

MEMORANDUM

Date: July 7, 1996

Reply to

Attn of: Wildlife Biologist, Fort Niobrara NWR Original to RH, cc to MC

Subject: 1996 Prairie Grouse Breeding Ground Count Results and
Discussion of Results 1956-Present.

To: Refuge Manager, Fort Niobrara/Valentine NWR Complex

PROCEDURES:

Annual prairie chicken and sharp-tailed grouse breeding ground counts were conducted 12 mornings during the period April 1 - 27, 1996 on Fort Niobrara NWR. Initial counts were conducted by Wildlife Biologist McPeak with follow-up counts conducted by Seasonal Employees Jarrod Lee and Amy Buckmeier. Refuge units south and east of the Niobrara River (count area = ~14,000 acres) were thoroughly searched for booming/dancing grounds from approximately 30 minutes before local sunrise time to 1 hour after sunrise. If birds were heard or seen, the ground was located and a count conducted. Leks located on private ground adjacent to the refuge were also counted. The count area was searched again during follow-up counts to assess Biologist McPeak's ability to accurately detect/locate grounds with impaired hearing. In past, follow-up counts were only conducted of new grounds or traditional grounds with low bird activity.

RESULTS:

Twenty-three prairie chicken males were counted on 3 leks this spring which is a 47% decrease from last year (48 males counted on 5 leks) and 46% less than the 10 year average of 49.5 males. Sharp-tailed grouse numbers also decreased from 1995 with 50 males counted on 6 grounds (1995 results: 73 males counted on 6 grounds), however, this year's results are similar to the 10 year average of 51.2 males. Refer to Attachment 1 for a summary of lek count results 1987-1996.

Surveys conducted by both the wildlife biologist and seasonal employees produced similar results suggesting that low prairie grouse numbers are due to population declines and not survey error. No significant changes in refuge management occurred in 1995 to cause a decline in grouse populations suggesting that "other factors" were to blame. Prairie grouse harvest data collected in the sandhills region last fall suggested poor reproduction for prairie chickens and minimum production for sharp-tailed grouse. Although none of the data were collected near Fort Niobrara, harvest information along with the observation of little to no wild

fruit production on Fort Niobrara (due to multiple spring blizzards in 1995) suggest possible reasons for declines in prairie grouse numbers.

DISCUSSION:

Breeding ground counts have been conducted in Fort Niobrara units south and east of the Niobrara river since 1956. Surveys were initiated in this area in conjunction with the prairie grouse management study conducted by Merrill Hammond 1956-1963. At the beginning of the study all refuge land in the study area was grazed or hayed. Land use changes began in 1956 with the withdrawal of land from continued/annual use to non-use, refuge haying only, or "light" grazing by bison or longhorns. According to Hammond, the "combination of rapidly increasing amounts of idle grassland and favorable conditions for reproduction resulted in a rapid build-up in grouse numbers between 1956 and 1959." The substitution of bison grazing for idle in Units 28A and 28B beginning in 1963 did not depress the grouse population according to Hammond, however, he questioned what levels the grouse populations might have reached if this block had been left idle. Hammond believed that cover determined the average population size, but other factors (ie. weather) operated equally in good and poor habitat to cause similar rates of annual population change.

From 1963 to the late 1980's, prairie grouse populations on Fort Niobrara cycled with no apparent relation to fenced animal/grassland management programs. In comparing breeding ground survey data from Nebraska Game and Parks Commission routes in the sandhills 1978 to present with Fort Niobrara data, sharp-tailed grouse and prairie chicken populations experience similar changes. Both Fort Niobrara and the NGPC document the long-term decline of sharp-tailed grouse beginning in the early 1980's and the increase in prairie chicken numbers in the mid 1980's. Also, the winter of 1983/84 had significant negative effect to prairie grouse populations throughout the sandhills. Drought conditions in 1989 and 1990 caused declines in grouse populations on and off Fort Niobrara, however, the rate of decline on the refuge is much greater suggesting that a factor specific to Fort Niobrara was also affecting grouse populations. Data collected the past 5 years on NGPC routes suggest that the prairie chicken population is increasing while the sharp-tailed grouse population has stabilized at its current low level. Also, the number of male prairie chickens counted on state routes is ~5 times greater than the number of sharp-tailed grouse. Fort Niobrara data differs and suggests that both the prairie chicken and sharp-tailed grouse populations have stabilized at lower levels and the number of sharp-tailed grouse exceed the number of prairie chicken. (Refer to numerous attached graphs and charts for specific information.)

Changes to the fenced animal program beginning in the late 1980's that may have affected prairie grouse populations on Fort Niobrara include number of bison, number of longhorns, and grazing program. The bison herd was increased from ~225 animals beginning in 1986 to its current level of ~400 animals (winter population) in 1992.

Longhorns were increased beginning in 1989, peaked in 1991 at 370 head, and then decreased to their current winter level of ~258 animals. Beginning in 1988, spring use of habitat units 34, 35, 38, and 39 changed from no use to one week grazing by the main bison herd, and grazing of units 28A and 28B went from season long to short duration during the summer/early fall grazing period. Forage utilization in the lek count area 1988 - 1994 averaged 6079 AUM's with an average 1336 AUM's supplemented with hay in comparison to the previous 10-year average of 3341 AUM's utilized with an average 993 AUM's supplemented with hay. Forage utilization peaked at 6750 AUM's in 1992 and then declined. Forage utilization within the lek count area was 5931 AUM's in 1995. (Refer to attached graphs of fenced animal populations and grazing summaries for specific information.)

Numerous studies have documented the affect of grazing/forage removal to ground nesting birds that require medium-tall residual cover. According to habitat suitability index models, the lack of residual cover for nesting and brood-rearing is the most limiting factor for sharp-tailed grouse and prairie chicken populations, however, the sharp-tailed grouse suitability index model states "pastures that are not uniformly grazed can provide minimum cover for nesting." Kohn(1976) measured vegetation at sharp-tailed grouse nest and brood sites in North Dakota using visual obstruction readings(VOR) and found VOR's at nest sites in the spring averaged >1.5dm (5.91 inches). Because the average height of visual obstruction at nest and brood locations was consistently higher than in the surrounding vegetation, Kohn (1976) concluded that complete visual obstruction to an average height of 1.1dm (4.33 inches) within a pasture in the spring would provide sites of taller cover adequate for nesting and brood rearing. On Fort Niobrara, complete visual obstruction along 13 transects within the lek count area averaged 1.72" in mid May, 1996. Habitat unit 33 had the highest average reading of 2.98" with switchgrass areas recording +10" in visual obstruction. Although most of the 325 readings taken in the lek count area were 1 - 2 inches in height, areas of taller vegetation were present indicating the nonuniform grazing and potential for providing adequate cover for prairie grouse nesting and brood rearing. Recent breeding ground counts suggest that nesting and brood rearing conditions have changed from what they were 10-15 years ago on Fort Niobrara, however, the lack of grassland monitoring data (documentation of residual vegetation) prior to 1991 and minimal data collected since prevents defendable conclusions from being made as to what the "current picture" is, and how it is different from the past.

Literature Cited:

KOHN, S.C. 1976. Sharp-tailed grouse nesting and brooding habitat in southwestern North Dakota. M.S. Thesis. South Dakota State Univ., Brookings. 41 pp.

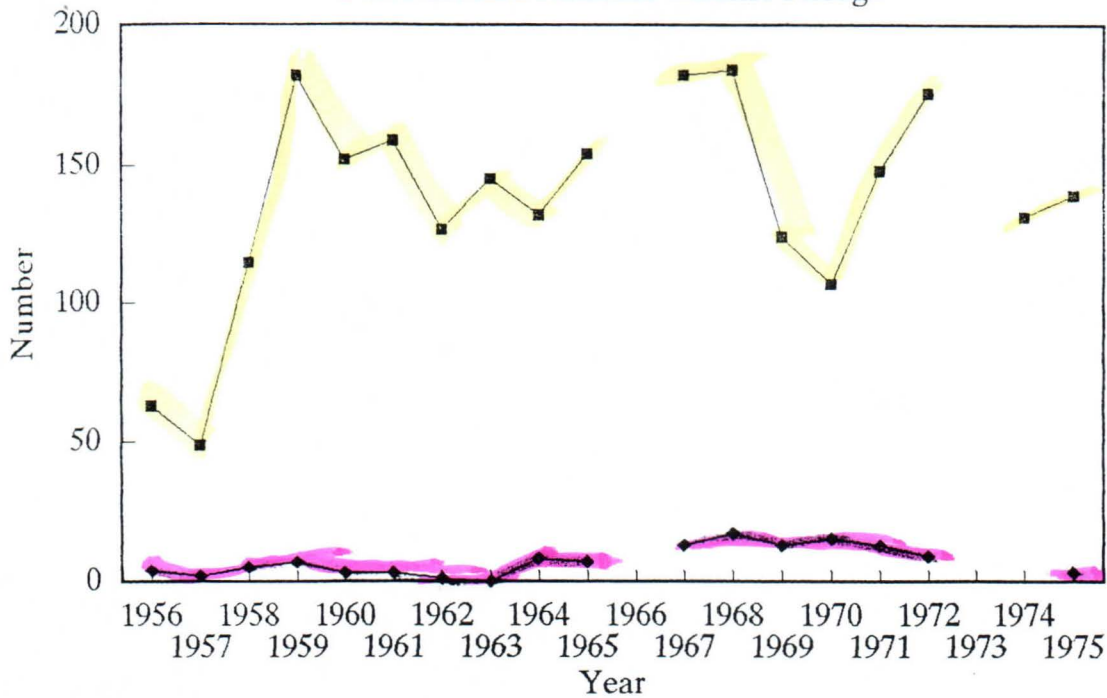
Prairie Grouse Lek Count Results
 Fort Niobrara National Wildlife Refuge
 1987-1996

Year	Sharp-tailed Grouse			Prairie Chicken		
	# Males	# Leks	Males/Lek	# Males	# Leks	Males/Lek
1996	50	6	8.30	23	3	7.6
1995	73	6	12.16	48	5	9.6
1994	49	4	12.25	40	9	4.4
1993	39	4	9.75	45	8	5.6
1992	37	4	9.25	28	5	6.4
1991	51	4	12.75	48	6	8.0
1990	36	3	12.00	42	7	6.0
1989	36	4	9.00	88	13	6.7
1988	90	9	10.00	73	11	6.6
1987	51	5	10.20	60	7	8.6

1997	53	5	10.6	35	9	3.8
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Lek Count Results 1956 - 1975

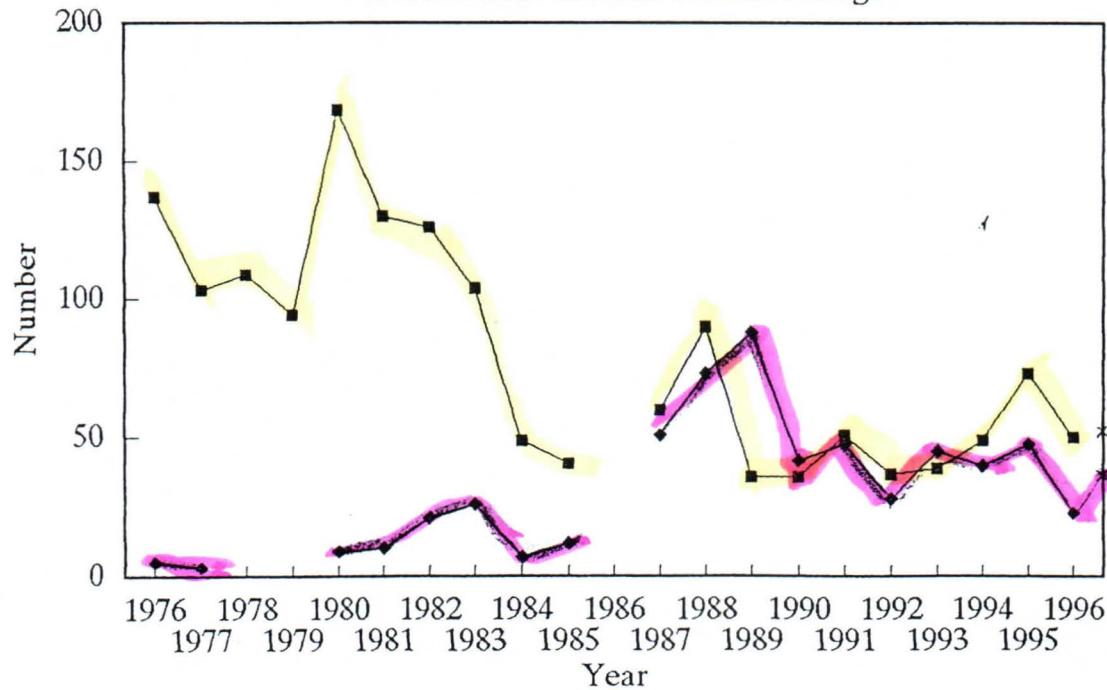
Fort Niobrara National Wildlife Refuge



■ # Sharp-tailed Grouse Males ◆ # Prairie Chicken Males

Lek Count Results 1976 - 1996

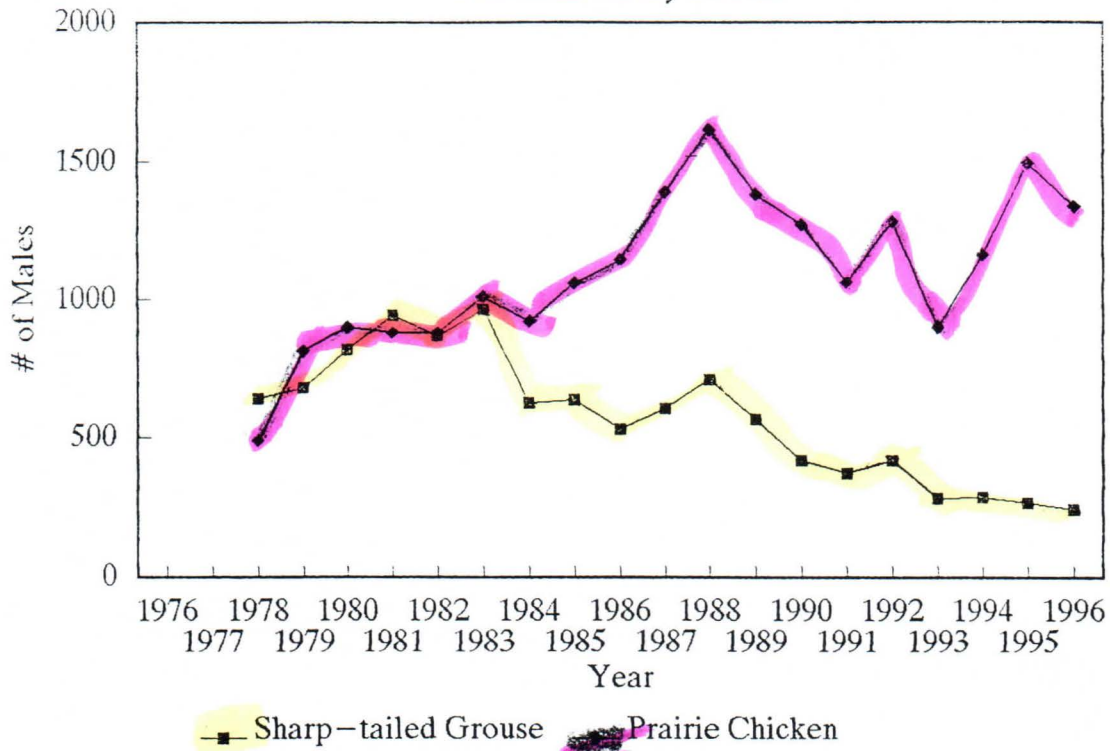
Fort Niobrara National Wildlife Refuge



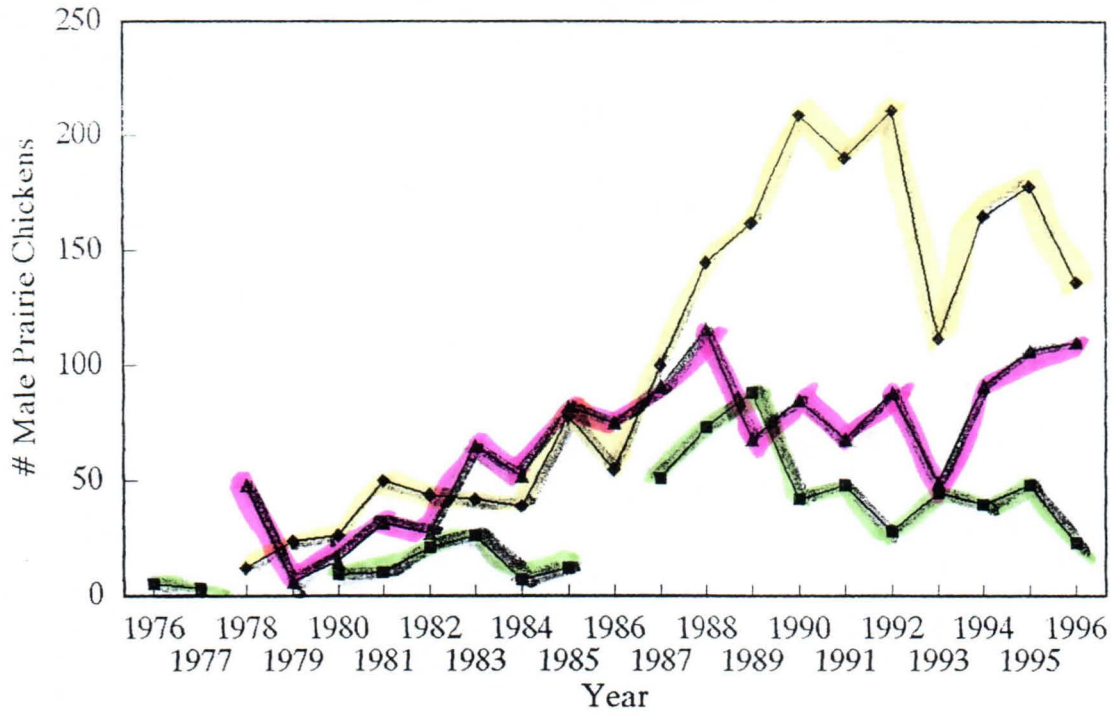
■ # Sharp-tailed Grouse Males ◆ # Prairie Chicken Males

Lek Count Results 1976–1996

Nebraska Survey Routes



Prairie Chicken Count Results 1976–1996

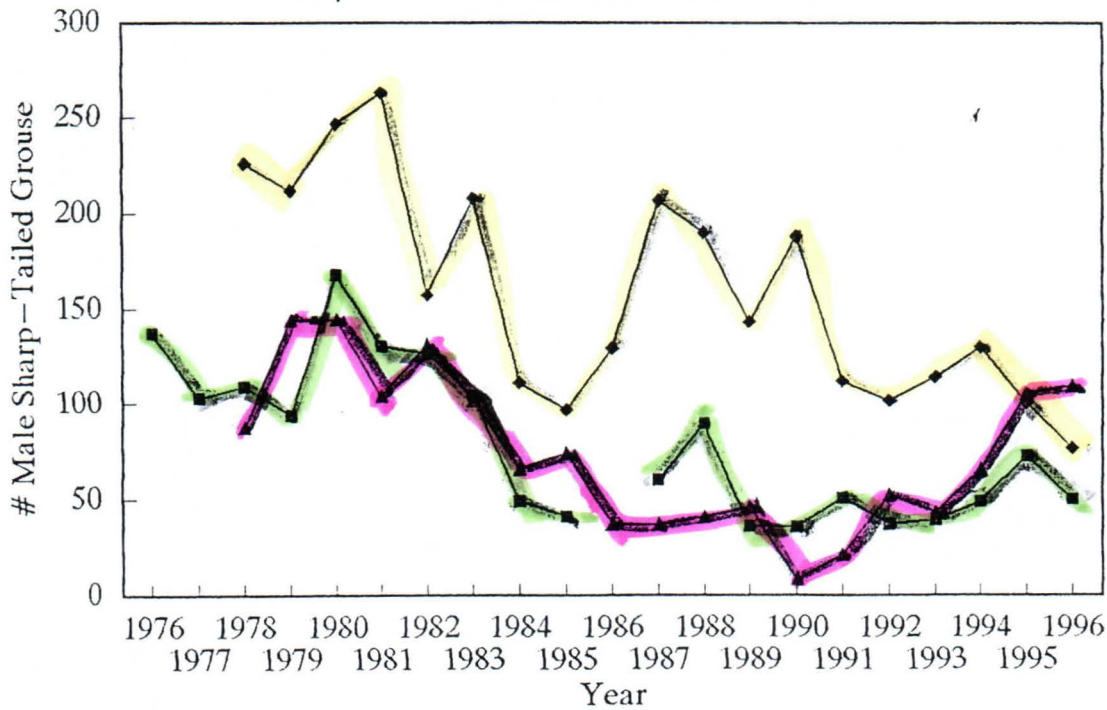


Fort Niobrara NWR

Valentine NWR (State Survey)

Johnstown Count (State Survey)

Sharp-Tailed Grouse Count Results 1976–1996

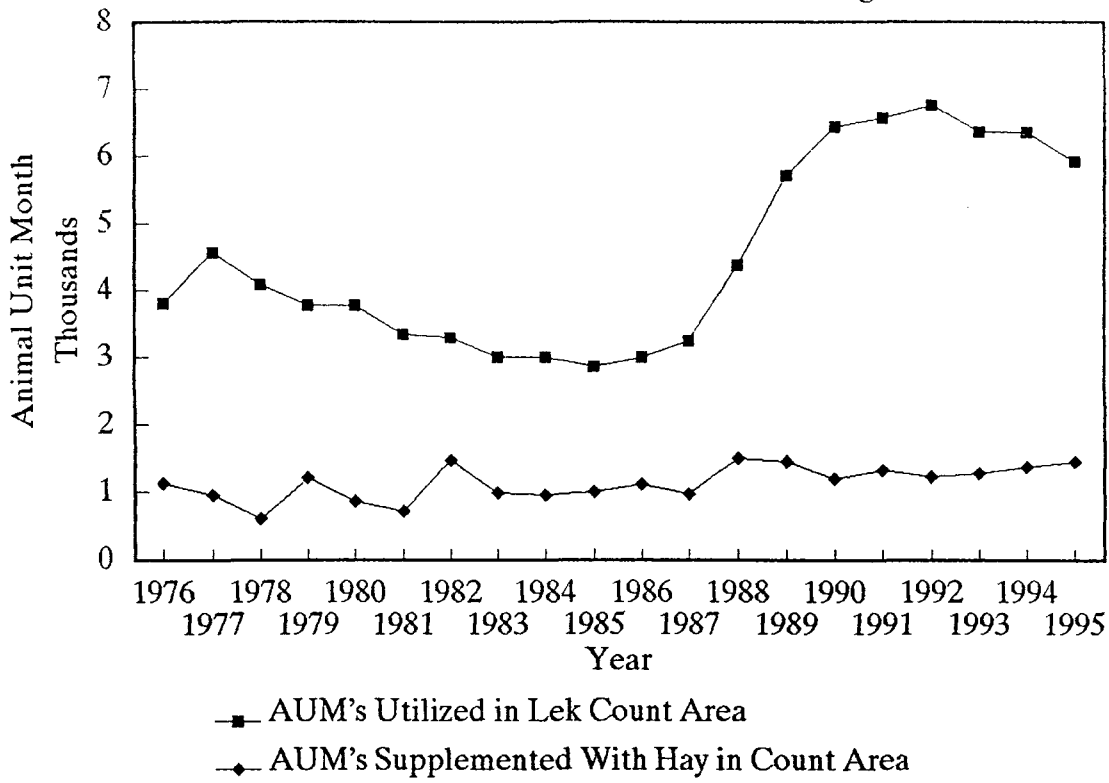


Fort Niobrara NWR

Valentine NWR (State Survey)

Johnstown Count (State Survey)

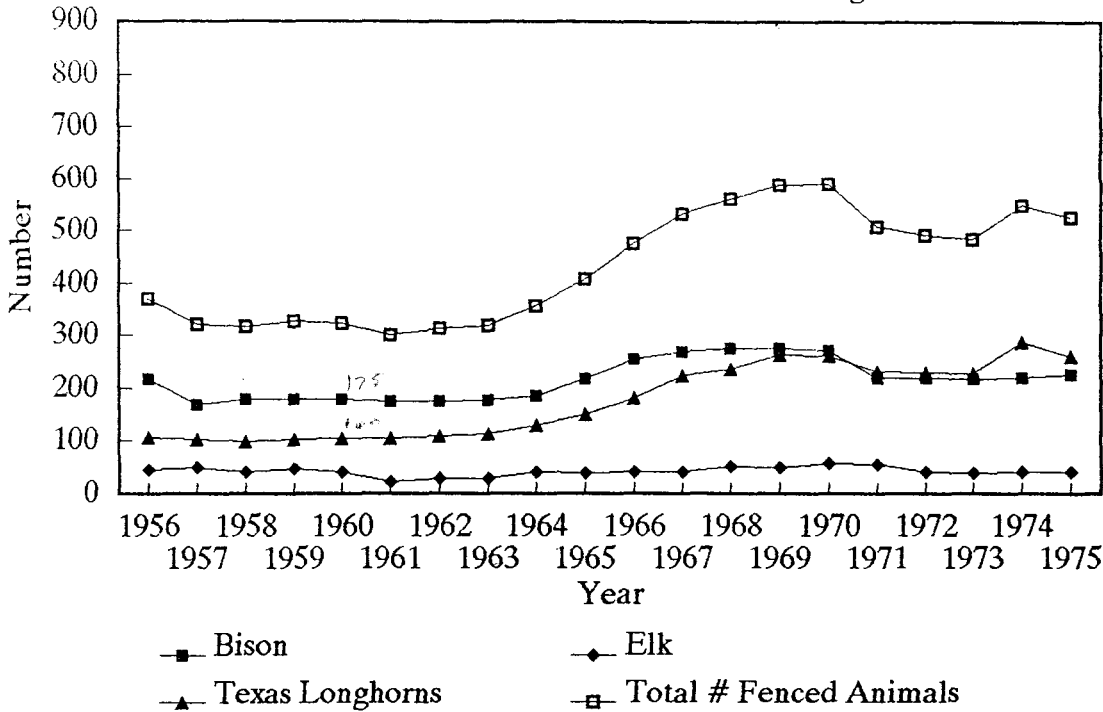
Fenced Animal Forage Utilization 1976-1995
Fort Niobrara National Wildlife Refuge



Minimum AUM's (forages removed from area by grazing)

Fenced Animal Populations 1956–1975

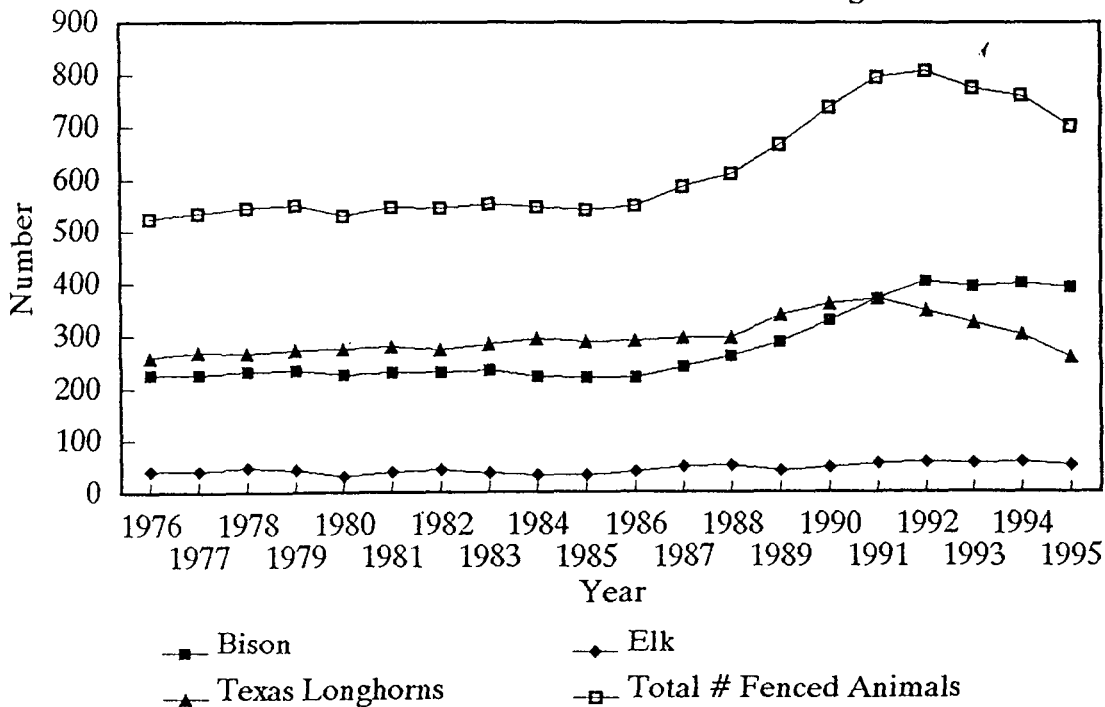
Fort Niobrara National Wildlife Refuge



Winter Population (December of that Year)

Fenced Animal Populations 1976–1995

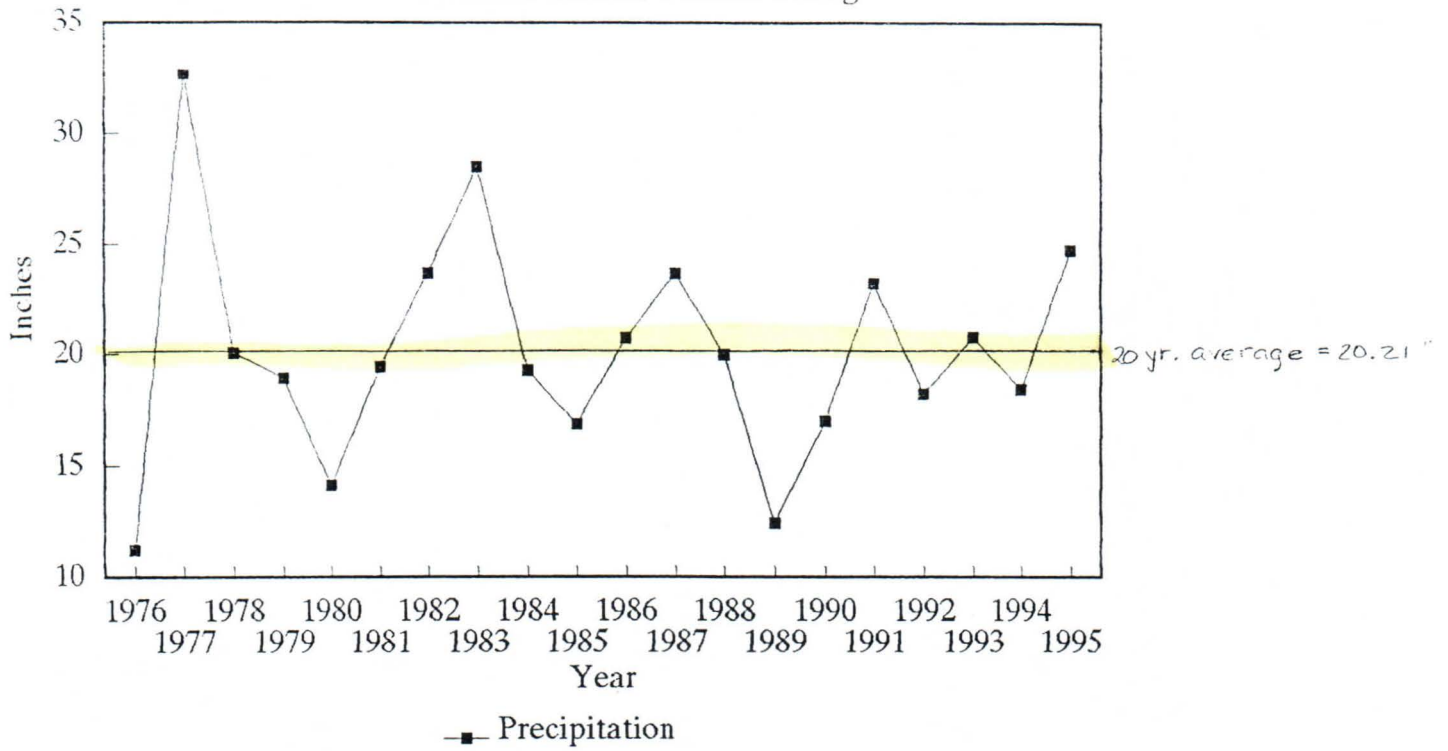
Fort Niobrara National Wildlife Refuge



Winter Population (December of that Year)

Annual Precipitation 1976–1995

Fort Niobrara National Wildlife Refuge



Average Visual Obstruction Readings* in Lek Count Area
Fort Niobrara National Wildlife Refuge
1991-1996

Habitat Unit	1991		1992		1993		1994		1996	
	SP	FA	SP	FA	SP	FA	SP	FA	SP	FA
16a	1.42	3.14	1.29	1.73			1.48	1.57	1.40	
16b1	1.16	1.88	1.14				1.62	1.18	1.28	
27	.91	2.43	.95				1.64		1.35	
28a1	1.32	1.96	1.43			1.48	1.30	1.25	1.46	
28a4	.88	1.05	.71			.92	.86		1.16	
28b2	.95	2.25	1.10			1.74	1.46		1.47	
28b3	1.92	3.02	1.51			2.28	1.42		1.89	
29	1.58	2.75	1.58				1.26		1.32	
33	2.27	5.91	2.13				2.48		2.93	
35	2.10	4.77	2.87				2.21		2.45	
36b									1.72	
37a	1.48	3.82	2.25				2.15		2.33	
38	1.44	3.49	1.71				1.55		1.60	

*Readings are in inches. Spring(SP) readings were taken the second week of May. Fall(FA) readings in 1991 & 1992 were collected in August and the other years in October or November.

*Robby McPeak
includes this*

LITERATURE CITED

- Adrian, W. J., and R. E. Keiss. 1977. Survey of Colorado's wild ruminants for serologic titers to brucellosis and leptospirosis. *J. Wildl. Dis.* 13:429.
- Aune, K. 1995. Wildlife Laboratory, Annual Report. Montana Department of Fish, Wildlife and Parks. 68pp.
- Barton, C. E. 1991. Human brucellosis: USDA brucellosis training course. Columbus, Ohio, March 4-6, 1991.
- Beale, V. C. 1995. Meyer and Meagher manuscript: statistical and scientific validity. Letter to R. Botzler, Editor, *J. Wildl. Dis.* 6pp.
- Beatson, N. S. 1985. Tuberculosis in red deer in New Zealand. Pages 147-150 in P. F. Fennessy and K. R. Drew, eds. *Biology of red deer production*. Royal Soc. New Zealand.
- Berger, J. 1996. Scenarios involving genetics and population size of bison in Jackson Hole. Unpublished report to Grand Teton National Park, Moose, Wyo. 21pp.
- Berger, J. and C. Cunningham. 1994. *Bison: mating and conservation in small populations*. Columbia University Press, New York. 330pp.
- Blood, D. C., J. A. Henderson, and O. M. Radostits. 1979. *Veterinary Medicine*. Lea and Febinger, Philadelphia. 1135pp.
- Boyce, M. S. 1989. *Elk management in North America: the Jackson herd*. Cambridge Univ. Press, Cambridge. 306pp.
- Boyce, M. S. 1995. Brucellosis and the future of Greater Yellowstone: Summary of the National Brucellosis Symposium, September 27-28, Jackson, Wyoming. *Yellowstone Science* 3(1):15-16.
- Bridgewater, D. R. 1989. Parker Land and Cattle Co. Epidemiology, Brucellosis reactor herd, Dubois, Wyoming. Potential source(s). USDA Report. 29pp.
- Carbyn, L. N., S. M. Oosenbrug, and D. W. Anions. 1993. Wolves, bison, and the dynamics related to the Peace-Athabasca Delta in Canada's Wood Buffalo National Park. Canadian Circumpolar Institute, Univ. of Alberta, Edmonton.
- Carter, G. R. 1982. Whatever happened to hemorrhagic septicemia? *J. Am. Vet. Med. Assoc.* 180:1176-1177.
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