



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



Proposal for Collaborative Research Effort / Grant Application

(PRIVILEGED COMMUNICATION)

1a. Experimental test of the viability of spaying wild mares
TITLE OF PROPOSAL (90 Character Maximum)

1b. Pielstick, Leon; Thain, David; Gray, Meeghan; Collins, Gail H.
INVESTIGATORS (Principle-Investigator LAST NAME, FIRST NAME; Co-Investigators LAST NAME, FIRST NAME)

2a. Leon Pielstick, DVM 2b. (b) (6)
NAME OF PRINCIPLE INVESTIGATOR (PI) SOCIAL SECURITY NUMBER

2c. Doctor of Veterinary Medicine 2d. (b) (6)
POSITION TITLE EMAIL

2e. Private Practice 2f,g. (b) (6) (cell)
INSTITUTION AND DEPARTMENT PHONE FAX

2h. ADDRESS: (b) (6)

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

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

3c. AMOUNT OF FUNDING REQUESTED: (b) (4) + Contributed funds, (b) (4) Total (b) (4)

3d,e DATES OF PROPOSED STUDY: February 1, 2010 Dec 31, 2010
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. (b) (6)
EMAIL

4e,f. (b) (6) (cell)
PHONE FAX

B. RESEARCH OBJECTIVES

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

Privileged Communication

Name and Address of Applicant:

Dr. Leon Pielstick

(b) (6)

Title of Project:

Experimental test of the viability of spaying wild mares for population control

Abstract:

Proposed Research

Currently, thousands of wild horses are gathered from public rangelands each year as the primary method of controlling population levels. These individuals are then offered for adoption or sale, or placed in long-term holding facilities. However, the BLM faces a constant challenge in adopting enough animals to maintain both healthy herds and healthy public rangelands. Adoptions have been declining in recent years due to higher fuel and feed costs; adoptions fell from 5,701 in FY2005 to 3,706 in FY2008 (Bureau of Land Management 2009a). As of April 2009, the BLM reported 31,716 wild horses and burros in holding facilities across the country (Bureau of Land Management 2009b). The BLM has stated that the agency "*faces difficult choices in the West's wild horse and burro program. Rising energy prices have increased feed and transportation costs, and it is clear the BLM cannot continue in its current removal and holding practices under existing and projected budgets. Neither can the BLM allow horses to multiply unchecked on the range without causing an environmental disaster. The BLM is looking at all options at this point to manage through the situation*" (Bureau of Land Management 2009a). Recent recommendations of the BLM's Wild Horse and Burro Advisory Board recognize that in an attempt to slow population growth, unproven field techniques may be considered and utilized on a conditional basis. However, the spaying of mares and vasectomies for stallions as population control methods was not recommended unless these methods can be demonstrated as safe, practical, and effective (Bureau of Land Management 2008).

Recent pilot investigations of an ovariectomy (spay) field technique demonstrated that wild mares could be safely and efficiently ovariectomized in the field using techniques which have been widely utilized on domestic mares for many years. In July of 2007, 33 feral mares managed by Sheldon National Wildlife Refuge were ovariectomized (spayed) via vaginal colpotomy while restrained in a standing position in a hydraulic chute. These horses were either "open" (not pregnant) or pregnant within their first trimester. The mares were sedated and pre-surgical analgesics were administered. Following surgical prep for sterile surgery, the horses were spayed, administered a long lasting antibiotic (i.e., Biomycin), and then corralled for post-operative monitoring. Two of the 33 mares (6%) suffered complications from which one died and one was euthanized. The remaining patients were reasonably comfortable and eating post surgically. Three of the surviving mares foaled the following spring and no abortions were noted. An additional 41 feral mares were selected for ovariectomy in September 2009, and ranged across gestational levels from "open" to mid-stage pregnancy. Thirty-eight of the mares were successfully spayed without noted complication. Of the remaining three, the ovaries in two were unable to be selectively removed and the other failed to respond adequately to sedation; all three were released back onto the range intact. No deaths occurred during the observation period before release (24-48 hours). Including these additional subjects, the overall complication rate was 2.7%. We believe that the complication rate can be further reduced with increased surgical proficiency.

This project proposes to expand on previous experiments to further examine the viability of spaying mares as a potential tool for wild horse population management, specifically conducting an evaluation of the safety and practicality of the procedure.

Research Objectives

- A. Expand the evaluation of a field technique to perform ovariectomy (spay) on wild horse mares and the potential for surgery-related complications.

Methods

A sample of wild horse mares currently confined in Bureau of Land Management holding facilities will be selected by BLM personnel as appropriate candidates for non-breeding status and by the veterinarian as deemed healthy enough for surgery, without consideration to stage of gestation. Mares will be divided into 4 groups based upon gestation (estimated by palpation at time of surgery): (1) Open (not palpably pregnant); (2) 1st trimester, <112 days; (3) 2nd trimester, 112-224 days; and (4) 3rd trimester, 225-335 days.

Surgery

Individuals selected for inclusion in the study will be restrained in a chute that allows for access to the horses neck for injections, and to the tail and perineal area adequate to perform surgery. Each mare will be intravenously administered a mix of Detomidine (10 mg), Butorphanol (10 mg), and Xylazine (400mg) to sedate and provide analgesia for surgery (exact dosages may be adjusted as determined by the veterinarian). Tetanus toxoid will also be administered to unvaccinated individuals. Additionally, 500 mg of Flunixin Meglumine and 10 mg of Buprinorphine Sustained Release (SR) will be administered for post surgical analgesia (Buprinorphine SR 10 mg/ml.) The recommended dosage of Buprinorphine SR in horses by the manufacturer is 10 mg (1 ml) per 500 kg (ZooPharm, Fort Collins, Colorado, www.zoopharma.net). This product is currently the only analgesic providing extended pain relief with a single dose (72 hrs) making it the best available product for use in wild horses where re-dosing is impractical. Each mare will also be administered a long-duration antibiotic (Excede). Excede (Ceftiofur Crystalline Free Acid) is effective for 7 days and Pfizer Animal Health is currently undergoing approval trials for its use in horses.

Following sedation, the procedure will involve sterile surgery with an incision in the anterior-dorsal-lateral vagina and removal of the ovaries with a chain ecrasure and without surgical closure. This technique of ovariectomy in horses has been commonly described (see Auer and Stick 1999, McKinnon and Vasey 2007). It is possible to incorporate the use of local anesthesia of the ovarian pedicle; however, the investigator's experience with the use of lidocaine-soaked gauze for this purpose has been of limited effect and has the potential for losing the gauze in the abdomen. Ultimately, the advent of newer, more powerful analgesics has allowed for the surgical removal of the ovaries with minimal, if any, discomfort noted. During recovery from anesthesia, the mares will be returned to their corral and provided adequate feed and water. It has been suggested that keeping the mare standing 2-4 days post-operative could be used to prevent evisceration. However, the risk of evisceration is rare, and in the investigator's experience, withholding feed for 48-hours prior to surgery and relatively emptying the intestines lessens the risk for evisceration either during surgery or post-surgically.

Post-surgery observation

Following surgery, all mares will be monitored for 14 days and observed for post-operative complications, including pain, bleeding, infection, or signs of abortion. If a death occurs or an individual show signs of a life-threatening complication and must be humanely euthanized, that individual will be necropsied within 12-hours to determine cause of death if necessary. Veterinarians will be on-site to observe for a minimum of 2-days post-operative; the remaining observation period will be completed BLM personnel with a veterinarian on-call as needed.

Research Personnel

Leon Pielstick, DVM

Doctor of Veterinary Medicine
Burns, OR
Principle Investigator
Full-term commitment to the project

David S. Thain, DVM

State Extension Veterinarian
Dept. of Animal Biotechnology
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Fax 775-784-4087
Email: dthain@cabnr.unr.edu
Co-investigator
Part-time commitment to the project

Meeghan E. Gray, Ph.D.

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Co-investigator
Part-time commitment to the project

Gail H. Collins, M.S.

Senior Wildlife Biologist
U.S. Fish and Wildlife Service
Sheldon-Hart Mountain National Wildlife Refuge Complex
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Lakeview, OR 97630
Phone 541-947-3315
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Co-Investigator
Part-time commitment to the project

C. RESEARCH PROPOSAL

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

Privileged Communication

1. Goals / Objectives / Hypotheses:

Goals

Department of Interior Secretary Ken Salazar recently put forth new proposals for the management of wild horses and burros, including new strategies aimed at balancing wild horse and burro population growth with public adoption demand. Proposed strategies include slowing population growth rates of wild horses on public rangelands through the aggressive use of fertility control and considering the introduction of non-reproducing herds on some HMAs (Salazar 2009). In addition, recent recommendations of the BLM's Wild Horse and Burro Advisory Board recognize that in an attempt to slow population growth, unproven field techniques may be considered and utilized on a conditional basis. However, the use of spaying of mares and vasectomies for stallions as population control methods was not recommended unless these methods can be demonstrated as safe, practical, and effective (Bureau of Land Management 2008). This project proposes to conduct such a captive experiment to expand testing the viability of spaying mares as a tool for wild horse population control, including an evaluation of the safety and practicality.

Research Objectives

- A. Expand the evaluation of a field technique to perform ovariectomy (spay) on wild horse mares and the potential for subsequent surgery-related complications;

Hypotheses

It is our hypothesis that ovariectomy via vaginal colpotomy can be safely and effectively performed on wild mares that have been selected for non-breeding status and that those individuals can then be returned to the range to live out their natural lives without individually contributing to population growth. The proposed research effort is based on recent pilot studies that have suggested the potential for surgery-related health complications from ovariectomy in adult female horses is low (2.7%); our hypothesis is that with increased surgical proficiency, post-operative complication rates can be lowered to less than 2%. In addition, we will examine how the stage of gestation affects the surgical procedure and recovery.

2. Specific Aims:

Research Aims for 2010

- Select study sample populations from animals in holding facilities
- Perform a maximum of 120 surgeries
- Complete post-operative monitoring
- Analyze results and prepare reports and/or manuscripts

3. Background and Significance/Preliminary Studies:

One of the Bureau of Land Management's (BLM) key responsibilities under the Wild Free-roaming Horse and Burro Act is manage the species at an "appropriate management level" (AML). Federal protection, a lack of natural predators, and a high reproductive rate have resulted in significant increases in wild horse populations which can easily exceed the AML in many areas. In addition to overpopulation, drought and poor forage conditions often set the stage for emergency situations and wild horses in danger of perishing on the range. Currently, thousands of wild horses are gathered from public rangelands each year as the primary method of controlling population levels. These individuals are then offered for adoption or sale, or placed in holding facilities. However, the BLM faces a constant challenge in adopting enough animals to maintain both healthy herds and healthy public rangelands. Adoptions have been declining in recent years due to higher fuel and feed costs; adoptions fell from 5,701 in FY2005 to 3,706 in FY2008 (Bureau of Land Management 2009a). As of April 2009, the BLM reported 31,716 wild horses and burros in holding facilities across the country (Bureau of Land Management 2009b). The BLM's direct sales program has also met with limited success in its current implementation (Bureau of Land Management 2009a). Currently, animals placed in long term holding live out

the rest of their lives there, which can range from 10 to 25 years depending on the age at which they entered the facility. The BLM has stated that the agency “*faces difficult choices in the West’s wild horse and burro program. Rising energy prices have increased feed and transportation costs, and it is clear the BLM cannot continue in its current removal and holding practices under existing and projected budgets. Neither can the BLM allow horses to multiply unchecked on the range without causing an environmental disaster. The BLM is looking at all options at this point to manage through the situation*” (Bureau of Land Management 2009a). Recent recommendations of the BLM’s Wild Horse and Burro Advisory Board include that the BLM not use spaying of mares and vasectomies for stallions as population control methods unless these methods can be demonstrated as safe, practical, and effective (Bureau of Land Management 2008).

Two pilot studies were recently conducted on feral horse mares from Sheldon National Wildlife Refuge in 2007 and 2009 towards the development of an ovariectomy field technique. The individuals in these pilot efforts were “open” (not pregnant) or ranged from early- to mid-gestation. Results from these efforts suggest that the potential for surgery-related health complications from ovariectomy in adult female horses is low (2.7%). We believe that the complication / death rate can be further reduced with increased surgical proficiency. In addition, evaluation of this technique on mid- to advanced-stage gestation is necessary for evaluating the full viability of the procedure.

Study Site Description

To date, the Burns Wild Horse Facility, Burns, Oregon has been selected for the study site. Additional facilities may be included if there is both interest from the managing agency and availability of personnel. The availability of more than one facility would assist in determining the range of settings in which the procedure can be effectively implemented.

Potential Difficulties and Limitations

Surgery on wild horses

Handling wild horses can be difficult and all personnel involved in the study will either be experienced with handling these animals or supervised by someone with that experience. Surgeries are also risky events, and qualified veterinarians will perform all surgeries. The drugs selected to be administered during the procedure are commonly used with very low known occurrences of adverse reactions or are used “off-label” with good justification; however, a small proportion of individuals may have an adverse reaction for unknown reasons.

Post-operative complications

Ovariectomy is a risky procedure and a low incidence of surgical complications is probable. Following surgery, all mares will be monitored for 14 days and observed for post-operative complications, including pain, bleeding, infection, death, or signs of abortion. If a death occurs or an individual show signs of a life-threatening complication and must be humanely euthanized, that individual will be necropsied within 12-hours to determine cause of death if necessary. Veterinarians will be on-site to observe for a minimum of 2-days post-operative; the remaining observation period will be completed BLM personnel with a veterinarian on-call as needed.

Value of Research for Long-term Broad BLM Goals

The BLM has stated that the agency currently “*faces difficult choices in the West’s wild horse and burro program. Rising energy prices have increased feed and transportation costs, and it is clear the BLM cannot continue in its current removal and holding practices under existing and projected budgets. Neither can the BLM allow horses to multiply unchecked on the range without causing an environmental disaster. The BLM is looking at all options at this point to manage through the situation*” (Bureau of Land Management 2009a). In addition, Department of Interior Secretary Ken Salazar recently stated that “*the current path of the wild horse and burro program is not sustainable for the animals, the environment, or the taxpayer*” (Salazar 2009). Successful development of a field spay technique has the potential to benefit wild horse management by reducing the number of animals that must be removed from the range and thereby reducing the associated costs of adoptions or long-term holding.

Significance of the Problem and the Contribution to Equine Science

As previously discussed, the management of wild horses on the western rangelands is a difficult issue. Population control is one viable technique of reducing both the environmental impacts and the number of

horses that must be gathered and removed from the range. While the definitive effects of spaying on wild horse population growth is currently unknown, each ovariectomized mare will be sterile and unable to contribute individually to population increase. This has the potential to affect overall production in wild horses if enough individuals in the population are sterilized. Similar reproduction control techniques such as PZP vaccination are already in limited application as a management tool, and selecting mares for spay using criteria similar to that as PZP may be appropriate. Ultimately, the first step in evaluating the efficacy of ovariectomy as a tool for population control is to test its safety and practical application.

4. Experimental Approach

IACUC

Since the previous proposal, Dr. Bohnert is no longer available to assist with the IACUC review. We are currently working with Dr. David Thain and Dr. Meehan Gray at University of Reno-Nevada to complete the IACUC review.

Study Design

A sample of wild horse mares currently confined in Bureau of Land Management holding facilities will be selected by BLM personnel as appropriate candidates for non-breeding status and by the veterinarian as deemed healthy enough for surgery, without consideration as to stage of gestation. Mares will be divided into 4 groups based upon gestation (estimated by palpation at time of surgery): (1) Open (not palpably pregnant); (2) 1st trimester, <112 days; (3) 2nd trimester, 112-224 days; and (4) 3rd trimester, 225-335 days. Following surgery, all mares will be monitored for 14 days and observed for post-operative complications, including pain, bleeding, infection, death, or signs of abortion. If a death occurs or an individual show signs of a life-threatening complication and must be humanely euthanized, that individual will be necropsied within 12-hours to determine cause of death if necessary.

5. Statistical Methods

Records of post-surgical complications for each individual will include death (either directly or via euthanasia), pain, bleeding, infection, or abortion. Descriptive statistics will be used to estimate the types and overall rate of surgical complications as well as complication rates evaluated by gestation.

6. Pitfalls and Limitations:

This study will depend on the availability of appropriate mares in holding facilities to meet adequate sample sizes.

7. Funding Request:

Item	Per horse cost	Estimated total for 120 horses	Contributed Funds
Surgery, including all drugs and supplies	(b) (4)	(b) (4)	
BLM Personnel (3 staff, 5 days)	(b) (4)		(b) (4)
Post-operative monitoring			
Veterinarian	(b) (4)	(b) (4)	
BLM Personnel (1 staff, 14 days)	(b) (4)		(b) (4)
Travel costs	(b) (4)	(b) (4)	
Corral remodel @ Burns	(b) (4)		(b) (4)
Estimated total for project	(b) (4)	(b) (4)	(b) (4)

References

Auer, J.A, and J.A. Stick, editors. 1999. Equine surgery, 2nd edition. W.B. Saunders Company.

Bureau of Land Management. 2008. Recommendations of the BLM's Wild Horse and Burro Advisory Board. http://www.blm.gov/wo/st/en/info/newsroom/2008/november/NR_11_19_2008.html. Date last accessed: May 20, 2009.

Bureau of Land Management. 2009a. Factsheet on challenges facing the BLM in its management of wild horses and burros. http://www.blm.gov/wo/st/en/prog/wild_horse_and_burro/new_factsheet.html. Date last accessed: May 20, 2009.

Bureau of Land Management. 2009b. Wild horse and burro numbers in holding facilities, Report date April 2009. http://www.blm.gov/pgdata/etc/medialib/blm/wo/Planning_and_Renewable_Resources/wild_horses_and_burros/holding_area_statistics.Par.16255.File.dat/Holding_Facility_Statistics_4_13_09.pdf. Date last accessed: May 20, 2009.

McKinnon, A.O., and J.R. Vasey. 2007. Selected reproductive surgery of the broodmare. Pp. 146-160 in Current therapy in equine reproduction. Saunders, St. Louis, Missouri.

Salazar, K. 2009. Letter to the Honorable Harry Reid, Majority Leader, U.S. Senate. Dated October 7, 2009. <http://www.doi.gov/documents/LettertoHarryReidonWHB.pdf>. Date last accessed: December 15, 2009.

D. BIOGRAPHICAL SKETCH

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

Privileged Communication

Principle Investigator

Name: Leon Pielstick, DVM
Burns, Oregon
541-573-2501

Title: Doctor of Veterinary Medicine

(b) (6) cell

(b) (6)

Previous Research:

- Unpublished field trials – Heifer Spay with Ovarian Autograft – approximately 2,000 heifers involved to determine if previously reported weight gains were consistent from this procedure.
- Field work on drug company field trials for efficacy of respiratory vaccines in cattle
- Field work for Summit Research Company on respiratory vaccines in horses

Current Research:

- Participating with the study titled “Spatial distribution and habitat use of wild horses in the Intermountain West” in cooperation with the U.S. Fish and Wildlife Service and others.

Education:

- Farrier school – 1966
- Pre-vet studies, Oregon State University – 1967-1969
- Doctor of Veterinary Medicine, Colorado State University – 1973

Professional Experience and Employment:

- Mixed animal practice – Hermiston, Oregon – 1973-1975
- Mixed animal practice – Burns, Oregon – 1975-Present
 - Began practice and developed Harney County Veterinary Clinic
 - One of the first veterinarians to work with the BLM Wild Horse Program

Recent Certifications:

- Oregon’s Veterinarian of the Year – 2004
- Harney County Business Person of the Year (along with wife Susan) – 2004
- Chair, Oregon Veterinary Medical Examining Board, 2008 - 2009

Professional Affiliations:

- AVMA
- OV MA
- AABP
- ARV
- NEOVMA

Co – Investigator

Name: David Thain, DVM

Title: Nevada State Extension Veterinarian

Co – Investigator

Name: Meeghan E. Gray, Ph.D. **Title:** Post Doctoral Researcher UNR

Co – Investigator

Gail H. Collins

Senior Wildlife Biologist
U.S. Fish and Wildlife Service, Sheldon-Hart Mountain National Wildlife Refuge Complex
P.O. Box 111, Lakeview, OR 97630
Telephone: 541-947-3315; FAX: 541-947-4414
E-mail: Gail_Collins@fws.gov

Previous and Current Research:

Population status, distribution, and effects of feral horse and burro herds on Sheldon National Wildlife Refuge: 2007 to present.

Distribution and range of mule deer on Sheldon National Wildlife Refuge: 2007 to present.

Population status of pronghorn and California bighorn sheep on Sheldon and Hart Mountain National Wildlife Refuges: 2007 to present.

Home range, distribution, and population dynamics of moose in interior Alaska: 2003-2007

Home range, distribution, and movements of brown bears in southwestern Alaska: 1999-2003.

Reproduction and survival of brown bears in southwest Alaska: 1999-2003.

Population dynamics, movements, and distribution of barren-ground caribou in southwest Alaska: 1999-2003.

Population growth, movements, and status of the Nushagak Peninsula Caribou Herd following reintroduction: 1999-2003.

Education

M.Sc. (1999) Washington State University, Wildlife Biology

B.Sc. (1994) Washington State University, Wildlife Biology

Professional Experience and Employment

Senior Wildlife Biologist, U.S. Fish and Wildlife Service, Sheldon-Hart Mountain National Wildlife Refuge Complex, Lakeview, Oregon (2007 to present).

Wildlife Biologist, U.S. Fish and Wildlife Service, Tetlin National Wildlife Refuge, Tok, Alaska (2003 to 2007).

Wildlife Biologist, U.S. Fish and Wildlife Service, Togiak National Wildlife Refuge, Dillingham, Alaska (1999 to 2003).

Recent Certifications

Chemical Immobilization of Animals, SafeCapture International, Inc. (2007)

Advanced Immobilization Field Techniques, SafeCapture International, Inc. (2007)

Certified Wildlife Biologist, The Wildlife Society. (2006)

Emergency Trauma Technician, State of Alaska. (2006)

Search and Rescue Canine Handler, Interior Search and Rescue Assn (2006)

Professional Affiliations

Society for Range Management. Member: 2007 to present.

International Assn for Bear Research and Management. Member: 2000 to present.

The Wildlife Society. Member: 1996 to present.

Refereed Publications

- Collins, G.H. (Chair)**, M.R. Bertram, H.V. Reynolds, and C.T. Seaton. 2006. Issues related to the sale of black and brown parts in Alaska. Technical Review for the Alaska Chapter of the Wildlife Society.
- Kovach, S.D., **G.H. Collins**, M.T. Hinkes, and J.W. Denton. 2006. Reproduction and survival of brown bears in southwest Alaska, USA. *Ursus* 17:16-29.
- Collins, G.H.**, S.D. Kovach, and M.T. Hinkes. 2005. Home range and movements of female brown bears in southwestern Alaska. *Ursus* 16:181-189.
- Hinkes, M.T., **G.H. Collins**, L.J. Van Daele, S.D. Kovach, A.R. Aderman, J.D. Woolington, and R.J. Seavoy. 2005. Influence of population growth on caribou herd identity, calving ground fidelity, and behavior. *Journal of Wildlife Management* 69:1147-1162.
- Collins, G.H.**, M.T. Hinkes, A.R. Aderman, and J.D. Woolington. 2003. Population growth, movements, and status of the Nushagak Peninsula Caribou Herd following reintroduction, southwest Alaska. *Rangifer Special Issue* 14:143-151.
- Collins, G.H.**, R.B. Wielgus, and G.M. Koehler. 2002. Effects of sex and age on black bear conifer damage and control. *Ursus* 13:153-158.

Collaborators and Cooperators

Bureau of Land Management

Mr. Gary McFadden – Wild Horse Specialist, State Lead, Oregon / Washington

E. FACILITIES STATEMENT

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

Privileged Communication

FACILITIES

BLM Wild Horse Facility, Burns, Oregon

EQUIPMENT

- Corrals
- Chute and handling facilities
- Staff for monitoring

F. DETAILED BUDGET FOR EACH 12 MONTH PERIOD

**BLM Wild Horse and Burro Program
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Privileged Communication

The following table lists funds that are currently available for this research project.

Organization	Item	Available Funds	Matching Funds
Total Funds			

G. HUMANE CARE AND USE OF ANIMALS

**BLM Wild Horse and Burro Program
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Privileged Communication

Protocol number:

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 can commence. Private individuals must seek local/regional institutional approval.