

N-1615

April 22, 1994

Wildlife Resource Specialist

Summary of the 1994 Feral Horse Fertility Management Program

On January 25, 1994, park staff met with Dr. Brian Underwood to discuss the application of the pony population modeling which was developed by Underwood and Randy Downer, Applied Biomathematics.

That model based population projections on known historic genealogy, fecundity and mortality, and density dependent birth and survival correlations. Five variables were programmed into the model to account for "losses" which could affect growth rate: unique losses from winter season events (storms), adult (problem) horse transfers occurring prior to breeding/foaling season, fertility control treatments that affect subsequent years' production, annual catastrophic and/or chronic losses.

Model simulations which factored in modest natural mortality indicated a continued rise in the population over the next decade. Recent park monitoring and research data indicates an increase in the extent of horse grazing impacts. In order to reduce the ongoing grazing impacts and to stabilize the herd population at, or near, the current stated management goal of 150 horse maximum, several management alternatives were proposed.

An Environmental Assessment was prepared to assess management alternatives for the current year. The approved alternative was to treat all mares with a single dose of the immunocontraceptive for one year, the goal being to suppress population growth in 1995.

The January 1994 horse population was approximately 164, of which 80 were mares of breeding age. Four mares were excluded from treatment: T6, N6H, and M6I have all been recently taken off of long-term immunocontraceptive treatments and are being monitored to verify the reversibility of long-term treatment. M4J is the only remaining mare of a bloodline with a high rate early-age mortality.

Of the 76 adult mares available for treatment, 28 were previously part of the immunocontraception research. For these mares, the single shot would act as a booster to the immune system and should provide near 100% effectiveness. The single shot vaccine for the remaining 48 mares would be less effective. Research on western horses reported that an initial single shot dose could

provide contraceptive effectiveness of up to 70% of treated mares. Note that recent records indicate that only about 50% of mature mares breed successfully each year. With a best-case scenario, we should expect at least 10 births during the 1995 foaling season. Based on an expected 27 births in 1994 and a herd-wide 10% annual mortality rate, the 1995 summer population could be as high as 180. Although this would be an all-time high, it is actually only slightly above the summer 1993 high of 176. According to the population model, the 1994 treatment appears to at least stabilize the present population. The treatment also conditions all reproductive age mares for the future use of immunocontraceptives.

Dr. Jay Kirkpatrick, Jack Kumer, Allison Turner and Grace Bottitta have all received training in special weapons use and completed the park's special weapons qualification course. The lcc darts used to inject the vaccine are delivered by blow gun, CO₂ pistol and 22 caliber charged rifle (Pneu-dart system). The blow gun and pistol have a functional range of 12 meters, the rifle to 35 meters.

The dart contains a cap charge which explodes on impact, driving a plunger forward thus ejecting the vaccine. The lcc of vaccine is mixed immediately before loading into the dart. It is made by mixing equal amounts of the PZP (5000) drug and Freund's adjuvant. The adjuvant stimulates the immune system, increasing the effectiveness of the drug.

Darting began on March 3 and continued through March 21, with 15 actual field days. Kirkpatrick, Turner and Bottitta were the primary administrators. Dr. Kirkpatrick concentrated early darting on mares still part of his ongoing research, and habituated roadside horses. Turner and Bottitta concentrated on first-time animals, primarily on the southern portion of the range. Daily results were:

3/3:	2	3/4:	14	3/5:	4	3/6:	6	3/7:	6
3/8:	7	3/9:	5	3/10:	6	3/11:	11	3/13:	2
3/14:	2	3/15:	4	3/18:	4	3/19:	1	3/21:	2

The successful darting of 76 horses in 15 days was a combination of good luck and good shooting. The 1/3 which had been previously treated normally take time because of their wariness of the researcher carrying the darting weapons. Although first time animals are not as wary of dart guns, they tended to be more cautious of humans in general and of humans venturing into the interior and marsh habitats during winter months. Probably the biggest advantage was that all of the horses were accustomed to seeing either Turner or Bottitta during our monthly horse surveys, and were not threatened by their approach.

During the course of treatment, only 5 doses of the drug were lost (darts misfired or only partially discharged) and five darts were not recovered from the field.