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Project Title: Bible Spring Complex Wild Horse Gather Plan

Location: Iron and Beaver Counties, Utah

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Chapter 1. Introduction

This Environmental Assessment (EA) has been prepared to disclose and analyze environmental effects of the Bureau of Land Management (BLM) Cedar City Field Office's (CCFO) Proposed Action which consists of achieving and maintaining a herd population within the Appropriate Management Level (AML) by gathering and removing excess wild horses from the Blawn Wash, Bible Spring, Four Mile and Tilly Creek Herd Management Areas (HMA) and conducting population growth suppression. In April 2005, the BLM adjusted the AML on the HMAs to maintain an ecological balance based on changes in vegetation conditions and land tenure (see Table 1.1). At that time, the BLM determined that three of the HMAs (Bible Spring, Four Mile, and Tilly Creek) would be managed as the Bible Spring Complex (Complex) and possibly combined into one HMA in future land use plans. Maps of the project area are contained in Appendix 1. The Proposed Action would achieve management objectives through gather and removal of excess horses within and near the HMAs, implementation of population control measures, and follow-up gathers to ensure that the wild horse population remains within AML.

1.1. Background

Since the passage of the Wild Free-Roaming Horses and Burros Act of 1971 (WFRHBA), Public Law 92-195, the BLM has refined its understanding of how to manage wild horse population levels. By law, the BLM is required to control any overpopulation, including by removing excess animals once a determination has been made that excess animals are present, and removal is necessary. The WFRHBA requires the BLM to achieve and maintain a Thriving Natural Ecological Balance (TNEB) on public land to protect the range from the deterioration associated with overpopulation of wild horses and burros. To achieve program goals, the BLM must, among other things, identify the AML for individual herds. The AML upper limit shall be established as the maximum number of wild horse and burros which results in a TNEB and avoids a deterioration of the range. This number should be below the number that would cause rangeland damage (refer to Animal Protection Institute of America v. Nevada BLM, 118 IBLA 63, 75, (1991)). The AML is the number of wild horses that can be sustained within a designated HMA which achieves and maintains a TNEB in keeping with the BLM's multiple-use mandate. Program goals have also included the application of contraceptive treatments to reduce total population growth rates in the short-term and increase the time between gathers. Other management efforts include conducting accurate population inventories and collecting genetic data to support genetic health assessments. Since the passage of the WFRHBA, management knowledge regarding horse population levels has increased. For example, wild horses are capable of increasing numbers 15-20% annually (NAS, 2013), resulting in the doubling of wild horse populations about every 3-4 years.

The four HMAs are located in western Iron and Beaver counties, Utah approximately 30 miles west of Minersville, Utah in the Wah Wah and Indian Peak mountain ranges. The HMAs contain approximately 215,350 acres. The Blawn Wash HMA has both the highest and lowest elevation of the four HMAs, with elevations ranging from 9,117 feet to 5,443 feet. Average annual precipitation in all four HMAs is 12.5 inches a year, depending on elevation. The combined

Appropriate Management Level (AML) for the four HMAs is 80-170. As of March 2022, the estimated wild horse population in the four HMAs is 831 which is over the established AML identified above.

In 2001, a land exchange between the BLM and the State of Utah School and Institutional Trust Lands Administration (SITLA) placed the most critical wild horse habitat of the Blawn Wash HMA into SITLA administration. As a result, SITLA lands comprise 43% (25,970 acres) of the Blawn Wash HMA and produce an estimated 70% of the forage. Consequently, the forage allocations within this portion of the HMA are now managed by SITLA. Wild horses managed by the BLM could not be excluded from the SITLA lands without fencing the whole boundary of those lands, which would be extremely resource intensive due to the rough terrain. In April 2005, the BLM determined that the land tenure changes required that the Blawn Wash HMA would be managed at an AML of zero (see EA UT-040-2004-0047). The current AMLs for the HMAs are shown in Table 1.1.

Table 1.1 Current Information for Bible Spring, Blawn Wash, Four Mile, Tilly Creek HMAs.

HMA	AML	Season of Use	AUMs	HMA Acres*
Bible Spring	30-60	Year Long	720	57,890
Blawn Wash	0	Year Long	0	62,787
Four Mile	30-60	Year Long	720	58,710
Tilly Creek	20-50	Year Long	600	35,963
Total	**80-170**		**2,040**	**215,350**

*Includes BLM, SITLA and private land.

Rangeland resources and wild horse health have been and are currently stressed within the HMAs (see maps, Appendix 1). Drought conditions and overpopulation of wild horses during recent years have reduced forage production in some of the key wild horse habitat areas. Although livestock numbers have been reduced and/or completely removed during drought conditions, excess wild horses overgraze many areas within the HMAs during critical growth periods. This, along with the reduced vigor of the plants because of the drought, causes mortality of key forage species throughout the HMAs.

There is currently no Herd Management Area Plan (HMAP) in place for the HMAs. The Interior Board of Land Appeals has held that an HMAP is not a prerequisite to BLM conducting a gather operation (*Animal Protection Institute of America*, 109 IBLA 112, 127 (1989)), so long as the record otherwise substantiates compliance with the WFRHBA. Based on all available information, BLM has determined under the WFRHBA that excess wild horses are present and that a gather for removal of excess animals and application of population control measures is necessary to achieve a thriving natural ecological balance. While BLM has not prepared a formal HMAP document, the major components of an HMAP have nonetheless been addressed by BLM, including the establishment of the HMAs, AML and objectives for managing the HMAs (through the Pinyon

Management Framework Plan [MFP] and other decision documents), monitoring and evaluating whether management objectives are being met (as summarized in this NEPA document), and establishing a ten-year management plan (through the Proposed Action and alternatives being analyzed). The BLM is also providing an opportunity for public participation through the comment period for this EA.

1.2. Purpose and Need

The BLM's purpose for agency action is to implement actions that would achieve and maintain the wild horse population within established AML over a period of 10 years and help the BLM in achieving and maintaining a TNEB on these public lands. The BLM's need for agency action is to prevent undue or unnecessary degradation of the public lands associated with excess wild horses, allow for recovery of degraded range resources, and to restore a TNEB and multiple-use relationship on public lands, consistent with the provisions of section 1333(b) of the WFRHBA.

1.3. Land Use Plan Conformance

The Proposed Action and alternatives are in conformance with the Pinyon MFP approved on June 1, 1983. The MFP contains the following decisions that specifically apply to management of the HMAs.

MFP decisions RM 1.8 and WH1.1: *"…remove horses as required to maintain horse numbers at or below 1982 inventory levels…*"

This MFP decision also provides that the number of herd units and the population of each herd would depend on the results of monitoring studies, range condition, viewing opportunities, cooperative management, and range developments.

The HMAs overlap the Hamlin Valley Greater Sage-Grouse (GRSG) Priority Habitat Management Area (PHMA) and, as such, is subject to the Greater Sage Grouse Environmental Impact Statement Record of Decision (ROD) and Approved Resource Management Plan Amendments (ARMPA) for Utah, approved in September 2015. The action alternatives are in conformance with MA-WHB-1, which states that the BLM will "manage HMAs in GRSG habitat within established appropriate management level ranges to achieve and maintain GRSG habitat objectives" and MA-WHB-3, which states that the BLM will "prioritize gathers and population growth suppression techniques in HMAs in GRSG habitat, unless removals are necessary in other areas to address higher priority environmental issues, including herd health impacts."

1.4. Relationship to Statutes, Regulations, and Other Plans

The action alternatives are consistent with all applicable BLM policies and regulations implementing the WFRHBA at Title 43 Code of Federal Regulations (CFR) Part 4700.

The action alternatives are also consistent with the WFRHBA, which mandates, among other things, that the Bureau *"prevent the range from deterioration associated with overpopulation," and "remove excess horses in order to preserve and maintain a TNEB and multiple use relationships in that area."*

Additionally, 43 CFR 4700.0-6(a) states that *"wild horses and burros shall be managed as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat."*

The action alternatives are consistent with local county plans. The Beaver County RMP (2017) states in Objective 2*, "keep wild free-roaming horses at or below established AMLs in all HMAs in Beaver County."* The Iron County RMP (2017) states, *"excess wild horses that exceed appropriate management levels must be removed to keep the fragile balance with other uses."*

The AML was adjusted in all four HMAs (see Table 1.1) in the Bible Spring, Blawn Wash, Four Mile and Tilly Creek Wild Horse Appropriate Management Level Assessment (UT-040-04-47). Past gathers in the project area have been analyzed in the following documents, which are available upon request from the CCFO.

- Blawn Wash Wild Horse Gather & Removal Plan, UT-044-95-13 (Decision Record [DR] signed January 5, 1994).
- FY98 Wild Horse Gather/Removal, UT-044-98-09A (DR signed December 29, 1997).
- Blawn Wash and Bible Spring Wild Horse Gather Plan, UT-044-01-09 (DR signed February 5, 2001).
- Emergency Wild Horse Removal from 4 HMA's in SW Utah, (UT-040-02-31 (DR signed June 27, 2002).
- Bible Spring, Blawn Wash, Four Mile and Tilly Creek Wild Horse Appropriate Management Level (AML) Assessment, UT-040-04-47 (DR signed April 18, 2005).
- Bible Spring Complex Wild Horse Gather, UT-040-05-041 (DR signed October 3, 2005).
- Bible Spring Complex Wild Horse Gather and Removal, DOI-BLM-UT-C010-2009-0053-EA (DR signed June 29, 2009).
- Bible Spring Complex Wild Horse Gather and Removal and Fertility Treatment Plan, DOI-BLM-UT-C010-2014-0035-EA (DR signed June 23, 2014).

Term grazing permit renewals for allotments in the HMAs have been addressed in EA-UT-040-06-35, UT-040-06-36, EA-UT-040-07-03, EA-UT-040-07-08, EA-UT-040-08-10, EA-UT-040-08-11, EA-UT-040-08-13, EA-UT-040-08-15, EA-UT-040-08-16, EA-UT-040-08-17, EA-UT-040-09-14, and DOI-BLM-UT-C010-2011-0031-EA.

1.5. Decision to Be Made

The authorized officer will determine whether to implement actions to achieve management objectives of maintaining the wild horse population within the established AMLs to maintain a thriving ecological balance. Any decision would not adjust AML or livestock use, including forage allocations, as these were set through previous land-use planning decisions.

1.6. Scoping and Identification of Issues

Identification of issues for this assessment was accomplished by considering the resources that could be affected by implementation of the action alternatives and the anticipated and foreseeable results of the no-action alternative through involvement with the public and input from the BLM Interdisciplinary Team. Both Iron County and Beaver County commissioners have contacted BLM requesting the removal of excess wild horses from private and public lands to within AML. The

counties requested the use of fertility treatment methods on wild horses to reduce future population growth of wild horses. Additional public involvement is described in Chapter 5. Consultation and Coordination.

Resources which are not present or are not affected by the Proposed Action or alternatives are included as part of the Interdisciplinary Team NEPA Checklist (Appendix 2). Issues which need detailed analysis to make a reasoned choice between alternatives or determine levels of significance are listed below and are analyzed in Chapter 3.

Issue 1. How would removal of wild horses affect livestock grazing?
Issue 2. How would removal of excess wild horses affect rangeland health?
Issue 3. How would the removal of wild horses affect soil conditions?
Issue 4. How would gathering wild horses affect wetland and riparian resources?
Issue 5. How would the gathering of horses affect wildlife?
Issue 6. How would the gathering and removal of excess wild horses affect individual wild horses and the overall population of the HMAs?

Chapter 2. Proposed Action and Alternatives

2.1. Introduction

Based on identified issues, three alternatives are considered in detail:

- Alternative 1: Proposed Action – Gather and Removal of Excess Wild Horses from the Blawn Wash HMA and the Bible Spring Complex with Population Growth Suppression using Fertility Control Vaccines, Intrauterine Devices (IUDs), and Sex Ratios Manipulations.
- Alternative 2: Gather and Removal Excess Wild Horses without Population Growth Suppression.
- Alternative 3: No Action – No Gather, Removal, or Population Growth Suppression.

Alternatives considered but not analyzed in detail (see Appendix 3) include:

- Population growth suppression without removals.
- Remove or reduce livestock within the HMAs.
- Gather and remove wild horses to the AML upper limit.
- Population growth suppression treatment only including using bait/water trapping to remotely dart mares with PZP liquid only (no removal).
- Bait or water trap only.
- Control wild horse numbers by natural means.
- Gather and release excess wild horses every two years and apply PZP-22 to horses for release.
- Make individualized excess wild horse determinations prior to removal.
- Use of gelding as non-reproductive population to reduce population growth rate.
- Allow the public to capture and remove wild horses.
- Use alternative capture techniques instead of helicopters to capture excess wild horses.
- Designate the HMAs to be Managed Principally for Wild Horse Herds Under 43 C.F.R. 4710.3-2.

2.2. Description of Alternatives Considered in Detail

2.2.1. Proposed Action – Gather and Remove Excess Wild Horses from the Blawn Wash HMA and the Bible Spring Complex and Population Growth Suppression using Fertility Control Vaccines, IUDs, and Sex Ratio Manipulations

Under the Proposed Action, BLM would gather and remove excess wild horses within and around the HMAs to low AML as expeditiously as feasible through one or more gathers, manage population growth using PZP or GonaCon-Equine, IUDs, and manipulation of Sex Ratios, and equip horses with GPS tracking units (either collar or tag).

The number of horses removed would be based on the latest population inventory from within and around the HMAs and would achieve and/or maintain low AML. BLM would also collect

information on herd characteristics, collect genetic samples for monitoring, determine herd health, provide for public safety, and establish a TNEB with the other resources within the HMAs. Information gained from these management actions and subsequent monitoring of results would then be used to inform future management of wild horses.

2.2.1.1 Gather

The BLM would conduct gathers over a 10-year period to remove excess wild horses until the project area wild horse population is at the lower AML of 80 individuals (see Table 2.1). The 10-year period would begin with the first gather on the HMAs after the decision record for this EA is signed. BLM would strive to reach low AML as quickly as possible, but it is expected that gather efficiencies and holding space available during the initial gather would not allow for the attainment of low AML during the initial gather. Based on the BLM's experience with past gathers conducted in the project area, only 60-70% of the population can typically be gathered in a single gather operation due to excessive tree cover, vast area, terrain, and behavior of the target animals. Consequently, follow-up gathers to remove any additional excess wild horses would be necessary to achieve low AML and to gather a sufficient number of wild horses to implement the population growth suppression component of the Proposed Action. Gather efforts would prioritize public health and safety. Once low AML is reached, additional gathers would be needed to implement population growth suppression to keep the population within AML and slow the population growth rate. If the wild horse population exceeds AML, follow-up gather(s) with removals to keep the population within AML would be conducted during the 10-year period.

Regular population inventories would be conducted at a minimum of every 4 years to calculate the estimated population size. That estimate would be used to determine the number of excess horses to be captured, removed, and/or treated with population growth suppression during each gather. A population inventory was conducted in the project area in February 2022, which was used to estimate the population and proposed capture, removal, and treated numbers for the initial gather (see Table 2.1). This process would be followed over the 10-year period to achieve and maintain the wild horse population within AML. Other administrative factors (budget, adoptions, holding space, etc.) and individual gather success could also impact the numbers gathered, removed, or treated over the 10-year period. Gathers would be scheduled by the BLM National Wild Horse and Burro Program Office. Several factors such as animal condition, herd health, weather conditions, or other considerations could result in adjustments in the national gather schedule.

Authorized wild horse capture techniques would be used to capture excess wild horses from the project area. These techniques include helicopter drive trapping, water and bait trapping, and roping. One or a combination of capture techniques may be used. The selected technique(s) would depend on herd health and the season (fall, winter, or summer) in which the gather is scheduled to maximize gather success and minimize impacts to wild horses. All techniques would be consistent with the comprehensive animal welfare program[1] outlined in BLM Permanent Instruction

[1] The Comprehensive Animal Welfare Program for Wild Horse and Burro Gathers Standards, published in 2016, outlines the Welfare Assessment Standards that BLM follows to assure humane care of wild horses and burros. It covers facility design, capture technique, wild horse and burro care, handling, transportation, euthanasia or death, and required documentation and responsibilities of lead DOR/PI at gathers. This document is available on the ePlanning website for this project (https://eplanning.blm.gov/eplanning-ui/project/2018159/510).

Memorandum (IM) 2021-002.[2] Appendix 4 includes Standard Operating Procedures for Wild Horse Gathers.

2.2.1.2 Collected Data

During gather operations, BLM will record data including sex and age distribution, reproduction, survival, condition class information (using the Henneke rating system), color, size, and other information, along with the disposition of that animal (removed or released). Consistent with BLM IM 2009-062,[3] hair follicle samples will be acquired every gather to determine whether the herd is maintaining acceptable genetic diversity (*e.g.*, avoiding inbreeding depression). Periodic introduction of a small number of studs or mares from a different HMA, with desired characteristics similar to the wild horses within the HMAs, could be made to augment genetic diversity in the project area, as measured by observed heterozygosity, if the results of monitoring indicate that this is prudent.

The population inventory conducted in February 2022 used the Simultaneous Double Observer Method (Griffin et al., 2020). Horses were identified as individuals or as a band by their color, leg markings, face markings, and area/time recorded. Yearlings were distinguished from adults, when possible, but for administrative purposes, yearlings are considered adults (BLM 2010, H-4700-1). For large groups, photos were used to ensure that any observed horses were only counted once in the totals. The planned flight paths were loaded into a Global Positioning System (GPS) and followed. The actual fight paths were recorded by GPS. Raw counts of horses seen can be as much as 20%-30% lower than the actual population size of wild horses present at the time of the survey (NAS, 2013), so the observation data are analyzed to produce estimates of the number present, including those not seen. Crabb (2022) analyzed the February 2022 survey data, leading to estimated herd sizes at the time of survey. There were 178 total horses observed in the Bible Spring HMA, 192 in the Blawn Wash HMA, 223 in the Four Mile HMA, and 100 in the Tilly Creek HMA.

Removal numbers listed in Table 2.1 were based on the estimated herd sizes as of February 2022, plus an additional net population increase of 20% through the spring of 2022.

Table 2.1. Estimated 2022 Population Size, Capture, and Removal Numbers

HMA	AML	2022 Estimated Population Post-foaling 2022 (7/1/2022)*	Summer 2022 Gather Numbers to Lower AML**	Summer 2022 Removal Numbers to Upper AML**
Bible Spring	**30-60**	214	184	154
Blawn Wash	**0**	230	230	230
Four Mile	**30-60**	267	237	207

[2] This document is available at https://www.blm.gov/policy/pim-2021-002.
[3] This document is available at https://www.blm.gov/policy/im-2009-062.

HMA	AML	2022 Estimated Population Post-foaling 2022 (7/1/2022)*	Summer 2022 Gather Numbers to Lower AML**	Summer 2022 Removal Numbers to Upper AML**
Tilly Creek	**20-50**	120	100	70
Total	**80-170**	**831**	**751**	**661**

*These values are based on the estimated February 2022 wild horse numbers (Crabb 2022), plus 20% to account for projected net herd growth over the course of the 2022 foaling season.

** The gather and removal numbers are based on an estimated population of horses for the summer of 2022 and may be subject to change based on outside factors influencing the population level such as interchange between adjacent HMAs during gather operations, timing of gather, and success of the gather and removal operation(s). Because the AML within the Blawn Wash HMA is zero, gather and removal of all horses within the HMA would be attempted. Gather, removal, and fertility treatment numbers will be adjusted over the 10-year period to reflect excess wild horses and numbers treated to achieve or maintain the population within AML.

2.2.1.3 Population Growth Suppression

BLM would begin implementing the population growth suppression component of the Proposed Action as a part of the initial gather or follow-up gathers. BLM would use PZP-22, (which consists of an initial PZP vaccine fluid injection followed by PZP pellet injection), GonaCon-Equine™ vaccine, flexible IUDs, and sex ratio manipulations. The primary purpose of population growth suppression would be to slow the herd's growth rate to help maintain the population within AML once achieved. BLM may apply PZP-22 or GonaCon-Equine or IUDs prior to achieving AML if gather success, holding capacity limitations, population growth rates, other national gather priorities, or other circumstances prevent the BLM from achieving AML during the initial gather operations. The procedures to be followed for implementing fertility control are detailed in Standard Operating Procedures (SOP) and Scientific Literature Review for Population Growth Suppression Methods (Appendix 5).

PZP proteins are the antigens in PZP contraceptive vaccines. The PZP-22 treatment is one form of PZP vaccine that can lead to longer-lasting effects than the PZP ZonaStat-H liquid PZP alone (Rutberg, et al., 2017). Each released mare treated with PZP would receive the most current formation of a single dose of PZP-22 or a similar PZP population growth suppression treatment while in a temporary holding facility. The general understanding of PZP-22 vaccines is that when injected, PZP (antigen) causes the mare's immune system to produce antibodies; these antibodies bind to the mare's eggs and effectively block sperm binding and fertilization (ZooMontana, 2000). More recent information also indicates that some mares may have impaired ovarian function after treatment with PZP vaccines (Joonè et al., 2017; Nolan et al., 2018). PZP vaccine can be relatively inexpensive, meets BLM requirements for safety to mares and the environment, and can easily be administered in the field (NAS, 2013). Darting horses is not a preferred in the HMAs due to excessive tree cover, vast area, terrain, and behavior of the target animals, but could be used to administer PZP. In addition, among mares, PZP contraception appears to be completely reversible if fewer than approximately 4-5 doses are given to the same mare (Kirkpatrick and Turner, 2002; Nuñez, et al., 2017). Permanent sterility for mares treated consecutively in each of 5-7 years was observed by Nuñez, et al. (2010, 2017). Repeated treatment with PZP led to long-term infertility in Przewalski's horses receiving as few as one PZP booster dose (Feh, 2012). However, even if

some number of mares become sterile due to PZP treatment, that potential result would be consistent with the contraceptive purpose that motivates BLM's potential use of the vaccine.

GonaCon-Equine would be administered by hand injection. Darting horses is not preferred in the HMAs due to excessive tree cover, vast area, terrain, and behavior of the target animals, but could be used to administer GonaCon-Equine after the first treatment. It is preferred that mares being treated for the first time would be held for approximately thirty days or more (depending on holding space, cost and resources) after the first treatment to administer a booster shot to increase efficacy and treatment longevity. Mares initially treated with GonaCon-Equine vaccine would be subsequently treated only with forms of the GonaCon-Equine vaccine. The immune-contraceptive GonaCon-Equine vaccine meets most of the criteria that the National Research Council of the National Academy of Sciences (NAS, 2013) used to identify the most promising fertility control methods, in terms of delivery method, availability, efficacy, and side effects. GonaCon-Equine is approved for use by authorized federal, state, tribal, public and private personnel, for application to wild and feral equids in the United States (EPA, 2013, 2015). Its use is appropriate for free ranging wild horse herds. Taking into consideration available literature on the subject, the NAS concluded in their 2013 report that GonaCon-B (which is produced under the trade name GonaCon-Equine for use in feral horses and burros) was one of the most preferable available methods for contraception in wild horses and burros (NAS, 2013).

In 2013, the NAS suggested that additional studies be done on the contraceptive efficacy and behavioral effects of GonaCon-Equine, and such suggested studies have been published since that time. GonaCon-Equine has been used on feral horses in Theodore Roosevelt National Park (Baker et al. 2018), on a small number of wild horses in the Water Canyon area within the Antelope Complex (see DOI-BLM-NV-L020-2015-0014-EA) and was given to over 150 wild mares in fiscal year 2020. As with other contraceptives applied to wild horses, the long-term goal of GonaCon-Equine use is to reduce or eliminate the need for gathers and removals (NAS, 2013). GonaCon-Equine vaccine is an EPA approved pesticide (EPA, 2009, 2013, 2015) that is relatively inexpensive, meets BLM requirements for safety to mares and the environment, and is produced in a USDA-APHIS laboratory. Its categorization as a pesticide is consistent with regulatory framework for controlling overpopulated vertebrate animals, and in no way is meant to convey that the vaccine is lethal; the intended effect of the vaccine is as a contraceptive. GonaCon-Equine is produced as a pharmaceutical-grade vaccine, including aseptic manufacturing technique to deliver a sterile vaccine product (Miller et al., 2013). If stored at 4° C, and the shelf life is 6 months (Miller et al., 2013).

Miller et al. (2013) reviewed the vaccine environmental safety and toxicity. When advisories on the product label (EPA, 2015) are followed, the product is safe for users and the environment (EPA, 2009b). EPA waived a number of tests prior to registering the vaccine because GonaCon- was deemed to pose low risks to the environment, so long as the product label is followed (Wang-Cahill et al. in press).

Non-pregnant, released mares could be treated with Y-Shaped Silicone IUD for Feral Horses as the population growth suppression instead of GonaCon-Equinevaccine or PZP-22 (or latest formula). As with GonaCon-Equine and PZP, the long-term goal of using flexible IUDs would be to reduce or eliminate the need for gathers and removals (NAS, 2013). Mares treated with IUDs

would not receive GonaCon-Equine or PZP treatment at the same time. IUDs could be placed in non-pregnant mares selected to be released back into the Complex. Generally, the mares selected for release would be 5 years and older. Animals to be treated would be sent to a short-term holding facility where the mares would be checked by a veterinarian using ultrasound to confirm pregnancy status. Pregnant mares would not receive an IUD. The IUD prevents pregnancy by its physical presence in the mare's uterus as long as the IUD stays in place (NAS, 2013). For example, in trials of one type of flexible IUD, approximately 75% of mares living and breeding with fertile stallions retained the Y-Shaped Silicone IUD for Feral Horses over two breeding seasons (see Appendix 5). None of the mares that kept their IUDs became pregnant during an experimental trial. After IUD removal, the majority of mares returned to fertility.

The BLM would return to the HMAs as needed over the ten-year period to remove excess horses and to re-apply IUDs and initiate new treatments to maintain contraceptive effectiveness in controlling population growth rates. IUDs can safely be reapplied as necessary to control the population growth rate. Once the herd size in the project area is at AML and population growth seems to be stabilized, BLM will determine the required frequency of new mare treatments and mare re-treatments with IUDs, to maintain the number of horses within AML. Reference in this text to any specific commercial product, process, or service, or the use of any trade, firm or corporation name is for the information and convenience of the public, and does not constitute endorsement, recommendation, or favoring by the U.S. Department of the Interior.

Until a wild horse population of 150 animals is reached, BLM's objective under the action alternatives would be to maintain an approximately 60/40 male to female sex ratio in the Complex. The NAS (2013) report noted that sex ratio manipulations where herds have approximately 60% males and 40% females can expect lower annual growth rates, simply as a result of having a lower number of reproducing females. Once a population of 150 horses is reached, sex ratio manipulation would not be used as long as the population remains within AML.

2.2.1.4 Identification and Tracking

Under this alternative, every mare that is handled and returned to the range would be identifiable by a uniquely numbered radio-frequency identification (RFID) chip, placed in the nuchal ligament, in keeping with standard equine veterinary practice. Individual identification is consistent with BLM policy for fertility control application (BLM H-4700-1, 2010), and allows for vaccine applicators to have access to the complete treatment history of any given mare. Additional guidelines for visibly marking fertility vaccine-treated animals are noted in Appendix 5. Also, BLM would fit some wild horses with GPS and very high frequency (VHF) radio collars and tags with the intent to collect high spatial and temporal resolution information for recording free-roaming horse movement, locations, and for other monitoring purposes including but not limited to effectiveness of population inventories, demographics, habitat use, and interactions with other resources. Not every treated mare would be fitted with a tracking device. Procedures for attaching the collars are described in Appendix 6. Affixing Radio Collars.

Only female horses would be fitted with GPS collars, while males or females could have a GPS radio transmitter tag braided into their tails (Schoenecker, et al., 2020). Once tags are braided into the tails, they would be held in place with a non-toxic, low temperature curing epoxy resin. Collars would only be placed on horses that are 3 years old or older and in Henneke body condition score

4 or greater. Animals that are "thin" (Henneke score of ≤3), deformed, or who have any apparent neck problems would not be fitted with a collar. As tail tags are small (<200g) and are not worn around the neck, they are considered of low burden to the animal and, therefore, could potentially be worn by animals in lower body condition. All radio collars would have a remote manual release mechanism in case of emergency and a timed-release mechanism which would be programmed to release at the end of the monitoring period. No collars would remain on wild horses indefinitely. If the collar drop-off mechanism fails at the end of the monitoring period, those individual horses would be captured, and the collars manually removed. The welfare of each collared horse would be observed once per month while collared. Radio tagged horses would not need to be observed as often but would be observed regularly (6-10 times per year).

2.2.1.5 Design Features to Minimize Impacts

- When actively trapping wild horses, traps would be checked daily. Horses would be either removed immediately or fed and watered for up to several days prior to transport to a holding facility.
- Whenever possible, capture sites would be placed in previously disturbed areas. Generally, these activity sites would be small (less than one half acre) in size and temporary.
- No new roads would be constructed.
- When possible, trap sites would avoid active ground nesting wildlife.
- Staff would follow best management practices for pygmy rabbit if habitat for this species is suspected to occur within the trap site (Ulmschneider, 2004).
- When possible, a qualified biologist would search for migratory bird nests in the trapping site locations during the primary migratory bird nesting season. Any active nest found would have spatial buffers appropriate for the species applied.
- Trap sites would be located a minimum of 0.5 miles from occupied mapped Utah prairie dog habitat. No trap site would be located within identified Utah prairie dog habitat without clearance and consultation with the U.S. Fish and Wildlife Service (USFWS).
- All capture and handling activities would be conducted in accordance with the most current BLM policies and procedures.
- Helicopter gathers would not be conducted during the 6 weeks prior to and following the expected peak of the foaling season, which is generally between March 1 and June 30 (BLM Handbook H-4700-1). Exceptions to this policy may occur due to emergency actions or escalating problems, as described in IM 2015-152.
- During capture operations, safety precautions would be taken to protect all personnel, animals, and property involved in the process from injury or damage (Appendix 4).
- Only authorized personnel would be allowed on site during the removal operation (see Appendix 7. Observation Protocol and Ground Rules).
- Private landowners or the proper administering agency(s) would be contacted, and authorization obtained prior to setting up traps on any lands which are not administered by BLM.
- Wherever possible, traps would be constructed in such a manner as to not block vehicular access on existing roads.
- If possible, traps would be constructed so that no riparian vegetation is contained within them. Impacts to riparian vegetation and/or running water located within a trap (and available to horses) would be mitigated by removing horses from the trap immediately upon capture. No

vehicles would be operated on riparian vegetation or on saturated soils associated with riparian/wetland areas.

- When possible, gathers would be scheduled to minimize impacts with big game hunting seasons.
- The helicopter would avoid eagles and other raptors and would not be flown repeatedly over any identified active raptor nests.
- Small amounts of carefully managed veterinary medicines and treatments may be used to treat sick or injured animals at the capture sites.
- Weed-free hay would be used in trap sites and temporary holding facilities located on BLM-administered lands.
- Females 3 years and older being returned to the Complex may be collared with GPS location-recording devices that have a VHF radio beacon ('radio collars'). No males would be collared. If collars are too tight, the release function would be deployed remotely, or collar would be removed after capture. If neck abrasions or sores caused by a collar are observed and have not healed within 4 weeks of when they are observed, the collar's remote release would be activated, or the horse would be captured as soon as possible to remove the collar.
- Male and Female horses being released after gather operations may have GPS/VHF radio transmitter tags braided into their tails.
- Mares released back into the HMAs after receiving IUDs, GonaCon, PZP or other fertility control would receive a microchip with a specific identification number and may be hip branded with the last the last 4 numbers of their freeze mark.
- No hazardous material would be used, produced, transported or stored in conjunction with this action.
- Gather operations would be conducted in accordance with the Comprehensive Animal Welfare Program (CAWP) as adjusted or amended through the National and State wild horse and burro program direction. This document can be found on the BLM's ePlanning website: https://eplanning.blm.gov/eplanning-ui/project/2018159/510
- Gather operations will be conducted in accordance with the SOPs described in Appendix 4 and/or the National Wild Horse Gather Contract as adjusted or amended through the National and State wild horse and burro program direction.
- When gather objectives require gather efficiencies of 50-80% or more of the animals to be captured from multiple gather sites (traps) within the HMAs, the helicopter drive method and helicopter assisted roping from horseback would be the primary gather methods used. Post-gather, every effort would be made to return released animals (if any) to the same general area from which they were gathered.
- Given a summer or early fall gather window, bait and/or water trapping may be used provided the gather operations timeframe is consistent with current animal and resource conditions. Bait and/or water trapping may also be selected as the primary method to maintain the population within AML and other special circumstances as appropriate.
- An Animal and Plant Inspection Service (APHIS) or other licensed veterinarian may be on-site during gathers, 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 (Permanent IM-2021-007) by the BLM authorized officer or other delegated official.
- Data including sex and age distribution, reproduction, survival, condition class information (using the Henneke rating system), color, size, and other information may also be recorded,

along with the disposition of that animal (removed or released). Hair and/or blood samples would be acquired every gather in accordance with BLM IM 2009-062, to determine whether BLMs management is maintaining acceptable genetic diversity (avoiding inbreeding depression).

- The following age class removal priorities, which are outlined in BLM IM 2010-135, would be followed:

  a) *Age Class – Four Years and Younger:* Wild horses 4 years of age and younger should be the first priority for removal and placement into the national adoption program.

  b) *Age Class – Eleven to Nineteen Years Old:* Wild horses aged 11 to 19 years of age should be removed from an HMA only if management goals and objectives for the herd cannot be achieved by removing horses 4 years and younger or if specific exceptions prevent them from being turned back and left on the range.

  c) *Age Class – Five to Ten Years Old:* Wild horses 5 to 10 years of age are the lowest priority for removal and should be removed only if management goals and objectives for the herd cannot be achieved through the removal of animals identified in a) and b) above.

  d) *Age Class – Twenty Years and Older:* Wild horses 20 years and older should not be removed from an HMA unless specific exceptions prevent them from being turned back and left on the range. In general, this age group can survive on an HMA but can have greater difficulty adapting to captivity and the stress of handling and shipping if removed.
- Any horses or burros gathered and determined, with consultation between BLM and Utah State brand inspectors, to be domestic animals will be turned over to the local brand inspector in accordance with state law. This is in accordance with the Cooperative Agreement between The Department of Agriculture, State of Utah and the Utah State Office, BLM, approved January 2001.
- Excess animals would be transported to a BLM facility where they would be cared for in accordance with the WFRHBA, most current regulations and policies (i.e., prepared (freeze-marked, vaccinated, and de-wormed) for adoption, sale, or long-term holding).

2.2.1.6 Temporary Holding Facilities During Gathers

Wild horses gathered would be transported from the trap sites to a temporary holding corral near the HMAs or off-range facilities within 8 hours of the trap site, in goose-neck trailers or straight-deck semi-tractor trailers. At the temporary holding corral, the wild horses may be aged and sorted into different pens based on sex. The horses would be provided an ample supply of good quality hay and water. Mares and their un-weaned foals would be kept in pens together. All horses identified for retention in the Complex would be penned separately from those animals identified for removal as excess. All mares identified for release would be treated with fertility control vaccine or flexible IUDs.

At the temporary holding facility, a veterinarian, when present, would provide recommendations to the BLM regarding care, treatment, and, if necessary, euthanasia of the recently captured wild horses. Any animals affected by a chronic or incurable disease, injury, lameness, or serious physical defect (such as severe tooth loss or wear, club foot, and other severe congenital abnormalities) would be humanely euthanized in keeping with BLM policy (Permanent IM 2021-007) using methods acceptable to the American Veterinary Medical Association.

2.2.1.7 Transport, Off Range, Holding, and Adoption Preparation

Wild horses removed from the range as excess would be transported to the receiving short-term holding facility in a goose-neck stock trailer or straight-deck semi-tractor trailers. Trucks and trailers used to haul the wild horses would be inspected prior to use to ensure wild horses could be safely transported. Wild horses would be segregated by age and sex when possible and loaded into separate compartments. Mares and their un-weaned foals may be shipped together depending on age and size of foals. Mare and un-weaned foals would not be separated for longer than 12 hours. Transportation of recently captured wild horses would be limited to a maximum of 8 hours.

Upon arrival, recently captured wild horses would be off-loaded and placed in holding pens where they would be fed good quality hay and water. Most wild horses begin to eat and drink immediately and adjust rapidly to their new situation. At the short-term holding facility, a veterinarian would provide recommendations to the BLM regarding care, treatment, and if necessary, euthanasia of the recently captured wild horses. Any animals affected by a chronic or incurable disease, injury, lameness or serious physical defect (such as severe tooth loss or wear, club foot, and other severe congenital abnormalities) that was not diagnosed previously at the temporary holding corrals at the gather site would be humanely euthanized in keeping with BLM policy (Permanent IM 2021-007) using methods acceptable to the American Veterinary Medical Association (AVMA). Wild horses in very thin condition (Henneke score of <3) or animals with injuries are sorted and placed in sick pens, fed separately, and/or treated for their injuries. Recently captured wild horses, generally mares, in very thin condition (Henneke score of <3) may have difficulty transitioning to feed. Based on the BLM's experience, a small percentage of animals can die during this transition; however, some of these animals are in such poor condition that it is unlikely they would have survived if left on the range. At short-term corral facilities, a minimum of 700 square feet would be provided per animal.

After recently captured wild horses have transitioned to their new environment, they would be prepared for adoption or sale. Preparation involves freeze-marking the animals with a unique identification number, vaccination against common diseases, castration, and de-worming.

2.2.1.8 Public Participation

- Prior to conducting a gather, a communications plan or similar document summarizing the procedures to follow when media or interested public request information or viewing opportunities during the gather would be prepared.
- The public must adhere to guidance from the agency representative, and viewing must be prearranged.

2.2.1.9 Safety

- Safety of BLM employees, contractors, members of the public, and the wild horses would be given primary consideration.
- A briefing between all parties involved in the gather would be conducted each morning.
- All BLM personnel, contractors and volunteers would wear protective clothing suitable for work of this nature. BLM would alert observers of the requirement to dress properly (see Wild Horse and Burro Operational Hazards, BLM File 4720, UT-067). BLM would assure that members of the public are in safe observation areas. Observation protocols and ground rules

would be developed for the public and enforced to keep both public and BLM personal in a safe environment.
- The handling of hazardous, or potentially hazardous materials such as liquid nitrogen and vaccination needles would be accomplished in a safe and conscientious manner by BLM personnel or the contract veterinarian.

2.2.1.10 Responsibility and Lines of Communication

- The local Wild Horse and Burro Specialist / Project Manager from the Color Country District Office (CCDO) would have the direct responsibility to ensure that the procedures in IM 2013-060, Wild Horse and Burro Gather: Management by Incident Command System are followed.
- The Gather Research Coordinator (GRC) from the CCFO would have the direct responsibility to ensure compliance with all monitoring data collection and sampling. The GRC would also ensure appropriate communication with Field Office Manager, HQ-260 National Research Coordinator, College of Veterinary Medicine at Texas A&M University, and APHIS.
- BLM personnel would take an active role to ensure the appropriate lines of communication are established between the Field Office, State Office, Axtell Wild Horse Corrals, Delta Wild Horse Corrals, Southerland Wild Horse Corral, or other Wild Horse Facility.
- While understanding that public and employee health and safety is the top priority, all employees involved in the gathering operations would keep the best interests of the animals at the forefront at all times.

2.2.2. Alternative 2 – Gather and Removal Excess Wild Horses without Population Growth Suppression

This alternative would be the same as the Proposed Action; however, no population growth suppression treatments would be applied as identified in Section 2.2.1.3.

2.2.3. Alternative 3 - No Action – No Gather, Removal, or Population Growth Suppression

No wild horse gathers, removals, or use of any population growth suppression would be undertaken to address the wild horse overpopulation and associated range degradation at this time. The No Action Alternative does not comply with the WFRHBA, regulations, or the Pinyon MFP, and does not meet the purpose and need for action in this EA. It is included as a basis for comparison with the Proposed Action.

2.3. Alternatives Considered but Eliminated from Further Analysis

Alternatives considered but eliminated from detailed analysis are included in Appendix 3, which has discussion and rationale about why each alternative was not carried forward.

Chapter 3. Affected Environment and Environmental Impacts

3.1. Introduction

Chapter 3 contains the effects analysis related to the issues. Section 3.2 presents an overview of reasonably foreseeable environmental trends and planned actions considered in the effects analysis. The Interdisciplinary Team NEPA Checklist (Appendix 2) indicates which resources of concern are either not present in the project area or would not be impacted to a degree that requires detailed analysis. Issues which are necessary to make a reasoned choice between alternatives or determine levels of significance are described in Section 3.3. A scientific literature review is also included in Appendix 5. Standard Operating Procedures and Scientific Literature Review for Population Growth Suppression Methods.

3.2. Reasonably Foreseeable Environmental Trends and Planned Actions

The HMAs is mainly being utilized by livestock, wildlife, and wild horses. All of these uses are expected to continue. Alternatives 1 and 2 contemplate outcomes monitoring with use of radio collars for the purposes of BLM's possible monitoring efforts. No experimental study is contemplated here. However, if there is any experimental research project in the future, that would be considered through additional NEPA analysis. The area has also been impacted by ongoing drought. Vegetation treatments on Federal land, private land, and land administered by SITLA have helped to offset the impacts from drought and excess horse numbers. Dispersed recreation would likely continue. No other reasonably foreseeable future actions are known in the HMAs.

3.3. Issues

For all issues, the impact analysis area is considered to be the sixteen grazing allotments (or portions of grazing allotments) that overlap the HMAs. Horses may also be gathered outside of the HMAs where horses have strayed in search of forage, water, and space.

3.3.1. General Setting Resource

In 2005, 2011, and 2019 the precipitation was near 140% of normal throughout the HMAs. In 2000, 2006, 2010, and 2011 annual precipitation was near normal. In 2012 and 2013, precipitation was normal or slightly below normal, but because of the timing of precipitation, it had little effect on the recovery of vegetation or the recharge of springs and seeps creating drought conditions during most of the year. In 2002, 2003, 2007-2009, 2016, 2018, 2020, and 2021, drought conditions and below normal precipitation occurred (see the BLM monitoring report on the BLM's ePlanning website: https://eplanning.blm.gov/eplanning-ui/project/2018159/510. Vegetation, springs, and seeps continue to struggle to recover from so many years of below normal precipitation.

Available water within the HMAs is currently the limiting factor regarding the wild horse populations. However, if populations expand and/or forage production declines, forage could also become a limiting factor. Water is limited to isolated springs and man-made developments that supply water to permitted livestock, wildlife, and wild horses. Several springs primarily used by wild horses were dry during the summers of 2000-2004, 2007-2008, 2012-2014, 2016, 2018, and 2021, forcing animals onto winter ranges and into areas outside of the HMAs traditionally unoccupied by horses.

3.3.2 *Issue 1. How will removal of wild horses affect livestock grazing?*

Affected Environment

Approximately 2,474 sheep Animal Unit Months (AUMs) and 14,873 cattle AUMs are permitted on the 16 allotments with an active grazing preference that have some portion of the allotment within the HMAs (see Table 3.1). Four other allotments have very small acreage within the HMAs, but do not have forage assigned to wild horses (not included within Table 3.1).

It is estimated that the portions of allotments within the HMAs account for 5,696 cattle AUMs and 1,533 sheep AUMs. Soil Vegetation Inventory Method (SVIM) data from 1980 showed that approximately 8,165 cattle AUMs, 2,353 sheep AUMs, 322 Wildlife AUMs, and 3,116 Wild Horse AUMs were available for use in the HMAs. Since 1980, drought, the age of seeded areas, and land exchanges have reduced the amount of forage available for all animals within the HMAs. In 2005, the BLM adjusted the AUMs for wild horses in the four HMAs as part of the Bible Spring, Blawn Wash, Four Mile, and Tilly Creek Wild Horse Appropriate Management Level Assessment (UT-040-04-47).

Livestock forage allocations based on existing grazing preference (authorized AUMs) were included in the 1983 Pinyon MFP. All the livestock permits have been renewed within the HMAs since 2007. Adjustments to livestock grazing permits have included changes in seasons-of-use, kind-of-livestock, AUMs, and numbers of livestock, to improve or maintain the vegetative condition on the allotments. For the past ten years actual livestock use within the HMAs or in the allotments has been substantially reduced or non-use approved during the years of drought. As livestock grazing permits are evaluated, additional adjustments to the total livestock grazing may be made through the permit renewal process based on current utilization levels, actual grazing use, vegetative trend and precipitation monitoring data. Livestock actual use on all the permitted grazing allotments shows that permittees are only using from 24 percent (Gold Springs Allotment) to 84 percent (Water Hollow Allotment) of their authorized permitted AUMs.

Table 3.1. Allotment, Season of Use, Numbers, Kind of Livestock, and AUMs in the HMAs

Allotment	Livestock Number	Livestock Kind	Grazing Begin	Period End	%Public Land	AUMs
Bennion Spring	300	cattle	02/01	11/30	36%	1,076
Bucket Ranch	335	cattle	06/01	09/30	25%	336
Bull Spring	130	cattle	06/01	02/28	94%	1,157
Culver Spring	40	cattle	02/20	04/30	44%	41
Gold Spring	133	cattle	04/01	10/15	67%	582
Jackson Wash	300	cattle	03/01	02//28	65%	2,340
Jockeys	27	cattle	10/16	05/14	100%	188
	100	cattle	05/15	10/15	100%	506
	27	cattle	10/16	05/14	100%	188
	100	cattle	05/15	10/15	100%	506
Lone Pine Spring	200	cattle	06/01	11/30	91%	1,095
Lund	260	cattle	03/01	02/28	67%	2,090

Allotment	Livestock Number	Livestock Kind	Grazing Begin	Period End	%Public Land	AUMs
Modena Canyon	40	cattle	07/01	09/30	100%	121
Mountain Spring	100	cattle	06/01	11/30	93%	560
Pine Valley	146	cattle	05/15	09/15	82%	486
	36	cattle	05/15	09/15	82%	122
Rosebud	118	cattle	05/01	11/30	10%	83
Sheep Spring	19	cattle	07/01	11/15	100%	86
Tilly Creek	180	cattle	3/1	5/31	58%	316
Water Hollow	272	cattle	05/01	11/30	90%	1,722
Willow Creek	387	sheep	10/20	05/31	100%	570
	245	cattle	10/20	05/31	72%	1,299
	1,287	sheep	10/20	05/31	100%	1,904
	116	cattle	10/20	05/31	41%	352
					TOTAL AUMs	**17,665**

Vegetation in these areas continues to be impacted by wild horses; these impacts are exacerbated by drought conditions. During years of drought, the reduction in the amount of available forage and the utilization of forage by wild horses caused most livestock permittees to place a substantial portion of their grazing preference in non-use, as approved by the BLM. Reasons for non-use vary with the livestock permittees and area, but often include recognition that there is insufficient forage for both the present numbers of wild horses and the preference level of livestock grazing or that the economics of the range livestock industry are down. Although voluntary reductions in cattle AUMs have been taken by permittees, horse numbers have remained at or above the upper AML levels throughout most of the drought years.

Wild horses will drive away livestock and wildlife from watering and feeding areas (Miller, 1981; Perry et al., 2015). When these resources become depleted, wildlife and wild horses will move to new locations, while livestock must be removed. When the BLM managed these HMAs separately in the past, the agency's attempts to reduce the horse population in one HMA were challenging because many horses would move to an adjacent HMA. This reduced the number of horses that could be removed during a gather, prohibiting BLM from reaching gather objectives. This movement of horses temporarily reduced competition with livestock and wildlife in one area, while increasing it in another area for a short-term period (1-2 years). Eventually, the horses slowly migrated back into the best forage and water locations.

There are numerous water developments throughout the HMAs. These developments range from springs dug out with a pick and shovel to developed springs or wells with pipelines and troughs. Most of the developments have been installed for livestock grazing but provide additional water sources and benefits for wildlife and wild horses. These developments require maintenance annually from the grazing permittee(s) before livestock are allowed on an allotment. When permittees do not turn any livestock out on an allotment or area due to drought or other reasons, these developments may not be maintained and can fall into disrepair. This has resulted in reduced water sources for all animals when water is most needed. The BLM has hauled water onto the

HMAs to provide additional water for wild horses during severe drought several times during the past ten years, but this is not sustainable for long periods of time.

Wild horses have dug out holes where there is a seep of water, allowing them to get a drink. However, this can compact the soil over time and can seal off the seep. Horses by nature will paw at a water source, causing damage to some water troughs. Wild horses have also been known to dig up and break pipelines near air vents because they can smell the water at that location, adding to the maintenance cost of a pipeline and troughs.

Fences placed prior to passage of the WFRHBA for livestock management have inhibited the "natural and free roaming nature of the wild horses" in the area. Some fences have been damaged by wild horses in their natural movement and in their search for water.

Environmental Impacts

Proposed Action – Gather and Removal of Excess Wild Horses from the Blawn Wash HMA and the Bible Spring Complex with Population Growth Suppression using Fertility Control Vaccines, Intrauterine Devices (IUDs), and Sex Ratios Manipulations.

Livestock located near gather activities may be temporarily disturbed or displaced by helicopter use and increased vehicle traffic during the gather operations. This displacement would be temporary, and the livestock would move back into the area once gather operations move to another area. Past experience has shown that gather operations have little impact on cattle and sheep. Direct impacts to livestock grazing from removal of excess wild horses would be reduced competition for water and forage, resulting in an increase in forage availability and quality.

Annual authorized livestock use may be adjusted due to a number of factors, including rangeland health or drought. Managing wild horses at the AML through gather and removal with or without fertility control would help with long-term sustainability of authorized livestock use within the HMAs at the current permitted levels. Managing wild horses within AML would reduce the likelihood of adjustments to livestock permits due to overuse of resources by excess wild horses. This action would have no direct impact on current livestock permits in terms of active AUMs, season of use, and/or terms and conditions. Any adjustments to livestock permits would be made through the grazing permit renewal process.

Alternative 2 – Gather and Removal Excess Wild Horses without Population Growth Suppression

Under Alternative 2, impacts on livestock grazing associated with gather and removal activities would be identical to those that would occur under the Proposed Action. However, in the absence of population growth suppression, wild horse populations would be expected to increase at a faster rate (up to 20% annually) and exceed the high end of the AML sooner, increasing competition between livestock and wild horses before the Proposed Action.

Alternative 3 – No Action – No Gather, Removal, or Population Growth Suppression

Eventually, rangeland health would be reduced below a threshold from which it would be difficult to recover. Progress towards achieving BLM Utah's Standards and Guidelines for Rangeland

Health[4] (see the BLM's ePlanning website: https://eplanning.blm.gov/eplanning-ui/project/2018159/510) would not occur. Under the No Action Alternative, wild horse populations would continue to increase above the AMLs established in the Decision Record associated with EA-UT-040-04-47. Because wild horses compete directly with cattle and sheep for resources, there is the potential for authorized livestock to be reduced in line with forage availability, which could impact permittees and result in long-term changes in grazing management. As wild horse numbers increase above the AML, forage availability for livestock grazing decreases. Finally, reduced forage production could result in reduced permitted livestock use within the HMAs.

3.3.3. *Issue 2. How will removal of wild horses affect rangeland health?*

Affected Environment

To achieve desired conditions on the public lands, the BLM uses rangeland health standards and guidelines. Standards describe specific conditions needed for public land health, such as the presence of streambank vegetation and adequate canopy and ground cover. Guidelines are the management techniques designed to achieve or maintain healthy public lands, as defined by the standards. Rangeland health assessments were completed on 16 grazing allotments within the gather area from 2007 through 2015 as indicated by the monitoring report for the HMAs (see the BLM's ePlanning website: https://eplanning.blm.gov/eplanning-ui/project/2018159/510). Nested frequencies, utilization, rangeland health assessments, actual use, precipitation, etc., were utilized to determine whether BLM Utah's Standards and Guidelines for Rangeland Health were being achieved. With the exceptions of Modena Canyon, Pine Valley and Willow Creek, all of the allotments or portions of allotments that occur within the HMAs failed to meet at least one of the Standards. The riparian, soils and wildlife sections of this document contain more information on those Standards (see sections 3.3.4, 3.3.5, and 3.3.6, respectively). Causal factors for not meeting standards include, but are not limited to, Pinyon Pine/Juniper (PJ) encroachment, drought, and grazing by livestock, wildlife, and wild horses. If the BLM determined that livestock grazing was a causal factor toward the non-attainment of the Standards and Guidelines, the agency made changes through the grazing permit renewal process. These changes included livestock reductions, changes to season of use, implementation of grazing management systems, changes in kind of livestock, and other livestock management actions. Wildlife grazing or impacts that are identified as causal factors are addressed during annual coordination with Utah Division of Wildlife Resources and completion of habitat improvement projects.

Monitoring data demonstrates that some areas within allotments show utilization levels from moderate-heavy due to repeated grazing by excess wild horses. Trend data shows static to downward trends based on drought, PJ encroachment, and continued grazing by wild horses during critical growing seasons, especially within wildfire Emergency Stabilization and Rehabilitation (ESR) treatments. Key area monitoring data shows mostly static trend patterns with two downward trend patterns. The downward trend patterns occurred on, one on the Lone Pine Allotment that can be contributed in part to wild horse season long use and the second is within the Sheep Spring Allotment, which has been in non-use from livestock, but has had wild horse and wildlife use.

[4] BLM Utah's Standards and Guidelines for Rangeland Health includes a summary of the Fundamentals for Rangeland Health contained in 43 C.F.R. 4180; the Utah Standards of Rangeland Health, published in 1997; and the Utah Guidelines for Grazing Management, published in 1997.

Wild horses and wildlife have free access to all areas year-round, thus livestock rest does not allow for complete rest for vegetative communities, especially in riparian areas which continue to be degraded by wild horses. Use pattern mapping reflects those areas that show moderate to heavy use is from wild horse and sometimes wildlife activity that is occurring during and outside the livestock permitted season of use.

Continued grazing pressure from horses in concentrated areas, especially during persistent years of drought conditions, impairs the potential for future forage production. Livestock grazing is regimented into frequency, intensity, and timing of grazing according to permitted or authorized dates in order to promote forage reproduction and vigor of key species. In contrast, wild horses, especially at levels above AML, continue to graze key species during critical growing periods and without rest, resulting in above-ground production loss. In addition, grazing more than 50 percent of a plant's foliage reduces its root mass and ability to obtain nutrients and water from the soil (Herbel, 1982; Williams, et al., 1968). This is supported by the BLM's utilization pattern mapping reports, which have documented plants showing poor health, vigor, and sometimes lacking in any seed production within areas where wild horses are known to concentrate. Removal of excess horses over AML would, therefore, increase forage production and create overall better range conditions for horses, wildlife, and livestock.

Vegetation production and vigor has been reduced by the past and present droughts. Drought is defined as prolonged dry weather generally when precipitation is less than 75% of average annual amount (Society for Range Management, 1974). Precipitation is the most important single factor determining the type and productivity of vegetation in an area. Forage production increases rapidly as precipitation increases up to about 20 inches per year (Holechek, 1989). Slight reduction from normal precipitation can cause severe reductions in plant yield in areas with less than 12 inches of precipitation (Klages, 1942). During the periods from 1999-2004, 2012-2014, 2016, 2018, and 2020-2021, average annual precipitation never exceeded 12 inches within the HMAs, which was approximately 75% of the normal precipitation for that area. Drought maps from 2022 are contained in Appendix 8.

The HMAs supports multiple vegetation types including grasslands, sagebrush, sagebrush/grasslands, PJ, mountain fir, and mountain fir/mountain shrub (see Table 3.2). The PJ woodland type dominates the HMAs and is very dense with minimal understory forage. Open areas outside the PJ canopy are dominated by big sagebrush with Indian ricegrass, Crested wheatgrass, and intermediate wheatgrass as the primary forage species.

Table 2.2 Wild Horse Management Units – Acres of Vegetation per HMA

HMA Name	Vegetation Cover	Acres	Percent
Bible Spring	Sagebrush/perennial grass	5,582.71	9.64
Bible Spring	Pinyon-Juniper	25,446.18	43.96
Bible Spring	Pinyon	10,041.79	17.35
Bible Spring	Grassland	91.86	0.16
Bible Spring	Juniper	13,741.26	23.74
Bible Spring	Sagebrush	2,739.76	4.73
Bible Spring	Mountain fir	246.19	0.43

HMA Name	Vegetation Cover	Acres	Percent
	Total	**57,889.75**	**100.00**
HMA Name	**Vegetation Cover**	**Acres**	**Percent**
Blawn Wash	Juniper	10,122.74	16.72
Blawn Wash	Sagebrush	7,238.39	11.95
Blawn Wash	Sagebrush/perennial grass	370.38	0.61
Blawn Wash	Pinyon-Juniper	22,662.52	37.42
Blawn Wash	Pinyon	19,742.66	32.60
Blawn Wash	Grassland	15.67	0.03
Blawn Wash	Mountain fir/Mountain shrub	406.31	0.67
	Total	**60,558.68**	**100.00**
HMA Name	**Vegetation Cover**	**Acres**	**Percent**
Four Mile	Pinyon-Juniper	28,017.27	47.72
Four Mile	Sagebrush/perennial grass	1,299.17	2.21
Four Mile	Grassland	360.28	0.61
Four Mile	Pinyon	483.13	0.82
Four Mile	Juniper	22,133.97	37.70
Four Mile	Sagebrush	6,416.20	10.93
	Total	**58,710.03**	**100.00**
HMA Name	**Vegetation Cover**	**Acres**	**Percent**
Tilly Creek	Pinyon	9,543.08	26.54
Tilly Creek	Sagebrush/perennial grass	671.96	1.87
Tilly Creek	Pinyon-Juniper	12,759.24	35.48
Tilly Creek	Juniper	9,369.58	26.05
Tilly Creek	Grassland	58.47	0.16
Tilly Creek	Sagebrush	3,561.00	9.90
	Total	**35,963.33**	**100.00**

Within portions of the HMAs, mastication, chaining, and/or burning PJ encroachment, combined with aerial seeding, has restored a portion of the PJ woodlands to a grassland and shrub community. These projects were completed to improve wildlife habitat, reduce fuels that increase fire occurrence or behavior, and provide ESR to rangelands after wildfires. As intended, these projects have reduced tree cover and competition with grasses and forbs and increased the amount of available forage within the HMAs. Based on the BLM's data, vegetation species diversity was also greatly increased through these projects. A few of these treatments were completed in the last 10 years, but many are now 20-30 years old; as a result, PJ and/or sagebrush has infilled these areas, reducing vegetation diversity and forage production.

Fire or vegetation treatments can reset the seral stage to a more productive forage site for wildlife, wild horses, and livestock. Succession can be accelerated by excessive wild horses, that forces the animals to congregate in areas where they would normally graze and move on due to the limited forage availability within the HMAs from lack of fire and vegetation treatments. These rehabilitated sites, however, can lose productivity if forage species are grazed heavily and repeatedly, especially during critical growing times, resulting in diminished root growth and

reproductive processes. This allows species that are not as desirable for forage such as shrubs, trees and weeds to invade into these opened spaces. Although seral stage is a natural process and seedings do lose some productivity over time, many of these seedings have lasted longer than expected despite conditions. Based on BLM monitoring data (see https://eplanning.blm.gov/eplanning-ui/project/2018159/510), between 2002 and 2022 most of the older seedings have lost some of their productivity due to age. This data shows that production of forage species was limited by the drought and some plants died, increasing the grazing on surviving forage species.

From1999-2004, the wild horse population in the HMAs was at the highest since the passage of the WFRHBA (available on the National Wild Horse and Burro Website (https://www.blm.gov/programs/wild-horse-and-burro/about-the-program/program-data). Heavy and severe utilization near water and on treated areas by wild horses, wildlife, and livestock contributed to the loss of seeded species and the invasion of sagebrush and pinyon/juniper. The current estimated population of wild horses in the HMAs is once again nearing the 1999-2004 population, with drought conditions similar to those years occurring in 2021.

Utilization studies that have been completed during the past 20 years, along with CCFO staff observations, suggest that as wild horse populations increase, there is a decrease of forage species. This is especially true in grassland, sagebrush/grassland, and seeded areas. The grasses in the reseeded and key foraging areas were grazed by wild horses, livestock, and wildlife during the critical spring season and utilized moderately-to-severely. Livestock grazing systems that eliminated repeated critical growing period grazing within the same pasture on an annual basis were implemented during the grazing permit renewal process throughout the HMAs.

Based on the BLM's experience, year-long grazing by excess wild horses has been one contributing factor to the decline of many of the treated and seeded areas. Horses, because they are territorial, are grazing the same areas repeatedly throughout the spring during critical growing periods for grasses. The Elk Spring ESR Project in Wilson Canyon (within the HMAs), for example, demonstrates this relationship. The area associated with that project has not been grazed by livestock since 1993 and has only been used by wildlife and wild horses. The heavy to severe use currently being made on the area is reducing the available forage and the species diversity.

Environmental Impacts

This analysis assumes that livestock use would continue at levels established by grazing permit renewal decisions, big game population numbers would continue as established by herd management plans and state law, and removal of wild horses would be conducted as proposed in the action alternatives to within the AML levels specified for the HMAs.

Proposed Action – Gather and Removal of Excess Wild Horses from the Blawn Wash HMA and the Bible Spring Complex with Population Growth Suppression using Fertility Control Vaccines, Intrauterine Devices (IUDs), and Sex Ratios Manipulations.

Under the Proposed Action, competition for forage and water between wild horses, wildlife, and livestock would be directly reduced because there would be fewer horses within the HMAs. This would also improve rangeland health and keep use levels within management plan objectives.

A reduced demand for forage would help improve the vigor of vegetation and allow for seedling establishment and increased ground cover, thereby maintaining a TNEB. If precipitation remains near or above long-term average levels, this reduced demand for forage would facilitate recovery from the extended drought and result in improved vegetative trend of key forage species. Long-term rangeland health would improve within the allotments as key forage and riparian areas would receive less use, especially during time of drought when wild horses are hardest on these areas. Reducing excess wild horse population to within AML would contribute to maintaining sufficient vegetation and litter within the HMAs to protect soil from erosion, meet plant physiological requirements, facilitate plant reproduction, and reduce potential for spread of noxious weeds.

Based on the BLM's experience, helicopter gather operations would result in short-term (1 to 10 days) direct impacts to vegetation including disturbance of native vegetation immediately in and around temporary trap sites and holding and handling facilities. Bait trapping would result in longer duration (5-365 days) direct impacts to vegetation, but these impacts would still be considered short-term. There would be direct impacts to the vegetation immediately in and around temporary trap sites and holding, sorting, and animal handling facilities. Impacts would be created by vehicle traffic and hoof action of penned horses and could be locally severe in the immediate vicinity of the corrals or holding facilities. Keeping the sites approximately one-half acre in size would minimize the disturbance area. Since most trap sites and holding facilities are re-used during recurring wild horse gather operations, any impacts would remain site-specific and isolated in nature. In addition, most trap sites or holding facilities are selected to enable easy access by transportation vehicles and logistical support equipment and would, therefore, generally be near or on roads, pullouts, water haul sites, or other previously disturbed flat spots. These common practices would minimize impacts.

The use of population growth suppression on wild horse gathers would not impact rangeland resources and vegetation directly but would have indirect impacts if wild horse populations were reduced or maintained within AML for longer periods of time. Maintaining populations within AML would extend the beneficial impacts described in this section.

Alternative 2 – Gather and Removal Excess Wild Horses without Population Growth Suppression

Under this alternative, impacts on rangeland health associated with gather and removal activities would be the same as those that would occur under the Proposed Action. However, without the use of population growth suppression, the AML would be more difficult to maintain as the growth rate would be higher than it would be with the Proposed Action. This would require more frequent gathers in the HMAs to maintain AML. Increased frequency of gathers would result in greater short-term disturbance of vegetation and soils in and around temporary trap sites and holding and handling facilities.

Additionally, without slowing reproduction, a steady increase in the number of wild horses through natural foaling rates would result in heavier utilization and downward trend in key forage species. Removal of excess wild horses would be beneficial to vegetative resources, but plant communities would not receive as much opportunity to recover as under the Proposed Action.

Alternative 3 – No Action – No Gather, Removal, or Population Growth Suppression
Under the No Action Alternative, wild horses within and adjacent to the HMAs would continue to increase in population beyond the capacity of the habitat to provide water and forage. Heavy and severe use of vegetation resources by wild horses would continue and increase, resulting in further degradation of plant communities, increased soil erosion, and greater susceptibility to invasive species. Downward trends in key perennial species would be expected in conjunction with reductions in ecological condition and soil stability. The vegetative functional/structural groups (i.e., grass, shrubs, trees, etc.) would be changed as grasses are over utilized during critical growing seasons. Vegetation would also experience reduced production, which would result in reduced forage availability to wildlife, livestock, and wild horses. Eventually, rangeland health would be reduced below a threshold from which it would be difficult to recover. Considerable progress towards the Standards and Guidelines for Rangeland Health would not occur.

3.3.4. *Issue 3. How would the removal of wild horses affect soil conditions?*

Affected Environment
Soils within the proposed gather area are highly variable in terms of parent material, erosiveness, productivity, and other aspects. Detailed soil descriptions and maps may be found in the Soil Survey of Iron – Washington Area, Utah (Natural Resource Conservation Service (NRCS), 1996) for that portion of the analysis area in Iron County (available upon request). No similar data is available for the Beaver County portion of the analysis area.

BLM Utah's Rangeland Health Standards include rating soil conditions in terms of current conditions and causal factors for those conditions. The results of Rangeland Health assessments are the basis of soils analysis for this proposal. Rangeland Health Standard 1 includes productive upland soils as evidenced by sufficient cover and litter to protect soil surfaces from erosion, the absence of erosion indicators, and appropriate kind and amounts of vegetation to allow properly functioning ecological conditions. Utilization data has been collected to monitor how much vegetation has been removed (primarily by large ungulates) and may be used to reflect whether adequate protective vegetation cover and litter has been left on-site to protect soils surfaces from erosion.

Key area monitoring sites showed overall static trends across the HMAs, with the majority of trend being from a 5 to 10-year interval. This could indicate that range conditions are not demonstrating a positive or negative departure. Sites within the Sheep Spring and Lone Pine Spring allotments, which were within the Broken Ridge Fire, show a downward trend that correlates back to heavy utilization levels within an area in which horses are known to concentrate.

Regarding residual vegetation cover, renewed grazing permits generally include a utilization objective to not exceed 50 percent of current year's growth of key forage species. This objective is important in the management of grazing allotments for several reasons, including key forage plant health, ability to support a reasonable amount of wild ungulate use after livestock are removed, and to offer protection to the soil surface as required by Rangeland Health Standard 1. In addition to the four allotments not meeting Rangeland Health Standard (Gold Spring, Lone Pine Spring, Lund, Mountain Spring) there are ten allotments within the HMA that met Standard 1 but had areas that exceeded utilization (greater than 50 percent) which is a threat to the long-term soil

stability of the allotments. These allotments include Bennion Spring, Bucket Ranch, Bull Spring, Culver Spring, Jackson Wash, Jockeys, Modena Canyon, Pine Valley, Sheep Spring and Water Hollow. Specific use levels and areas where excessive use is occurring are contained in the monitoring report (see the BLM's ePlanning website: https://eplanning.blm.gov/eplanning-ui/project/2018159/510). Based on the data in this report, wild horses are contributing to the failure to meet the Rangeland Health Standards.

Environmental Impacts

This analysis assumes that livestock use would continue at levels as established by grazing permit renewal decisions, big game numbers would continue as established by herd management plans and state law, and removal of wild horses would be as proposed to within the AML levels specified for each HMA.

Proposed Action – Gather and Removal of Excess Wild Horses from the Blawn Wash HMA and the Bible Spring Complex with Population Growth Suppression using Fertility Control Vaccines, Intrauterine Devices (IUDs), and Sex Ratios Manipulations.

The Proposed Action would have direct short-term impacts on soils in the trap and temporary holding areas. These areas would be disturbed by the hoof action of wild horses when they are concentrated in the trap area to be loaded on the trailers. The disturbance would be one quarter to one half acre in size at each trap and would normally be in an area that has already been disturbed like a road, wash, or previous trap site. Most gather operations would occur when soils are dry or frozen, thereby reducing the impact to soils. The BLM's experience with previous gathers is that the vegetation at past trap site locations has recovered within a year, which serves to stabilize the soils. The BLM has not observed any long-term compaction of soils resulting from past gather operations.

The Proposed Action would have the indirect impact of moving allotments within the HMAs toward the maintenance/attainment of the Rangeland Health Standard 1. In general, the reduction of wild horses to within AML would reduce utilization levels, which would allow more residual vegetation and litter to remain on site and reduce bare ground. Reduction of wild horse numbers would allow allotments to achieve utilization objectives. Increased litter would provide additional protection from wind and water erosion, promote infiltration, detain surface flows, and reduce soil moisture loss by evaporation, thus allowing for better vegetative productivity. Indicators, such as pedestals, bare ground, litter movement, flow patterns, etc., should lessen with implementation of the Proposed Action. Further, reduced numbers of horses should result in less compaction of wet sites, such as riparian areas which would enhance soil and vegetation production.

Alternative 2 – No Population Growth Suppression

Under Alternative 2, impacts on soils associated with gather and removal activities would be the same as those that would occur under the Proposed Action. However, in the absence of population growth suppression, wild horse populations would be expected to increase at a faster rate (up to 20% annually) and exceed the high end of the AML sooner, increasing the frequency of gathers. Heavy and severe use of desirable vegetation resources by wild horses would increase faster than under the Proposed Action.

Alternative 3 – No Action – No Gather, Removal, or Population Growth Suppression
Under the No Action Alternative, wild horse populations would continue to increase beyond the capacity of the habitat to provide water and forage. Heavy and severe use of desirable vegetation resources by wild horses would continue and increase.

Current indicators of poor soil conditions would remain on allotments currently not meeting Rangeland Health Standards. Additional indicators, such as increased overland flows, rills, and gullies could occur as additional soil was lost from the allotments. Wind erosion could become a factor, where it is not currently. Horses would have to expand their ranges because of the distances they would need to travel from water to obtain forage. Ultimately, the 12 allotments currently meeting Rangeland Health Standard 1, (ten of which are experiencing excessive utilization already due to excessive wild horses), would no longer meet Standard 1 (or other standards) as soil conditions deteriorate. Under the No Action Alternative, additional trailing, trampling, and compaction would occur at riparian zones and other water sources. Decreased soil percolation and water holding capacity and increased surface runoff from these water sources would result in increased soil erosion.

3.3.5. *Issue 4. How would gathering wild horses affect wetland and riparian resources?*

Affected Environment
There are approximately 27 miles of lotic habitat and 17 acres of lentic habitat within the HMAs (Table 3.3). Common riparian/wetland species are willows, cottonwoods, sedges, rushes, Woods rose, and Kentucky bluegrass. There are approximately 16 miles and 12 acres rated in Proper Functioning Condition (PFC), 10 miles and 5 acres rated as functioning at risk (FAR), and 1 mile and 0.5 acres rated as nonfunctional (NF).

Damage to wetland and riparian areas often increases during drought years when excess wild horses may trample and dig in these areas in search of water. Drought conditions have resulted in many of the springs being unavailable as water sources for wildlife, livestock, and wild horses. High populations of wild horses impact riparian areas with increased trailing, vegetative use, and trampling. Wild horses will drive away livestock and native ungulates from watering and feeding areas (Miller, 1981; Perry et al., 2015). Wild horse use has been identified through the BLM's PFC assessments as a contributing factor in riparian areas within the HMAs not achieving PFC.

Table 3.3. Summary of Riparian Condition Ratings

HMA	Proper Functioning Condition		Functional at Risk – trend up		Functional at Risk – trend unknown		Functional at Risk – trend down		Nonfunctional	
	miles	acres	miles	acres	miles	acres	miles	acres	miles	Acres
Blawn Wash	11	9.8	--	--	2.0	--	3.7	0.02	--	--
Four Mile	--	--	--	0.1	0.1	--	0.92	0.34	0.14	0.06
Bible Spring	--	--	--	--	--	--		0.06	0.6	--

HMA	Proper Functioning Condition		Functional at Risk – trend up		Functional at Risk – trend unknown		Functional at Risk – trend down		Nonfunctional	
	miles	**acres**	**miles**	**acres**	**miles**	**acres**	**miles**	**acres**	**miles**	**Acres**
Tilly Creek	5.23	2.02	1.7	0	0.9	0.05	1.06	4.82	--	0.1
TOTAL	**16.23**	**11.82**	**1.7**	**0.1**	**3.0**	**0.05**	**5.68**	**5.24**	**0.74**	**0.16**

Environmental Impacts

Proposed Action – Gather and Removal of Excess Wild Horses from the Blawn Wash HMA and the Bible Spring Complex with Population Growth Suppression using Fertility Control Vaccines, Intrauterine Devices (IUDs), and Sex Ratios Manipulations.
Helicopter trap sites and temporary holding facilities would not be constructed in riparian areas. The Proposed Action would indirectly impact riparian wetland zones and water quality due to the decreased utilization by wild horses in these sensitive areas, which would allow for the possibility of riparian wetland areas to improve through natural processes. Implementing the Proposed Action would decrease competition for water sources and alleviate pressures exerted on riparian habitat due to wild horses congregating around these sensitive areas. The functionality of riparian resources would improve towards PFC with the removal of excess wild horses and implementation of fertility control.

Alternative 2 – Gather and Removal Excess Wild Horses without Population Growth Suppression
Under Alternative 2, impacts on riparian areas associated with gather and removal activities would be the same as those that would occur under the Proposed Action. However, in the absence of population growth suppression, wild horse populations would be expected to increase at a faster rate (up to 20% annually) and exceed the high end of the AML sooner, increasing the utilization of riparian vegetation and browse and trampling faster than under the proposed action.

Alternative 3 – No Action – No Gather, Removal, or Population Growth Suppression
Direct impacts would result from continued and increased utilization on riparian vegetation as wild horse populations continued to increase. Riparian areas currently rated at PFC, would experience downward trends caused by utilization of riparian vegetation and browse, and trampling by populations of wild horses in excess of AML. Riparian areas rated below PFC (FAR and NF) would likely not improve, and downward trends would continue.

3.3.6. *Issue 5. How would the gathering of horses affect wildlife?*

Affected Environment
With design features, no threatened or endangered species would be affected by the gather activities. While several special status wildlife species are known to occur in the project area, greater sage-grouse would be the primary special status wildlife species affected.

Part of the Complex is located in the Hamlin Valley greater sage-grouse PHMA. Typically, proximity and abundance of nesting habitat are key factors for lek locations. Nesting habitat for sage-grouse includes sagebrush with an understory of native grasses and forbs, with horizontal and vertical structural diversity. This provides an insect prey base, herbaceous forage for pre-laying and nesting hens, and cover for the hen while she is incubating. Brood rearing habitat is typically defined for early-brood rearing and late-brood rearing activities. Late spring/early summer grazing by wild horses generally impacts the habitat and the ability of the vegetative communities to provide adequate cover for brood-rearing sage-grouse. Competition between wild horses and sage-grouse may occur during the winter because sage-grouse feed exclusively on the leaves of sagebrush. Studies corroborate the general conclusion that wild horses can lead to biologically significant changes in rangeland ecosystems, particularly when their populations are overabundant relative to water and forage resources, and other wildlife living on the landscape (Eldridge et al., 2020). The presence of wild horses may be associated with a reduced degree of greater sage-grouse lekking behavior (Muñoz et al., 2020). Moreover, increasing densities of wild horses as measured by a percentage above AML can be associated with decreasing greater sage-grouse population sizes as measured by lek counts (Coates et al., 2021).

Big game species that occur in the HMAs include mule deer, Rocky Mountain elk, and pronghorn. All three species are year-long residents. Competition between wildlife and wild horses increases dramatically when fewer resources such as forage or water are available. UDWR biologists are observing lower big game population numbers all across the unit, as well as in the Bible Spring area. UDWR has also reported declining habitat conditions where feral horse numbers exceed management levels. Horses also limit access to water sources for many other wildlife species such as pronghorn, which demonstrate an increased vigilance and decreased time foraging or drinking when feral horses are present (DWR 2022).

A variety of migratory birds inhabit the HMAs during the spring, summer, and fall months, including the black rosy finch, black-throated gray warbler, Brewer's sparrow, broad-tailed hummingbird, gray vireo, Lewis's woodpecker, loggerhead shrike, prairie falcon, sage sparrow, and Virginia's warbler. Additionally, Golden eagles may occur on the HMAs area year-round. A majority of the area would be used for foraging.

Environmental Impacts

Proposed Action – Gather and Removal of Excess Wild Horses from the Blawn Wash HMA and the Bible Spring Complex with Population Growth Suppression using Fertility Control Vaccines, Intrauterine Devices (IUDs), and Sex Ratios Manipulations.

Activities such as using helicopters and roping can have short-term effects on wildlife due to human noise and activity and potential surface disturbances. Direct impacts from bait and water trapping would vary by wildlife species. The intensity of these impacts would vary by individual and would be indicated by behaviors ranging from nervous agitation to physical distress. Temporary disturbance or displacement would occur to wildlife during set up of traps or if they were unable to escape when horses were captured in a trap. Since traps are monitored, it is very unlikely wildlife would become trapped.

Greater sage-grouse or its habitat could be impacted temporarily and in the short-term through disturbance and/or displacement caused by gather operations. After these activities have ceased, sage-grouse would be expected to return to the area. Bringing the population of wild horses to within AML would benefit sage-grouse in the short-term through improved access to water sources and in the long-term through improved habitat conditions, both at water sources/riparian areas and in upland habitat containing sagebrush.

Big game habitat would be indirectly affected by the improvements in resource health from the removal of excess horses and population growth suppression. Implementing the Proposed Action would reduce utilization on key forage species, improving the quantity and quality of forage available to wildlife and decreasing competition for water sources. Impacts to big game from gather operations should be minimized because gather operations would not occur from March 1-June 30, which overlaps with the most critical stress periods for mule deer and pronghorn fawning seasons.

Short-term impacts to migratory birds could include the occasional destruction of nests and eggs due to trampling by horses, or associated nest abandonment of birds intolerant to disturbances.

Alternative 2 – Gather and Removal Excess Wild Horses without Population Growth Suppression
Under Alternative 2, impacts to wildlife associated with gather and removal activities would be the same as those that would occur under the Proposed Action. However, in the absence of population growth suppression, wild horse populations would be expected to increase at a faster rate (up to 20% annually) and exceed the high end of the AML sooner, increasing the frequency of gathers. Heavy and severe use of desirable vegetation resources by wild horses would increase faster than under the Proposed Action.

Alternative 3 – No Action – No Gather, Removal, or Population Growth Suppression
Under the No Action Alternative, important wildlife upland habitats would continue to be impacted to a greater degree as the wild horse population increases. Downward trends in key perennial species would be expected in conjunction with reductions in ecological condition. As this occurs, vegetation would also experience reduced production levels resulting in reduced forage available to wildlife. Wild horses would increasingly compete with wildlife for habitat suitable for breeding, nesting, foraging, and burrowing for greater sage-grouse, pygmy rabbits, and burrowing owls. Sagebrush obligates dependent on suitable sagebrush ecosystems for nesting and breeding would continue to be depleted. Competition between mule deer, pronghorn and wild horses for forage and water resources during the spring and summer months would continue. However, the potential impacts from disruption due to increased human activity, trampling of nests at trap sites, and helicopter use would not occur.

3.3.7. *Issue 6. How would the gathering and removal of excess wild horses affect individual wild horses and the overall population of the HMAs?*

Affected Environment
The CCFO has attempted since the completion of the MFP in 1983 to keep the wild horse population on the four HMAs within the AML of 80-170 horses (Table 1.1). Gathers and removals have been conducted within the different HMAs in 1982-1985, 1988-89, 1991, 1994-95, 1998,

2000-02, 2006-10, 2012-15, and 2017-20 to attempt to keep the horse population within the AML or to remove wild horses from private lands adjacent to the HMAs. Only the 2006, 2009 and 2018 gathers were done on all four of the HMAs at once. The gathers in 2010, 2012-15, 2019 and 2020 were small private land gathers. The horse populations on the different HMAs have varied within AML from 1980 to present. Gathers of wild horses within the HMAs has proven to be difficult due to heavy tree cover, terrain, and horse movement. As the population increases, it becomes harder to gather the number of horses needed to reduce the population to within AML.

The current estimated population of the Blawn Wash HMA and the Bible Spring Complex (Table 2.1) was developed after completion of an aerial population inventory flight in February of 2022, and subsequent analysis of the data to estimate the number of animals that were present in the surveyed area, but not seen by any observer (Crabb, 2022). (see Population Inventory, Appendix 9). The total estimated number of horses at the time of the February 2022 survey was 693 horses, of which 296 were estimated to be counted outside the HMA boundaries. Based on the HMA's population increasing by 20% each year by the summer of 2022, the projected population size for the HMAs would be 831 horses. That is 488 percent of the upper AML.

The presence of wild horses can have substantial effects on rangeland ecosystems, and on the capacity for habitat restoration efforts to achieve landscape conservation and restoration goals. While wild horses may have some beneficial ecological effects, such benefits are outweighed by ecological dam age they cause when herds are at levels greater than supportable by allocated, available natural resources (i.e., when herds are greater than AML).

In the biological sense, all free-roaming horses and burros in North America are feral, meaning that they are descendants of domesticated animals brought to the Americas by European colonists. Horses went extinct in the Americas by the end of the Pleistocene, about 10,000 years ago (Webb 1984; MacFadden 2005). The published literature refers to free-roaming horses as either feral or wild. In the ecological context the terms are interchangeable, but the terms 'wild horse' are associated with a specific legal status. The following literature review on the effects of wild horses on rangeland ecosystems draws on scientific studies of feral horses, some of which also have wild horse legal status. The following literature review draws on Parts 1 and 2 of the *Science Framework for Conservation and Restoration of the Sagebrush Biome* interagency report (Chambers et al. 2017, Crist et al. 2019).

Because of the known damage that overpopulated wild horse herds can cause in rangeland ecosystems, the presence of wild horses is considered a threat to greater sage-grouse habitat quality, particularly in the bird species' western range (Beever and Aldridge 2011, USFWS 2013). Wild horse population sizes on federal lands have more than doubled in the five years since the USFWS report (2013) was published (BLM 2021). On lands administered by the BLM, there were over 95,000 BLM-administered wild horses and burros as of March 1, 2020, which does not include foals born in 2020. Lands with wild horses and burros are managed for multiple uses, so it can be difficult to parse out their ecological effects. Despite this, scientific studies designed to separate out those effects, which are summarized below, point to conclusions that landscapes with greater wild horse and burro abundance will tend to have lower resilience to disturbance and lower resistance to invasive plants than similar landscapes with herds at or below target AML levels.

In contrast to managed livestock grazing, neither the seasonal timing nor the intensity of wild horse and burro grazing can be managed, except through efforts to manage their numbers and distribution. Wild horses live on the range year-round, they roam freely, and wild horse populations have the potential to grow 15-20% per year (Wolfe 1980; Eberhardt et al. 1982; Garrott et al 1991; Dawson 2005; Roelle et al. 2010; Scorolli et al. 2010). As a result of the potential for wild horse populations to grow rapidly, impacts from wild horses on water, soil, vegetation, and native wildlife resources (Davies and Boyd 2019) can increase exponentially unless there is active management to limit their population sizes.

The USFWS (2008), Beever and Aldridge (2011), and Chambers et al (2017) summarize much of the literature that quantifies direct ecosystem effects of wild horse presence. Beever and Aldridge (2011) present a conceptual model that illustrates the effects of wild horses on sagebrush ecosystems. In the Great Basin, areas without wild horses had greater shrub cover, plant cover, species richness, native plant cover, and overall plant biomass, and less cover percentage of grazing-tolerant, unpalatable, and invasive plant species, including cheatgrass, compared to areas with horses (Smith 1986; Beever et al. 2008; Davies et al. 2014; Zeigenfuss et al. 2014; Boyd et al. 2017). There were also measurable increases in soil penetration resistance and erosion, decreases in ant mound and granivorous small mammal densities, and changes in reptile communities (Beever et al. 2003; Beever and Brussard 2004; Beever and Herrick 2006; Ostermann-Kelm et al. 2009). In contrast to domestic livestock grazing, where post-fire grazing rest and deferment can foster recovery, wild horse grazing occurs year-round. These effects imply that horse presence can have broad effects on ecosystem function that could influence conservation and restoration actions.

Many studies corroborate the general conclusion that wild horses can lead to biologically significant changes in rangeland ecosystems, particularly when their populations are overabundant relative to water and forage resources, and other wildlife living on the landscape (Eldridge et al. 2020).

Although horses and cattle are often compared as grazers, horses can be more destructive to the range than cattle due to their differing digestive systems and grazing habits. The dietary overlap between wild horses and cattle is much higher than between wild horses and wildlife, and averages between 60 and 80% (Hubbard and Hansen 1976, Hansen,et al. 1977, Hanley 1982, Krysl et al. 1984, McInnis and Vavra 1987). Horses are cecal digesters while most other ungulates including cattle, pronghorn, and others are ruminants (Hanley and Hanley 1982, Beever 2003). Cecal digesters do not ruminate or have to regurgitate and repeat the cycle of chewing until edible particles of plant fiber are small enough for their digestive system. Ruminants, especially cattle, must graze selectively, searching out digestible tissue (Olsen and Hansen 1977). Horses, however, are one of the least selective grazers in the West because they can consume high fiber foods and digest larger food fragments (Hanley and Hanley 1982, Beever 2003, Bauer et al. 2017). Because horses have a cecal digestive system and can cover longer distances than can domestic ruminants, wild horses can remain in good health under forage conditions fatal to domestic ruminants (Holechek, 1989).

In 1999 and 2000, range conditions within the HMAs became so poor that even with almost no livestock use and several hundred wild horses removed, health of some horses declined to critical

conditions. Some horses were lost to starvation and dehydration during those years. In 2021, the range conditions and wild horse populations were similar to those in 1999 and 2000. If drought conditions continue, the BLM expects that there would be an increase in horses lost to starvation and dehydration, as has occurred in the past.

Based on the BLM's data and observations, the overriding limiting factor for the carrying capacity of the horses in the four HMAs are not the available forage, although this is a concern; instead, it is the supply of reliable water during the summer months. Upland vegetation in proximity to reliable water sources is used heavily by wild horses, wildlife, and livestock, while vegetation in areas farther from water (i.e., a neighboring HMA) is used slightly or not at all. There are many areas within the HMAs that have adequate forage but are not usable for most of the year due to lack of water and/or seasonal conditions, such as snow depth. During drought conditions, as has occurred during 1999-2004 and the last few years, several water sources dry up, concentrating wild horses on the remaining water sources and limiting the number of horses that a particular HMA can support. The increased concentration of wild horses at these sites reduces vegetation and causes soil compaction. The BLM has previously hauled water to a variety of locations to spread the use out and to sustain wild horses, but this is not sustainable for long periods of time.

Currently, none of the four HMAs on its own has an AML large enough to maintain a genetically viable population over the long term without introduction of horses from outside the HMAs. However, these HMAs have viable populations because of the interchange of horses between HMAs and introduction of horses from other HMAs. Horses from the different HMAs move from one adjacent HMA to another in search of food, water, shelter, a new band, or because of pressure from other resource uses, which allows for genetic mix of the population. For these reasons, BLM manages the three HMAs as the Bible Spring Complex.

The BLM collected hair samples in 2018 from wild horses gathered from the HMAs and sent samples to Dr. Gus Cothran at the Texas A&M University for genetic analysis. The BLM received the resulting report on the wild horse's genetic viability in the Bible Spring Complex in January 2021 (see Genetic Analysis, Appendix 10). Current genetic variability levels of the wild horse population within the Complex are good. The variation results suggest that this is a single, interbreeding herd overall, but that there could be some limited population subdivision. This, if true and maintained, could be beneficial to long term maintenance of genetic diversity. The herd appears to be primarily of mixed breed ancestry. (Cothran, 2021). Wild horses in the Complex appear to be well connected, genetically, to other BLM-managed herds; pairwise Fst values between other HMAs and Blawn Wash and Tilly Creek indicated over 70 other sampled areas with Fst values lower than 0.075 (NAS, 2013). Although no immediate action is needed in the Complex, it would continue to be monitored through the action of sample collection at the time of gathers, and subsequent sample analysis. Horses from outside the Complex may again need to be introduced to maintain diversity once the population is within AML, depending on future results of genetic monitoring. Intermixing of wild horses between the three HMAs has helped maintain the genetic viability of the Complex. During the years of drought there has been more movement than normal, as the horses have moved in search of other reliable water sources. Much of this movement has been between the three HMAs, but some has been between other HMAs outside the Bible Spring Complex (i.e., Eagle and Sulphur HMAs) and outside of any HMAs.

From 1997-2000, 2013, and 2022, the estimated population of wild horses within the HMAs was triple the AML. The population of horses move between the HMAs (population inventories 2000-present). In the last 20 years, within the HMAs the population has been double AML most years. Based on the BLM's experience, if horse populations were allowed to continue to double or triple throughout the HMAs, wild horses could realistically utilize all of the available forage and water allocated for other resources and uses, causing increased competition, reduced horse health (or death), and placing vegetation communities at risk. This scenario is exacerbated by drought conditions that have occurred over the past several years. Similar conditions in 1999-2002 of high wild horse population combined with drought reduced horse health, and several wild horses died on the range.

Based on the BLM's data, forage utilization levels by wild horses on rangelands within the HMAs increase as the population increases. The potential for loss of key forage species also increases as the amount of sustainable forage is depleted through higher levels of use. When grazer density is high relative to available forage resources, overgrazing by any species can lead to long-term reductions in plant productivity, including decreased root biomass (Herbel, 1982; Williams, et al., 1968) and potential reduction of stored carbon in soil horizons. Drought events over the past fifteen years have shown the effects of limited resources for wild horses through body condition and range condition. Areas inside and outside the HMAs are experiencing increased use on forage species and resources by wild horses as they expanded outside the HMAs in search of forage and water. Below are pictures of the condition of wild horses during the drought years at various springs in the HMAs.

Bible Spring 2001 Bible Spring 2014


Mustang Spring 2021

Removals from the HMAs have been sporadic due to changing priorities and budget constraints. Populations in the HMAs have varied dramatically from 1971 to present. In 2006, 2009, 2014, 2016, 2017, and 2018 gathers were conducted with 181, 371, 184, 158, 125, and 504 horses removed respectfully. The lowest populations were observed in 1971, and the highest populations were in 1999, 2000, 2014, and currently. The highest populations of wild horses occurred during the first part of the last extended year drought, the 2014 and 2021 droughts. Based on the BLM's data and observations in the field, this had a dramatic effect on wild horse health, water availability, and abundance of vegetative resources. In 1999, wild horses were in poor to very poor condition. Over the period of the 1999-2004 drought, several wild horses died because of the harsh conditions. Currently, the Blawn Wash HMA and the Bible Spring Complex is experiencing similar conditions (see Drought Map, Appendix 8).

Environmental Impacts

Proposed Action

Removal of excess wild horses would improve herd health. Decreased competition for forage and water resources would reduce stress and promote healthier animals. Wild horse populations above AML compete for forage, water, and cover allocated to wildlife and livestock. The removal of excess animals coupled with anticipated reduced reproduction (population growth rate) as a result of population growth suppression should, therefore, result in improved health and condition of mares and foals as the actual population comes into line with the population level that can be sustained with available forage and water resources and would allow for healthy range conditions (and healthy animals) over the longer-term. Reduced population growth rates with the use of fertility control vaccines or IUDs would be expected to extend the time interval between and potentially reduce the total number of gathers and reduce disturbance to individual animals as well as to the herd social structure over the foreseeable future.

Bringing the wild horse population back to low range AML would reduce damage to the range from excess wild horses and allow vegetation resources to start recovering. Once AML is achieved

and fertility treatments are conducted on a regular basis, the number of follow-up gathers needed to maintain AML would be reduced. As a result, there would be fewer disturbances to individual animals and the herd, and a more stable wild horse social structure would be provided.

Based on the BLM's experience with past gather operations, impacts to individual animals may occur as a result of handling stress associated with the gathering, processing, and transportation of animals. The intensity of these impacts varies by individual animal and is indicated by behaviors ranging from nervous agitation to physical distress. Mortality to individual animals from these impacts is infrequent but does occur in 0.5% to 1% of wild horses gathered in a given gather (Scasta, 2019). Other impacts to individual wild horses include separation of members of individual bands of wild horses and removal of animals from the population. Indirect impacts can occur after the initial stress event and may include increased social displacement or increased conflict between stallions. The BLM's experience is that these impacts may occur intermittently during wild horse gather operations. Traumatic injuries may occur, and typically involve bruises from biting and/or kicking, which do not break the skin.

Normally, gather success in the HMAs is 60-70% using the helicopter drive trap method. Because it would likely take several successive gather operations over the ten-year period to bring the wild horse population of the HMAs to low end of AML, bands of horses would continue to leave the boundaries of the HMAs into areas not designated for their use in search of forage and water. The stated objectives for wild horse herd management area, to "prevent the range from deterioration associated with overpopulation" and "preserve and maintain a thriving natural ecological balance and multiple use relationship in that area" would not be met with just the first gather operation but would be met as proposed over time.

Until the population in the HMAs is brought within AML, individuals in the herd would still be subject to increased stress and possible death as a result of continued competition for water and forage. Although lessened, the areas experiencing heavy and severe utilization levels by wild horses would remain near current levels and impacts to rangeland resources (concentrated trailing, riparian trampling, increased bare ground, etc.) throughout the HMAs would be expected to continue until its wild horse population can be reduced to within the AML.

Bible Spring Complex 2022 Population Modeling identifies general trends of growth rates, removal numbers, treatment numbers, and populations under each of the action alternatives; this modeling indicates that none of the action alternatives would cause a population crash (see Bible Spring 2022 Population Modeling, Appendix 11).

The BLM's experience with previous gathers in the CCFO is that the more an area is gathered, the more likely it is for horses to learn to evade the helicopter by taking cover in forested areas and canyons. Wild horses would also move out of the area when they hear a helicopter, thereby further reducing the overall gather efficiency. Frequent gathers would increase the stress to wild horses, as individuals and as entire herds.

PZP Vaccine

Selected released mares would receive a single dose of PZP and/or PZP-22 contraceptive vaccine or similar vaccine/fertility control. A more thorough review of the potential effects of PZP vaccines

is in Appendix 5. When injected, PZP (antigen) causes the mare's immune system to produce antibodies; these antibodies bind to the mare's eggs and effectively block sperm binding and fertilization (ZooMontana, 2000). Some mares may have impaired ovarian function after treatment with PZP vaccines (Joonè et al., 2017; Nolan et al., 2018). PZP is relatively inexpensive, meets BLM requirements for safety to mares and the environment, and can easily be administered in the field. In addition, among mares, PZP contraception appears to be reversible for mares treated only a few times. One-time application at the capture site would not affect normal development of a fetus should the mare already be pregnant when vaccinated, hormone health of the mare, or behavioral responses to stallions (Kirkpatrick et al., 1995). The vaccine has also proven to have no apparent effect on pregnancies in progress, the health of offspring, or the behavior of treated mares (Turner et. al., 1997).

Based on the BLM's experience, mares receiving the vaccine would experience slightly increased stress levels associated with handling while being vaccinated and freeze marked. Serious injection site reactions associated with fertility control treatments are rare in treated mares. Any direct impacts associated with fertility control, such as swelling or local reactions at the injection site, would be minor in nature and of short duration. Most mares recover quickly once released back to an HMA, and none are expected to have long term impacts from the fertility control injections, other than the contraceptive effects that are the purpose of treatment.

Ransom et al. (2010) found no differences in how PZP-treated and control mares allocated their time between feeding, resting, travel, maintenance, and social behaviors in three populations of wild horses, which is consistent with Powell's (1999) findings in another population. Likewise, body condition of PZP-treated and control mares did not differ between treatment groups in Ransom et al.'s (2010) study. Turner and Kirkpatrick (2002) found that PZP-treated mares had higher body condition than control mares in another population, presumably because energy expenditure was reduced by the absence of pregnancy and lactation.

In two studies involving a total of four wild horse populations, both Nunez et al. (2009) and Ransom et al. (2010) found that PZP-treated mares were involved in reproductive interactions with stallions more often than control mares, which is not surprising given the evidence that PZP-treated females of other mammal species can regularly demonstrate estrus behavior while contracepted (Shumake and Wilhelm, 1995; Heilmann et al., 1998; Curtis et al., 2002). Ransom et al. (2010) found that control mares were herded by stallions more frequently than PZP-treated mares, and Nunez et al. (2009) found that PZP-treated mares exhibited higher infidelity to their band stallion during the non-breeding season than control mares. Madosky et al. (2010) found this infidelity was also evident during the breeding season in the same population that Nuñez et al. (2009) studied, resulting in PZP-treated mares changing bands more frequently than control mares.

Long-term implications of these changes in social behavior are currently unknown. One expected long-term, indirect effect on wild horses treated with fertility control would be an improvement in their overall health (Turner and Kirkpatrick 2002). Many treated mares would not experience the biological stress of reproduction, foaling, and lactation as frequently as untreated mares, and their better health is expected to be reflected in higher body condition scores (Nuñez et al., 2010). After a treated mare returns to fertility, her future foals would be expected to be healthier overall and would benefit from improved nutritional quality in the mares' milk. This is particularly to be

expected if there is an improvement in rangeland forage quality at the same time, due to reduced wild horse population size. Past application of fertility control has shown that mares' overall health and body condition remains improved even after fertility resumes. PZP treatment may increase mare survival rates, leading to longer potential lifespan (Turner and Kirkpatrick, 2002; Ransom et al., 2014a). To the extent that this happens, changes in lifespan and decreased foaling rates could combine to cause changes in overall age structure in a treated herd (i.e., Turner and Kirkpatrick, 2002; Roelle et al., 2010), with a greater prevalence of older mares in the herd (Gross, 2000). Observations of mares treated in past gathers showed that many of the treated mares were larger, maintained higher body condition, and had larger healthy foals than untreated mares.

Following resumption of fertility, the proportion of mares that conceive and foal could be increased due to their increased fitness; this has been called a 'rebound effect.' Elevated fertility rates have been observed after horse gathers and removals (Kirkpatrick and Turner, 1991). More research is needed to document and quantify these hypothesized effects; however, it is believed that repeated contraceptive treatment may minimize the hypothesized rebound effect.

Because successful fertility control would reduce foaling rates and population growth rates, another indirect effect would be to reduce the number of wild horses that have to be removed over time to achieve and maintain the established AML. So long as the level of contraceptive treatment is adequate, the lower expected birth rates can compensate for any expected increase in the survival rate of treated mares. Also, reducing the numbers of wild horses that would have to be removed in future gathers could allow for removal of younger, more easily adoptable excess wild horses, and thereby could eliminate the need to send additional excess horses from this area to off-range pastures or for other statutorily mandated disposition. A high level of physical health and future reproductive success of fertile mares within the herd would be sustained, as reduced population sizes would be expected to lead to more availability of water and forage resources per capita.

Reduced population growth rates and smaller population sizes would also allow for continued and increased improvement to range conditions within the project area, which would have long-term benefits to wild horse habitat quality. As the population nears or is maintained at the level necessary to achieve a TNEB, vegetation resources would be expected to recover, improving the forage available to wild horses and wildlife throughout the HMAs. With rangeland conditions more closely approaching a TNEB, and with a less concentrated distribution of wild horses across the HMAs, there should also be less trailing and concentrated use of water sources, which would have many benefits to the wild horses still on the range. Lower population density would be expected to lead to reduced competition among wild horses using the water sources, and less fighting among horses accessing water sources. Water quality and quantity would continue to improve to the benefit of all rangeland users including wild horses. Wild horses would also have to travel less distance back and forth between water and desirable foraging areas. Should PZP booster treatment and repeated fertility control treatment continue into the future, the chronic cycle of overpopulation and large gathers and removals would no longer occur; instead, a consistent cycle of balance and stability would ensue, resulting in continued improvement of overall habitat conditions and animal health. While it is conceivable that widespread and continued treatment with PZP could reduce the birth rates of the population to such a point that birth is consistently below mortality, that outcome is not likely unless a very high proportion of the mares present are treated in almost every year.

GonaCon-Equine Vaccine

Most of the impacts to animals treated under this alternative would be similar to those treated with PZP. GonaCon-Equine is a vaccine that causes a mare to develop antibodies against gonadotropin releasing hormone (GnRH; NAS, 2013). A more thorough review of the potential effects of GonaCon-Equine vaccine is in Appendix 5. Selected released mares would receive GonaCon-Equine before release back on to the HMAs to control the population growth rate. After the first dose that a mare receives, following doses would be considered a booster. GonaCon-Equine can safely be reapplied as necessary to control the population growth rate. Even with one booster treatment of GonaCon-Equine, it is expected that most, if not all, mares would return to fertility at some point (Baker et al., 2018), although the average duration of effect after a booster dose has not yet been fully quantified. It is unknown what would be the expected rate for the return to fertility in mares boosted more than once with GonaCon-Equine. It is possible that some mares treated multiple times with GonaCon-Equine vaccine may remain infertile until they die on the range; that result would be consistent with the contraceptive intention of the vaccine.

Based on the BLM's experience, mares receiving the vaccine would experience slightly increased stress levels associated with handling while being vaccinated and freeze marked. Serious injection site reactions associated with fertility control treatments are rare in treated mares. Any direct impacts associated with fertility control, such as swelling or local reactions at the injection site, would be minor in nature and of short duration. Most mares recover quickly once released back to an HMA, and none are expected to have long term impacts from the fertility control injections.

GonaCon and other anti-GnRH vaccines can be injected while a female is pregnant with no apparent effect on pregnancies in progress, foaling success, or the health of offspring (Miller et al., 2000; Powers et al., 2011; Baker et al., 2013) – in such a case, a successfully contracepted mare will be expected to give birth during the following foaling season, but to be infertile during the same year's breeding season. Thus, a mare injected in November 2022 would not show the contraceptive effect (i.e., no new foal) until spring 2024.

Intrauterine Devices (IUDs)

As with other methods of population growth suppression, use of flexible IUDs and other fertility control measures are expected to help reduce population growth rates, extend the time interval between gathers, and reduce the total number of excess animals that will need to be removed from the range. A more thorough review of the potential effects of IUDs is in Appendix 5. The 2013 NAS report considered IUDs, and a recent study by Holyoak et al. (2021) indicates that a flexible, inert, Y-shaped, medical-grade silicone IUD design prevented pregnancies in all the domestic mares that retained the device, even when exposed to fertile stallions.

IUDs are considered a temporary fertility control method that does not generally cause future sterility (Daels and Hughes, 1995). IUDs have historically been used in livestock management, including in domestic horses. Insertion of an IUD can be a very rapid procedure, but it does require the mare to be temporarily restrained, such as in a squeeze chute. IUDs in mares may cause physiological effects including discomfort, infection, perforation of the uterus if the IUD is hard and angular, endometritis, uterine edema (Killian et al., 2008), and pyometra (Klabnik-Bradford et al., 2013). The effects of IUD use on genetic diversity in a given herd should be comparable to those of other temporary fertility control methods; use should reduce the fraction of mares breeding

at any one time but does not necessarily preclude treated mares from breeding in the future, as they survive and regain fertility.

The exact mechanism by which IUDs prevent pregnancy is uncertain, but may be related to persistent, low-grade uterine inflammation (Daels and Hughes, 1995; Gradil et al., 2021; Hoopes et al., 2021). Turner et al. (2015) suggested that the presence of an IUD in the uterus may, like a pregnancy, prevent the mare from coming back into estrus. However, some domestic mares did exhibit repeated estrus cycles during the time when they had IUDs (Killian et al., 2008; Gradil et al., 2019; Lyman et al., 2021; Hoopes et al., 2021). The main cause for an IUD to not be effective at contraception is its failure to stay in the uterus (Daels and Hughes, 1995; NAS, 2013). As a result, one of the major challenges to using IUDs to control fertility in mares on the range is preventing the IUD from being dislodged or otherwise ejected over the course of daily activities, which could include, at times, frequent breeding.

At this time, it is thought that any IUD inserted into a pregnant mare may cause the pregnancy to terminate, which may also cause the IUD to be expelled. For that reason, IUDs would only be inserted in non-pregnant (open) mares. Wild mares receiving IUDs would be checked for pregnancy by a veterinarian prior to insertion of an IUD. This can be accomplished by transrectal palpation and/or ultrasound performed by a veterinarian. Pregnant mares would not receive an IUD. Only a veterinarian would apply IUDs in any BLM management action.

The U.S. Geological Survey (USGS) / Oklahoma State University (OSU) researchers tested a Y-shaped IUD to determine retention rates and assess effects on uterine health; retention rates were greater than 75% for an 18-month period, and mares returned to good uterine health and reproductive capacity after removal of the IUDs (Holyoak et al., 2021). These Y-shaped silicone IUDs are considered a pesticide device by the EPA, in that they work to mitigate fertility in treated animals by physical means (EPA, 2020).

Sex-Ratio

Skewing the sex ratio of a herd so that there are more males than females is an established BLM management technique for reducing population growth rates. As part of a wild horse and burro gather process, the number of animals returned to the range may include more males, the number removed from the range may include more females, or both. By reducing the proportion of breeding females in a population (as a fraction of the total number of animals present), the technique leads to fewer foals being born, relative to the total herd size.

Sex ratio is typically adjusted in such a way that 60 percent of the horses are male. In the absence of other fertility control treatments, this 60:40 sex ratio can temporarily reduce population growth rates from approximately 20% to approximately 15% (Bartholow, 2004). While such a decrease in growth rate may not appear to be large or long-lasting, the net result can be that fewer foals would be born, at least for a few years – this can extend the time between gathers, reduce impacts on-range, and costs off-range. Any impacts of sex ratio manipulation are expected to be temporary because the sex ratio of wild horse and burro foals at birth is approximately equal between males and females (NAS, 2013), and it is common for female foals to reproduce by their second year (NAS, 2013). Thus, within a few years after a gather and selective removal that leads to more males than females, the sex ratio of reproducing wild horses and burros would be returning toward a 50:50 ratio.

Water/Bait Trapping

Bait and water trapping would be used in some small areas of the HMAs to remove a small number of wild horses or to conduct fertility treatments. This method is slightly less stressful to the horses, but after frequent gathers, wild horses would become more difficult to trap using this method. Horses would begin to avoid water sources or areas where the traps are set. During past water trap operations, some wild horses near death have been observed avoiding going into a water trap. Water trap operations had to be stopped and panels removed to allow these horses to drink before dying.

Bait or water trapping generally requires a long window of time for success. Although the trap would be set in a high probability area for capturing excess wild horses residing within the area and at the most effective time periods, time is required for the horses to acclimate to the trap and/or decide to access the water/bait.

Trapping involves setting up portable panels around an existing water source or in an active wild horse area, or around a pre-set water or bait source. The portable panels would be set up to allow wild horses to go freely in and out of the corral until they have adjusted to it. When the wild horses fully adapt to the corral, it is fitted with a gate system. The acclimatization of the horses creates a low stress trap. During this acclimation period the horses would experience some stress due to the panels being set up and perceived access restriction to the water/bait source.

When actively trapping wild horses, the trap would be checked daily. Horses would either be removed immediately or fed and watered for up to several days prior to transport to a holding facility. Existing roads would be used to access the trap sites.

Based on the BLM's experience with past gather operations, bait/water trapping is most effective when a specific resource is limited, such as water during the summer months. For example, in some areas, a group of wild horses may congregate at a given watering site during the summer because few perennial water resources are available nearby. Under those circumstances, water trapping could be a useful means of reducing the number of horses at a given location, which can also relieve the resource pressure caused by too many horses. As the proposed bait and/or water trapping in this area is a lower stress approach to gathering of wild horses, such trapping can continue into the foaling season without harming the mares or foals. Conversely, the BLM has observed that at times water trapping can be stressful to wild horses due to their reluctance approaching new, human structures or intrusions. In these situations, wild horses may avoid watering or may travel greater distances in search of other watering sources or panels may have to be removed to let the horse drink.

Transport, Short-Term Holding, and Adoption Preparation

The BLM's experience is that potential impacts to individual horses during transport can include stress, as well as slipping, falling, kicking, biting, or being stepped on by another animal. Unless wild horses are in extremely poor condition, it is rare for an animal to die during transport.

Recently captured wild horses, generally mares, in very thin condition may have difficulty transitioning to feed. A small percentage of animals can die during this transition; however, some of these animals are in such poor condition that it is unlikely they would have survived if left on

the range. During the preparation process, potential impacts to wild horses are similar to those that can occur during transport. Injury or mortality during the preparation process is low but can occur. Mortality at short-term holding facilities averages approximately 5% (GAO-09-77, page 51), and includes animals euthanized due to a pre-existing condition, animals in extremely poor condition, animals that are injured and would not recover, animals which are unable to transition to feed; and animals which die accidentally during sorting, handling, or preparation.

Radio Collaring and Tagging

Based on numerous studies that have used modern radio collars with remote releases and tags to study the ecology of wild ungulates and equids in particular, the current design of these devices has minimal effects on the animals wearing them. The impact of radio collars and tags is very minimal. For example, from March 2015 into 2020 researchers at the USGS conducted a preliminary study on captive wild horses and burro jennies to determine proper fit and wear of radio collars (Schoenecker et al., 2020). The condition of wild horses wearing radio collars was compared to non-collared controls and documented with photographs. In addition, both collared individuals and controls were observed for 80 minutes each week for 14 weeks to quantify any impact of the collar on their behavior and health. At the end of the study period (2020) the collars were removed. Analyses indicate that mares had almost no impact in terms of rubbing or wear from radio collars and behavior of collared and uncollared mares did not differ (Schoenecker et al., 2020). There was also no impact of radio tags on behavior or wear.

There are some possible effects from the use of collars on horses. On males, on rare occasions, a collar over an ear has been observed, so no males would be collared. Also, collars may be fitted too tightly, or a horse may grow, tightening the collar. If these situations are observed, the remote-release function would be deployed remotely. If remote release failed, the collar would be removed after capturing the animal through approved methods part of the Proposed Action. Serious neck abrasions or sores have not been reported in the wild where BLM-managed wild horses have been collared recently (e.g., Collins et al., 2014; Schoenecker et al., 2020). If neck abrasions or sores caused by a collar are observed and have not healed within 4 weeks of when it is sighted, the collar's remote release would be deployed, or the horse would be captured as soon as possible to remove the collar.

No effects are expected from the tail tags; however, it is possible that they may form an irritation to individuals should vegetation get tangled in the tail. In this case it is expected that the tag would ultimately rip out of the hair (leaving no injury) as the horse rubs it. Similarly, the BLM's observation has been that tail tags eventually fall off the animal as the tail hair grows out, typically within a year.

The use of collar and tag technology is critical to understanding how free-roaming horses move across the HMAs and use increasingly scarce resources. Lack of this information has contributed to the management complexity of this species. Applying this technology to the study of free-roaming horses would provide the opportunity to better understand horse resource use, habitat preference, home range, and movement patterns and can be incorporated into investigations of social structure and herd or band dynamics as well as behavioral modifications associated with reproductive management, including contraceptive use and sterilization. Such information can be used for future management decisions within the HMAs.

Wild Horses Remaining or Released Following a Gather

The wild horses that are not captured may be temporarily disturbed and may move into another area during the gather operations. Apart from changes to herd demographics (primarily in the form of a lower population size after some animals are removed), the BLM's experience with gathers over the past 25 years is that direct population wide impacts have been temporary in nature with most if not all impacts disappearing within hours to several days of when wild horses are released back into the HMAs. No observable effects associated with these impacts would be expected within one month of the gather operations or release, except for a heightened awareness of human presence.

As a result of lower density of wild horses across the HMAs following the removal of excess horses, competition for resources would be reduced, allowing wild horses to utilize preferred, quality habitat. Confrontations between stallions would also become less frequent, as would fighting among wild horse bands at water sources. Achieving the AML and improving the overall health and fitness of wild horses could also increase foaling and foaling survival rates over the current conditions.

The primary effects to the wild horse population that would be directly related to this proposed gather would be to herd population dynamics, age structure or sex ratio, and subsequently the growth rates and population size over time. The remaining wild horses not captured would maintain their social structure and herd demographics (age and sex ratios). Impacts to the rangeland as a result of the current overpopulation of wild horses would be reduced under the Proposed Action. Fighting among stud horses would decrease since they would protect their position at water sources less frequently; injuries and death to all age classes of animals would also be expected to be reduced as competition for limited forage and water resources is decreased.

Indirect individual impacts are those impacts which occur to individual wild horses after the initial stress event, and may include spontaneous abortions in mares, and increased social displacement and conflict in studs. These impacts, like direct individual impacts, are known to occur intermittently during wild horse gather operations. An example of an indirect individual impact would be the brief skirmish which occurs among older studs following sorting and release into the stud pen, which lasts less than two minutes and ends when one stud retreats. The BLM's experience with past gathers indicates that traumatic injuries usually do not result from these conflicts. These injuries typically involve a bite and/or kicking with bruises which do not break the skin. Like direct individual impacts, the frequency of occurrence of these impacts among a population varies with the individual.

Spontaneous abortion events among pregnant mares following capture are also rare, though poor body condition can increase the incidence of such spontaneous abortions. Given the expected timing of gathers contemplated in this action, spontaneous abortion is not considered to be an issue for the proposed gather.

A few foals may be orphaned during gathers. This may occur due to:

- The mare rejecting the foal. This occurs most often with young mothers or very young foals.
- The foal and mother becoming separated during sorting and cannot be matched.

• The mare dying or being humanely euthanized during the gather.
• A foal being ill, weak, or needing immediate special care that requires removal from the mother.
• The mother not producing enough milk to support the foal.

Occasionally, foals are gathered that were already orphans on the range (prior to the gather) because the mother rejected it or died. These foals are usually in poor, unthrifty condition. Orphans encountered during gathers are cared for promptly and the agency's experience is that they rarely die or have to be euthanized. Nearly all foals that would be gathered would be over four months of age and some would be ready for weaning from their mothers. In private industry, domestic horses are normally weaned between four and six months of age.

Gathering the wild horses during the fall/winter reduces risk of heat stress, although this can occur during any gather, especially in older or weaker animals. Adherence to the SOPs as well and techniques used by the gather crew or contractor help minimize the risks of heat stress. Heat stress does not occur often, but if it does, death can result.

Alternative 2 - Gather and Removal Excess Wild Horses without Population Growth Suppression

Under Alternative 2, impacts on wild horses associated with gather and removal activities would be the same as those that would occur under the Proposed Action. However, in the absence of population growth suppression, wild horse populations would be expected to increase at a faster rate (up to 20% annually) and exceed the high end of the AML sooner, increasing the frequency of gathers.

Alternative 3 – No Action – No Gather, Removal, or Population Growth Suppression

The No Action Alternative would not meet the purpose and need and would violate the WFRHBA, Federal regulations, and BLM policy. The current population would likely continue to increase at a rate of 20% annually (NAS, 2013). The BLM realizes that some members of the public advocate "letting nature take its course." However, allowing horses to die of dehydration and starvation would be inhumane treatment and clearly indicates that an overpopulation of horses exists in the HMAs. The No Action Alternative would not allow for data collection of genetic information of the wild horses in the HMAs.

The No Action Alternative would allow wild horse populations to increase beyond the carrying capacity of the rangeland resources within the four HMAs. The general health of the wild horse population in the HMAs would be reduced as horse numbers increased. Large die-offs may occur if the population increases to a point where available forage and water are depleted. This would be especially true during drought or other events such as wildfire. Over time, the potential risks to the health of individual horses would increase, and the need for emergency removals to prevent their death from starvation or thirst would also increase. Over the long-term, the health and sustainability of the wild horse population is dependent upon achieving a thriving natural ecological balance and sustaining healthy rangelands.

Short-term herd dynamics would not be impacted under the No Action. Horses would continue to be free-roaming and follow natural patterns. However, if populations increased beyond the carrying capacity, herd dynamics could be impacted because of declines in individual horse health.

Near normal populations exhibit a 1:1 sex ratio. Population shifts favoring males could occur as males are better adapted to compete for resources during changing environmental conditions.

Chapter 4. Monitoring

Under all alternatives, including the No Action Alternative, monitoring would be required to determine if the program goals are being met. BLM personnel would collect and maintain the data during gather and removal operations as outlined in the Proposed Action and Alternative 2. Population inventory via aerial survey would be conducted every three to four years in the HMAs as required by the WFRHBA and BLM policy. Additionally, vegetation monitoring studies (e.g., rangeland health, trend, and utilization) would be ongoing and continue to be conducted to document livestock, wildlife, and wild horse use. During gather operations under the Proposed Action and Alternative 2, an APHIS or other licensed veterinarian will be on-site, if needed, to examine animals and make recommendations to BLM for care and treatment of the wild horses.

For the Proposed Action and Alternative 2, supplemental monitoring would take place, based on available funding and personnel, using GPS/VHF radio collars or radio tags to locate individuals and to monitor and record population dynamics, group size responses to change in animal density, management interventions, seasonal weather, and climate. Birth rates and population increase would be monitored after population growth suppression as funding and priorities allow. Samples for genetic monitoring will be collected during gathers. Periodic introduction of studs or mares from a different HMA, with desired characteristics similar to the wild horses within the Complex, could be made to augment genetic diversity in the Complex, as measured by observed heterozygosity, if the results of genetic monitoring indicate that that is prudent.

Chapter 5. Consultation and Coordination

BLM conducted a virtual public hearing regarding the use of helicopters and motorized vehicles to capture wild horses (or burros) on April 26, 2022. During the hearing, the public was given the opportunity to comment with new information and to voice any concerns or opinions regarding the use of these methods to capture wild horses (or burros). As required by 43 CFR 4740.1(b). Primary issues discussed include the following.

(1) How helicopters are used during gathers and their effects on wild horses.
(2) Appropriate management levels in HMAs and how they are established and monitored.
(3) Legal ability of BLM using motorized vehicles.

5.1. Persons, Groups, and Agencies Consulted

Name	Purpose & Authorities for Consultation or Coordination	Findings & Conclusions
State Historic Preservation Office (SHPO)	Consultation for undertakings, as required by the National Historic Preservation Act (NHPA) (16 USC 470)	No cultural resources would be affected. The project will be reviewed by SHPO as part of the quarterly submittal as per existing protocol.
Paiute Indian Tribe of Utah (PITU)	Consultation as required by the American Indian Religious Freedom Act of 1978 (42 USC 1531) and NHPA (16 USC 1531)	The Tribe stated in a letter dated May 10, 2022, that they have no concerns with the project.

5.2 List of Preparers

The list of BLM preparers is included in Appendix 2.

5.3 Public Involvement and Scoping

Notification of the Proposed Action was posted on the BLM's ePlanning website on February 24, 2022 (https://eplanning.blm.gov/eplanning-ui/project/2018159/510). The BLM offered a 30-day public comment period on the EA beginning May 18, 2022. The EA information was provided on the project's ePlanning website and announced through a news release, letters, and emails.

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