HSUS FERTILITY CONTROL RESEARCH

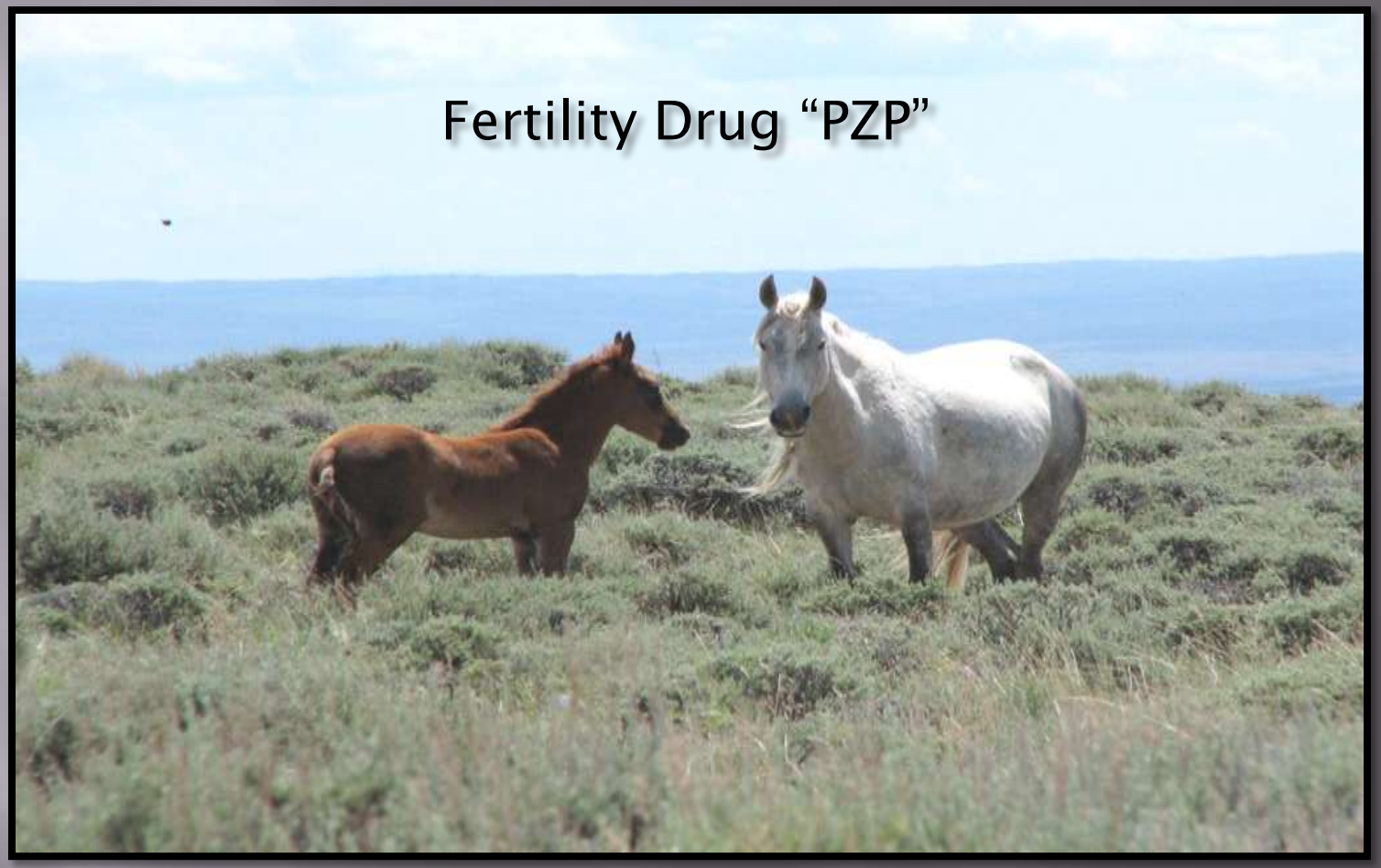
If not subjected to management, predators, or severe environmental conditions, wild horse populations on western public lands grow rapidly. Published estimates of population growth in western herds range from 15-27% per year, with a mean of about 20-21% (Eberhardt et al., 1982; Garrott et al., 1991).

Over the past 100 years, wild horse population control has included everything from simply shooting them, to sending them to slaughter for dog food, to gathers and adoptions. None have been effective at stabilizing the populations over the long haul.

Gather and removal management methods are expensive. The cost of a gather typically exceeds $200,000, and the cost of gathering, handling, processing, holding, transporting, and adopting a single wild horse ranges from $800 to $1,600. In addition, sale and adoption have proven chronically inadequate to dispose of wild horses removed from the range. Following an ambitious program to achieve appropriate management level (AML) on all herd management areas (HMA's), the BLM now finds itself holding more than 37,800 wild horses in short- and long-term holding facilities. In FY 2010, BLM spent $36.9 million maintaining these horses, which constituted 57% of the entire budget of the agency's wild horse and burro program.

An effective wild horse fertility control program would offer an opportunity to reduce program costs (Bartholow, 2004); it would also reduce pressure on the adoption program and improve the welfare of wild horses, which would experience fewer gathers and, potentially, higher quality adoptions (Kirkpatrick, 2005).

Fertility Drug "PZP"



The BLM has been supporting research on wild horse fertility control since the 1970's. While some of the early methods were successful, they proved difficult to deliver to wild horses in the field, they raised concerns about passage through the food chain, and they did not substantially control population growth. In the late 1980's and early 1990's, the focus of wild horse contraceptive research shifted to "PZP"

Surrounding all mammalian eggs is a non-cellular membrane known as the zona pellucida (ZP). Within this membrane are proteins. One of these proteins is the sperm receptor (the molecule which permits attachment of the sperm to the egg during the process of fertilization).

The PZP vaccine is derived from pig eggs (obtained from slaughterhouses). When this vaccine is injected into the muscle of the target female animal, it stimulates her immune system to produce antibodies against the vaccine. These antibodies attach to the sperm receptors on the ZP of her own eggs and distort their shape, thereby blocking fertilization .

Experimental PZP application on the wild horses of Assateague Island commenced in 1988, resulting in promising reductions in the pregnancy rates of mares: by 1994, population growth on Assateague began to stabilize solely through the use of PZP immunocontraception.

The PZP vaccine has gone through several formulations, however the most effective formulation is a one-year dose that must be re-administered annually; this formulation is about 90% effective. The vaccine is typically delivered by hand while the mare is restrained in a squeeze chute during a gather. Because it is not feasible to gather wild horse herds every year to administer the vaccine, the development of a single shot vaccine that would provide multi-year effectiveness and could be administered either remotely or by hand while the mares were restrained in a squeeze chute was needed.

The BLM, USGS and HSUS have been working together to develop such a vaccine. In the early 2000's, a timed released, pelleted formulation of the vaccine became available. This vaccine is formulated with pellets that dissolve at 1, 3, and 12 months and provide contraception for 22 months if administered 3 to 4 months prior to foaling. However, this vaccine still needs to be delivered by hand during a gather.

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Since 2004, the BLM has administered the pelleted vaccine to 2,746 mares in 76 out of 179 herd management areas, but significant reductions in the rate of population increase have not yet been apparent.

Population models suggest that a high percentage of mares within a herd would have to be treated in order to achieve stability or herd reduction. These population models have not yet been tested with data from western wild horses. Field data on the population effects of PZP have been reported for Assateague horses and for white tailed deer, but all of these studies have used vaccines that were administered annually.

Ongoing USGS studies of contraception at other herd management areas (Pryor Mountains, Little Bookcliffs, McCullough Peaks) were not designed to examine management –type population effect (where at least 50% or more of the mares are treated) and population data on other contracepted BLM herds are not being gathered with sufficient frequency or intensity to describe population dynamics in detail.

Published data on behavior of PZP-treated mares and bands that include PZP-treated mares are also scarce.

Behavioral data is being collected on the Pryor Mountains, Little Bookcliffs and McCullough Peaks HMAs, but again, less than 50% of the mares were treated and none were treated with the new 22-month heat extruded vaccine.

HSUS, through a grant from the Annenberg Foundation, wanted to conduct research on two wild horse populations.

In identifying the study herds, HSUS looked for the following characteristics:

The herds needed to model "typical" BLM management situations.

Each study population needed to consist of approximately 100-180 horses, including foals.

The study population needed to be accessible by vehicle and relatively approachable

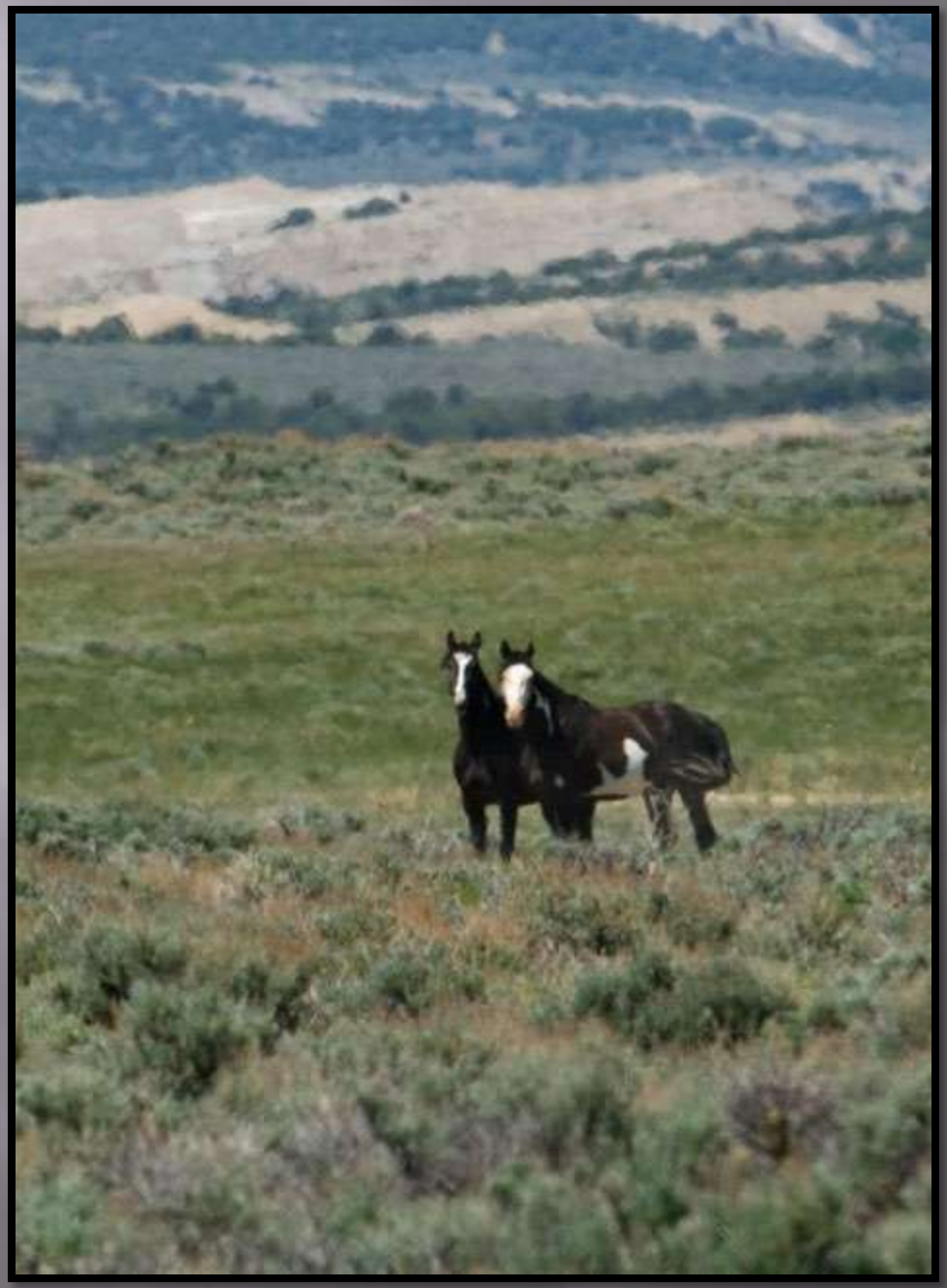
A study population with a lot of color variability would make it easier to identify individuals.

There should not be excessive interchange with other herd management areas.

The Sand Wash HMA in Colorado and the Cedar Mountain HMA in Utah most closely met these characteristics.

Objectives of the Study

- To answer the following questions:
- What are the effects of the 22-month PZP vaccine on the population's foaling and growth rates?
- What are the effects of a PZP booster administered remotely in year 3 on the fertility of individual treated mares and on the population's foaling and growth rates?
- What are the effects of PZP treatments on the health and social dynamics of treated bands?



- *Question 1* – What are the effects of the 22-month PZP vaccine on the population's foaling and growth rates?
- To answer this question, HSUS will collect data on the proportion of mares foaling each year, group composition, and population size in the two study populations. The results will be compared with data that are available from published sources and public records from other HMAs.

- *Question 2* – What are the effects of a PZP booster administered remotely in year 3 on the fertility of individual treated mares and on the population's foaling and growth rates?
- To answer this question, HSUS will dart with PZP as many previously treated mares as possible and collect data on foaling by individually-known boosted and unboosted mares, and on population size, proportion of mares foaling each year, and group composition.

Question 3 – What are the effects of PZP treatments on the health and social dynamics of treated bands?

To *answer this question, HSUS* will identify individual mares and stallions in the study herds, and foals born during the study.

They will visually examine known animals for abscesses and general health at each encounter, observe new foals, and record body condition scores.

HSUS will also collect data on group membership, intra- and inter-band aggression, courtship and mating behavior, and spatial relationships with bands. Data will be summarized and compared with published data on untreated wild horse herds and with the results of current USGS research.

Timeline

Summer 2008 – HSUS had an individual who spent the entire summer and fall collecting pre-gather baseline data on population parameters (foaling rates and seasonality, population size), foaling by individual mares, and social dynamics (band composition and membership).

■ Fall 2008 – Gather by BLM. 380 horses were gathered; 262 were removed; 118 were released; 62 mares were treated with the 22-month PZP vaccine

■ Spring/Summer/Fall 2009 – HSUS collected post-gather baseline data on population parameters, foaling by individual mares, and social dynamics (including changes in band composition, membership and behavioral data). Mares were monitored for responses to injection, including injection site reactions, lameness, etc.

■ Spring 2010 – First year of 2008 PZP treatment effects on foaling. HSUS observers examined any resulting changes in individual and population foaling rates and seasonality, population growth rates, individual condition and health, and social dynamics.

■ Fall 2010 – 2 HSUS employees attempted to remotely booster all 62 mares that were treated in 2008

■ Spring/Summer 2011 – Second year of 2008 PZP treatment effects on foaling. Observations as in 2010. Also monitoring responses to booster delivery, including injection site reactions, lameness, or disruption of social dynamics.

■ Spring 2012 – First year of 2010 booster effects on foaling. Observations as in 2010.

Status

- In mid-summer 2010, “soft” traps were constructed to in an attempt to cause the bands of horses to linger at water sources long enough for the target mare(s) to be darted.
- This technique failed as there were too many alternative water sources in the HMA and the horses moved to the sources that did not have the traps around them.

The 2 HSUS employees have been able to deliver the booster to 50 mares by walking to within an average range of 27 yards.

The gun in these pictures was used to dart 17 horses and had a range of 20 yards. 33 horses were darted with a CO2 gun which had a range of 10-50 yards.

Summer of 2009 saw 58 foals born to 79 mares (62 treated mares and 17 untreated mares). The PZP was not supposed to effect foaling rates in 2009 and it does not appear that it did.

As of July 2010, 23 out of 62 treated mares had foals (37%)and 12 out of 17 non-treated mares had foals (79%). By the end of the summer and fall, a total of 44 foals had been born in the Sand Wash herd area; HSUS has not reported final foaling percentages of treated versus untreated mares.

It's important to note that the final numbers have not been summarized nor analyzed by HSUS. In other words, it is too early to draw conclusions.

Decreasing the number of foals born each year will decrease the number of horses that have to be removed from the range and placed either into the adoption program or long-term holding.

The BLM believes that there is potential for savings in reduced removal and holding costs through the use of fertility control in wild horses.

Secretary Salazar has indicated in his Wild Horse and Burro Initiative that he wants to see the "aggressive use of fertility control" on western public lands.

The BLM will be conducting 11 gathers in 2011 for the primary purpose of applying a fertility-control vaccine to mares. These types of gathers are called CTR gathers for "catch, treat, and release,". PZP -22 will be given to approximately 890 mares, which will then be released back areas from which they were gathered.

In summary, the LSFO would like to believe that by providing HSUS the Sand Wash herd to conduct their research, the BLM and the wild horses will ultimately benefit from the development of a long lasting fertility control vaccine and a reliable method of delivery. It is also our hope that through this research, it will be proven that the vaccine is safe, effective and not detrimental to the social and behavioral characteristics of the horses.