM	JJ	LM	JO	NP	MN	KO	IP	IR	KK	FO	KR
56669	MQ	MM	JJ	LN	JK	MM	MM	KO	IP	RR	JK	FK	LO
56670	MO	LM	IJ	LM	KN	OP	QQ	KO	PP	FM	JS	FF	OR
56671	LN	MM	JK	LM	KN	NP	NQ	MP	IN	IR	KK	FL	OR
56672	NO	LM	KK	LM	LM	PP	QQ	LO	NP	IR	KS	MN	KL
56673	LQ	KM	JJ	LL	JQ	MN	MN	KQ	IM	RR	JK	FO	KO
56674	LL	MM	JJ	LO	KO	MP	NQ	PR	MP	NR	JK	FL	LL
56675	NN	MP	HJ	MM	JM	PP	MN	KO	NP	FM	JS	NN	KR
56676	IM	KL	OO	MN	MN	OP	IK	LR	NN	NR	LT	FN	LQ
56677	NN	MM	IK	LN	LN	OP	NQ	LO	PP	FI	JK	MM	KL
56678	II	KP	NN	LL	JK	OP	MM	SS	IP	NN	JL	FN	KK
56679	NN	MM	JJ	MN	KN	MO	QQ	MO	NP	NR	JK	MN	QR
56680	NN	MM	HK	KL	NN	PP	KQ	LP	MP	MM	JJ	FF	KQ
56681	MP	MN	JJ	LM	OO	OP	NN	KO	MP	IR	KK	OO	QR
56682	MO	LL	JK	LM	MO	PP	KQ	OO	MN	RR	JK	NN	KL
56683	LQ	MM	JJ	LO	KO	MP	MN	KP	MP	MR	JS	LL	KL
56684	NP	LM	JJ	MM	NO	OO	NQ	OO	NP	NR	KK	MM	QQ
56685	LM	MM	JK	LL	KO	MM	MQ	KR	PR	MR	JK	KK	LO
56686	IQ	MM	JJ	LM	JK	MO	MQ	OR	PR	MR	JJ	KK	OO
56687	MN	KM	HJ	LN	KO	MO	MQ	KO	PR	MR	JK	KK	LR
56688	JM	MM	HJ	LN	KO	MN	MM	KO	PP	MR	KK	KK	OQ
56689	LQ	MM	JJ	LM	KN	NP	MQ	PQ	IM	IR	KS	LL	KO
56690	NN	LM	JK	LL	KN	MO	QQ	OP	MP	II	JK	MM	QR
56691	IO	MN	JJ	MN	NN	OP	QQ	OR	MP	RR	JK	MM	KL
56693	MN	MM	JO	LM	NN	MO	QQ	KO	MP	MR	KK	FM	QQ
56695	IQ	KM	JJ	LO	JK	NP	NN	QR	IN	RR	JK	FO	LO
56696	NN	LM	JK	KM	MN	PP	MQ	KL	NP	IR	KK	FN	KQ
56697	MN	MP	JJ	LM	JN	PP	NQ	KO	MN	FM	JS	FN	KQ
56698	MP	KL	HJ	LM	JO	PP	NN	MO	IP	RR	KK	FM	QR
56699	IL	LM	KO	LN	KK	MM	QQ	KR	MP	RR	JK	KN	LR
56700	MN	MM	KO	LN	NN	OP	OQ	MO	PR	IM	JS	FM	OR
56701	LL	MP	JJ	NO	KK	MM	QQ	OP	MM	MR	JK	KL	LQ
56702	NO	MN	JJ	MM	JN	OP	NQ	OO	IM	IR	KK	MO	KR

Map A
Kiger and Riddle Mountain
Herd Management Areas



Map B - Kiger HMA



Map C - Riddle Mountain HMA