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To: [Craig Hansen](#)
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Chapter 3.2: Free-roaming Equids

INTRODUCTION

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THREAT DESCRIPTION

Free-roaming equids (wild horses (*Equus caballus*) and burros (*E. asinus*)) have utilized sagebrush and other communities across the West since they were brought to North America starting in the late 15th century. Additional equids escaped captivity or were released in modern times (Wagner 1983, p. 116; Beever 2003, p. 887; Beever and Aldridge 2011, p. 278; BLM 2014, p. 1).

Approximately 49,209 free-roaming equids currently inhabit BLM-managed rangelands in 10 western States (including 2 states outside the range of the sage-grouse) (BLM 2015, p. 1). Currently, free-roaming equids consume an estimated 315,000 to 433,000 AUMs as compared to over 7 million AUMs for domestic livestock within the range of greater sage-grouse (Beever and Aldridge 2011, p. 287).

Cattle typically outnumber horses by a large degree in areas where both occur; however, locally ratios of 2 to 1 (horse to cow) have been reported (Wagner 1983, p.126). Beever and Aldridge (2011, p. 278) estimate that about 12 percent (78,839 km²; 30,266 mi²) of the current sage-grouse range is also managed for free-roaming equids. However, the extent to which equids use land outside of designated management areas may be considerable, but is difficult to quantify.

CURRENT IMPACTS

Mechanism

Comment [KNorman1]: The Elevator Speech (please write this last)

- What is the take home message (this is very bad across the range, this may be bad locally, this really isn't a big deal for all but a few populations)
- What has changed since 2010? What's new or different in a nutshell?

Comment [KNorman2]: What is the threat?

- Historic Source (1 sentence, reference 2010)
- Current source

Comment [GS3]: BLM website Myths and Facts

Comment [GS4]: Need to see if FS has a #, can't find online.

Comment [GS5]: BLM website WHB Quick Facts

Free-roaming equids effects on sage-grouse can occur directly, indirectly, and via feedback

loops. Direct effects include disturbance of lekking behavior, trampling of nests or young, and loss of food resources (Beever and Aldridge 2011, pp. 281–282). The local effects of ungulate grazing depend on a host of abiotic and biotic factors (e.g., elevation, season, soil composition, plant productivity, and composition). Additionally, significant biological and behavioral differences influence the impact of equids as compared to cattle grazing on sagebrush ecosystems (Beever 2003, pp. 888–890). Equids are generalists, but grass comprise the majority of their diet throughout the year (McInnis and Vavra 1987, p. 61). Due to physiological differences, an equid forages longer and consumes 20 to 65 percent more forage than a cow of equivalent body mass (Wagner 1983, p. 121; Menard *et al.* 2002, p. 127). Unlike cattle and other ungulates (hoofed mammals), equids can crop vegetation closer to the ground, potentially limiting or delaying recovery of plants (Menard *et al.* 2002, p. 127). Equids also tend to move to higher elevations depending on the season, spend less time at water, and range farther from water sources than cattle (Beever and Aldridge 2011, p. 286).

Comment [KNorman6]: What is the mechanism for impacts to sage-grouse persistence? Could do a quick summary and incorporate by reference 2010 or other more complete explanation. This should be very brief.

Results of impact (vital rate/population level effects (direct, indirect)

A comparison of areas in the Great Basin with and without equid grazing showed 1.9 to 2.9 times more grass cover and higher grass density in areas without equid grazing. Additionally, sites with equid grazing had less shrub cover and more fragmented shrub canopies as equids can trample, rub against, and consume shrubs (Plumb *et al.* 1984, p. 132; Beever *et al.* 2007, p. 18; Beever *et al.* 2008, pp. 119–120). Furthermore, sites with equid grazing typically showed less plant diversity, altered soil characteristics, and 1.6 to 2.6 times greater abundance of nonnative invasive cheatgrass (Beever *et al.* 2008, pp. 18–19). These impacts combined indicate that free-roaming equids have the potential to result in an overall decrease in the quality and quantity of sage-grouse habitat in areas where they overlap.

We are unaware of any studies that directly address the impact of free-roaming equids on sage-grouse. However, some authors have suggested that free-roaming equids could negatively impact important meadow and spring brood-rearing habitats that provide forbs and insects for chick survival (Crawford *et al.* 2004, p. 11; Connelly *et al.* 2004, p. 7-37). Sage-grouse need significant grass and shrub cover for protection from predators particularly during nesting season. Female sage-grouse will preferentially choose nesting sites based on grass and shrub cover (Hagen *et al.* 2007, p. 46). Equids can reduce the density of both of these site characteristics, thereby increasing energetic costs and stress levels of sage-grouse required to locate alternative suitable habitat or increasing predation risks to a sage-grouse nesting in a less favorable location. Additionally, nest success, chick survival, or other aspects of fitness and survival could be affected, all of which could ultimately affect the viability of some populations of sage-grouse.

Comment [KNorman7]: What is the result? So far, this has resulted in fragmentation which isolates populations resulting in inbreeding depression? So far, the individual deaths do not have population impacts?

Timing

Include graphic from Amy showing overlay of impacts and sage-grouse timing

- Mesic habitats – forbs and insects as food resources from pre-laying in early spring through brood-rearing and into the fall (references in Beever and Aldridge 2011).
- Loss of productive mesic habitats – linked to low productivity of sage-grouse and linked to population declines (Connelly *et al.* 2004, Aldridge and Boyce 2007 – in Beever and Aldridge 2011).
- Heavy use of mesic habitats by equids could increase conflicts and reduce the availability and quality (Beever and Aldridge 2011).

Comment [KNorman8]: Potentially include graphic from Amy (as it fits your threat). Include:

- Direct effects (threat generally occurs at X time and impacts the following life stages: a, b, c, d, e...)
- Indirect effects (impacts may continue until Y which would result in impact to life stages a, b, c, d, e...)

- The extent to which free-roaming equids in sagebrush communities directly or indirectly alter the availability of insects important to sage-grouse broods at these mesic sites is currently unknown (Beever and Aldridge 2011).
- Disturbance to lekking behavior
- Disturbance/mortality to nests and young
- Impact on food resources – degradation of sagebrush – all year
- Reducing grass and shrub cover for nesting and brood-rearing
- In the Red Desert of Wyoming, peak use of sagebrush-grass vegetation occurred in the fall and winter (Miller 1980 in Beever and Aldridge 2011)
- The peak spatial overlap in use of sagebrush habitat with sage-grouse may occur during the breeding or late brood-rearing periods (in next paragraph of Beever and Aldridge 2011).
-

Location and extent

We are unaware of the specific severity and scope of impacts caused by feral horses on sage-grouse and sage-grouse habitat, although localized areas of concern are apparent. Over half of the total free-roaming equids occur in Nevada (BLM 2015, p. 1). Management of herd size by Federal agencies is an ongoing challenge as horses reproduce rapidly, in most areas they have no natural predators, and management is expensive. Based on this understanding, we anticipate future impacts caused by wild horses to increase. However, we recognize that changes in management direction, if realized, could influence the degree of impact caused by horses.

Analyses for grazing impacts at landscape scales important to sage-grouse are confounded by the fact that almost all sage-grouse habitat has at one time been grazed and thus no ungrazed control areas exist for comparisons (Knick *et al.* 2011, p. 232).

Given these differences, along with the confounding factor of past range use, it is difficult to assess the overall magnitude of the impact of equids on the landscape in general, or on sage-grouse habitat in particular. In areas grazed by both equids and cattle, whether the impacts are synergistic or simply additive is currently unknown (Beever and Aldridge 2011, p. 286). Therefore, equid presence may negatively affect sagebrush vegetation communities and habitat suitability for sage-grouse by decreasing grass cover, fragmenting shrub canopies, altering soil characteristics, decreasing plant diversity, and increasing the abundance of invasive cheatgrass.

Table 1: List of impacts by management zone.

Management Zone	Timing of Impacts (Season)	Immediacy of Impacts	Severity of Impacts	Extent of Impacts	Resource or Life stage impacted	Notes
<u>Example</u>	<u>Spring (or all the time, etc.)</u>	<u>Happening right now (or planned)</u>	<u>Direct mortality (or habitat destruction, etc.)</u>	<u>Impacting X% of occupied range by MZ pops (see Kevin's models)</u>	<u>Lekking adults, broods</u>	<u>This is an example...</u>
1						
2						
3						
4						
5						
6						
7						

Comment [KNorman9]: Short and sweet narrative (1 paragraph)
Map if possible to use map with current threat layers (as available)
Table if possible – by management zone describe threats impacts.

Based on Conversations at January 2015 in-person meeting, this table is included at Management Zone scale

Map Showing Current Threats (this is “Map 2” that the GIS team is working on; we will not have this map for all chapters)

Compounded effects

The compounding effects will be discussed in greater detail in the Compounded Effects chapter.

In brief, the following impacts are likely to interact with the threat described in this chapter.

- Equids effects on sage-brush ecosystems may interact synergistically with livestock-grazing effects or simply be additive (Beever and Aldridge 2011, p. 286).
- Equids effects on sage-brush ecosystems may be especially pronounced in periods of drought, which are forecasted to occur with increasing frequency in the southwestern United States under climate change (Beever and Aldridge 2011, p. 273).
- Cheatgrass tends to be more abundant at horse-occupied than horse-removed sites (1.6 to 2.6 times greater abundance; Beever et al. 2003, 2008 in Beever and Aldridge 2011).
Dung piles of feral horses in montane natural grasslands of Argentina act as invasion windows for exotic plants (Loydi and Zalba 2009 in Beever and Aldridge 2011).
Nonnative ungulates (cattle) disperse 1,200,000 germinable exotic seeds/km² – about two orders of magnitude greater than that estimated for the native ungulates in the same area (elk and mule deer) (Bartuszevige and Endress 2008 in Beever and Aldridge 2011).
-
- Bulleted list showing potential impacts

Comment [KNorman10]: Will be discussed further in compounding/ cumulative effects section

PROJECTED FUTURE IMPACTS

a. Timescale for Projecting this Threat

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Comment [KNorman11]: How far into the future can we reasonably predict this threat

b.Likelihood of future impacts

asfasdfas

Comment [acn12]: Clearly articulated, fact-based rationale for timeframe.

c. Anticipated changes from present (direct, indirect; same amount of range? Populations?)

asfasf

THREAT AMELIORATION

Active Conservation

Through the Conservation Efforts Database (CED), the Service collected information relating to conservation actions that were completed, in progress, or planned. Based on a summary report of that information created on XXXXXX, the following table indicate the number of actions and approximate areas for threat amelioration. These numbers are self-reported; the Service will further review and certify these actions if they are pivotal to any determination.

Comment [KNorman13]: The CED reports will include a summary of conservation actions designed to ameliorate each threat.

Based on January In-Person meeting, this list may include ALL self-certified actions. Service personnel may need to further review these actions in future.

The Service addresses regulatory actions in a separate chapter???

Comment [KNorman14]: Kate's attempt...

Comment [KNorman15]: Do we want to make this easier on folks? Does that undermine the "take away"?

Table 2: List of Conservation Efforts (ameliorating threat described in this chapter) by management zone

Management Zone	Type of Conservation Effort	Sum of Acres or Miles	Number of Actions	Notes
1				

2
3
4
5
6
7

Threat Amelioration Summary

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ASSESSMENT OF POTENTIAL THREAT

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Comment [KNorman16]: This should be a VERY brief restatement of the introduction. 1 paragraph. Remind reader of the overall message.

CITATIONS

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