Absaroka Wild Bison Management Area
Brucellosis Management Action Plan Update
Wyoming Game and Fish Department
July 11, 2019

A. Introduction and management area overview

This Absaroka Wild Bison Management Area (AWBMA) Brucellosis Management Action Plan (BMAP) is an update to the AWBMA BMAPs and associated management actions developed and implemented in 1995 and revised in 2008. Meetings were held among Wyoming Game and Fish Department (WGFD) and Wyoming Livestock Board (WLSB) personnel, interested livestock producers, federal land managers, and non-government organizations to review the ecology and current status of brucellosis and feasibility and potential success of BMAP options. WGFD will update this plan as needed

The AWBMA contains all lands in Park, Hot Springs, and Fremont counties east of the Continental Divide in Wyoming, excluding lands administered by the National Park Service and the Wind River Reservation (WRR). The AWBMA includes Wild Bison Hunt Areas (HA) 1 and 3 and encompasses much of the Wyoming brucellosis designated surveillance area (DSA). The Bureau of Land Management (BLM) oversees 4,871 mi^2 (39%) of the area. The U. S. Forest Service (USFS) is responsible for 4,187 mi^2 (33%) of the land surface area. Private (2,606 mi^2), state (823 mi^2), and other lands (144 mi^2) account for the remaining 38% of the area (Fig. 1A). From west to east, habitat consists of forested mountains, sagebrush/grassland foothills, and badlands interspersed with riparian and agricultural ecotones along the Shoshone River, Greybull River, Wind River, and Sweetwater River drainages. Climate consists of cold winters and ephemeral snowpack in foothills and badlands, and hot summers with limited precipitation.

Seasonal ranges are not currently delineated for wild bison in the AWBMA. From 1979 to 2017, at least 2,217 wild bison were documented mostly on riparian corridors of USFS lands, particularly along the North Fork of the Shoshone River (Fig. 1B). Of wild bison observed in the AWBMA, 1,926 (87%) were male, 24 (1%) were female, and 283 (12%) were unclassified, juvenile, and/or yearling animals (Wildlife Observation System Database, WGFD unpublished data). Despite relative suitability of habitat throughout the AWBMA, social acceptance and compatibility of wild bison with current land use is low.

Seroprevalence of brucellosis in wild bison tends to increase with age, averaging about 60% in adults in Yellowstone National Park (YNP) and the AWBMA (Scurlock and Edwards 2010). Migration of wild bison into the AWBMA is limited as most migrate across the northern boundary of YNP (Wallen et al. 2015; R. Wallen, National Park Service, unpublished data). Potential causes of high seroprevalence include large, dense groups of wild bison on winter range during the abortion period, and birthing in groups. Persistent concentration of wild bison on specific winter areas is likely promoted by land use, terrain, and overall distribution and availability of resources (National Academy of Sciences, Engineering, and Medicine 2017). From 2002 to 2016, spillover of brucellosis into multiple livestock herds in the AWBMA was most likely from elk (Rhyan et al. 2013; Kamath et al. 2016), yet continued management of wild bison in the AWBMA will likely help prevent transmission of brucellosis to livestock.

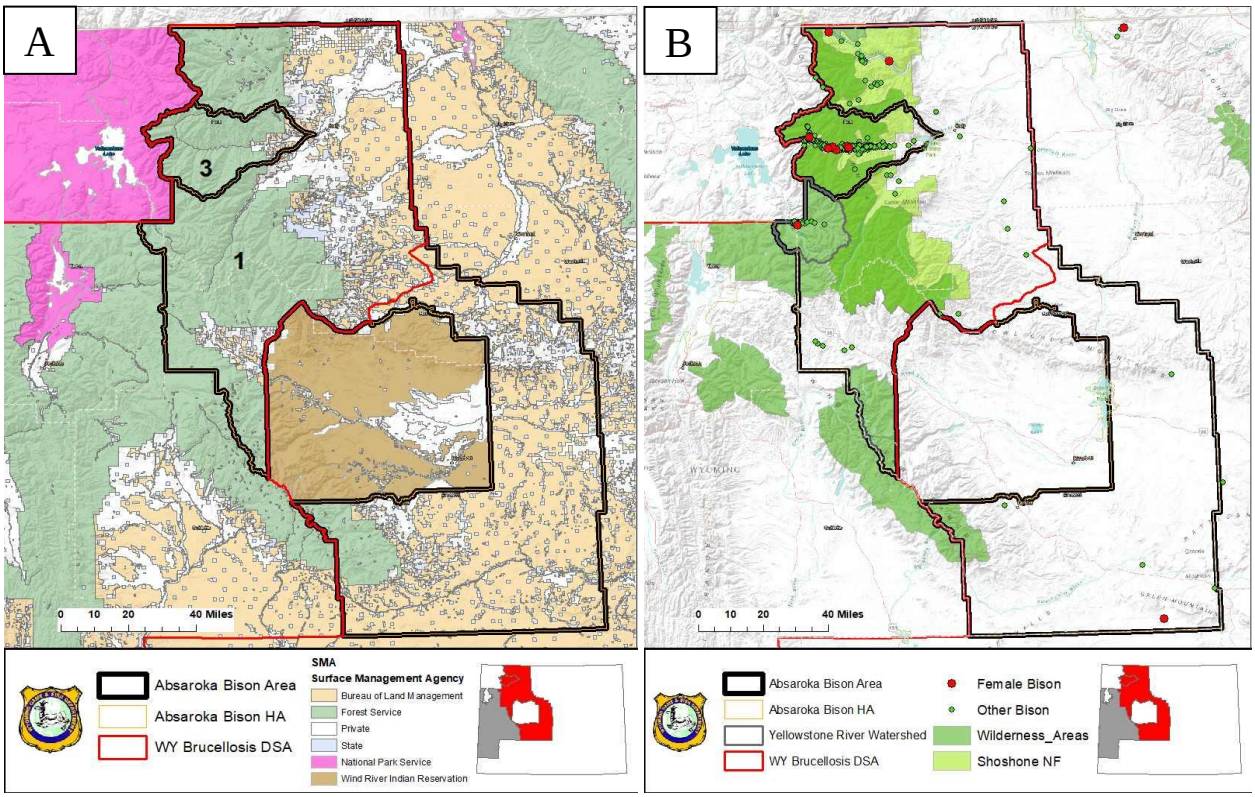

Figure 1. Absaroka wild bison management area, hunt areas, and land ownership (A); locations of adult females and all other wild bison, 1979-2018; Wilderness Areas and Shoshone National Forest lands; and Yellowstone River Watershed within the Washakie Wilderness Area (B); and the WY brucellosis designated surveillance area.

B. Brucellosis Management Options

Listed below are potential options for managing brucellosis in the AWBMA. Short-term objectives for these options are to reduce commingling of wild bison and cattle and the prevalence of brucellosis in wild bison. Long term objectives include eliminating the reservoir of brucellosis in wildlife in the Greater Yellowstone Ecosystem (GYE) if determined to be feasible; maintain livestock producer viability; establish wild bison population and range health objectives, and maximize benefits to all wildlife. Implementation of multiple options together will likely be more effective than instituting any one option alone. The Wyoming Game and Fish Commission (WGFC) will require support from various constituencies (agriculture, land management agencies, sportspersons, etc.) prior to pursuing these options.

1. Reducing numbers of wild bison through increased harvest and targeted removal.
2. Sampling harvested wild bison for brucellosis exposure or infection.
3. Hazing wild bison away from livestock during the abortion risk period.

C. Discussion of Options

1. *Reduced Numbers*

Although population size does not appear to be a strong predictor of seroprevalence (Hobbs et al. 2015), reduction of wild bison numbers simplifies potential subsequent management actions aimed at maintaining spatial separation from livestock or possibly reducing group size (e.g., hazing, habitat treatments; National Academy of Sciences, Engineering, and Medicine 2017). Reducing wild bison numbers in the AWBMA through hunting seasons (Chapter 15, WGFC regulations) and targeted removal of wild or privately owned bison (Chapter 41 WGFC and Wyoming Livestock Board regulations and Chapter 56 WGFC regulation) facilitates harvest sampling and could allow more favorable conditions for hazing. The WGFC and Wyoming Livestock Board (WLSB) have the authority to make this decision.

Pros:

- Increase hunting opportunities and license revenues in the short term
- Reduced agricultural conflicts

Cons:

- Brucellosis will persist
- Success limited by access

Most recent management recommendations for number of wild bison in the AWBMA (WGFD 2008) allow up to:

A) 25 male wild bison in the Washakie and North Absaroka Wilderness Areas (lethally remove females)
B) 15 male wild bison on USFS lands of the North Fork of the Shoshone River (lethally remove females)
C) 25 wild bison (including females) in the Yellowstone River Watershed of the AWBMA

Annual trend counts or population estimates are not derived for wild bison, yet from 2013-2017, at least 295 wild bison observations were documented in the AWBMA primarily along the North Fork of the Shoshone River (WGFD and Wyoming Natural Diversity Database Wildlife Observation System, unpublished data). From 2009-2017, hunting seasons were designed to allow hunters with licenses for HA 2 (Jackson and the National Elk Refuge) the ability to harvest wild bison in designated areas of HA 1. Observations of wild bison in HA 3 per year were insufficient to warrant hunting seasons. Other wild bison lethally removed from HAs 1 and 3 during this period were targeted and donated or destroyed.

2. Harvest Sampling

Understanding trends, spread, and management of brucellosis through seroprevalence (i.e., proportion of wild bison with serum antibodies suggesting exposure to the bacteria out of all sera samples tested) and genetic typing of *B. abortus* in affected free-ranging wild bison populations can be achieved through collection and testing of samples from animals harvested by hunters or targeted by WGFD personnel. This requires coordination among WGFD field and Wildlife Health Laboratory personnel, and hunters, landowners, outfitters/guides, or other entities. Reducing numbers of bison through harvest or lethal removal would facilitate this option.

Pros:

- Can cover broad or targeted geographical areas
- Can detect presence, trends, or differences in seroprevalence with sufficient sample sizes
- Facilitates public education, participation, and engagement

Cons:

- Cost
- Low return of sample kits from hunters relative to kits distributed to hunters
- Low sample size

Since 1991, WGFD has opportunistically sampled blood from hunter-harvested and targeted bison. In the AWBMA, seroprevalence of all wild bison sampled is 60% (21 positive of 35 tested), and most of these samples were derived from hunter-harvested wild bison from 1996-1998. Seroprevalence of wild bison from the National Elk Refuge (61%; 849 positive of 1,393 tested), and YNP (60%; Hobbs et al. 2015) are similar. Although no genetic isolates of *B. abortus* have been obtained from wild bison in the AWBMA, several have been obtained from within YNP (Kamath et al. 2016).

3. Hazing

Hazing (e.g., negative reinforcement of wild bison via pursuit and discharge of cracker-shells) can be used to prevent commingling of wild bison and livestock during the abortion period (1 May – 1 June) and reduce risk of brucellosis transmission from wild bison to livestock. Hazing operations require coordination among WGFD, affected landowner, and occasionally federal land managers. Frequency and total number of hazing operations typically increases as landowner tolerance for wild bison decreases. This is often determined by prevalence of brucellosis, number, and the amount of time wild bison spend on private land.

Pros:

- Separates wild bison from livestock
- Reduces the risk of wild bison-vehicle collisions

Cons:

- Temporary; wild bison often return to areas where previously hazed from
- Concentrates wild bison during abortion period, may promote wild bison-to-wild bison brucellosis transmission
- May require additional measures (lethal removal) for sustained effectiveness

Hazing operations in the AWBMA typically occur along the North Fork of the Shoshone River to move males away from major roads and private land to reduce risk of conflict, and are typically conducted solely by WGFD personnel. This option may be best used in conjunction with option 1 to achieve maximum success.

D. Coordination Meetings

1. *Producer, Interagency, and Non-Government Organization Meetings*
From July 2017 to April 2018, 23 meetings were held one-on-one and in group settings with at least 83 individuals representing livestock producers, land-management agencies (BLM, USFS), and non-government organizations (Rocky Mountain Elk Foundation Thermopolis and Cody, Wyoming Outdoorsmen, Greater Yellowstone Coalition, Cody Country Outfitters and Guides). Group livestock producer meetings were held in Cody, Thermopolis, Burlington, and Meeteetse where WGFD and WLSB personnel attended to provide information and address specific questions.

Meetings and interest of attendees focused on management of brucellosis in elk rather than wild bison. One producer noted little tolerance to wild bison, but wild bison are mostly a non-issue as the last one seen [in the South Fork of the Shoshone River] was 30 years ago. USFS personnel of the Shoshone District agreed with the proposed options. A draft of this document was submitted to personnel from YNP and the WRR with no comments returned.

2. *Intra-Agency Meetings*
From March to April 2018, several informal conversations occurred between the Cody disease biologist and various WGFD personnel including administrators, wardens, and biologists regarding the three options and additional actions proposed in the 2018 update.

3. *Public Meetings*
From 11 April to 16 April 2018, three meetings were held in Burlington, Meeteetse, and Cody to allow the general public opportunity review and comment on the Cody Elk Herd, Gooseberry Elk Herd, and AWBMA BMAPs. Attendees (21) were primarily livestock producers and farmers. Also attending were WGFD, USFS, and WSLB personnel as well as local media. Among all meetings, all options for wild bison were supported.

E. Proposed Management Actions

1. *Increased Harvest*
WGFD will continue to manage wild bison in each area of the AWBMA:

A. 25 male wild bison in the Washakie and North Absaroka Wilderness Areas
B) 15 male wild bison on USFS lands within the North Fork of the Shoshone River drainage
C) 25 wild bison (including females) in the Yellowstone River Watershed

WGFD will continue to utilize hunter-harvest as the primary tool for managing wild bison populations in HA 1 and 3 of the AWBMA by maintaining flexibility in the hunting regulations (e.g., allow license holders from bison HA 2 ability to harvest wild bison in designated areas of HA 1). Outside of established hunting seasons, male wild bison will be targeted for removal on a case-by-case basis. Outside of established hunting seasons, and when logistically feasible, all female wild bison outside the Yellowstone River Watershed of the AWBMA will be targeted by WGFD for lethal removal. Privately owned bison running at large in the AWBMA may be lethally removed by WGFD personnel after coordination and consultation with the WLSB.

2. *Harvest sampling*
WGFD will continue to coordinate among intra- and interagency personnel, hunters, and stakeholders to collect blood from all hunter-harvested and targeted wild bison in the AWBMA for serologic testing. When available, WGFD personnel will collect iliac and supramammary lymphatic tissue from female wild bison harvested by hunters or lethally removed by WGFD personnel.

3. *Hazing*
WGFD will continue to haze wild bison out of agricultural and other potential damage situations. Female wild bison may be hazed to facilitate lethal removal by WGFD personnel.

F. Additional Actions

1. *Standardize Counts*
Knowing the number and composition of populations assists with establishing hunting seasons and understanding animal responses to disturbances (e.g., large-scale wildfire). To obtain relative abundance and distribution of wild bison throughout the AWBMA, WGFD will continue to document the number, sex, relative age, and location of wild bison encountered opportunistically or during classification flights of other species (e.g., bighorn sheep). WGFD will also coordinate with YNP personnel to obtain counts of wild bison documented leaving through the East and Northeast Gates. To obtain an annual classification, WGFD will investigate and develop a standardized method (e.g., 2-day flight and ground count) for counting wild bison annually in HA 3.

2. *Reporting Abortions*
Aborted materials (fetus, placenta, and fluids) are the primary source of contagious *Brucella abortus* bacteria in elk, wild bison, and livestock. Direct contact with these materials and uptake of bacteria are the primary mode of transmission of brucellosis (Nicoletti 1980; Thorne et al. 1978). Observing abortions and aborted materials is rare (Cross et al. 2015), yet when found, maintaining separation of materials and animals through physical barrier (e.g., tarp) and ultimately reporting the event to WGFD allows personnel to remove materials and clean the site with 50:50 bleach:water to prevent transmission (WGFD 2016).

Despite exceptionally rare occurrences of female wild bison in the AWBMA, WGFD encourages public and/or private individuals to notify WGFD personnel of any suspected abortion. WGFD will remove aborted materials and clean-up site to reduce likelihood of transmission to wildlife and livestock. Verbal assurance from WLSB personnel that producers with livestock near aborted materials are not predisposed to herd quarantine should further encourage individuals to report abortions (J. Logan, WSLB, personal communication).

3. *Habitat Enhancement*
Distribution of resources (e.g., forage, water) and topography affects distribution and movement of wild bison (National Academy of Sciences, Engineering, and Medicine 2017). Despite ruggedness of USFS lands and relatively low number of wild bison in the AWBMA, large scale habitat treatments (e.g., fire) near the border of the AWBMA and YNP may help reduce concentration of wild bison on riparian areas, diminishing group size and risk of brucellosis

transmission among wild bison. WGFD will continue to coordinate with land management agencies and the YNP to determine feasibility of large-scale habitat treatments.

4. *Research*

To continue understanding brucellosis, its management in wildlife, and prevention of transmission to livestock in and beyond the AWBMA, pertinent questions concerning various actions that have (or have not) been implemented need to be answered. Based on options in this plan and discussions pertaining to its development, below is a list of possible questions to facilitate management-oriented research:

A. What is the population and composition of wild bison throughout AWBMA?
B. Do habitat treatments in YNP reduce wild bison use of the AWBMA?
C. Do scavengers move pseudo-aborted materials away from or toward wild bison and livestock?
D. Does offering incentives increase return of useable blood samples by hunters?
E. Does immunocontraception control seroprevalence in wild bison?

G. Literature Cited

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