

Bison Quarantine Feasibility Study

Interim Summary

April 2012



Background:

In the negotiations and hearings held in the development of the Interagency Bison Management Plan, the agencies were instructed to examine the feasibility of bison quarantine. The Uniform Methods and Rules (UM&R) for Brucellosis Eradication contain a protocol for the quarantine of bison from Yellowstone and Grand Teton National Parks in order to qualify the animals as brucellosis-free.

Purpose of BQFS:

The purpose of the BQFS is to determine the feasibility, efficacy, and associated risk of utilizing the protocol for bison quarantine set forth in the UM&R to qualify bison from Yellowstone National Park (YNP) as free of brucellosis.

1st Cohort Statistics:

The first calves entered in the BQFS were captured in the management actions of April 2005. Calves were captured with other bison migrating out of YNP and were sero-negative on brucellosis tests performed at the trap. These tests included the card test for rapid screening and the fluorescent polarization assay (FPA) for confirmation. Animals had to be negative on both tests in order to qualify for quarantine.

Initially, 17 bison were transported to the Brogan facility in April of 2005. As the study required 100 bison to begin, these animals were held for 1 year, and additional animals (85) entered the facility to fill the 1st cohort in 2006. All animals entering the quarantine facility were tested every 30-45 days as required until all animals tested negative twice on the a panel of brucellosis serology tests including the card, buffered antigen plate agglutination (BAPA), standard plate(SPT), standard tube (STT), rivanol, FPA and complement fixation (CF). Three of the initial 17 animals sero-converted and were euthanized for tissue collection and brucellosis culture in 2005. Of the next 85, 4 sero-converted and were euthanized for culture. Two animals were called suspects and were euthanized and cultured in December of 2006. No brucella was cultured from any tissue in the 2 suspects. Animals with "suspect" status were therefore not euthanized and cultured in further testing events. Only "reactors" were removed from the quarantine population. No other animals have sero-converted from the 1st cohort.

Testing History of Bison Captured in 2005:

The animals entering quarantine in 2005 were last exposed to a sero-positive and culture positive yearling bull in August 2005. No animals in this group have been reactors since August 2005. They have been tested by serology and blood culture between 10 and 16 times depending on which individual test group they were in. All females were tested within 5 days after delivering their 1st calf in 2008 and all remained sero-negative as well as culture negative on vaginal swabs and birth fluids at that time. They were last tested February 15, 2011 and were all sero-negative.

Testing History of Bison Captured in 2006:

The animals entering quarantine in 2006 were last exposed to a sero-positive and culture positive heifer in August 2006. In November 2006, 3 bison were considered suspects. Two were euthanized and cultured negative, the third was sero-negative one month later. No animals in this group have been called reactors since August 2006. They have been tested between 10 and 16 times depending on which individual test group they were in. All but one female had their 1st calf in either 2008 or 2009 and were tested within 5 days after calving. All were sero-negative and culture negative after birth. They were last tested November 17, 2011 and were all sero-negative. The one female who was not bred was held back with the 2nd cohort in order to allow her to get pregnant. All females must get pregnant and have a calf in order to be released from quarantine.

Testing History of Calves Born in Facility:

There were 16 calves born in 2008 and 5 calves that died at birth for a total of 21 birth events. Four of the above cows delivered stillborn calves due to dystocia, while one cow rejected her calf after birth. Two cows died in May 2008 after giving birth, the 2 calves were euthanized as well. All tissues from cows and calves were culture negative for brucellosis including conjunctival swabs from calves within 5 days of birth.

There were 30 calves born in 2009; 13 of which were 1st calves of animals that were not pregnant in 2008. The 13 calves were captured and tested within 5 days of birth, and all were negative on brucella culture and serology.

Additional Testing of BQFS Bison:

In June 2006, 48 randomly selected sero-negative bison (including animals placed in quarantine in 2005 and 2006) were slaughtered and an extensive set of tissues from each cultured in an effort to determine latent infection. All were culture negative.

Current Status of Bison:

A total of 87 bison (33 adult cows, 8 adult bulls, 16 yearlings, 30 calves) successfully met requirements to be translocated from quarantine and were moved to Turner Enterprises lands on February 17/18 2010 after the MTFWP published their EA decision notice on the request for proposals. All bison were tested again on February 15, 2011 and November 17, 2011 and all remain seronegative. The herd will be tested again in the fall of 2012.

MTFWP is the primary steward with oversight of the bison housed at TEI. Total bison at TEI as of November 2011 was 142 including 2010/2011 births and all mortalities during 2010/2011.

2nd Cohort Statistics

Bison for the second cohort were captured during the IBMP operations in winter of 2008. The same protocol was used to determine eligibility for quarantine as stated for the 1st cohort. A total of 112 bison were initially brought to quarantine; as many of the initial animals were found to be sero-positive on tests done at the MTDOL laboratory and were therefore ineligible for quarantine, more animals were needed to meet the 100 head sero-negative requirement. Again, bison were tested every 30-45 days until all animals tested sero-negative twice. All animals that sero-converted were euthanized and tissues were collected for brucella culture. A total of 27 bison sero-converted in the 2nd cohort through October 2008, 4 died at quarantine; 2 from unknown causes, 2 from trauma related to handling of bison. Only “reactors” were removed from the quarantine population. No animals have sero-converted from the 2nd cohort since October 2008.

Testing History of 2nd Cohort:

The bison in the 2nd cohort were last exposed to a sero-positive and culture positive heifer in October of 2008. This cohort has been blood tested 12-13 times since entering quarantine and all have remained negative, including serology and culture tests immediately after giving birth. In October of 2008, 41 sero-negative bison were slaughtered and an extensive set of tissues were collected for culture. Again, all animals were culture negative for *B. abortus*.

Testing History of Calves Born in Facility:

There were 22 calves born in 2010 and 4 stillbirths or calves die after birth for a total of 26 birth events. All stillbirths were negative for *Brucella* culture. The live calves have now been tested 3 times and are all negative on serologic tests. All live calves were negative for *Brucella* culture on conjunctival swabs at birth.

There were 6 live births and 1 stillbirth in 2011. All calves tested negative on serologic and culture tests at birth and remain negative for *Brucella abortus*. These calves have been tested 3 times.

Current Status of Bison:

There were 61 (34 adult, 21 2 yrs and 6 yearling) bison shipped to Fort Peck to establish a conservation herd in March of 2012. Three adults and one 2 YO were injured and died from injuries associated with shipping bison. One cow died from unknown causes in July 2011 and 1 cow (from the 1st cohort) never calved, and so was ineligible to pass quarantine. The herd will be tested again in February or March of 2013.

This research is currently under evaluation and preparation for submission to the Journal of the American Veterinary Medical Association for publication.