

IBMP Briefing Statement

Agency: Yellowstone National Park
Issue: Implications of Bison Birth Synchrony and *Brucella* Persistence on Adaptive Management
Date: November 9, 2009

Background:

- Management Action 1.1.c in the Adaptive Adjustments to the IBMP (2008) indicates the partner agencies, led by the NPS and MFWP, will use research findings on bison birth synchrony and fetal and field persistence of *Brucella abortus* to inform adaptive management.
- The monitoring metric for this action will be research reports and publications in peer-reviewed, scientific journals.
- Migratory bison are currently hazed back into Yellowstone National Park around May 1 along the northern boundary and May 15 along the western boundary per adaptive adjustments to the IBMP in December 2008.
- These forced movements can place additional stress on chronically undernourished females and vulnerable newborn calves; especially during years of persistent deep snow pack on summer ranges.
- Natural migration of bison back into the park typically begins in June and follows the progressive green-up of vegetation at higher elevations, similar to other ungulates in the region.

Status of Research/Reports/Publications:

Montana Fish, Wildlife, and Parks

- MFWP staff investigated the persistence of *B. abortus* on bovine fetuses and the rate of fetus removal by scavengers near Yellowstone National Park during 2001-2003.
- They found that *B. abortus* survived longer on the underside of the fetus than on the top, and longer in February (81 days) than mid-May (21 days), suggesting the duration of *B. abortus* persistence is linked to cool temperatures and avoiding ultraviolet light.
- They also found that fetuses were scavenged and disappeared sooner inside Yellowstone National Park (mean = 7.5 days) than outside (mean = 13.0 days) during investigations conducted in 2001. Bovine fetuses placed outside Yellowstone's western and northern boundaries disappeared, on average, in 18.2 days (range = 1-78; sd = 20.1) during investigations conducted in 2002 and 2003.
- Preliminary findings were published in an article entitled "Environmental persistence of *Brucella* organisms in natural environments of the Greater Yellowstone Area – a preliminary analysis" Aune et al. (2007; Proceedings of the U.S. Animal Health Association 110:205-212).

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- NPS staff monitored radio-collared, adult, female bison from April through mid-June during 2004-2007 to estimate the timing and location of bison births where tissues infected by *B. abortus* may be shed.
- Observed abortions ($n = 29$) occurred during January through May 19, while peak calving (80% of births) occurred during April 25 to May 26 and calving was finished by June 5.
- These observed parturition events ($n = 115$) occurred in the Park and on the Horse Butte peninsula in Montana, where cattle were not present during any time of year and are summarized in a report entitled "Parturition in Yellowstone Bison" (Jones et al. 2009).

Adaptive Management Implications:

- Brucellosis transmission risk from bison to cattle is extremely low after June 1 and negligible by June 15 because (1) parturition is essentially completed for the year, (2) parturition events rarely occur in areas that will later be occupied by cattle, (3) cattle are generally not released on summer ranges until after mid-June, (4) females meticulously consume birthing tissues, (5) ultraviolet light and heat degrade *Brucella* on tissues, vegetation, and soil, (6) scavengers remove fetuses and remaining birth tissues, and (7) management maintains separation between bison and cattle (Aune et al. 2007, Jones et al. 2009).
- Allowing bison to remain on essential winter ranges outside Yellowstone National Park until late-May or early June, when they typically begin migrating back into the park to high-elevation summer ranges, is unlikely to significantly increase the risk of brucellosis transmission from bison to cattle.

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