



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ft. Niobrara-Valentine National Wildlife Refuge Complex

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BISON BRIEFING PAPER D.O.I. Bison Meeting, Billings MT March 10-12, 1999

Refuge Purpose and General Description

Fort Niobrara National Wildlife Refuge was established by Executive Order in January, 1912 as a preserve and breeding ground for native birds. Through donation document, administrative memorandum and correspondence from the Secretary of Agriculture and Chief of the Bureau of Biological Survey, the Refuge's purpose was expanded later that same year to include the preservation of bison and elk herds representative of those that once roamed the Great Plains.

The 19,131 Refuge is located in north-central Nebraska along the Niobrara River and consists of ~74% sandhill and mixed-grass prairie; 16% ponderosa pine savanna and forest; 7% eastern deciduous/northern boreal forest; 2% river, streams and ponds; and 1% administrative sites.

Bison Management

Bison were reintroduced to Fort Niobrara in 1913 with the donation of six bison (sex unknown) from J.W. Gilbert of Friend, Nebraska and the transfer of two bulls from Yellowstone National Park. Additional introductions were made in 1935 (4 bulls, Custer State Park), 1937 (4 bulls, Custer State Park), and 1952 (5 bulls, National Bison Range) to minimize inbreeding and maintain the herd genetically as close as possible to bison surviving the bottleneck of near extinction. Management policy/philosophy implemented over the years has been to maintain a representative herd under reasonably natural conditions in numbers sufficient to ensure their continued existence. More specific management goals have been to (1) maintain a genetically viable population, (2) provide appropriate viewing opportunities for public enjoyment, and (3) support that level of scientific study feasible within the management of a representative herd.

Management actions implemented over the years have evolved and changed to reflect the knowledge, philosophy, and policy of maintaining a representative herd of bison where population size and natural movements are affected by fence. Population characteristics, such as age and sex ratios, have been managed to approximate wild, free-roaming herds recognizing the ecological and biological importance of these factors on herd health, genetics, behavior, grazing and non-grazing impacts to their habitat. The bison herd has been managed under a controlled grazing program since 1913, however, the intensity has varied from a two-unit rotation on 5,000 acres in the early years to the current program of a 17-unit rotation on 14,000 acres. Herd levels have varied over time based on habitat availability, carrying capacity, use by the various species, genetics, and consideration of public viewing opportunities. Winter population levels numbered less than 200 during the period 1940 - 1964, approximately 200-300 bison from 1965-1985, 300- 400 bison in recent years with the herd currently consisting ~356 bison. Age composition is basically descending pyramidal with the oldest bison on the refuge approximately 20 years old. In the sub-adult age classes, the sex ratio is approximately 1:1, while in the older age classes, females outnumber males slightly. Breeding occurs under natural conditions without manipulation of bulls or cows. The average calving rate during the past 25+ years for 3 year-old and older females is 80%, however, in recent years, the calving rate has averaged 90%. Mortality has been minimal with an average of 5-7 fatalities documented each year.

Bison have been rounded-up annually since the early 1930s to remove surplus, complete various health tests, vaccinate, and/or mark animals. Number of bison surplused each year is based upon the approved herd level and production. Calf and yearling age classes are each reduced by ~50% with weights (correlated to age and

condition), appearance, and health factors used to differentiate potential surplus and keepers with final determination made in a random manner to the extent possible. Criteria used to select surplus bison in the two-year-old and older age classes include health, condition, and reproductive success with efforts made to random cull where possible across the herd (not in one cut or a specific class). A total of 132 bison were surplus in October 1998 with 92 bison sold for \$171,325 through live animal auction, 33 donated to the InterTribal Bison Cooperative, 4 bison donated to zoos, and 3 bison transferred to Neal Smith NWR.

Population monitoring and use of information for herd management over the years has been possible due to a marking program. Bison were branded with a single digit signifying year of birth beginning in the 1930s and was changed in the 1980s to a 4-digit number representing year of birth and individual (ie. 9803). The brand is seldom noticed by public visitors due to its relatively small size and location (behind the hip bone parallel to the backbone), however, a trained observer can read it using binoculars. The marking system has facilitated recent field research and minimized the impact on bison being studied.

Bison Disease and Vaccination History

Fort Niobrara bison have been maintained in good health with disease not a significant problem. Periodic testing of surplus bison for various diseases including brucellosis, tuberculosis, leptospirosis, anaplasmosis, and/or blue tongue has been accomplished since 1940. Leptospirosis was diagnosed in approximately 12% of the bison tested in 1962 which resulted in a 2-year vaccination program for this disease. The entire bison herd tested negative for brucellosis in 1965 and was declared brucellosis-free in 1974 by the State of Nebraska. Annual testing of surplus bison during the past 30+ years have shown the herd to be negative for the various diseases.

Brucellosis vaccinations began in 1941 with male and female yearlings inoculated. In subsequent years, bison were vaccinated as calves and eventually only females were vaccinated. Bison were not vaccinated against brucellosis 1971 to 1982. Since 1983, all age eligible heifer calves have been vaccinated with *Brucella abortus* Strain 19 with the exception of 1996 when RB51 was used.

Bison calves have been vaccinated in the fall for hemorrhagic septicemia, blackleg, and malignant edema as part of standard accepted health management practices for fenced bovines since the late 1960s.

Management Partners

USDA Natural Resources Conservation Service: Range condition surveys, determination of carrying capacity, assistance with spring and fall roundups and auction.

USDA-APHIS: Disease testing of surplus animals.

State of Nebraska Veterinarian: Compliance with regulations, technical assistance on state disease issues and concerns, general animal health.

National Park Service: Assistance with spring roundup.

Nebraska Game and Parks Commission: Assistance with spring and fall roundups.

Agreements with Native Americans

InterTribal Bison Cooperative: Donate up to 25% of surplus bison (representative sex and age).

Status of Plans and NEPA Compliance

Fort Niobrara's DRAFT Comprehensive Conservation Plan (CCP) will be out for public review this spring. A bison management plan will be completed as a step-down plan of the approved CCP.

Current Policy Controversies or Unresolved Issues

Bison managed for population conservation objectives, as a native prairie management "tool", or both.

Ecological effects of various sex and age compositions.

Disease management as it relates to herd health and compliance with state and federal veterinary regulations.

Extent of genetic diversity in different public herds, long-term genetic monitoring protocol and use of information for management decisions.

Litigation Status and History

None

On-Going Research and Monitoring Activities

Biosafety of Calfhood Vaccination with *Brucella abortus* Vaccine Strain RB51. (Thomas Roffe, D.V.M./Ph.D. with U.S.G.S., National Wildlife Health Center, Bozeman, MT)

Responses of Bison to Calfhood Vaccination with *Brucella abortus* Strain RB51; Effect of Dose on Clearance, Clinical Responses, Efficacy and Biosafety. (Steven Olsen, D.V.M./Ph.D., U.S.D.A. Agricultural Research Service, Ames, IA)

Management Implications of Genetic Variability Among and Within Populations of American Bison. (Julie Schneider, M.S. Candidate, Humboldt State University, CA)

Briefing paper presented for Royce Huber, Refuge Manager, by James Sellers, Supervisory Refuge Operations Specialist.

KM 3/09/99