ENVIRONMENTAL ASSESSMENT

BISON QUARANTINE FEASIBILITY STUDY – PHASE II/III

Prepared jointly by
Montana Fish, Wildlife and Parks
Animal and Plant Health Inspection Service, Veterinary Services

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1.0 INTRODUCTION

As noted in the Interagency Bison Management Plan (IBMP) (USDOI et al. 2000a), bison are essential to Yellowstone National Park (YNP) because they contribute to the biological, ecological, cultural, and aesthetic aspects of the Park. However, Yellowstone National Park is not a self-contained ecosystem. Bison regularly move from YNP into Montana during winter, especially in the Gardiner and West Yellowstone areas. This herd is chronically infected with brucellosis (*Brucella abortus*). From 40 to 60% of the bison have serological evidence of brucellosis (Meyer and Meagher 1995; Cheville et al. 1998). Transmission of brucellosis from bison to cattle has occurred experimentally (Davis et al. 1990) and in nature (Flagg, 1983). As the YNP bison population increases, the probability of wild bison coming in contact with domestic cattle increases. As the probability of contact increases, so does the potential for transmission of brucellosis from YNP bison to cattle. While the transmission of brucellosis from YNP bison to cattle has not been reported in recent years, the potential for such transmissions between elk and cattle have been realized several times in recent years in both Idaho and Wyoming. The initial transmission event in Idaho case was quickly discovered and controlled while the second most recent event is still under management. Wyoming ranchers were not as fortunate and the cattle industry there has suffered economic losses due to brucellosis.

Recognition of the potential for brucellosis transmission from bison to cattle and the very real economic impacts that can accompany the transmission have brought numerous federal and state agencies together to address the problem. The U.S. Department of the Interior, National Park Service (NPS); the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services (APHIS VS); the U.S. Department of Agriculture, U.S. Forest Service; the Montana Department of Livestock (DoL); and, Montana Fish, Wildlife and Parks (MFWP) have limited authority for the management of bison that migrate from YNP into Montana, the management of brucellosis in bison and/or the management of lands used by bison. None of the agencies, acting alone, has sufficient authority to manage YNP bison across all jurisdictional boundaries. The agencies recognize the shared responsibility and the need for cooperation in bison management and thus approved respective federal and state Records of Decision to implement the IBMP in December 2000. Management under the IBMP includes actions to protect private property; actions to reduce the risk of transmission of brucellosis from bison to cattle; and, actions to maintain a viable, free-ranging population of Yellowstone bison. The Records of Decision were supported with a draft Environmental Impact Statement (EIS) that was jointly prepared by all agencies, a final EIS that was prepared by the federal agencies and a final EIS that was prepared by the Montana state agencies.

The IBMP recognizes the need to maintain a wild and free ranging bison herd in the Greater Yellowstone Area (GYA), as well as the need to protect domestic livestock from the effects of brucellosis and livestock producers from the economic hardship that transmission of brucellosis to domestic cattle could cause. The IBMP provides a framework to manage both bison and the risk of transmission of brucellosis from bison to domestic livestock. The IBMP emphasizes measures to maintain temporal and spatial separation between bison and cattle. This plan establishes population targets for the bison herd and identifies management actions to be taken if and when bison move beyond the YNP boundary. The plan also establishes a framework for adaptive management. In the context of the IBMP, adaptive management means testing and validating with generally accepted scientific and management principles the proposed spatial and temporal separation, risk management and other management actions. Under the adaptive management approach, the agencies may adjust future management actions, based on feedback from implementation of the various risk management actions.

1.1 Coordination with a North American Bison Conservation Strategy

There has been a long history in North America of restoring wildlife populations by capturing animals from robust populations and transplanting them to new habitats or augmenting existing populations otherwise facing extinction. In the Greater Yellowstone Ecosystem, there is an extensive history of capturing, holding, transporting and relocating wildlife as a species conservation strategy. Yellowstone elk were routinely captured and widely distributed in the mid 1900's to successfully restore wild elk populations throughout North America. Bison and antelope have been captured and moved from YNP to create or augment free-ranging populations elsewhere. YNP has also been a recipient of such transplanted rocky mountain wolves from Canada and transplanted bison from Texas and northern Montana.

As it applies to the management of bison, there have been many discussions about quarantine procedures and the use of YNP's growing bison population to establish other free-ranging bison herds or augment existing public and tribal herds. Several quarantine options have been considered and APHIS VS has established a protocol appropriate for bison management that was included as Appendix B in the FEIS (USDOI et al. 2000a). Despite the frequent discussions and its inclusion in the IBMP framework, the quarantine protocol has not been formally tested. The protocol should be validated before the agencies consider amending the IBMP to include quarantine.

Concurrent with the discussions about quarantine in the GYA, there have also been frequent discussions and meetings regarding bison conservation strategies in North America and the potential for restoring the species to grassland ecosystems. There currently is no unified conservation plan for bison in North America. The successful development of such a plan and subsequent implementation of a conservation strategy for plains bison is contingent upon reliable and suitable source stocks for restoration efforts. The World Conservation Union (IUCN)-Bison Specialist Group of North America recently supported a project to examine the status of bison, which presents several conservation recommendations (Boyd 2003). The project outlines the current status of bison, offers guidance for the advancement of a conservation strategy and identifies the few free-ranging and genetically pure bison herds in North America suitable for restoration projects. According to the document, there are only about 8,300 plains bison,

classified as free-ranging and genetically pure, in 13 conservation herds and these bison present the best source stocks available for restoration efforts (Boyd 2003). Nearly two-thirds of these bison are from larger diseased herds, such as YNP bison and the Jackson, Wyoming bison herd, while the remainder is found in small fragmented populations with limited potential as a reliable source for restoration efforts. The larger diseased conservation herds could become suitable source stock for conservation programs provided that disease free animals could be reliably filtered from the population. If animals can be declared disease free then bison from YNP could serve as a reliable source of genetically pure bison to be reintroduced into historical habitats, thus contributing to the continued conservation of this species.

Several factors support a decision to explore the feasibility of using YNP bison for conservation efforts. The Yellowstone National Park bison herd provides a very good genetically diverse source of bison that have been free ranging for many decades (Halbert 2003). In addition this is a population that has been influenced heavily by natural selection forces. Currently, the bison population in YNP is above the management trigger levels for aggressive removals and there are annual habitat and weather dependent movements of bison out of YNP which cause conflicts and concerns in the states of Montana, Idaho and Wyoming (Plumb and Aune 2002). The major elements of this conflict include the presence of brucellosis, a nationally regulated disease, in YNP bison and management of the population size and distribution of YNP bison. As we attempt to manage brucellosis, many bison are routinely hazed or captured, tested and slaughtered to minimize the risk of transmission to cattle. Despite the successful management of the risk for transmission of brucellosis there are no strategies in place to restrain the base population of bison in this conservation herd. The relocation of YNP bison completing a valid quarantine program could provide one means of reducing the population pressures that result in the annual migrations of bison out of YNP.

The cooperating agencies agree that capture and relocation of bison to other suitable habitats would be an appropriate alternative to lethal removal of bison that exceed the population objectives for YNP, as defined by the IBMP. Relocation of surplus bison also would provide an opportunity to coordinate the IBMP with a broader North American bison conservation strategy by founding new public and tribal bison herds and augmenting existing public and tribal bison herds with YNP bison. However, the Brucellosis Uniform Method and Rules (UM&R) (USDA APHIS, VS 1998) discourage the movement of animals from brucellosis-affected herds unless the animals have first cleared quarantine to certify that each animal is free of brucellosis. Therefore, the agencies also understand that additional work must be completed to determine the feasibility of incorporating quarantine into the long-term bison management strategy.

To facilitate the potential for quarantine and subsequent live relocation of bison, the IBMP includes provisions for the agencies to determine the design, location and operation parameters for a bison quarantine facility. The APHIS protocol regarding a quarantine facility requires that the quarantine facility be approved by state and federal animal health officials. If approved, the quarantine facility would receive seronegative bison that exceed either the number of bison that may be tolerated in the management areas or the 3,000 population target for the whole herd. At the time they approved the IBMP, the agencies anticipated that operation of the quarantine facility would follow the quarantine protocol described in the federal FEIS (Appendix B, p. 701 – 705) (USDOI et al. 2000a).

2.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the bison quarantine feasibility study is to determine whether it is possible, using the protocol described in this EA, to certify that individual or groups of YNP bison are free from brucellosis, including latent infections of brucellosis. The need for such a study is to demonstrate whether quarantine is a feasible management tool for the management of YNP bison. The study also responds to a growing interest in using surplus YNP bison as part of a broader bison conservation strategy.

The cooperating agencies propose that it is possible that some bison migrating from YNP could be placed in a quarantine program to conserve genetic diversity and ultimately provide healthy bison for restoration projects in other portions of North America. Quarantine also would provide an alternative to slaughter for the removal of bison when the population exceeds levels prescribed by the IBMP. However, prior to adoption of a quarantine program, research is needed to determine if the protocol can be successfully implemented.

The primary goal of the bison quarantine feasibility study is to develop quarantine procedures, using the best available science and adaptive research strategies, that would allow bison from YNP to be accepted as free of brucellosis and suitable for the establishment of new public and Native American bison herds or to augment existing public and tribal herds in North America. Completion of the study also might provide insight to the feasibility of quarantine protocols and the reintroduction of bison to large grassland systems as one component of a broader bison conservation strategy.

2.1 Authorities

Under current federal and state statute the National Park Service has management authority for bison within YNP. APHIS VS has regulatory authorities under the Animal Health Protection Act (AHPA) (7#U.S.C. 8301 et seq.). It is under this act that APHIS manages the National Brucellosis Eradication Program.

Pursuant to the AHPA, Congress authorized the Secretary of Agriculture to cooperate with state authorities to carry out the provisions of the AHPA and to administer its regulations. Thus APHIS enters into cooperative agreements with individual states for a brucellosis eradication program. This program is premised on the Code of Federal Regulations and UM&R. The UM&R describes minimum standard procedures for surveillance, testing, quarantine, and interstate transport. APHIS VS has the federal regulatory authority to approve quarantine protocols.

The Montana Legislature has designated bison that originate from YNP as a species requiring disease control. The Montana Department of Livestock (DoL) is authorized to remove or destroy publicly owned bison that enter Montana from a herd that is infected with a dangerous disease or whenever those bison jeopardize Montana's compliance with state or federally administered livestock disease control programs (81-2-120 (1-4) M.C.A.). The DoL regulatory

authority for the administration of the control of bison which emigrate from YNP is identified in Montana Administrative Rule (A.R.M. 32.3.224) The Montana legislature has found that bison pose a significant potential for transmission of infectious disease to persons or livestock and for damage to persons or property (87-1-216 (1) M.C.A.). MFWP is required to cooperate with the Department of Livestock in the management of these bison (87-1-216 M.C.A). MFWP also is authorized to enter into cooperative agreements with other agencies to promote wildlife research (87-1-210 M.C.A.).

APHIS VS and MFWP have jointly prepared this environmental assessment. It is fully consistent with the APHIS National Environmental Policy Act (NEPA) implementing procedures (Title 7 of the Code of Federal Regulations, Part 372) and with the Montana Environmental Policy Act (MEPA). The proposed action evaluated in this environmental assessment is envisioned as a state/federal partnership with APHIS and MFWP being the cooperating agencies.

2.2 Decisions to be Made

By federal regulation, an environmental assessment is a "…a concise public document…that serves to: (1) briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact…" (40 CFR Part 1508.9). A similar definition is included in the Administration Rules of Montana (ARM 12.2.429(9)). If, based on the analysis in this EA, the decision makers reach a Finding of No Significant Impact (FONSI), the agencies may proceed with Phase II and Phase III of the bison quarantine feasibility study. The decision whether to proceed also must consider several related issues, including the determination that Phase I of the study was successful; identification of the appropriate locations for facilities to hold bison during Phase II and Phase III of the quarantine feasibility study; and, identification of a strategy for selection of recipients and release sites for those bison that clear quarantine during the feasibility study.

2.3 Other Relevant Environmental Documents

The State of Montana was a joint-lead with the Departments of the Interior and Agriculture in the development of the Interagency Draft Environmental Impact Statement (DEIS) and Bison Management Plan. A federal Final Environmental Impact Statement (FEIS) for Bison Management for the State of Montana and Yellowstone National Park, which included the IBMP, was published in August, 2000. In November 2000 the state Final Environmental Impact Statement (FEIS) (State of Montana 2000a) for the IBMP was completed. The final state State of Montana 2000b) and federal (USDOI et al. 2000b) Records of Decision were published in December 2000 pursuant to the requirements of the Montana Environmental Policy Act (MEPA) and NEPA. These documents anticipated the addition of quarantine as a method for live distribution of bison that otherwise would be sent to slaughter. Thus, the IBMP includes provisions for the addition of a bison quarantine facility if it is determined to be an appropriate component of the plan. This EA, therefore, is tiered to the previous documents and they are incorporated by reference into the EA.

Several other projects have recently been completed or are in progress related to bison management and the IBMP. These include the following:

- APHIS VS completed an Environmental Assessment (2003) and issued a Finding of No Significant Impact in February 2004 concerning the subcutaneous vaccination of bison against brucellosis in the GYA.
- MFWP (2004a) recently approved a limited public hunt for bison from the Yellowstone herd that enter Montana. That decision was supported with an Environmental Assessment.
- NPS has indicated its intention to prepare an Environmental Impact Statement to evaluate a comprehensive program of remote vaccination of bison in YNP. The Notice of Intent was published in the Federal Register on August 3, 2004.
- DoL (2004) recently issued a decision to initiate vaccination of bison calves and yearlings in the Western Boundary Area. That decision was supported with an Environmental Analysis.
- MFWP (2004b) recently issued a decision to initiate Phase I of the bison quarantine feasibility study. That decision also was supported with an Environmental Assessment.

3.0 ISSUES

3.1 Public Involvement Process

MFWP and APHIS VS announced their intention to prepare this environmental assessment on March 15, 2005. At that time the agencies identified pertinent issues and invited public comment for the purpose of clarifying those issues and identifying additional pertinent issues. MFWP and APHIS VS encouraged comments regarding the overall scope of the project; additional issues beyond those included in the list of issues in the scoping notice; and, specific information sources that would strengthen the analysis of issues.

The scoping period ended on April 15, 2005 during which 67 comments were received. Groups who submitted comments included: the American Buffalo Foundation; Buffalo Field Campaign; Greater Yellowstone Coalition; Humane Society of the United States; the National Parks Conservation Association; Gallatin Wildlife Association; Prickly Pear Sportsmen's Association; Public Lands/Water Access Association; and, Voices for Animals. Other comments were submitted by individuals.

In addition to the formal scoping process, project personnel have discussed this proposal with a variety of groups and organizations (see Appendix A, Meetings, Public Contacts and Expert Consultations). The input from people with a variety of expertise was essential to the design and planning for a quarantine feasibility study.

3.2 Issues Identified by the Public that are within the Scope of the EA

MFWP and APHIS VS have determined that the following issues, identified by commentors during the scoping process, are relevant to the scope of the pending decision. These will be included in the analysis that is presented in the EA:

<u>Issues related to NEPA/MEPA compliance</u>

- The scoping notice did not clearly articulate the purpose and need for the quarantine feasibility study.
- The agencies might be proceeding with inadequate information. The analysis in the EA should be based on the best available science.

<u>Issues related to the proposed action</u>

- The scoping notice did not identify the location for a third quarantine facility.
- The EA should provide specific details as to the location and design of the Phase II/III facilities and all associated operations.
- The EA must assess the ecological impact of the Phase II/III facilities on other resources.
- The EA must disclose the source of bulls that are used for breeding in quarantine and evaluate the impacts of removing those animals from the source population.

<u>Issues related to release of brucellosis free bison</u>

- The scoping notice did not identify locations for the subsequent release of those bison that survive the feasibility study.

- The EA must provide a detailed analysis of where bison that clear protocol during the feasibility study will be located and the terms that will be required of the recipient entities.
- Decisions should be made such that any bison that have gone through a rigorous quarantine process should not end up in a holding status. If the recipients for the quarantined bison have not been identified, the project should not proceed.

Issues related to other wildlife

- The EA should analyze the effects of existing and proposed quarantine facilities on the migration of wildlife from YNP to the Paradise Valley. The quarantine facilities might block natural migration routes between YNP and Dome Mountain Wildlife Management Area (WMA).
- The location of a quarantine facility on Dome Mountain WMA will withdraw critical habitat from the purpose for which the WMA was established.
- Locating quarantine facilities on the Dome Mountain WMA will displace elk onto private land causing game damage to private land and increasing the potential for brucellosis transmission from elk to cattle.

Other issues

- The EA should consider alternative locations for the Phase II facility on Dome Mountain, e.g. near the Stephens Creek capture facility or Red Bluff Research Station.
- Bison in quarantine facilities might transmit brucellosis to cattle on adjacent lands.
- Management of the quarantine facilities should include a weed management plan.
- Bison must be handled humanely and all phases of the quarantine operations – capture, transport and holding in the quarantine facilities - must comply with the Animal Welfare Act.
- Native American Tribes have a vested interest in the restoration of buffalo to tribal lands and should be included in the planning and development of bison relocation proposals.

3.3 Issues Identified by the Public that are outside the Scope of the EA

Commentors identified several issues that are pertinent to bison management but outside the scope of the pending decision whether to issue a FONSI and whether to proceed with Phase II and Phase III of the bison quarantine feasibility study. In addition to being outside the scope of the EA, most of these issues already have been evaluated in the EIS for the Interagency Bison Management Plan or in environmental documents prepared by other agencies on other matters related to bison and elk management in the GYA. For each of these comments, a brief explanation for the rationale to exclude the issue from further analysis is provided.

Comment: The quarantine proposal is being analyzed in phases. Instead, it should be analyzed as a single, comprehensive and completely described project. The analysis should include all aspects of quarantine and not just the feasibility standards. MFWP and APHIS VS are inappropriately segmenting the decision making for the overall issue of quarantine.
Response: The design of the quarantine feasibility study follows the adaptive management paradigm adopted by the cooperating agencies in the Records of Decision for the IBMP. The quarantine proposal is being analyzed in phases because the study is an iterative one that is likely to require adaptations in the various steps based upon results achieved as it progresses. It is important to note that each step is dependent upon and holds no independent utility without the

success of the previous step. Therefore, it is appropriate that the environmental review process be done sequentially to coincide with the phases of the proposed study.

Comment: The agencies have prematurely initiated scoping for Phase II/III of the quarantine feasibility study because Phase I of the study is not yet complete.
Response: Prior to completion of Phase I, MFWP and APHIS VS must make a decision about the appropriate disposition of animals that have successfully completed Phase I of the feasibility study. MFWP and APHIS VS will not implement Phase II/III of the quarantine feasibility study prior to a decision that is supported with this EA and prior to indications of success during Phase I of the feasibility study. This EA includes an analysis of an alternative to terminate the feasibility study at the completion of Phase I. At the completion of Phase I, bison will move on to Phases II and III of the feasibility study; be used for other research; or, will be slaughtered. Bison also could be returned to YNP, but that is unlikely because the current population significantly exceeds population targets defined in the IBMP.

Comment: The MEPA/NEPA analysis for Phase I of the quarantine feasibility study was legally insufficient. Therefore, MFWP and APHIS VS must terminate the Phase I study and return those bison to YNP.
Response: MFWP and APHIS VS have complied with all pertinent statutes and regulations as they apply to Phases I and II/III of the quarantine feasibility study.

Comment: The agencies must prepare an EIS evaluating all changes and modifications to bison management strategies.
Response: The Records of Decision to implement the IBMP were supported with Environmental Impact Statements. The IBMP includes an adaptive management framework. The decisions to implement the IBMP also included commitments to support revisions to the IBMP with additional environmental review, as appropriate.

Comment: The YNP bison herd has extraordinary biological, cultural and historic value. The agencies, including the National Park Service, should prepare a comprehensive EIS to evaluate this proposal.
Response: The IBMP and the Records of Decision contemplated the use of quarantine as an operational tool. The effects of quarantine and the quarantine feasibility study on the biological, cultural and historic values of bison are within the scope of the IBMP. Those effects were evaluated and disclosed in the federal FEIS for the IBMP.

Comment: Analysis should consider the effects on the disruption of herd dynamics and family relationships in the wild population. Animals that graduate from the facility will not be wild bison.
Response: The effects of the quarantine feasibility study on the herd dynamics and family relationships in the wild population are within the scope of the IBMP. Those effects were evaluated and disclosed in the federal FEIS for the IBMP.

Comment: YNP bison are the only bison with a continuous history of being wild and unfenced. They also have the highest level of genetic diversity. Quarantine is not acceptable for the last wild, genetically pure bison in this country.

Response: The effects of the quarantine feasibility study on the wild nature of bison and on the genetic diversity in this bison herd are within the scope of the IBMP. Those effects were evaluated and disclosed in the federal FEIS for the IBMP. Much of the early history of bison management in YNP included intense husbandry, including management behind fences. There is no evidence that this period of intense management resulted in the domestication of bison currently found in YNP.

Comment: YNP bison are free-roaming. Quarantine is not a suitable alternative to having truly free-roaming bison on public land in the Yellowstone area. If the study is successful, quarantine will eliminate any incentive for providing habitat for bison on public lands adjacent to the Park.
Response: The IBMP and the federal FEIS explained how the term, free-roaming, applied to this bison herd. The IBMP, while contemplating the use of quarantine as a tool in brucellosis management, does not anticipate replacement of free-roaming bison with herds in quarantine. Wild and free ranging bison are an important component of the natural ecosystem of YNP and there are no plans to eliminate that component. The expanding, genetically pure and diverse bison herd in the GYA could serve as an attractive source of excess bison for restoration projects, however. Quarantine holds the potential to be able to provide certified disease-free bison for such a purpose. Habitat management will remain a high priority and will be pursued by the management agencies according to the laws, policies, management prescriptions and available funding of those agencies irrespective of the quarantine feasibility study.

Comment: Montana's first priority should be tolerance of bison outside of YNP. Efforts to restore bison populations to appropriate North American landscapes should proceed concurrently with efforts to secure conflict-free habitat for bison and expand their range beyond the boundaries of YNP. The scoping notice failed to assure that the study would result in more bison ranging more freely outside of YNP. The EA should analyze an alternative that addresses the establishment of a free-ranging bison population and the risk of brucellosis transmission by reducing real or perceived spatial and temporal conflicts between bison and cattle in Zone 2 and provides sufficient habitat for bison near the north and west boundaries of YNP.
Response: The level of tolerance for bison outside YNP is defined by the IBMP. The federal EIS analyzed and disclosed consequences associated with a broader distribution of bison than that defined by the IBMP. The bison quarantine feasibility study is being conducted to determine if quarantine is a feasible tool for brucellosis management.

Comment: The target of no more than 3,000 bison in YNP is not based on any scientific study of the Park's carrying capacity for bison.
Response: The rationale for the bison population targets in the IBMP was analyzed and disclosed in the federal FEIS.

Comment: The EA should define what mechanism, if any, is in place to determine when and if seronegative bison that have been through the quarantine protocols will be permitted to roam free outside of YNP and free to move back and forth across the Park boundary without being challenged.
Response: The IBMP includes provisions to incorporate quarantine as an alternative for removing bison that exceed the population targets in the plan. As long as brucellosis remains in

the GYA, it would be inappropriate to return bison that have cleared quarantine to YNP because they could be exposed to and re-infected with brucellosis.

Comment: Efforts to develop quarantine protocols should not occur at the expense of efforts to develop more effective vaccines and diagnostics that would help reduce brucellosis-infection rates in Park bison.
Response: Quarantine and vaccination are separate issues. The quarantine feasibility study will not affect the development and use of other tools in the management of brucellosis with the exception that information developed during the quarantine feasibility study may be valuable in research to improve diagnostics and vaccines (or vice versa). The agencies are actively investing in research to find a more effective vaccine for use in bison. The agencies along with the U.S. Animal Health Association (USAHA) held a working symposium on August 16–18, 2005 to address these issues and to develop new concepts and ideas for research in these areas. The agencies invited scientists from around the world to this meeting. A report of the findings was presented at the annual USAHA meeting in Hershey, Pennsylvania in November. The agencies are also active participants in Greater Yellowstone Interagency Brucellosis Committee (GYIBC) and conduct routine discussions and research reviews relative to vaccines and diagnostics. At the present time vaccine efforts are underway outside of YNP and are proposed for areas within YNP.

Comment: The EA should evaluate the development of a more accurate diagnostic test, which, if available, could render the quarantine research program unnecessary.
Response: A latent period between exposure and subsequent infection is one characteristic of brucellosis. Therefore, a quarantine protocol is necessary if the management intent is to certify individual animals that originate from an exposed herd as brucellosis-free and suitable for live distribution. The most accurate available diagnostic tests will be used in the testing protocol of this feasibility study.

Comment: A cost-benefits analysis should be prepared to weigh the cost of current bison management and the quarantine venture against the benefits of simply refocusing more attention on the management of cattle that graze land adjacent to YNP.
Response: The EA will disclose costs associated with the quarantine feasibility study. The costs and benefits of the IBMP were evaluated and disclosed in the federal FEIS for the IBMP.

Comment: The cost/benefit analysis should include a comparison of the costs for the project versus comparable expenditures for the purchase of bison habitat in the GYA.
Response: Purchase of bison habitat would require a major revision of the IBMP and is outside the scope of the EA for the quarantine feasibility study.

Comment: The EA should analyze the temporary population reduction of wild and relatively free-ranging YNP bison and the environmental and economic consequences associated with that reduction.
Response: Quarantine, if eventually incorporated into the IBMP, would be used as an alternative to slaughter for removing bison that exceed the population targets defined by the IBMP. The effects on the environment and the economic consequences associated with the population targets were evaluated and disclosed in the federal FEIS for the IBMP.

Comment: The quarantine process will significantly impact YNP bison and the animals will be domesticated.
Response: Bison from YNP have previously been managed behind high fences and yet are not considered domestic today. Moreover, bison assigned to the quarantine feasibility study would otherwise be subject to lethal removal. The impact of such removals already was evaluated and disclosed in the state and federal EIS's for the IBMP. It is unlikely that animals that clear quarantine would be returned to the Park. Therefore, behavioral changes, if any, which result from quarantine, would not affect bison that remain in YNP. If released in wild environments elsewhere, subsequent generations will retain the wild character.

Comment: Quarantine is not consistent with standard wildlife management practices.
Response: Holding wildlife in captivity for varying periods of time until they are released to the wild is a historically accepted and commonly employed conservation method used throughout the world to restore wildlife populations. There are many published examples in the scientific literature and historical models demonstrating that captive animals have routinely been successfully reintroduced into the wild and will retain wild behaviors.

Comment: The proposal will create at least two feed grounds in prime wildlife habitat.
Response: The quarantine facilities will be fenced to exclude predators and ungulates. The only animals to receive supplemental feed will be those animals that are held in the facility.

Comment: The EA should analyze the potential re-infection of bison from other species.
Response: Quarantine, if eventually amended into the IBMP, would be used as an alternative method for removing bison that exceed the population targets defined by the IBMP. It is unlikely that animals that clear quarantine would be returned to YNP and, therefore, would not be vulnerable to exposure to infected elk. Bison within the quarantine feasibility facility will remain separated from other potentially infected bison, elk and other animals. Therefore, the potential re-infection of bison is very low.

Comment: The proposal should honor treaty rights with those tribes that have a spiritual connection with America's last wild bison.
Response: The effects of the quarantine feasibility study on cultural issues are within the scope of the IBMP. Those effects were evaluated and disclosed in the federal FEIS for the IBMP. Tribal representatives were consulted in the design of the quarantine feasibility study and will be consulted regarding decisions to distribute YNP bison that have cleared quarantine.

Comment: Bison should not be treated like a school science project.
Response: The design of the quarantine feasibility study was developed in consultation with people who are broadly recognized for their expertise in the fields of brucellosis and/or bison management.

Comment: There has never been a documented case of brucellosis transmission from YNP bison to cattle. The EA must provide a detailed assessment of the risk of brucellosis transmission from bison to cattle under natural conditions.

Response: Flagg (1983) reported on transmission of brucellosis from wild bison to cattle. The risk of brucellosis transmission from bison to cattle and the consequences that might result, in the event that such transmission were to occur, were analyzed and disclosed in the federal FEIS for the IBMP.

Comment: Stop the hazing, the cruelty, the tormenting and the slaughtering of bison.
Response: Current management operations comply with the provisions of the IBMP. The effects associated with the Records of Decision to implement the IBMP were analyzed and disclosed in the corresponding state and federal environmental impact statements.

Comment: Baby bison should not be separated from their mothers.
Response: Bison that are assigned to the quarantine feasibility study would be 8 – 12 months old at the time of capture and capable of living independently. Consistent with the provisions of the IBMP, these bison also would be subject to removal by other methods.

Comment: If the purpose of the quarantine project is to restore bison to their native range, the agencies should restore the natural migratory corridors.
Response: The distribution of bison is outside the scope of the EA, but was evaluated in the development of the IBMP. The Federal FEIS analyzed and disclosed consequences associated with a broader distribution of bison than that defined by the IBMP.

Comment: Quarantine is the first step to depopulate Yellowstone bison.
Response: There is no intent or desire to depopulate Yellowstone bison. Depopulation would not be consistent with the IBMP. As defined by the IBMP, quarantine is an alternative to other methods for removing bison that exceed the population targets.

Comment: Elk will reinfect the clean bison that are returned to the Park.
Response: Infected elk could transmit brucellosis to clean bison, if those bison were returned to the Park. Currently, the bison herd significantly exceeds the population targets defined by the IBMP and no management purpose would be served by returning brucellosis-free bison to the Park. Therefore, it is unlikely that bison that have cleared quarantine would associate with infected elk.

Comment: The quarantine facilities should be located within the boundaries of YNP.
Response: Location of facilities within YNP was considered but not evaluated because location within YNP would not be consistent with NPS management policies.

Comment: Department of Livestock personnel disregard the standards for humane treatment, as discussed in the IBMP.
Response: MFWP and APHIS VS are committed to the humane treatment of the bison that will be involved in this study. They also have established an Animal Use and Care Committee to provide advice on the humane treatment of bison. The agencies will apply the best standards of care determined from American Veterinary Medicine Association guidelines, this Animal Use and Care Committee and additional consultations with many bison experts.

Comment: The vaccination in question is ineffective in bison.

Response: The proposal being evaluated concerns bison quarantine, not vaccination. Vaccination was considered by APHIS VS in an EA and FONSI signed in November, 2003 and confirmed in February, 2004. Montana's decision memorandum regarding vaccination of bison in the Western Boundary Area was issued in February 2005. In addition, the NPS has published a Notice of Intent to prepare an EIS for remote vaccination of bison. Release of the draft EIS is pending.

Comment: Brucellosis eradication is a worthy goal but remains biologically and politically impossible to achieve. The EA must provide an analysis of how a bison quarantine operation in concert with other bison management activities will reduce or eliminate brucellosis in YNP bison.
Response: The purpose of the bison quarantine feasibility study is to determine if quarantine will be an effective method to identify and remove from the population animals that have latent infection with brucellosis. If it is successful, it will begin to address one of the primary frustrations in trying to manage and ultimately eradicate brucellosis, namely latency. While quarantine alone will not directly lead to brucellosis eradication, it is a tool that will help manage the disease and could be extremely useful in bison conservation and restoration efforts outside the GYA by providing genetically pure, disease-free animals to start and augment free-ranging herds on public and tribal lands.

Comment: Allowing bison to disperse onto substantial areas of public land on the north and west sides of YNP and controlling numbers through public hunting would have the potential to turn the perceived problem into an asset.
Response: The level of tolerance for bison outside YNP is defined by the IBMP. The federal EIS analyzed and disclosed consequences associated with a broader distribution of bison than that defined by the IBMP. Changes to bison distribution, as defined by the IBMP, are outside the scope of this EA. Expanding and increasing bison populations will not address brucellosis management and is not likely to decrease the overall prevalence of the disease. Although hunting will increase the wildlife value of bison, there will remain issues relative to controlling the spread of brucellosis to cattle adjacent to YNP.

Comment: Instead of researching the quarantine protocol, the agencies should focus the effort on developing a cure for brucellosis with the eventual intent of returning cured animals back into the Park.
Response: The agencies are actively involved in other research to examine some of these issues. Until that work is successfully completed, treatment alternatives are not available. All treatments would have to be carefully evaluated and pass significant peer review and multiple agency approval before they could be applied to the management or control of brucellosis. The agencies and USAHA are working on a series of working symposiums to help guide further research and encourage the development of better vaccines and diagnostics.

3.4 Issues that will Frame the Analysis

MFWP and APHIS VS have worked extensively with a variety of agencies, organizations and interested individuals to develop the procedures for a quarantine feasibility study. MFWP also completed an EA for Phase I of the study. Based on this work and the relevant issues identified

by the public, MFWP and APHIS VS determined that the following issues are pertinent to the pending decision and appropriate for framing a reasonable range of alternatives for analysis in the EA:

1. Which locations are suitable for siting Phase II and Phase III quarantine facilities?
2. What are the site-specific environmental effects associated with each of the quarantine facilities?
3. What are the implications associated with the siting the Phase II facilities on the Dome Mountain WMA relative to the purpose for which the WMA was acquired?
4. What are the effects on private landowners in the vicinity of the various quarantine facility locations?
5. What are the criteria for determining appropriate recipients and locations for distribution of live bison that are certified as brucellosis-free at the end of the feasibility study?
6. How will the agencies ensure that bison that clear quarantine will not transmit brucellosis to other susceptible animals?

4.0 DESCRIPTION OF THE ALTERNATIVES

Previously, MFWP issued a decision to jointly conduct with APHIS VS Phase I of a three-phase bison quarantine feasibility study. Phase I is designed to evaluate the potential for latent brucellosis infection in bison calves which, on the basis of a battery of blood tests, are presumed to be free of brucellosis. During the selection process, up to 100 bison calves, that initially are seronegative for *Brucella abortus*, per year in each of two years would be retained for one year at the Brogan Bison Facility leased by APHIS VS. These calves would have been born the previous June and captured during the winter period as a result of normal operations of the IBMP. Approximately half of these animals would be euthanized at the end of Phase I and tissues would be cultured for *B. abortus* to determine the prevalence of latent expression of this disease.

If results from the cultures and serologic testing of bison during Phase I indicate a 95% certainty of finding brucellosis if it is present in 5% or more of the population (assuming Phase I test groups of approximately 100 animals) then Phase II would be initiated. During Phase II, bison would be held until they reach sexual maturity, at which time they would be bred. During Phase III, bison would be held in small cohorts through calving to confirm that cows did not develop a brucellosis infection during pregnancy. Completion of all phases of the feasibility study is critical to subsequently determine whether it is appropriate to incorporate quarantine into the long-term bison management strategy.

This Environmental Assessment has been prepared to identify and evaluate effects to the human environment that may result from completion of Phase II and Phase III of the bison quarantine feasibility study. If successful, the results of this study would be used to evaluate the feasibility of amending quarantine procedures into the IBMP and to prepare the corresponding environmental analysis.

Alternatives in this EA include the following:

1. Terminate the feasibility study upon completion of Phase I (No Action)
2. Complete the feasibility study at two project facilities – Brogan Bison Facility and Slip ‘n Slide Ranch (Proposed Action)
3. Complete the feasibility study at two project facilities – Brogan Bison Facility and Dome Mountain WMA
4. Complete the feasibility study at three project facilities – Brogan Bison Facility, Slip ‘n Slide Ranch, and a third site, to be specified at a future date.
5. Complete all phases of the feasibility study at the Brogan Bison Facility

Features common to all of the action alternatives include the use of the feasibility study protocol and the decision framework for distributing live, brucellosis-free bison remaining at the end of the feasibility study.

4.1 Description of Feasibility Study

All action alternatives would follow the same overall research design (Figure 1). The general goal of the feasibility study is to progressively determine if quarantine procedures can result in a reasonable probability that most, if not all, of the bison processed through each phase of quarantine research would remain seronegative for brucellosis and eventually meet the APHIS VS requirements for quarantine of YNP bison.

The quarantine feasibility study procedures would include processing two groups of bison calves through the quarantine facilities in 4 to 6 years. Initial capture and testing operations (Phase I) will select up to 100 seronegative calves out of Duck Creek, Horse Butte and/or Stephens Creek capture facilities during winter operations of the IBMP. All calves will be tagged for identification, tested and held in field capture facilities for one day, until the Full Panel and Card serologic tests are completed.

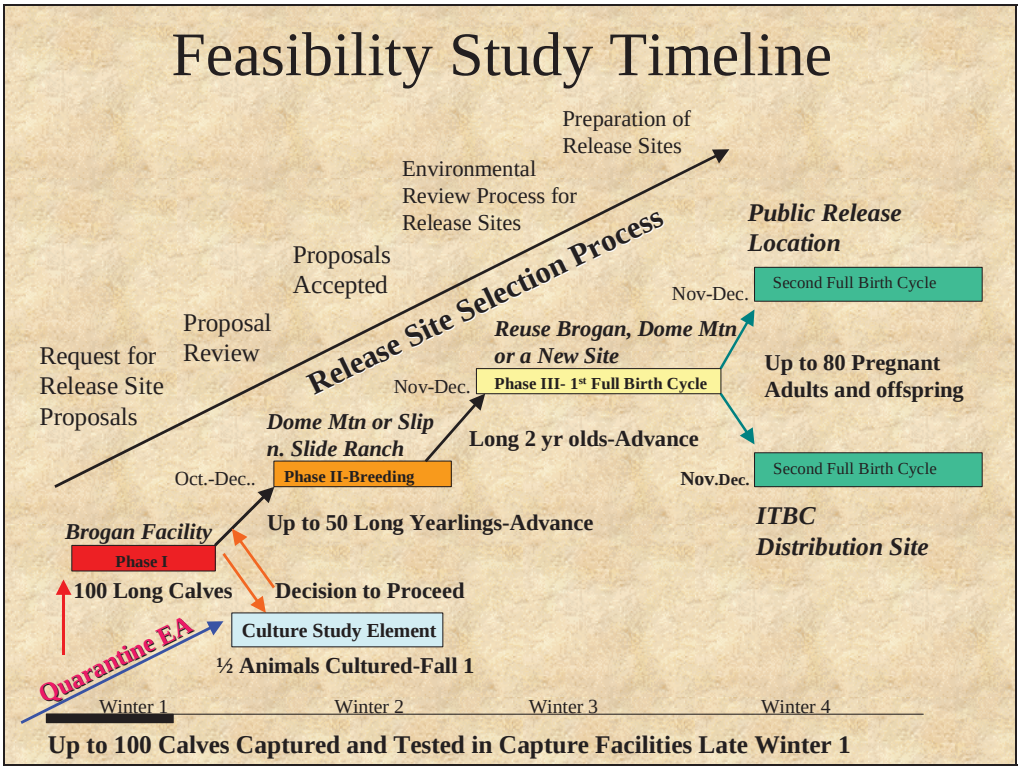

Figure 1. Bison quarantine feasibility study framework.

Seronegative bison calves will be assembled in a holding pasture at the Brogan Bison Facility. Seropositive animals will be sent to slaughter or used in other research, as provided for in the IBMP. After the final assembly, bison will be retested using a number of known test methodologies (Appendix B, Tests for Brucellosis) and sorted into two groups of 40- 50 bison. All suspect or positive animals would be removed after full panel testing. The test panel may include the card, buffered antigen plate agglutination (BAPA), standard plate, standard tube, CF, rivanol, and PCFIA tests, and fluorescence polarization assay (FPA). Additional tests, such as polymerase chain reaction (PCR) test, may be added as they are validated and become available. Blood samples would be collected and sent to the National Veterinary Services Laboratory (NVSL) for culture.

The two groups of seronegative test animals will be placed into a three-pasture rotation system using two irrigated lower pastures and one large upper pasture through the spring, summer and fall. Following a fall gathering of the animals, a sample of seronegative bison would be randomly selected from each of the two groups. Selected bison will be euthanized and submitted to detailed tissue sampling and culture. The sample rate will be sufficient to assure a 95% probability that an infection rate of 5% would be detected (Cannon and Roe 1982). Tissues will be sampled according to protocols established by Rhyan et al (2001). Specific target tissues (including whole blood and retropharyngeal, supra mammary, and iliac lymph nodes) will be submitted to culture while other tissues would be sampled but frozen at –70° F. for follow-up culture upon evidence of latent infection in the group or an individual. Bison not selected for sacrifice and tissue culture will receive serological tests. Any positive animals will be removed from the study.

If serology and culture results at the completion of Phase I establish a 95% certainty of detecting infection at a 5% or greater prevalence, thus indicating a reasonable probability for success during subsequent quarantine phases, then all remaining bison (up to 50 animals) would be graduated into Phase II/III procedures. The Phase I facility would be cleared of bison in fall and rested. During this period, fences would be checked and the property would be dragged to reduce fecal matter. Pasture design flaws, if any, also would be corrected. Following these preparations, the facility would be ready to receive a second cohort of up to 100 calves. The grazing process, outlined above, also would be repeated again with a second cohort of bison calves in year two.

Following the final testing at the end of Phase I and the removal of any seropositive animals, the test groups would be moved to the Phase II facility during November-early December. Bison would be sorted into four test groups of 10-20. Supplemental forage would be provided through winter and summer. Group separation would be maintained through Phase II.

Breeding would be allowed in late summer-early fall using the young bulls from each test group. If necessary, additional bison bulls retained by USDA in Fort Collins, Colorado would be introduced for breeding. These bulls are animals that have been used for other research projects and are YNP genetic stock. Bison would be re-tested using a serological testing panel similar to that used in Phase I in late November and would be sorted by pregnancy status. Non-pregnant cows would be retained in Phase II and bred again in the following year. A few bulls from the first cohort would also be retained in Phase II. Holdover animals would provide benefits in herd management during the second year because they would be familiar with the settings. Pregnant cows and some bulls would advance to Phase III.

Pregnant bison would be introduced into the Phase III calving facility in November-early December. Pregnant bison would be initially sorted into groups of 10-20 in large open pens in the company of a few bulls. Bison would acclimate through the winter, December-February. In February bison would again be sorted into smaller test groups of 5-8 animals. Bulls would be separated from cows during calving and the pregnant cow groups would be sorted into calving paddocks. Pregnancy and calving progress would be monitored with vaginal implants and intense observation. Bison cows and calves would be tested for brucellosis within five days of calving or abortion.

Newborn calves would be allowed to mature in paddocks until they are ready for open pastures at about 2 months of age. All seronegative cows with seronegative viable calves would be sorted back into field pastures until late fall or early winter. Bulls would be with these pasture groups to breed cows that cycle back in summer-late fall. Bison in test groups that remain serologically negative on all tests and demonstrate one successful calving would be sorted and grouped for distribution. Selected animals and calves meeting quarantine standards would be relocated no later than December to allow acclimation at the release site. Many if not all of the cows in these groups may be pregnant.

If, during Phases II and III, individual bison test positive for brucellosis, positive animals would be shipped to slaughter, necropsied and disposed of at the DoL Veterinary Diagnostic Laboratory or transferred to another USDA approved research facility. The remaining animals in that group would be held through another breeding, calving and testing cycle, but isolated from other test groups to ensure that all individuals remain seronegative for brucellosis.

A final interagency review panel composed of research scientists from universities and federal and state agencies would evaluate quarantine procedures using data from this feasibility research. The agencies would complete a study report and conduct a peer reviewed risk assessment of quarantine procedures by the USDA Centers for Epidemiology and Animal Health. This report would be the basis for developing and adopting new or improved strategies for quarantine procedures suitable for future implementation of quarantine programs.

In the event this quarantine protocol is not sufficient to certify bison that are free of brucellosis infection, the agencies would reconsider whether bison quarantine is appropriate within the framework of the IBMP. Complete failure may result in a decision to remove facilities and abandon all quarantine efforts. Partial failure may result in modification of procedures and additional study efforts.

4.2 Distribution of Brucellosis-free Bison

Bison that successfully clear the quarantine feasibility study could, with a high degree of confidence, be considered brucellosis-free. Since each of the action alternatives uses the same protocol, brucellosis-free bison are likely to be produced, no matter which alternative is chosen. It is therefore necessary to determine the criteria that would be used to distribute brucellosis-free bison that may result from the quarantine feasibility study. All action alternatives would employ the same process for making decisions about where to place these bison.

4.2.1 Distribution Criteria

The agencies have established an exploratory interagency/tribal panel to define the socio-economic and biological criteria for identifying suitable release sites. The agencies would continue to work with this panel to develop a process for selecting the most suitable restoration site for the release of the feasibility study animals. The panel may be incrementally expanded into an interagency/tribal bison restoration panel that could include key non-government

organizations involved in conservation projects after the basic standards and criteria are established by the initial exploratory group.

White et al. (2001) have already outlined many of the ecological and management considerations in restoring plains bison in Canada. The agencies anticipate building upon the existing body of knowledge produced by others who have considered bison restoration in recent years. At a minimum, the criteria to be adopted would specify that bison must be released into suitable natural habitats within the historical range of plains bison in North America and allowed to naturally range within a defined project area. The criteria would specify the minimum requirements for environmental review of bison restoration proposals. The panel would apply existing guidelines developed and published by the International Union for Conservation of Nature and Natural Resources/Species Survival Commission (IUCN/SSC) (IUCN 1998) for reintroductions of bison and would conform with the IUCN's position statement on translocation of living organisms (http://www.iucn.org). The agencies would routinely consult with the IUCN Bison Specialist Group as they develop further species-specific guidelines for bison restoration while developing a North American Conservation Strategy during the coming year. The agencies anticipate these criteria would define minimum biological, conservation, social, legal and economic standards for an acceptable bison restoration project. These criteria would be used in the distribution of the feasibility study animals. They also would serve as draft criteria for distributing animals should a quarantine program be considered and adopted by the agencies.

The agencies would solicit project proposals for public or tribal herds in any portion of North America within the historic range of plains bison. Projects would be considered in suitable states or provinces of Canada, United States or Mexico. Key grassland inventories have been developed by The Nature Conservancy (Karl and Hoth 2005) and the Northern Plains Conservation Network (Forrest et al. 2004) to assist in this selection process. Efforts would be made to integrate bison restoration into existing or proposed large-scale grassland restoration efforts being conducted in North America whenever possible. Cooperative programs between the agencies, tribes and private landowners would be considered as well as restoration projects designed solely by specific public land management agencies.
The proposed interagency/tribal bison restoration panel would prioritize and select public sites to be considered for restoration based on the overall conservation value of the project, socio-economic considerations, biological/ecological criteria, funding and local public support. At a minimum the agencies expect this panel to initially include representatives from several federal agencies (APHIS VS, USFWS, NPS, USFS, BLM), State of Montana (DoL, MFWP), IUCN Bison Specialist Group and the Intertribal Bison Cooperative (ITBC). Additional representatives from the agricultural and conservation communities would be included in discussions as project areas emerge and interest develops in a focus area. The agencies anticipate that the selection and approval process for restoration sites on public lands would be completed before bison reach Phase III so that the necessary field preparations can begin at the selected release sites.

4.2.2 Process for Distributing of Study Animals to Public Lands

Environmental reviews would be completed prior to implementing a restoration project on public lands to ensure compliance with the relevant federal and/or state environmental regulations and to ensure appropriate public involvement in the decision process. Recipient agencies would

develop an appropriate management plan prior to release that outlines specific population management objectives; means to control the numbers and distribution of bison within the restoration area; and, methods to monitor populations. The recipient agency, in cooperation with APHIS VS, would establish the appropriate disease monitoring during any subsequent phases of the release and restoration process and would assure that bison are not used for commercial purposes. Agency agreements would be developed and approved by appropriate authorities involved in each restoration project.

4.2.3 Distribution Process for Distributing of Study Animals to Tribal Lands

Tribal consultations would be completed prior to implementing a restoration project on tribal lands. ITBC would develop a bison distribution center on suitable lands of one of the cooperating Tribal members of the ITBC. The distribution center would operate as a temporary location to hold and sort bison received from the bison quarantine facility in the GYA. ITBC, in cooperation with APHIS VS, would establish the appropriate disease monitoring during any subsequent phases of the release and restoration process and would assure that bison are not used for commercial purposes. Upon successful completion of the quarantine feasibility study and during the subsequent efforts to amend the quarantine protocol into the IBMP, the ITBC would facilitate the necessary Tribal decision processes and oversee the final distribution and transfer of qualified YNP quarantined bison to various tribal restoration project sites.

4.2.4 Standards for Soft Release

The concept of "soft release" provides a mechanism for allowing bison to establish home tendencies and to acclimate to the pastures in which they are introduced. Soft release facilities would be constructed to meet secure containment criteria at each reintroduction site. Restoration programs would use a fence design that offers suitable containment but can be removed after an initial acclimation and testing period. Fencing would be designed to be wildlife friendly and allow the passage of wild ungulates (Karhu and Anderson, 2002). Bred cows, new calves and bulls from the release group would be introduced into the area in early winter, if possible, to allow acclimation to the home site. Bison would be maintained within the acclimation pasture through that first winter to establish a home tendency. Bred cows would complete a second calving in the acclimation pen. Prior to parturition, pregnant female bison would be equipped with vaginal implants to quickly detect successful birth and/or any abortion events. All bison would be serologically tested following calving and before the final removal of fencing. Any animals that test positive for brucellosis would be slaughtered. Associates of those animals would be either quarantined on site or slaughtered. If all tests are negative for brucellosis, the fencing would be removed and bison would be permitted to naturally range at the new site. Following removal of the fencing, some individual bison would be radio-monitored for management purposes. Each recipient agency would continue to monitor calving annually, as per the provisions of its disease surveillance plan.

4.3 Weed Management

Noxious weeds compete with desirable forage plants. The occurrence of spotted knapweed and leafy spurge is increasing in Park County. All alternatives include a commitment to control

noxious weeds. Control may occur with the use of properly prescribed chemicals on a prioritized basis to eradicate small, isolated weed patches and prevent the further spread of weeds to adjacent lands. Where the use of chemicals is inappropriate, weeds would be controlled with mechanical methods or biological controls. The agencies would continue to monitor weed distribution and coordinate weed control efforts with adjacent landowners and with the Park County Weed Control Board.

4.4 Alternative 1. Terminate the feasibility study upon completion of Phase I (No Action)

Under the No Action Alternative, MFWP and APHIS VS would complete Phase I of the bison quarantine feasibility study, as described in the previous EA (MFWP 2004b), and would not progress with Phases II and III. The cooperating agencies would retain up to 100 seronegative bison calves that are captured during normal operations pursuant to the IBMP. These calves would be held for one year in a test at the Brogan Bison Facility. During the course of the year, all calves would be periodically serially tested to screen for brucellosis. Prior to completion of Phase I, up to half of the bison would be euthanized for the purpose of collecting tissue samples for culture tests in an attempt to isolate *Brucella abortus*. At the end of the year, all animals that remain would be slaughtered or used in other research projects, regardless of the results of the Phase I study. If the results are favorable, the agencies may retain a second cohort of up to 100 bison calves and replicate the Phase I portion of the study in year two. At the end of the second replication, all remaining animals would be slaughtered and the quarantine feasibility study would be terminated.

The facility for this alternative was developed pursuant to the decision to implement Phase I of the bison quarantine feasibility study. No further facility development would be proposed.

4.5 Alternative 2. Complete the feasibility study at two project facilities – Brogan Bison Facility and Slip ‘n Slide Ranch (Proposed Action)

If the results of Phase I of the feasibility study meet the criteria for continuing with the feasibility study, the proposed quarantine feasibility study would be completed in two additional phases. During Phase II, the breeding phase, the agencies would transport the cohort of yearling bison from the Brogan Bison Facility to a quarantine facility to be constructed on property that would be leased from the Slip ‘n Slide Ranch and administered by the MFWP specifically for the feasibility study. The bison would be maintained at this facility through the breeding season (August-September) following their second birthday. Breeding, using Yellowstone bull bison, would be attempted and breeding activity would be carefully monitored. Mating would be designed to maximize genetic diversity.

The Slip n’ Slide Ranch has a small cattle herd that would be sold once a lease arrangement has been consummated and before initiation of Phase II at the facility. The horse operations would continue during the study but, contact between the horse herd and bison would be prevented by double fencing and strict management of the horse herd. Annual testing may be implemented to assure that no transmission has occurred to the breeding horse stock.

The agencies propose to complete the quarantine feasibility study through two successive replications of the three phases of this protocol. Thus, after the first cohort of yearlings has been transported to the facility at the Slip ‘n Slide Ranch, a second cohort of calves would be assembled at the Brogan Bison Facility for replication of Phase I. When the second cohort has completed Phase I, those animals would be transported to the Slip ‘n Slide Ranch. At that time, the agencies would modify the Brogan Bison Facility to include calving paddocks.

During Phase III, the calving phase, the agencies would transport the pregnant cows from the Slip ‘n Slide Ranch back to the Brogan Bison Facility and the cows would complete their first calving in quarantine. Bison would be allowed to free-range within the Brogan Bison Facility until just before calving and then would be brought into paddocks in small test groups until calving is completed. After calving, cows and calves would be tested for brucellosis. Seronegative cows, with their newborn calves, would then be placed back out into the larger pastures.

If, following calving, all of the cows remain seronegative for brucellosis, the cows and their calves would be eligible for soft release to another location. The decision for the location of soft release would be based on the distribution criteria.

Following two successful replications of the three-phase quarantine suitability study, the agencies would complete a detailed review of procedures and, based on that review, would evaluate options to amend quarantine procedures into the IBMP. Any such decision to amend the IBMP would be supported with additional environmental review.

The Phase II facility would be constructed on two parcels, totaling approximately 60 acres, of existing hay-meadow within the Slip ‘n Slide Ranch (see Appendix C, Proposed Quarantine Facility at the Slip ‘n Slide Ranch). A game-proof exterior fence would be erected around the grazing lands. The fence design would include a high tensile fence interior with 8-foot Interlock fencing exterior and an additional electric fence perimeter at low heights for predator defense. The grazing lands would be divided into four pastures with internal cross-fencing. A portable handling facility would be located within the pasture complex. Water and electrical power already are sufficient to support the operation of the proposed facility.

Final design modifications and site construction for the quarantine facility at the Slip ‘n Slide Ranch would begin in the summer, following approval of a decision to implement this alternative. Construction would be contracted and would begin contingent upon final serologic testing of animals slaughtered for culture. Culture results would follow in approximately 10 weeks. Contracting procedures and final design modifications to accommodate Phase II of the study at the Slip ‘n Slide Ranch would begin prior to final results of Phase I culture efforts. If the results of Phase I indicate that the study should be terminated, any Phase II facilities construction would be halted and the area returned to its pre-construction state.

The agencies currently are discussing an option with the owner of the Slip ‘n Slide Ranch. The option would secure the opportunity to negotiate the lease at little or no cost. The option would be conditional on the final decision and would not commit the agencies to either a decision to proceed with Phases II and III of the quarantine feasibility and or to select this alternative.

4.6 Alternative 3. Complete the feasibility study at two project facilities – Brogan Bison Facility and Dome Mountain WMA

This alternative is similar to Alternative 2 except that Phase II would be completed on the Dome Mountain WMA. Facility construction and study design would be similar to that described for Alternative 2.

The Phase II facility would be constructed on about 300 acres of sagebrush-grassland and cultivated hay-meadow within the Dome Mountain WMA (see Appendix D, Proposed Phase II Quarantine Facility at Dome Mountain WMA). A game-proof exterior fence would be erected around the grazing lands. The fence design would include a high tensile fence interior with 8-foot Interlock fencing exterior and an additional electric fence perimeter at low heights for predator defense. The grazing lands would be divided into four pastures with internal cross fencing. A portable handling facility would be located on the lower portions of the hay meadows. A water well would be developed at a suitable location within the complex. The power supply would be upgraded and electrical systems would be installed to support the facility operations.

There are no grazing cattle adjacent to the proposed site on Dome Mountain. Cattle are trailed through the WMA to either forest allotments or to private lands where summer pasture is available to several cattle operations.

Final design and site construction for the quarantine facility at Dome Mountain WMA would begin the summer following a decision to implement this alternative. Hay fields at Dome Mountain would be harvested prior to introducing the bison to the new facility. Construction would be contracted and would begin contingent upon final serologic testing of animals slaughtered for culture. Culture results would follow in approximately 10 weeks. Contracting procedures and final design modifications to accommodate Phase II of the study at Dome Mountain would begin prior to final culture results from Phase I. If the results of Phase I indicate that the study should be terminated, any Phase II facilities construction would be halted and the area returned to its pre-construction state.

4.7 Alternative 4. Complete the feasibility study at three project facilities – Brogan Bison Facility, Slip ‘n Slide Ranch and an un-specified third site

This alternative is similar to Alternative 2 except that, during Phase III, the calving phase, the agencies would transport the pregnant cows to a third facility at an as yet undetermined location, and the cows would complete their first calving in quarantine.

This alternative does not require the modifications to the Brogan Bison Facility to accommodate Phase III, as described for Alternative 2. It includes the Phase II facility at the Slip ‘n Slide Ranch, as described for Alternative 2. Pending the lease or purchase of a suitable third property, a Phase III site would be constructed to accommodate calving operations. A game-proof exterior fence would be constructed, similar to that described for the Phase II facility at Slip ‘n Slide. Within the exterior fence, up to eight small paddock areas, each with separate holding pens for

calving bison would be constructed. A semi-portable handling facility would be located at an appropriate site on the property. Depending on specific property features, water and power development may be necessary. The facility would be designed to maximize sorting capability and gently handle bison mothers. Several experts would be consulted in developing an efficient animal handling and pasture design.

Phase III facility design and planning would begin after the initiation of Phase II operations. Facility construction would begin after bison yearlings have been successfully transferred into Phase II facility and most remain seronegative. Further negotiations would be pursued with federal land managers or willing private landowners to find a suitable site for an additional facility. If the agencies select Alternative 2 (proposed action), the Dome Mountain WMA also could be considered for the location of the Phase III facility. Because the agencies have not definitively identified a suitable location, an additional, site-specific, environmental review would be completed prior to a decision to locate Phase III quarantine facilities at a third location. The environmental review would focus on evaluation of issues specific to development of the third site.

4.8 Alternative 5. Complete feasibility study at the Brogan Bison Facility

This alternative also would follow the three-phase protocol. However, bison would be held at the Brogan Bison Facility (see Appendix E, Proposed Modification to the Brogan Bison Research Facility to Accommodate Phase III Operations) throughout the bison quarantine feasibility study. Therefore, the replications of the three-phase protocol would occur consecutively over a 6-year period rather than concurrently over a 4-year period. The Brogan Bison Facility would be modified to include calving paddocks, as described in Alternative 2.

4.9 Alternatives considered but not evaluated

The agencies considered but did not evaluate an alternative to terminate the feasibility study and return the current cohort of quarantined bison to the Park.

5.0 AFFECTED ENVIRONMENT

5.1 Description of Paradise Valley

Phases II and III of the bison quarantine feasibility study would be completed within the northern Yellowstone Ecosystem so there is no risk of transmitting brucellosis outside of the area where wildlife are currently infected with the disease. Locating the study facilities within the GYA would assure that if there were failures in the procedures, brucellosis would remain inside the GYA and not inadvertently spread beyond the area that is currently considered to contain brucellosis-infected wildlife. The federal FEIS for the IBMP provides a comprehensive description of YNP and the Montana portion of the GYA, including the Paradise Valley. All phases of the feasibility study would occur in the southern portion of Paradise Valley, near or adjacent to YNP.

5.2 Description of the Slip 'n Slide Ranch

The Slip n' Slide Ranch is a privately owned, 500-acre diversified ranching operation that is located just inside Yankee Jim Canyon north of Gardiner, Montana. The ranch is within the boundary of the canyon identified in the IBMP as a significant landmark beyond which free-ranging Yellowstone bison are not allowed after Step III of the IBMP has been initiated. The ranch is primarily surrounded by Gallatin National Forest and State of Montana land. The ranch family currently manages a small cattle operation, raises horses, and outfits hunting, fishing and horseback trips on the ranch and in surrounding U.S. Forest Service lands. The ranch produces hay on several irrigated fields as a cash crop and also to supplement the cattle and horse operations. The landscape is gently sloping and mostly native grassland except for the mixed alfalfa- and grass-cultivated hay meadows. A small portion of the eastern side is forested on the north slopes and creek bottoms. The ranchers also have a grazing lease on the adjacent U.S. Forest Service allotment.

5.3 Description of Dome Mountain WMA

The Dome Mountain WMA (MFWP 2005a) is comprised of 4,680 acres located on the east side of the Upper Paradise Valley (southern portion), approximately 14 miles north of YNP and 30 miles south of Livingston. Adjacent lands include federal lands managed by either USFS or BLM and lands in private ownership.

The WMA is primarily open bunchgrass rangelands. Principal habitat types include 3,150 acres of winter range slopes and basins; 200 acres of riparian aspen-shrub communities; 150 acres of irrigated agricultural hay meadows; 100 acres of wetland marsh community; 960 acres of dry grassland bench; and, 120 acres of open water.

MFWP acquired the Dome Mountain WMA for the primary purpose of providing winter range for a local elk population and for migratory elk from the Northern Yellowstone Elk Herd and for relieving game damage problems on private lands. Secondary management purposes include improvements in habitat for other wildlife species and provision of public recreational opportunities. Consistent with those purposes, MFWP prepared a management plan for the

WMA in 1990 with the stated goal: To conserve and improve the soil and vegetation of the wildlife management area, while providing winter habitat for elk; seasonal habitat for deer, grouse and nongame wildlife; hunting and other recreational opportunities for the public; and, access to the national forest. Specific objectives within the plan include:

1. Prevent soil erosion and conserve and improve the vegetative communities, striving for maximum vegetation diversity dependent on soil types.
2. Manage for a wintering population of 2,000 – 3,000 elk, a wintering population of 200 – 250 mule deer and a yearlong population of 100 – 150 mule deer; provide for waterfowl and upland game bird production; and, maintain existing nongame species.
3. Provide 400 hunter days and 200 additional recreation days for the public and at least one travel lane to national forest lands.

5.4 North American Bison Conservation Strategy

In May, 2005 the IUCN Bison Specialist Group met to discuss development of a North American Conservation Strategy for plains and wood bison. The group was composed of bison specialists from across the continent including private as well as government sectors. A Conservation Strategy outline was proposed and a draft strategy is expected within one year of this initial meeting. This strategy would address the current status of bison, the habitat needs and restoration potential, legal and policy issues related to restoration and management, and population demographic/genetic issues. The combined efforts of these scientists and managers would provide information relevant to the restoration activities of agencies and private landowners to assure successful reintroduction of bison to various habitats in North America. The bison quarantine feasibility study would use this benchmark work to aid in the identification of restoration sites in North America and the development of release procedures that would assure success.

5.5 Potential recipients/release sites for bison resulting from feasibility study

Bison release sites are being explored annually by ITBC. The ITBC mission is to help its 55 member tribes develop restoration projects on Native American lands. Many of these member tribes are currently working on restoration plans and the ITBC is serving as a coordinating organization for the activities associated with these projects.

Several bison restoration plans are already in place for private and government lands in Canada and the United States. The American Prairie Foundation (APF) has recently introduced bison from Wind Cave behind a fenced pasture on lands they own in South Phillips County, Montana. This introduction of these domestic bison is a precursor to their proposal to restore wild bison onto these landscapes. Two restoration plans have been developed in Canada for Banff National Park and Grasslands National Park in Canada. These plans call for the establishment of wild free-ranging bison in numbers and places where they can be accepted.

The Nature Conservancy and the World Wildlife Federation have conducted extensive reviews of the temperate grasslands in North America. These reviews have identified over 50 areas where the native temperate grasslands are intact and major restoration of functional grassland ecosystems could be considered. Ten suitable landscapes of public land that are 1,000,000

hectares in size or larger are identified in the Northern Plains region by the World Wildlife Fund (Forrest et al. 2004). Returning a native grazer such as bison is a major consideration in these conservation efforts.

The MFWP Comprehensive Fish and Wildlife Strategy identified several important species, focus areas, and plant communities in need of conservation. One of the goals of this plan is to take a comprehensive look at conservation of native species and habitats they are associated with. Bison and several grassland communities are identified as needing conservation efforts by the State of Montana. The restoration of bison on associated habitats to create a functional ecosystem where wild bison can be managed is of interest to MFWP.

5.6 Decision Framework for Bison Release

On August 10 and 11, 2005, MFWP and APHIS hosted an interagency meeting to explore the concept of bison restoration on public lands. This meeting was designed to share background information, explore legal and policy obstacles for bison restoration, and to establish some basic criteria that would be necessary for these agencies to participate in bison restoration activities.

From this exploratory discussion and internal review, FWP and APHIS VS determined to establish a standing Interagency Bison Restoration Committee to advise the agencies in the solicitation and evaluation of suitable restoration projects according to some well-defined criteria. The Committee would include representatives from Montana Fish, Wildlife and Parks, Montana Department of Livestock, USDA/Animal Plant Health Inspection Service/Veterinary Services, U.S. Fish and Wildlife Service, U.S. Forest Service, Bureau of Land Management, National Park Service and ITBC. In addition, the Interagency Bison Restoration Committee would consider guidance and counsel of the IUCN bison specialist group. The chair of the IUCN bison specialist committee would participate in committee functions and assure better coordination across international boundaries. The agencies would also encourage input and involvement from interested non-governmental organizations (NGO), especially groups with an agriculture, sport-hunting or conservation perspective. The role of the Committee and the NGO's would be information sharing, only.

The Interagency Bison Restoration Committee would not seek consensus nor would it be responsible for developing formal recommendations. MFWP and APHIS VS would seek advice from the Committee members on a variety of issues, especially the following:

1. When a suitable group of bison becomes available during Phase I of the quarantine study, the agencies would develop a request for proposals and release the request to appropriate management agencies or tribes.
2. Sponsoring agencies or ITBC (representing a member tribe) interested in receiving Yellowstone Bison would submit an application to the Director of the Montana Fish, Wildlife and Parks.
3. MFWP would supply any application documents received to the Bison Restoration Committee for review and opinions of each proposal relative to all other existing proposals.
4. The Committee would offer opinions and advice regarding which, if any, projects could be served with existing supplies of Yellowstone Bison.

5. The Director would approve the selected projects and instruct the Wildlife Division to proceed with a release of suitable bison.

At a minimum, the application for YNP bison would include:

- Description of the project objectives, including how the project serves the greater conservation needs of plains bison;
- Description of the location and habitats in the project area;
- Identification of secured and potential funding sources;
- A comprehensive management plan that includes: population objectives and clearly defined means to control herd size and distribution; habitat management objectives; a disease monitoring plan; and, conflict management strategies;
- Clarification of any legal or policy constraints and or treaty constraints that impact the project;
- A clear description of the environmental review process to be conducted, if required;
- A description of socio-economic cost versus benefits associated with the project; and,
- Letters of support from all partners and a definition of the role of each partner in the conservation program.

5.7 Criteria for suitable recipients/release site

With input from the individual experts who participated in the August 2005 meeting and IUCN bison specialist committee, the agencies established a basic set of criteria for YNP bison restoration efforts resulting from the proposed quarantine feasibility study. We anticipate that these basic criteria would be modified and refined by the Interagency Bison Restoration Committee, once established, as new information is available for consideration in this decision process. Some of the basic criteria or guiding principles identified to date for restoration projects in North American include:

- Bison cannot be utilized for commercial purpose.
- Bison must be restored to suitable native grassland habitats within the historic range of plains bison.
- Bison must be managed as native wildlife and in a manner that achieves maximum conservation benefits.
- On public land, a suitable comprehensive management plan to address population management, control of distribution, management of wildlife conflicts and habitat management within the project area would be required.
- As much as is practical, hunting should be part of the population management program on any restoration area.
- All restoration projects must comply with environmental regulations of recipient jurisdictions.
- A public involvement process must be completed to assure a degree of social acceptance of the project.
- A monitoring program for evaluating final disease status and restoration project success would be implemented for 5 years following each release.

We anticipate that restoration projects resulting from the quarantine feasibility study would serve as pilot efforts to provide additional knowledge about bison restoration onto new landscapes. As a result of these learning experiences, improvements and adaptations in procedure and policy are likely.

5.8 Bison

The federal FEIS for the IBMP included a comprehensive description of the bison herd that migrates into Montana from YNP and from which animals would be selected for inclusion in the feasibility study. The FEIS also included a description of the effects of the IBMP on this bison herd. Additional research has been conducted to describe the seasonal movements and migrations of bison into Montana (Peter Gogans, U.S. Geological Service, unpublished data, Aune et al 1997; Keith Aune, MFWP, unpublished data). Research on the genetics of bison from YNP are presented in Halbert (2004), Ward et al. (1999), Ward et al. (2001) and Seabury et al (2005). Boyd's (2003) compendium of bison herds also provides information, where it is available, on the genetic purity of herds in North America. This would be important information in deciding which herds might be eligible for augmentation and avoid the potential for using YNP bison to augment herds in which cattle genes are prevalent.

The size of the YNP bison population was estimated at 2,616 when the Interagency Bison Management Plan was implemented in 2000. Since then, the herd has increased to about 4,900 bison (Table 1.)

Table 1. Bison population estimates in Yellowstone National Park.

Winter	Previous summer population estimate	Late winter population estimate
2000/2001	2616	2870
2001/2002	3283	3300
2002/2003	3900	3160 (range 3050 to 3690)
2003/2004	4250	3604 (range 3430 to 4352)
2004/2005	4240	4900

Since 1997, 657 bison have been captured and removed from the West Boundary Area and an additional 6 bison have been removed by other lethal means (Table 2.). A total of 213 bison were captured, tested and released from the capture facilities in the West Boundary Area.

Table 2. Summary of bison management actions in the West Boundary Area.

Year	Captured	Slaughtered	Released	Hazed
1997-1998	15	11	4	300+*
1998-1999	142	90	52	615
1999-2000	0	0	0	432
2000-2001	14	5**	9	1,561
2001-2002	262	202**	63	1,632
2002-2003	20	13**	8	1,603
2003-2004	20	14**	8	1,530
2004-2005	184	97	69	2,614

*Totals of hazed animals include animals that may have been hazed multiple times
**Totals include lethal removal of animals that were not first captured

Since 2000, 495 bison have been captured and removed at the Stephens Creek facility. In addition, 198 bison were captured, tested and returned to the Park from the Stephens Creek facility.

5.9 Elk Management in the Paradise Valley

The project area is within the Northern Yellowstone Elk Management Unit (EMU), which includes Deer and Elk Hunting Districts (HD) 313, the southern portion of 314 and 316, as defined by the statewide elk management plan (MFWP 2005b). This EMU is comprised of several sub-groups of elk, including migratory and resident animals. The largest number of elk found near the proposed feasibility study site are migratory animals coming from YNP to winter on lands surrounding Dome Mountain. A smaller portion are resident elk migrating in elevation from surrounding mountain ranges to the lower elevation winter ranges surrounding Dome Mountain. Based on movement patterns and elk distribution, MFWP elk management actions can only affect a portion of the entire Northern Yellowstone elk herd, typically 30-50% of the population. For this reason, population objectives for the EMU focus primarily on the number of elk that winter north of YNP and are available to hunters. In this EMU, the hunter harvest of elk is only a portion of overall elk mortality that includes predation by wolves, bears, and mountain lions, and mortality due to periodic winterkill events. However, hunting outside YNP is currently the only type of elk mortality that can be regulated. We do not anticipate human-directed population management of wolf, bear, or elk populations within YNP. A management challenge in this EMU is monitoring the relatively small “resident” portion of the Northern Yellowstone elk herd that spends the entire year north of YNP. It is impossible to accurately monitor the trend in population size and recruitment of the “resident” population because before they move to more open winter ranges where they can be surveyed, they are joined by large numbers of migrant YNP elk early in the winter (often in early December). In some years migrant elk may cause elk HD 317 north of Six-mile Creek Road.

An interagency Cooperative Elk Count is done annually between mid to late-December to monitor populations in this EMU (Figure 2.). This is an aerial population trend count covering 68 winter range units inside and outside YNP accomplished with 4 fixed-wing airplanes flying simultaneously over the entire Northern Yellowstone winter range. No effort is made to correct for observability bias. MFWP conducts 2-3 fixed-wing aerial elk counts north of YNP to estimate the number of elk that migrate onto winter ranges within HD 313 and 314. This information is used to estimate trends in migration size/timing and potential impacts on winter range habitat. In late February to early March, NPS biologists conduct a helicopter classification survey of Northern Yellowstone elk to document the trends in calf:cow:bull ratios. In addition to elk population monitoring there are several elk/predator and elk/habitat research projects underway inside YNP. These studies help shed light on important questions related to elk mortality, behavior and habitat use.

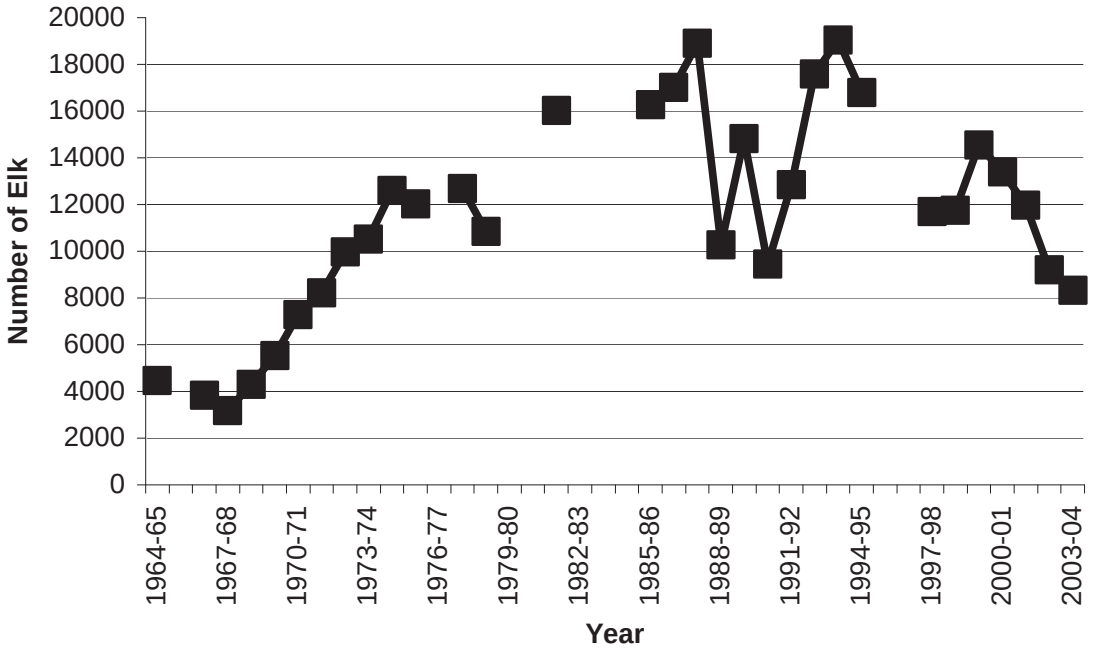

Figure 2. Number of elk counted during Cooperative early winter post-season trend surveys of the Northern Yellowstone elk winter range (includes elk wintering in Yellowstone National Park), 1964-1965 through 2003-2004.

Several unique factors affect elk management in this EMU. The Northern Yellowstone EMU differs from most EMUs in the state, in the following significant ways:

- This EMU does not include the entire year-round home range of the Northern Yellowstone elk herd.
- The majority of the Northern Yellowstone elk are seasonal migrants, spending only 4-5 months during the winter/early spring in this EMU.
- A large portion of the total elk population is not available to sport hunting, and the majority of elk that are available to hunters are hunted during a special limited-access, winter late hunt.
- The Northern Yellowstone elk herd is subject to higher natural mortality than elk in other EMUs, including periodic major winterkill events and high predation rates from a full complement of large predators, including gray wolves. Drought conditions during recent years may have further increased mortality/reduced recruitment.
- As a result of natural predation and environmental conditions, elk recruitment for Northern Yellowstone elk is typically lower than elk recruitment rates in other EMUs in southwest Montana. Trends in elk recruitment become a major factor in determining if the size of this elk population declines, increases, or remains stable.

MFWP administers an early backcountry hunt within portions of the Absaroka-Beartooth Wilderness Area north of YNP in HD 316. This season provides a backcountry elk hunting opportunity to hunt older age-class bull elk with a rifle during the rut. Due to the backcountry

nature of the area, only 400-500 hunters participate and they harvest relatively few (75-150) elk, primarily bulls. This season is managed primarily for the purpose of providing an uncommon recreational experience.

MFWP administers archery and general season elk hunting opportunities to harvest elk in HD 313 and a small portion of HD 314 (S. of Sphinx Creek). These hunting seasons depend on a relatively small portion of the Northern Yellowstone elk population (400-600 elk) that is north of YNP during fall. The last week or two of the general season may also provide an opportunity to harvest migrant elk as they move out of YNP. This potential movement can attract a large number of hunters and increase the harvest substantially in some years.

Wolf restoration and subsequent predation have contributed to the reduction of elk numbers and influenced elk distribution and behavior. Elk management decisions and hunting opportunities are impacted by the effect of wolves on elk populations, movements, and behavior. In addition to wolves, results of an ongoing elk calf mortality study in YNP indicate that grizzly and black bear predation is the major cause of elk calf mortality during the first few weeks of life.

5.10 Threatened and Endangered Species

Grizzly bears (MFWP 2005c) are occasionally observed on Dome Mountain Wildlife Management area. Grizzly bears are common throughout the region and are increasing slightly. A proposal for delisting the grizzly bear in the Greater Yellowstone Ecosystem was published in the *Federal Register* (*Federal Register* vol. 70, no. 221, pp 69854-69884, November 17, 2005).

The gray wolf was reintroduced to YNP in 1995 as a non-essential, experimental population. The most recent description of the Yellowstone Non-essential Experimental Population Area (YNEPA) can be found in the Federal Register dated January 6, 2005 (USDOI, 2005). Montana has completed an acceptable state wolf management plan and has accepted responsibility for management of this species from the U.S. Fish and Wildlife Service (MFWP 2005d). MFWP attempts to balance the needs of both wolf and elk populations with the interests of hunters, non-hunters, and landowners. This management would be within the legal requirements of the Montana Gray Wolf Conservation and Management Plan.

Within Montana, lynx populations are well distributed and in relatively good numbers (MFWP, 2005e), although in the mountains in southwestern Montana, the habitat is marginal (more patchy and drier forest types) (USDOI, 2003). In the GYA, there may be a small population of lynx located in the higher elevations.

There are no nesting bald eagles within 10 miles of the Dome Mountain WMA, although on rare occasions there may be wintering eagles sighted at Daily Lake or on the Yellowstone River in the vicinity of Dome Mountain feeding on fish or gut piles left by hunters ((MFWP 2005f;Tom Lemke, MFWP, personal communication). Bald eagles are also known to winter in the low elevations near Gardiner (USDOI, NPS, 2000).

5.11 Other Wildlife

Mule Deer

Mule deer are common throughout the entire Gardiner Basin (includes Slip n' Slide Ranch) and Dome Mountain WMA and are frequently seen in the areas affected by the proposed action. Mule deer are frequently seen using the hay fields in fall and winter and the native grass and sagebrush covered slopes of the Slip n' Slide Ranch during winter and into spring. Most mule deer in this area migrate to summer ranges at higher elevations as the low elevation grasses mature. The mule deer population is increasing in the area.

Bighorn Sheep

Bighorn sheep are found in areas a short distance from the proposed Phase II facility at Slip n' Slide but are not found along the northern face of Dome Mountain. Bighorn sheep are not typically observed in the cultivated hay fields proposed for Phase II because rugged escape cover is not found near this site. The bighorn sheep population in the Gardiner Basin is fragmented into small matriarchal groups and is stable in numbers. There is substantial interchange among bighorn groups in the Gardiner Basin and those within Yellowstone National Park. Most bighorn sheep use of the low elevations is during the winter and spring. These sheep move to higher elevations away from sites proposed for this quarantine study during the summer months.

5.12 Weed Management

Locally intensive grazing and hoof damage to soil and vegetation are expected during the study. The degree of impact would vary with the stocking rate. Invasive weed species are likely to become established in some areas as the project continues. Weed control measures would be necessary on both the Phase I and II facilities to minimize the establishment of weeds. Management and control would include spraying appropriate herbicides, mechanical treatment and/or biological control. Weed control would be a major duty of the hired labor associated with the project. In addition, arrangements would be considered with lessees of both facilities to assure that weed management is accomplished. Currently, weeds are intensively managed at the Brogan Bison Facility, Dome Mountain WMA and the Slip 'n Slide Ranch. Invasive weeds are not likely to become a significant problem with aggressive weed control measures in place.

5.13 Historical and Cultural Resources

The MFWP State Historic Preservation Office (SHPO) liaison was consulted during the preparation of this EA. Previous cultural inventories have been conducted in the areas surrounding the proposed Dome Mountain site. There are several important archeological sites on the Dome Mountain WMA and important archeological sites may occur elsewhere in the Paradise Valley. Known sites include rock alignments and prehistoric occupation sites.

6.0 ANALYSIS OF ENVIRONMENTAL EFFECTS

6.1 Analysis Common to all Alternatives

The effects of implementing the IBMP were evaluated in previous state and federal Environmental Impact Statements. Those effects would continue under all alternatives evaluated in this EA. Bison selected for inclusion in the quarantine feasibility study would be animals that are subject to removal according to the provisions of the IBMP. Therefore, the effects of consigning bison to quarantine would have no additional effects on the herd beyond those previously disclosed.

Additional effects, specific to a decision to proceed with Phase II and Phase III of the bison quarantine feasibility study, are evaluated in this EA.

All alternatives would employ the same basic protocol for periodically testing animals for latent infections of *B. abortus*.

All alternatives would follow the same research protocol and an adaptive management approach. To assure that the research goals and basic theory behind this research project were consistent with that approach, a draft concept proposal was presented, reviewed and eventually approved by the Greater Yellowstone Interagency Brucellosis Committee (GYIBC) and the USAHA Special Committee on Brucellosis in the GYA. In addition, extensive review of the concept proposal and development of the research proposal has been provided by MFWP, DoL and APHIS VS. These animal health groups and government agencies recommended continued development of this concept into the current quarantine feasibility study and requested the project team to report results annually to ensure good scientific scrutiny throughout project development and implementation. The Interagency Tribal Bison Cooperative was also consulted, provided proposal review, and offered support to assure Native American participation in the project. Additional, reviews have been conducted by the National Park Service prior to issuance of the Research Permit that is necessary to continue the project.

6.2 Costs

The estimated cost to complete all phases and both replications of the quarantine feasibility study, as described for Alternative 2 (proposed action), is $2,170,000 (see Appendix F, Schedule and Budget for the Quarantine Feasibility Study). Costs for facilities would be similar to implement Alternative 3, however the total cost for that alternative would be approximately $60,000 less because lease payments would not be required. Costs for Alternative 4 would be greater because it would require both additional development costs and additional lease payments. Alternative 4 also would require an additional environmental review.

It is possible to estimate the cost per live bison that completes the feasibility study and the cost would be substantially higher than the value of bison in commercial markets. However, such a comparison is not relevant to the analysis because the purpose of the project is to complete the feasibility study. Moreover, the costs displayed in the analysis are specific to the feasibility study and are not indicative of anticipated costs to produce brucellosis-free bison from a long-

term bison quarantine operation. If the IBMP eventually is amended to include a quarantine protocol, many of the costs for initial construction and implementation already would have been incurred during the feasibility study and the corresponding benefits would accrue over a long period. Thus, the cost per animal would be substantially less.

6.3 Determination of Effects on Threatened and Endangered Species

The three potential sites that have been identified for possible use in bison quarantine feasibility study are the Brogan Bison Facility, the Slip n' Slide Ranch and Dome Mountain Wildlife Management Area. The Brogan Bison Facility is currently leased and used by APHIS VS for bison research. Prior to this, it was used for animal husbandry. The proposed study will not alter the historical use of the ranch and is unlikely to have an impact on threatened and endangered species. The Slip 'n Slide Ranch is a working ranch that has a small cattle herd and horse operation. If this ranch is leased for use in the feasibility study, the cattle will be disposed of and two pastures (approximately 30 acres each) will be fenced to accommodate bison for the purposes of the study. Wildlife habitat will not be altered or disrupted by the study and no impact is expected to threatened and endangered species.

Dome Mountain Wildlife Management Area is a state owned and managed wildlife area. Its primary function is to serve as an elk migratory corridor and elk wintering area. The area that is under consideration for use in the quarantine feasibility study is currently an existing hay meadow and surrounding rangeland. This area is used by elk and other wildlife in the fall and winter. It is a wildlife management area and could be used by listed species, especially predators, (gray wolves and grizzly bears) a Biological Assessment (BA) was prepared to assess the potential impact on threatened and endangered species (see Appendix G). The BA concluded that use of the Dome Mountain Wildlife Management Area for the proposed Bison Quarantine Feasibility Study was not likely to adversely affect threatened and endangered species. The US Fish and Wildlife Service, in a letter dated June 20, 2005, concurred with the BA..

The bald eagle was listed as endangered under the Endangered Species Act in 1978. Subsequently, its status improved and, in 1995, it was down-listed to threatened status. The proposed study is not likely to adversely affect the bald eagle.

The grizzly bear was listed as a threatened species under the Endangered Species Act in 1975. Delisting of the grizzly bear in the Greater Yellowstone Ecosystem was recently proposed. The proposed study is not likely to adversely affect the grizzly bear.

The Canada lynx was listed as a threatened species under the Endangered Species Act in 2000. Generally, the proposed quarantine facilities would be located in areas that are not lynx habitat. The proposed study is not likely to adversely affect the Canada lynx.

Gray wolves may occupy a wide variety of habitats. Their distribution and habitat use in the GYA is closely tied to food availability (USDOI, NPS, 2000). Wolves feed on live and dead elk, deer, bison, and smaller mammals. The fence design for the proposed quarantine facilities should be sufficient to separate wolves from bison. The proposed study is not likely to jeopardize the continued existence of the gray wolf.

6.4 Effects on Elk

Alternative 2 (proposed action) would have minimal impact on elk. The proposed site for the Phase II quarantine facility is very near an existing highway. These fields are infrequently utilized by elk. Existing human activity along the highway and at the homes and ranches along this highway often keep elk from occupying habitats in the proposed study area. Elk are known to graze in habitats east of the study area and would continue utilizing these resources during the study as tolerated by the private landowners. The Dome Mountain Wildlife Management Area would not be affected by the preferred alternative.

Alternative 3, if selected, would directly impact the distribution of elk within the Dome Mountain WMA. Elk could be displaced onto other winter range areas and would not be able to utilize the 400-acre enclosure constructed for the Quarantine Feasibility Study. Elk encountering game proof fencing around this site would be able to migrate around the fenced site to arrive at traditional winter ranges. The impact on elk is not expected to be significant but could have implications to adjacent landowners where elk might be displaced. Mitigation measures would be developed to manage elk distribution through modification of the late hunting season and specific herding practices around the Dome Mountain WMA. Several ranches surrounding Dome Mountain WMA are very tolerant of elk, do not graze cattle, and are protected by conservation easements. There is adequate public and private land available to provide adequate winter forage for the current population of elk wintering on this landscape.

Elk migrate from the northern Yellowstone region onto the Dome Mountain WMA following significant winter snows usually in December. Most elk migrate via mountain passes and along grassy slopes of the National Forest between Gardiner and Dome Mountain but occasionally collect along valley floors near Gardiner during late winter. Elk hunting seasons are held from December until mid-February in this area. During these hunts, sportsmen pursue elk and influence their distribution and movements onto winter ranges. In most instances, during these hunting seasons, elk do not feel secure around roads, ranches and homes. The construction of a game-proof fence around the proposed Phase II site would not inhibit elk migrations as they prefer the slopes above the highway and could freely migrate around the eastern portions of the Slip n' Slide Ranch and adjacent public land.

Alternative 2 (proposed action) would not significantly affect the elk resources in the area. The impacts associated with using a portion of Dome Mountain WMA for the Phase II quarantine facility could be mitigated through modification of existing management.

6.5 Effects on other Wildlife

Some mule deer would be displaced by the activities associated with this study and game-proof fencing would eliminate use of these meadows by mule deer.

Bighorn sheep are not likely to be impacted by the proposed action.

6.6 Effects related to Construction

The primary impacts associated with quarantine facility construction include the activities of fencing contractors and the vegetation/soil damage resulting from the use of equipment to construct the fences. Construction would be conducted during the summer and fall, when elk and deer are more likely to be occupying higher-elevation summer ranges. Fencing would be rapidly completed and construction activity likely would last only 4-5 months.

Construction associated with developing Phase II would be temporary in nature and would not have any significant effects.

6.7 Change in Land Use

The Slip n' Slide Ranch has a small cattle herd that would be sold once a lease arrangement has been consummated. For the duration of the study, cattle would not be grazed on the ranch. Horse ranching operations would continue during the study, but contact between the existing horse herd and quarantine bison would be eliminated by double fencing and strict management of the horse herd and bison. Periodic bleeding and testing of the horses on the ranch may be implemented to assure that brucellosis has not been transmitted to the breeding horse stock. Outfitting activities would continue during the study but managed carefully by the landowner to avoid conflicts with the quarantine feasibility study and hunting activities on the ranch.

Some changes in land use would occur as a result of the study, but these changes would be based upon negotiated agreements between the lessee and the agencies.

Alternative 3 would result in the change of use of the 400-acre hay meadow on the Dome Mountain WMA. The meadow currently is harvested under the terms of a lease agreement. If this alternative were selected, MFWP would not renew the agreement with the lessee.

For both Alternative 2 (proposed action) and Alternative 3, the Phase II quarantine facility would be constructed on existing hay meadows. Thus, neither alternative would cause disturbance to native prairie.

6.8 Effects on Historical and Cultural Resources

The quarantine feasibility study will not significant affects historical and cultural resources. The lands that would be impacted by this study currently are hay meadows and have been under cultivation for more than 50 years. Existing archeological sites, if any occur within the boundaries of the hay meadows, were disturbed many years ago when the sites were developed for hay production. Upon completion of final facility design, the agencies would consult with SHPO and would obtain clearance prior to proceeding with any ground disturbance activity. At the request of SHPO, the agencies would complete additional cultural surveys and/or modify the facility design to avoid disturbance to important cultural resources.

7.0 PERSONS RESPONSIBLE FOR PREPARING THIS EA

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8.0 LITERATURE CITED

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9.0 APPENDICES

Appendix A. Meetings, Public Contacts and Expert Consultations Made During Project Development, May 2003-November 2005.

Landowner Meetings

RTR-sponsored Landowners Meeting in Gardiner-by Aune/Flowers
Mr. Richard Knee-Landowner and Hay Contractor-Paradise Valley-by Aune/King
Dome Mtn. Ranch-Landowner near Dome Mtn. Wildlife Management Area-by Aune/Rhyan
Mr. Bob Cartier-Landowner near Dome Mtn. Wildlife Mgmt. Area-by Aune/Rhyan
Mr. Paul Rigler-Landowner near Dome Mtn. Wildlife Management Area-by Lemke
Mr. Franklin Rigler-Landowner in Yankee Jim Canyon-Aune/Rhyan
HOBNOB-meeting with West Yellowstone landowners concerned about bison-by Flowers
Livingston Area Producers Meeting--Sponsored by Dr. Jeff Dickerson--Aune/Linfield/Alt/Clarke

Interagency Coordination

Introductory Presentation to MFWP Helena Staff-by Aune
MFWP Region 3 Staff-multiple meetings and discussions-by Aune
Presentation to MFWP Regional Managers and discussion-by Aune
Field Tours-NPS, USFS, MFWP, USFWS, USDA/APHIS, ITBC and MDOL-by Aune/Rhyan
Presentation to USFS Regional Staff in Missoula-by Aune
Ad-hoc committee to identify potential study sites-USFS, USDA/APHIS, MFWP, NPS, MDOL
National Park Service-Multiple meetings for input and discussion-by Aune/Rhyan
Inter-tribal Bison Cooperative-Annual Meeting in Denver-by Aune/Rhyan
Greater Yellowstone Interagency Brucellosis Committee-Two presentations-by Aune/Rhyan
Montana Board of Livestock-Two presentations and discussions of project-by Aune
Montana Fish, Wildlife and Parks Commission-Presentation and discussions-by Aune/Flowers
Upper Yellowstone Watershed Basin-Park County Cons. Dist.-Presentation –by Aune
Montana Governors Briefing-Helena-with DOL and FWP representatives
National Park Service-Ranger Division-Tour of Facility-Aune
Interagency Exploratory Group for Bison Restoration-Aune/Rhyan
Research and Technical Services Annual Meeting-Review and Comment-Aune

Bison Consultants and Specialists (Includes direct conversations and field tours of proposed sites)

Mr. Duane Lammers-S. Dakota-National Bison Association and bison owner-by Aune/Rhyan
Dr. Temple Granden-Col. State University specialist in animal handling- by Rhyan/Aune
Mr. Mark Costler-Bison manager-Turner Enterprises/fencing and management-by Aune/Rhyan
Mr. Rob Tierney-Montana Department of Livestock-management of bison-by Aune/Rhyan
Inter-tribal Bison Cooperative-Fred Dubray-Bison restoration expert-Aune/Rhyan
Montana Bison Association-presentation and discussion—Aune
Dr. Vern Anderson-NDSU bison nutrition specialist-field tour and visit-Aune/Rhyan/Clarke

Scientific Specialists Consulted for Input

Dr. Francisco Roberto-INEEL Scientist working on PCR test for brucellosis-Aune/Rhyan
Dr. James Derr-Texas A and M—Genetics of bison- by Rhyan
Dr. Cormack Gates-University of Alberta-by Aune/Rhyan
Dr. Brett Elkin-Northwest Territories-Wildlife Veterinarian for wood bison-by Aune/Rhyan
Dr. John Nishi-Leader of Hook Lake Salvage Project-NWT-wood bison-by Aune/Rhyan
Dr. Robert Cook-Wildlife Veterinarian for Wildlife Conservation Society-by Rhyan/Aune
Dr. M.D. Salman-Colorado State University-Animal Population Health Inst.-by Rhyan/Aune
Dr. Tom Roffe-U.S. Fish and Wildlife Services-Wildlife Vet-Bison health-by Aune/Rhyan
Dr. Helen Schwantje-B.C. Wildlife Veterinarian-by Aune
Dr. Steve Olson-USDA/ARS-Ames Iowa-by Rhyan
Dr. Steve Torbit-National Wildlife Federation-by Aune/Rhyan

Dr. Glenn Plumb-National Park Service-by Aune/Rhyan
Wayne Brewster-National Park Service-by Aune/Rhyan
Rick Wallin-National Park Service-by Aune/Rhyan
Members of the IUCN Bison Specialist Group-North American Bison Conservation Strategy-Aune

Sportsmen Groups

Livingston Sportsmen's Association-by Lemke
Gallatin Wildlife Association-Three meetings and regular phone conversations-by Aune/Flowers
Skyline Sportsmen-during scoping the hunt issue-by Alt
Numerous individual and small group contacts by Alt/Aune/Jourdonnais/Lemke/King
GWA/MWF tour of facility and Dome Mtn.-Aune/Rhyan/Lemke/Clarke
Prickly Pear Sportsmen-East Helena-Aune

Conservation Organizations

Wildlife Conservation Society-Field tour of sites and presentation in NY-by Rhyan/Aune
Boone and Crockett Club-Two visits with full presentations-by Aune/Rhyan
Rocky Mountain Elk Foundation-Two visits to leadership-by Aune/Rhyan
Greater Yellowstone Coalition-Two visits with leadership-by Flowers/Aune
World Wildlife Fund and American Prairie Foundation-presentation-by Aune
Turner Endangered Species Fund-presentation and discussion-by Aune
Montana Chapter of the Wildlife Society-presentation-by Aune
Bureau of Land Management-Regional Advisory Counsel-Presentation-Aune
Tour of facility with George Nell-Bear Creek Council-Aune/Rhyan
Big Sky Institute-Bison Conservation and Restoration-Alt

Animal Health and Livestock Organizations

United States Animal Health Association- 2 presentations-Brucellosis Committee-by Aune/Rhyan
Western States Livestock Health Association-1 presentation and discussion-Aune/Rhyan
Montana Stockgrowers Association-Presentation to the Public Lands Commission-Aune
Montana Stockgrowers Association-Presentation at Mid Summer Meeting-Aune
Western Association of Fish and Wildlife Agencies-Wildlife Health Committee-Summer Meeting-Aune

Media Contacts

Newspapers
- Bozeman Chronicle-Feature Articles-Scott McMillian-in Jan, Mar., May-2005
- Associated Press-Becky Bohrer-picked up regionally-Idaho, Mt. Wyoming
- Billings Gazette- Mike Stark-Jan, 2005
- Legal Notices for EA Phase I and Scoping Phase II-Livingston Enterprise, Bozeman Chronicle, Montana Standard, Independent Record, Billings Gazette

Television and Radio
- Interview by Channel 7-Aune
- Interview by Channel 28-Alt
- Press releases profiled quarantine multiple times on 7, 28 and 42-No specific interviews
- KGPR radio in Great Falls-"Spirit Talk" a Native American Call-in Program

Magazines-Periodicals
- Montana Outdoors-Buffalo hunt and quarantine-Nov/Dec 2004
- Montana History Magazine-History of Bison Management-August, 2005
- USAHA 107th and 108th Annual Meeting Proceedings-2003 and 2004

GYIBC Information and Education Subcommittee
- GYIBC Annual Report (2003 and 2004)-1 pg. Report on the quarantine feasibility project
- GYIBC posted articles on the Internet
- GYIBC posted minutes of each meeting when quarantine was discussed

Websites
- FWP Website: http://fwp.state.mt.us/ and search under Bison Quarantine.
- USDA Website: http://www.aphis.usda.gov/lpa/news/1995/01/BISON.HTM#content

Appendix B. Tests for Brucellosis

1. *Tests on blood serum*

a. Buffered Acidified Plate Antigen (BAPA) Presumptive Test—may be used to classify cattle and/or bison as negative. The test is recorded as either negative or positive. A test is positive when any agglutination is observed.

b. Rapid Automated Presumptive (RAP) Test—may be used as an approved presumptive test in accordance with the published protocol. The test result is recorded as either positive or negative.

c. Card test—may be used to classify cattle and/or bison as negative on surveillance samples collected at slaughter, on routine samples collected on farms, and on tests of suspicious and affected herds. The test results are recorded as either negative or positive. The card test is to be used as an official test to classify cattle and/or bison as reactors under the following circumstances only:

(1) When conditions and time are such that no other test is available; or

(2) When the owner and/or his or her agent request it because of time or situation constraints; or

(3) In stockyards when the State animal health official specifically designates the card test as the official test. No other test except the BAPA is to be used in stockyards as an official test in those States. (The CITE® test can also be used on all cattle and/or bison as a supplemental test whenever the card test is used.); or

(4) In stockyards when the State animal health official designates the card test as the official test, the card test will be the only official diagnostic test; and the CITE test, standard plate test (SPT), or rivanol test may be used as supplemental tests at the stockyard. Cattle and/or bison that are positive to the card test must be classified as reactors or suspects if supplemental tests completed support suspicious or reactor classifications.

(5) To test MCI test samples. Cattle and/or bison that are tested under the MCI program using an approved presumptive test (BAPA or RAP) and that are found to be positive on the presumptive test must be retested using the card test, the SPT, the tube agglutination test, or other official tests. If there is no further testing, all samples that are positive on the card test or SPT or tube agglutination test will be reported as MCI reactors and traced to the herd of origin. However, the designated brucellosis epidemiologist can reclassify MCI reactors for purposes of State or area classification, provided additional information and tests are available that support such action.

(6) Results of the card test may be used to supplement the results of other tests conducted in the cooperative State–Federal brucellosis laboratory to give the designated brucellosis epidemiologist additional information when classifying cattle and bison. Card-positive cattle and/or bison may be classified negative only by a designated brucellosis epidemiologist, provided that supplemental tests are negative and additional documented information supports such actions.

d. Standard Tube Agglutination Test (STT) or Standard Plate Test (SPT)—The blood titers of cattle and bison tested by the STT or SPT methods are interpreted in Table 1.

Note: These interpretations do not apply to official Strain 19 adult-vaccinated cattle or bison until after the STT or SPT titer resulting from vaccination has reverted to negative.

Table 1—Interpretation of standard tube agglutination test (STT) and standard plate test (SPT) results

Test results 1:50	1:100	1:200	Test interpretation Non-Strain 19-vaccinated	Strain 19-vaccinated
-	-	-	Negative	Negative
I	-	-	Suspect	Negative
+	-	-	Suspect	Negative
+	I	-	Suspect	Suspect
+	+	-	Reactor	Suspect
+	+	I	Reactor	Suspect
+	+	+	Reactor	Reactor

Key: - = no agglutination; I = incomplete agglutination; + = complete agglutination.

e. Rivanol test—The rivanol test is an official test when conducted in cooperative State–Federal brucellosis laboratories. However, the designated brucellosis epidemiologist can reclassify MCI reactors for purposes of State or area classification, provided that additional information and tests are available to support reclassification. The rivanol test is interpreted in table 2.

Table 2—Interpretation of rivanol test results

Test results Non-Strain 19-vaccinated	Strain 19-vaccinated	Test interpretation
I 1:25 or lower. (But within 5 months after adult vaccination of cattle or bison, a + 1:50 titer or lower titer is considered negative.)	Negative	Not + 1:25 to + 1:50, provided the Suspect applicable CF test is performed and is interpreted as negative or suspect, as described in paragraphs f and g in this section.
+ 1:25 or higher, provided the CF test is not performed or when the CF test is interpreted as a reactor, or I 1:100 on the rivanol test regardless of CF test results.	Reactor	Reactor

Key: I = incomplete agglutination; + = complete agglutination.

f. Manual complement-fixation (CF) test—The CF test is an official test when it is conducted at a cooperative State–Federal brucellosis laboratory using manual methods approved by the National Veterinary Services Laboratories (NVSL) of APHIS, VS. The manual CF test is interpreted in table 3.

Table 3—Interpretation of manual complement-fixation test results

Test results Non-Strain 19-vaccinated	Strain 19-vaccinated[1]	Test interpretation
1+ 1:10 or lower	1+ 1:10 or lower	Negative
2+ 1:10 through 1+ 1:20	2+ 1:10 through 4+ 1:20	Suspect
2+ 1:20 or higher	1+ 1:40 or higher	Reactor

[1] Includes Strain 19 adult-vaccinated cattle and bison beginning 2 months after vaccination.
Key to degree of fixation of complement: 1+ = 25 percent, 2+ = 50 percent, 3+ = 75 percent, 4+ = 100 percent.

g. Technicon automated complement-fixation test—The Technicon automated CF test is an official test when it is conducted at a cooperative State–Federal brucellosis laboratory using recognized methods. This test is interpreted in table 4.

Table 4—Interpretation of the Technician automated complement-fixation test results

Test results			Test interpretation
Non-Strain 19-	Strain 19 vaccinated	vaccinated [1]	
N 1:5 +	1:5 but N 1:10	Negative	
+ 1:5 but N 1:10	+ 1:10 but N 1:20	Suspect	
+ 1:10 or higher	+ 1:20 or higher	Reactor	

[1] Includes Strain 19 adult vaccinates beginning 2 months after vaccination.
Key to fixation of complement: + = observed; N = none observed.

h. Particle Concentration Fluorescence Immunoassay -(PCFIA) may be used as a presumptive or official diagnostic test and classified according to the following ratio between the test sample and a known negative sample (S/N ratio). Note: The designated brucellosis epidemiologist can reclassify MCI reactors for purposes of State or area classification, provided that additional information and tests are available that support such action.

Table 5 PCFIA

Non-Strain 19 vaccinates			Strain 19 vaccinates (6 months of age and older[1,2]) (test-eligible)		
Negative	Suspect	Reactor	Negative	Suspect	Reactor
S/N values Negative	S/N values as Suspect	S/N values as Reactor	Same values greater than 0.6.	Same values less than or equal to 0.6	Same values less than or less than or equal to 0.3
Non-Strain 19 vaccinates	Non-Strain 19 vaccinates	Non-Strain 19 vaccinates	Non-Strain 19 and greater than 0.3	Non-Strain 19 vaccinates	Non-Strain 19 vaccinates

i. Fluorescent Polarization Assay (FPA) - The Fluorescent Polarization Assay (FPA) can be used as a presumptive or supplemental test. It is used as an official test when conducted in an approved cooperative State-Federal brucellosis laboratory. However, the designated brucellosis epidemiologist can reclassify MCI reactors for purposes of State or area classification, provided that additional information and tests are available to support reclassification. This test is interpreted in table 6.

Table 6. FPA Non-Strain 19 vaccinates (6 months of age an older [1,2]) N S P Strain 19 vaccinates (test-eligible)

N S P

Negative<11
Suspect 11-20
Positive>21
Negative < 11
Suspect 11-20
Positive >21

Appendix C. Proposed Phase II Quarantine Facility at the Slip ‘n Slide Ranch

Through a contractual lease arrangement of four years, two irrigated alfalfa/grass pastures would be double-fenced to allow one of two individual test groups (25 bison) to range within each pasture for approximately one full year. These two irrigated pastures are approximately ¼ mile distance from each other adjacent to highway 89 and inside the Yankee Jim Canyon (Figure 3). Prior to operation, a broad-leaf herbicide would be applied to each pasture to reduce the amount of alfalfa and other broad leaf invaders and increase the grass available in each pasture. Late yearling bison from Phase I could be brought into the pastures as early as December 2006, well after pastures were cut to harvest a final hay crop. We anticipate that the ground within the pastures would be frozen with some residual fall regrowth available for immediate forage for bison introduced into the pastures. Feeding operations would begin, as needed, during the winter. These pastures would be irrigated with existing sprinkler systems during the growing season to encourage maximum forage yield during the quarantine study. The distribution of bison within pastures would be managed, using temporary electric cross fences and water management to minimize site-specific vegetation and soil damage.

The Rigler Pasture (Figure 4) includes about 35 acres of highly productive grazing in which on test group of 25 would be pastured. The Slip ‘n Slide pasture (Figure 5) is partitioned by a road and old ranch home into two pastures that in combination are approximately 30 acres in size. A crossing lane would be constructed between the pastures to move animals securely from one pasture to the other. All pastures would be double-fenced. The outer fence would be a tight-lock game-proof fence. The interior fence, spaced 10 feet inside the outer fence, would be a 5-foot high tensile fence design and modeled after the Phase I facility fence design. Proper gates and vehicle access would be necessary into the various fields. Fence design would be consistent with requirements of the APHIS quarantine protocols. The outer fence line perimeter would be approximately 2.4 miles in length and enclose a total of 65 acres of managed hay lands. Temporary electric cross fencing may be applied within each pasture, but would not be double-fenced because individual test groups would already be pastured apart from each other.

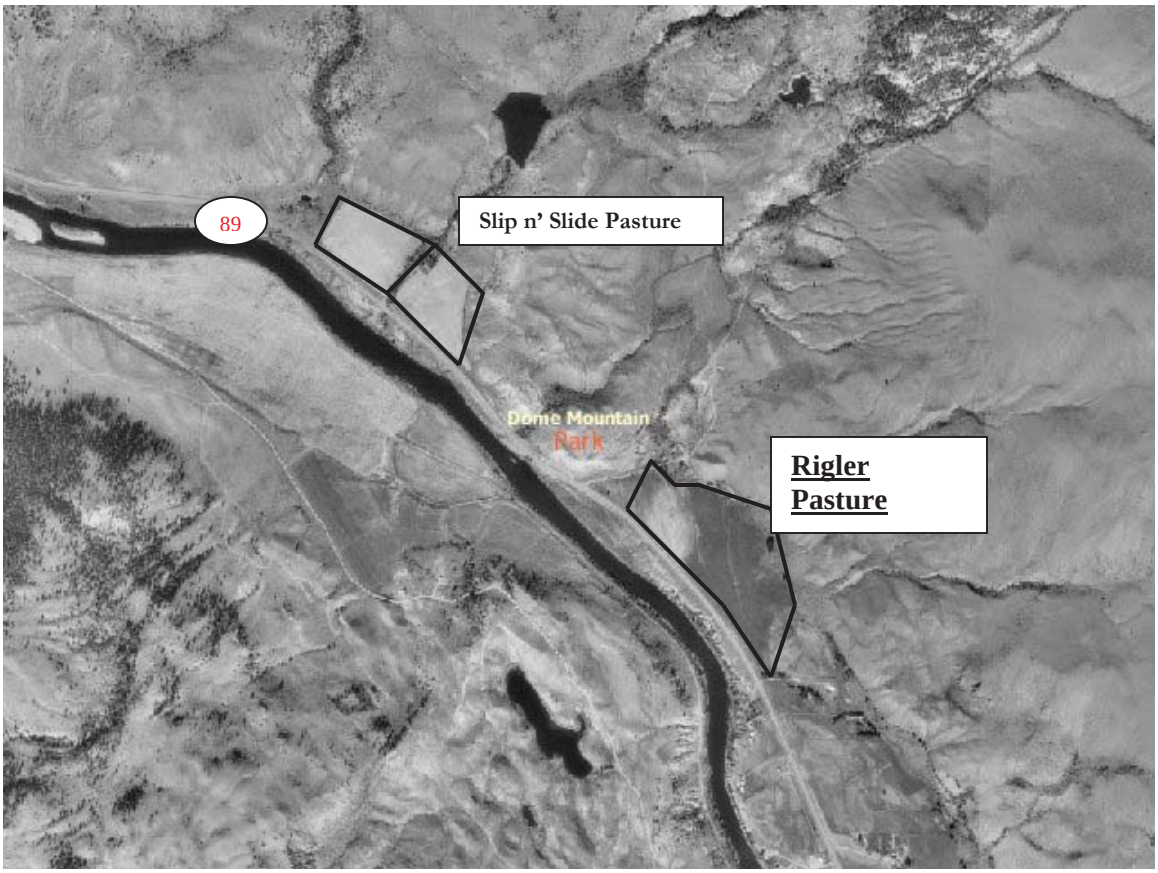

Figure 3. Aerial photograph of the proposed Phase II Quarantine site (two pastures) on the Slip n' Slide Ranch.

Figure 4. Rigler Pasture of Phase II Quarantine Site for one test group of 25 bison.

Figure 5. Slip ‘n Slide Pasture of Phase II Quarantine site for one test group of 25 bison.

Appendix D. Proposed Phase II Quarantine Facility at Dome Mountain WMA

The proposed Phase II site at Dome Mountain includes a combination of native bunchgrass rangeland and an existing hay meadow (Figure 6). This 300-acre area lies north of the county road west of Daily Lake on the Dome Mountain Wildlife Management Area. The area would be double-fenced with an external 8-foot interlock game-proof fence and high-tensile interior fences. Exterior fencing would be approximately 2.7 miles to enclose the hay meadow and a portion of the adjacent uplands. One double fence of high-tensile construction would be built to dissect the main pasture into two smaller pastures of approximately equal size (120-150 acres) that can accommodate one of two test groups (25 bison). Within each test group pasture, an additional single fence would be constructed to dissect each for better pasture rotation and to minimize vegetation and soil damage due to grazing the landscape. Each large test group pasture would then be dissected into two pie-shaped pastures of approximately 60-80 acres each. The forage available would not sustain bison grazing this system. Therefore, we expect that annual supplement with feed and hay would be provided. Annual irrigation would be possible in the hay meadow portions of these pastures, provided adequate water is available.

Using the proposed site would require the development of a water well, a watering system and portable handling facilities along the county road (Figure 7). Electrical power is available, but development would be necessary to make the power system operational. A portable handling system would be placed along the county road where power and water systems would be installed. The handling system would be composed of portable panels and chutes. Some semi-permanent brace posts (approximately 30) would be installed to allow rapid installation and removal of the system over several years of operation. Temporary housing in the form of a 30-foot trailer would be placed at an old home site to allow field staff some protection and workspace. The site would not be occupied year-round, but intermittently to accommodate work requirements at the facility. Throughout the year, daily trips by field staff would be necessary to conduct quarantine operations. Operations would be minimized during winter to basic care and feeding of animals. All major handling operations would be scheduled to minimize impact to wintering elk and deer on the wildlife management area.

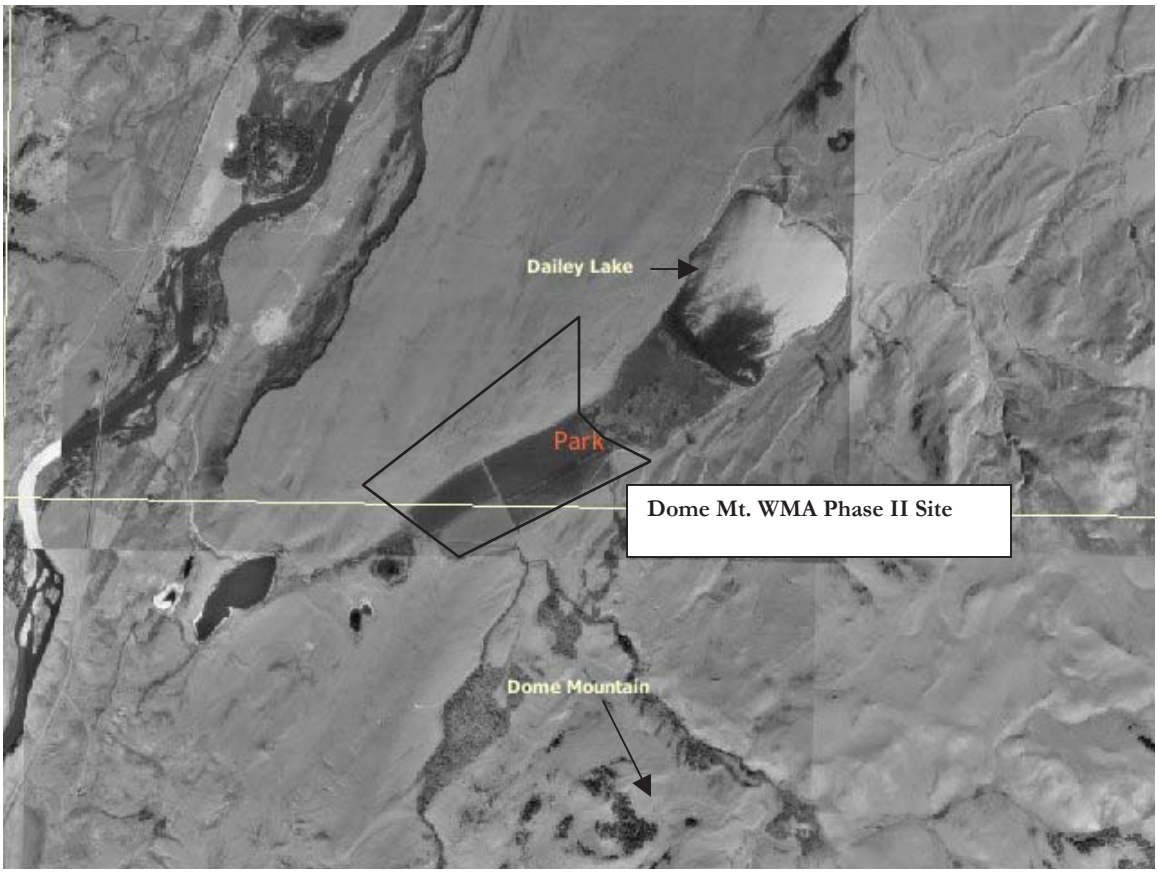

Figure 6. Aerial photograph of the proposed Dome Mountain Phase II Quarantine site.

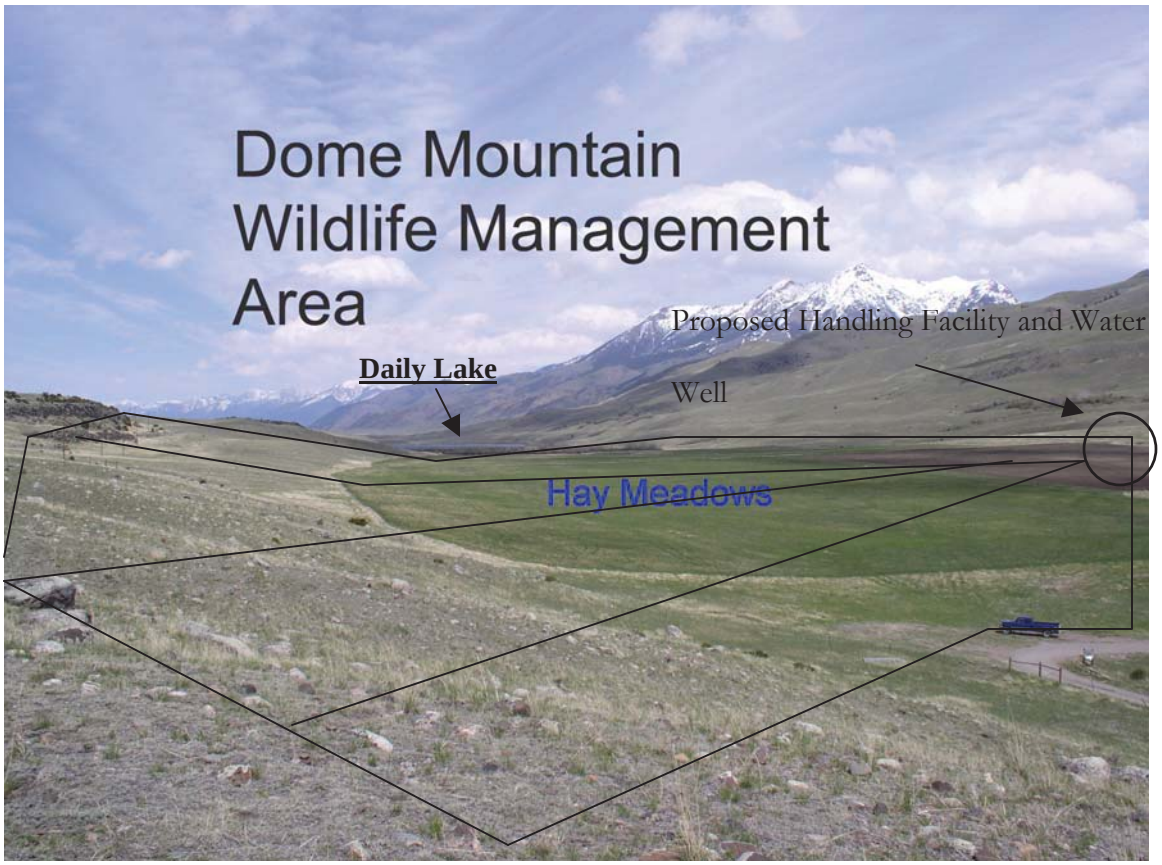

Figure 7. Approximate region for development of a Phase II site on Dome Mountain Wildlife Management Area.

Appendix E. Proposed Modification to the Brogan Bison Research Facility to accommodate Phase III Operations.

The Brogan Bison Research Facility is currently composed of three small paddocks of 1-3 acres near the handling facility and three larger pastures (Figure 8). Two smaller pastures are located along the highway and can be irrigated with an existing sprinkler system. The forage in these pastures includes a mix of cultivated and native grasses. One large upper pasture is on a steep slope along the west side of the property with several grass bench lands and steep rocky drainages. The landscape in this upper pasture is rough. The vegetation is composed of some thinly forested slopes and interspersed native bunchgrass rangelands. This research facility was modified this past summer so that it is currently securely double-fenced. A second, more robust handling facility will be constructed this winter-spring as was proposed in the Phase I development plan. In addition, several water impoundments were improved or developed this summer to hold free water captured during spring runoff. When completed, the fully modified Brogan Bison Research Facility at the end of Phase I would include six fully fenced pastures/paddocks and two handling stations.

To accommodate phase III operations, the Brogan Bison Research Facility would need additional cross fencing to adequately separate six test groups of 6 or 7 adult female bison and up to 10 bull bison. The limited number of pastures available and terrain limitations would require further dissection of the pastures into smaller areas before Phase III would begin. We expect that range forage would be limited in these smaller pastures and year-round feeding to supplement diets would become necessary. Although feeding would become essential, some pasture forage would be available and likely utilized by the bison. In addition, stock water tanks would be necessary in some pastures to provide free water. Water impoundments, spring waters, ephemeral flowing surface water, and existing wells are currently available that could carry water to additional pastures with minimal additional piping and water development.

Figures 9 and 10 indicate the placement of existing foraging pastures available for bison. To enhance the facility further for Phase II operations, additional cross fencing would be constructed to dissect each of the large lower pastures into equal-sized portions to accommodate four irrigatable pastures. The larger upper pasture would also be dissected with the placement of one cross fence to create two large upland pastures. Bison distribution would be managed within each internal pasture to minimize specific site damage using temporary electric fencing and water management. In addition, some bison test groups may be occasionally placed in one or all of the three existing small pastures associated with the existing handling facility (Figure 8). Groups may be seasonally rotated among various pastures or paddocks to minimize vegetation and soil damage.

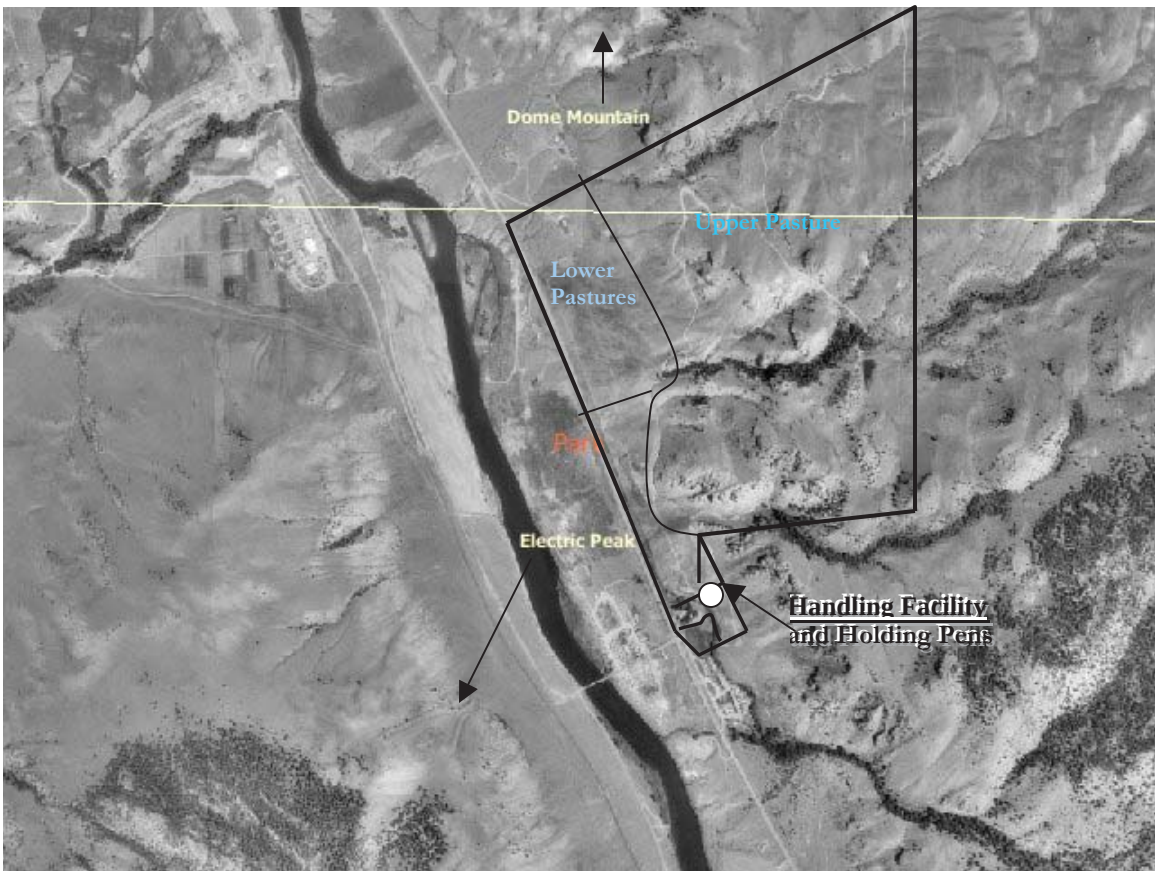

Figure 8. Aerial Photograph of the Brogan Bison Research Facility (Phase I Quarantine site) near Corwin Springs, Montana.

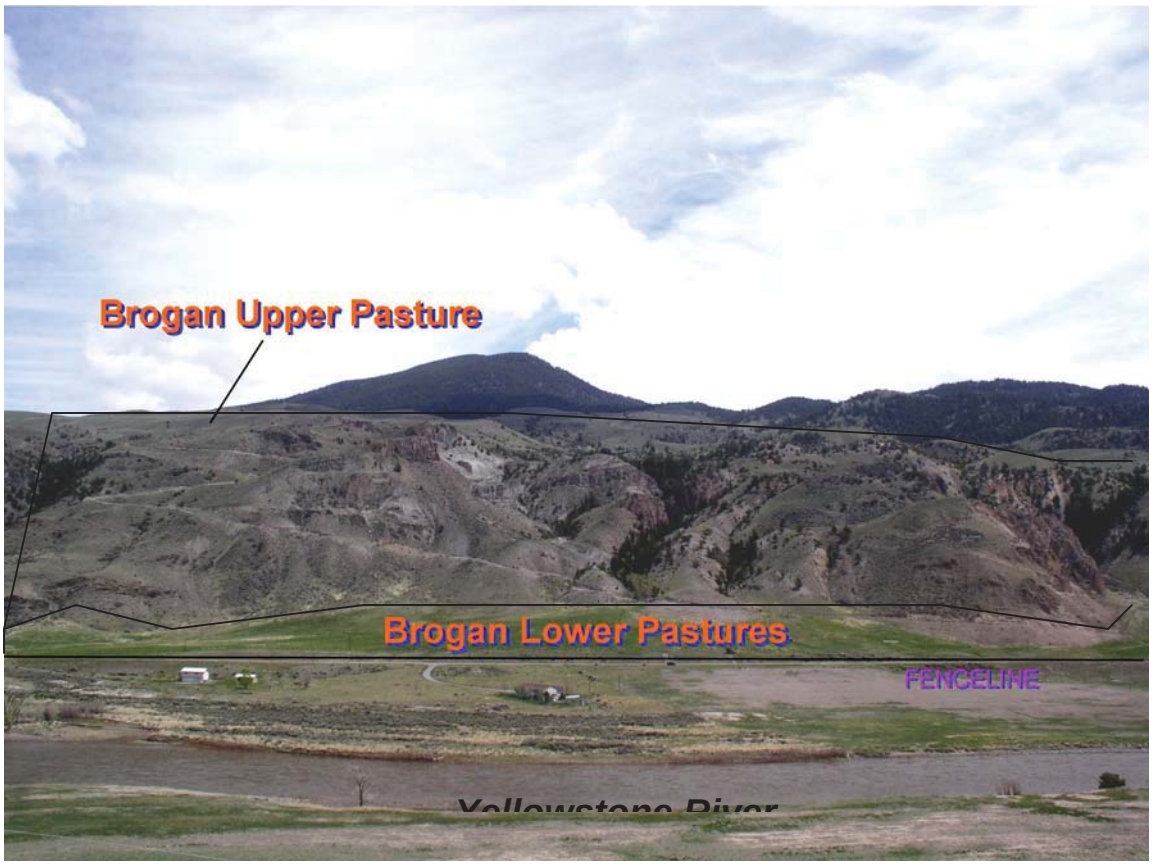

Figure 9. Approximate layout of upper and lower pastures at the north end of the Phase I facility at the Brogan Bison Research Facility.

Figure 10. Approximate layout of upper and lower pastures at the south end of the Phase I facility at the Brogan Bison Research Facility.

Appendix F. Schedule and Budget for the Quarantine Feasibility Study

Phase 1 Facility-Brogan- Development schedule and operations budget	
Upgrade Brogan Facility	
Fencing-Summer/Fall 2005	$100,000.00
Upgrade Handling Facility - Aug-Dec 2005	100,000.00
Lease 2005	80,000.00
Pilot Study group 1	
Capture, test, and ship calves - Jan.-Apr. 2006.	5,000.00
Facility Operations	40,000.00
Lease 2006	80,000.00
Pilot Study group 2	
Capture, test, and ship calves - Jan.-Apr. 2007	5,000.00
Facility Operations	40,000.00
Lease 2007	80.000.00
Personnel	90,000.00
	$620,000.00
Phase 2 Facility-Slip 'n Slide-Development and operations budget	
Develop a bison facility on Slip n' Slide.-July 2005	$400,000.00
Lease 2006	50.000.00
Pilot Study group 1	
Ship, sort and test yearlings - December 2006	5,000.00
Facility Operations	20,000.00
Lease 2007	50,000.00
Pilot Study group 2	
Ship, sort and test yearlings - December 2007	5,000.00
Facility Operations	20,000.00
Lease 2008	50,000.00
Finish Groups	
Facility Operations	20,000.00
Final year Lease 2009	50.000.00
Personnel	60,000.00
	$730,000.00
Phase 3 Facility-Brogan-Development schedule and operations budget	
Develop Calving Facility (Upgrade Brogan Facility Option)	$400,000.00
Pilot Study group 1	
Ship and test 2-year-olds - December 2007	5,000.00
Facility Operations	60,000.00
Lease 2008	75,000.00
Pilot Study group 2	
Ship and test 2-year-olds - December 2008	5,000.00
Facility Operations	60,000.00
Lease 2009	75,000.00
Personnel	90,000.00
	$830,000.00
Quarantine EA	$50,000.00
TOTAL OPERATIONS AND DEVELOPMENT	$2,170,000.00

Appendix G. Endangered Species Act Biological Assessment

I. Introduction and Background

Free-ranging bison have been an important part of the Yellowstone National Park (YNP) experience for many years. Unfortunately, during winter, the bison tend to move out of the Park onto Forest Service and private lands in direct response to the severity of the weather. Since bison are known to be infected with brucellosis, their movement out of the Park results in a potential conflict with the cattle industry, which had achieved brucellosis-free status in the three States within the Greater Yellowstone Area (GYA). The ability of brucellosis to be transmitted from wildlife to cattle in the natural environment had been a topic of great controversy until 2002, when infected wild elk transmitted it to cattle in Idaho. Subsequently several cattle herds in Wyoming have also been infected with brucellosis that is believed to have been transmitted by elk. The situation in Wyoming was serious enough that the State lost its brucellosis-free status and the cattle industry continues to suffer the consequences. While bison have not been implicated, the potential for disease transmittal from bison to cattle is present. Bison and elk in the GYA are the only wild reservoir of bovine brucellosis in the country and are an impediment to elimination of the disease from the United States.

An environmental impact statement (EIS) outlining various alternatives for a joint bison management plan was published in August 2000 (USDOI, NPS and USDA, FS and APHIS, 2000a). The management plan was designed to ensure bison management could be conducted in such a way as to minimize the potential for disease transmission between bison and cattle while ensuring the existence of a free-ranging bison herd. The National Park Service (NPS) took the lead in this effort and the U.S. Forest Service (FS) and Animal and Plant Health Inspection Service (APHIS) were cooperating agencies.

The Record of Decision (ROD), signed in December 2000 by each of the agencies and approved by the Secretaries of Agriculture and the Interior, adopted a Joint Management Plan for bison in YNP, the Gallatin National Forest, and private lands on the north and west boundaries of YNP (USDOI, NPS and USDA, FS and APHIS, 2000b). The plan employs an adaptive management approach that allows the agencies to gain experience and knowledge before proceeding to the next step, particularly with regard to managing bison on winter range outside YNP. The plan especially relies upon temporal and spatial separation of bison and cattle to eliminate any intermingling of the two. The adaptive management approach, as discussed in the EIS and ROD, recognizes that bison quarantine may become a necessary or desirable component of the bison management program. The Bison Quarantine Feasibility Study will provide information that will inform the decision on whether to include quarantine as a tool for bison management in the GYA.

In March 2000, NPS completed a Biological Assessment (BA) (USDOI, NPS, 2000) for the Bison Management Plan, and in July 2000 the Fish and Wildlife Service (FWS) issued a concurrence on the BA. The BA concluded that the management plan was not likely to adversely affect the bald eagle, gray wolf, grizzly bear, or Canada lynx and was unlikely to have any effect on the whooping crane.

This BA has been prepared to evaluate the effects of the proposed bison quarantine feasibility study on listed species. The BA for the Interagency Bison Management Plan that was prepared by the NPS in March 2000 with concurrence by FWS in July 2000 is incorporated by reference in this BA.

II. Description of Proposed Study

See description of the bison quarantine feasibility study protocol, as described in the body of this EA.

III. Description of Study Site

Dome Mountain Wildlife Management Area (WMA) is a 4,680 acre wildlife management area that is owned and operated by Montana Fish, Wildlife and Parks. The WMA is located in Park County, Montana, near the town of Emigrant in the Paradise Valley. The management goal of the WMA is to maintain the quality and quantity of vegetation in an improving condition on historic elk wintering range. The only access to Dome Mountain WMA is a small county-maintained road that enters the property at Daily Lake, a popular fishing and recreational site, continues past the lake roughly following the small feeder stream that flows into Daily Lake and ends at the fenced boundary with Dome Mountain Ranch. Daily Lake supports rainbow trout, yellow perch, and walleyes, as well as a variety of birds. Dailey Lake has a large no-fee, no-reservations campground for overnight use. The area also offers excellent hiking and horseback riding opportunities. Dome Mountain WMA offers seasonal opportunities to hunt elk and mule deer and access to the adjacent Absaroka-Beartooth Wilderness Area. The elevation of Dome Mountain WMA ranges from approximately 5,200 feet in the vicinity of Daily Lake to 7,400 feet.

The proposed bison quarantine facility would cover an area of approximately 400 acres a short distance upstream from Daily Lake (Figure 8). The elevation ranges from about 5,250 feet to a little over 5,400 feet. Part of the area is currently an irrigated hayfield that is leased, but the lease will expire before initiation of the quarantine feasibility study at the Dome Mountain site. The remainder of the area consists of native vegetation and is not irrigated.

IV. Determination of Effects on Listed Species

There are four species that may potentially be impacted by location of facilities for the proposed Bison Quarantine Feasibility Study at the Dome Mountain Wildlife Management Area: bald eagle, grizzly bear, Canada lynx, and gray wolf (USDOI, FWS, March, 2005).

A. Bald Eagle

The bald eagle was listed as endangered under the Endangered Species Act in 1978. Subsequently, its status improved and, in 1995, it was down-listed to threatened status. In Montana, the bald eagle population showed a marked increase in breeding pairs between the time of listing in 1978 and the 1995 status change, going from 12 breeding pairs to 166 (MFWP, 2005).

There are no nesting bald eagles within 10 miles of the Dome Mountain WMA, although on rare occasions there may be wintering eagles sighted at Daily Lake or on the Yellowstone River in the vicinity of Dome Mountain feeding on fish or gut piles left by hunters (Tom Lemke, MFWP, personal communication). Bald eagles are also known to winter in the low elevations near Gardiner (USDOI, NPS, 2000).

The proposed study would result in a fenced enclosure of approximately 400 acres, along with interior cross-fencing, housing up to 50 bison. There would be regular, but minimal, human activity associated with the care of the bison. This will not have a noticeable impact to bald eagles, if any are in the area. If any disturbance is experienced by bald eagles, it will be minor in intensity and short in duration. Behavioral patterns of bald eagles are unlikely to be altered by the proposed study.

Determination: The proposed study is not likely to adversely affect the bald eagle.

B. Grizzly Bear

The grizzly bear was listed as a threatened species under the Endangered Species Act in 1975. Its historic range covered the plains westward to California and northward into Canada and Alaska. Populations in Alaska and Canada remain strong and are not included in the threatened listing. Range in the lower 48 States, however, has been reduced to only a few populations, including the GYA.

Being an opportunistic omnivore, grizzly bears will eat whatever food item is available. In the spring, after bears begin to emerge from their winter dens, one of the most prevalent foods available is winter-killed ungulates, particularly elk and bison. From March through mid-May, the scavenging of winterkilled animals, including bison, is a primary source of nutrition for grizzly bears (USDOI, NPS, 2000; Mattson, 1997; Green *et al*., 1997).

Direct and indirect effects of the proposed study to grizzly bears are likely to be insignificant. The fences constructed to house the bison in the proposed study will be built to the best practical predator-proof standards, so it is unlikely that grizzly bears will enter the fenced bison yards. In addition, if bison mortality occurs during the study, husbandry practices require the carcasses to be removed from the site at the earliest possible time, thus there will be no dead and/or rotting carcasses to attract bears. Caretakers at the research site will also ensure that any trash and garbage that may be generated is properly disposed of so as not to attract nuisance scavengers, including bears. With such precautions in place, it is unlikely that grizzly bears will be affected by the proposed Bison Quarantine Feasibility Study.

Determination: The proposed study is not likely to adversely affect the grizzly bear.

C. Canada Lynx

The Canada lynx was listed as a threatened species under the Endangered Species Act in 2000. The lynx is primarily an occupant of thickly wooded forests in the higher elevations (usually

1,500-2,000 meters or approximately 4,920-6,560 feet) where snowshoe hares, their primary food source, are located. Lynx habitat can generally be described as boreal forests that have cold winters with deep snow and that provide a snowshoe hare prey base (USDOI, 2003). It often consists of a dense, multi-layered understory that maximizes cover and browse at both ground level and at varying snow depths throughout the winter in order to provide cover and food for snowshoe hares (Ruediger *et al.*, 2000).

Within Montana, lynx populations are well distributed and in relatively good numbers (MFWP, 2005), although in the mountains in southwestern Montana, the habitat is marginal (more patchy and drier forest types) (USDOI, 2003). In the GYA, there may be a small population of lynx located in the higher elevations. The Dome Mountain area is in the northern portion of the GYA. It is generally drier in this area and the specific site for the Bison Quarantine Feasibility Study is open grassland. This area is not lynx habitat. Since lynx habitat does not overlap the proposed study area, it is unlikely that the lynx will be impacted from the proposed study.

Determination: The proposed study is not likely to adversely affect the Canada lynx.

D. Gray Wolf

The gray wolf was reintroduced to YNP in 1995 as a non-essential, experimental population. The most recent description of the Yellowstone Non-essential Experimental Population Area (YNEPA) can be found in the Federal Register dated January 6, 2005 (USDOI, 2005). The area encompasses the State of Wyoming, and the area in Idaho and Montana that is east of Interstate Highway 15 and south of the Missouri River. Wolves that are in the YNEPA and also within the boundaries of any unit of the National Park System or National Wildlife Refuge System are treated as threatened species under the Endangered Species Act. Section 7 consultations would be required if an agency action was likely to adversely affect the gray wolf. Wolves that are within the YNEPA but not in a unit of the Park or Refuge System are to be treated as proposed species under the Endangered Species Act. As such, federal agencies are only required to confer under Section 7 when they have determined that an action is likely to jeopardize the continued existence of the species. Since Dome Mountain is not within the Park or Refuge Systems, APHIS would be required to confer with FWS only if it has determined that its proposed action is likely to jeopardize the continued existence of the gray wolf.

Wolves may occupy a wide variety of habitats. Their distribution and habitat use is closely tied to food availability (USDOI, NPS, 2000). In the YNEPA, wolves feed on live and dead elk, deer, bison, and smaller mammals.

The proposed construction of bison corrals, complete with a double-fenced perimeter and reinforced with an electric predator guard wire, should be sufficient to separate wolves from bison, if wolves should happen upon the area while occupied by study bison. The bison that will be housed at the facility will be healthy young animals just reaching maturity. As such, they would not be a primary target for predators, as long as easier prey was available. During the winter when food is scarce for predators, any wolves in the Dome Mountain area would be more likely to be preying upon elk that winter in the vicinity then on healthy, well-cared-for bison.

Furthermore, elk hunting in the area would likely provide wounded elk that could be preyed upon, as well as carrion in the form of elk that had been wounded and later died after escaping their hunters. In addition, gut piles and normal winterkill animals would also likely be available for scavenging by wolves. Therefore, direct and indirect effects of the proposed study to wolves are likely to be small.

> Determination: The proposed study is not likely to jeopardize the continued existence of the gray wolf.

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