

Reining in the Wild Horses

Management of the growing mustang population on federal lands has been a controversial issue. A suggested method for controlling overpopulation is to sterilize the dominant male in each group. Eagle, Asa, and Garrott et al. (1993) conducted an experiment evaluating the effectiveness of sterilizing the dominant males as a way to reduce foaling (birth) rates for 2 or more years.

The researchers chose two Herd Management Areas (HMAs), Flanigan in northwestern Nevada and Beaty Butte in southeastern Oregon, for this study. In December 1985, they rounded up the horses in bands and counted all individual horses, determined their sex, and estimated their ages by looking at tooth wear. They photographed all horses three years old or older and fitted them with numbered collars to assist in identification throughout the study. They identified the dominant male in each band, vasectomized it, and fitted it with a radio-transmitting collar. Finally, they released the band as a group. Between June 1986 and July 1988 they attempted to locate each sterilized male 3-4 times a year by aerial survey from helicopter. The researchers recorded the number of adults and foals in each group containing a sterilized male (treated groups), and in the groups without a sterilized male (untreated groups).

While the researchers could not record actual birthrates in the bands of horses, the number of foals per 100 adults in each band is a good substitute.

Use what you know about statistics to analyze the data and determine if the method described above was effective. Explain your findings. (For example, you could construct box and whisker plots of the treated and untreated groups of horses.)

Reference: Eagle, T. C., Asa, C., and Garrott, R. et al. (1993), "Efficacy of Dominant Male Sterilization To Reduce Reproduction in Feral Horses," *Wildlife Society Bulletin* , 21(2), 116-121.

Variable Names:

Adults: total number of adults in the group

Sterile_Males: number of sterilized males counted in the group

Foals: number of foals counted in the group

Year: Year

Location: F if in Flanigan Herd Management Area; B if in Beaty Butte Herd Management Area

Date: date of the observation

Treatment: 1 if sterilized group; 0 if untreated group

Adults	Sterile Males	Foals	Year	Location	Date	Treatment
232	0	28	1986	F	8-Jun	0
172	0	18	1986	F	17-Jul	0
136	0	16	1986	F	13-Aug	0
127	0	20	1986	B	14-Jun	0
118	0	20	1986	B	18-Jul	0
115	0	20	1986	B	14-Aug	0
226	0	39	1987	F	9-May	0
197	0	34	1987	F	3-Jun	0
143	0	26	1987	F	17-Jun	0
159	0	17	1987	B	10-May	0
139	0	22	1987	B	4-Jun	0
169	0	28	1987	B	18-Jun	0
173	0	32	1987	B	17-Jul	0
243	0	28	1988	F	5-May	0
240	0	27	1988	F	19-May	0
180	0	24	1988	F	16-Jun	0
192	0	27	1988	B	9-May	0
170	0	27	1988	B	20-Jun	0
178	0	37	1988	B	20-Jul	0
52	9	7	1986	F	8-Jun	1
36	5	3	1986	F	17-Jul	1
25	5	6	1986	F	13-Aug	1
69	13	17	1986	B	14-Jun	1
65	10	14	1986	B	18-Jul	1
60	12	14	1986	B	14-Aug	1
35	7	1	1987	F	9-May	1
31	3	1	1987	F	3-Jun	1
63	9	2	1987	F	17-Jun	1
53	8	7	1987	B	10-May	1
57	9	6	1987	B	4-Jun	1
40	7	1	1987	B	18-Jun	1
36	8	3	1987	B	17-Jul	1
30	5	1	1988	F	5-May	1
36	5	1	1988	F	19-May	1
65	5	2	1988	F	16-Jun	1
44	8	2	1988	B	9-May	1
45	8	2	1988	B	20-Jun	1
38	8	5	1988	B	20-Jul	1