SWORN STATEMENT OF DR. ALLEN RUTBERG

1. I hold an A.B. in Biological Anthropology from Harvard College and a Ph.D. in Zoology from University of Washington. As a Ph.D. zoologist, I have significant research experience in wild horse behavior and fertility control.

2. I currently work as a Research Assistant Professor in the Department of Environment and Population Health at Cummings School of Veterinary Medicine at Tufts University. I have extensive experience teaching coursework in comparative vertebrate anatomy, physiology, endocrinology, animal behavior, sociobiology, ecology, evolutionary biology, and introductory biology. I simultaneously serve as the Director of the Center for Animals and Public Policy within the School of Veterinary Medicine. A copy of my curriculum vitae is attached.

3. Concurrent to my career at Tufts, since 2000 I have served as a Senior Research Scientist for The Humane Society of the United States (HSUS). Prior to joining the Tufts-Cummings faculty, I spent nine years working as a Senior Scientist in Wildlife and Habitat Protection for HSUS.

4. I am a former appointee to the National Wild Horse and Burro Advisory Board for the U.S. Departments of Interior and Agriculture (1998-2000). As a member of the Advisory Board, I chaired the science subcommittee, authored the BLM's first guidelines on the use of immunocontraception in wild horse herds (dated April 29, 1999), and drafted the board's final report to the Secretaries of Agriculture and Interior. I was also a principal author of the HSUS's EPA registration application for the use of porcine zona pellucida (PZP) as a contraceptive in wild horses and burros.

5. In my capacity as a research scientist, I have spent more than twenty years studying wildlife immunocontraception, as well as the breeding and social organization of ungulates

(hoofed animals). My research has included extensive field tests on the efficacy and efficiency of delivery of PZP contraceptive vaccines in populations of feral horses (Equus caballus) at Assateague Island National Seashore, MD, Cedar Mountains, UT, Sand Wash Basin, CO, and elsewhere; and on white-tailed deer (Odocoileus virginianus) at Fire Island National Seashore, NY, the National Institute of Standards and Technology, MD, Mumford Cove, CT, Fripp Island, SC, and elsewhere. I have published more than two dozen peer-reviewed articles on wildlife contraception wildlife management, and wild horse behavior; edited a book on wildlife contraception; and frequently provide seminars and presentations for professionals in these fields.

6. Prior to beginning my research on wildlife immunocontraception, I conducted extensive studies on group cohesion and dispersal in feral horses on Assateague Island, Maryland (1985-88). This work included research on the ecological, social and reproductive influences on juvenile dispersal, band stallion experience, adult group membership and within-group spacing, female intraspecific aggression, and opportunities for peer interaction among immature males.

7. In addition to my work as a professor and research scientist, I have reviewed research grant proposals for the Bureau of Land Management (BLM), National Science Foundation, U.S. Agency for International Development (USAID), U.S. Department of Agriculture SBIR program, Park Foundation, Alternatives Research & Development Foundation, Earthwatch, and Animal Welfare Institute. I have also served as a manuscript reviewer for the following peer-reviewed journals: Animal Behaviour, Biosciences, Crop Protection, Journal of Animal Welfare Science, Journal of Applied Animal Behavior Science, Human-Wildlife Conflicts, Journal of Mammalogy, Ethology, Journal of Wildlife Management, Wildlife

Research, Wildlife Society Bulletin, Netherlands Journal of Zoology, Reproduction, and Zoo Biology, and for the University of Chicago Press, University of Massachusetts Press, Smithsonian Institution Press, and Harvard University Press.

8. I have also worked extensively in policy-making related to wild horse management, hunting and state wildlife management, endangered species conservation, and wildlife management in national parks. In that capacity I have prepared fact sheets and delivered testimony to legislatures and legislative committees, conducted lobbying visits to congressional and state legislative offices, and prepared formal comments on federal regulations and environmental impact analyses. I have also worked with the Food and Drug Administration (FDA) Center for Veterinary Medicine to develop research protocols for Investigational New Animal Drug files, and assisted in drafting a registration submission to the Environmental Protection Agency for the use of PZP as a contraceptive in wild horses and burros (approved in January 2012 as "ZonaStat-H").

9. I strongly object to the decision of the BLM to manage many wild horses on the Jackson Mountains HMA as "non-reproducing." I have analyzed the Preliminary Environmental Assessment, and, in my professional opinion, the BLM will cause serious behavioral, physiological, and other impacts to individual horses and their herds.

10. If implemented, the proposed action would create a semi-free-roaming herd of domesticated horses (44 geldings or about 25% of the 174 horses in the HMA) on public lands, where the Wild Free-Roaming Horses and Burros Act of 1971 (WFRHBA) requires that true "wild," "free-roaming" horses belong.

11. As a result of the proposed action, the herds will no longer be "wild horses" from a conservation, population ecology, or behavioral viewpoint. Wild horses typically live in

reproductive bands consisting of adult mares, their dependent offspring, and one or more stallions whose lives revolve around trying to protect mares from harassment by other stallions to secure exclusive reproductive access to the mares for themselves; and bachelor bands of stallions whose lives revolve around displacing band stallions and acquiring or re-acquiring reproductive access to mares. Mares, meanwhile, simultaneously bond with one another and compete with each other for access to water, food, and other resources for themselves and their foals. Geldings will not participate in these fundamental processes of wild horse behavior, meaning that 25% of the remaining horses will not interact in the ways that wild horses have evolved to do in order to carry our critical herd behavioral functions and dynamics.

12. The castrated males will also not retain their "free-roaming nature," except in the literal sense that they will be able to move around the HMA without physical restraint, because these horses will not be hormonally prompted to protect their mares, compete with other stallions for reproductive mates, or cover as much geographical distance as they would in their natural state. The castrated horses will behave much more like domesticated horses, with diminished aggressiveness and competitiveness, meaning that these geldings will be of little value to the public and scientists interested in observing wild horse behavior.

13. The proposed action, without explanation, deviates from longstanding BLM herd management policies. Since the mid-1970's, the BLM has looked to various fertility control technologies to reduce the "excess" population of wild horses. I have been involved with that effort since 1992, both as a researcher contributing to the testing of PZP immunocontraception of wild horses, and as a formal and informal advisor to the BLM on fertility control policy. Indeed, BLM frequently relies on scientific studies I have conducted in making decisions with respect to wild horse population suppression. With respect to PZP, I can personally attest that BLM has

moved very cautiously, subjecting proposed research projects to intensive scrutiny, and discussing, revising, and adopting strict and specific guidelines for its use. Before approving PZP research projects, the BLM has required extensive testing in laboratory and captive settings, detailed documentation of minor side effects, and maintained detailed records on treated individuals - even for minor variants of vaccines whose safety and efficacy have been scrutinized for decades.

14. For field use, guidelines adopted by BLM require the adoption of detailed use protocols, extensive NEPA compliance and public involvement, population modeling (to demonstrate long-term viability under the prescribed treatment regime), and other conditions. This scrutiny, evaluation, and planning has been directed at a vaccine for which data published in peer-reviewed journals show is reversible, has no serious adverse health effects, has no major disruptive behavioral effects, preserves genetic viability better than management by gather and removal, and is cost effective. It has also been proven to be effective in managing several populations of wild horses on public lands.

15. To the individual wild horses, their bands, and their populations, the reproductive interventions entailed with the newly designed approach adopted by the BLM (gelding) is, by contrast with PZP, highly invasive, intrusive, and disruptive. Moreover, the environmental impacts of this approach are completely uncertain at this juncture since no scientific research supports this approach as a sustainable measure that will maintain the normal evolutionary functions of the horses and the dynamics of the herds.

16. Given that PZP represents a better tested, better scrutinized, effective, and far more benign management alternative for fertility control in wild horses, and that the language of the Act dictates, "[a]ll management activities shall be at the minimal feasible level," it is my

professional opinion that there is no defensible justification for implementing the largescale sterilization action proposed in the Jackson Mountains HMA.

17. The BLM's chosen action represents an unnatural and unsustainable environmental management scenario because the castrated males will continue to use limited resources while contributing nothing to the demographic or genetic viability of the herd. In consuming the herds' resources, the 44 released geldings will have similar environmental impacts as the non-castrated stallions. By consuming resources that would otherwise be available to breeding horses, this environmental pressure will actively decrease the herd's overall viability and resilience to environmental pressure.

18. I am opposed to the method of management that was chosen by the BLM here. As a scientist who is intimately familiar with the BLM's management of wild horses on public lands, I believe the biological and ecological consequences of this management approach have not been adequately considered, and could have drastic impacts on the "wild" and "free-roaming" nature of the herds in these areas. In addition, as explained above, there are better, less invasive, systems for accomplishing the goal of sustainable herd management, as the BLM has long recognized.

19. My opinions stated herein would be the same in any HMA where the BLM proposes a similar management strategy of returning geldings to the range, considering that other less invasive, better studied management options exist to achieve the agency's stated goals.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Executed this 14 day of May, 2012.

Dr. Allen Rutberg

SWORN STATEMENT OF DR. BRUCE NOCK

1. I hold a B.A. from Elizabethtown College, an M.S. in psychobiology from Bucknell University, and a Ph.D. from the Rutgers University Institute of Animal Behavior. Between college and graduate school I served in the United States Air Force. I had top secret security clearance and served overseas in Guam and Viet Nam. After my Ph.D., I continued my education as a Post-doctoral Fellow at Rutgers University (1980-82) and then at The Rockefeller University (1982-84), where I focused on behavioral neuroendocrinology – the study of the interaction between the nervous system, hormones, and behavior.

2. I am currently an Associate Professor of Neurobiology in the Department of Psychiatry and the Department of Anatomy and Neurobiology at Washington University School of Medicine in St. Louis. I have been a faculty member at Washington University since 1985. My complete curriculum vitae is attached, as Attachment A.

3. I have spent more than thirty years working as a laboratory scientist. I have published numerous articles of original research in leading scientific journals on diverse topics, including wild horse behavior, stress physiology, brain biochemistry, anatomy, molecular drug design. I am also an avid horseman with extensive experience as a dressage and trail rider, and dressage and training instructor.

4. In 2003, I founded Liberated Horsemanship in Warrenton, Missouri with the goal of bringing science-based information on horse use and care to horse owners and equine professionals. Liberated Horsemanship provides a variety of services and educational programs for equine professionals and horse owners that are designed to maximize the health and welfare of horses while also increasing the fun and enjoyment of horse ownership.

5. I have authored several books, including two on riding and training horses: Ten Golden Rules of Horse Training: Universal Laws for all Levels and Riding Styles; Ride for Tomorrow: Dressage Today and a series of articles entitled: The Biology of Natural Horsemanship.

6. I am a Advisory Board member of the American Wild Horse Preservation Campaign ("AWHPC"), a broad-based coalition representing over ten million supporters, and have written a series of science-based articles for the AWHPC on how Bureau of Land Management practices affect the long-term health and welfare of America's wild horses.

7. In addition to my current academic appointments and work with Liberated Horsemanship, I have promoted horse welfare by serving in the following positions: Wild Horse Research Coordinator, Association for the Advancement of Natural Horse Care Practices (2006-2008); Board of Directors, Association for the Advancement Of Natural Horse Care Practices (2006-2008); and Director, Science and Applied Technology, Association For The Advancement Of Natural Horse Care Practices (2006-2008). I am also on the faculty of The Kerulos Center—a non-profit organization that finds science- based solutions to questions and concerns that affect the lives of animals.

8. I am familiar with the Bureau of Land Management ("the BLM") proposed roundup of the wild horses in the Jackson Mountains Herd Management Area ("HMA") in Nevada, and I strongly oppose that action for the reasons explained below. My primary concern is that the return of large numbers of castrated male horses, or geldings, to the range will have serious adverse impacts on individual horses and the social and behavioral dynamics of the herds. These serious environmental impacts, which the BLM has not even considered here, are impacts that are not specific to the Jackson Mountains HMA, but which would be problematic

for wild horse populations wherever this drastic approach is implemented.

9. The BLM recently proclaimed, "to ensure [the wild horses] of the Western United States are there forever for us to enjoy, the Bureau of Land Management must protect and manage the land and the animals in a thriving natural ecological balance." Working Toward Sustainable Management of America's Wild Horses and Burros: Draft Goals, Objectives and Possible Management Actions, Bureau of Land Management, Department of the Interior, June 2010. That goal is consistent with Congress' intent in passing The Wild Free-Roaming Horses and Burros Act of 1971 ("WFRHBA").

10. However, the proposed Jackson Mountains action will not preserve our wild horses in "a thriving natural ecological balance." Scientifically speaking, a natural ecological balance cannot be obtained by implementing a management procedure that causes unnatural social interactions and social disruption, which will almost certainly happen if the BLM goes forward with its plan to return castrated males to these herds. If the goal is to establish "a thriving natural ecological balance," management practices that disrupt key social interactions within a herd or alter herd structure – like the BLM's proposed action − should not be employed.

11. Gelding (removing a horse's testes) will have irreversible effects on both the individual horse and the herd. A gelded horse does not behave as a "wild" or "free-roaming" horse. In fact, one of the reasons that domesticated and adopted wild horses are castrated is to make them more "manageable" – i.e. to artificially tame them by altering its physiological and biochemical makeup.

12. Testes produce powerful steroid hormones called androgens or "sex hormones," such as testosterone. These hormones are powerful agents that function to coordinate an animal's behavior and physiology with the external world. Androgens have a wide range of biological

functions. Their classic effects are on the induction and maintenance of secondary sexual characteristics and reproductive behaviors.

13. Gelding (also called castration) has an array of behavioral and physiological consequences, either through direct actions on tissues like muscle or by altering other physiological systems. Removing a horse's testes affects more than circulating sex hormones levels. It also affects the production and synthesis of other hormones, like cortisol, that are important to behavior, physiology and long-term health. By binding to transcription factors which regulate the activity of certain genes, androgens also affect neural circuits in the brain which are important to physiology and behavior." While gelded horses may do okay in captivity, this unnatural physiology will undoubtedly affect the horse's ability to survive and compete in the wild.

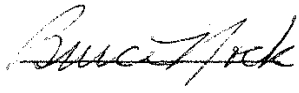
14. Androgens are anabolic steroids. They are what some athletes use to enhance musculature development, physical strength, and overall performance. As in humans, anabolic steroids make horses bigger, stronger, and faster. Castrating a horse has the opposite effect. It decreases muscle mass and strength, reduces bone density, and increases frailty. These deficits put the horse at a significant disadvantage on the range in terms of survival. A gelding will still have to compete with intact stallions for resources. His smaller size and strength, however, will not only put him at a competitive disadvantage, it increases the likelihood that agonistic encounters with intact stallions will result in severe injuries. That is particularly true here, where BLM is proposing to return a significant number of geldings to the HMA – 44 geldings, constituting approximately 25% of the overall horse population there – that will have to compete with 78 stallions, which constitute 45% of the overall horse population in the HMA (the remaining 30% will be mares).

15. The compromised physical capacities that accompany gelding are likely to endanger castrated horses in a number of ways. In addition to undermining their ability to compete with intact stallions, it may diminish their ability to traverse the harsh terrain, particularly in the great distances normally travelled to acquire food and water. This would jeopardize their survival particularly during challenging weather conditions, like droughts which are apparently somewhat routine in the Jackson Mountains HMA. A limited geographical home range is also likely to disproportionately deplete local resources and negatively impact the ecological system as a whole.

16. To survive in the wild, a horse must be able to achieve a certain fitness level that may be impossible to attain once the animal is castrated. In my professional opinion, releasing a castrated horse into a wild herd is an inhumane management approach that certainly does not "protect" or "help preserve" wild horses in any sense of the word.

17. The BLM's proposed action will foster unnatural competition for resources, including unnatural competition for reproductive mares, and cause social disruption within the herd. Social disruption is a very powerful stressor for herd animals that can accelerate physical and mental deterioration and long-term viability of individuals and the herd as a whole. An artificially produced atypical male to female sex ratio is not "a thriving natural ecological balance." It is difficult for me to envision anyone with even a superficial understanding of animal behavior and herd dynamics suggesting this as a possible viable management practice.

Pursuant to 28 U.S.C. § 1746, I hereby declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.



Bruce Nock

Executed this ____ day of April, 2012

Sworn Statement of Dr. Jay Kirkpatrick

1. I hold a B.S. in Biology from East Stroudsburg State College, and a Ph.D. in Reproductive Physiology from The College of Veterinary Medicine at Cornell University.

2. I currently work as the Director of The Science and Conservation Center in Billings, Montana. Prior to this position, I was an Associate Adjunct Professor in the Department of Population Health and Reproduction within the School of Veterinary Medicine at University of California, Davis. Concurrently, I was a Senior Staff Scientist for the Deaconess Research Institute in Billings, Montana. I also spent more than two decades working as an Associate Professor of Physiology in the Department of Biology at Montana State University-Billings, Montana. I also spent thirty years working with the U.S. Department of Interior, National Park Service, Bureau of Land Management (BLM), researching reproductive biology and chemical fertility control in wild horses.

3. For the past forty years I have dedicated my work as research scientist to studying wildlife fertility control. I have conducted research in a variety of areas including: reversible contraception in free-roaming herds, ovarian function in mares chronically treated with porcine zonae pellucidae (PZP), long-term effects immunocontraception of wildlife, and mechanisms of reproductive self-regulation in free-roaming ungulates. I was also integrally involved in the construction of a laboratory for wildlife immunocontraception research. In addition to this work, I have published more than seventy peer reviewed articles and peer reviewed book chapters on these topics.

4. Throughout my career I have been actively involved in many professional organizations. Since 1999, I have served as a Professional Fellow for the Association of Zoos and Aquariums (AZA), and for the past twenty years I have been a Member of the AZA

Contraceptive Advisory Group and the American Association of Zoo Veterinarians. In addition to these positions, I was a long-time member of the Society for Experimental Biology and Medicine and the Society for Study of Reproduction. A copy of my curriculum vita is attached, as Attachment A.

5. I have spent considerable time living, recreating, and working on the public lands in the Western United States, including six years working as a Park Ranger at Rocky Mountain National Park in Estes Park, Colorado. The wild horses that roam public lands are an integral part of the landscape and the ecological systems that comprise these areas.

6. I am familiar with the proposed BLM roundup in the Jackson Mountains Herd Management Area ("HMA"), which includes a proposal to return 44 geldings (castrated male horses) to the HMA. Based on my review of the pertinent scientific literature, I oppose this approach to herd management. It is extremely intrusive for the individual horses and not viable for the herds as a whole.

7. If stallions are sterilized as proposed by BLM, there will be massive changes in social organization and behavior. As a research scientist, current collaborator with the National Park Service with regard to wild horse management, and former BLM contractor who worked extensively on chemical fertility control in wild horses, I believe capturing and castrating – a non-reversible sterilization technique – wild male horses, and then releasing them back into the herds, is incompatible with the BLM's mandate to protect and retain the free-roaming nature of wild horses. This is true anywhere that BLM manages wild horses, meaning that geography plays no role in the level impact that would occur to horses and their herds as a result of this irreversible approach, because the impacts would be uniform across their range.

8. The very essence of the wild horse, that is, what makes it a wild horse, is the social organization and social behaviors that differ significant from domesticated horses. Geldings (castrated male horses) no longer exhibit the natural behaviors of non-castrated stallions. We know this to be true from hundreds of years' experience with gelded domestic horses. Furthermore, gelded stallions will not keep their bands together, which is an integral part of a viable herd. These social dynamics were molded by millions of years of evolution, and will be destroyed if the BLM returns castrated horses to the Jackson Mountains HMA.

9. Reproduction in male horses is a complex cycle that moves from the horse's brain to the testes and back again. Reproductive steroids, such as testosterone [T], affect the higher levels of the brain and cause a variety of a stallion's behaviors. These higher levels of the brain also send neural messages to the hypothalamus. The hypothalamus, in turn, stimulates the production and release of a protein hormone known as gonadotropin releasing hormone (GnRH). The GnRH, in turn, stimulates the anterior pituitary to produce and release follicle stimulating hormone (FSH) and luteinizing hormone (LH). The protein hormones stimulate the testes. Testosterone causes the aggressive behavior associated with successful stallions. These higher levels of the brain signal the hypothalamus to release GnRH, which in turn signals the pituitary to secrete FSH and LH. The FSH causes sperm production and the LH causes the testes to produce testosterone, which then feeds back to the brain, and on and on. This is a serious and significant alteration of normal physiological and behavioral functions for horses so treated and again, inconsistent with the law.

10. A major flaw in the plan to geld stallions and return them to the range both generally and at the Jackson Mountains HMA, is the fact that this will have absolutely no effect on reproductive rates of mares on the same range. As long as the harem band is intact and a

fertile stallion is at the head of it, mares will get pregnant regardless of the number of gelded stallions on the range. Indeed, the proposed action calls for 78 stallions (in addition to 44 geldings) – which is many more than is necessary to impregnate the 52 mares that will remain in the HMA. Further, gelded male horses will not become harem stallions, affecting social dynamics and behavior. But, beyond that, as explained above, the gelded stallions no longer even represent wild horses; they will quickly become the biologic anomaly that domestic horses have become. Finally, an emphasis on male fertility control to attempt to limit reproduction and "manage" any population of wildlife (deer, elk, horses) is superfluous; females have offspring – not males. Thus, as BLM has long recognized, population growth suppression must focus primarily, if not only, on limiting female reproduction. Since gelding does not further that goal, there is no scientific basis for returning geldings to the Jackson Mountains HMA under the circumstances.

11. The age priority given in the EA for removal actually runs counter to the objective of slowing reproduction. The removal of young animals from mares simply increases reproductive performance of those mares, a phenomenon known as compensatory reproduction (see Kirkpatrick and Turner 1991, *Compensatory reproduction among feral horses*. J. Wildlife Manage. 55:649-652). This action simply exacerbates the situation. Instead removal should focus on mares in the primary reproductive age class of five to ten years.

12. Castrating horses will effectively remove the biological and physiological controls that prompt these stallions to behave like wild horses. This will negatively impact the place of the horse in the social order of the band and the herd. For this reason, I oppose the BLM's proposed method of managing the Jackson Mountains HMA. There are less intrusive, more humane, and more sustainable forms of fertility control available to the BLM, which find

much more support in the scientific literature, and which comport with BLM's past understanding and handling of these issues with respect to wild horse population control.

Pursuant to 28 U.S.C.§ 1746, I hereby declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Jay Kirkpatrick

Executed this 25th day of April, 2012.