SIERRA CLUB
Grand Canyon Chapter ● **514 W. Roosevelt St.** ● **Phoenix, AZ 85003**
Phone: (602) 253-8633 ● Email: grand.canyon.chapter@sierraclub.org

June 14, 2017

Superintendent Chris Lehnertz
Grand Canyon National Park
P.O. Box 129
Grand Canyon, Arizona 86023

Re: Initial Bison Herd Reduction Environmental Assessment (May 2017)

Dear Superintendent Lehnertz:

Please accept these scoping comments on the Bison Management Plan for Grand Canyon Nation Park on behalf of Sierra Club – Grand Canyon Chapter.

Sierra Club is one of the nation's oldest and most influential grassroots organizations whose mission is "to explore, enjoy, and protect the wild places of the earth; to practice and promote the responsible use of the earth's ecosystems and resources; and to educate and enlist humanity to protect and restore the quality of the natural and human environments." Sierra Club has more than 2.4 million members and supporters with 35,000 in Arizona as part of the Grand Canyon (Arizona) Chapter. Our members have long been committed to protecting and enjoying our national parks, including Grand Canyon, and enjoy various types of recreation including hiking, backpacking, wildlife viewing and more. Sierra Club has been involved in issues, including providing comments, attending meetings, and participating in field trips related to the bison hybrids in the North Kaibab and Grand Canyon National Park for more than a decade.

Background
In 2014, Sierra Club and Grand Canyon Wildlands Council submitted comments during the scoping period for a proposed Environmental Impact Statement, called the *Bison Management Plan for Grand Canyon National Park*. In that letter, we provided documented, factual, legal, and scientifically based evidence that the bison hybrids found on the north side of Grand Canyon are non-native "stray animals" with a high proportion of cattle genetics that *cannot be bred out of the herd*, and that Grand Canyon National Park has the legal authority to manage the animals.

In 2016, a new scoping period was opened for a new Environmental Assessment (EA) and Sierra Club, Grand Canyon Wildlands Council, Center for Biological Diversity, and Public Employees for Environmental Responsibility collaboratively provided a documented scientific and legal foundation justifying removal of all bison hybrids from Grand Canyon National Park.

We commend the National Park Service (NPS) for moving forward with the Initial Bison Herd Reduction Environmental Assessment. Action is needed now, and NPS has created a constructive and thoughtful plan to begin removal of bison hybrids from the park. However, NPS must allow itself the leeway to continue bison hybrid removal if adjacent land managers (i.e., U.S. Forest Service (USFS) - Kaibab National Forest and Arizona Game and Fish Department (AGFD) - House Rock Wildlife Area) are not ready to implement complementary actions to completely remove bison hybrids from the Kaibab Plateau. If NPS abandons the effort to manage bison hybrids before they are completely relocated and removed from adjacent lands, animals will continue to breed and to move into the park, and it will be more expensive and more difficult for NPS to restart removal than to sustain it. If other agencies are not willing to assist, NPS must prepare to remove all bison hybrids from the park.

The National Park Service must adhere to its mandates and do nothing in this action that diminishes its ability nor its responsibility to remove any exotic species that "interferes with natural processes and the perpetuation of natural features, native species or natural habitats" (NPS 2006).

Legal Framework (as presented in scoping comment letters in 2014 and 2016, and including updates)

The National Park Service has the authority and the obligation to manage these animals under both state and federal law. The section "NPS Authority to Manage Wildlife" (EA at p.4) offers only a partial story because it omits some relevant federal law, and also omits Arizona state law referring specifically to bison and bison hybrids.

Under federal law, the National Park Service (NPS) maintains authority to manage the bison at Grand Canyon. The following, excerpted from NPS's Briefing Statement on the issue of "Clarification of NPS authority to regulate and manage wildlife on Park lands," regarding Rocky Mountain National Park, identifies the hierarchy of authorities that designate this power to NPS:

> Property Clause of the U.S. Constitution (Article IV, Section 3, Clause 2) states that "The Congress shall have Power to dispose of and make all needful Rules and Regulations respecting the Territory or other Property belonging to the United States; and nothing in this Constitution shall be so construed as to Prejudice any Claims of the United States, or of any particular State."
>
> The NPS Organic Act (16 U.S.C. l, 2, 3, and 4) states that "The service thus established shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations hereinafter specified by such means and measures as conform to the fundamental purposes of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" and "That the Secretary of the Interior shall make and publish such rules and regulations as he may deem necessary or proper for the use and management of the parks, monuments, and reservations under the jurisdiction of the National Park Service…."

Additional support for federal authority over wildlife on federal property comes from case law.

> In 1928, *Hunt v. United States* confirmed that the federal government had the right to protect federal lands from damage by wildlife.
>
> In the 1969 case *New Mexico State Game Commission v. Udall*, the court held that the Secretary has the authority to kill deer to protect the park property in the future, and that damage need not have occurred in order to take such action.
>
> In 1976, *Kleppe v. New Mexico,* the court held that the federal government has the right to manage wildlife on federal public land under the Property and the Supremacy clauses of the U.S. Constitution, and that this right was not limited solely to property damage as interpreted in *Hunt v. United States*. (This is the strongest case law upholding federal rights over wildlife on federal public land).
>
> In 1995, a tort claim against the NPS for the value of cattle shot and killed at Bandelier National Monument by park staff was denied under the Federal Tort Claims Act. The claim by the New Mexico Livestock Board alleged that the NPS should compensate the Board for the value of the cattle since *they were strays*. The DOI Office of the Solicitor denied the case on the grounds that the National Environmental Policy Act (NEPA) process had been correctly applied, and that several laws including the Organic Act and *New Mexico State Game Commission v. Udall* upheld Bandelier's actions. (excerpted from NPS Briefing Statement, date unknown)

Arizona law does not attempt to usurp this authority from the NPS. Under Arizona law, these animals are not considered "Wildlife," but instead are defined as "Stray" animals. ARS 3-1401 defines a "stray animal":

> "Stray animal" as used in this article means livestock, bison or ratites whose owner is unknown or cannot be located, or any such animal whose owner is known but permits the animal to roam at large on the streets, alleys, roads, range or premises of another without permission, except that this section does not apply to livestock where the principles of a federal permit, federal allotment or federal lease are in dispute. (ARS 3-1401)

The Arizona Revised Statutes also include definitions of "Wild" and "Wildlife," which do not apply to the bison hybrids because they are not "normally found in a state of nature" and therefore not "Wild":

> 21. "Wild" means, in reference to mammals and birds, those species which are normally found in a state of nature.
>
> 22. "Wildlife" means all wild mammals, wild birds and the nests or eggs thereof, reptiles, amphibians, mollusks, crustaceans, and fish, including their eggs or spawn.

AGFD identified bison as an introduced, and therefore non-wild, species until 2015. In the 2015 hunt data booklet, AGFD reported "these animals are not native to Arizona." (AGFD 2015, p. 144) In 2016, for the first time ever, they changed the wording to read, "American bison, also known as buffalo, are are native wildlife in Arizona, occuring at the southwest edge of its original historic range." [sic] (AGFD 2016, p. 144)

A 1950 Memorandum of Understanding between AGFD, Kaibab National Forest, Bureau of Land Management, and ranchers dedicated an allotment in House Rock Valley to the keeping of the state-owned bison hybrids. In that document, AGFD agreed, "To maintain an adequate fence on the north boundary of the buffalo allotment on the Kaibab National Forest and to keep the buffalo confined to their designated range on the Kaibab National Forest." NPS was not a party to this agreement.

A 1973 Memorandum of Understanding between AGFD and the U.S. Forest Service (USFS) adds that, "The (AGFD) Commission agrees… To neither make nor sanction any release, introduction or establishment of wildlife, excluding fish, which may affect National Forest management until a joint investigation has been made and a mutual agreement reached regarding its possible effect upon all other resources." (AGFD, USFS 1973). Therefore, the bison hybrids that roam on the Kaibab National Forest outside of House Rock Valley and all bison in Grand Canyon National Park should be considered "stray animals."

According to ARS 3-1402, those who find stray animals on their land are to notify the owner, who should recover the animal; if the owner fails to recover the animal, a livestock officer or inspector is to capture it and sell it at auction. However, Arizona has a specific statute regarding buffalo and buffalo meat. According to ARS 17-233, the bison hybrids found on NPS land can be sold or given away by the Arizona Game and Fish Commission to public or charitable institutions:

> 17-233. Acquisition and disposition of buffalo and buffalo meat.
> The commission may purchase, sell, barter, or give away buffalo or buffalo meat provided the same may be given only to public institutions or charitable institutions and monies derived therefrom shall be deposited in the game and fish fund. (ARS 17-233)

All of this is especially applicable considering that, in 2014, after park and state officials were successful in experimentally corralling and transporting 18 bison hybrids off the plateau using well-proven bison ranching techniques, the bison were later intentionally released from the State's House Rock Wildlife Area. The experiment failed when state staff prematurely released the animals without infrastructure to keep them. The small herd immediately returned to the park.

It is not surprising that bison have proven difficult to manage on and around the Kaibab Plateau. The animals were deemed as "excess for their Forest Service grazing lands" by the mid-1940s (AGFD 2015). In its explanation of the history of bison in northern Arizona, AGFD elucidates as to why bison management will never be a profitable, or even sustainable, endeavor for the State of Arizona: "The herds at House Rock and Raymond Ranch wildlife areas remained, however, and the Department set out to manage these herds on a sustained basis. A economic profit [sic] proved elusive, however, as it was impossible to sustain sufficient breeding stock without damaging the range," (AGFD 2015, p.145).

NPS must protect the native plants and wildlife of Grand Canyon National Park, as well as the soils, seeps, springs, wetlands, and archaeological sites. NPS is required to remove any exotic species that "interferes with natural processes and the perpetuation of natural features, native species or natural habitats" (NPS 2006). The USFS has the legal right and responsibility to consider the potential impacts of all introduced species. History demonstrates that bison hybrids are difficult to contain, so, without removing the animals from adjacent USFS lands, it will be impossible to keep them from returning to the park. To protect the natural resources of Grand Canyon National Park and the Kaibab National Forest, which belong to all Americans, the bison hybrids should be removed.

In light of this legal framework and the history of stray bison hybrids being allowed by AGFD to roam on the Kaibab Plateau and Grand Canyon National Park, NPS should edit the EA in the following manner:

NPS should use appropriate common and scientific names
These animals are the result of an intentional experimental crossing of cattle with bison. NPS should refer to the animals by the proper scientific and common names. The common name should be "bison hybrid", not "bison". The scientific name is not *Bison bison*; they are *Bison bison* X *Bos taurus* Linnaeus. (EA at p.1 and elsewhere)

NPS should not abandon the goal of eventually eliminating bison hybrids from park.
While the short-term goal of this action may be "to quickly reduce" bison hybrid numbers, the ultimate goal of is to have this introduced species removed from the park to protect park resources. (EA at p.1). NPS should not commit to simply "reducing the House Rock bison herd to fewer than 200 animals" if adjacent land managers (USFS, AGFD) don't have a complementary management plan in place when the population is brought below 200 (EA at p.1). The bison hybrids must eventually be securely corralled within House Rock Wildlife Area or entirely removed from the area. NPS should not codify any requirement to maintain a population of bison hybrids through this or any other document. Not only is this is not a need of Grand Canyon National Park, it will be an expensive and work-intensive drain on park resources to sustain these animals, and is counter to NPS policy (NPS 2006).
Suggestion: Remove any commitment to discontinue this action before bison are completely removed from the park.

NPS is *not* required to act in a manner "consistent with recommendations for a free-ranging bison herd on the Kaibab Plateau" (EA at p.1). NPS is not a party to any Memorandum of Understanding and the NPS mandate is to "preserve and protect" park resources, according to the NPS Organic Act (16 U.S.C. l, 2, 3, and 4). Park resources are being damaged by this introduced species. History has shown that it is extremely difficult to maintain a free-ranging bison herd on the Kaibab Plateau without degrading park resources. Keeping these introduced bison hybrids on the Plateau will cause a long term taxpayer burden and intensified resource impacts over time.
Suggestion: Remove the phrase, "consistent with recommendations for a free-ranging bison herd on the Kaibab Plateau" (EA at p.1).

NPS should not dismiss the possibility that it will have to act alone to keep bison hybrids from repopulating in

Grand Canyon National Park. The EA states, "While the proposed action, if implemented, would result in fewer than 200 bison in the park, for the purpose of this environmental assessment regarding short-term management options, the National Park Service has dismissed an alternative that eliminates bison from the park (see "Alternatives Considered But Dismissed from Detailed Analysis" in chapter 2)." (EA at p.3). NPS is not a party to any Memorandum of Understanding and the NPS mandate is to "preserve and protect" park resources, according to the NPS Organic Act (16 U.S.C. l, 2, 3, and 4). NPS should not codify any requirement to maintain a population of bison hybrids through this or any other document.
Suggestion: Remove any commitment to discontinue this action before bison are completely removed from the park. Rather than considering full removal to be a separate alternative, NPS should commit to ongoing removal of bison hybrids until USFS and AGFD have begun implementation of a complementary bison hybrid management plan outside the park.

NPS should not just aim to "minimize" impacts on park resources, but to *eliminate* them by eliminating bison hybrids (EA at p.3). NPS has the responsibility to maintain native species and preserve and protect all park resources (*See* "NPS Authority to Manage Wildlife", EA at p.4). NPS shouldn't commit to keeping some number of bison hybrids that is less than 200 animals unless and until future National Environmental Policy Act (NEPA) environmental reviews are completed.
Suggestion: Remove any commitment to require future NEPA analysis for ongoing bison hybrid unless NPS actions or other conditions significantly change. Allow NPS to continue this action until USFS and AGFD have begun implementation of a complementary bison hybrid management plan outside the park.

NPS states that, "The Kaibab National Forest Land and Resource Management Plan (USFS 2014) states that "the bison herd has been present on the North Kaibab Ranger District for more than 100 years and was specifically mentioned in legislation leading to the Grand Canyon Game Preserve."" It fails to also mention that the Kaibab National Forest Land and Resource Management Plan offers the following Desired Condition: "Bison are a desired introduced wildlife species **within the designated House Rock Wildlife Area in House Rock Valley**," and the following Guidelines: "The bison s**hould be managed so that the herd is concentrated within the House Rock Wildlife Area**," and, "Active management should be used to minimize impacts from bison to sensitive resources, particularly outside the House Rock Wildlife Area." (USFS 2014, p. 103, *emphasis added*) USFS therefore also has a mandate to return the bison hybrids to lands off of the Kaibab Plateau. And, although it is important for NPS to acknowledge the legal framework and policies that guide its neighbors, NPS must remain accountable to the legal framework and policies that specifically guide its own actions (i.e., NPS Organic Act, Director's Order 100, NPS 2006). Grand Canyon National Park is not managed under the same rules of the preceding Game Preserve. Nor is it managed under the Kaibab National Forest Land and Resource Management Plan.
Suggestion: Add in other relevant text from the Kaibab National Forest Land and Resource Management Plan, and emphasize the relevant NPS laws and policies that guide NPS actions.

NPS declares, "This environmental assessment focuses on reducing the House Rock bison herd to a level that would protect park resources and values while still allowing for a viable bison population on the Kaibab Plateau." (EA at p.5) NPS' only responsibility is to protect park resources.
Suggestion: Remove the words, "while still allowing for a viable bison population on the Kaibab Plateau" (EA at p.5).

NPS reports, "Additionally, research in other areas where bison are managed at densities and abundance compatible with their local ecological environment have shown that bison can have some potential positive effects on native plant communities (e.g., increased overall plant community diversity through physical effects and increased overall plant productivity through compensatory plant response to herbivory) (Schoenecker 2012)." (EA at p.8) What is "compatible with their local ecological environment" in an area that did not evolve with such heavy footed ungulates?
Suggestion: Remove this from the EA. It is irrelevant to this situation.

NPS intends to "identify the desired population composition (age classes and sex ratio)…The results of this monitoring would also be used to help inform future management of the House Rock bison herd inside and outside of the park." (EA at p.30)
Suggestion: Remove any reference to maintaining a future bison hybrid herd in the park. NPS should not commit to maintaining a non-native species in the park that is damaging park resources.

NPS identifies the "Complete elimination of bison from Grand Canyon National Park" under "Alternatives considered but dismissed from further detailed analysis" (EA at p.35). If AGFD and USFS have not begun implementation of a complementary bison hybrid management plan outside the park, NPS should continue this action to keep bison hybrids out of the park and protect resources.
Suggestion: Remove "Complete elimination of bison from Grand Canyon National Park" from the section "Alternatives considered but dismissed from further detailed analysis" (EA at p.35).

NPS mandates and Arizona statutes must guide NPS actions (EA at p.5)
NPS states that, "Arizona statute guides bison management as wildlife on USFS lands adjacent to the park." (EA at p.5) What statutes is NPS referring to? Arizona statutes do not define the bison hybrids as wildlife; Arizona statutes actually define bison hybrids on the Kaibab Plateau and Grand Canyon National Park as stray animals. We have submitted the relevant Arizona statutes to NPS twice before, in our 2014 and 2016 scoping comments, and submit them again in this letter:

Under Arizona law, these animals are not considered "Wildlife," but instead are defined as "Stray" animals. ARS 3-1401 defines a "stray animal":

> *"Stray animal" as used in this article means livestock, bison or ratites whose owner is unknown or cannot be located, or any such animal whose owner is known but permits the animal to roam at large on the streets, alleys, roads, range or premises of another without permission, except that this section does not apply to livestock where the principles of a federal permit, federal allotment or federal lease are in dispute. (ARS 3-1401)*

The Arizona Revised Statutes also include definitions of "Wild" and "Wildlife," which do not apply to the bison hybrids because they are not "normally found in a state of nature" and therefore not "Wild":

> *21. "Wild" means, in reference to mammals and birds, those species which are normally found in a state of nature.*
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The Arizona Game and Fish Department (AGFD) identified bison as an introduced, and therefore non-wild, species until 2015. In the 2015 hunt data booklet, AGFD reported "these animals are not native to Arizona." (AGFD 2015, p. 144) In 2016, for the first time ever, they changed the wording to read, "American bison, also known as buffalo, are are native wildlife in Arizona, occuring at the southwest edge of its original historic range." [sic] (AGFD 2016, p. 144)

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fish, which may affect National Forest management until a joint investigation has been made and a mutual agreement reached regarding its possible effect upon all other resources." (AGFD, USFS 1973). Therefore, the bison hybrids that roam on the Kaibab National Forest outside of House Rock Valley and all bison in Grand Canyon National Park should be considered "stray animals."

According to ARS 3-1402, those who find stray animals on their land are to notify the owner, who should recover the animal; if the owner fails to recover the animal, a livestock officer or inspector is to capture it and sell it at auction. However, Arizona has a specific statute regarding buffalo and buffalo meat. According to ARS 17-233, the bison hybrids found on NPS land can be sold or given away by the Arizona Game and Fish Commission to public or charitable institutions:

> *17-233. Acquisition and disposition of buffalo and buffalo meat.*
> *The commission may purchase, sell, barter, or give away buffalo or buffalo meat provided the same may be given only to public institutions or charitable institutions and monies derived therefrom shall be deposited in the game and fish fund. (ARS 17-233)*

All of this is especially applicable considering that, in 2014, after park and state officials were successful in experimentally corralling and transporting 18 bison hybrids off the plateau using well-proven bison ranching techniques, the bison were later intentionally released from the State's House Rock Wildlife Area. The experiment failed when state staff prematurely released the animals without infrastructure to keep them. The small herd immediately returned to the park.

Suggestion: Correct statement on p.5 to say, "Arizona statute guides bison management as *stray animals* on USFS lands adjacent to the park." Add relevant legal framework.

NPS goes on to say, "the National Park Service recognizes the non-game values (e.g., bison viewing opportunities) that the Arizona Game and Fish Department places on bison." (EA at p.5) The non-game values of non-native wildlife should not be a priority for NPS.
Suggestion: Remove this text from the EA.

NPS also reports, "the Arizona Game and Fish Department plans to restart a subpopulation of bison with site fidelity to the House Rock Wildlife Area" (EA at p.5). If these bison are to be allowed outside House Rock Wildlife Area, NEPA environmental reviews must be done to determine whether bison should be allowed on the Kaibab National Forest.
Suggestion: Specifically mention that NEPA environmental reviews are required for any importation of bison onto public lands.

NPS should focus on removal before moving forward with any lethal culling, and ensure that animals don't return

NPS has demonstrated that live capture and transport of bison hybrids can work but culling has not been proven, and has caused bison hybrids to migrate unpredictably in the past. Culling could also undermine future gathering efforts by causing the bison hybrids to mistrust the gathering process or by forcing animals deeper into the Canyon. If culling primarily occurs in winter, bison hybrids will not be limited by heat and could move further down in elevation.

In order to limit impacts on park resources and maximize the use of techniques that have already proven successful, animals could be live captured from the park to the greatest extent possible, moved to House Rock Wildlife Area, and then hunted in specific parts of House Rock Wildlife Area (after fencing is completed). There is precedent for this approach. Bandelier National Monument consented to live capture and removal of burros with an agreement that those that could not be rounded up would be lethally culled.
Suggestion: Lead effort with live capture and transport before and if any lethal culling ensues. Encourage AGFD

to hold hunts in House Rock Wildlife Area, far from the park and off the Kaibab Plateau.

Since Kaibab National Forest is a partner in this process, some roundup locations could be outside the NPS boundary on Forest Service land. This would help in the preservation of park resources.
Suggestion: Work with USFS to designate some corral sites outside the park.

"Site fidelity" to House Rock Wildlife Area is not a replacement for active management and secure fencing (EA at pp.5,20,71,80,83,86,90,92,95,100,107,120,124,128,135,137). Bison hybrids move into new areas as resource conditions and perceived threats change.
Suggestion: NPS should be explicit about what is meant by "site fidelity" and specifically request that secure fencing is established and maintained at House Rock Wildlife Area.

To retain bison hybrids below the Kaibab Plateau, it will be important that the bison hybrids in House Rock Wildlife Area Valley don't know their way up to North Rim. ***Suggestion:*** Hold bison hybrids in House Rock Wildlife Area that aren't familiar with the route to the North Rim, not animals that have lived in both places. Preferentially capture young animals that have never been down in House Rock Valley; 2012 was the last time they came down.

This plan should minimize and absolutely should not bring lethal culling into the park perpetually. ***Suggestion:*** Lethal culling of bison hybrids should be minimized and capture addressed first, as noted above, and should not become a long-term annual or ongoing event. Continue bison hybrid removal from the park until USFS and AGFD have begun implementation of a complementary bison hybrid management plan outside the park.

NPS does not dismiss "House Rock Bison Herd Genetics" issue and must present accurate science
In the section titled, "Issues and Impact Topics not Retained for Additional Analysis" (EA at p.12), NPS claims that "House Rock Bison Herd Genetics" are not considered, specifically stating that:

> Issues associated with bison genetics vary from cattle introgression in the current herd to the loss of genetic diversity associated with reducing the herd to key numerical thresholds needed for conservation of both existing genetic diversity and continued long-term evolutionary potential…these issues have been dismissed from further consideration. While such issues are important to the long-term management of bison populations, they are not relevant to the short time frame of the House Rock bison herd reduction proposed here. (EA at p.12)

Yet, NPS follows that statement with a lengthy discussion of genetics, including several statements of misinformation. NPS discusses "potential to suffer greater genetic decline" (EA at p.12) and later, NPS discusses "Genetic Considerations," specifically discussing how individual animals would be chosen to protect genetic diversity of the bison hybrid herd. NPS lists genetics as a potential indicator to be monitored (Table 3, EA at p.34). NPS must be consistent and if NPS is going to consider genetics, the best available science should be offered and it should be interpreted accurately.

In our scoping comments, we offered the following:

> Cattle genes cannot be bred out of the House Rock herd; the herd has a significant level of cattle genes compared to 11 bison populations in the U.S., with hybridization levels that are an order of magnitude larger than any of the other federal herds (Halbert 2003, Halbert and Derr 2007, as cited in Larson et al. 2009). Hedrick (2010) reports that the House Rock herd has 97.5 percent cattle mtDNA and 1.9 percent autosomal ancestry, placing it as one of the top two out of 22 herds studied for percent of cattle ancestry. Bison bulls were bred with domestic cattle, and almost no fertile males resulted from the first generation of mating. As a result, mtDNA carries through on X chromosomes and cannot be bred out of

> the herd. While the House Rock herd showed 97.5 percent cattle mtDNA, the average for the 22 herds is 13.9 percent mtDNA and 0.6 percent autosomal cattle ancestry. This raises a question of whether House Rock animals should be called "bison" for hunt purposes and certainly for management purposes within the park.

Loss of genetic diversity should not be considered an issue for this herd, because this herd is not an appropriate conservation herd.

NPS states:

> Recent genetic information from the House Rock bison herd that currently occur in and around the park, Kaibab National Forest, and House Rock Wildlife Area confirms evidence of cattle mitochondrial DNA, but low levels of cattle chromosomal DNA (Wakeling 2006), which is the source of the vast majority of heritable traits for bison. In other words, the House Rock bison herd exhibits few, if any, recognizable traits of cattle (pelage, body conformation); they look and behave like bison, and they produce viable male and female offspring indicating essential chromosomal DNA functionality. Not unlike other public bison conservation herds, these animals were and remain bison, with some cattle genetics lingering on after a century. In a recent report (Plumb et al. 2016), the National Park Service, Arizona Game and Fish Department, and US Forest service note that the genetics of the current herd can be improved and are not in conflict with missions and policies of the respective agencies. (EA at p.12)

There are many falsehoods presented here.

First, "…evidence of cattle mitochondrial DNA, but low levels of cattle chromosomal DNA (Wakeling 2006), which is the source of the vast majority of heritable traits for bison." (EA at p.12). Wakeling (2006) actually says, "Compared with other public and private hybrid bison herds, the levels of cattle genes detected in these Arizona bison herds are high." Wakeling then goes on to claim that, "phenotypically and behaviorally, the animals cannot be distinguished from pure bison," but he does not report on any research into phenotypic traits, nor does he elaborate on why he thinks the animals cannot be distinguished from pure bison (Wakeling 2006). He does no experiments on heritability of phenotypic traits and declines to explain where his assumptions about heritability derive from.

Next, NPS goes on to say, "In other words, the House Rock bison herd exhibits few, if any, recognizable traits of cattle (pelage, body conformation); they look and behave like bison, and they produce viable male and female offspring indicating essential chromosomal DNA functionality. Not unlike other public bison conservation herds, these animals were and remain bison, with some cattle genetics lingering on after a century." (EA at p.12) NPS offers no evidence for a lack of phenotypic variation or heritable traits. Interestingly, the few studies we could locate that actually examined phenotypic traits and heritability in cattle/bison hybrids all found heritable phenotypic traits unique to these hybrids. Both feedlot and feral cattle/bison hybrids with mitochondrial DNA exhibited lower weights than pure bison, and in a feral population they were shorter than pure bison (Derr et al. 2012). Mandible dimensions of bison hybrids are a transgressive trait, more extreme than that demonstrated in either parent species (Rieseberg et al. 1999). Unfortunately, it is hard to quantify phenotypic variation and heredity because there has been very little research into heritable traits of cattle/bison hybrids (Hedrick 2009). There have been no behavioral studies.

Finally, NPS reports, "In a recent report (Plumb et al. 2016), the National Park Service, Arizona Game and Fish Department, and US Forest service note that the genetics of the current herd can be improved and are not in conflict with missions and policies of the respective agencies." (EA at p.12) In reality, these animals have 97.5% cattle mtDNA, and it cannot be bred out of the herd (Hedrick 2010, Larson et al. 2009).

Suggestion: NPS should base decisions on accurate science, as required by Director's Order 100. NPS should not misrepresent or dismiss scientific research. These bison hybrids have a high level of cattle DNA and it is unknown whether "they look and behave like bison…were and remain bison" because there has never been

research to examine phenotypic traits, heredity, or behavior in this herd (EA at p.12). This should not be considered as a conservation herd, especially since "the Arizona Game and Fish Department plans to restart a subpopulation of bison" with different genetic stock (EA at p.5).

NPS should minimize the use of helicopters

NPS plans to use helicopters to remove animals in remote areas, particularly below the rim and on Powell Plateau (EA at p.27). Helicopters will cross the Canyon and spend one to two hours per trip, six times per year, to collect carcasses from within the proposed Wilderness areas of the park in January to March, the quietest time of the year.

NPS will do minimum tool analyses to determine how to remove carcasses from these remote areas, but instead, NPS should ask what is the minimum tool to get the job done (dispatch bison hybrids) (EA at p.26). In this case, the minimum tool might be to remove live animals or to merely leave the carcasses to benefit scavengers.

The largest threat to California condors near Grand Canyon is lead exposure via the carcasses they consume. Leaving carcasses for wildlife benefit in the most remote parts of the backcountry would benefit condors by keeping them local and providing a safe food source.

Suggestion: Rather than introduce a huge amount of noise and disturbance to remote areas during the quietest time of the year, allow some carcasses to remain in place for the benefit of scavengers including Colorado condors.

NPS should be more direct about the need to restore native predators

While we acknowledge that this EA does not deal directly with wolf reintroduction to Grand Canyon National Park (EA at p.36), NPS must be up front about the fact that the loss of wolves is a component of the reproductive success of introduced bison hybrids. NPS acknowledges a "lack of predators" as part of the problem (EA at pp.3,4), but does not specifically mention wolves as one of these predators, and the "Carnivores" section of the EA (EA at p.52) fails to mention that wolves once roamed on the North Rim and North Kaibab. It is troubling that NPS would agree to keep less than 200 of an introduced hybrid species in the park but will not make mention of an extirpated native species.

Suggestion: Add mention of lack of wolves to "Carnivores" section (EA at p.52). Add text, "such as wolves" after the words "lack of predators" (EA at pp.3,4).

Thank you for considering our comments.

Sincerely,

Alicyn Gitlin
Sierra Club – Grand Canyon Chapter

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