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**Mare Sterilization Research
Environmental Assessment
DOI-BLM-OR-B000-2015-0055-EA**

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Table of Contents

I.	INTRODUCTION	1
A.	Background.....	1
B.	Purpose and Need for Proposed Action.....	5
C.	Decision to be Made	5
D.	Consistency with Laws, Regulations, and Policies.....	6
E.	Scoping and Identification of Issues	6
1.	Issues.....	8
2.	Issues Considered but Eliminated from Detailed Analysis.....	8
II.	DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES	10
A.	Alternative A - No Action.....	10
B.	Alternative B - Proposed action.....	10
C.	Common to All Methods	11
1.	Ovariectomy Study	13
2.	Tubal Ligation Study	17
3.	Hysteroscopically-guided Laser Ablation Study	22
III.	AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS	26
A.	Introduction.....	26
B.	Identified Resource with Issue.....	27
1.	Wild Horses - Mares	27
2.	Social and Economic Values	39
IV.	CONSULTATION AND COORDINATION	47
A.	Summary of Public Participation.....	47
1.	Agencies, Tribes, Individuals, or Organizations Consulted	48
2.	List of Preparers.....	48
V.	REFERENCES, GLOSSARY AND ACRONYMS	49
A.	References Cited	49
B.	Glossary of Terms.....	54
C.	Acronyms.....	57

Appendices

Appendix A: Request for Applications: Wild Horse and Burro Sterilization or Contraception – Development of Techniques and Protocols	59
Appendix B: NRC Review of Oregon Proposals, redacted.....	95
Appendix C: IM 2015-151 CAWP.....	102
Appendix D: Affected Environment Table.....	104

List of Tables

Table I.1: Consistency with Laws, Regulations, and Policies	6
Table III.1: Number of Horses and Burros BLM Manages Nationally, On and Off the Range	40
Table IV.1: Agencies, Tribes, Individuals, or Organizations Consulted.....	48
Table IV.2: List of Preparers	48

List of Figures

Figure II-1: The well-padded hydraulic chute at the Oregon Wild Horse Corral Facility. Note the half gate (right photo) which allows the veterinarian to safely perform the procedure.....	12
Figure II-2: Each mare’s tail would be wrapped and tied to the side prior to each surgery, in an effort to keep the procedure sterile.	12
Figure II-3: (A) The site for the vaginal incision is located ventrolateral and caudal to the cervix. (B) The chain loop of the ecraseur is positioned over the hand so that the ovary can be grasped and drawn inside the loop. (C) After ensuring that only ovarian pedicle is within the loop, the pedicle is slowly crushed and transected. (From Kobluk et al., 1995).	15
Figure II-4: A chain ecraseur being used during an ovariectomy via colpotomy procedure.	15
Figure II-5: Diagram of a typical flexible endoscope similar to what would be used in the minimally invasive surgical procedures.....	19
Figure II-6: Diagram of the route taken (red arrows) through the vaginal wall and into the abdominal cavity to conduct the tubal ligation procedure	20
Figure II-7: Diagram of the route taken (red arrow) through the vaginal vault, through the uterus to the oviduct opening to conduct the laser ablation procedure.....	24

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I. INTRODUCTION

The Bureau of Land Management (BLM) is proposing to conduct three research studies investigating the safety and effectiveness of three separate methods of surgical sterilization of wild horse mares. The three proposed methods include ovariectomy via colpotomy, and two minimally invasive methods, tubal ligation and hysteroscopically-guided laser ablation of the oviduct papilla. The proposed studies would be conducted under financial assistance agreements with Oregon State University (OSU), with OSU staff serving as the principal investigators of the research. The three studies combined would involve approximately 225 wild horse mares previously gathered and removed from BLM Herd Management Areas (HMA). All three studies would be conducted at Oregon's Wild Horse Corral Facility in Hines, Oregon and would be planned to begin in February 2016 with an estimated completion date of September 2020. This environmental assessment (EA) is a site-specific analysis of the potential impacts of the proposed action.

A. Background

The Department of the Interior's (DOI) BLM Wild Horse and Burro (WH&B) Program protects, manages, and controls wild horses and burros under the authority of the Wild Free-Roaming Horses and Burros Act of 1971 (WFRHBA) (Public Law 92-195), as amended by the Federal Land Policy and Management Act (FLPMA) of 1976 (Public Law 94-579) and the Public Rangelands Improvement Act of 1978 (Public Law 95-514). The WFRHBA directs the DOI Secretary to "maintain a current inventory of wild free-roaming horses and burros on given areas of the public lands. The purpose of such inventory shall be to: make determinations as to whether and where an overpopulation exists and whether action should be taken to remove excess animals; determine appropriate management levels of wild free-roaming horses and burros on these areas of the public lands; and determine whether appropriate management levels [AML] should be achieved by the removal or destruction of excess animals, or other options such as sterilization, or natural controls on population levels" (WFRHBA, 16 U.S.C. § 1333(b)(1)). "For the purpose of furthering knowledge of wild horse and burro population dynamics," direction to conduct research is contained in the WFRHBA (WFRHBA, 16 U.S.C. § 1333(b)(2)(C)(3)).

When BLM became responsible for managing these animals under the WFRHBA, approximately 25,000 wild horses and burros were on the range. Through land use planning, the BLM determines the AML, which is the number of wild horses and burros that can thrive in balance with other public land resources and uses. The total AML for public lands is 26,715 wild horses and burros, which range on 179 HMAs in ten western states (WH&B Quick Facts, 2015). As annual wild horse population growth rates approach 20 percent or higher (National Research Council (NRC) Review, 2013, page 55), BLM has relied upon periodic gathers and removals of excess animals as well as temporary fertility control as the primary tools to maintain animal populations within AML for each herd.

After being removed from the range, excess animals are managed in short-term corral facilities where they are prepared for adoption or sale, or in long-term off-range pasture facilities where they live out the remainder of their lives (Government Accountability Office (GAO), 2008). When adoption demand is not sufficient to place into private care all the animals removed, the WFRHBA, as amended, directs BLM to either destroy the remaining healthy animals in the most humane and cost-efficient manner possible or, under certain circumstances, sell them without limitation. The BLM has not destroyed excess unadoptable animals since January 1982, when a former BLM director issued a moratorium to end the destruction of excess unadoptable animals. Congress prohibited the use of appropriated funds for the purpose of euthanizing unadoptable horses and sale without limitation between 1987 and 2004 and again in 2010 and all years since then. To manage for the growing number of unadoptable animals, BLM began procuring additional long-term off-range pasture facilities (GAO, 2008).

In a 2008 report, the GAO warned “If not controlled, off-the-range holding costs will continue to overwhelm the program” citing that direct costs for holding animals off the range increased from \$7 million in 2000 to \$21 million in 2007 (GAO, 2008). As of March 1, 2015, the number of animals on the public lands was estimated to be 58,150, which is 31,435 animals over AML (WH&B Quick Facts, 2015). In addition to the nearly 60,000 horses and burros on range, an additional 47,000 horses and burros that were previously removed from the public lands are being cared for in off-range pastures and corrals (WH&B Quick Facts, 2015). By fiscal year 2015, off-range holding costs exceeded \$49 million, consuming nearly 64 percent of the annual appropriations that fund the BLM WH&B Program (WH&B Quick Facts, 2015).

In its 2010 report of the BLM WH&B Program, the DOI-Office of Inspector General (OIG) concluded that gathers are necessary for population control and BLM is required by law to manage the range for authorized multiple uses (OIG, 2010). However, the OIG report echoed the GAO warning, stating that “mounting costs are straining BLM’s ability to sustain the Wild Horse and Burro Program. Continued unchecked horse population increases will result in a growing need for holding horses with a commensurate increase in program funding” (OIG, 2010). The OIG (2010) recommended continuing to move forward with the Secretary’s initiative and BLM’s program improvements to the extent that:

1. There is urgent and aggressive focus on research and testing of improved population control methods to balance WH&B population growth with adoption demand, thereby minimizing the need for additional long-term holding facilities;
2. There is an ambitious effort to minimize and reduce over the long term the need for short- and long-term storage facilities;

3. The best science for WH&B management and needed new research is coordinated with and confirmed by the National Academy of Sciences (NAS) and the results put into practice (OIG, 2010).

In 2011, BLM commissioned the NRC of the NAS to conduct an independent review of the WH&B Program. In 2013, the NRC published their review titled, *Using Science to Improve the BLM Wild Horse and Burro Program: A Way Forward*. Among the various management topics reviewed was an evaluation of information related to the effectiveness of fertility-control methods to prevent pregnancies and reduce herd population growth rates. The committee evaluated the methods available to BLM on the basis of the criteria related to delivery method, availability, efficacy, duration of effect, and potential physiological and behavioral side effects. Using these criteria, the committee judged that porcine zona pellucida (PZP) (in the forms of PZP-22 and SpayVac) and GonaCon™ vaccination of females and chemical vasectomy in males were the most promising approaches available at that time (NRC Review 2013, pages 133–134). The committee acknowledged that given the short duration of effect of those available contraceptives and the ability of one fertile stallion to impregnate many mares, intensive management of free-ranging horse and burro herds would be required. Intensive management would entail more frequent gathers to deliver fertility-control treatments to the animals. Unfortunately, more recent research has indicated that SpayVac is not an effective contraceptive agent (Butch Roelle, United States Geological Service (USGS), pers. comm.), and that the current formulation of PZP-22 leads to only one year of contraception, not two (John Turner, University of Toledo, pers. comm.). As a result, any management program that relies on immunocontraceptive techniques such as PZP delivery would require annual handling or darting to prevent a given mare from conceiving.

In its review, the committee briefly discussed surgical ovariectomy (removal of the ovaries) as a method of female-directed fertility control, noting that although ovariectomy is commonly used in domestic species, it has been seldom applied to free-ranging species (NRC Review, 2013, page 98). The committee cautioned that “the possibility that ovariectomy may be followed by prolonged bleeding or infection makes it inadvisable for field application” (NRC Review, 2013, page 130); however they explained that ovariectomy via colpotomy was an alternative approach which avoids an external incision and reduces the chances of complication and infection (NRC Review, 2013, page 98). The committee noted that no fertility control method existed that did not affect physiology or behavior. The committee warned that the impacts of not managing population numbers were potentially harsher than contraception, as population numbers would likely be limited by starvation (NRC Review, 2013, page 134).

In response to the 2010 OIG Report and the 2013 release of the NRC Review, BLM issued a September 23, 2013, “Request for Information” (RFI) on free-ranging horse and burro sterilization or contraception specifically related to the development of techniques and protocols. After receiving information in response to the RFI, on March 6, 2014, BLM issued a “Request for Applications” (RFA) for research proposals “aimed at developing new or refining existing techniques and establishing protocols for the

contraception or permanent sterilization of either male or female wild horses and/or burros in the field” (Appendix A). The RFA solicited research proposals related to any sterilization or contraceptive method applicable to male or female horses or burros, including surgical, chemical, pharmaceutical, or mechanical (such as intrauterine devices (IUD)) approaches, excluding surgical castration of stallions.

The BLM received 19 separate research proposals from universities in response to the RFA. In November 2014, BLM arranged for the NRC to have a committee of scientific experts provide an independent review, and provide BLM with indications about which of the proposals merited funding. On January 21, 2015, the NRC committee returned to BLM a report entitled “Review of Proposals to the Bureau of Land Management on Wild Horse and Burro Sterilization or Contraception.” This full report has been an internal BLM document in order to protect proprietary information of the proposal authors. BLM Oregon received from Paul Griffin, WH&B Program research coordinator, a summary of the report and the NRC committee’s review of the proposals being analyzed in this EA (Appendix B - NRC Review of Oregon Proposals, 2015). The committee recommended BLM move forward with awarding research funding, pending availability of funds, to 9 of the 19 research proposals reviewed. Four of the recommended research proposals were to investigate methods of permanent sterilization in wild horses, including two methods of minimally invasive surgical sterilization of female wild horses proposed by OSU. The two methods include tubal ligation and hysteroscopically-guided laser ablation. Both methods would occur at Oregon’s Wild Horse Corral Facility in Hines, Oregon and are analyzed in this EA.

The committee also reviewed an additional research proposal from OSU entitled “Functional assessment of ovariectomy via colpotomy of wild mares” (Appendix B). It was the determination of the committee that because this method is a common procedure performed on domestic mares, the proposal contained no science or experimentation related to the technique; therefore they did not recommend the proposal for research funding. However, because this is a common method in open (not pregnant) domestic mares, the committee suggested this method could be put into operation immediately as a tool to sterilize wild horse mares, noting there could be an increase in surgical complications compared to those observed in domestic mares (Appendix B). BLM has determined that because the surgical complications of performing this technique on wild horse mares at various gestational stages has not been well documented, research investigating potential complications as a function of gestational stage should be performed and compared to other methods of surgical sterilization before this technique is made operational. Thus, this third OSU proposal is also considered by BLM to be one for a research project. This research would also take place at Oregon’s Wild Horse Corral Facility in Hines, Oregon and is analyzed in this EA.

Because the veterinarians proposing the procedures are in Oregon, and for logistical purposes related to the suitability of the BLM facility under consideration, the studies would be conducted at Oregon’s Wild Horse Corral Facility in Hines, Oregon.

On September 11, 2015, BLM and OSU entered into a financial assistance agreement to fund research projects of two methods of minimally invasive sterilization techniques as well as a separate financial assistance agreement to fund research investigating ovariectomy via colpotomy as a technique in wild horses. The financial assistance agreements would begin following National Environmental Policy Act (NEPA) analysis.

B. Purpose and Need for Proposed Action

The purpose of the action is to conduct research on three methods of permanent mare sterilization on horses at the BLM's Oregon Wild Horse Corral Facility in Hines, Oregon, in order to assess which method(s) are effective in wild horses and could, in the future, be applied safely and efficiently to wild horse mares on lands administered by the BLM.

The DOI has identified the need for the BLM to research and test wild horse population control methods that have been reviewed and highly rated by the NRC as potentially useful surgical sterilization methods. These three methods are: ovariectomy via colpotomy, minimally invasive tubal ligation, and minimally invasive hysteroscopically-guided laser ablation. The BLM would like to conduct research on these three methods to ensure they are effective and safe for application in wild horses.

C. Decision to be Made

The BLM will decide whether or not to proceed with one or more of the proposed mare sterilization research procedures at the BLM's Oregon Wild Horse Corral Facility and under what terms and conditions.

These studies represent feasibility or proof of concept approaches and the results are not policy setting for BLM. Any future decision by BLM to utilize any of the procedures analyzed in this EA would require additional analysis and would be subject to NEPA compliance.

D. Consistency with Laws, Regulations, and Policies

Table I.1: Consistency with Laws, Regulations, and Policies

Cite the Element of the Proposed Action and Alternatives which is Consistent with Law, Regulation, or Policy	Cite the Relevant Law, Regulation, or Policy to which the Federal Action is Consistent
Mare sterilization research	<p>The Wild Free-Roaming Horses and Burros Act of 1971 (Public Law 92-195). - 16 U.S.C. § 1333. Powers and duties of Secretary (b) Inventory and determinations; consultations; overpopulations; <u>research study</u>; submittal to Congress (1) The Secretary shall maintain a current inventory of wild free-roaming horses and burros on given areas of the public lands. The purpose of such inventory shall be to: make determinations as to whether and where an overpopulation exists and whether action should be taken to remove excess animals; determine appropriate management levels of wild free-roaming horses and burros on these areas of the public lands; and determine whether appropriate management levels should be achieved by the removal or destruction of excess animals, or other options (<u>such as sterilization, or natural controls on population levels</u>). In making such determinations <u>the Secretary shall consult with the United States Fish and Wildlife Service, wildlife agencies of the State or States wherein wild free-roaming horses and burros are located, such individuals independent of Federal and State government as have been recommended by the National Academy of Sciences, and such other individuals whom he determines have scientific expertise and special knowledge of wild horse and burro protection, wild-life management and animal husbandry as related to rangeland management.</u></p>
	<p>Wild Horses and Burros Management Handbook H-4700-1 – 4.5.3 Reduce Population Growth Rates; “Additional management alternatives (tools) may be considered in the future, pending further research (see Chapter 8)”.</p> <p>8.1 Strategic Research Plan - “Research results will be used to improve management practices within the WH&B program”.</p> <p>8.3.2 Other Possible Fertility Control Tools - “Other possible fertility control tools that could potentially be considered in the future include: spaying mares ...”</p> <p>8.3.2.1 Spaying (Mares) - “Spaying mares involves major abdominal surgery, is risky, and requires good post-operative care. Spaying mares could be considered in the future if safe, effective and humane surgical methods and post-operative care procedures can be perfected for use on wild horses”.</p>

E. Scoping and Identification of Issues

External scoping involving notification and opportunities for feedback from agencies, organizations, tribes, local governments, and the public was not conducted for this EA. The determination not to conduct external scoping was made based upon the extent of

external scoping that has been conducted for similar projects, the discussions on mare sterilization at WH&B National Advisory Board public meetings since 2012, and the public RFI and RFA for research proposals on wild horse contraception or permanent sterilization.

Sterilization of wild mares, especially ovariectomy, and the possibility of BLM conducting this type of research is not a new topic. The tubal ligation and hysteroscopically-guided laser ablation methods of mare sterilization have not been extensively discussed, but because they are anticipated to be less invasive than ovariectomy via colpotomy the issues raised from the ovariectomy discussions would be adequate scoping for these procedures.

At least three years ago the National WH&B Advisory Board (Advisory Board) began discussing the possibility of mare sterilization. These meetings are open to the public, with public comment periods provided. The agenda and minutes from these meetings are posted online (http://www.blm.gov/wo/st/en/prog/whbprogram/Advisory_Board/advisory_board_minutes.html) and are, therefore, available for public review. The public may comment on any aspect of present or past agenda items, via the public comment periods during the meetings. In October 2012, the Advisory Board recommended that, “BLM add ovariectomy as one additional tool for population growth suppression,” and drafted a 7-page description of their interpretation of this specific recommendation. The 2013 NRC Review evaluated ovariectomy of mares, and explained that ovariectomy via colpotomy was an alternative approach to ovariectomy, as it avoids an external incision and reduces the chances of complication and infection (NRC Review, 2013, page 98). The NRC Review (2013) noted that this surgery is not without risk (page 98), but also noted that all fertility control measures have some effects on physiology or behavior (page 134).

The NRC Review (2013) did not review tubal ligation or hysteroscopically-guided laser ablation. In September 2013, the Advisory Board provided discussion and recommendations to BLM in response to the NRC Review recommendations. In response to NRC Review finding #7, the Advisory Board recommended that no options for reproductive control be eliminated from consideration due to the conflicting data on immune-contraceptives such as IUDs, ovariectomy, and tubal ligation (BLM, 2013). On September 23, 2013, the BLM released an RFI inviting research project ideas aimed at refining techniques and establishing protocols for the permanent sterilization or contraception of either male or female wild horses and/or burros in the field. In March 2014, BLM issued an RFA for research proposals related to the ideas generated from the September 2013 RFI. In November of 2014, BLM again commissioned the NRC of the NAS to assemble a committee of experts to review and assess 19 proposals received from universities. The NRC submitted their review of the proposals on January 21, 2015, with recommendations for BLM to fund all three research proposals included in the proposed action of this EA. On July 7, 2015, BLM announced new research to curb population growth and improve health of WH&B herds on the National WH&B Program webpage (BLM, 2015). A link on this page directs those interested to further details on the list of research projects reviewed and considered for recommendation by the NRC panel of

experts. In September 2015, two financial assistance agreements were issued to OSU for studying/developing three sterilization methods for wild horse mares. The ovariectomy via colpotomy research proposal is addressed in one agreement with OSU, and the two minimally invasive techniques' proposals are addressed in the second agreement with OSU. On November 18, 2015, BLM announced agreements with universities to conduct research to improve fertility control tools and methods (http://www.blm.gov/wo/st/en/prog/whbprogram/science_and_research/usgs_partnership.html). This announcement described the three methods of mare sterilization proposed by OSU and analyzed in this EA.

The issues brought forth from the scoping of similar projects, in addition to those brought up during Advisory Board meetings and suggested during internal scoping, are compiled below.

1. Issues

- How long would each procedure take to be performed on a mare?
- Would the procedures be conducted under clean surgical and environmental conditions consistent within an acceptable standard of care for domestic equidae?
- What are the anticipated complication rates of each procedure?
- What mortality may be associated with the procedure?
- Since the ovariectomy and tubal ligation studies are to be conducted on pregnant mares in various gestational stages, would these procedures affect the development of the foal?
- Are there concerns about the long-term side effects to mares (e.g. bone density loss) following each procedure?
- Would mares continue to cycle following these procedures?
- Are any of these procedures expected to cause abortions?
- What is the estimated cost per mare to conduct each procedure?
- Once the study is complete would the mares return to the range or be placed in the adoption program?

2. Issues Considered but Eliminated from Detailed Analysis

- a. Could this research be conducted over a longer time period to study the side effects of the procedures and the social and behavioral effects once returned to the range?

The proposed action would be conducted entirely in Oregon's Wild Horse Corral Facility in Hines, Oregon. Treated mares would not be returned to any HMA. Therefore this issue is outside the scope of this EA and was eliminated from detailed analysis. However, in evaluating fertility-control methods, it is important to compare them not only for obvious factors - such as efficacy, mode of delivery, and cost - but for the constellation of their effects on physiology, behavior, and social structure (NRC Review,

2013, page 97). It is likely that no method of fertility control exists that would not affect physiology or behavior of wild horses (NRC Review, 2013, page 134). Therefore, if studies can be proven safe and effective in pen trials, then studying the procedures' effects on behavior and social structure may be a logical next step. There is a proposed study titled "Evaluating behavior, demography, and ecology of spayed [sterilized] free-roaming mares" that is currently being developed by BLM's Rock Springs Field Office in conjunction with the USGS. Refer to page 26 of this EA for a description of that proposed study. The results from the proposed action of this EA may be useful and valuable for the implementation of the Rock Springs study.

b. How would sterilizing mares affect a population's genetic viability?

The proposed research would be conducted in its entirety in Oregon's Wild Horse Corral Facility. The proposals do not include releasing treated mares back to any HMA. Future proposals to release permanently sterilized mares back to an HMA would only be conducted following adequate NEPA analysis of such a proposed action.

c. Sterilizing wild mares is an action that is contrary to the WFRHBA.

This issue was eliminated from detailed analysis because the 1971 WFRHBA specifically states that "The Secretary shall maintain a current inventory of wild free-roaming horses and burros ... The purpose of such inventory shall be to ... determine whether appropriate management levels should be achieved by the removal or destruction of excess animals, or other options (such as sterilization, or natural controls on population levels)."

d. The availability and success of using PZP fertility control to manage wild horse populations is well-documented in the scientific literature; why don't we just continue using PZP?

The use of PZP for fertility control is well documented; however longer lasting formulations have not proven effective at population growth suppression on a majority of HMAs. Using the two-injection liquid PZP inoculation, BLM would need to gather the horses and treat the mares during the appropriate time period (late winter to early spring) then release those mares back to the HMA. For PZP to remain effective mares would either need to be gathered or bait/water trapped *every year* to be retreated with PZP, or mares would need to be located, identified, and successfully

darted *every year* with a booster vaccination of liquid PZP. Locating, identifying, and successfully darting all individual mares during late winter or early spring annually is logistically infeasible across most HMAs. When identifying the most promising fertility-control methods, the NRC Review (2013) concluded there are HMAs in which remote delivery (i.e. darting) is possible, but these seem to be exceptions where horses are easily approached and individually identifiable. Given the current fertility-control options, remote delivery (darting) appears not to be a practical characteristic of an effective population management tool, but it could be useful in some scenarios (NRC Review, 2013, page 129). Access to animals for timely inoculation and other management constraints may affect the utility of PZP as a management tool for western feral horse populations (Ransom et al., 2011). BLM must explore new methods and techniques for long-term population growth suppression, such as surgical sterilization, which could ultimately be applied to horses in HMAs with limited access and other constraints.

e. The WFRHBA states that all management activities shall be at the minimal feasible level; is surgical sterilization the most [minimal] feasible level of management that would achieve population growth suppression?

The results from the studies in this EA would simply help determine if the proposed research techniques would be effective and safe. Further NEPA analysis would be required to determine if and how these methods would actually be implemented in HMAs. Those further analyses would be site specific and determine which methods applied would be the most minimal feasible.

II. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

A. Alternative A - No Action

The no action alternative would reject all three mare sterilization research proposals. It would not be possible to conduct the research specified in the financial assistance agreements. The BLM funding for the agreements would be de-obligated.

B. Alternative B - Proposed Action

This alternative proposes to conduct research on the safety and practicality of sterilizing mares as a tool for wild horse population control using the three methods specified below. The proposed action includes the functional assessment of three methods of mare sterilization;

1. *Ovariectomy via colpotomy* (further referenced as “ovariectomy”) - to remove both ovaries,

2. *Minimally invasive tubal ligation* (further referenced as “tubal ligation”) - to cauterize and then cut the oviduct,
3. *Minimally invasive hysteroscopically-guided oviduct papilla laser ablation* (further referenced as “hysteroscopically-guided laser ablation”) - to use a laser to scar and seal the opening of each oviduct.

C. Common to All Methods

All procedures would take place at Oregon’s Wild Horse Corral Facility in Hines, Oregon. The treated mares involved in the studies would not be released back to any HMA. Following the completion of the studies the mares would be placed in BLM’s adoption program.

Each mare in the studies would be identified by her individual freeze mark and a neck tag with the last four numbers of her freeze mark. Each wild horse removed from the range due to overpopulation receives an individual freeze mark in order for BLM to identify and track him/her throughout his/her life. Some horses selected to be returned to the range may also be marked for monitoring purposes.

In coordination with BLM, a team of experienced veterinarians has been assembled by OSU to conduct and support the objectives of this study. Three veterinarians licensed in the State of Oregon would conduct the procedures. This team has extensive experiences in equine reproduction, equine urogenital surgery, veterinary endoscopy, and minimally invasive surgery.

A sample of wild horse mares cared for in BLM holding facilities would be selected by BLM personnel. These mares would have been held at Oregon’s Wild Horse Corral Facility, separate from stallions, for at least one month prior to the procedures. Horses chosen for the procedures would be adult females and immature females estimated to be older than 8 months and weighing 250 kg (551 lbs.) or more. A mare would only take part in one of the three studies. Low stress handling techniques, as described in the BLM’s Comprehensive Animal Welfare Program (Appendix C - Instruction Manual (IM) 2015-151), would be utilized to assure that the horses stay as calm as possible while in captivity and while being handled for the procedures. In addition to BLM’s IM 2015-151, animal handling would follow the OSU Institutional Animal Care and Use Committee’s animal care and use protocols. Veterinarians would determine each mare’s health status as being adequate prior to surgery. Each mare would be held in a padded, hydraulic chute during the procedure (Figure II-1). Mares would undergo palpation per rectum and ultrasound for pregnancy with an estimate of stage of pregnancy made by the surgeon on those mares that are pregnant. Prior to each surgery, the veterinarian would tie up the tail and wrap it to the side (Figure II-2).

This study would include a control group of 25 open mares. These mares would be exposed to fertile stallions in order to quantify the conception rate of wild horse mares in the corral facility. At least 12 mares in the tubal ligation and at least 25 mares in the hysteroscopically-guided laser ablation studies would be exposed to fertile stallions for

3–5 months to quantify conception rates in those groups. Comparison of conception rates between groups would allow assessment of the success of each procedure.



Figure II-1: The well-padded hydraulic chute at the Oregon Wild Horse Corral Facility. Note the half gate (right photo) which allows the veterinarian to safely perform the procedure.

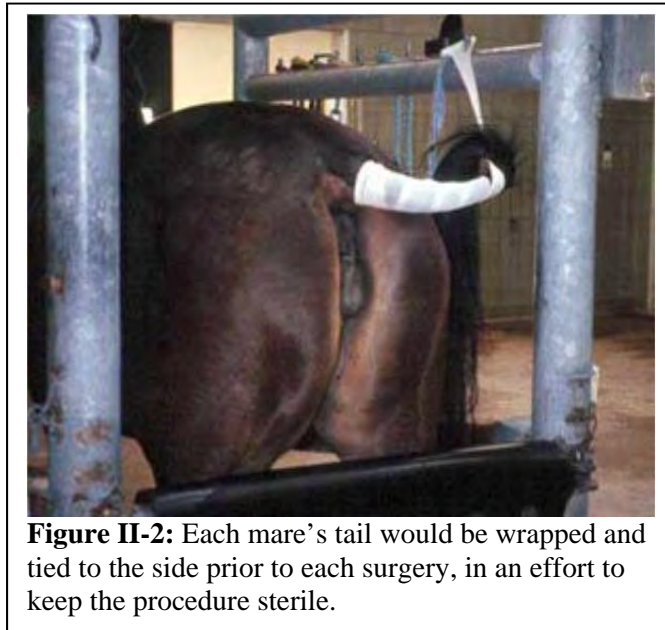


Figure II-2: Each mare's tail would be wrapped and tied to the side prior to each surgery, in an effort to keep the procedure sterile.

Following the completion of all three studies, BLM would release preliminary results to the public. The financial assistance agreements with OSU state that the results and accomplishments of activities funded by the BLM should be made available to the public. OSU is expected to make the results and accomplishments of their activities available to the research community and to the public at large. As a means of sharing knowledge, BLM encourages awardees to arrange for publication of BLM-supported original research in primary scientific journals. Awardees also should assert copyright in scientific and technical articles based on data produced under the award where necessary to affect journal publication or inclusion in proceedings associated with professional activities.

1. Ovariectomy Study

Following the determination of gestational stage (discussed above) each mare would be categorized according to one of four gestational stage groups: a gestational age of less than 4 months, 4–8 months, over 8 months, or open (not pregnant). Ovariectomy would be performed on 100 horses with a plan to have approximately 25 horses in each gestational stage group.

Sample size considerations for the ovariectomy via colpotomy study are intended to allow for reliable conclusions about the severe complication rate associated with this surgery in the four gestational stage groups (open, early, middle, late). If sample sizes are too small for this study, then favorable outcomes could falsely lead to a conclusion that the procedure leads to a lower complication rate than it actually does. If the severe complication rate is in fact 12 percent or greater, then a sample size of 25 mares per pregnancy category leads to adequate statistical power ($\beta > 0.8$) to avoid falsely estimating a severe complication rate of 7 percent or lower. Prior expectations for complication rates are less than 2 percent, based on preliminary results from Sheldon National Wildlife Refuge (NWR) (Bowen, 2015). If that rate is approximately correct, then the overall sample size of 100 mares should allow for a 95 percent confidence interval around the estimate of that rate that is from approximately 1 percent–8 percent.

In order to have the 25 mares needed per gestational stage group, the studies would need to be conducted on at least some horses that have been recently gathered from the range, because normal procedures are to separate horses by sex and age in the corral facility so they do not continue to breed. If there are not enough horses in BLM holding of the appropriate gestational stages at the time the study begins, then BLM would need to wait until another HMA is gathered to fill each gestational group and complete the study.

a. Procedure

Individuals selected for inclusion in the ovariectomy procedure would be held without feed for 36 hours prior to surgery for maximum evacuation of the bowels, allowing adequate room in the abdomen with minimal interference from the intestines. Holding mares off feed minimizes the

negative impact of distended intestines near the surgical region. Water will not be withheld.

The patient would be restrained in the well-padded chute which allows for access to the horse's neck for injections, and to the tail and perineal area to allow for performance of the surgery. Each mare would be intravenously administered a mixture of detomidine hydrochloride (10–20 µg/kg; 5–10mg), Butorphanol (0.02–0.04 mg/kg; 5–15 mg), and Xylazine (0.2–0.5 mg/kg; 100–300mg) to sedate and provide analgesia (to minimize discomfort) for surgery (exact dosages may be adjusted as determined by the veterinarian). Tetanus antitoxin would be given to any unvaccinated individuals. Each mare would also be administered a long-duration antibiotic (Excede - Ceftiofur Crystalline Free Acid, Zoetis, Florham Park, New Jersey). Excede is effective for 4 days.

Following sedation, a rectal examination would be performed to evacuate the rectum and determine pregnancy status and gestational stage. While the surgical field may not be entirely sterile, all reasonable steps would be taken to ensure that it is aseptic. The perineal region would be aseptically cleansed and the vagina would be aseptically prepared for surgery using tamed iodine solution prior to insertion of the surgeon's sterile gloved arm into the vaginal vault. The procedure would involve making an incision, approximately 1–3 centimeters long, in the anterior-dorsal-lateral vagina. The incision would be bluntly enlarged digitally (using the veterinarian's fingers) to perforate the peritoneum to allow the surgeon's hand to enter the abdomen. This method, blunt dissection, separates rather than transects the muscle fibers so the incision decreases in length when the vaginal muscles contract after the tranquilization wanes post-surgery (Bowen, 2015). The ovary and associated mesovarium are isolated by direct manual palpation. At this point administration of the local anesthesia to each ovary can take place. Local anesthesia would consist of a mixture using 5 ml of bupivacaine (0.5 percent) and 5 ml of 2 percent lidocaine hydrochloride injected into each ovarian pedicle. This combination was selected to provide rapid onset (lidocaine) and extended duration (bupivacaine) of effect, eliminating pain associated with removal of the ovaries. Removal of the ovaries would be done with a chain ecraseur, seen in the hands of the veterinarian in Figure II-3 and Figure II-4. If the internal structure of a mare appears or feels abnormal, that mare would not be included in the study. Removing such contraindicated mares would prevent complications to the mares and ensure the procedure is only conducted on a uniform group of structurally correct mares.

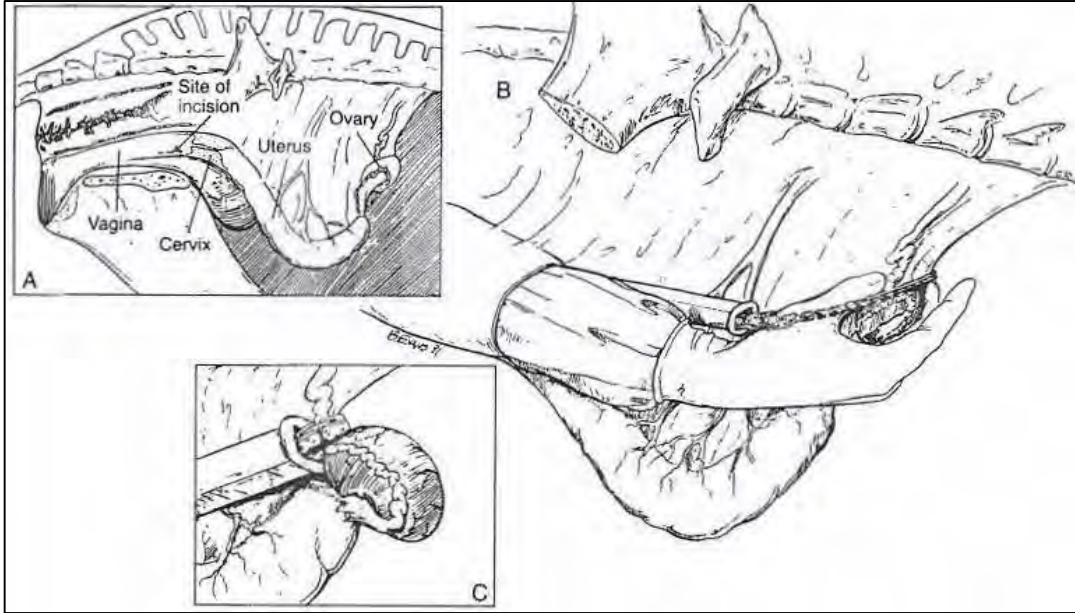


Figure II-3: (A) The site for the vaginal incision is located ventrolateral and caudal to the cervix. (B) The chain loop of the ecraseur is positioned over the hand so that the ovary can be grasped and drawn inside the loop. (C) After ensuring that only ovarian pedicle is within the loop, the pedicle is slowly crushed and transected. (From Kobluk et al., 1995).



Figure II-4: A chain ecraseur being used during an ovariectomy via colpotomy procedure.

Consistent with current standard of care, the colpotomy incision would be allowed to heal by second intention (heals without suturing). Second

intention healing of the surgical incision in the anterior vagina avoids complications associated with placing suture material in the incision, and experimental studies have revealed that the breaking strength of secondarily healed wounds is comparable to that of primarily closed wounds (Auer and Stick, 1999, page 136, Johnson et al., 1982). This technique of ovariectomy in horses has been described and is the most commonly utilized technique in rural veterinary practice (McKinnon and Vasey, 2007; Auer and Stick, 1999, page 576; Pielstick pers. comm.). Once the procedure is completed and the mare has recovered from a sedated state, she would be returned to her corral and provided adequate feed and water. It has been suggested that keeping the mare standing for 2–4 days after surgery could be used to prevent evisceration. However, this risk is rare, and in the veterinarian's experience, withholding feed for 36 hours prior to surgery creates relatively empty intestines, decreasing the risk for evisceration either during surgery or post-surgically.

This procedure is anticipated to take approximately 15 minutes per horse. This is based on three similar scenarios where the veterinarian who would perform this study conducted ovariectomies on groups of mares. To ovariectomize a group of 100 horses, 3–4 days would be planned. Variation on this amount of time could be based on the horse's behavior in the chute.

Following surgery, all mares would be monitored for 14 days and observed for post-operative complications, including pain (obtundation, colic signs, pawing, anorexia), bleeding, infection, or signs of abortion. Veterinarians would be on-site to observe for a minimum of 2 days post-operatively; the remaining observation period would be completed by BLM personnel with a veterinarian on call. Any mare showing signs of post-operative complications would receive treatment as indicated by a veterinarian. If a death occurs or an individual show signs of a life-threatening complication with a poor prognosis for recovery and must be euthanized, that individual would be necropsied, when necessary, to determine cause of death.

b. Data Collection and Animal Observation

Data to be recorded for each mare, at time of surgery, would include:

- Signalment (a set of letter codes that identifies a horse's sex, color, and markings) and any unusual preoperative findings or contraindications,
- Incidence of complications (poor sedation, inadequate analgesia, discomfort during surgery, hemorrhage from the pedicle, post-op colic, or post-op obtundation),

- Pregnancy and gestational stage,
- Injuries to the surgeon.

Post-surgical observation would continue for two weeks and any abortions, complications, and behavioral changes would be documented. Veterinarians would be on-site to observe for a minimum of 2 days post-operatively; the remaining observation period would be completed by BLM personnel with a veterinarian on-call. Any mare showing signs of post-operative complications would receive treatment as indicated by a veterinarian. If a death occurs or an individual shows signs of a life-threatening complication and must be humanely euthanized, that individual would be necropsied, if necessary, to determine cause of death.

Successful births would be recorded and any fetal abnormalities would be noted.

c. Analysis and Interpretation of Data

OSU would lead the analysis, summarizing the percentage of horses in which the surgery was successfully completed. Differences in the gestational groups, any surgical or post-surgical complications (e.g. abortions or obtundation), and obvious changes in post-surgical behavior would be documented and evaluated. In judging whether the procedure is appropriate for future applications to wild horses, BLM would also consider factors such as: comfort level after the procedure; birth rates of fully developed and healthy foals born to horses that were of differing gestational stages at the time of surgery; whether the procedure is safe for the mare and veterinary personnel; the discovery of any changes that would simplify or improve the procedure. After the conclusion of the study and receipt of associated reports from the researchers, the BLM would be more fully informed about the procedure and its potential for use in future management applications.

2. Tubal Ligation Study

In an effort to develop new minimally invasive, low risk techniques for permanent sterilization in female wild horses, tubal ligation of the oviduct is being proposed in standing, sedated mares. It is hypothesized that a flexible endoscope (Figure II-5), inserted through a small incision in the vaginal vault, would allow for visualization of each oviduct in pregnant and non-pregnant mares. Use of a diode laser or cautery instrument would allow effective fulguration (destruction of the tissue) followed by bloodless sectioning (cutting) of the oviduct.

Following the determination of gestational stage (discussed above), each mare would be categorized according to a gestational age of less than 4 months, 4–8 months, over 8 months, or open (not pregnant). The tubal ligation technique

would be performed on 50 pregnant or open mares, with a plan to have approximately 10–15 horses in each gestational group.

For this proposed procedure, the sample size considerations are intended to allow for adequate statistical power to differentiate the pregnancy outcomes in treated mares compared to control mares. It is expected that the tubal ligation surgery will lead to very low post-operative conception rates. Twelve mares in each of the four pregnancy categories should allow the study to reliably differentiate a post-operative conception rate of 30 percent or less (based on $\alpha=0.05$ and power $\beta=0.8$), compared to a conception rate of 70 percent or more in the twenty-five untreated, control mares. The expected severe complication rate for the tubal ligation procedure is lower than that expected for the ovariectomy procedure, and may be lower than 1 percent. For that reason, a much larger sample size per gestational group (approximately 100 horses per group) would have been required if accurate quantification of severe complication rates had been the primary goal for the study.

In order to have the 10–15 mares needed per gestational group the studies would need to be conducted on horses that have been recently gathered from the range, because normal procedures are to separate horses by sex and age in the corral facility so they do not continue to breed. If there are not enough horses of each gestational stage in BLM holding at the time this study begins, then BLM would need to wait until another HMA is gathered to have an adequate size in each gestational group to complete the study.

a. Procedure

Mares selected for the tubal ligation technique would be held off feed for 24–36 hours to minimize the amount of intestinal fill. This effort would allow a wider field of view during endoscopic visualization and minimize potential risks associated with a full abdomen. Water would not be withheld.

Mares would be restrained in a padded, hydraulic chute specifically designed for routine processing of wild horses. Mares would be sedated using detomidine (10–20 ug/kg; 5–10 mg) and butorphanol (0.02–0.04 mg/kg; 5–15 mg), with the potential addition of xylazine (0.2–0.5 mg/kg; 100–300 mg) for additional sedation. Ketamine (50–100 mg) could be added on an as needed basis for additional standing chemical restraint. Anti-inflammatory/analgesic (pain) treatment would include flunixin meglumine (Banamine) at 1.1 mg/kg (10 ml of 50 mg/ml). Infection of the surgical site or abdomen is unlikely due to the minimally invasive nature of this procedure; despite this, each mare would be given a long-duration antibiotic (Excede - Ceftiofur Crystalline Free Acid, Zoetis, Florham Park, New Jersey). Excede is effective for 4 days.

The mare's tail is then wrapped and tied high and to one side. Manual rectal evacuation of fecal material is followed by cleansing and aseptic preparation of the perineal region. Sterile gloves and sleeves are used to palpate the vaginal vault and then proceed to introduce an insufflation needle into the abdomen through the anterior portion of the vaginal wall. The needle is then attached to tubing which conveys sterilely filtered air for compressed carbon dioxide (CO₂) under pressure into the abdomen. This insufflation causes pneumoperitoneum (gas in the abdominal cavity), which allows for better visualization of the abdominal structures with the flexible endoscope (Figure II-5). Insufflation of the abdomen can be an uncomfortable process for some individuals (pers. comm. principal investigator). If a mare is showing signs of discomfort during this portion of the procedure, she would receive epidural treatment with an appropriate dose of morphine or xylazine, which would provide additional analgesia for an extended time period (up to 24 hrs.). Following insufflation, a sterilely-gloved hand in the vaginal vault would make a small incision (10–12 mm) which would allow direct placement of a sterile flexible endoscope.

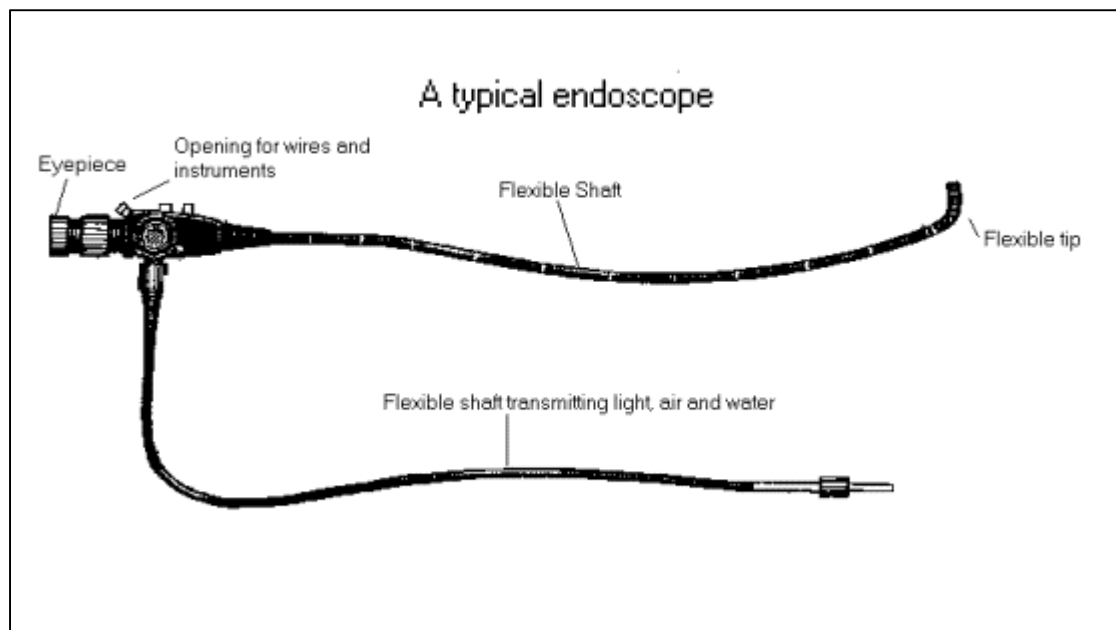


Figure II-5: Diagram of a typical flexible endoscope similar to what would be used in the minimally invasive surgical procedures.

Images of the mare's internal anatomy would be obtained using a flexible endoscope. The spatial relationship of each ovary, its corresponding oviduct, and the uterine horn would be clearly apparent to the surgeon. Local anesthetic (bupivacaine) would be applied to each oviduct to provide local anesthesia which would be expected to last 4–6 hours. The imaging device would be manipulated to guide the direct application of a cautery instrument or a 600 micron diode laser fiber, introduced through

the endoscope, to the oviduct and adjacent tissue, resulting in fulguration (destruction) of the exposed tissue. A flexible endoscopic instrument would then be used to divide the oviduct, resulting in obstruction of the oviduct lumen and prevention of future pregnancy. Refer to Figure II-6 for a simplified diagram of the endoscope placement once inside the mare.

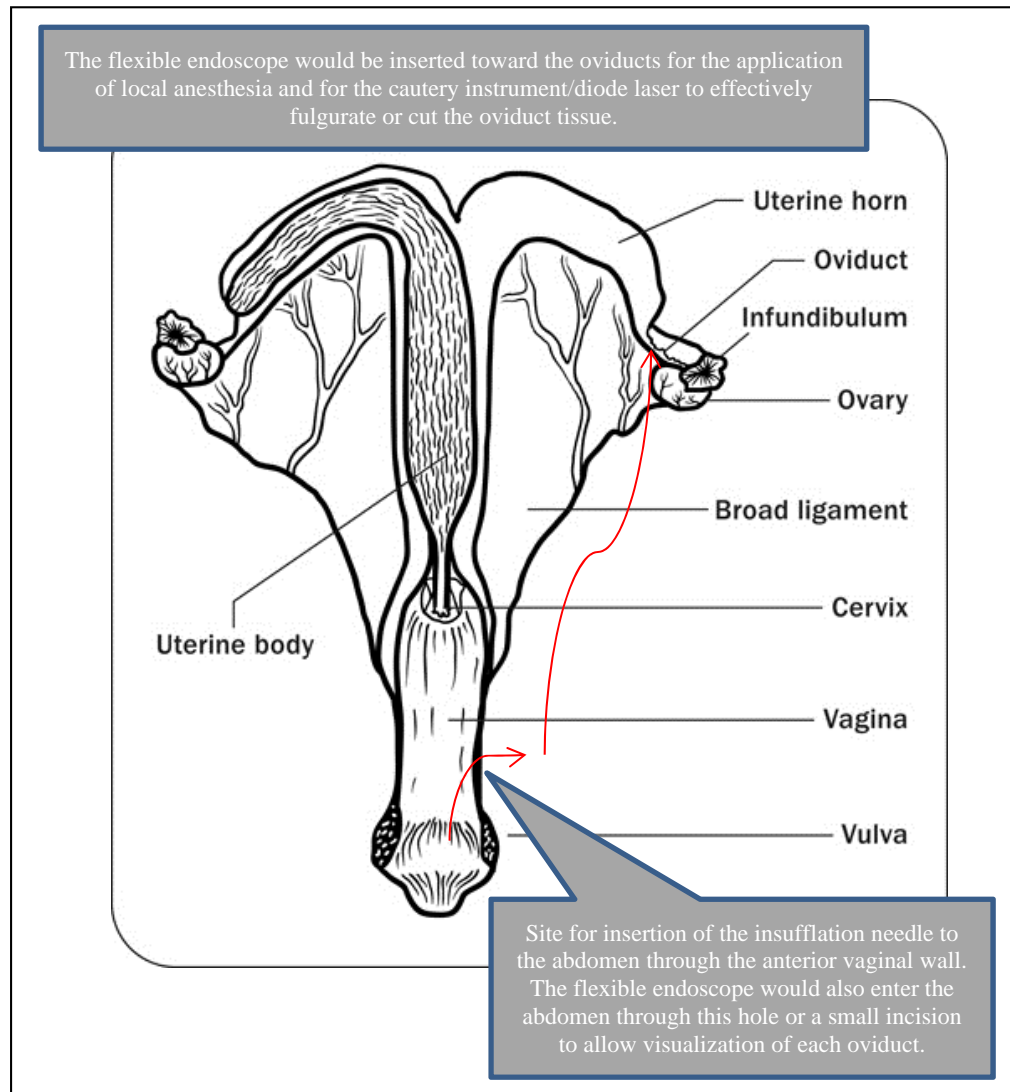


Figure II-6: Diagram of the route taken (red arrows) through the vaginal wall and into the abdominal cavity to conduct the tubal ligation procedure (Diagram from <http://www.omafra.gov.on.ca/english/livestock/horses/facts/10-099f3.jpg>).

Because the endoscopic surgery entails a single, small vaginal incision approximately 10–12 mm long, it would likely seal within 24 hours (pers. comm. principal investigator).

After completing the procedure, mares would return to a corral with other recovering mares. Within 2–4 hours, the operated patients would be less

sedate and could be allowed access to feed and water. The most likely complications would be mild abdominal pain (colic), from expansion of the abdomen, and/or a dull attitude (obtundation). Some humans undergoing similar surgery complain of nausea as a side effect of the general anesthetic and may experience some abdominal pain and discomfort in the immediate post-op period (Women's Health Queensland Wide, Inc., 2011).

Two to four weeks following the procedure, operated mares that were open at the time of surgery would be ultra-sounded for pregnancy again. This would be done to ensure they were in fact open and did not have pregnancies that were of less than 12 days and not able to be visualized via pre-surgery ultrasound; these post-operative ultrasounds would only be conducted if the mares received the procedure within 12 days of being gathered or exposed to stallions. These mares would then be allowed exposure to a fertile stallion for 3–5 months, observed for mating behavior, and be checked for pregnancy following the period exposed to a stallion.

There are no known studies using this technique to permanently sterilize domestic mares, therefore the duration of the surgical procedure is not entirely known. It is anticipated that the procedure would take approximately 15 to 30 minutes, allowing up to two to four horses being operated on per hour.

b. Data Collection and Animal Observation

Data to be recorded for each mare, at time of surgery, would include:

- Signalment (a set of letter codes that identifies a horse's sex, color, and markings) and any unusual preoperative findings,
- Gestational stage, including open, (would be recorded and utilized to assess whether the suitability of the procedure may be dependent on pregnancy state or gestational age),
- Incidence of complications (poor sedation, inadequate analgesia, discomfort during the procedure, hemorrhage, post-op colic, or post-op obtundation),
- Pregnancy (duration of gestation would be estimated and compared to outcomes (abortion) and complications (hemorrhage, colic, poor analgesia, etc.),
- Injuries to the surgeon, and
- Duration of the procedure.

Post-surgical observation would continue for two weeks with any abortions, complications, or behavior changes documented. Veterinarians would be on-site to observe for a minimum of 2 days post-operatively; the

remaining observation period would be completed by BLM personnel with a veterinarian on-call. Any mare showing signs of post-operative complications would receive treatment as indicated by a veterinarian. If a death occurs or an individual shows signs of a life-threatening complication and must be humanely euthanized, that individual would be necropsied, if necessary, to determine cause of death.

Pregnant mares would be reevaluated within 1 month after the procedure to evaluate pregnancy status. Successful births would be recorded and any abnormalities would be noted.

c. **Analysis and Interpretation of Data**

OSU will lead the analysis of surgical procedure success, in terms of the percentages of treated mares in which the surgery was successfully completed and of the horses which become sterile. Differences in outcome that vary according to gestational groups, the rate of any surgical or post-surgical complications (e.g. abortions), and apparent changes in post-surgical behavior of treated mares would be documented and evaluated. In judging whether the procedure is appropriate for future applications to wild horses, BLM would also consider factors such as: apparent comfort level after the procedure; birth rates of fully developed and healthy foals born to horses that were of differing gestational stages at the time of surgery; procedure safety for the mare and veterinary personnel; and the discovery of any changes that would simplify or improve the procedure. After the conclusion of the study and receipt of associated reports from the researchers, the BLM should be more fully informed about the procedure and its potential for use in future management applications.

3. Hysteroscopically-guided Laser Ablation Study

In an effort to develop new minimally invasive, low risk surgical techniques for permanent sterilization in female wild horses, hysteroscopically-guided laser ablation of the oviduct papilla is being proposed in standing, sedated mares.

As discussed above, each mare would undergo palpation per rectum and ultrasound for pregnancy. Hysteroscopically-guided laser ablation is applicable only to open (non-pregnant) mature mares because placement of an endoscope through the cervical opening of the pregnant uterus would likely result in abortion. Hysteroscopically-guided laser ablation would be performed on up to 50 open mares.

For this proposed procedure, the sample size considerations are intended to allow for adequate statistical power to differentiate the pregnancy outcomes in mares treated with the hysteroscopically-guided laser ablation procedure compared to control mares. It is expected that the laser ablation procedure may not lead to adequate scarring to prevent pregnancies in some cases, such that this procedure

may lead to higher post-procedural conception rates than the tubal ligation surgery. As a result, a higher sample size of laser ablation procedures may be required to differentiate the conception rates of laser-ablation treated versus control mares. Twenty-five or more treated mares should allow the study to reliably differentiate a post-operative conception rate of 40 percent or less (based on $\alpha=0.05$ and power $\beta=0.8$), compared to a conception rate of 70 percent or more in the untreated mares. Larger sample sizes would allow for a more precise estimation of the confidence intervals around the conception rate for mares treated with the laser ablation procedure. The expected severe complication rate for the hysteroscopically-guided laser ablation procedure is lower than that expected for the ovariectomy procedure, and may be lower than 1 percent. For that reason, a much larger sample size of several hundred horses would have been required if accurate quantification of severe complication rates had been the primary goal for the study.

a. Procedure

Individuals selected for inclusion in this study would be held without feed for up to 24 hours prior to surgery for evacuation of the bowels, allowing adequate room in the abdomen with minimal interference from the intestines. Banamine (flunixin meglumine) at 1.1 mg/kg and Buscopan at 0.3 mg/kg would be administered intravenously prior to the procedure to minimize transient colic (abdominal cramping) following the procedure. Ketamine (50–100 mg) could be added on an as needed basis for additional standing chemical restraint.

Individuals selected for inclusion in the procedure would stand in the padded, hydraulic chute. The perineal area of each mare would be cleansed. A sterilized, flexible endoscope would be placed into the vaginal vault and advanced through the cervix in an atraumatic manner. The uterus would be partially inflated with filtered room air to visualize the oviduct papilla located at the proximal end of the uterine horn. Local anesthesia of Bupivacaine, a local anesthetic, would be dripped directly onto each oviduct papilla to minimize any discomfort. Local anesthesia should last 4–6 hours. A 600–800 micron diode laser fiber encased in a plastic tube (to protect the endoscope) would be placed into the instrument channel of the flexible endoscope until the diode laser fiber is visualized on the monitor. The endoscope would be manipulated until the fiber directly contacts the papillary ostium (oviduct opening). Continuous power, ranging from 15–30 watts, would be used to visually scar and seal the opening of the oviduct. The diode laser is expected to immediately “seal” the oviduct opening and the resulting inflammatory reaction is expected to result in additional scar tissue formation. The procedure would then be repeated on the opposite uterine horn. Still images or a video of the entire procedure would document the effort. Refer to Figure II-7 for a basic diagram of the endoscope placement once inside the mare.

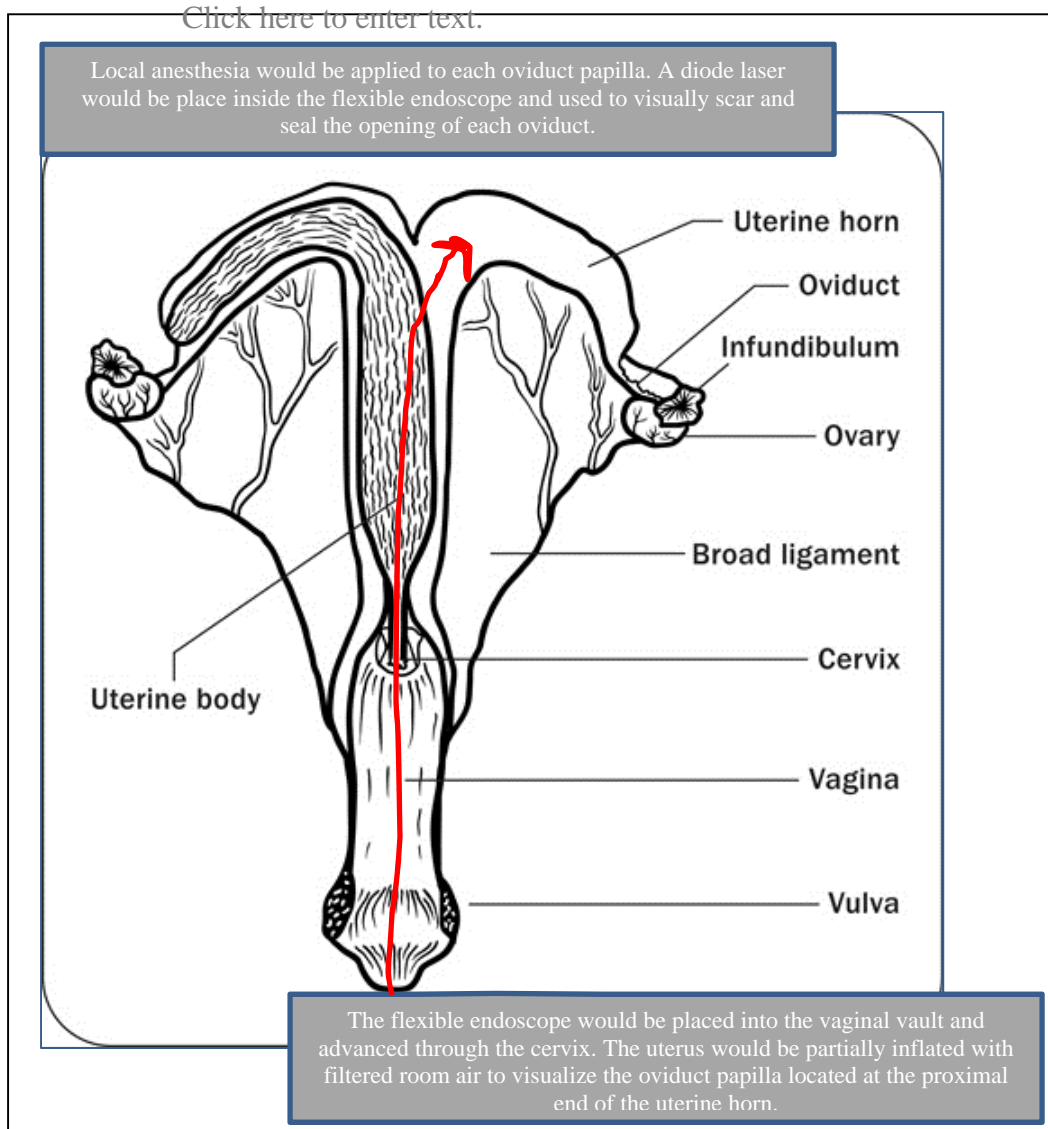


Figure II-7: Diagram of the route taken (red arrow) through the vaginal vault, through the uterus to the oviduct opening to conduct the laser ablation procedure (Diagram from <http://www.omafra.gov.on.ca/english/livestock/horses/facts/10-099f3.jpg>).

The endoscope would be removed and subjected to routine cleaning, chemical disinfection, rinsing, and drying in preparation for the next patient.

This procedure is new; there are no known studies using this technique to permanently sterilize wild or domestic mares. As a result, the duration of the surgical procedure is unknown and may vary. It is anticipated that the procedure would take approximately 10–15 minutes.

After surgery, the uterus would be infused with an antibiotic (5 million international units potassium penicillin) and saline to minimize the potential for infection secondary to any bacterial contamination.

Once the procedure is complete, mares would be monitored for 24 hours. Post-surgical observation would continue for two weeks with any complications documented. Veterinarians would be on-site to observe for a minimum of one day post-operatively; the remaining observation period would be completed by BLM personnel with a veterinarian on-call. Any mare showing signs of post-operative complications would receive treatment as indicated by a veterinarian. If a death occurs or an individual shows signs of a life-threatening complication and must be humanely euthanized, that individual would be necropsied, if necessary, to determine cause of death.

At approximately 3 weeks after the operation, a portion of the mares would be re-evaluated by endoscope to document and confirm scar tissue formation and closure of the oviduct ostium.

At approximately four weeks following the procedure, depending on the time of year, up to 50 operated mares would be allowed exposure to a fertile stallion for 3–5 months, observed for mating behavior, and checked for pregnancy following the period exposed to a stallion. Mares would remain grouped in pens while exposed to stallion.

b. Data Collection and Animal Observation

Data to be recorded for each mare, at time of surgery, would include:

- Signalment (a set of letter codes that identifies a horse's sex, color, and markings) and any unusual preoperative findings,
- Incidence of complications (poor sedation, inadequate analgesia, discomfort during surgery, post-op colic, or post-op obtundation).
- Injuries to the surgeon,
- Still images or a video of the entire procedure (to document the effort),
- Duration of the procedure.

c. Analysis and Interpretation of Data

OSU will lead the analysis of surgical procedure success in terms of percentages of treated mares in which the surgery was successfully completed and of those that become sterile. OSU would also evaluate the rate of any surgical or post-surgical complications (e.g. abortions), and apparent changes in post-surgical behavior of treated mares. In judging

whether the procedure is appropriate for future applications to wild horses, BLM would also consider factors such as: apparent comfort level after the procedure; procedure safety for the mare and veterinary personnel; and the discovery of any changes that would simplify or improve the procedure. After the conclusion of the study and receipt of associated reports from the researchers, the BLM should be more fully informed about the procedure and its potential for use in future management applications.

III. AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

A. Introduction

This chapter describes the affected environment for each of the resources that could be potentially affected by the alternatives discussed in Chapter II and displays the potential effects of the alternatives to those resources.

The environmental effects section for each resource identifies the direct, indirect, and cumulative effects associated with the alternatives. Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and occur later in time or farther removed in distance, but are still reasonably foreseeable.

Cumulative effects are those impacts resulting from the incremental impact of an action when added to other past, present, or reasonably foreseeable future actions (RFFA) regardless of what agency or person undertakes such other actions. RFFAs include those Federal and non-Federal activities not yet undertaken, but sufficiently likely to occur, that a responsible official of ordinary prudence would take such activities into account in reaching a decision. These Federal and non-Federal activities that must be taken into account in the analysis of cumulative impact include, but are not limited to, activities for which there are existing decisions, funding, or proposals identified by the BLM. RFFAs do not include those actions that are highly speculative or indefinite. RFFAs for this project include BLM Rock Springs Field Office's proposed sterilized wild mare behavior and demography study.

The BLM Rock Springs Field Office in Wyoming is currently developing an EA that proposes to gather excess wild horses from the White Mountain and Little Colorado HMAs in August 2016. Their proposal also includes conducting a research study, in conjunction with the USGS, in the two HMAs. The research study would place radio collars on a portion of the mares and place radio telemetry tail tags on a portion of the stallions in the HMAs following the 2016 gather. Approximately one year after the radio collars and tags are fitted to animals, a portion of the White Mountain mares would be selected to be again gathered, sterilized via ovariectomy, and released for further study to examine their behaviors including measures of band fidelity, demography (birth and survival rates), and spatial ecology both pre-treatment and post-treatment. The Little Colorado HMA would be gathered to the high AML of 100 horses and would be studied as a control group. A USGS convened panel of experts recently assessed available ovariectomy techniques and considerations required for use in field conditions (Bowen,

2015). BLM would use input from this USGS panel review to determine which ovariectomy method to use in the Rock Springs District study.

B. Identified Resource with Issue

The BLM Burns District and Washington, D.C. Office interdisciplinary team (IDT) reviewed the elements of the human environment, as required by law, regulations, Executive Order, and policy, to determine if they would be affected by any of the alternatives. The results of the review are summarized in the Affected Environment Table (Appendix D). The resources with no issues identified and listed as either not affected or not present will not be discussed further in this document. Because the action alternative (proposed action) would take place at Oregon's Wild Horse Corral Facility and the treated mares are not proposed to be released back to any HMA, the resources affected by the alternatives are limited. Resources with an issue question(s) will be analyzed in detail in this chapter.

1. Wild Horses - Mares

a. Affected Environment - Wild Horse Mares

Two hundred twenty-five wild horse mares previously removed from the range would be held at Oregon's Wild Horse Corral Facility in Hines, Oregon. The facility is located approximately 6 miles west of Hines, Oregon on Highway 20. At the corrals, horses are separated into pens by age and sex.

Within a short time of their arrival from the range, the horses are given a health inspection by a veterinarian. All horses are then prepared for adoption by bringing them into the barn where they are restrained in a hydraulic chute and aged by inspection of their teeth, vaccinated against common diseases, dewormed, and freeze marked. The horses' hooves are trimmed periodically as the ground in the pens is soft and hooves do not wear as readily as they would on the range over rougher terrain.

Each horse is freeze marked using liquid nitrogen and a special marking tool which permanently marks the animal. Each horse is individually identified by alpha angle symbols applied as a freeze mark on the left side of the neck. The mark identifies the horse as an official wild horse and includes the horse's birth year and identification number.

The pens near the barn are used as working pens where horses are separated for various reasons, whether for shipping, health inspections, or viewing for adoption. Numerous gates, small side pens, wings, and alleyways make it easier and safer to work with the horses. The larger holding pens are to the north of the barn and are connected to the working pens and alleyways. The horses and burros are kept in the larger holding

pens unless they are to be shipped out in a short time. Horses are provided fresh water in each pen and are fed once daily on a diet of high quality grass and alfalfa hay. The large barn and handling facility was built in 2001 to replace a wooden barn which was lost to fire.

All horses would remain at the corral facility to be included in potential future study of sterilized mares, or until they are either adopted, sold, or sent to an off-range pasture facility to live out the remainder of their lives.

b. Environmental Consequences - Wild Horse Mares

Common to Both Alternatives

Short-Term Holding and Adoption (or Sale) Preparation

After recently captured wild horses have transitioned to their new environment at the corrals, they are prepared for adoption or sale. Because these horses are wild and not accustomed to being handled, potential effects to wild horses include serious injuries and deaths from injuries during the preparation or handling processes. Oregon's Wild Horse Corral Facility staff members have 35 combined years of experience handling wild horses and use low-stress handling techniques as well as follow BLM's Comprehensive Animal Welfare Program (Appendix C) to ensure humane care and handling of horses. Mortality at short-term holding facilities averages approximately 5 percent per year (GAO, 2008, page 51), and includes animals euthanized due to pre-existing conditions; animals in extremely poor condition; animals which are unable to transition to feed; and animals which are seriously injured or accidentally die during sorting, handling, or preparation.

Adoption or Sale with Limitations, and Long-Term Pasture

All horses at Oregon's Wild Horse Corral Facility are made available for adoption. The time period between when the horses arrive at the facility and when they would be entered in the adoption program is outlined in the analysis for each alternative.

Adoption applicants are required to have at least a 400 square foot corral with panels at least 6 feet tall for horses over 18 months of age. Applicants are required to provide adequate shelter, feed, and water. The BLM retains title to the horse for 1 year, and a subset of the horses and facilities are inspected to ensure the adopter is complying with the BLM's requirements. After 1 year, the adopter may take title to the horse, at which point the horse becomes the property of the adopter. Adoptions are conducted in accordance with 43 CFR 4750.

Potential buyers must fill out an application and be pre-approved before they may buy a wild horse. A sale-eligible wild horse is any animal more than 10 years old; or which has been offered unsuccessfully for adoption 3 times. The application also specifies all buyers are not to resell the animal to slaughter buyers or anyone who would sell the animal to a commercial processing plant. Sales of wild horses would be conducted in accordance with BLM policy under IM 2013-032 or any future BLM direction on sales (BLM, 2012b).

When horses are shipped for adoption, sale, or long-term holding, animals may be transported for a maximum of 24 hours. Immediately prior to transportation, and after every 18 to 24 hours of transportation, animals are offloaded and provided a minimum of 8 hours on-the-ground rest. During the rest period, each animal is provided access to unlimited amounts of clean water and 25 pounds of good-quality hay (per horse) with adequate bunk space to allow all animals to eat at one time. Most animals are not shipped more than 18 hours before they are rested. The rest period may be waived in situations where the travel time exceeds the 24-hour limit by just a few hours if the stress of offloading and reloading is likely to be greater than the stress involved in the additional period of uninterrupted travel.

Long-term pastures are designed to provide excess wild horses with humane, lifelong care in a natural setting off public rangelands. Wild horses are maintained in grassland pastures with enough space to allow free-roaming behavior and with forage, water, and shelter necessary to sustain them in good condition. About 31,000 wild horses in excess of the existing adoption or sale demand (because of age or other factors) are currently being held in long-term pastures (WH&B Quick Facts, 2015). These animals are generally more than 10 years in age. Located in mid or tall grass prairie regions of the United States, these long-term holding pastures are highly productive grasslands as compared to more arid western rangelands. Generally mares and castrated males (geldings) are segregated into separate pastures. No reproduction occurs in the long-term grassland pastures, but foals born to mares that were pregnant on arrival are gathered and weaned when they reach about 8–10 months of age and are then shipped to short-term facilities where they are made available for adoption. Handling by humans is minimized to the extent possible, although regular on-the-ground observation and periodic counts of wild horses to ascertain their numbers, well-being, and safety are conducted. A very small percentage of the animals may be humanely euthanized if they are in underweight condition and are not expected to improve to a body condition score (BCS) of 3 or greater, due to age or other factors. Natural mortality of wild horses in long-term holding pastures averages approximately 8 percent per year, but can be higher or lower depending on the average age of the horses pastured (GAO, 2008, page 52).

Euthanasia and Sale without Limitation

While humane euthanasia and sale without limitation of healthy horses for which there is no adoption demand is authorized under the WFRHBA, Congress prohibited the use of appropriated funds for that purpose between 1987 and 2004 and again in 2010 and all years since then.

No Action

Under the no action alternative no wild horse mares at Oregon's Wild Horse Corral Facility would participate in mare sterilization research. Following preparation (e.g. freeze marking, vaccinating, etc.), all mares would be immediately available for adoption or sale. The no action alternative would not achieve the purpose and need of this EA as there would be no strides forward in meeting the DOI's need to research and test wild horse population control methods that were recommended for research study by the NRC (Appendix B).

Proposed action

Common to all three procedures

Mares chosen to participate in the sterilization research would not be available for adoption until after the study in which they participate is complete; this may be approximately 6 months from the beginning date of each study.

Ovariectomy

In 1903, Williams first described a vaginal approach, or colpotomy, using an ecraseur to ovariectomize mares (Loesch and Rodgeron, 2003; Williams, 1903). The ovariectomy via colpotomy procedure has been conducted for over 100 years and is considered acceptable to the public on open (non-pregnant), domestic mares. The NRC committee that reviewed the 19 research proposals stated, "Colpotomy, as described in this proposal, is not a new technique; the only novelty in the proposal is that the procedure would be performed on free-ranging rather than domestic horses" (NRC Proposal Review, 2015, Appendix B). The committee did not consider this difference to be a matter of research. However there is a lack of information on the risk associated with conducting the procedure on pregnant mares. When wild horses are gathered or trapped for fertility control treatment there would likely be mares in various stages of gestation. Removal of the ovaries is, of course, permanent and 100-percent effective; however the procedure is not without risk. Before this technique

is made operational, a better understanding of the gestational stages in which ovariectomy via colpotomy could be utilized is warranted.

The average mare gestation period usually ranges from 335 to 340 days (Evans et al., 1977, page 373). There are few peer reviewed studies documenting the effects of ovariectomy on the success of the pregnancy in a mare. The NRC committee that reviewed the research proposals explained, “The mare’s ovaries and their production of progesterone are required during the first 70 days of pregnancy to maintain the pregnancy” (NRC Proposal Review, 2015, Appendix B). In 1977, Evans et al., in *The Horse*, stated that by 200 days, the secretion of progesterone by the corpora lutea is insignificant since removal of the ovaries does not result in abortion (page 376). If this procedure were performed in the first 120 days of pregnancy, the fetus would be resorbed or aborted by the mother. If performed after 120 days, the pregnancy should be maintained. The effect of ovary removal on a pregnancy at 90–120 days of gestation is unpredictable because it is during this stage of gestation that the transition from corpus luteum to placental support typically occurs” (NRC Review, 2015, Appendix B). In 1979, Holtan et al., evaluated the effects of bilateral ovariectomy at selected times between 25 and 210 days of gestation on 50 mature pony mares. Their results show that abortion (resorption) of the conceptus (fetus) occurred in all 14 mares ovariectomized before day 50 of gestation, that pregnancy was maintained in 11 of 20 mares after ovariectomy between days 50 and 70 and that pregnancy was not interrupted in any of 12 mares ovariectomized on days 140 or 210. Those results are similar to the suggestions of the NRC committee.

Between 2009 and 2011, at the Sheldon National Wildlife Refuge in Oregon, 117 feral mares received the same type of ovariectomy as the one in this proposed action. Gestational stage was not recorded, but a majority of the mares were pregnant (Gail Collins, US Fish and Wildlife Service (USFWS), pers. comm.). Only 1 or 2 mares were very close to full term and did not receive the surgery as the veterinarian could not get good access to the ovaries due to the position of the foal (Gail Collins, USFWS, pers. comm.). As per veterinarian recommendation, the mares were held at the processing facility an average of 8.1 days following the procedure before release back onto the refuge. However, the only complications were observed within two days of surgery. During the 8.1 average days of holding time, 2 fatalities were observed, potentially related to the procedure. Therefore the observed mortality rate for ovariectomized mares following the procedure was 1 percent–2 percent.

During the Sheldon National Wildlife Refuge ovariectomy study, Banamine was added to the procedure to reduce signs of colic post-surgery. Mares generally walked out of the chute and started to eat. Some would raise their tail and act as if they were defecating, however, in most mares one could not notice signs of discomfort (Bowen, 2015).

In their discussion of ovariectomy via colpotomy, McKinnon and Vasey (2007) considered the procedure safe and efficacious in many instances, able to be performed expediently by personnel experienced with examination of the female reproductive tract, and associated with a complication rate that is similar to or less than male castration. The NRC committee that reviewed this proposal recommended that this procedure could be operationalized immediately to sterilize mares, with the caveat that fatalities may be higher than the 1 percent reported in the literature (Appendix B). However they did not give a recommendation to the BLM on what rate of abortion might be “acceptable” for ovariectomies at various stages of gestation or if BLM should only conduct the procedure on specific gestational stages. The committee also stated that tubal ligation and hysteroscopically-guided laser ablation would be safer - with less risk of hemorrhage and evisceration - and probably less painful (Appendix B).

For those pregnancies that are maintained following the procedure, likely those past approximately 120 days, the development of the foal is not expected to be affected. However, because this procedure is not commonly conducted on pregnant mares the rate of complications to the fetus has not yet been quantified. There is the possibility that the entry of the abdominal cavity could cause premature births related to inflammation; however, after five months the placenta should hormonally support the pregnancy after removal of ovaries (pers. comm. principal investigator).

In September 2015, the BLM solicited the USGS to convene a panel of veterinary experts to assess the relative merits and drawbacks of several surgical ovariectomy techniques that are commonly used in domestic horses for application in wild horses. A table summarizing the various methods was sent to the BLM (Bowen, 2015) and provides a concise comparison of several methods. Of these, ovariectomy via colpotomy appears to be relatively safe when practiced by an experienced surgeon, and is associated with the shortest duration of potential complications after the operation. In marked contrast to a suggestion by the NRC Review (2013), this panel of experts identified evisceration as not being a risk associated with ovariectomy via colpotomy.

The analysis of observations and collected data would determine the suitability of ovariectomy via colpotomy as a viable and acceptable procedure for utilization by the BLM as a population management tool. Results would also quantify any adverse effects on the mare and fetus, depending on the gestational stage of pregnancy when the surgery is performed.

Despite this being a pen trial, consideration must be taken of the long-term effects to the mare. When the ovaries are removed from a mare she cannot have an estrous cycle; however, she may show signs of estrous behavior. Unpredictable results follow bilateral ovariectomy for the treatment of

abnormal nymphomaniac behavior [in domestic mares] (Kobluk et al., 1995). It has been reported that 60 percent of ovariectomized mares will cease estrous behavior following surgery (Loesch and Rodgerson, 2003; Vaughn J.T., 1984). Yet, the full repertoire of courtship and mating behavior has been displayed by ovariectomized mares and by anestrus mares during the nonbreeding season (Asa et al., 1980; Hooper et al., 1993; NRC Review, 2013, page 99). If free-ranging ovariectomized mares also show estrous behavior and occasionally allow copulation, interest of the stallion may be maintained, which could foster band cohesion (NRC Review, 2013, page 99). A full analysis of the behavior and social effects once the ovariectomized mare is returned to the range is outside the scope of this EA as the full study would take place within the corral facility. Rather, the proposed study of ovariectomized mare behavior and demography that would take place in the Rock Springs District is expected to provide quantitative results on mare behavior after ovariectomy, in the wild.

A concern has been raised in an opinion article (Nock, 2013), that ovary removal in mares could lead to bone density loss. That paper was not peer reviewed nor was it based on research in wild or domestic horses, so it does not meet the BLM's standard for "best available science" on which to base decisions (Kitchell et al., 2015). Hypotheses that are forwarded in Nock (2013) appear to be based on analogies from modern humans, or perhaps from the author's dissertation on guinea pigs. Certainly, pre-menopausal women who have a hysterectomy with bi-lateral oophorectomy (both ovaries removed) undergo what could be termed surgical menopause; and those women may experience more sudden changes than women who experience naturally occurring menopause (Women's Health Queensland Wide, Inc., 2011). Menopause is associated with lower levels of estrogen, which can increase the risk of bone density loss in modern humans. The comparison between sedentary modern humans and wild horses that have been active their entire lives, though, is not appropriate, as there are substantial differences in lifestyle between modern humans and wild horses. The effect of exercise on bone strength in animals has been known for many years and has been shown experimentally (Rubin et al., 2001). Dr. Simon Turner, Professor Emeritus of the Small Ruminant Comparative Orthopaedic Laboratory at Colorado State University, conducted extensive bone density studies on ovariectomized sheep, as a model for human osteoporosis. During these studies he did observe bone density loss on ovariectomized sheep, but those sheep were confined in captive conditions; fed twice a day, had shelter from inclement weather, and had very little distance to travel to get food and water (Simon Turner, Colorado State University Emeritus, written comm., 2015). Dr. Turner agreed that an estrogen deficiency (no ovaries) could affect a horse's bone metabolism, just like it does in sheep and human females when they lead a sedentary lifestyle (Simon Turner,

Colorado State University Emeritus, written comm., 2015). Home range size of wild horses in the wild has been described as 4.2 to 30.2 square miles (Green and Green, 1977) and 28.1 to 117 square miles (Miller, 1983). Green and Green (1977) reported bands travelling up to 7 miles each day to water. A study of distances travelled by feral horses in ‘outback’ Australia shows horses travelling 5–17.5 miles per 24 hour period (Hampson et al., 2010a). Horses were recorded up to 34 miles from their watering points (Hampson et al., 2010a). Even when restricted to small paddocks, domestic horses moved approximately 4.5 miles per day (Hampson et al., 2010b); the expected daily movement distance would be far greater in the context of larger pastures typical of BLM long-term holding facilities in off-range pastures. The constant weight bearing exercise, coupled with high exposure to sunlight ensuring high vitamin D levels, are expected to prevent bone density loss (Simon Turner, Colorado State University Emeritus, written comm., 2015). A horse would have to stay on stall rest for years after removal of the ovaries in order to develop osteoporosis (Simon Turner, Colorado State University Emeritus, written comm., 2015) and that condition does not apply to any wild horses turned back to the range, or any wild horses that go into off-range pastures. BLM knows of no scientific, peer-reviewed literature that documents bone density loss in mares following ovariectomy.

Observations from the Sheldon NWR provide some insight into long-term effects of ovariectomy on feral horse survival rates. The Sheldon NWR ovariectomized mares were returned to the range along with untreated mares. Between 2007 and 2014 mares were captured, a portion treated, and then recaptured. There was a minimum of 1 year between treatment and recapture; some mares were recaptured a year later and some were recaptured several years later. The recapture rates for released mares were; treated mares 85.1 percent and untreated mares 86.1 percent (Collins, 2015). Since the recapture rate was virtually the same, it could be deducted that the long-term survivability rate of treated mares is the same as that of untreated mares.

Tubal Ligation

Tubal ligation is a technique commonly performed in humans, where it may be referred to as “getting your tubes tied.” It has not been commonly performed on mares. Ovariectomy is the most common form of sterilizing domestic mares.

Tubal ligation, as described for women, is a type of permanent birth control where the oviducts (also known as fallopian tubes or uterine tubes) are cut or blocked to permanently prevent pregnancy (Mayo Clinic, 2014). The principal difference between the proposed mare tubal ligation procedure in this EA and the typical human procedure is the placement of

the incision for insertion of instruments. In the proposed mare surgery, the incision is in the vaginal wall while in women the incision (or two) is made through the navel. A flexible endoscope is inserted into the abdomen allowing the placement of a tool to cut the fallopian tubes. Some women choose to receive this procedure during a caesarian section, as the doctor can readily see the ovaries and oviducts; caesarian surgery requires a large incision in the abdomen, so is not analogous to the proposed surgery for mares.

The proposed tubal ligation surgery would be conducted on open mares as well as those in the three trimesters of gestation. The procedure is expected to be successfully accomplished on both pregnant mares, without pregnancy loss, and non-pregnant mares. Miscarriage is not expected because neither the ovaries nor the uterus should be affected by this minimally invasive procedure. Hormones should not be affected, as compared with the ovariectomy study, because the ovaries would not be removed or altered. Physical status of the pregnancy should not be affected because the uterus would not be entered or physically traumatized. There may be some effects of the stage of gestation on the ability to complete the surgery if it happens that the weight and locations of the gravid uterus distort the utero-ovarian relationship enough to prevent visualization of the oviduct with the flexible endoscope. This circumstance is not expected to be commonly encountered, because the ovary is relatively “fixed” in position. However, the NRC committee that reviewed the proposal was concerned about the visibility in late pregnancy because the ovaries may be pulled medially and anteriorly as the pregnant uterus moves over the pelvis and down to the floor of the abdomen (NRC Proposal Review, 2015, Appendix B). The committee also had concerns over the collapse of the anterior vagina in pregnant mares preventing passage of the endoscope but recognized that conducting this study would answer whether or not their concerns are warranted (NRC Proposal Review, 2015, Appendix B).

As evidenced by the only known similar tubal ligation study on mares, oviduct obstruction with focal laser destruction is expected to be permanent and 100 percent effective (McCue et al., 2000). The study by McCue et al. (2000) was different than the proposed study in several ways: surgery was laparoscopic (through the flank); was unilateral tubal ligation (only blocked one oviduct); and was not conducted on pregnant mares. However, the study supports the hypothesis that tubal ligation causes the mare to be infertile, because none of the mares became pregnant when ovulations occurred from the ovary adjacent to the ligated oviduct (McCue et al., 2000).

No long-term effects to the overall health of the mares are expected, other than sterility. Mares may be dull or obtunded, with the occasional mare having an elevated temperature for up to 24 hours after the procedure. The

expectation is a return to normal physical behavior and function within 24 hours after the surgery. The NRC committee stated “tubal ligation and laser ablation would be safer - with less risk of hemorrhage and evisceration - and probably less painful” (Appendix B).

Pregnancy and the development of the foal are not expected to be affected; however, since this is a new procedure the outcome is not completely known.

It is important to identify long-term effects on mares that undergo surgery in the corral-based study. The treated mares in the tubal ligation study would continue to have a normal estrous cycle as their ovaries would still be intact. However, they would be unable to become pregnant as the oviduct would have been cut, essentially blocking the passage of sperm needed to fertilize the egg. With the occurrence of a normal estrous cycle and the inability to become pregnant, it could be presumed the mare would receive repeated copulation through the breeding season.

As noted in the section addressing effects of the ovariectomy surgery, we do not anticipate that any of the surgeries would lead to bone density loss in wild horses. Moreover, in the tubal ligation surgery, the ovaries would remain functional.

Long-term survival rates in these mares are expected to be similar to, or higher, than a typical untreated mare because the physical demands of pregnancy and raising a foal would be eliminated.

Hysteroscopically-Guided Laser Ablation

Hysteroscopically-guided laser ablation for mare sterilization is not documented as a surgery used in domestic horses. Nevertheless, many authors have published articles on the use of hysteroscopy in the mare for a variety of purposes (Brinsko, 2014). One common use of hysteroscopy is for laser ablation of endometrial lymphatic [uterine] cysts (Brinsko, 2014). Other studies reporting using laser ablation for the removal of uterine cysts in mares include Griffin and Bennett (2002), Ley et al. (2002), and Blikslager et al. (1993). In those studies the endoscope was inserted through the vagina and cervix into the uterus; as described in the procedure proposed in this EA. As in this proposed study, the laser in those studies was directed hysteroscopically through a flexible endoscope using the biopsy channel port for introduction of the laser fiber (Griffin and Bennett, 2002). Laser instrumentation has also been used for ablation of endometrial cups (pers. comm. principal investigator).

The NRC indicated that the simplicity of this proposal is its greatest strength and that with some training many veterinarians could become proficient in performing this procedure (Appendix B).

In human females a hysteroscope is used to see inside the uterus for procedures such as endometrial ablation. This procedure is conducted to destroy (ablate) the uterine lining or endometrium to treat uterine bleeding (WebMD, 2014). In women, endometrial ablation may be done in an outpatient facility or doctor's office, using local or spinal anesthesia; in humans this procedure takes about 45 minutes (WebMD, 2014). Short-term side effects may include cramping, nausea, and vaginal discharge that may be watery and mixed with blood; it takes a few days to 2 weeks to recover (WebMD, 2014). As compared to the entire uterine lining, the hysteroscopically-guided laser ablation for mare sterilization procedure would use a laser only to ablate (destroy) each oviduct opening and papilla, each opening being approximately 2–3 mm in diameter. For this reason the side effects and symptoms of the mare sterilization procedure would likely be less notable than those described in human endometrial ablation procedures.

Because this procedure does not involve incisions, there is no risk of hemorrhage, failure of sutures, or prolonged discomfort. There is the potential for mild, transient colic (abnormal cramping) after the procedure due to temporary inflation and expansion of the uterus. Use of banamine (flunixin meglumine) and buscopam prior to the procedure should minimize this incidence.

It is expected this procedure would prevent normal sperm/egg union with resultant contraception approaching 100 percent success. There is no question that the laser would damage the oviduct. Whether the scar damage is sufficient to sterilize the mare permanently is the question that will be resolved by the study (NRC Proposal Review, 2015, Appendix B).

It is important to identify long-term effects on mares that undergo surgery in this corral-based study. The treated mares in the hysteroscopically guided laser ablation study would continue to have an estrous cycle, as their ovaries would still be intact. However, they would be unable to become pregnant as the oviduct papilla will have been sealed, essentially blocking the passage of sperm needed to fertilize the egg. With the occurrence of a normal estrous cycle and the inability to become pregnant it could be presumed the mare would receive repeated copulation through the breeding season.

As noted in the section addressing effects of the ovariectomy surgery, we do not anticipate that any of the surgeries would lead to bone density loss

in wild horses. Moreover, in the hysteroscopically-guided laser ablation procedure, the ovaries would remain functional.

Long-term survival rates in these mares are expected to be similar to, or higher than, a typical untreated mare because the physical demands of pregnancy and raising a foal would be eliminated.

c. Cumulative Effects – Wild Horse Mares

No Action

Under the no action alternative, three research studies that the NRC recommended could lead to immediately useful techniques would not take place. Without investment in research of various methods and techniques of mare sterilization, the BLM Wild Horse and Burro program as a whole would be no further along in efforts to manage wild horse populations in a way that restores or maintains a thriving natural ecological balance (TNEB) to the range and protects the range from deterioration associated with overpopulation (WFRHBA, 1971).

The no action alternative would not provide additional data to the Rock Springs Field Office regarding complications rates, effectiveness, and success rates of the ovariectomy via colpotomy procedure on pregnant mares. Without this information Rock Springs Field Office would be less informed on determining the type of ovariectomy procedure to choose.

Proposed Action

The consequent behavioral effects of these procedures are unknown at this time. Many suppositions might be made as to how an individual mare would respond to a stallion after having been treated (refer to discussion on estrous cycle, above). However, quantitative measures of the overall behavioral effects of sterilized mares living in wild horse bands can only be surmised at this time, as no studies of that nature have yet taken place. The proposed USGS demographic and behavioral study of ovariectomized mares in Rock Springs, Wyoming is an RFFA for this EA. Results of that study should inform BLM managers in the future about the behavioral effects of ovariectomy in wild horses. Given that mares in Wyoming are not proposed to be sterilized until fall of 2017, the results from the proposed ovariectomy via colpotomy study in this EA may be valuable in refining surgical and post-operative procedures that could be followed for that study; if ovariectomy via colpotomy is their selected method of sterilization.

The BLM assumes that tubal ligation and laser ablation would have similar behavioral effects as open mares or similar effects to those

displayed in mares treated with PZP. This assumption is made based on to the fact that two the minimally invasive surgical techniques and short term immunocontraceptive treatment with PZP all leave ovaries intact, which leads to continued estrous cycling with the inability to become pregnant. After the minimally invasive surgical procedures, the behaviors associated with estrous cycling are expected to continue, just as is the case when mares are treated with PZP. Multiple studies of the behavior and social effects following PZP treatment have been conducted (i.e. Gray et al., 2010 and 2011; Ransom et al., 2010; Nuñez, 2009; Powell, 1999; and Madosky et al., 2010). At this time, the behavioral effects following treatment with PZP are well enough known that treatment of wild horses with PZP has become fairly routine BLM management practice. As a result of the expectation that the minimally invasive procedures would have similar behavioral effects as treatment with PZP, BLM does not anticipate any need to study the behavioral effects following tubal ligation or laser ablation before those procedures could be put into practice as management tools.

All of these procedures, if successful, confer permanent sterility. Before using any of the techniques in a widespread manner, BLM would need to consider effects on genetic diversity that would follow from treating given fractions of the female population. Identifying those effects is outside of the scope of this document. Such planning could make use of combined modeling of population dynamics and population genetics (Roelle and Oyler McCance, 2015).

2. Social and Economic Values

a. Affected Environment - Social and Economic Values

Scoping from previous NEPA documents proposing types of wild horse sterilization and various public meetings where mare sterilization was a topic of discussion have amassed numerous concerns both opposing and supporting the sterilization of wild horses.

Many of the individuals and groups showing concern derive benefit from the presence of wild horse herds by actively participating in recreation to view the horses. A certain number of these individuals believe that any type of capturing and active management of wild horses is inhumane. Others value the existence of wild horses without actually encountering them. This value represents a non-use or passive value commonly referred to as existence value. Existence values reflect the willingness to pay to simply know these resources exist. Conversely, a separate group of individuals may or may not support the existence of wild horses on public land yet express concern about wild horse numbers and the adverse impacts on other resources and rangeland habitats. These “other resources” include but are not limited to the economic impacts that could result from reduced livestock grazing opportunities,

impacts on recreational activities influenced by overpopulation of wild horses, the impacts to wildlife resources, and the resultant decline in hunting opportunities.

For the purposes of the “Social and Economic Values” portion of this analysis; it is important to recognize the number of horses the BLM manages across the United States in order to fully understand the potential future effects analysis area of social and economic costs of the decisions to be made. Table III-1 displays the numbers of horses estimated on the range and in short- and long-term holding facilities. The national high AML is 26,715 horses and burros ranging on 179 HMAs in 10 western states (WH&B Quick Facts, 2015).

Table III.1: Number of Horses and Burros BLM Manages Nationally, On and Off the Range

	Horses	Burros	Total
On the Range (Estimate as of March 1, 2015. Does not include 20% increase for the 2015 foal crop).	47,329	10,821	58,150
Off the Range (BLM facilities and long term holding as of October 2015).	45,936	1,268	47,204
Total			105,354

BLM has placed more than 230,000 wild horses and burros into private care since 1971.

The BLM placed 2,631 removed animals into private care through adoption in fiscal year (FY) 2015 (WH&B Quick Facts, 2015). Compared to some years in the past, the adoption demand is down for many reasons, including, but not limited to: the cost of caring for a horse is continuously increasing as hay prices and veterinary care costs increase, the national economy is down, there is no outlet for unwanted horses available in the United States, and the market is flooded with domestic and wild horses.

The costs associated with certain wild horse population management activities included in the BLM’s available and approved population management tool, as well as those analyzed in this EA, are listed below. Not all activities are included in the list as it is extremely difficult to put a numerical value on such things as vegetative resource damage or decreased recreational opportunities, yet there is certainly a social and economic value associated with their improvement, maintenance, or loss. The costs associated with holding, gathering, bait/water/horseback drive trapping, and available fertility treatments are listed below.

- Holding horses at Oregon's Wild Horse Corral Facility costs approximately \$5 per day per horse. This includes the costs of hay, BLM staff, and equipment to operate the facility. During FY 2015 there was an average of 700 horses being held at this facility. This cost per day per horse calculates to \$3,500 per day to run the facility or approximately \$108,500 per month.
- Long-term holding costs average about \$1.80 per day per horse.
- Helicopter-drive gather operations are currently costing around \$600 per horse gathered.
- Bait, water and horseback-drive trap gathers are currently averaging \$1,170 per horse trapped.
- PZP-22 fertility treatment costs approximately \$350 per mare treated. This includes the costs of vaccine and administration, as well as holding of the horse during gather operations before it is released back to the HMA. PZP-22 is currently widely used and therefore used in this cost analysis. However, several options for fertility treatment may be available after further research is complete.
- Gelding of stallions costs approximately \$60 per horse. This includes the surgery only.

b. Environmental Consequences - Social and Economic Values

Common to Both Alternatives

Given the complexity of issues surrounding free-ranging horses and burros, it is not surprising that Nimmo and Miller (2007) refer to them as having a pluralistic status: their bodies and behavior are sites of conflict (NRC Review 2013, p. 240). As noted by studies in Australia where the highest population of feral horses exists, control methods for feral horses vary in their social acceptability (Ballard, 2005), which must be weighed against logistic and economic constraints (Nimmo and Miller, 2007). Some methods, while economically and ecologically viable, may be politically tenuous, and vice versa (Nimmo and Miller, 2007). BLM has the challenging task of choosing wild horse population control methods that are ecologically viable, financially viable, and socially acceptable.

No Action

Under the no action alternative the financial assistance agreements with OSU would not be issued and further research on ovariectomy via colpotomy, tubal ligation, and hysteroscopically-guided laser ablation for the permanent sterilization of wild mares would not be conducted.

There are individuals and organizations that do not support permanent sterilization research. Opposition to permanent sterilization includes, but is not limited to, the belief that no over-population of wild horses actually exists; that permanent sterilization would affect the genetic viability of herds; that capturing and surgically sterilizing wild mares is inhumane; and that other options of temporary contraception (e.g. a PZP based fertility control program) are viable options for population control.

Most of the concerns listed above are outside the scope of this EA, as this is a pen trial of captive horses: the analysis of the effects from a gather due to over population have already been addressed in previous NEPA documentation; population genetics would not be affected in a pen trial as the treated mares would not be returned to an HMA; standards have been established within the BLM for the humane capture and handling of wild horses during gather operations (Appendix C, IM 2015-151); and PZP has not been effective across most HMAs, leading to the need to continue researching additional population control techniques.

The notion that surgically sterilizing wild mares is inhumane is a complex issue that can be broken into two parts: 1) the idea of permanently removing a mare's ability to reproduce and 2) the effect of the surgery on the mare's behavior and social status once returned to the range. The second part, behavior and social status, is outside the scope of this EA as this is a pen trial. However, a better understanding of those effects is an RFFA, as has been proposed in the USGS ovariectomized wild mare behavior and demography study in Wyoming.

The opposition some people feel regarding permanently removing a mare's ability to reproduce may stem from the appreciation and admiration most people have for the horse. In a comprehensive study of attitudes toward animals, Kellert and Berry (1980) found that of 33 species of animals, the horse was the second-most liked animal by U.S. respondents, behind only the dog. Horses maintain immense cultural value as symbols of grace, beauty, companionship, and courage (Nimmo and Miller, 2007; Unwanted Horse Coalition (UHC), 2009) (NRC Review, 2013, page 240). The thought of permanently removing a mare's ability to reproduce, therefore, can be troubling to some people. However, when overpopulation exists on the range and no action is taken to maintain a population at levels that allow for a TNEB, then it is possible that horse populations can grow to the point that self-limitation occurs. In this situation, an animal's response to density dependence, due to food limitation, will increase the number of animals that are in poor body condition and dying from starvation (NRC Review, 2013, page 6). Personal communication with wild horse enthusiasts who regularly view and photograph wild horses in Burns District BLM managed lands indicate that self-limitation (via water and/or food starvation) is neither a

humane nor a responsible option for wild horse management. These individuals want to see healthy and comfortable horses on the range. In the 2013 NRC Review, the committee indicated that rangeland health, as well as food and water resources for other animals which share the range, would be affected by resource limited horse populations, which could be in conflict with the legislative mandate that BLM maintain a thriving natural ecological balance (page 56). In fact, the WFRHBA of 1971 indicates that sterilization could be taken as a management action, along with removal or destruction or natural controls on population levels, when excess horses exist (§ 1333(b)(1)). To summarize, investigating sterilization methods available is the remaining permitted alternative because removals have occurred and there is little to no space remaining in holding facilities, destruction of excess animals is unacceptable under current BLM policy, and natural controls (i.e. self-limitation) do not preserve and maintain a TNEB and multiple-use relationship as mandated by the WFRHBA. Consequently, the no action alternative would not pursue any options for management of wild horse populations currently available as provided for in the WFRHBA, nor would that alternative contribute to solutions regarding the management of wild horses in the United States as required by the WFRHBA.

Due to the lack of long-term and widely effective population control methods available to BLM the no action alternative would continue BLM's seemingly endless cycle of allowing horse populations to grow at a rapid rate, gathering excess horses, and sending removed horses to off-range holding facilities. In 2015, the total appropriations for the entire WH&B Program were \$75.2 million; of which 65.7 percent (\$49.3 million) went to off-range holding costs (WH&B Quick Facts, 2015).

A percentage of the public believes it is socially and financially unacceptable for the BLM to fail to pursue new methods of population growth suppression with some of the current populations of wild horses causing a decline in rangeland conditions, causing conflict with other land uses, and creating the exponential costs to tax payers of maintaining horses in holding facilities. These concerns are evidenced by public comments observed during Advisory Board meetings, scoping for population control projects, and in various types of media. In choosing the no action alternative, BLM would be passing up an opportunity to pursue all the options made available in the WFRHBA (§ 1333(b)(1)) to achieve AMLs. The no action alternative would also dismiss the 2015 NRC Review of the proposals received by BLM in that the NRC recommended BLM fund and proceed with all three of the proposals in the proposed action.

Proposed action

Under the proposed action, the OSU studies would proceed, allowing for BLM to take steps toward a better understanding of various mare sterilization methods that have potential for future application in the field.

There are a multitude of opinions of how BLM should manage wild horse populations and at what levels of intensity. This is noted in the 2013 NRC Review with reference to Beever and Brussard (2000) noting that managers often cannot satisfy all interest groups, but they can help to shape public attitudes if they communicate research findings transparently. BLM's intent with this proposed action is to research these methods of sterilization on a group of mares in the controlled setting of a corral, using only the number of mares necessary for statistically accurate comparisons of variables. BLM intends to release the results of these studies to the public. Depending on the results of these studies, BLM may or may not choose in the future to apply any of the three sterilization methods to wild horse mares on the range. Application to mares returning to the range would be done following adequate, site-specific NEPA analysis. Some interest groups may consider this proposed action a "baby step", but it is a necessary step toward addressing the need of the DOI, while transparently communicating research findings.

Support for the research of permanent sterilization may arise from viewpoints including, but not limited to: understandings and observations from multiple wildlife and natural resource organizations to the effect that excessive wild horse populations have a negative impact on rangeland habitats and something must be done to maintain AMLs; the viewpoint that permanent sterilization of mares may be considered more humane than fertility control vaccinations insofar as the animal would only require capture one time as compared to multiple captures or human interactions for fertility control inoculation; and the understanding that fertility control treatments such as PZP may have a place in a handful of HMAs but that the majority of HMAs would benefit from research of new techniques.

The concerns listed above are outside the scope of this EA. This is a pen trial and therefore the analysis of the effects of overpopulations of wild horses on rangeland habitats would be analyzed in separate site-specific NEPA. The analysis of what technique or techniques should be employed in a given on-range management decision in the future would be analyzed in separate NEPA. The results of this proposed action and the proposed behavior and demography study of ovariectomized mares in Rock Springs, Wyoming, may inform such future decisions with quantitative measures of safety, side effects, and long-term behavioral effects after mares are returned to the range. Comparative analysis of the various techniques

available would be conducted in the context of future agency decision-making, including NEPA analysis.

Despite there being some public support for various techniques of permanent mare sterilization, it is the responsibility of BLM during our decision making process to ensure that the procedure(s) available for implementation, as well as any known side effects, are clearly understood and pose only an acceptable level of risk to the mare and veterinarian. In October 2012, the Advisory Board provided a recommendation for ovariectomy of mares as a long lasting, immediately available alternative to existing population growth suppression methods. Their recommendations state that the procedure is simple and safe to perform in the field with costs comparable to a single dose of PZP, but with no need to handle the mare again in her natural lifetime (2012 Advisory Board Recommendations, p. 28). The Advisory Board acknowledged that there will always be concerns and drawbacks to any procedure that interferes with natural selection and that there will always be some risk associated with surgical procedures (p. 31). They encouraged further study to improve the safety for animals and staff, as well as to improve the procedure in ways that reduce recovery time and potential complications (p. 31). Results from the studies under the proposed action would aid in determining the social acceptability of each procedure because the studies would quantify complications rates, effectiveness, and success rates of each technique.

Due to the lack of research on ovariectomies conducted on pregnant mares, the rate of fetal loss following the procedure is unknown. This study would quantify that rate, with respect to three categories of gestational stage. There is no direct invasion of the reproductive tract during the tubal ligation procedure; so it is not expected to affect pregnancies. Because the tubal ligation procedure has not been performed on wild mares before, this study would be useful in quantifying the effects of that surgery on pregnancy as well. These studies would help establish the expected and acceptable levels of fetal loss caused by each procedure. If, in the future, a method of permanent sterilization were applied in field conditions following a gather, such results would allow BLM to have a policy as to which mares, according to gestational stage, should or should not receive an ovariectomy or tubal ligation. The hysteroscopically-guided laser ablation procedure would only be done on open mares in this study as it is expected to always cause abortions if used on pregnant mares.

Estimated costs for each mare associated with the proposed procedures are as follows.

- Ovariectomy via colpotomy is expected to cost approximately \$250–\$300 for each mare. The cost for each mare includes the cost of the antibiotic (\$30/dose), the sedation drugs, and the veterinarian’s labor and travel.
- Tubal ligation is expected to cost approximately \$150–\$250 for each mare. Since this is a new procedure, future logistics of such things as where the procedure is conducted, the facilities available, and travel distance for a veterinarian make this cost per horse a rough estimate.
- Hysteroscopically-guided laser ablation is expected to cost approximately \$75–\$125 or less. Again, since this is a new procedure, future logistics of such things as where the procedure is conducted, the facilities available, and travel distances for a veterinarian make this cost per horse only a rough estimate. This procedure should be the least expensive and take the shortest amount of time due to its minimally invasive nature.

The timeframe of this study is flexible as it depends on the availability of adequate numbers of mares in each of the necessary categories of gestational stage. If all gestational stage groups are not filled during the first set of surgical procedures, then it may not be continued until a wild horse gather is approved and leads to more mares coming to Oregon’s Wild Horse Corral Facility. If the study were completed within a 12 month time frame, then the cost to the BLM of holding 225 mares for the study would be approximately \$410,625. This calculation is based on Oregon’s Wild Horse Corral Facility’s cost per day of approximately \$5 per horse. This includes the costs of hay, BLM staff, and equipment to operate the facility.

c. Cumulative Effects - Social and Economic Values

No Action

Under the no action alternative, there would be no data regarding complication rates, effectiveness, and success rates of the ovariectomy via colpotomy procedure on pregnant mares for Rock Springs Field Office to use during their determination of which type of ovariectomy procedure to implement in their proposed study.

Proposed Action

The ultimate question in the reasonably foreseeable future of wild horse population management is to weigh the pros and cons of the procedures

and the associated effects on wild horse behavior and social structure once the mare is returned to the range and to determine which methods are safe, effective, and socially acceptable. The ovariectomy procedure may not be as appealing since it is more invasive than tubal ligation and laser ablation, however, following ovariectomy the mare would not have an estrous cycle and most mares would not exhibit behaviors associated with estrous. As a result stallions may not continuously tend to her (every 21 days) and fight over her. On the other hand, tubal ligation and laser ablation are less physically invasive to the mare and more appealing as minimally invasive procedures. If the techniques are effective, then the anticipated behavior on the range would be similar to open mares or PZP-treated mares with the mare continuing to cycle without getting pregnant. This would be expected to cause stallions to tend such treated mares every 21 days throughout the estrous season. Understanding each procedure's immediate effects and evaluating their pros and cons is the first step to aid in ultimately making decisions on what techniques to use on the range in the future.

The results of this study are expected to aid BLM in determining the social acceptability of each procedure. In addition, Rock Springs Field Office would have further information on complication rates, effectiveness, and success rates of the ovariectomy via colpotomy procedure on pregnant mares which would allow for more informed decision making on the social acceptability of the procedure at various gestational stages.

IV. CONSULTATION AND COORDINATION

A. Summary of Public Participation

The public has participated in the long-running discussion of wild mare sterilization for multiple years. The overall public concerns have been captured in this document from the public comments during the National Advisory Board meetings; public comment periods for NEPA documents including wild horse sterilization proposals; submissions from the public for BLM's RFI of September 23, 2013, inviting research project ideas; and responses to BLM's RFA of March 6, 2014, inviting research project proposals aimed at developing new or refining existing techniques and establishing protocols for the contraception or permanent sterilization of wild horses and/or burros. The RFA included a reminder that eligible applicants included institutions of higher education, veterinarians, scientists, or any other non-profit organizations capable of conducting research to accomplish the aims of the RFA.

1. Agencies, Tribes, Individuals, or Organizations Consulted

Table IV.1: Agencies, Tribes, Individuals, or Organizations Consulted		
Name	Purpose & Authorities for Consultation or Coordination	Findings & Conclusions
National Research Council of the National Academies of Science	BLM requested peer reviews of research proposals related to population growth suppression (contraception and sterilization).	Recommended the BLM fund the two minimally invasive procedures and that BLM could put ovariectomy via colpotomy into operation immediately as a tool to sterilize wild horse mares.

2. List of Preparers

Table IV.2: List of Preparers		
Name	Title	Responsible for the Following Section(s) of this Document
Lisa Grant	WH&B Specialist, Burns District.	Lead Preparer, Wild Horses and Social and Economic Values
Rob Sharp	Supervisory WH&B Specialist, Burns District	EA development and review.
Emily Erwin	Planning and Environmental Coordinator, Burns District	EA development and review.
Brenda Lincoln-Wojtanik	Program Analyst - NEPA Coordinator, Oregon State Office.	EA development and review.
Robert Hopper	Rangeland Management Specialist, Oregon State Office.	EA development and review.
Dean Bolstad	Senior Advisor, WH&B Program, Washington D.C. Office.	EA development and review.
Paul Griffin	WH&B Specialist, Research Coordinator, Washington D.C. Office.	EA development and review.

Albert Kane, DVM, MPVM, PhD	National Coordinator and Advisor, Animal and Plant Health Inspection Service/BLM WH&B Partnership.	EA development and review.
Alan Shepherd	WH&B Specialist, Nevada State Office.	EA development and review.
Bryan Fuell	On-Range Branch Chief, WH&B Program, Washington D.C. Office	EA development and review.
Oregon State University, College of Veterinary Medicine	Principal Investigators	EA development and review.

V. REFERENCES, GLOSSARY, AND ACRONYMS

A. References Cited

Advisory Board Recommendations. 2012. Page 28.

Asa, Cheryl S., David A. Goldfoot, M.C. Garcia, and O.J. Ginther. 1980. *Sexual Behavior in Ovariectomized and Seasonally Anovulatory Pony Mares (Equus caballus)*. *Hormones and Behavior* 14:26–54.

Auer, Jorg A. and John A. Stick. 1999. *Equine Surgery*: Second Edition. W.B. Saunders Company. Pages 136 and 576.

Ballard, Guy-Anthony. 2005. *Understanding people to improve wildlife management: Case studies in human dimensions research from New South Wales, Australia*. Thesis for the degree of Doctor of Philosophy of the University of New England - abstract only. November 2005.

Beever, Erik A. and Peter F. Brussard. 2000. *Examining ecological consequences of feral horse grazing using exclosures*. *Western North American Naturalist* 60(3):236–254.

Blikslager, Anthony T., Lloyd P. Tate, Jr., and Daniel Weinstock. 1993. *Effects of Neodymium: Yttrium Aluminum Garnet Laser Irradiation on Endometrium and on Endometrial Cysts in Six Mares*. *Veterinary Surgery* vol. 22(5):351–356.

BLM. 2010. *Wild Horse and Burros Management Handbook 4700-1*.

- BLM. 2012. *National Wild Horse and Burro Advisory Board Meeting Minutes*. Radisson Hotel Salt Lake City Downton. October 29–30, 2012.
- BLM. 2012b. *Instruction Memorandum 2013-032. Direction for the Sale of Wild Horses and Burros - Interim Guidance*. December 18, 2012.
- BLM. 2013. *National Wild Horse and Burro Advisory Board Meeting Minutes*. Key Bridge Marriott, Arlington, VA 22209. September 9–11, 2013. Page 29.
- BLM. 2015. *BLM Announces New Research to Curb Population Growth and Improve Health of Wild Horse and Burro Herds*. July 7, 2015. Retrieved from: http://www.blm.gov/wo/st/en/info/newsroom/2015/july/nr_07_07_2015.html. Accessed December 1, 2015.
- Bowen, Z. 2015. *Assessment of spay techniques for mare in field conditions*. Letter from US Geological Survey Fort Collins Science Center to D. Bolstad, BLM. November 24, 2015.
- Brinsko, Steven P. 2014. *How to Perform Hysteroscopy in the Mare*. American Association of Equine Practitioners (AAEP) Proceedings 60:289–293.
- Code of Federal Regulations (CFR). 2004. 43 CFR Ch. II, Part 4700 - Protection, Management, and Control of Wild Free-Roaming Horses and Burros, Subpart 4750 - Private Maintenance.
- Evans, J. Warren, Anthony Borton, Harold F. Hintz, and L. Dale Van Vleck. 1977. *The Horse*. San Francisco, California: W.H. Freeman and Company. Pages 373–377.
- Government Accountability Office. October 2008. *Bureau of Land Management; Effective Long-Term Options Needed to Manage Unadoptable Wild Horses*, GAO-09-77.
- Gray, Meeghan E., David S. Thain, Elissa Z. Cameron, and Lowell A. Miller. 2010 and 2011 (Corrigendum). *Multi-year fertility reduction in free-roaming feral horses with single-injection immunocontraceptive formulations*. Wildlife Research 37:475–481.
- Green, Nancy F. and Howard D. Green. 1977. *The Wild Horse Population of Stone Cabin Valley, Nevada: A Preliminary Report*. Proceedings National Wild Horse Forum, April 4–7, 1977.
- Griffin, Richard L. and Scott D. Bennett. 2002. *Nd:YAG Laser Photoablation of Endometrial Cysts: A Review of 55 Cases (2000–2001)*. AAEP Proceedings 48:58–60.
- Hampson, B.A., M.A. De Laat, P.C. Mills, and C.C. Pollitt. 2010a. *Distances travelled by feral horses in 'outback' Australia*. Equine Veterinary Journal, Suppl. 38:582–586.

- Hampson, B.A., J.M. Morton, P.C. Mills, M.G. Trotter, D.W. Lamb, and C.C. Pollitt. 2010b. *Monitoring distances travelled by horses using GPS tracking collars*. Australian Veterinary Journal 88:176–181.
- Holtan, D.W., F.L. Squires, D.R. Lapin and O.J. Ginther. 1979. *Effect of Ovariectomy on Pregnancy in Mares*. Journal of Reproduction and Fertility Suppl. 27:457–463.
- Hooper, Neil R., Tex S. Taylor, Dickson D. Varner, and Terry L. Blanchard. 1993. *Effects of Bilateral Ovariectomy Via Colpotomy in Mares: 23 Cases (1984–1990)*. Journal of the American Veterinary Medical Association vol. 203(7):1043–1046.
- Johnson, Brian W., Paul G. Scott, James L. Brunton, Peter K. Petrik, and Thomas Williams. 1982. *Primary and Secondary Healing in Infected Wounds: An Experimental Study*. Archives of Surgery Journal vol. 117, September 1982.
- Kellert, S.R. and J.K. Berry. 1980. Knowledge, affection and basic attitudes toward animals in American society. #024-010-00-625-1, Washington, DC: U.S. Government Printing Service.
- Kitchell, Katherine, Steven Cohn, Roxanne Falise, Heidi Hadley, Michael Herder, Kathie Libby, Kit Muller, Ted Murphy, Matthew Preston, Mary Jo Rugwell, and Sarah Schlanger. 2015. *Advancing Science in the BLM: An Implementation Strategy*. Bureau of Land Management. March 2015.
- Kobluk, Calvin N., Trevor R. Ames and Raymond J. Geor. 1995. *Surgery of the Reproductive Tract in the Horse: Diseases and Clinical Management*. Philadelphia: W.B. Saunders. Pages 1036–1038.
- Ley, William B., Russell G. Higbee, and G. Reed Holyoak. 2002. *Laser Ablation of Endometrial and Lymphatic Cysts*. Clinical Techniques in Equine Practice vol. 1(1). March 2002. Pages 28–31.
- Loesch, Dawn A. and Dwayne H. Rodgerson. 2003. *Surgical Approaches to Ovariectomy in Mares*. VetLearn.com. Compendium 25(11). November 2003.
- Madosky, Jessa M., Daniel I. Rubenstein, Jerome J. Howard, and Sue Stuska. 2010. *The effects of immunocontraception on harem fidelity in a feral horse (Equus caballus) population*. Applied Animal Behavior Science 128:50–56.
- Mayo Clinic. 2014. Tubal Ligation. <http://www.mayoclinic.org/tests-procedures/tubal-ligation/basics/definition/prc-20020231?p=1>. Accessed November 18, 2015.
- McCue, P.M., D.A. Hendrickson, and M.B. Hess. 2000. *Fertility of Mares After Unilateral Laparoscopic Tubal Ligation*. Veterinary Surgery 29:543–545.

- McKinnon, Angus O. and James R. Vasey. 2007. *Current Therapy in Equine Reproduction: Selected Reproductive Surgery of the Broodmare*. St. Louis, Missouri: Saunders Elsevier. Pages 146–160.
- Miller, Richard. 1983. *Seasonal Movements and Home Ranges of Feral Horse Bands in Wyoming's Red Desert*. *Journal of Range Management* 36(2):199–201.
- National Research Council of the National Academies. 2013. *Using Science to Improve the BLM Wild Horse and Burro Program: A Way Forward*.
- National Research Council the National Acadamies. 2015. Proposal Review, Appendix B.
- Nimmo, Dale Graeme and Kelly K. Miller. 2007. *Ecological and human dimensions of management of feral horses in Australia: a review*. *Wildlife Research* 34:408–417.
- Nock, Bruce. 2013. *Liberated Horsemanship: Menopause.... And Wild Horse Management*. Warrenton, Missouri: Liberated Horsemanship Press.
- Nuñez, Cassandra M.V. 2009. *Management of Wild Horses with Porcine Zona Pellucida: History, Consequences, and Future Strategies in Horses: Biology, Domestication, and Human Interactions*. Nova Science Publishers, Inc. Chapter 4, Pages 1–14.
- Office of the Inspector General. December 2010. *Bureau of Land Management Wild Horse and Burro Program*. Report No. C-IS-BLM-0018-2010. December 13, 2010.
- Powell, David M. 1999. *Preliminary Evaluation of Porcine Zona Pellucida (PZP) Immunocontraception for Behavioral Effects in Feral Horses (Equus caballus)*. *Journal of Applied Animal Welfare Science* 2(4):321–335.
- Ransom, Jason I., Brian S. Cade, and N. Thompson Hobbs. 2010. *Influences of immunocontraception on time budgets, social behavior, and body condition in feral horses*. *Applied Animal Behavior Science* 124:51–60.
- Ransom, Jason I., James E. Roelle, Brian S. Cade, Linda Coates-Markle, and Albert J. Kane. 2011. *Foaling Rates in Feral Horses Treated With the Immunocontraceptive Porcine Zona Pellucida*. *Wildlife Society Bulletin* 35(4):343–352.
- Request for Information (RFI). October 23, 2013. *Wild Horse and Burro Sterilization or Contraception: Development of Techniques and Protocols*. Solicitation Number: 113ps01214. Department of the Interior, Bureau of Land Management. <https://www.fbo.gov/index?s=opportunity&mode=form&id=cca45fd7e277033207e01b928d2a0a7b&tab=core&cvview=1>. Accessed November 13, 2015.

Roelle, J.E., and S.J. Oyler McCance. 2015. Potential demographic and genetic effects of a sterilant applied to wild horse mares: U.S. Geological Survey Open-File Report 2015-1045, page 153, <http://dx.doi.org/10.3133/ofr20151045>.

Rubin, Clinton, A. Simon Turner, Steven Bain, Craig Mallinckrodt, and Kenneth McLeod. 2001. *Low mechanical signals strengthen long bones*. Nature 412:603–604. August 9, 2001.

Turner, Anthony Simon, BVSc, MS, Dipl. ACVS, DVSc-hc Professor Emeritus (retired), Department of Clinical Sciences, Colorado State University, August 2011–present. October 29, 2015. Written Communication.

UHC (Unwanted Horse Coalition). 2009. *Unwanted Horses Survey*. Washington, DC: Unwanted Horse Coalition.

United States Department of the Interior, Bureau of Land Management, Wild Horse and Burro Program. *Wild Horse and Burro Quick Facts*. Retrieved from: http://www.blm.gov/wo/st/en/prog/whbprogram/history_and_facts/quick_facts.html. Accessed November 2, 2015.

Vaughan, J.T. 1984. *Equine urogenital systems*, in Morrow DA (ed): *Current Therapy in Theriogenology: diagnosis, treatment, and prevention of reproductive diseases in small and large animals*. Philadelphia: WB Saunders. Pages 756–775.

WebMD. 2014. *Women's Health: Endometrial Ablation*. <http://www.webmd.com/women/endometrial-ablation-16200>. Accessed November 4, 2015.

Wild Free-Roaming Horses and Burros Act of 1971 (WFRHBA)(Public Law 92-195).

Williams, W.L. 1903. *Surgical and Obstetrical Operations*. Ithaca, NY: W.L. Williams. Pages 97–106.

Women's Health Queensland Wide, Inc. *Hysterectomy fact sheet*. 2011. <http://www.womhealth.org.au/conditions-and-treatments/hysterectomy-fact-sheet>. Accessed October 28, 2015.

B. Glossary of Terms

Analgesia - An analgesic or painkiller is any member of the group of drugs used to achieve analgesia, relief from pain. Analgesic drugs act in various ways on the peripheral and central nervous systems. They are distinct from anesthetics, which reversibly eliminate sensation. (wikipedia.org)

Colic - a form of pain which starts and stops abruptly. It occurs due to muscular contractions of a hollow tube in attempt to relieve an obstruction by forcing content out. Colic is a potentially fatal condition experienced by horses, caused by intestinal displacement or blockage. (wikipedia.org)

Colpotomy - A colpotomy, also known as a vaginotomy, is a procedure by which an incision is made in the vagina. A colpotomy is performed either to visualize pelvic structures or to perform surgery on the fallopian tubes or ovaries. (<http://www.surgeryencyclopedia.com>)

Conceptus - denotes the embryo and its adnexa (appendages or adjunct parts) or associated membranes (i.e. the products of conception). The conceptus includes all structures that develop from the zygote, both embryonic and extraembryonic. It includes the embryo as well as the embryonic part of the placenta and its associated membranes - amnion, chorion (gestational sac), and yolk sac. (wikipedia.org)

Corpora lutea - The corpus luteum is a temporary endocrine structure in female mammals that is involved in the production of relatively high levels of progesterone and moderate levels of estradiol and inhibin A....The corpus luteum is essential for establishing and maintaining pregnancy in females. The corpus luteum secretes progesterone, which is a steroid hormone responsible for the decidualization of the endometrium (its development) and maintenance, respectively.... in placental animals such as humans, the placenta eventually takes over progesterone production and the corpus luteum degrades into a corpus albicans without embryo/fetus loss. (wikipedia.org)

Diode laser - Used in soft-tissue laser surgery. Interaction of laser light with the soft tissue provides a special approach to surgery. A highly focused laser beam vaporizes the soft tissue with the high water content. Lasers can make very small incisions when the beam is focused on the tissue (focal spot size can be as small as = 0.1 mm, but the most widely used in practice is 0.4 mm). When the beam is defocused, the intensity of the laser light on the tissue diminishes, and it can be used for cauterization of small blood vessels and lymphatics, therefore decreasing post-operative swellings. A laser beam has a natural sterilization effect—it evaporates bacteria, viruses, and fungi, which leads to a decrease in local infections. Probably most important, the laser decreases post-operative pain by sealing nerve endings. (wikipedia.org “soft-tissue laser surgery”)

Ecraseur - An ecraseur is a surgical instrument containing a chain or wire loop that is used to encircle and sever a projecting mass of tissue (as the testicles of a horse or a pedicled tumor) by gradual tightening of the chain or loop. (wikipedia.org)

Evisceration - to protrude through a surgical incision or suffer protrusion of a part through an incision. (merriam-webster.com)

Fulguration - also called electrofulguration, is a procedure to destroy and remove tissue (such as a malignant tumor) using a high-frequency electric current applied with a needlelike electrode. During fulguration, lesions are destroyed by the use of high frequency current, essentially similar to cauterization. Fulguration is used to ablate tumors and other lesions such as hemangiomas and warts. (wikipedia.org)

Hemorrhage - is blood escaping from the circulatory system. (wikipedia.org)

Hysteroscopically - A hysteroscope is an endoscope that carries optical and light channels or fibers. It is introduced in a sheath that provides an inflow and outflow channel for insufflation of the uterine cavity. In addition, an operative channel may be present to introduce scissors, graspers, or biopsy instruments. (wikipedia.org)

Insufflation - Inert, nontoxic gases, such as carbon dioxide, are often insufflated into a body cavity, in order to expand workroom, or reduce obstruction during minimally invasive or laparoscopic surgery. (wikipedia.org)

Intravenously - Intravenous therapy is the infusion of liquid substances directly into a vein. *Intravenous* simply means "within vein". (wikipedia.org)

Laser ablation - the process of removing material from a solid (or occasionally liquid) surface by irradiating it with a laser beam. (wikipedia.org)

Lumen - meaning "an opening"; is the inside space of a tubular structure, such as an artery or intestine. (wikipedia.org)

Mesovarium - the portion of the broad ligament of the uterus that suspends the ovaries. (wikipedia.org)

Necropsy - a highly specialized surgical procedure that consists of a thorough examination of a corpse to determine the cause and manner of death and to evaluate any disease or injury that may be present. (wikipedia.org)

Obtunded - Obtundation refers to less than full alertness (altered level of consciousness), typically as a result of a medical condition or trauma. The root word, obtund, means "dulled or less sharp" cf. (wikipedia.org)

Ostium - in anatomy is a small opening or orifice. (wikipedia.org)

Ovariectomy - the surgical removal of an ovary or ovaries. (wikipedia.org)

Palpate - Palpation is the process of using one's hands to examine the body. Usually performed by a healthcare practitioner, it is also the process of feeling an object in or on the body to determine its size, shape, firmness, or location (such as a veterinarian would check/feel the stomach of a pregnant animal to ensure good health and successful delivery). (wikipedia.org)

Papilla - a small rounded protuberance on a part or organ of the body. (Google.com)

Pedicle - the narrow basal part by which various organs (as kidney or spleen) are continuous with other body structures, or the narrow base of a tumor. (merriam-webster.com)

Perineal area - the perineum is a region of the body including the perineal body and surrounding structures. There is some variability in how the boundaries are defined. According to some definitions, in females it is located between the vagina and anus and in males between the scrotum and anus. (wikipedia.org)

Pneumoperitoneum - the presence of air or gas in the abdominal (peritoneal) cavity. (wikipedia.org)

Principal investigator - A principal investigator is the lead researcher for a particular well-defined project, usually in the sciences, such as a laboratory study or a clinical trial. The phrase is often used as a synonym for "head of the laboratory" or "research group leader." (wikipedia.org)

Tubal ligation - often referred to as "having your tubes tied," is a surgical procedure in which a woman's fallopian tubes are blocked, tied, or cut. (webmd.com)

C. Acronyms

Acronym or Abbreviation	Definition
AAEP	American Association of Equine Practitioners
ACUP	animal care and use protocol
ACVS	American College of Veterinary Surgeons
AML	appropriate management level
B.V.Sc.	Bachelor of Veterinary Science
BCS	body condition score
BLM	Bureau of Land Management
CAWP	Comprehensive Animal Welfare Program
CFR	Code of Federal Regulations
CO ²	carbon dioxide
D.V.Sc.	Doctor of Veterinary Science
DOI	Department of the Interior
DVM	Doctor of Veterinary Medicine
e.g.	exempli gratia (for example)
EA	environmental assessment
EIS	environmental impact statement
et al.	et alia (and others)
FLPMA	Federal Land Policy and Management Act (of 1976)
FONSI	finding of no significant impact
FY	fiscal year
GAO	Government Accountability Office
hc	honoris causa (indicates an honorary degree)
HMA	herd management area
i.e.	id est (it is, that is)
IACUC	Institutional Animal Care and Use Committee
IDT	interdisciplinary team
IM	instruction manual
IUD	intrauterine device
kg	kilogram
lb.	pound
MS	Master of Science
mg	milligram
ml	milliliter
MPVM	Master of Preventive Veterinary Medicine
NAS	National Academy of Sciences

Acronym or Abbreviation	Definition
nd:YAG	neodymium-doped yttrium aluminium garnet
NEPA	National Environmental Policy Act
NRC	National Research Council
NWR	National Wildlife Refuge
OIG	Office of the Inspector General
OSU	Oregon State University
PhD	Doctor of Philosophy
PZP	porcine zona pellucida
RFA	request for applications
RFFA	reasonably foreseeable actions
RFI	request for information
suppl.	supplement
TNEB	thriving natural ecological balance
U.S.C.	United States Code
ug	microgram
UHC	Unwanted Horse Coalition
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Service
vol.	volume
WFRHBA	Wild Free-roaming Horses and Burros Act (of 1971)
WH&B	wild horse and burro
WO	Washington Office

**APPENDIX A
REQUEST FOR APPLICATIONS
WILD HORSE AND BURRO STERILIZATION OR CONTRACEPTION-
DEVELOPMENT OF TECHNIQUES AND PROTOCOLS**



**UNITED STATES
DEPARTMENT OF THE
INTERIOR**

BUREAU OF LAND MANAGEMENT



<p style="text-align: center;">Title Wild Horse and Burro Sterilization or Contraception-Development of Techniques and Protocols</p> <p style="text-align: center;">Authority Wild Free Horses and Burros Act of 1971</p>
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L14AS00048
CFDA No.15.229
CFDA Title:
Wild Horses and Burros Resource Management
ISSUE DATE:
5/1/2014

CLOSING DATE & TIME

5/28/2014 @ 4:59pm EST

Contact Information:

Grants Management Officer (GMO) Lisa Clayton

Phone: 202-912-7098

Fax: 202-912-7186

SECTION I. FUNDING OPPORTUNITY DESCRIPTION

A. Project Background Information:

The Bureau of Land Management (BLM) Wild Horse and Burro Program protects, manages, and controls wild horses and burros under the authority of the Wild Free-Roaming Horses and Burros Act of 1971 to ensure that healthy herds thrive on healthy rangelands. Development of effective population growth suppression methods for wild horses and burros is vital to effectively managing herd population growth rates as an alternative to gathering and removing animals from BLM lands. Without the development of effective on-range population growth suppression methods, cost to the government will continue to grow as described in the Government Accountability Office 2008 report and again in the Office of the Inspector General report from 2010. This action will help fulfill the first recommendation of the 2010 OIG report that states, "There is urgent and aggressive focus on research and testing of improved population control methods to balance wild horse and burro population growth with adoption demand, thereby minimizing the need for additional long-term holding facilities and preserves."

B. Project Objective:

This Request for Applications invites research project proposals aimed at developing new or refining existing techniques and establishing protocols for the contraception or permanent sterilization of either male or female wild horses and/or burros in the field. While these projects would be conducted in a controlled environment, the final goal of this work would be to apply the refined sterilization or contraception techniques to free-roaming animals on the range. Proposals involving laboratory work, pen trials and/or field trials will be considered. Any sterilization or contraceptive method applicable to male or female horses or burros, including surgical, chemical, pharmaceutical, or mechanical (such as Intrauterine Devices) approaches, will be considered (with the exception of surgical castration).

We are particularly interested in the following components of a potential protocol:

1. The logistics of the full procedure as applied in wild horses or burros : a) pre-operative procedures if a surgical technique, b) restraint techniques required, c) sedation and anesthesia protocols if required, d) the method of sterilization or contraception, e) post-treatment care required, f) recovery time and follow-up
2. Animal welfare and animal and practitioner safety considerations (due to the wild nature of these animals on the range)
3. Expected efficacy and duration of sterilization or contraception
4. Anticipated effects on the health of horses or burros: What are the limitations that the stage of gestation may place on the treatment or procedure? Can the treatment or procedure be conducted on pregnant mares? Will the treatment or procedure cause miscarriage in pregnant mares? Will the treatment or procedure otherwise cause harm to unborn or nursing foals or non-target animals?
5. Will the treatment or procedure be readily available to BLM in the future and widely applicable by a large number of applicators?
6. Demonstrated qualifications, experience and ability of the proponents to conduct research of the highest caliber and successfully publish the results of that research in the peer reviewed literature.

7. Projected approximate cost of the refined procedure per animal as applied in the field
8. Approximate total budget required to implement the research project idea

Wild horses and burros could be made available for pen trials or in the field for this research, but advance approval will be required. The availability of wild horses and burros for proposed projects should not be assumed. It is unlikely that wild horses and burros will be provided for non-survival studies of safety and mechanism of action. Studies that would require frequent and repeated handling or procedures such as repeated blood sampling or ultrasound examinations on a recurring basis may be more efficiently performed using domestic horses. Wild horses and burros will retain their wild status and be afforded protection under the Wild Free Roaming Horse and Burro Act. BLM will be responsible to conduct all National Environmental Policy Act assessments prior to the start of any agreement. Studies may be conducted at select BLM holding facilities (boarding and feed costs would be covered by the holding facility), or at private locations approved by BLM. The BLM will be substantially involved in the project by working directly with the recipient to provide technical advice and guidance. If wild horses still under the jurisdiction of the federal government are used in research projects at private facilities, the BLM will conduct periodic checks of the facilities and animals being used for compliance with any resultant agreement and the Wild-Free Roaming Horses and Burros Act.

If you have any questions, a Q&A is provided at the end of this announcement

C. Period of Project:

The term or period of time for individual projects will be variable and depend on the proposal and may range from one to five years. No more than five years will be authorized.

SECTION II. AWARD INFORMATION

A. Expected Number of Awards:

One or more.

B. Estimated Total Program Funding:

The total sum of funds committed to one or more agreement(s) entered into under this RFA will Not Exceed ten (10) million dollars over a five year period.

C. Award Ceiling:

The maximum annual award per project will not exceed \$1,000,000.

D. Assistance Instrument: Cooperative Agreement

SECTION III. ELIGIBILITY INFORMATION

A. Eligible Applicants:

Institutions of higher education, veterinarians, scientists or any other non-profit organization capable of conducting research to accomplish the aims of this Request for Applications.

B. Cost Sharing or Matching: SECTION IV. APPLICATION AND SUBMISSION INFORMATION

A. Address to Request Application Package:

- -

This announcement contains all information and electronic addresses necessary to submit an application through Grants.gov.

B. Content and Form of Application:

The application package shall consist of all the required Standard Forms shown below AND a Certification for Federal Assistance “if applicable” (**Attachment A**), Proposal Submission Format (**Attachment B**) and Budget (**Attachment C**) narrative:

Required Standard Forms:

SF Forms to Submit	SF Form Information
Application	Form SF-424, Application for Federal Assistance
Budget Information	Form SF-424A, Budget Information - Non-Construction Programs
Assurances	Form SF-424B, Assurances - Non-Construction Programs

1. Indirect Charges. Most States, Universities and larger non profits have a negotiated indirect cost rate agreement with the Federal Government. This agreement provides the rates approved for use on cooperative agreements, grants, contracts and other agreements with the Federal Government. A copy of the current rate agreement must be submitted with any proposed project. Proposals that fail to document their indirect costs will have those costs disallowed.

2. Proposal Submission Format (Attachment B) can be used as an example when submitting your proposal. The proposal technical text must be no longer than 10 pages, no smaller than font size 11, and have 1-inch margins. The 10-page limit includes *all* text, figures, references, and vitae. (The Budget, Attachment B, is *not* included in the 10-page limit.) The text should include the following:

- a. Purpose, Objectives, and Relevance – (**Attachment B, Section II**) - (a) Describe why the project is needed by the applicant; (b) Describe the applicant’s objectives; (c) Describe how the applicant’s objectives support their mission and how this project will provide a public benefit.
- b. Technical Approach – (**Attachment B, Section II**) - Describe how the applicant proposes to conduct and achieve the project in accordance with the Statement of Joint Objectives in Section I.B. The project design must contain enough detail to show the development of the project and the relationship between the partners, tasks, milestones, and objectives. The work plan must be clear, suitable, and feasible with respect to the following: (a) Describe the techniques, procedures, and methodologies to be used; (b) Describe data collection, analysis, and means of relationship interpretation; (c) Describe expected results

or outcomes; and (d) Describe the procedures for evaluating project efficacy, including fixed performance indices with probabilities for obtaining them. Explain how the applicant will meet the completion schedule identified in Section I.B.

- c. **Qualifications, Experience, and Past Performance – (Attachment B, Section III)** - Describe who will carry out the project activities. List all project personnel, including consultants. Describe their responsibilities and the amount of time each will dedicate to the project. Briefly describe how their experience and qualifications are appropriate to successfully achieve the stated objectives.

3. Budget (**Attachment C, Section IV**). Please include a description of the cost share (cash vs. in kind). The budget should contain the following:

- a. **Salaries and Wages**. Include all employees and their titles working on the project.
- b. **Fringe Benefits**. Propose your rates/amounts. If rates are audit approved, include a copy of the audit agreement and/or the name of the audit agency. If more than one rate is used, list each rate and the wage or salary base.
- c. **Consultant/Contracting Fees**. Include payments for professional and technical consultants and contractors participating in the project.
- d. **Travel and Per Diem**. For each trip, indicate the number of persons traveling, the total days they will be in travel status, and the total subsistence and transportation costs for that trip. Per diem rates shall not exceed maximum Federal rates. To view current Federal per diem rates, visit http://www.gsa.gov/Portal/gsa/ep/contentView.do?contentId=17943&contentType=GSA_BASIC and follow the links to per diem information.
- e. **Supplies and Materials**. Include consumable supplies and materials to be used in the project, listing each item and quantity individually. Include items of expendable equipment, i.e., equipment costing less than \$500 or with an estimated useful life of less than two years. Equipment costing more than that should be listed in the Other Costs category (Category G, below).
- f. **Services**. This should include the cost of duplication and printing, long distance telephone calls, equipment rental, postage, and other services not previously listed.
- g. **Other Costs**. List equipment items in excess of \$500 and other items not previously listed. Note that equipment items worth less than \$500 or that have a useful life of less than 2 years must be listed in the Supplies and Materials category.
- h. **Indirect Charges**. If indirect costs will be charged to the grant, complete the table below with your current approved indirect cost rate and the direct costs it

will be applied to. A copy of your most recent indirect cost rate must be attached if indirect costs will be requested.

4. Complete the Proposal for Research Effort/Grant Application (Attachment D).

C. Submission Dates and Times:

The electronic submission into Grants.gov is due by 5/28/2014@4:59 p.m. **Eastern Standard Time**. A proposal received after the closing date and time will not be considered for award. If it is determined that a proposal will not be considered due to lateness, the applicant will be so notified immediately.

All proposals will be required to be submitted electronically through grants.gov. All of the required attached forms can be prepared online. Any form that is not available online may be submitted as attachments at the end of the proposal. If you have not registered in grants.gov, go to visit the website www.grants.gov and get started in the registration process. **Application preparation time may take several weeks to get certified.** Once at the website, choose "Get Started" and work through the first 5 steps. If you have any questions or problems with the registration process, please contact the grants.gov help desk at 1-800-518-4726. In addition, Grants.gov has an "Applicant Users Guide" available at: http://www.grants.gov/help/user_guides.jsp that will answer most if not all your questions.

D. Submission Instructions and Information:

Applications/proposals may be submitted by the following methods only:

1. **On-Line Submittal** - The Bureau of Land Management (BLM) is participating in the Grants.gov Initiative that provides the grant community with a single site to find and apply for grant funding opportunities. BLM requires applicants to submit their applications/proposals electronically through: <http://www.grants.gov/Apply>.

YOU MUST REGISTER WITH GRANTS.GOV PRIOR TO SUBMITTING AN APPLICATION THROUGH THE GRANTS.GOV WEBSITE. THE REGISTRATION PROCESS MAY TAKE FROM 7 TO 21 DAYS.

2. **Electronic Signature** - Applications submitted through Grants.gov constitute submission as electronically signed applications. The registration and e-authentication process establishes the Authorized Organization Representative (AOR). When you submit the application through Grants.gov, the name of your authorized organization representative on file will be inserted into the signature line of the application. Applicants must register the individual who is able to make legally binding commitments for the applicant organization as the Authorized Organization Representative.

3. **Late Submissions, Modifications, and Withdrawals of Application and/or Proposal** - Any application/proposal received after the exact time specified for receipt will not be considered in the original selection process unless the application is received before award is made and it is determined by BLM that the late receipt was due to mishandling by the Government. Any modification of an application or quotation is subject to the same conditions stated above.

4. **Electronic Application Submission and Receipt Procedures** - This provision provides information on the application submission and receipt instructions for applications submitted through Grants.gov apply. Please read the following instructions carefully and completely.

5. **Timely Receipt Requirements and Proof of Timely Submission:**

- a. **Electronic Submission.** An electronic time stamp is generated within the system when the application is successfully received by Grants.gov. The applicant will receive an acknowledgement of receipt and a tracking number from Grants.gov with the successful transmission of their application. Applicants should print this receipt and save it.
- b. BLM suggests that applicants submit their applications during the operating hours of the Grants.gov Support Desk, so that if there are questions concerning transmission, operators will be available to walk you through the process. Submitting your application during the Support Desk hours will also ensure that you have sufficient time for the application to complete its transmission prior to the application deadline. Applicants using dial-up connections should be aware that transmission will take some time before Grants.gov receives it.
- c. Grants.gov will provide either an error or a successfully received transmission message. The Grants.gov Support desk reports that some applicants abort the transmission because they think that nothing is occurring during the transmission process. Please be patient and give the system time to process the application. Uploading and transmitting many files, particularly electronic forms with associated XML schemas, will take some time to be processed.

6. **Customer Support** - The Grants.gov website provides customer support via (800) 518-GRANTS (this is a toll-free number) or through email at support@grants.gov. The customer support center is open from 7:00 a.m. to 9:00 p.m. Eastern time, Monday through Friday, except Federal holidays, to address Grants.gov technology issues. For technical assistance on program related questions, contact the number listed in Section VII, Agency Contacts.

E. Intergovernmental Review:

This funding opportunity is not subject to Executive Order (EO) 12372, "Intergovernmental Review of Federal Programs". Applicants subject to EO 12372 must contact their State's Single Point of Contact (SPOC) to find out about and comply with the State's process. The names and addresses of the SPOC's are listed in the OMB's home page at: <http://www.whitehouse.gov/omb/grants/spoc.html>

F. Funding Restrictions:

A cooperative agreement issued by the BLM Washington Office, signed by the BLM GMO, obligates BLM funds. Notification of a successful proposal does not constitute authority to incur costs. Costs incurred prior to receipt of a signed cooperative agreement may not be reimbursed. Once the cooperative agreement for a successful proposal has been signed by the BLM GMO, the

recipient may incur costs as specified in their proposed and approved budget submittal. **Funding for the first year does not guarantee funding in subsequent years.** A new application must be submitted for subsequent years.

SECTION V. Application Review Information Criteria (by order of importance)

A. Evaluation Criteria

- Ability to enter into a cooperative agreement with the BLM.
- Vested with rights and authorities under the Establishment Act with permit the ability to receive funds from the federal government and to make use of any interest and investment income that accrues as a consequence of this action.
- Qualify as exempt under exemption 8.A.3 in the Grants.govFIND policy

1. Technical Approach:

- a. The project design contains enough detail to show the development of the project and the relationship between the partners, milestones, and goals. The roles and responsibilities of each partner are clearly articulated. The milestones are clear, and supported by a well thought-out schedule that supports the work to be accomplished for the duration of the project.
- b. The proposed project's importance/relevance and applicability are tied to the program goals. Is there value and importance to the program goals?
- c. The work plan objectives are clear, suitable, and feasible with respect to the following:
 - (1) Techniques, procedures, and methodologies;
 - (2) Data collection, analysis, and means of interpretation;
 - (3) Expected results or outcomes; and
 - (4) Procedures for evaluating project efficacy, including fixed performance indices with probabilities for obtaining them.
- d. The project proposal work plan is designed to produce the proposed outcomes and outputs. The outcomes are clearly stated and tied to intermediate outcomes as stated in the announcement.

2. Qualifications, Experience, Past Performance:

- a. The qualifications and experience of the organization are evident, and appear to be adequate to achieve project goals and objectives.
- b. The qualifications and experience of the Project Director/Principal Investigator to be assigned for direct work on the project are evident, and appear to be adequate to achieve project goals and objectives and will be available for work on this agreement.
- c. The applicants past and current assistance awards show they have completed project goals.

3. Purpose, Objectives, and Relevance:

- a. The proposal adequately describes why the project is needed by the recipient.
- b. The objectives are well defined, measurable, and realistic for the project's anticipated timeframe.
- c. The benefits support the mission of the recipient and as well as a public benefit and can be tied to a BLM Performance Measure.

4. Budget:

- a. The budget line items are appropriate, reasonable, allowable, well justified and commensurate with the level of effort needed to accomplish the project objectives.
- b. The budget breakdown or narrative provides adequate justification for each budget category used. If equipment is requested by the applicant is it fully justified and necessary for the performance and completion of the project?
- c. The applicant and other counterparts cash and in-kind matching funds or contributions are acceptable.

B. Review and Selection Process :

A scientific review panel will be organized by BLM directly or indirectly through an agreement with another agency or by contracting with a Non-Government Organization or private entity. This panel will be comprised of scientists with research expertise that may include but not be limited to those with expertise in equine sciences, veterinary medicine, reproductive physiology, theriogenology, animal welfare and research methodology. The scientific review panel will consider factors related to the scientific validity of the proposed technique(s), goals and objectives of the work, research methodology and design of the study, proposed statistical analysis and interpretation of anticipated data obtained, animal welfare implications and Institutional Animal Care and Use Committee approvals, feasibility, as well as the qualifications, expertise and experience of the investigators. The panel will rank and characterize their top proposals for final consideration and selection by BLM management. The number of awards will depend on the panel's recommendations and final decisions by BLM.

SECTION VI. AWARD ADMINISTRATION INFORMATION

A. Award Notices:

If the applicant's proposal is selected for award, work cannot begin before the awardee receives a fully executed copy of the agreement approved by the GMO.

B. Administrative and National Policy Requirements:

1. Office of Management and Budget (OMB) Circulars

By accepting Federal assistance, your organization agrees to abide by the applicable OMB Circulars in the expenditure of Federal funds and performance under this program.
<http://www.whitehouse.gov/omb/circulars/>

2 CFR Part 220 (OMB Circular A-21) - Cost Principles for Educational Institutions

2 CFR Part 225 (OMB Circular A-87) - Cost Principles for State, Local and Indian Tribal Governments

2 CFR Part 230 (OMB Circular A-122) - Cost Principles for Non-Profit Organizations

2 CFR Part 215 (OMB Circular A-110) - Uniform Administrative Requirements for Grants and Other Agreements with Institutions of Higher Education, Hospitals and Other Non-Profit Organizations

OMB Circular A-133, "Audits of States, Local Governments, and Non-Profit Organizations."

2. Standard Award Terms and Conditions

This agreement incorporates the Standard Award Terms and Conditions found at the following Department of the Interior website as if they were given here:
<http://www.doi.gov/pam/TermsandConditions.html>

Prohibition on Text Messaging and Using Electronic Equipment Supplied by the Government while Driving. This executive order introduces a Federal Government-wide prohibition on the use of text messaging while driving on official business or while using Government-supplied equipment, driving company-owned or rented vehicles or GOV, or while driving POV when on official Government business or when performing any work for or on behalf of the Government.

Acceptance of a Federal Financial Assistance award from the Department of the Interior (DOI) carries with it the responsibility to be aware of and comply with the terms and conditions of award. Acceptance is defined as the start of work, drawing down funds, or accepting the award via electronic means. Awards are based on the application submitted to, and as approved by DOI and are subject to the terms and conditions incorporated either directly or by reference in the following:

- a. Program legislation/regulations.
- b. Special terms and conditions.
- c. Code of Federal Regulations/Regulatory Requirements, as applicable (Contact your program officer with any questions regarding the applicability of the following):

2 CFR Part 175 Trafficking Victims Protection Act of 2000

43 CFR 12(A) Administrative and Audit Requirements and Cost Principles for Assistance Programs

43 CFR 12(E) Buy American Requirements for Assistance Programs

43 CFR 12(C) Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local

43 CFR 12(F) Uniform Administrative Requirements for Grants and Cooperative Agreements with Institutions of Higher Education, Hospitals, other Non-Profit and Commercial Organizations

43 CFR 43 Government wide Requirements for a Drug-Free Workplace

43 CFR 42 Government wide Debarment and Suspension (Nonprocurement)

43 CFR 18 New Restrictions on Lobbying

3. Compliance With Buy American Act:

a. Notice: Pursuant to sec. 307 of the Omnibus Consolidated Appropriations Act of 1997, Public Law 104-208, 110 Stat. 3009, please be advised of the following:

In the case of any equipment or product that may be authorized to be purchased with financial assistance provided using funds made available in this act, it is the sense of the Congress that entities receiving the assistance should, in expending the assistance, purchase only American-made equipment and products.

b. Recipient agrees to follow the requirements in 43 CFR Part 12, Subpart E, Buy American Requirements for Assistance Programs.

4. Opposition to Any Legislation - In accordance with the Department of the Interior, Environment, and Related Agencies Act, 2006, Title IV, Section 402, No part of any appropriation contained in this Act shall be available for any activity or the publication or distribution of literature that in any way tends to promote public support or opposition to any legislative proposal on which Congressional action is not complete other than to communicate to Members of Congress as described in 18 U.S.C. 1913.

5. Endorsements - Recipient shall not publicize or otherwise circulate, promotional material (such as advertisements, sales brochures, press releases, speeches, still and motion pictures, articles, manuscripts or other publications) which states or implies governmental, Departmental, bureau, or government employee endorsement of a product, service, or position which the recipient represents. No release of information relating to this award may state or imply that the Government approves of the recipient's work products, or considers the recipient's work product to be superior to other products or services.

All information submitted for publication or other public releases of information regarding this project shall carry the following disclaimer:

The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Government.

Mention of trade names or commercial products does not constitute their endorsement by the U.S. Government.

Recipient must obtain prior Government approval for any public information releases concerning this award which refer to the Department of the Interior or any bureau or employee (by name or title). The specific text, layout photographs, etc. of the proposed release must be submitted with the request for approval.

A recipient further agrees to include this provision in a subaward to and subrecipient, except for a subaward to a State government, a local government, or to a federally recognized Indian tribal government.

6. Retention and Access Requirements for Records - All recipient financial and programmatic records, supporting documents, statistical records, and other grants-related records shall be maintained and available for access in accordance with 43 CFR Subpart C, Section 12.82 for State, local and Indian tribal governments or Subpart F, Section 12.953 for institutions of higher education, hospitals, other non-profit and all other organizations.

7. Increasing Seat Belt Use - Recipients of grants/cooperative agreements and/or sub-awards are encouraged to adopt and enforce on-the-job seat belt use policies and programs for their employees when operating company-owned, rented, or personally owned vehicles. These measures include, but are not limited to, conducting education, awareness, and other appropriate programs for their employees about the importance of wearing seat belts and the consequences of not wearing them.

8. Special Terms and Conditions.

a. Order of Precedence - Any inconsistency in the agreement shall be resolved by giving precedence in the following order: (a) Any national policy requirements and administrative management standards; (b) 43 CFR Part 12; (c) requirements of the applicable OMB Circulars and Treasury regulations; (d) special terms and conditions; and (e) all agreement sections, documents, exhibits, and attachments; (f) and the recipient's project proposal.

b. Amendments - The agreement may be amended by written agreement signed by both the recipient's Authorized Representative and the GMO. Administrative changes (i.e. GMO name change, etc.) which do not change the project management plan, NTE amount, etc. or otherwise affect the recipient may be signed unilaterally by the GMO. Additionally, a unilateral amendment may be utilized if it should become necessary to suspend or terminate the agreement in accordance with 43 CFR, Subpart C, Section 12.83 for State, local and Indian tribal governments or Subpart F, Section 12.961 for institutions of higher education, hospitals, other non-profit and all other organizations.

All other changes shall be made by means of a bilateral amendment to the agreement. No oral statement made by any person, or written statement by any person other than the GMO, shall be allowed in any manner or degree to amend or otherwise effect the terms of the agreement.

All requests for amendment of the agreement shall be made in writing, provide a full description of the reason for the request, and be sent to the attention of the GMO. Any request for project extension shall be made at least 30 days prior to the expiration date of the agreement or the expiration date of any extension period that may have been previously granted. Any determination to extend the period of performance or to provide follow-on funding for continuation of a project is solely at the discretion of the BLM.

c. Budget and Program Plan Revision - The budget plan is the financial expression of the project or program as approved during the award process. Recipients are required to report deviations from budget and program plans and request prior approval for budget and program plan revisions. Recipients are not required to request prior approval for deviations among approved direct cost categories when the cumulative amount of the transfer is less than 10 percent of that cost category. However, the recipient must report any deviation to the GMO and Program Officer (PO).

d. Audit Requirements - Non-Federal entities that expend \$500,000 or more during a year in Federal awards shall have a single or program-specific audit conducted for that year in accordance with the Single Audit Act Amendments of 1996 (31 U.S.C. 7501-7507) and revised OMB Circular A-133, which is available at http://www.whitehouse.gov/omb/grants/grants_circulars.html. Federal awards are defined as Federal financial assistance and Federal cost-reimbursement contracts that non-Federal entities receive directly from Federal awarding agencies or indirectly from pass-through entities. They do not include procurement contracts, under grants or contracts, used to buy goods or services from vendors. Non-Federal entities that expend less than \$500,000 for a fiscal year in Federal awards are exempt from Federal audit requirements for that year, except as noted in A-133, § 215(a), but records must be available for review or audit by appropriate officials of the Federal agency, pass-through entity, and General Accounting Office (GAO).

Audits shall be made by an independent auditor in accordance with generally accepted government auditing standards covering financial audits. Additional audit requirements applicable to this agreement are found at 43 CFR 12.66 or 43 CFR 12.926, as applicable. General guidance on the single audit process is included in a pamphlet titled, "Highlights of the Single Audit Process" which is available on the internet at <http://www.dot.gov/ost/m60/grant/sincontact.html>. Additional information on single audits is available from the Federal Audit Clearinghouse at <http://harvester.census.gov/sac/>.

e. Metric Conversion - All performance and final reports, other reports, or publications, produced under this agreement, shall employ the metric system of measurements to the maximum extent practicable. Both metric and inch-pound units (dual units) may be used if necessary during and transition period(s). However, the recipient may use non-metric measurements to the extent the recipient has supporting documentation that the use of metric measurements is impracticable or is likely to cause significant inefficiencies or loss of markets to the recipient, such as when foreign competitors are producing competing products in non-metric

units.

f. Officials Not to Benefit - No member of or delegate to Congress, or resident commissioner, shall be admitted to any share of this agreement, or to any benefit arising from it. However, this clause does not apply to this agreement to the extent that this agreement is made with a corporation's general benefit.

g. Deposit of Publications - In addition to any requirements listed in the Project Management Plan, two (2) copies of each applicable publication produced under this agreement shall be sent to the Natural Resources Library with a transmittal that identifies the sender and the publication, and states that the publication is intended for deposit in the Natural Resources Library. Publications shall be sent to the following address:

U.S. Department of the Interior
Natural Resources Library
Interior Service Center
Gifts and Exchanges Section
1849 C Street, N.W.
Washington, D.C. 20240

h. Reimbursable Costs and Limitations:

The recipient shall not incur costs or obligate funds for any purpose pertaining to operation of the program or activities beyond the expiration date stated in the agreement. The only costs which are authorized for a period of up to 90 days following the award expiration date are those strictly associated with closeout activities for preparation of the final report.

The BLM's financial participation is limited. The BLM will only fund up to its share of those amounts requested in the project proposal and as are subsequently approved and funded in the agreement. The recipient shall not be obligated to continue performance under the agreement or to incur costs in excess of the costs set forth in the proposal and subsequent agreement. However, if the recipient chooses to expend funds in excess of the approved project budget, the recipient will be responsible to fund the excess without funding participation by the Bureau.

i. Inspection - The BLM has the right to inspect and evaluate the work performed or being performed under this agreement, and the premises where the work is being performed, at all reasonable times and in a manner that will not unduly delay the work. If BLM performs inspection or evaluation on the premises of the recipient or a subrecipient, the recipient shall furnish and shall require sub-recipients to furnish all reasonable facilities and assistance for the safe and convenient performance of these duties.

j. Copyrights:

1. For recipients subject to the administrative standards set forth in OMB Circular A-110, the following copyright provision, as implemented by 43 CFR

12.936(a), shall apply:

“The recipient may copyright any work that is subject to copyright and was developed, or for which ownership was purchased, under an award. The Federal awarding agency(ies) reserves a royalty-free, nonexclusive and irrevocable right to reproduce, publish, or otherwise use the work for Federal purposes, and to authorize others to do so.”

2. For recipients subject to the administrative standards set forth in OMB Circular A-102 and the Grants Management Common Rule, the following copyright provision, as implemented by 43 CFR 12.74, shall apply:

“The Federal awarding agency reserves a royalty-free, nonexclusive, and irrevocable license to reproduce, publish or otherwise use, and to authorize others to use, for Federal Government purposes:

(a) The copyright in any work developed under a grant, subgrant, or contract under a grant or subgrant; and

(b) Any rights of copyright to which a grantee, subgrantee or a contractor purchases ownership with grant support.”

k. **Rights to Data** - For recipients subject to the administrative standards set forth in OMB Circular A-110, the following provision, as implemented by 43 CFR 12.936(c), shall apply:

“The Federal Government has the right to:

(1) Obtain, reproduce, publish or otherwise use the data first produced under an award; and

(2) Authorize others to receive, reproduce, publish, or otherwise use such data for Federal purposes.”

I. Procurement Procedures - It is a national policy to place a fair share of purchases with minority business firms. The Department of the Interior is strongly committed to the objectives of this policy and encourages all recipients of its grants and cooperative agreements to take affirmative steps to ensure such fairness. Positive efforts shall be made by recipients to utilize small businesses, minority-owned firms, and women's business enterprises, whenever possible. Recipients of Federal awards shall take all of the following steps to further this goal:

1. Ensure that small businesses, minority-owned firms, and women's business enterprises are used to the fullest extent practicable.

2. Make information on forthcoming opportunities available and arrange time frames for purchases and contracts to encourage and facilitate participation by small businesses, minority-owned firms, and women's business enterprises.

3. Consider in the contract process whether firms competing for larger contracts intend to subcontract with small businesses, minority-owned firms, and women's business enterprises.
4. Encourage contracting with consortiums of small businesses, minority-owned firms and women's business enterprises when a contract is too large for one of these firms to handle individually.
5. Use the services and assistance, as appropriate, of such organizations as the Small Business Development Agency in the solicitation and utilization of small business, minority-owned firms and women's business enterprises.

9. Central Contractor Registration (CCR) - Prior to award the Recipient shall register and maintain their own information with Dun & Bradstreet and the Central Contractor Registration System.

Obtain a valid Dun & Bradstreet Number (D&B) from Dun & Bradstreet @ <http://www.dnb.com>/or by calling them at 800-333-0505.

Register on the Central Contractor Registration System (CCR) @ <http://www.ccr.gov>

10. Payments:

- a. Financial Management Service's (FMS), Automated Standard Application for Payment (ASAP) System. If recipient is registered in ASAP payments will be made through that system.

Payments will be made by the United States Department of Treasury, FMS, ASAP system. ASAP is a recipient-initiated, on-line payment and information system for Financial Assistance Agreements that is recipient initiated. The recipient will request federal funds that are due directly from the Federal Reserve Bank on a reimbursable basis.

The ASAP Requestor ID, furnished by the Department of Treasury, will be used to access the account to request reimbursement payments. The BLM GMO will create an ASAP Account ID unique to this agreement. The first nine characters will be the agreement number. The remaining three characters will identify BLM funding line items. Drawdown of funds will be taken from specific lines on this agreement. An amendment will be stamped to indicate the appropriate line number for the drawdown.

11. Property Management and Disposition - Any BLM property used or other property acquired under this agreement, including intangible property such as copyrights and patents shall be governed by the provisions of 43 CFR, Subpart C, Section 12.71 through 12.72 for State, local and Indian tribal governments or Subpart F, Section 12.930 through 12.937 for institutions of higher education, hospitals, other non-profit and all other organizations. The BLM assumes no liability for any actions or activities conducted under this agreement except to the extent that recourse or remedies are provided by Congress under the Federal Tort Claims Act [28 U.S.C. 1346(b), 2401(b), 2671 - 2680, as amended by P.L. 89-506, 80

Stat. 306]".

C. REPORTING:

1. For ASAP Recipients: - Federal Financial Reports: Reports of expenditures are required as documentation of the financial status of awards according to the official accounting records of the recipient's organization. The recipient shall submit a completed original and one copy of the quarterly FFR, the SF 425, Federal Financial Report (Short Form), (*Down load the form at:* http://www.whitehouse.gov/OMB/grants/grants_forms.html) to report the status of funds for this agreement. In addition include separately, detailed information of costs, by budget categories that reflects the approved SF 424A, Budget Information. The quarterly report(s) shall be sent to the GMO and are due 30 calendar days after the end of the quarterly reporting period. The recipient will report program outlays and program income on a cash basis.

An original and one copy of the final FFR is due to the GMO no later than 90 calendar days after the expiration or termination of this agreement.

Recipients who are placed on agency review, shall submit an original and one completed copy of the SF 425, Federal Financial Report (Short Form), (*Down load the form at:* http://www.whitehouse.gov/OMB/grants/grants_forms.html) to report the status of funds for each payment requested before reimbursement payments are made. In addition include separately, detailed information of costs, by budget categories that reflects the approved SF 424A, Budget Information. This does not relieve the recipient of the quarterly FFR requirement unless reimbursement is only requested on a quarterly basis.

The GMO may review the report for patterns of cash expenditures, including accelerated or delayed drawdowns, and to assess whether performance or financial management problems exist. Before submitting FFRs to the GMO, grantees must ensure that the information submitted is accurate, complete, and consistent with the grantee's accounting system. The recipient's Authorized Certifying Official's signature on the FFR certifies that the information in the FFR is correct and complete and that all outlays and obligations are for the purposes set forth in agreement documents, and represents a claim to the Federal government. Filing a false claim may result in the imposition of civil or criminal penalties.

2. Performance Reports - Recipient shall submit an annual performance report(s) to the GMO within 30 days after the end of the fiscal year. The performance report must be prepared in accordance with 43 CFR, Subpart C, Section 12.80 for State, local and Indian tribal governments or Subpart F, Section 12.951 for institutions of higher education, hospitals, other non-profit and all other organizations. The performance report shall include a narrative summary both of completed activities and activities in progress, a calculation of percent of completed work based on work identified in the Project Management Plan, the reason for slippage if objectives or milestones are not met, a prediction of future activities and how they will be accomplished, and a discussion of issues and problems which may impact the ability to complete the work on time. Recommendations to overcome problems shall also be provided.

In lieu of the fourth quarter performance report an annual program performance report shall

be submitted at the end of each year of the agreement. An original shall be submitted to the GMO no later than 90 days following the end of each year of the agreement. Copies of this report may be required to be included with any application for continuing support of the agreement.

An original of the final program performance report shall be submitted no later than 90 days following the expiration or termination of the agreement.

3. **Non-compliance** - Failure to comply with the reporting requirements contained in this agreement may be considered a material non-compliance with the terms and conditions of the award. Non-compliance may result in withholding of future payments, suspension or termination of the agreement, recovery of funds paid under the agreement, and withholding of future awards.

D. DEFINITIONS:

1. **Agreement** - Cooperative or Grant Agreement.

2. **Grants Management Officer (GMO)** - The BLM's Grants Management Officer. The GMO is the only individual authorized to obligate funds, award, modify or terminate an agreement.

3. **Project Officer (PO)** - The Project Officer. The PO will be designated for the purpose of administering the technical aspect of an agreement. The PO is authorized to clarify technical requirements, and to review and approve work which is clearly within the scope of the work specified in an agreement. The PO is not authorized to issue changes or in any other way modify an agreement.

4. **The Bureau of Land Management (BLM)** - May also be referred to as Bureau.

5. **The Code of Federal Regulations (CFR)** - General and permanent regulations issued by Executive departments and agencies of the Federal Government.

6. **Fiscal Year (FY)** - The Federal fiscal year which extends from October 1 of one year through September 30 of the following year.

7. **Not-to-Exceed (NTE) Amount** - The maximum Federal funding amount.

8. **The Office of Management and Budget (OMB)** -

9. **Project Inspector (PI)** - The BLM's project inspector. At the time of award, a BLM employee(s) may be appointed as the PI. If appointed, the PI will be responsible for providing on-site inspection of the work and for giving the recipient's representative any special instructions, guidance, or training necessary to complete or perform the work. The PI will not be authorized to issue changes or in any way modify the agreement.

10. **Project Manager/Principal Investigator** - The recipient's Project Manager/Principal Investigator.

11. Responsible Official: The recipient's Responsible Official - The responsible official is the individual who is authorized to act for the recipient's organization and commit the recipient to compliance with the terms and conditions of this agreement.

E. TERM OF AGREEMENT:

An agreement shall become effective on the date of signature of the BLM GMO and shall remain in effect until **up to 5 years from the date of the award**, unless terminated in accordance with the provisions of 43 CFR, Subpart F, Section 12.961 and 43 CFR, Subpart C, Section 12.83 and 12.84.

F. FINANCIAL SUPPORT.

1. An agreement shall be funded each FY based on the availability of BLM funding. The recipient hereby releases the BLM from all liability due to failure of Congress to appropriate funds for the agreement.
2. Funds obligated but not expended in one FY can be carried forward and expended in the subsequent FY.
3. **3.10 million** represents the estimated not-to-exceed (NTE) amount for which the BLM will be responsible under the terms of the agreement. The BLM shall not be obligated to pay for nor shall the recipient be obligated to perform any effort that will require the expenditure of Federal funds above the NTE amount.
4. Cost sharing for the agreement shall be in accordance with 43 CFR, Subpart F, Section 12.923.
5. Program income for the agreement shall be in accordance with 43 CFR, Subpart F, Section 12.924.

SECTION VII. AGENCY CONTACTS

For administrative questions contact: Bureau of Land Management, Lisa Clayton, Grants Management Officer (GMO), 20 M Street SE, Washington DC 20003, Phone: (202) 912-7098 or FAX (202) 912-7186, e-mail: Lisa_Clayton@blm.gov

For programmatic questions: On behalf of the Bureau of Land Management, contact Zachary Reichold (202)-912-7261 or e-mail: zreichold@blm.gov

- - END OF PROGRAM ANNOUNCEMENT - -

ATTACHMENT A

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
CERTIFICATION FOR FEDERAL ASSISTANCE

Certification Regarding Lobbying - Certification for Contracts, Grants, Loans, and Cooperative Agreements. Applies to recipients of awards exceeding \$100,000.

This certification is required by Section 1352, title 31, U.S. Code, entitled "Limitation on use of appropriated funds to influence certain Federal contracting and financial transactions."

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

As the authorized certifying official, I hereby certify that the above specified certifications are true.

Signature & Date _____

Typed name and title _____

Applicant/Recipient _____

ATTACHMENT B

PROPOSAL SUBMISSION FORMAT

Please read the announcement carefully before completing this information.

SECTION 1. PURPOSE, OBJECTIVES, AND RELEVANCE

- A. Describe why the project is needed by the applicant.**
- B. Describe the applicant's objectives.**
- C. Describe how the applicant's objectives support their mission and how this project benefits the Public.**

SECTION II. TECHNICAL APPROACH

Describe how the applicant proposes to conduct and achieve the project in accordance with the Statement of Joint Objectives in Section I. The project design must contain enough detail to show the development of the project and the relationship between the partners, milestones, and objectives. The work plan must be clear, suitable, and feasible with respect to the following: (a) Describe the techniques, procedures, and methodologies to be used; (b) Describe data collection, analysis, and means of interpretation; (c) Describe expected results or outcomes; and (d) Describe the procedures for evaluating project effectiveness, including fixed performance indices with probabilities for obtaining them.

SECTION III. QUALIFICATIONS, EXPERIENCE, PAST PERFORMANCE

Describe who will carry out the project activities. List all project personnel, including consultants. Describe their responsibilities and the amount of time each will dedicate to the project. Briefly describe how their experience and qualifications are appropriate to successfully achieve the stated objectives.

SECTION IV – ATTACHMENT C: BUDGET

This is a suggested format for the applicant to use for the detailed budget/costs breakdown. Each cost item should clearly show how the total charge for that item was determined. All major costs should be listed in budget categories similar to those listed below, and all cost items should be explained in the Budget Summary and Justification (Section 4).

I. ATTACHMENT C. BUDGET

This is a suggested format for the applicant to use for the detailed budget/costs breakdown. Each cost item should clearly show how the total charge for that item was determined. All major costs should be listed in budget categories similar to those listed below, and all cost items should be explained in the Budget Summary and Justification (Section 4).

A. SALARIES AND WAGES. Provide the names and/or titles of key project personnel.							
Name/Title of Position	Full Time Monthly Salary	% FTE	No. of Months	Grant Funds	Match / Cost Share (if any)	Third Party Share (if any)	Total
	\$			\$	\$	\$	\$
	\$			\$	\$	\$	\$
	\$			\$	\$	\$	\$
	\$			\$	\$	\$	\$
	\$			\$	\$	\$	\$
Subtotal				\$	\$	\$	\$

B. FRINGE BENEFITS. If more than one rate is used, list each rate and the wage or salary base.					
Rate	Salary or Wage Base	Grant Funds	Match / Cost Share (if any)	Third Party Share (if any)	Total
	\$	\$	\$	\$	\$
	\$	\$	\$	\$	\$
	\$	\$	\$	\$	\$
	\$	\$	\$	\$	\$
Subtotal		\$	\$	\$	\$

C. CONSULTANT/CONTRACTING FEES. This should include payments for professional and technical consultants participating in the project.						
Name and type of Consultant	# of Days	Daily Rate of Compensation	Grant Funds	Match / Cost Share (if any)	Third Party Share (if any)	Total
		\$	\$	\$	\$	\$
		\$	\$	\$	\$	\$
		\$	\$	\$	\$	\$
		\$	\$	\$	\$	\$
		\$	\$	\$	\$	\$
Subtotal			\$	\$	\$	\$

D. TRAVEL AND PER DIEM. For each trip, indicate the number of persons traveling, the total days they will be in travel status, and the total subsistence and transportation costs for that trip. Per diem rates shall not exceed maximum Federal rates. To view current Federal per diem rates, visit <http://www.gsa.gov/Portal/gsa/ep/channelView.do?pageType=8203&channelId=15943> and follow the links to per diem information.

From/To	No. of People	No. of Travel Days	Per diem (lodging and meals) per person per day	Total per diem (lodging and meals) for this trip	Transportation costs (airfare and mileage) per person	Total transportation costs (airfare and mileage) for this trip	Grant Funds	Match / Cost Share (if any)	Third Party Share (if any)	Total
			\$	\$	\$	\$	\$	\$	\$	\$
			\$	\$	\$	\$	\$	\$	\$	\$
			\$	\$	\$	\$	\$	\$	\$	\$
			\$	\$	\$	\$	\$	\$	\$	\$
			\$	\$	\$	\$	\$	\$	\$	\$
			\$	\$	\$	\$	\$	\$	\$	\$
			\$	\$	\$	\$	\$	\$	\$	\$
			\$	\$	\$	\$	\$	\$	\$	\$
			\$	\$	\$	\$	\$	\$	\$	\$
			\$	\$	\$	\$	\$	\$	\$	\$
Subtotal								\$	\$	\$

E. SUPPLIES AND MATERIALS. Include consumable supplies and materials to be used in the project, listing each item and quantity individually. Include items of expendable equipment, i.e., equipment costing less than \$500 or with an estimated useful life of less than two years. Equipment costing more than that should be listed in the Other Costs category (Category G, below).

Item	# of items	Cost	Grant Funds	Match / Cost Share (if any)	Third Party Share (if any)	Total
			\$	\$	\$	\$
			\$	\$	\$	\$
			\$	\$	\$	\$
			\$	\$	\$	\$
			\$	\$	\$	\$
			\$	\$	\$	\$
Subtotal			\$	\$	\$	\$

F. SERVICES. This should include the cost of duplication and printing, long distance telephone calls, equipment rental, postage and other services not previously listed.

Item	Method of Computation	Grant Funds	Match / Cost Share (if any)	Third Party Share (if any)	Total
		\$	\$	\$	\$
		\$	\$	\$	\$
		\$	\$	\$	\$
		\$	\$	\$	\$
Subtotal		\$	\$	\$	\$

G. OTHER COSTS. List equipment items in excess of \$500, and other items not previously listed. Note that equipment items worth less than \$500 or that have a useful life of less than 2 years must be listed in the Supplies and Materials category.

Item	Cost	Grant Funds	Match / Cost Share (if any)	Third Party Share (if any)	Total
	\$	\$	\$	\$	\$
	\$	\$	\$	\$	\$
	\$	\$	\$	\$	\$
	\$	\$	\$	\$	\$
	\$	\$	\$	\$	\$
Subtotal		\$	\$	\$	\$

H. INDIRECT COSTS. If indirect costs will be charged to the grant, complete the table below with your current approved indirect cost rate and the direct costs it will be applied to. A copy of your most recent indirect cost rate must be attached if indirect costs will be requested.

* The Direct Costs from items 1 -- 6 to which the indirect cost rate applies	Current Approved Indirect Cost Rate Percentage (%)	Indirect Cost Rate Amount
\$	%	\$

Budget Justification. Provide a brief narrative justification of all cost items, including matching funds, listed in the budget. Be specific and explain why these items are necessary to accomplish the grant objectives. If the project involves travel costs, include a brief summary of each trip (for example, Project Director and two students will fly from Hometown to Someplace and stay three days to examine Someplace Museum's collection). **Note:** Travel is limited to this project only. If purchasing or renting computer equipment or other large budget items follow the procedures in 43CFR, Subpart C, Section 12.76 for State, local and Indian tribal governments or Subpart F, Section 12.940 through 12.948 for institutions of higher education, hospitals, other non-profit and all other organizations, as applicable.

Attachment D

A. COVER PAGE



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



Proposal for Research Effort / Grant Application
(PRIVILEGED COMMUNICATION)

1a. _____
TITLE OF PROPOSAL (90 Character Maximum)

1b. _____
INVESTIGATORS (Principal-Investigator LAST NAME, FIRST NAME, Co-Investigators LAST NAME, FIRST NAME)

2a. _____ NAME OF PRINCIPAL INVESTIGATOR (PI) 2b. _____ (blank)

2c. _____ POSITION TITLE 2d. _____ EMAIL

2e. _____ INSTITUTION AND DEPARTMENT 2f.g. _____ PHONE _____ FAX

2h. ADDRESS: _____

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

3b. FOR COMPLETION, A FUNDING REQUEST IS: INCLUDED and REQUIRED INCLUDED but NOT REQUIRED NOT INCLUDED

3c. AMOUNT OF FUNDING REQUESTED \$ _____ FIRST YEAR \$ _____ SECOND YEAR \$ _____ THIRD YEAR

3d,e DATES OF PROPOSED STUDY: _____ START _____ END

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

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

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

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

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

4c. ADDRESS: _____ 4d. _____ EMAIL

4e,f. _____ PHONE _____ FAX

5a. FOR BLM USE ONLY: DATE RECEIVED _____

5b. FOR BLM USE ONLY: PROPOSAL # _____
(MM-YY-####)

B. RESEARCH OBJECTIVES

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

Privileged Communication

Name and Address of Applicant or Applicant Organization:

Title of Project:

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

Name, official title, department, project responsibilities and time commitment (% of annual work effort) of all professional personnel engaged in project:

C. RESEARCH PROPOSAL

BLM Wild Horse and Burro Program Proposal for Collaborative Research Effort / Grant Application

Privileged Communication

All pages must be type written in type font 12, single-spaced with one-inch margins and the pages numbered bottom center. Sections 1-6 cannot exceed a total of 12 pages or individual sections exceed the given page limits. *Guidelines in italics below can be deleted from the proposal prior to submission.*

1. Goals / Objectives / Hypotheses:

Concisely state your overall goals, the objectives of the work proposed here and the hypotheses as a statement or statements that can be tested by analytic study. The hypothesis statement(s) should be followed by a brief explanation of how each will be tested.

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

Describe the specific aims the proposed research is intended to accomplish within each year of the collaborative/funding period.

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

Briefly discuss the background of the proposal by critical evaluation of existing knowledge and by identification of gaps, which would be addressed by the proposed research. State concisely the importance of the proposed research by relating the objectives of the study to the broad, long-term goals of the BLM Wild Horse and Burro Program in the areas of fertility control and population growth suppression. . . Indicate how this effort will advance the fields of equine science, medicine and surgery toward achieving these goals and provide any relevant data (national, regional, local, institutional/ practice) to support the proposed investigation. The rationale for the proposed work must be established by the information presented here. Applicants may also use this section to describe preliminary studies that are pertinent to the application or to provide other information that will help establish the competence of the investigator to undertake the proposed research. Describe the impact of the potential outcome of the investigation to WH&B management, health, and wellbeing specifically regarding population growth suppression.

4. Experimental Approach: (Not to exceed 5 pages)

The experimental design and procedures should be described in detail. Include the process by which data will be collected. Discuss potential difficulties and limitations of the proposed procedures and alternative approaches to achieve the stated aims (Section 2 above). Provide a tentative sequence or timetable for the investigation (e.g., a Gantt chart).

5. Statistical Methods: (Not to exceed 1 page)

Describe what type of data will be collected and how the data will be analyzed, interpreted, and what assumptions will be made during the analysis and interpretation. State the statistical methods to be used. Specify the number of observations required to yield statistically significant results at a particular confidence level (e.g., 95%) or with sufficient power as stated.

6. Pitfalls and Limitations: (Not to exceed 1 page)

List and describe any potential pitfalls or limitations to successful completion of the study and address how these will be addressed.

7. References:

List appropriate documents in order cited according to a journal format.

D. BIOGRAPHICAL SKETCH

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

Privileged Communication

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

Name: _____ Title: _____

Education (Begin with baccalaureate training and include postdoctoral):

Institution and Location	Degree	Year Conferred	Scientific Field
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Honors/Awards:

Major Research Interest:

Role in Proposed Project (be specific):

Previous and Current Research Support Relating to the Current Proposal:

(Include role in that project (PI, CO-I, etc.) source, dates of funding, amount. Explain any apparent or real overlap with the work proposed here)

Research and/or Professional Experience—Starting with the present position, list training and experience relevant to area of this project. List publications of the applicant that are relevant to this project.

E. FACILITIES STATEMENT

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

Privileged Communication

Describe the facilities, equipment, assays etc. available for use in this project. (not to exceed 1 single-spaced page)

F. DETAILED BUDGET FOR EACH 12 MONTH PERIOD
(required even if funding is not being requested from BLM)

BLM Wild Horse and Burro Program
Proposal for Collaborative Research Effort / Grant Application

Privileged Communication

DATES FOR THIS 12 MONTH PERIOD FROM _____ TO _____
(use separate page for each 12 month period)

Salary & Wages (Describe % effort or hours for each person)
(NOTE: It is the policy of the WH&B Program not to support salary for
Principal or Co-Investigators in excess of actual time spent working on the project)

Category Total:

Equipment & Supplies (Describe and give cost of each item over \$100) – Itemize

Category Total:

Animal Costs (Including board and maintenance) – Itemize

Category Total:

Miscellaneous Costs (assays, etc.) – Itemize

Category Total:

Sub Total:

(NOTE: It is the policy of the WH&B Program not to support overhead or indirect costs
in excess of 15% of direct costs calculated as: indirect costs = direct costs x 0.15)

Indirect Costs:

TOTAL:

AMOUNT REQUESTED OF BLM:

List other available support for this project (source and amount).

List other requested support for this project (source and amount).

G. HUMANE CARE AND USE OF ANIMALS

BLM Wild Horse and Burro Program
Proposal for Collaborative Research Effort / Grant Application

Privileged Communication

Title of proposal:

Investigators:

Pursuant to procedures established by the Bureau of Land Management, Wild Horse and Burro Research Program, I certify that the above described protocol follows guidelines set forth in the National Institutes of Health "Guide for the Care and Use of Laboratory Animals" (#85-23) and the "Animal Welfare Act of 1966" (PL 89-544) as amended.

Signature: _____ Date _____

Name: _____
Chair, Institutional Animal Care and Use Committee

Name of Institution: _____

NOTE: This completed form must be in receipt of the BLM WH&B Research Advisory Team before the initiation of funding or collaborative work can commence. Private individuals must seek local/regional institutional approval.

Q & A

Q) There are two different formats listed in the RFA that request some of the same information. One in section III B number 2 and one in the same section number 4 (Attachment D). What format should I use? Do I have to fill them both out?

A) Your proposal will be evaluated based on the criteria listed in attachment D (pages 29 to 35); however you are still required to complete both sections even though some of the same information is requested.

Q) The RFA says that wild horses and burros could be made available for pen trails or in field trials for this research, but advance approval will be required. What approval is required and when will I know if animals will be approved for my research?

A) For the purpose of your response to this RFA you should simply state that you are requesting the use of a BLM facility and wild horses or burros. For budgeting purposes you should assume that horses located in a BLM facility will be fed and cared for by the BLM and that you do not need to include these costs in your budget estimate. If you are proposing to use BLM animals or domestic private animals that will be housed at non-BLM managed facilities, you should include budget for feed and care. Decisions regarding the use of BLM horses or burros for your research proposal will be made at the time of grant award.

Q) Can an award under this RFA be made as part of the Cooperative Ecosystem Study Units (CESU) Cooperative Agreement and if so should my budget be submitted using CESU overhead rates?

A) Yes

Q) Can Federal Agencies submit applications?

A) No, not under this solicitation but a university could submit an application that has a federal agency as a cooperator in the study.

Q) Can individuals or for profit entities submit applications?

A) Yes. A for profit entity could submit an application as long as the entity does not make a profit on the activities covered under this research agreement.

APPENDIX B
NRC REVIEW OF OREGON PROPOSALS 2015



United States Department of the Interior
Bureau of Land Management
National Wild Horse and Burro Program
1340 Financial Boulevard
Reno, Nevada 89502-7147



In Reply Refer To:
4700 (WO261)

Memorandum

To: District Manager, Burns District Bureau of Land Management
From: Paul Griffin, Ph.D.
Wild Horse and Burro Program, Research Coordinator, Bureau of Land Management, 2150 Center Ave., Building C, Fort Collins, Colorado, 80526
Subject: National Research Council's 2015 report to BLM

Mr. Cain,

In reference to the proposed Mare Sterilization Research Environmental Assessment, I am providing you the following information in support of your analysis. This letter includes the internal deliberations provided to BLM by the National Research Council regarding the three proposed wild horse sterilization studies that would take place in Burns, Oregon.

On March 6, 2014, the BLM made public its request for applications to a research program titled "Wild horse and burro sterilization or contraception – development of techniques and protocols." The National Research Council provided scientific reviews of research proposals that BLM received in response. The National Research Council's report to BLM (NRC 2015) included a letter and two appendices. In order to ensure that the reviews of those proposals were rigorous, confidential, and unbiased, the specific critiques of proposals were sent to BLM as nonpublic attachments labeled Appendix A and Appendix B. I also note here that, for administrative reasons including available funding, the specific proposals that BLM chose to fund were a subset of the proposals recommended in NRC (2015).

In this letter, I am quoting, in their entirety, the paragraphs of text in Appendix A that pertain to the three Oregon studies under your consideration, other than personally identifiable information. These proposals were labeled proposals 8, 9, and 19 by the review committee of the National Research Council (2015). After that text I am also copying over complete page images from the specific reviews of those three proposals from Appendix B, except again with personally identifiable information removed.

Sincerely,

A handwritten signature in black ink that reads "Paul Griffin".

Paul Griffin

Literature Cited

National Research Council. 2015. Review of proposals to the Bureau of Land Management on Wild Horse and Burro sterilization or contraception; a letter report. Committee for the review of proposals to the Bureau of Land Management on Wild Horse or Burro Sterilization or Contraception. The National Academies Press.

Quoted text from Appendix A of NRC (2015), related to proposed Burns, Oregon studies
"Appendix A

Recommended Proposals

In its public session with the Bureau of Land Management (BLM), the committee understood that the agency was looking for research projects that would yield results quickly and ones that may take more time to come to fruition. With that in mind, it has grouped the recommended proposals into ones that can be completed and (if successful) have their results implemented in 2 years or less, ones that may yield practical results in the medium term (2–5 years), and ones that hold promise to yield results in the long term (5–10 years). A strategy for setting funding priorities among the projects and ways in which BLM could work with the investigators to strengthen their proposals are suggested in the last section of this appendix.

RESEARCH PROPOSALS ON STERILIZATION THAT COULD BE COMPLETED IN 2 YEARS OR LESS

The committee grouped Proposals 8, 9, 12, and 10 because they all focused on permanent sterilization through straightforward surgical procedures or, in the case of Proposal 10, a single injection. They all also had relatively low budgets and should be completed within 2 years. The committee believes that all four proposals feature methods that could be used safely in the near future (1–3 years from now) and therefore recommends them all for funding (Table A-1). When these research activities have concluded, BLM will be in a position to evaluate which approach or combination of approaches works best under what conditions, such as time of year, open or pregnant mares, stage of pregnancy, and the terrain and size of the population in the Herd Management Area where a gather, sterilize, and release program is planned. It can then proceed with the best options, having evaluated the merits of each approach. With regard to Proposal 10, the committee does not think that treatment of stallions will have an effect on the population growth rate of herds. However, BLM will capture stallions with mares and foals when it conducts gathers, and having an easy-to-apply, one-dose treatment option available for all mature animals would be optimal for the agency. It should fund Proposal 10 to verify whether such an injection can be safely developed for free-ranging stallions.

The committee also examined a proposal on conducting ovariectomies on free-ranging mares: Proposal 19, Functional assessment of ovariectomy (spaying) via colpotomy of wild mares as an acceptable method of contraception and wild horse population control; PI, [*personally identifiable information omitted here*]. Ovariectomy is regularly conducted on domestic mares, but some of the protocols used in domestic animals after surgery would not be applicable to free-ranging mares because they cannot be held still for 48 hours. The committee did not view this as a research proposal because the procedure is already done regularly in mares and therefore it contains no science or experimentation related to technique. For that reason, the committee did not group Proposal 19 with the research proposals listed in Table A-1. Nevertheless, it evaluated the usefulness of ovariectomy as a tool for population-growth suppression and the risks associated with it. Details of the committee's conclusions (including the effects of ovariectomy on fetuses before 90 days of gestation, from 90 to 120 days of gestation, and after 120 days of gestation) are in Appendix B. In short, the committee believes that this procedure could be operationalized immediately to sterilize free-ranging mares but that the techniques in Proposals 8, 9, and 12 would be less invasive. If the research projects of Proposals 8, 9, or 12 prove successful, their procedures should replace the procedure described in Proposal 19."

The following four pages are copies from NRC (2015) Appendix B, Proposal Review Comments. These are the reviews for the three proposed studies that would take place in Burns, Oregon, but with personally identifiable information redacted.

Proposal Number: 8

Proposal Title: Hysteroscopy and laser ablation of the oviduct papillas as a minimally invasive method of sterilization in standing, sedated wild horses and burros

Principal Investigator: [REDACTED] Oregon State University

Funding Recommendation: Fund.

COMMITTEE DISCUSSION SUMMARY

The objective of this proposal is to sterilize nonpregnant mares by hysteroscopic laser ablation of the oviductal papilla while the mares are under standing sedation. Fertility would be assessed by allowing treated mares to mate with a fertile stallion.

The committee finds the simplicity of this proposal to be its greatest strength. The procedure is minimally invasive and would require only restraint in the stocks with standing sedation. In practiced hands, the entire procedure should take 20–30 minutes per horse. With some training, many veterinarians could become proficient in performing this procedure. There is no question that the laser would damage the oviductal papilla. Whether the scar damage is sufficient to sterilize the mare permanently is the question at hand in this proposal.

The committee considered this proposal in conjunction with Proposals 9 and 12, which also aim to sterilize mares through minimally invasive procedures. The committee concludes that Proposals 8, 9, and 12 should all be funded. The budgets for these proposals are not large, and each should be completed in a short period (no more than 2 years). When these research activities have concluded, BLM would be in a position to evaluate which approach or combination of approaches works best under what conditions, such as time of year, open or pregnant mares, stage of pregnancy, and the terrain and size of the population in the Herd Management Area where a gather, sterilize, and release program is planned.

That being said, a number of improvements could be made in Proposal 8, and the committee is skeptical about one important factor. The committee is not confident that many mares gathered from an HMA would be eligible for this procedure because it is aimed at nonpregnant mares. Free-ranging mares are extremely sound reproductively, and many are in foal by the age of 2 years. Free-ranging mares that are not pregnant after the age of 2 years are probably subfertile. Therefore, the procedure would be applicable primarily to subfertile mares or yearlings that are 8 months old and/or weigh around 300 kg. The committee is not confident that many gathered horses will fit that description. It would not be practical to conduct a gather to perform only this procedure given the likelihood of a low number of candidate fillies and subfertile mares.

Regarding the low number of candidates for this procedure, the committee wonders whether inducing early embryonic death is acceptable. If it were acceptable, this procedure could be used in early spring in most mares. Abortion itself would not be induced because any embryos lost would simply be resorbed by the mare rather than expelled.

Another option would be to use this approach in tandem with the 1-year PZP vaccine. A gather could be conducted in year 1 to treat all captured mares with the PZP vaccine, after which they would be released. That would help to ensure a large number of nonpregnant mares when a gather occurred in the following year. That approach would add expense by requiring two

gathers in consecutive years, but infertility after the second year would be permanent (assuming that the procedure is successful), and the need for future gathers would be obviated for some time.

With regard to improving the proposal, many details are omitted or assumed by the investigators. The committee interprets the proposal to indicate that the investigators plan to use 50 mares from a BLM holding facility in Burns, Oregon. If that is the case, it could be stated more clearly. No control group of mares is mentioned. Similarly, it is not said how the fertility of the stallion given access to the mares would be determined. And, methods for capturing, sedating, and minimizing pain and stress in the animal are not described or addressed.

Another issue not addressed in the proposal is tubal pregnancies. The investigators report that if a mare is bred in the preceding 6-7 days, tubal pregnancy may result. In an animal with a 21-day cycle, 5% of open mares would be expected to be in estrus on any given day, so in 6-7 days as many as 30% of open mares could have been recently bred. Tubal pregnancy would be a painful, iatrogenic condition and should be considered as a welfare concern.

A proof-of-concept study could be carried out quickly with domestic mares before the technique is introduced to the horses in Burns or perhaps the step in Burns could be skipped entirely. Using domestic mares that could be easily handled would allow well-managed breeding (via artificial insemination) with semen of known fertility. Pregnancy status could then be diagnosed within 2 weeks of insemination. After proof of the concept, the technique could be moved into a free-ranging herd to test the difficulty of using it in true field conditions.

The committee was confused by the statement at the end of the proposal: "Beginning in the spring, assuming our experimental population has remained at Burns. . . ." It is not clear why the investigators cannot assume that the experimental population would still be available. If that population were not available, this would be another justification for conducting the experiment in domestic mares to which access could be guaranteed from the start to the finish of the experiment.

Finally, BLM would need to invest in many expensive endoscopes and have access to a number of trained veterinarians if the procedure is to have an effect on the population growth rate of a herd. The costs for the proposed project are appropriate, although the indirect costs included in the budget are higher than the 15% for the Wild Horse and Burro Program.

Proposal Number: 9

Proposal Title: Minimally invasive tubal ligation of wild horse and burro mares as a method of contraception and population control

Principal Investigator: [REDACTED] Oregon State University

Funding Recommendation: Fund.

COMMITTEE DISCUSSION SUMMARY

The procedure put forward in this proposal uses a flexible endoscope inserted through the anterior vagina to cauterize and transect the oviduct. Before treatment, the mare would be sedated, and then the abdomen would be distended with filtered air or carbon dioxide to aid in visualization of the ovaries and oviducts. The endoscope would pass through an incision in the anterior vagina and be used to visualize each oviduct, and the oviduct would be cauterized and transected. An epidural would be performed if necessary. The ligation of the oviduct would render the mare permanently sterile but still able to cycle normally. The investigators plan to perform this procedure on pregnant mares.

The committee is concerned that the ovaries may not be visible in late pregnancy because the mare's ovaries are pulled medially and anteriorly as the pregnant uterus moves over the pelvis and down to the floor of the abdomen. The collapse of the anterior vagina would also prevent passage of the endoscope in pregnant mares. Conducting this study would answer whether or not those concerns are warranted.

The committee considered this proposal in conjunction with Proposals 8 and 12, which also aim to sterilize mares through minimally invasive procedures. The committee concludes that Proposals 8, 9, and 12 should all be funded. The budgets for these proposals are not large, and each should be completed in a short period (no more than 2 years). When these research activities have concluded, BLM will be in a position to evaluate which approach or combination of approaches works best under what conditions, such as time of year, open or pregnant mares, stage of pregnancy, and the terrain of and size of the population in the Herd Management Area where a gather, sterilize, and release program is planned.

The committee offers some caveats regarding this proposal. The major risk to the mare would be abdominal pain in the 24 hours after the procedure. Injection of lidocaine or similar products into the ovary or oviduct during the procedure is not mentioned. Given the experience of some committee members, this additional step is recommended for pain management.

The proposal could be written more clearly and with more detail. It states that mares would be restrained in a hydraulic, padded chute that is specifically and successfully designed for routine processing of free-ranging horses. However, no further information is provided regarding animal-handling facilities. It is also unclear whether the investigators would have access to the number of animals (50) that are proposed for use in this study.

The committee is skeptical of the claim that four horses could be treated in an hour. Given the time needed to inflate the abdomen, two is more likely. There is also the issue of skilled practitioners: this approach would require more training than the form of sterilization discussed in Proposal 8.

The costs for the proposed project are appropriate, although the indirect costs included in the budget are higher than the 15% for the Wild Horse and Burro Program.

Proposal Number: 19

Proposal Title: Functional assessment of ovariectomy (spaying) via colpotomy of wild mares as an acceptable method of contraception and wild horse population control

Principal Investigator: [REDACTED] Oregon State University

Funding Recommendation: Fund with nonresearch money.

COMMITTEE DISCUSSION SUMMARY

This proposal focuses on demonstrating the value of ovariectomy in free-ranging horses. The investigator proposes to evaluate the feasibility of using surgery as a management tool in controlling the growth rate of free-ranging horse herds.

The proposal contains no science or experimentation related to technique. Colpotomy, as described in this proposal, is not a new technique; the only novelty in the proposal is that the procedure would be performed on free-ranging rather than domestic horses. The committee did not consider this difference to be a matter of research.

Nevertheless, the committee evaluated the proposal's usefulness as a tool for population growth suppression and the risks associated with it.

Ovariectomy via colpotomy is a relatively common procedure and a standard veterinary practice that is performed widely by practitioners in domestic horses. The death rate associated with the procedure is low. Domestic mares are typically cross-tied to keep them standing for 48 hours post-surgery to prevent evisceration through the unclosed incision in the anterior vagina. That protocol would not be possible with free-ranging mares because they cannot be held still for so long. Therefore, there is some concern that the investigator may see more fatalities after surgery than the 1% quoted in the protocol, which is based on domestic mares. The procedure should be 100% effective in sterilizing treated mares.

The proposal does not state at what early stage of pregnancy a mare would be excluded from the study. The mare's ovaries and their production of progesterone are required during the first 70 days of pregnancy to maintain the pregnancy. It is the opinion of the committee that if this procedure were performed in the first 90 days of pregnancy, the fetus would be resorbed or aborted by the mother. If performed after 120 days, the pregnancy should be maintained. The effect of ovary removal on a pregnancy at 90–120 days of gestation is unpredictable because it is during this stage of gestation that the transition from corpus luteum to placental support typically occurs. The proposal also does not state how long it would take to perform the procedure on a mare. That would be useful information for BLM to have in assessing its practicality.

The committee believes this procedure could be operationalized immediately to sterilize mares, with the caveat that fatalities may be higher than the 1% reported in the literature. The sterilization techniques put forward in Proposals 8, 9, and 12 would be safer—with less risk of hemorrhage and evisceration—and probably less painful. Therefore, if the techniques in Proposals 8, 9, and/or 12 prove to be successful after the research has been conducted, the committee thinks that these techniques should replace Proposal 19's method of ovariectomy via colpotomy as surgical approaches for permanent sterilization.

APPENDIX C

IM 2015-151 COMPREHENSIVE ANIMAL WELFARE PROGRAM FOR WILD HORSE AND BURRO GATHERS

U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT

[Print Page](#)

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240-0036
<http://www.blm.gov>

September 25, 2015

In Reply Refer To:
4720 (260) P

EMS TRANSMISSION 09/29/2015
Instruction Memorandum No. 2015-151
Expires: 09/30/2018

To: All Field Office Officials (except Alaska)
From: Assistant Director, Resources and Planning
Subject: Comprehensive Animal Welfare Program for Wild Horse and Burro Gatherers

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

Purpose: The purpose of this Instruction Memorandum (IM) is to establish policy for the Wild Horse and Burro (WH&B) Gather component of the Comprehensive Animal Welfare Program (CAWP). It defines standards, training and monitoring for conducting safe, efficient and successful WH&B gather operations while ensuring humane care and handling of animals gathered.

Policy/Action: The Bureau of Land Management (BLM) is committed to the well-being and responsible care of WH&B we manage. At all times, the care and treatment provided by the BLM and its contractors will be characterized by *compassion and concern* for WH&B well-being and welfare needs.

All State, District and Field Offices are required to comply with the CAWP policy for all gathers within their jurisdiction. The CAWP for WH&B gathers includes three components:

1. Comprehensive Animal Welfare Program Standards for Wild Horse and Burro Gatherers (Attachment 1): These standards include requirements for trap and temporary holding facility design, capture and handling, transportation, and appropriate care after capture. The standards have been incorporated into helicopter gather contracts as specifications for performance.
2. Training: All Incident Commanders (IC), Contracting Officer Representatives (COR), Project Inspectors (PI) and contractors must complete a mandatory training course. The training is available online via DOI Learn. Course Title: BLM's Comprehensive Animal Welfare Program (CAWP) – gathers; Course Number: 4700-13.
3. CAWP Gather Assessment Tool (Attachment 2): The Gather Assessment Tool will be used during FY2016 for evaluating the effectiveness of mandatory training and adequacy of the Standards for CAWP for WH&B Gatherers. The WO-260 Division is responsible for overseeing implementation of assessments as well as providing the necessary access to the assessment tool for those gathers selected for internal assessment during FY2016.
4. Starting in FY2017, the Assessment Tool will be used to evaluate compliance by the BLM and its contractors with the Standards for CAWP for WH&B Gatherers. The WO-260 Division will oversee the completion of all assessments as well as providing the necessary access to the assessment tool for those gathers identified for both internal and external assessment by internal and external personnel during FY2017.

This IM supersedes Interim IM No. 2013-059, Wild Horse and Burro Gatherers: Comprehensive Animal Welfare Policy which was issued as part of a package of IMs covering various aspects of the management of WH&B gathers, including:

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

The goal of this IM is to ensure that the responsibility for humane care and treatment of WH&Bs remains a high priority for the BLM and its contractors at all times. The Bureau's objective is to use the best available science, husbandry and handling practices applicable for WH&Bs and to make improvements whenever possible, while also meeting our overall gather goals and objectives in accordance with current BLM policy, standard operating procedures and contract requirements. The CAWP and its associated components will be reviewed regularly and modified as necessary to enhance its transparency and effectiveness in assuring the humane care and treatment of the WH&Bs.

The Lead COR is the primary party responsible for promptly addressing any actions that are inconsistent with the Standards set forth in the CAWP. The Lead COR may delegate responsibility to an alternate COR. The Lead COR will promptly notify the contractor if any improper or unsafe actions are observed and will ensure that they are promptly rectified. If issues are left unresolved or immediate action is required, the Lead COR has the authority to suspend gather operations. Through coordination with the Contracting Officer, the Lead COR shall, if necessary, ensure that corrective measures have been taken to prevent such actions from reoccurring and all follow-up and corrective measures shall be reported as a component of the Lead COR's daily reports.

Timeframe: All portions of this policy are effective as of October 1st, 2015.

Budget Impact: This IM is implementing new policy and guidance with additional training and reporting requirements for personnel and

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10/13/2015

IM 2015-151, Comprehensive Animal Welfare Program for Wild Horse and Burro Gathers

contractors. The cost for the required training is about \$250 per person. CAWP program implementation, oversight, data compilation and reporting requirements will require an additional 12 to 15 work months per year.

Background: The authority for a Comprehensive Animal Welfare Program for WH&B Gathers is provided by Public Law 92-195, Wild Free-Roaming Horses and Burros Act of 1971 (as amended) and 43 CFR 4700.0-2.

The Comprehensive Animal Welfare Program for WH&B gathers consolidates and highlights the BLM's policies, procedures and ongoing commitment to protect animal welfare; provide training for employees and contractors on animal care and handling; and implement a gather assessment tool which will be used to evaluate the agency's and contractor's adherence to standards for the handling and care of animals during gather operations.

Manual/Handbook Sections Affected: None

Coordination: This IM was coordinated among WO-100, WO-200, WO-260, WO-600, WH&B State Leads and WH&B Specialists.

Contact: Bryan Fuell, On-Range Branch Chief, Wild Horse and Burro Program, at 775-861-6611.

Signed by:
Michael H. Tupper
Acting, Assistant Director
Resources and Planning

Authenticated by:
Robert M. Williams
Division of IRM Governance, WO-860

2 Attachments

- 1 - [Comprehensive Animal Welfare Program Standards for Wild Horse and Burro Gathers \(20 pp\)](#)
- 2 - [CAWP Gather Assessment Tool screen shots \(26 pp\)](#)

Last updated: 10-07-2015

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**APPENDIX D
AFFECTED ENVIRONMENT TABLE**

Mare Sterilization Research EA – DOI-BLM-OR-B000-2015-0055-EA		
Lead Preparer - Lisa Grant, Wild Horse and Burro Specialist		
Identified Resource with Issue Question for Analysis	Status	Explanation or Issue Question
	Affected;	If Affected (BOLD); Reference Applicable EA Chapter and Section; and State the Issue in a Question.
	Not Affected;	If Not Affected, explanation required.
	Not Present.	If Not Present, explanation required.
Air Quality (Clean Air Act)	Not Affected	Surgical procedures conducted on wild horse mares would have no effect on air quality.
American Indian Traditional Practices	Not Affected	Surgical procedures conducted on wild horse mares in pen trials at Oregon’s Wild Horse Corral Facility would have no effect on American Indian Traditional Practices because they would not affect access to or integrity of sacred sites, or affect the exercise of tribal traditional activities on public lands.
Areas of Critical Environmental Concern (ACEC)	Not Present	There are no ACECs/RNAs present at Oregon’s Wild Horse Corral Facility where the surgical procedures would take place. Surgical procedures would not be conducted on mares from the Kiger Mustang ACEC.
Cultural Resources	Not Affected	A very sparse lithic scatter/obsidian procurement site is located in a portion of Oregon’s Wild Horse Corral Facility west of Hines, Oregon. The site was found when the horse corrals were improved in the mid-1980s but was not thought to be eligible for nomination to the National Register of Historic Places and, therefore, did not require protection. Since that time, extensive use by horses and manure management has erased nearly all signs (obsidian flakes) that the site exists. Therefore, the effect of additional horses, undergoing research or not, would be unmeasurable.
Environmental Justice (Executive Order 12898)	Not Present	Implementation is not expected to result in an adverse effect on minority or economically disadvantaged populations as such populations do not exist within the project area.
Fire Management	Not Affected	Surgical procedures on wild horses have no effect on fire management.
Fisheries	Not Present	There are no fisheries present at Oregon’s Wild Horse Corral Facility.
Flood Plains (Executive Order 11988)	Not Present	There are no flood plains present at Oregon’s Wild Horse Corral Facility.
Forestry and Woodlands	Not Present	There are no forests or woodlands at Oregon’s Wild Horse Corral Facility.
Grazing Management and Rangeland	Not Affected	No grazing management or rangelands would be affected as the mares included in the research would remain inside the corrals at Oregon’s Wild Horse Corral Facility.

Mare Sterilization Research EA – DOI-BLM-OR-B000-2015-0055-EA

Lead Preparer - Lisa Grant, Wild Horse and Burro Specialist

Identified Resource with Issue Question for Analysis	Status	Explanation or Issue Question
	<p>Affected;</p> <p>Not Affected;</p> <p>Not Present.</p>	<p>If Affected (BOLD); Reference Applicable EA Chapter and Section; and State the Issue in a Question.</p> <p>If Not Affected, explanation required.</p> <p>If Not Present, explanation required.</p>
Hazardous Materials or Solid Waste	Not Affected	Any solid waste or sharps and syringes used would be disposed of in accordance with ORS601.140 and Occupational Safety and Health Administration (OSHA) 1910.1030, respectively.
Migratory Birds (Executive Order 13186)	Not Affected	Conducting the surgical procedures on mares held in Oregon’s Wild Horse Corral Facility would have no effect on migratory birds.
Minerals	Not Affected	There are no known measureable effects to minerals.
Noxious Weeds (Executive Order 13112)	Not Affected	The project will not impact noxious weed management on the range as the project is going to take place at Oregon’s Wild Horse Corral Facility. Weed treatments at the facility are on-going and would not be affected by this project.
Operations (Range Lead)	Not Affected	There are no range improvement projects proposed in this project.
Paleontological Resources	Not Present	No paleontological resources would be affected on public lands because the research is being conducted at Oregon’s Wild Horse Corral Facility where no paleontological resources are found.
Prime or Unique Farmlands	Not Present	Prime or unique farmlands are not present within the boundaries of Oregon’s Wild Horse Corral Facility and therefore would not be affected by this proposed project.
Reclamation (Engineering)	Not Affected	The proposed project would not require reclamation actions.
Realty and Lands	Not Affected	The proposed project would not affect any existing third party rights, leases, permits, rights-of-way, or land tenure actions since the research is taking place at Oregon’s Wild Horse Corral Facility. The only right-of-way is for the facility itself and the research would not be a conflict.
Recreation and Off Highway Vehicles (OHV)	Not Affected	The project area is not a recreation site, nor does public recreation take place on the grounds or within the buildings of Oregon’s Wild Horse Corral Facility.
Social and Economic Values	Affected	Effects are analyzed in Chapter III of the EA.
Soils and Biological Crusts	Not Affected	The entirety of the proposed project would take place inside the pens at Oregon’s Wild Horse Corral Facility where soils are currently disturbed and biological soil crusts are not present. There would be no affects to soils and biological soil crusts outside of Oregon’s Wild Horse Corral Facility.
Special Status Species (SSS) and	Fish	Not Affected
		There are no known populations of SSS Fish near Oregon’s Wild Horse Corral Facility since there are no

Mare Sterilization Research EA – DOI-BLM-OR-B000-2015-0055-EA

Lead Preparer - Lisa Grant, Wild Horse and Burro Specialist

Identified Resource with Issue Question for Analysis	Status	Explanation or Issue Question
Habitat for BLM	Affected;	If Affected (BOLD); Reference Applicable EA Chapter and Section; and State the Issue in a Question.
	Not Affected;	If Not Affected, explanation required.
	Not Present.	If Not Present, explanation required.
Threatened or Endangered (T/E) Species or Habitat	Wildlife	Not Affected There are no known populations of SSS Wildlife near Oregon’s Wild Horse Corral Facility so there would be no affects to SSS Wildlife.
	Plants	Not Affected There are no known populations of SSS plants at or near Oregon’s Wild Horse Corral Facility so there would be no affects to SSS plants.
	Fish	Not Affected There are no known populations of federally listed Threatened or Endangered Fish near Oregon’s Wild Horse Corral Facility since there is no flowing rivers or streams nearby. There are no populations of fish species proposed for federal listing or designated Critical habitat nearby so there would be no affects to T/E Fish from this proposal.
Transportation and Roads	Not Affected	Conducting the proposed surgical procedures on mares held in Oregon’s Wild Horse Corral Facility would have no effect on BLM roads or transportation system.
Upland Vegetation	Not Affected	The entirety of the proposed project would take place inside the pens at Oregon’s Wild Horse Corral Facility and therefore would not affect upland vegetation.
Visual Resources	Not Affected	This action would not change the visual characteristics of the site. Nor would it affect the Visual Resources Management class of III.
Water Quality (Surface and Ground)	Not Affected	The proposed action would not affect surface water quality as there are no surface or live ground water sources within or adjacent to Oregon’s Wild Horse Corral Facility.
Wetlands and Riparian Zones (Executive Order 11990)	Not Present	There are no known wetlands or riparian areas near Oregon’s Wild Horse Corral Facility so there would be no affects from this proposal.
Wild Horses	Affected	Effects are fully analyzed in Chapter III of the EA.

Mare Sterilization Research EA – DOI-BLM-OR-B000-2015-0055-EA

Lead Preparer - Lisa Grant, Wild Horse and Burro Specialist

Identified Resource with Issue Question for Analysis	Status	Explanation or Issue Question
Wild and Scenic Rivers (WSR)	Not Present	There are no WSRs in the project area, which is Oregon’s Wild Horse Corral Facility.
Wilderness/Wilderness Study Areas (WSA)/ Wilderness Inventory Characteristics (WIC)	Not Present	There is no Wilderness, Wilderness Study Areas, or Lands with Wilderness Characteristics in the project area, which is Oregon’s Wild Horse Corral Facility.
Wildlife	Not Affected	Although wildlife is near Oregon’s Wild Horse Corral Facility, this proposal would only involve wild horses confined in the corral facility and not affect any wildlife in the surrounding area.

**UNITED STATES
DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Burns District Office**

Finding of No Significant Impact

**Mare Sterilization Research
Environmental Assessment
DOI-BLM-OR-B000-2015-0055-EA**

INTRODUCTION

The Burns District Bureau of Land Management (BLM) has prepared an environmental assessment (EA) to analyze the effects of conducting three research studies investigating the safety and effectiveness of three separate methods of surgical sterilization of wild horse mares.

The purpose of the action is to conduct research on three methods of permanent mare sterilization on wild horses at the BLM's Oregon Wild Horse Corral Facility in Hines, Oregon in order to assess which method(s) are effective in wild horses, and could be applied safely and efficiently to wild horse mares on lands administered by the BLM.

The Department of the Interior (DOI) has identified the need for the BLM to research and test wild horse population control methods that have been reviewed and highly rated by the National Research Council (NRC) as potentially useful surgical sterilization methods. These three methods are: ovariectomy via colpotomy, minimally invasive tubal ligation, and minimally invasive hysteroscopically-guided laser ablation. The BLM would like to conduct research on these three methods to ensure they are effective and safe for application in wild horses.

SUMMARY OF THE PROPOSED ACTION

The proposed action is to conduct research on the safety and practicality of sterilizing mares as a tool for wild horse population control, using the three methods specified below. The proposed action includes the functional assessment of three methods of mare sterilization;

1. *Ovariectomy via colpotomy* (further referenced as "ovariectomy") – to remove both ovaries,
2. *Minimally invasive tubal ligation* (further referenced as "tubal ligation") – to cauterize and then cut the oviduct,
3. *Minimally invasive hysteroscopically-guided oviduct papilla laser ablation* (further referenced as "hysteroscopically-guided laser ablation") - to use a laser to scar and seal the opening of each oviduct.

All procedures would take place at Oregon's Wild Horse Corral Facility in Hines, Oregon. The three studies combined would involve approximately 225 wild horse mares previously gathered and removed from BLM herd management areas (HMA). In coordination with BLM, a team of experienced veterinarians has been assembled by Oregon State University (OSU) to conduct and support the objectives of this study. Three veterinarians licensed in the State of Oregon would conduct the procedures. This team has extensive experiences in equine reproduction, equine urogenital surgery, veterinary endoscopy, and minimally invasive surgery.

FINDING OF NO SIGNIFICANT IMPACT

The Council on Environmental Quality's (CEQ) regulations provide that the significance of impacts must be determined in terms of both context and intensity (40 CFR. § 1508.27). An analysis of the context and intensity of the selected alternative follows.

Context: In accordance with CEQ regulations found at 40 CFR. §1508.27(a), the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short and long-term effects are relevant.

The BLM has determined that the context of the selected alternative is the ten western states with HMAs based upon widespread interest in the topic of sterilizing wild mares and the urgent need for new methods and techniques for wild horse population control.

Intensity: The following analyzes the intensity of the selected alternative utilizing the ten significance criteria described in CEQ regulations found at 40 CFR. § 1508.27(b):

The CEQ's ten considerations for evaluating intensity (severity of effect):

1. *Impacts that may be both beneficial and adverse.* The EA considered potential beneficial and adverse effects.

Wild Horse Mares (EA, p. 27) - The proposed surgical procedures have potential to create discomfort for each mare within the first week following surgery. There is always a risk of mortality associated with surgical procedures and the handling of wild animals. The anticipated risk of mortality associated with these procedures is less than 2 percent. Because ovariectomies and tubal ligations would be conducted on pregnant mares the possibilities of and rates of abortions due to conducting the procedures are unknown. Project design features are incorporated into each proposal to reduce the risks to the mare, the pregnancy, and the veterinarian performing the procedure. These design features are described in the proposed action beginning on page 11 of the EA. Permanently sterilizing a mare is expected to provide long-term beneficial effects, such as maintaining or improving overall body condition, since the physical burden of pregnancy and raising a foal would not occur. The results of the research would provide a

better understanding of the beneficial and adverse effects of each procedure and allow for more informed decision making in the future regarding wild horse population management.

Social and Economic Values (EA, p. 39) - Permanent mare sterilization is both opposed and supported by the public. Some would like to see BLM only use the available and approved fertility control treatment porcine zona pellucida (PZP) or not apply fertility control methods at all. These groups feel that surgical procedures for sterilization are inhumane. Others support research to better understand potential new methods and techniques for population control. These supporters feel that overpopulations of wild horses on the range are inhumane and neglect BLM's responsibility to manage populations in a thriving natural ecological balance (TNEB). There is a lack of long-term and widely effective population control methods available to BLM resulting in the seemingly endless cycle of gathering excess horses and sending them to off-range holding facilities. In 2015, the total appropriations for the entire WH&B program were \$75.2 million; 65.7% (\$49.3 million) went to off-range holding costs (WH&B Quick Facts, 2015).

BLM has the challenging task of choosing appropriate, safe, and humane methods of wild horse population growth control that are ecologically and financially viable as well as socially acceptable. Results from the studies under the proposed action would aid in determining the social acceptability of each procedure because the studies would quantify complication rates, effectiveness, and success rates of each technique.

2. *Degree to which the proposed action affects public health and safety.* No aspect of the proposed action alternative would have an effect on public health and safety. The entirety of the three proposed procedures would be conducted within Oregon's Wild Horse Corral Facility and members of the public would not be involved in implementation of the proposed action.
3. *Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.* No aspect of the proposed action alternative would have an effect on unique characteristics of the geographic area as the entirety of the proposed action would take place in Oregon's Wild Horse Corral Facility.
4. *The degree to which effects on the quality of the human environment are likely to be highly controversial.* Controversy in this context means disagreement about the nature of the effects, not expressions of opposition to the proposed action or preference among the alternatives. The expressions of opposition to conducting sterilization research on wild mares are not supported by peer-reviewed science. The effects of the three sterilization proposals are fully analyzed in Chapter III of the EA. This analysis is supported by peer-reviewed science.
5. *Degree to which possible effects on the human environment are highly uncertain or involve unique or unknown risks.* The analysis has not shown there would be any unique

or unknown risks to the human environment as the entirety of the proposed action would take place within Oregon's Wild Horse Corral Facility. The analysis beginning on page 26 of the EA shows that the proposed action does involve unique or unknown risks to the mare since ovariectomy via colpotomy has not been adequately studied on pregnant mares and tubal ligation and hysteroscopically-guided laser ablation are new techniques of mare sterilization. However, based on the unpublished Sheldon National Wildlife Refuge study on ovariectomizing feral mares, the risk of mortality they observed was less than 2 percent. The tubal ligation and hysteroscopically-guided laser ablation studies are considered minimally invasive and therefore are accompanied by an even lower risk to the mare. This evidence indicates the risks to the mare are not *highly* uncertain.

6. *Degree to which the action may establish a precedent for future actions with significant impacts or represents a decision in principle about a future consideration.* The outcome of the ovariectomy study may have potential to influence the project design features incorporated into BLM's Rock Springs, Wyoming study "Evaluating behavior, demography, and ecology of spayed [sterilized] free-roaming mares." However the project neither establishes a precedent nor represents a decision in principle about future actions. The results of the proposed action should provide BLM additional information on the safety and effectiveness of potential new methods of mare sterilization. The results would not establish BLM policy.
7. *Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.* The EA did not reveal that the action is related to other actions with individually insignificant but cumulatively significant impacts.
8. *Degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places.* The entirety of the proposed action would take place in Oregon's Wild Horse Corral Facility and there are no features within this facility listed or eligible for listing in the National Register of Historic Places.
9. *The degree to which the action may adversely affect an endangered or threatened species or its habitat.* There are no known threatened or endangered (T&E) species or their habitat affected by the proposed action as the studies would take place at Oregon's Wild Horse Corral Facility.
10. *Whether an action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.* The proposed action does not threaten to violate any law. The proposed action is in compliance with the Wild Free-Roaming Horses and Burros Act of 1971 (Public Law (PL) 92-195).

§1333. Powers and duties of Secretary (b) Inventory and determinations; consultations; overpopulations; research study; submittal to Congress (1) The Secretary shall maintain a current inventory of wild free-roaming horses and burros on given areas of the public lands. The purpose of such inventory shall be to: make determinations as to whether and where an overpopulation exists and

whether action should be taken to remove excess animals; determine appropriate management levels [AML] of wild free-roaming horses and burros on these areas of the public lands; and determine whether appropriate management levels [AML] should be achieved by the removal or destruction of excess animals, or other options (such as sterilization, or natural controls on population levels). In making such determinations the Secretary shall consult with the United States Fish and Wildlife Service [USFWS], wildlife agencies of the State or States wherein wild free-roaming horses and burros are located, such individuals independent of Federal and State government as have been recommended by the National Academy of Sciences [NAS], and such other individuals whom he determines have scientific expertise and special knowledge of wild horse and burro protection, wild-life management and animal husbandry as related to rangeland management.

On the basis of the information contained in the EA and all other information available to me, it is my determination that the implementation of the proposed action alternative will not have significant environmental impact. The environmental effects, together with the incorporated project design features, do not constitute a major Federal action having a significant effect on the human environment. Therefore, an environmental impact statement (EIS) is not necessary and will not be prepared.

Brendan Cain, Burns District Manager

Date