




**National Park Service  
U.S. Department of the Interior**

**Grand Canyon National Park  
Arizona**

**FINDING OF NO SIGNIFICANT IMPACT  
Initial Bison Herd Reduction Environmental Assessment**

Recommended:

  
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08-17-2017  
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Date

Approved:

  
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9/1/17  
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## **INTRODUCTION**

In the 1990s, the House Rock bison herd, which the Arizona Game and Fish Department (AGFD) has managed at House Rock Wildlife Area (HRWA) since 1929, began spending more time off of House Rock Wildlife Area and venturing on to the North Rim of the Grand Canyon National Park (the park). Given current bison distribution, abundance, and density and the expected growth of the House Rock bison herd, the National Park Service (NPS) is concerned about any current and potential increased impacts on park resources, such as water, vegetation, soils, and archeological sites, and on values such as visitor experience and wilderness character.

In light of these concerns, the National Park Service, in cooperation with other agencies with jurisdiction for bison management on the Kaibab Plateau, prepared an environmental assessment (EA) in compliance with the National Environmental Policy Act (NEPA), to evaluate tools to quickly reduce the population of the House Rock bison herd on the North Rim of Grand Canyon National Park and to protect park resources and values from the impacts of the steadily growing bison population.

In addition, in collaboration with its partners, the National Park Service developed protocols for monitoring the House Rock bison herd (including movement, distribution, and abundance) and other park resources (e.g., water resources, including water quality and hydrology, vegetation, soils, cultural resources) to adapt bison reduction actions during implementation; gather data on bison movement and distribution in response to management actions and after the herd size is reduced; and understand resource response to the lower bison herd abundance.

This monitoring will also inform any decisions about long-term bison management on the Kaibab Plateau, which is outside the scope of this selected alternative. Such long-term management would also be informed by a growing body of science and scholarly work related to the possible role of bison on the Kaibab Plateau, bison management goals of other agencies, and Department of the Interior policy. Continued dialogue is needed with American Indian tribes and other federal and state agencies to assess any appropriate long-term, landscape-scale, ecological and cultural roles of bison across the multijurisdictional Kaibab Plateau. Although outside the scope of this environmental assessment, the National Park Service is committed to continuing to work collaboratively with its cooperators and tribal partners regarding the long-term management of the House Rock bison herd on the Kaibab Plateau.

The statements and conclusions reached in this finding of no significant impact (FONSI) are based on documentation and analysis provided in the EA, the errata that have been prepared in response to public comments (see attachment B), and associated decision file. To the extent necessary, relevant sections of the EA are incorporated by reference and summarized below, with specific reference to sections or page numbers in the EA where additional detail is provided.

## **SELECTED ALTERNATIVE AND RATIONALE FOR THE DECISION**

The National Park Service has selected Alternative 2 for implementation because it is the only alternative that provides the National Park Service with the suite of tools necessary to meet the purpose and need to quickly reduce the House Rock bison herd and protect park resources and values. As described beginning on page 17 of the EA, the National Park Service, which has

overall responsibility for implementing management actions on the North Rim, will collaborate with AGFD, the US Forest Service (USFS), and the InterTribal Buffalo Council (ITBC) to reduce the population of the House Rock bison herd in the park to fewer than 200 animals as quickly as possible. The National Park Service will have available a combination of reduction measures to use across the North Rim (see figure 2 of the EA), including nonlethal culling (i.e., capturing bison in corrals and removing them from the park in trailers) and lethal culling using primarily skilled volunteers and tribal personnel. Alternative 2 also provides the National Park Service with tools including (1) attractants to draw bison into areas where they can be captured in corrals, (2) targeted exclusion fencing in very sensitive areas, and (3) hazing/herding.

Recognizing the need to maximize effectiveness of the reduction, the National Park Service will monitor the response of the House Rock bison herd and other resources, adapt bison reduction actions accordingly, and work with AGFD and other partners to develop an annual operations plan. This annual operations plan will outline bison population survey protocols to establish a baseline population estimate prior to implementation, as well as protocols for periodic surveys and modeling each year thereafter. Based on the information collected through monitoring, the plan will address sequencing of tools and annual reduction goals based on bison population estimates and demographics; data obtained through ongoing monitoring of bison impacts on soils, hydrology, water quality, vegetation and cultural resources; and successes and challenges of the previous year's methodologies. Other considerations will include how best to coordinate activities occurring inside the park with AGFD management actions (e.g., hunting on national forest system lands) outside the park as well as the ability of tribal recipients to accept captured bison.

The analysis in the EA was informed by a population model and other assumptions, and as described on page 19, the information included in the EA was not intended to be prescriptive or guide implementation, but provide the reader and the decision maker insight into the relative frequency and duration of bison reduction actions, and how long it might take to reduce the House Rock bison herd to the desired density/abundance range. As the EA also explains, it is important to note that several factors could influence the number of years to reduce the bison population to fewer than 200 animals.

### **Nonlethal Culling**

#### *Timing and Location*

Weather permitting, nonlethal culling will generally occur in the park between June and September. These activities will continue annually until bison become more wary of the corrals and the approach becomes more difficult and less effective, or the initial bison population objective is achieved. The Little Park site shown on figure 2 in the EA will be used as the primary corral site; additional sites at Swamp Point Road, W-4 Road, Basin, and Walhalla may also be used, as could other locations where bison may congregate during the implementation of the selected alternative if they are logistically feasible. To the extent possible, corral sites will be placed outside recommended wilderness areas and near roads in nonwilderness corridors.

#### *Capture and Removal Methods*

The National Park Service will install temporary corrals anchored above or below-ground, as needed, at the sites noted above. Tarps or billboard screens will be attached to the panels to block

the ability of the bison to see out of the corrals, which is intended to reduce the stress on the animals being corralled. Corrals will be configured to allow for sorting and processing of bison, as appropriate. Tractors, backhoes, or trucks will be used to move corral construction materials. Some limited off-road travel will be required for these vehicles, but it will be restricted to a designated corridor to limit impacts to the smallest possible area. If any unknown archeological resources are encountered, work will be halted until the resources are evaluated and a mitigation strategy is developed.

As described later, bait stations and other attractants could be used in combination with soft handling, hazing and herding techniques to help guide bison towards or into corrals. Once corralled, staff will move the bison into stock trailers through chutes and the bison will be transported by truck to their ultimate destinations. Captured bison could be transferred to a variety of willing recipients, potentially including tribes, the state of Arizona, other federal agencies, and non-governmental organizations. If off-road travel is needed to bring trailers in and out of the corral site, it will be restricted to a designated corridor to minimize impacts. State requirements for the transport of animals across state lines will be followed should any bison be shipped out of Arizona. The National Park Service will enter into agreements with willing recipients who may be responsible for meeting these and other requirements. Capture and removal will also be conducted following appropriate animal welfare guidelines.

#### *Corral Storage*

Corrals will be disassembled when not in use; however, no corral storage will occur in recommended wilderness. Once capture and removal is deemed ineffective or when initial bison population objectives are met, corral material will be removed from the corral site until it is needed again. Once corral infrastructure is removed from the area, travel corridors and the corral site will be revegetated or reseeded with native species; soils in these areas may also be aerated as necessary.

### **Lethal Culling**

#### *Timing and Location*

As discussed in the EA, while lethal culling could occur year round, it will primarily be used from October 15 to May 14, after most facilities on the North Rim of the park are closed to the public. If lethal culling occurs outside of this time frame, some areas on the North Rim of the park may experience limited closures during these events to ensure visitor safety.

Primary lethal culling areas (see figure 2 of the EA) will most likely include areas within a short distance of public access roads in the known range of the House Rock bison herd on the North Rim. Lethal culling will not occur along the North Rim Entrance Road when the park's access roads are open and when nonlethal culling events are planned at Little Park but could occur there once these roads are closed or nonlethal culling is complete. Lethal culling could also occur in other more remote areas of the North Rim in the range of the House Rock bison herd as needed. Reduction actions will be coordinated with AGFD and USFS in areas near the national forest boundary to increase opportunities for hunter harvest outside of the park. Results of bison movement monitoring during implementation will be used to adjust lethal culling operations to encourage bison to move onto adjacent US Forest Service lands where they can be hunted, and to

minimize the potential for bison to move into more remote areas of the North Rim, including below the canyon rim.

#### *Lethal Culling Methods*

Each lethal culling team will consist of a qualified NPS employee as a team lead and up to four other team members (e.g., skilled volunteers, tribal personnel); although teams using horses or oversnow travel could be smaller (e.g., an NPS lead and two others). NPS team leaders will directly supervise teams in the field during any bison reduction activities. Team leaders will make all decisions regarding location and age/sex of individual bison to be removed during each lethal culling period, as informed by the annual operations plan. As noted in table 2 of the EA, additional people may accompany team members to assist with carcass processing and removal. Other agency personnel and contractors could also be used to cull bison or process meat in limited circumstances.

Before assisting with lethal culling actions, all team members will need to meet a number of predetermined requirements, including a demonstrated level of firearm proficiency and knowledge of public safety and protection policies that will be established by the park in consultation with the AGFD. Pre-reduction training will be required to prepare staff and volunteers for their roles; and to help them identify sensitive cultural and natural resources (e.g., archeological resources, cultural landscapes, rare plants etc.) and actions that can be taken to avoid disturbing these resources.

Lethal culling will target animals to accomplish population reduction and resource protection goals, as informed by the data collected during bison and resource monitoring. In addition, animals may be selected, as appropriate, for tribal use. The National Park Service will require the use of lead-free ammunition to eliminate the potential for lead poisoning in California condors. Lethal culling will also be conducted following appropriate animal welfare guidelines. Lethal culling team members will consider the caliber of ammunition, shot placement, and other factors to ensure the humaneness of the action.

Because water resources and associated vegetation are sensitive to impacts from bison disturbance, teams will be instructed to wait for bison to move away from water sources that are not protected by local exclusion fencing before shooting if at all possible. Baiting, as described later, may also be used to move bison away from sensitive resources.

#### *Carcass Handling and Disposition*

The National Park Service will make every reasonable effort, when safe, to remove salvageable meat from the field for beneficial human use and will donate it, as appropriate, to the state of Arizona, volunteers who participated in lethal culling and removal of carcasses from the field, food banks, and tribal members. Other bison parts (e.g., hides, heads, horns) will be either donated to tribal partners, and/or federal or state agencies or cooperators for non-commercial uses (e.g., tribal ceremonial uses, public or educational display, research); and/or they will be left in the field to recycle into the environment. Organ and gut piles will also be left in the field to recycle into the environment.

As discussed in the EA, bison meat and parts will be removed primarily by foot, or using stock packers. The National Park Service will consider the use of helicopters to remove bison meat and parts in very limited circumstances, such as when primary removal methods are not timely or

practical due to remoteness, and helicopters are determined (through a Wilderness Act Minimum Requirement Analysis to be conducted at the time) to be the minimum tool available to prevent leaving salvageable meat. Snow machines with attached sleds could also be used to remove dressed carcasses that have been brought to a roadway on which snow machines are allowed to operate.

While every effort will be made to safely remove salvageable meat, hides, and heads of bison during lethal culling operations, even in very remote locations, the NPS team leader will have the discretion to determine when it is appropriate to leave any of these items in the field. The decision will be based on a hierarchy of human and pack animal safety, logistics for accessing remote sites, environmental conditions, potential for resource damage, the likelihood of meat spoilage, the availability and cost of the park helicopter to assist while meeting the requirements for helicopter use (described in the 'Access to Sites and Reconnaissance' and 'Mitigation Measures' section), and the Wilderness Act Minimum Requirements Analysis.

Any meat that is removed from the field will be transported to a centralized cold storage site or facility. The park will consult with the NPS Public Health Program and AGFD to ensure meat is handled and stored properly for consumption. Responsibility for safe, legal transport and distribution of meat off NPS lands may rest with the recipient.

#### *Access to Sites and Reconnaissance*

Lethal culling and carcass processing teams will use several methods to reach areas where reduction activities will occur, depending on safety and efficiency as well as potential impacts to wilderness, resources and visitor experience. Where bison are within a few miles of open public or administrative use roads, lethal culling teams will gain access using standard trucks, sport utility vehicles, utility task vehicles, or snow machines on existing roads and then walk into the areas where bison are located. All vehicle use, including snow machines, will be restricted to established roads open to the public and roads used for administrative purposes on the North Rim by NPS staff. Off-road/over snow vehicle travel will not be permitted. No new roads will be constructed, nor will any abandoned roadbeds be reopened. Utility task vehicles could be allowed on roads when not open to and used by public vehicles. In more remote areas, stock animals (e.g., mules, horses) may be used to transport personnel. Hay brought in to feed the stock animals while in the field will comply with the park's weed-free hay policy to minimize risk that seeds of exotic and invasive plants are brought into the park.

The use of vehicles for bison reduction activities will be restricted by seasonal snowfall and snowpack, which likely will limit most vehicle use to May through November. Ultimately the exact mode of access will be determined after taking into consideration human and pack animal safety and logistics for accessing a remote site, environmental conditions, and the Wilderness Act Minimum Requirements Analysis, which will be revisited prior to taking any action.

Helicopters, if used to remove carcasses in remote locations or for hazing bison in remote areas (as described later), will be operated in accordance with all relevant regulations, policies, and plans and will be consistent with the interagency helicopter operations guide. If used for carcass removal and/or hazing animals, only personnel who have been trained and qualified will participate in such helicopter operations. Fixed-wing aircraft may be also used for aerial reconnaissance to locate bison to focus lethal culling activities and conduct monitoring.

Requirements for aircraft use in support of any bison reduction efforts will include those discussed in detail on page 28 of the EA, including:

- Coordinating with park helibase staff, pilots, and wildlife program staff
- Minimizing aircraft use along the rim and cliffs to the greatest extent possible
- Maintaining buffer distances required for the protection of Mexican spotted owl, Northern goshawk, and California condor
- Giving up airspace to the extent possible if airborne condors approach aircraft, as long as this action does not jeopardize safety

Overnight camps on the North Rim are not anticipated. However, if an overnight camp within the park is determined to be necessary during field operations for both lethal and nonlethal culling, the camp will be located at a previously designated or established location whenever possible. In the unlikely event that backcountry camping is necessary at a non-designated site, crews will use “leave no trace” protocols to avoid impacts and, if necessary, restoration will be undertaken at the site.

### **Additional Bison Reduction Tools**

#### *Hazing and Herding*

Hazing and herding will generally be accomplished using soft-handling techniques by people on foot and horseback to encourage the animals to move toward or away from certain locations. Helicopters could also be used in very limited circumstances to protect human and pack animal safety, such as if they are needed to move bison away from rim edges and off of Powell Plateau, taking into consideration all the factors noted previously for aircraft use. However, based on previous experiences indicating that herding and hazing is not always effective in the landscape of the North Rim, the park is unlikely to implement this technique on a regular basis. Hazing and herding, when used, will also be conducted following appropriate animal welfare guidelines. Although actions below the rim are not expected, if bison stray below the rim, the park could use hazing and herding to move bison back above the rim, or may lethally remove the animal. Animals fatally shot below the rim will be removed if possible or, if inaccessible, left in the field for scavengers.

#### *Use of Attractants*

Attractants involving food, water in the form of temporary portable water tanks, or mineral licks may be used in combination with hazing and herding to compel bison to move in a desired direction for capture, lethal culling, or away from areas where they may be damaging resources.

### **Local Exclusion Fencing**

The National Park Service may place exclusion fences, where feasible, to protect highly sensitive resources (e.g., springs and seeps or archeological sites). Fencing will be configured to let wildlife other than bison through to protect species that live in the wetland-associated vegetation and allow wildlife access to drinking water. Fencing will be necessary primarily while the reduction of the House Rock bison herd is taking place but may be left in place to help redistribute bison that remain in the park. Resource and bison impact monitoring will inform the use of fencing to protect other natural and cultural resources.



## **Human Safety**

The National Park Service will ensure a safety program is in place to minimize risk to staff, cooperators, volunteers, contractors and visitors from lethal or nonlethal culling activities or other elements of the selected alternative. Staff and cooperator training would address safety, and standard NPS practices would be followed to ensure the safety of all involved with bison reduction actions. Team members conducting the lethal and nonlethal culling activities must have experience with the shooting, capture, and handling of large mammals. Portions of the park in which lethal culling or corralling take place would be closed to visitors to ensure their safety. Details regarding these closures, such as announcing closures, mechanics of closures, and staffing, would be determined in the annual operations plan, and they would be announced in advance.

## **Bison Monitoring**

As described on page 33 and 34 of the EA, the National Park Service would work with its partners to implement monitoring that will measure the effectiveness of the program and inform the next year's implementation plan, such as:

- Bison population parameters
- Bison movement in response to culling
- Efficiency of culling techniques and tools

## **Bison Impact Monitoring**

As part of the proposed action, the National Park Service will also implement a monitoring program to evaluate how resources respond to bison reduction actions, such as:

- Water resources (including water quality and hydrology)
- Soils
- Vegetation
- Cultural resources
- Visitor experience

The National Park Service will work with its partners to identify desired conditions for the resources and would use the monitoring information to determine whether additional bison management actions should be taken in the future.

## **MITIGATION MEASURES**

The National Park Service has integrated certain mitigation measures to limit adverse impacts of the selected alternative. Additional mitigation measures for water resources, bison-affected vegetation, and soils that are not included and described as integral parts of the selected alternative are listed below:

### **Water Resources**

- Remediate sites that exceed a threshold value using best management practices related to the adversely impacted environment.
- Conduct post-coral restoration activities, such as soil aeration and erosion control structures (if needed) to reverse effects of compaction.

### **Bison-Affected Vegetation**

- Revegetate the corral sites or site of other actions with native species, if needed.
- Implement exotic invasive plant management measures, including manual removal with hand tools and application of herbicides in a localized and targeted fashion using backpack sprayers, depending on the plant, if needed.
- Construct bison exclusion fencing, consistent with what is described in the EA, around rare plants if needed

### **Soils**

- Conduct post-coral restoration activities, such as soil aeration and restoration and erosion control structures (if needed) to reverse effects of compaction and reduce erosion potential.

### **Noise**

- The National Park Service could consider the use of noise-suppressors on firearms.

### **Cultural Landscapes**

- Active mitigations for cultural landscapes could include activities such as seeding and replanting native vegetation in denuded areas, encouraging bison movements to other areas by limiting access to perennial water sources, and establishing temporary fencing in areas where vegetation restoration work has taken place.

The park will also consider revegetating areas that have been impacted by bison (e.g., around water resources and wallows), and may conduct compliance, as needed, when these site-specific activities are identified.

## **PUBLIC INVOLVEMENT/AGENCY CONSULTATION**

Public involvement for bison reduction in the North Rim began in 2014. In April 2014, public meetings were held during the public scoping period for a long-term bison management environmental impact statement (EIS) in Kanab, Utah; Flagstaff, Arizona; and Phoenix, Arizona; and via two webinars. In 2015 and 2016, the National Park Service reevaluated the scope of the bison management effort and refocused it on short-term reduction of the herd, changing the NEPA document to an EA. As a result, on February 25, 2016, the National Park Service released a newsletter and requested public comment on the change in scope over a 30-day comment period. Following the release and public review of the EA, public comments were accepted and considered from May 9, 2017, to June 14, 2017. The National Park Service held three public meetings during the public comment period and a public meeting via webinar (see Appendix C for responses to substantive public comments received). The four cooperating agencies, USFS,

the Bureau of Land Management, AGFD, and the InterTribal Buffalo Council, have been consulted and will continue to be involved throughout implementation of the project.

During informal consultation with the USFWS under Section 7 of the Endangered Species Act, the National Park Service determined the selected alternative may affect, but is not likely to adversely affect, the Mexican spotted owl and California condor. The National Park Service also determined that there will be no effect on any other federally listed threatened or endangered species or critical habitat. The USFWS concurred with the park's determination on June 12, 2017. In consultation with Arizona State Historic Preservation Office under Section 106 of the National Historic Preservation Act, the National Park Service determined there would be no adverse effect on historic properties. The Arizona State Historic Preservation Office sent a letter of concurrence with this determination on June 21, 2017. Consultation with the tribes traditionally associated with the park has occurred throughout the course of the project. The InterTribal Buffalo Council's involvement as a cooperating agency is providing wide-spread opportunities among the ITBC member tribes to request the transfer of live bison.

## **FINDING OF NO SIGNIFICANT IMPACT**

The potential for significant adverse impacts from implementation of the selected alternative was analyzed considering relevant context and the intensity of impacts as required by CEQ Regulations at 40 CFR 1508.27.

One of these considerations that is particularly relevant to this selected alternative is that when the ultimate outcome of an action is beneficial, it is possible that adverse impacts associated with taking the action can still be significant. As described in detail in chapter 4 of the EA, reducing the House Rock bison herd to fewer than 200 animals will ultimately result in a bison herd density and abundance that is expected to result in beneficial impacts compared to current conditions for all natural resources analyzed in detail in the EA, as well as cultural and tribal resources, wilderness character, and visitor use and experience. These effects are briefly noted below. However, during implementation, the selected alternative will also cause some limited adverse impacts to resources and values on the North Rim of the park or adjacent USFS lands.

As noted on page 6 of the EA, the National Park Service used internal, agency, and public scoping to identify the important issues associated with the alternatives and the impact topics to be analyzed in detail in the EA. Taking into account the potential for significant impacts and other considerations, the National Park Service analyzed the following issues and impact topics in detail, as described beginning on page 7 of the EA: House Rock bison herd, water resources in the karst landscape, bison-affected vegetation, soils, wildlife (other than bison) and their habitat, special-status wildlife species, cultural and tribal resources, wilderness character, and visitor use and experience. Based on the analysis of these issues and impact topics in the EA, which is incorporated by reference in this FONSI and summarized below, none of these adverse impacts are expected to be significant.

In addition, as described beginning on page 12 of the EA, several potential issues and impact topics were raised during scoping but were not retained for additional analysis, because the effects will not be significant and a detailed analysis was not necessary to make a reasoned choice between alternatives. As a result, these issues and impact topics, which included the following, are not discussed further in this FONSI: House Rock bison herd disease and genetics;

vegetation such as spruce-fir, pinyon-juniper, and mixed conifer woodlands; various special-status species; environmental justice; air quality, greenhouse gas emissions, and effects of climate change; soundscapes/acoustic environment; various historic districts, buildings, structures, and cultural landscapes; and Indian trust resources. In addition, there will be no significant impacts on public health, public safety, or unique characteristics of the region. No highly uncertain or controversial impacts, unique or unknown risks, significant cumulative effects, or elements of precedence were identified. Implementation of the NPS selected alternative will not violate any federal, state, or local environmental protection law.

### **Impacts on Resources in the Park**

#### *House Rock Bison Herd*

As described in detail beginning on page 74 of the EA, reducing the House Rock bison herd to fewer than 200 animals will ensure that all animals are able to satisfy forage and water needs, which will reduce competition and associated physiological stress for the House Rock bison herd and could lead to increased survival rates.

While the outcome of taking action will be beneficial, as described beginning on page 75 of the EA, nonlethal culling, lethal culling, hazing and herding, and fence construction will create noise in excess of natural sound conditions and thresholds for disturbance to wildlife as a result of additional vehicle trips on park roads during the primary bison removal season, the presence of teams for lethal culling and carcass handling, limited use of helicopters and use of fixed-wing aircraft, and use of equipment needed to construct corrals and fences. In addition, the presence of processing teams, the forced movement of bison, and the congregation of bison near corrals will create stressors along travel corridors, at lethal culling sites, and in/adjacent to corral sites. These actions would be taken repeatedly during initial reduction, sometimes during important periods in the bison life cycle (e.g., calving and breeding seasons), and could influence movement and distribution of the House Rock bison herd, affect reproductive success of individual animals that could slow population growth, and result in physiological stress that is more widespread across the herd during the initial reduction period.

However, the context in which the National Park Service is taking action is important to consider, as 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. In addition, culling activities are only expected to affect bison that remain on the landscape (i.e. are not removed) within 0.5 to 1 mile of the areas where actions are taken and hazing and herding will only be used periodically, resulting in localized impacts to remaining bison (e.g., less time foraging and at water sources could affect group dynamics, such as herd movements and group size and stability) that will persist for days to months. As described in the EA, due to the expected timing of reduction actions, there will be limited impacts during the breeding and calving season. With the exception of instantaneous noise related to the discharge of firearms, large portions of the action area will still reflect background noise levels during culling activities.

While the National Park Service acknowledges there could be some adverse effects on bison that remain on the landscape during implementation, those bison are expected to behave and reproduce in a manner reflective of the variability in behavior, movement, and group dynamics that bison typically exhibit (see Plumb, White, and Aune 2014; Reynolds, Gates, and Glaholt

2003). In addition, a reduction in reproductive success will actually help the National Park Service and its partners quickly reduce the bison herd to fewer than 200 animals on the landscape. The impacts of initial reduction will also be eliminated once the initial reduction is completed, after which House Rock bison herd forage, water use, behavior, and dynamics would stabilize, leaving a viable bison population on the landscape. When combined, the impacts of alternative 2 and other cumulative actions such as habitat management and hunting would have some adverse cumulative impacts while reduction actions are occurring. However, alternative 2 and these cumulative actions, including improvements at House Rock Wildlife Area, would also have beneficial impacts that persist beyond the initial reduction as a result of improved habitat conditions that would ensure sufficient resources (forage and water) are available for bison; the selected alternative will have considerable contributions to these beneficial cumulative effects. Therefore, the selected alternative will not have significant adverse effects on the House Rock bison herd.

#### *Water Resources in the Karst Landscape*

As described in detail beginning on page 81 of the EA, water resources, including springs, seeps, lakes, ponds, and sinkholes, would generally improve under alternative 2 because soils, riparian vegetation, and standing water resources would return to a nearly undisturbed state from bison over time as the bison population is reduced; and the resulting House Rock bison herd of fewer than 200 animals would be small enough to have little impact on most of the hydrologic resources of the area.

Although water resources on the North Rim are rare and fundamental resources in the park, as described beginning on page 81 of the EA, there will be limited potential for transient, localized adverse impacts (e.g., soil, vegetation, and water disturbance that could lead to degraded water quality or karst function) from implementation of the selected alternative. Impacts to these resources will be limited because: 1) actions in the vicinity of water resources will not last more than a few days at any one site; 2) corral sites will be located at least 200 feet from water sources and sinkholes, and any impacts that do occur will only impact water sources in the immediate vicinity of one of the corral sites; 3) if lethal culling does occur near water sources, sharpshooters will be directed not to shoot bison that are in the immediate vicinity of the water; 4) hazing and herding are not likely to occur often in the same place, and sinkholes or springs will be avoided to the extent possible; and 5) any adverse effects, such as sedimentation, that would result from movement of disturbed soils into the water bodies during fence construction or maintenance, will be very limited because areas for fencing will be limited to the periphery of springs and seeps and silt control devices will be used as needed.

Although the same water sources could be affected more than once during repeated implementation of reduction actions during initial reduction, disturbance will be limited to vegetation, soil or water in the immediate vicinity of an action, and sites are expected to recover naturally within a year to a few years because the disturbance is not expected to be widespread; natural revegetation or soil biological activity will occur; and restoration activities, such as soil aeration and revegetation, would take place as needed, depending on the amount of compaction and disturbed vegetation. In addition, monitoring of resource response during implementation will provide insights as to whether or not specific water resources are being impacted, and this information can be used to adjust management actions to avoid these areas in the future.

Because of the limited intensity of adverse impacts that are expected to water resources in the karst landscape and the mitigation that will be applied to these resources, adverse impacts to water resources in the karst landscape will not be significant.

#### *Bison-Affected Vegetation*

As described in detail beginning on page 86 of the EA, the overall conditions of grasslands and meadows that can be affected by bison will improve because the reduced pressure is expected to increase the vitality and cover of native plants, reduce the conditions that facilitate the spread of exotic species, and maintain native plant diversity at the community and ecosystem levels. The condition of these vegetation types will be more reflective of a condition prior to high concentrations of bison.

As described beginning on page 87 of the EA, there will be some small-scale adverse impacts on vegetation, primarily as a result of corralling live bison for removal. Such actions are expected to result in a total annual loss of approximately 10 acres (3.5% of the available grassland habitat on the North Rim), but this loss will be temporary because habitat will be restored once the initial reduction of the House Rock bison herd is complete. Any potential for the spread of exotic plants will be addressed through revegetation and invasive plant treatment efforts. The effects of this and other management actions including carcass removal, hazing, and herding are expected to be minimal with the implementation of mitigation measures and the timing of actions described in the EA, and will be similar to the effects of any park management action that requires deploying staff to the field. Any adverse effects from fence maintenance and construction, such as removal and trampling of vegetation, because areas for fencing will be limited to the periphery of springs and seeps and archeological sites and natural revegetation is expected to occur within 1 year after removal of the fencing.

Although the selected alternative will contribute minimal cumulative adverse impacts from the management actions taken, it will add important cumulative beneficial effects once reduction is complete because of the improvement in resources expected with less bison grazing, trampling, and wallowing as a result of the reduced number of bison on the landscape. The selected alternative will contribute substantially to this long-term beneficial cumulative impact.

Because of the limited intensity of adverse impacts that are expected to bison-affected vegetation and the mitigation (e.g., vegetation restoration actions) that will be applied to these resources, adverse impacts to bison-affected vegetation will not be significant.

#### *Soils*

As described beginning on page 92 of the EA, under the selected alternative, soil resources on the North Rim are expected to improve over time as the House Rock bison herd decreases and the concentration and frequency of impacts from soil-disturbing bison behavior decreases.

As described beginning on page 93 of the EA, there may be extremely localized adverse impacts because the resultant herd may congregate and remain for extended periods, but the reduction in the size of the House Rock bison herd will help to improve the conditions of the resource by reducing adverse impacts associated with an expanded bison population. Management actions themselves will have limited adverse impacts, with localized soil compaction, disturbance, and erosion most apparent to the approximately 10 acres of soils per year that will be disturbed for corralling operations. Lethal culling and hazing and herding activities will have some potential to

cause similar impacts, but they will be limited and are unlikely to occur in the same locations during initial reduction. In addition, hazing and herding will only be used periodically. Any adverse effects, such as compaction or exposure of soils that would result from fence construction or maintenance will be very limited because areas for fencing will be limited to the periphery of springs and seeps and archeological sites and erosion control devices may be used as needed. Mitigation actions, such as aeration and revegetation after these activities cease will also minimize the severity and duration of these adverse impacts.

Although some limited adverse impacts will be associated with cumulative actions and the implementation of management actions under the selected alternative, when the beneficial impacts on soils from the reduction of the House Rock bison herd under the selected alternative are realized, the overall cumulative impact on soils will be beneficial, and the selected alternative will contribute a substantial benefit to this overall cumulative impact.

Because of the limited intensity of adverse impacts that are expected to soils and the mitigation (e.g., aeration and revegetation) that will be applied to these resources, adverse impacts to soils will not be significant.

#### *Wildlife (Other Than Bison and Special Status Species)*

As described beginning on page 100 of the EA, bison grazing, trampling, and wallowing in meadows and around water sources will decrease under the selected alternative because of the anticipated smaller number of bison, which will result in more forage, more cover, and improved water quality that will benefit small mammals, ungulates, birds, reptiles, and amphibians. In addition, with fewer bison anticipated, the potential for wildlife species to be disturbed or displaced will decrease, and wildlife species will face decreased competition with bison for limited water supplies, forage, and space. The potential impacts on the various wildlife present will either be greatly reduced in magnitude or will be eliminated altogether. This could improve survivorship and reproductive rates for the more common mammals, birds, reptiles, and amphibians, and potentially result in larger wildlife populations on the North Rim. Conversely, a smaller bison herd will also mean less prey and biomass for carnivores and scavenging mammals/birds compared to what is available at the current population size. However, these species were present in the action area prior to the bison's arrival, indicating an ability to survive using sources of food other than bison, albeit at lower numbers. These other prey include small mammals and ungulates, and any potential increase in these populations could somewhat offset the loss of bison. As a result, it is not anticipated that the loss of prey and biomass for carnivores and scavengers will have impacts on the status or stability of the North Rim populations of these animals.

As discussed in the EA starting on page 101, the implementation of various management actions will have some adverse effects on wildlife, mainly because of the noise that will occur in excess of natural sound conditions during short periods in specific locations. Common wildlife species are likely to be temporarily affected until initial reduction efforts are complete. In addition, the presence of processing teams, the forced movement of bison, and the congregation of bison near corrals will also displace wildlife along travel corridors, at lethal culling sites, and in/adjacent to corral sites. In some cases, these management actions will occur during spring/summer, which are important breeding or nesting times. Some impacts could also occur during the fall and winter from lethal culling and limited hazing/herding, although some species will migrate away

from the North Rim during the these times or become less active, or hibernate, which will limit the number of animals affected. Reduction activities could also cause an increase in the trampling of some small species as well as accidental shootings of wildlife, which will result in mortality of individual wildlife. Additionally, if all corrals are used in a given year, approximately 10 acres of meadow vegetation within the immediate footprint of the corrals will be temporarily trampled and/or removed, including vegetation along any off-road access needed to remove bison from the corrals. Impacts will be minimal because wildlife will likely avoid these areas and use adjacent habitat until culling operations are complete and revegetation occurs.

These disruptions, mortality of individual wildlife, and habitat degradation will have adverse effects that could lead to reduced wildlife population numbers on the North Rim during initial reduction. Disturbances will generally last less than 1 day to several days to weeks. However, lethal and nonlethal culling and hazing and herding could all occur each year during initial reduction until fewer than 200 bison remain. Although lethal and nonlethal culling could occur at the same time, there will be purposeful efforts to ensure the actions are separated geographically. Fences would be configured to allow other animals, including large mammals like deer and larger species of carnivores, to access the fenced areas (Gates 2006). Fencing of the size and extent contemplated would not obstruct bats from using water sources because they could negotiate, with little trouble, the gaps to avoid fence wires and access the water. Monitoring effectiveness and removing fences when they are no longer needed would also minimize impacts on wildlife.

While the selected alternative could result in a reduction in wildlife population numbers during implementation, the affected wildlife will be common species found in the area, and disturbances are expected to be limited to certain locations on the North Rim which will limit the extent of the area where/time during which wildlife may be affected. The direct loss of habitat will be limited to less than 5% of the meadows found in the action area, and displaced/disturbed animals are expected to return/recover when bison reduction activities are complete and areas are restored. As a result, adverse impacts under the selected alternative will not affect the overall status or stability of the North Rim wildlife populations.

When the limited adverse impacts as a result of implementing the selected alternative are combined with the overall beneficial impacts of other actions, an overall beneficial cumulative impact is expected for wildlife, and the selected alternative will contribute substantially to these benefits because of the reduction in impacts associated with a smaller House Rock bison herd.

Because of the limited nature of adverse impacts that are expected to wildlife and the mitigation that will be applied to these resources, and since adverse impacts are not expected to affect overall status or stability of wildlife populations, adverse impacts to wildlife will not be significant.

#### *Special Status Wildlife Species*

As described beginning on page 111 of the EA, there are four special status species that occur in the action area and that could be affected by the selected alternative: Mexican spotted owl, California condor, northern goshawk, and northern leopard frog.



Under the selected alternative, bison grazing, trampling, and wallowing in meadows and around water sources will decrease as a result of the smaller number of bison anticipated under this alternative, which will result in more forage, more cover, and improved water quality that will benefit special-status species such as the northern leopard frog and Mexican spotted owl and northern goshawk prey species. In addition, the selected alternative could provide benefits to the California condor because of a short-term increase in carrion associated with lethal culling of the bison, which could positively affect condor survival and reproductive success. The northern leopard frog, which relies on grassland/meadow habitat and the limited water resources found throughout the action area, is expected to benefit in the long term from the reduced size of the House Rock bison herd, but there could be short-term impacts during reduction actions in terms of congregating bison on grassland/meadow habitat and in areas with water sources.

In addition, minimal impacts could occur during implementation as a result of noise disturbance from people, vehicles, helicopters and fixed wing airplanes, and the discharge of firearms; and from bird-aircraft strikes. However, measures such as distance buffers and surveys will be used to minimize any impact on condors, Mexican spotted owls, or goshawks. With the mitigation proposed, it is unlikely that these impacts will affect important breeding, nesting, or foraging behaviors or result in noticeable effects at the population level. Amphibians such as the northern leopard frog have a higher noise tolerance than mammals and birds (FHWA 2004). In addition, reduction activities in water sources, including the immediate adjacent wetland vegetation, will be avoided to the extent possible (National Park Service, Holm, pers. comm. 2016m) by waiting for the bison to move away from water sources before discharging firearms.

The selected alternative will contribute to cumulative impacts on these four species, however, the overall long-term, cumulative impact on owls will be unlikely to reduce reproductive success or survival, and the selected alternative will contribute a small and intermittent increment to cumulative impacts on owls. Cumulative impacts on the California condor will be mainly beneficial because condors will have increased forage from bison carcasses during reduction actions; the selected alternative will contribute only a small and intermittent increment to cumulative impacts from noise and the reduction of bison. The goshawk could benefit from increased forest prey populations once the size of the House Rock bison herd is reduced and any forest vegetative ground cover impacts are reduced. Overall, cumulative impacts on goshawks will be unlikely to affect reproductive success or overall survival, and the selected alternative will ultimately contribute some habitat-based benefits. Finally, the remaining bison will be attracted to surface water and could continue to affect leopard frog habitat if not fenced. However, the selected alternative will provide long-term cumulative benefits to the northern leopard frog by reducing the size of the House Rock bison herd and protecting water sources and associated vegetation.

With the measures implemented to minimize impacts on these special-status species, none of the actions are likely to reduce the reproductive success or survival of any of the special-status species analyzed and could result in overall improved conditions. Because of the limited nature of impacts that are expected to special-status wildlife species and the mitigation that will be applied to these resources, the US Fish and Wildlife Service concurred with the NPS determination that the selected alternative may affect, but is not likely to adversely affect, listed species under Section 7 of the Endangered Species Act. Because the reproductive success or

survival of special status wildlife species populations is not expected to be affected, impacts to special-status wildlife will not be significant.

#### *Cultural and Tribal Resources*

Under the selected alternative, the smaller House Rock bison herd will result in beneficial impacts to archeological resources based on the reduced amount of intense wallowing, trailing, and associated ground-disturbance that disturbs archeological resources and historic and prehistoric structures, as described in detail beginning on page 124 of the EA. Management actions could lead to some impacts to localized archeological resources and/or historic and prehistoric structures, but these adverse effects will be limited to areas that are subject to ground disturbance (including localized fencing) and will be mitigated by undertaking appropriate survey, avoidance and restoration activities. When the benefits of the selected alternative are combined with the adverse and beneficial effects of the other actions, an overall beneficial cumulative impact is expected and the selected alternative will contribute a noticeable beneficial increment to this overall cumulative effect.

Under the selected alternative, bison effects on the North Rim Entrance Road Corridor cultural landscape are expected to decrease over time as the size of the House Rock bison herd is reduced, a beneficial impact that is expected to last for many years, as described in detail beginning on page 129 of the EA. Vegetation is still expected to be grazed and barren areas created as a result of wallowing from the reduced bison herd, impacting the visual qualities of meadow areas, one of the character-defining elements of the cultural landscape. The use of appropriate mitigations, such as reseeding, will lessen the effects of those disturbances, and help retain the integrity of the landscape and its significance. Adverse effects from bison reduction activities are expected to be limited to mainly the Little Park corral site and only be in place for the time needed for the capture operations to occur. Impacts will be minimized by use of appropriate mitigation and restoration activities that will be undertaken following project implementation, such as reseeding. Overall, the selected alternative will contribute mainly temporary adverse effects limited to one area near Little Park and long-term benefits over the entire landscape, and the overall cumulative effect on the North Rim Entrance Road Corridor cultural landscape will be beneficial.

Under the selected alternative, there will be beneficial effects on traditional cultural properties and ethnographic resources throughout the current range that bison use because of the reduction in the population, as described in detail beginning on page 135 of the EA. Bison effects will continue to be adverse, but will be minimal and localized, with some temporary and some permanent impacts. Adverse effects from bison reduction activities will be limited to only certain times of the year and certain locations, and will be minimal given that avoidance and restoration activities will be undertaken following project implementation, as necessary. There will be an overall beneficial impact on traditional cultural properties and ethnographic resources compared to current conditions and the selected alternative will contribute a noticeable benefit to the overall cumulative impact.

Although the EA indicated the impacts to cultural and tribal resources could affect the integrity of these resources, ongoing consultation with the Arizona State Historic Preservation Office after the EA was completed resulted in a determination by the National Park Service that there would be *no adverse effect* to historic properties under Section 106 of the National Historic Preservation

Act. Such a determination indicates that the selected alternative will not diminish the integrity of the resources (36 CFR 800.5(a)(1)). The Arizona State Historic Preservation Office concurred with this determination on June 21, 2017.

Because of the limited impacts to cultural and tribal resources (including archeological resources and historic and prehistoric structures, the North Rim Entrance Road Corridor Cultural Landscape, and traditional cultural properties and ethnographic resources) and the mitigation that will be applied to these resources, adverse impacts to cultural and tribal resources will not be significant.

### *Wilderness*

As described beginning on page 140 of the EA, the selected alternative will create a marked improvement to the natural environment by allowing vegetation, soils, hydrology, and water quality to recover from the impacts of the House Rock bison herd and reducing the spread of exotic species. The benefits to the natural quality of wilderness on the North Rim will be substantial, and the biophysical environment will be restored to a condition closer to what it was before the House Rock bison herd began spending the majority of its time on the North Rim of the park.

As discussed in the EA beginning on page 141, some actions to achieve the bison reduction will create adverse impacts on the natural, untrammeled, undeveloped qualities of wilderness, and the opportunity for solitude or primitive and unconfined recreation. Many of these actions involve uses that are prohibited under Section 4(c) of the Wilderness Act, unless they are “necessary to meet minimum requirements for the administration of the area.” Therefore, none of these actions will be taken without first conducting a Minimum Requirement Analysis to determine if they are the minimum tool necessary. In addition, mitigations such as minimizing incursions outside non-wilderness corridors, leave-no-trace best practices, and post-action restoration will prevent these impacts from becoming larger than necessary. The action area encompasses approximately 97,200 acres of recommended wilderness and only approximately 10 acres per year of this will be disturbed from the installation of the corrals. This installation will be temporary and expected to be disassembled when not in use. Therefore, although nonlethal culling actions will adversely affect wilderness character, the impacts will be comparatively small (relative to the area of wilderness), localized to meadow and grassland habitat, and limited to duration of the initial reduction. Upon completion of capture activities, corrals will be removed each season. Restoration of corral sites and any off-road travel corridors used to install/access the corrals will likely require motorized transportation initially; however, specific methods for each site will be evaluated through a separate minimum requirements process for restoration activities.

The number of teams in the field will vary depending on the time of year, however teams will be supported by vehicles and fixed-wing aircraft flights necessary for reconnaissance and bison monitoring. In addition, there may be a limited number of helicopter flights per year for all bison-related actions, lasting from 1 to 2 hours each. Although all vehicle use will be limited to existing roads that are outside of wilderness, the associated noise has the potential to be heard in adjacent wilderness areas. These noise-related impacts will be short in duration, associated with periods of lethal culling and hazing/herding events followed by periods where natural sound conditions and opportunities for solitude will be similar to current conditions. These impacts are expected to only occur during initial reduction. In addition, mitigations such as minimizing

incursions outside non-wilderness corridors, leave-no-trace best practices, and post-action restoration will prevent these impacts from becoming larger than necessary. The use of fixed-wing aircraft, helicopters, snow machines, motorized vehicles, and motorized equipment will temporarily degrade the undeveloped quality and opportunities for solitude and primitive and unconfined recreation, but in the context of current activities in the park, they represent a very small fraction of the time that disturbances occur and will not create substantial adverse effects.

The reduction of the House Rock bison herd, as well as hazing and herding of the herd, will constitute an intentional manipulation of the biophysical environment and will impact the untrammelled quality of wilderness character. These trammeling actions will affect a relatively limited area compared to other actions which focus on protection of sensitive water, plant, and archeological resources. The selected alternative will adversely impact some qualities of wilderness character during initial reduction, but will benefit the natural quality of wilderness in the long-term through herd reduction.

Overall, cumulative impacts on the untrammelled quality, undeveloped quality, and opportunities for solitude or primitive and unconfined recreation will be adverse, and cumulative impacts on the natural quality of North Rim wilderness will be beneficial, but the selected alternative will add limited adverse effects, restricted to duration of initial reduction efforts, with long-term benefits to the natural quality extending well beyond the period of reduction efforts.

Wilderness character will be adversely impacted from reduction activities; however, because of the limited area and duration of adverse impacts that are expected to wilderness character and the mitigation (e.g., “leave no trace” protocols) that will be applied, adverse impacts to wilderness character will not be significant.

#### *Visitor Use and Experience*

As described beginning on page 150 of the EA, under the selected alternative, the decreasing size of the House Rock bison herd could result in beneficial outcomes because of increased bison viewing opportunities, visitor education and interpretation, improved resource conditions at campsites and areas where viewing occurs, and a reduced potential for safety concerns such as bison-vehicle collisions, vehicle-vehicle collisions, and bison-human interactions.

However as described beginning on page 150 of the EA, adverse impacts on visitor use and experience resulting from implementing herd reduction tools will include occasional closures, traffic congestion associated with lethal culling, herding, and corralling and transportation of bison in the Little Park area, and the noise and presence of teams in any area of the park where bison are present. Impacts from implementing lethal culling will occur for short periods primarily during the fall to spring months when visitation is lower and in more remote areas of the park, but capture and herding will occur during peak visitation periods from June to September and in the Little Park area. Impacts on visitor use and experience will be more adverse during initial reduction and will be more frequent during high visitation periods, but benefits will occur because of the reduced safety concerns and improved resource conditions. The selected alternative will contribute a considerable but temporary adverse effect to the overall cumulative impact because of the increased potential for closures, increased traffic disruption from the nonlethal culling operations, the transport of bison from the Little Park area, and noise disturbances associated with the reduction teams and aircraft use for carcass removal and monitoring.

Although adverse impacts to visitor use and experience will occur during active reduction activities, the limited intensity and extent of adverse impacts that are expected to visitor use and experience will not be significant.

*Impacts on Resources on Adjacent Lands*

As described in the EA, some resources on Kaibab National Forest lands adjacent to the park could experience indirect effects depending on the movement of bison that are in the park in response to the actions that will be taken under the selected alternative. Although the number of bison that may disperse and their movements in response to management actions is unpredictable, dispersing bison are expected to seek habitat outside the park that is similar to preferred habitat in the action area (i.e., grasslands, meadows, shrublands, wetland-associated vegetation, and water sources). An increased number of bison could affect water bodies, soils, vegetation, less mobile wildlife species or species that rely on these habitat types, and cultural resources or wilderness character. The types of impacts dispersing bison could cause outside the park will be similar to those described in the above sections for those same resources in the park, although based on current bison behavior (i.e., the fact bison spend the majority of their time in the park), more bison are expected to remain inside the park than outside. Therefore, impacts outside the park will be of a much lower magnitude than those inside, although these impacts could persist beyond the initial reduction phase if bison begin to spend more time outside of the park.

In addition, the *Kaibab National Forest Land and Resource Management Plan* (USFS 2014) notes that the goal of the US Forest Service is to develop site fidelity to the House Rock Wildlife Area and to use active management to minimize the impacts from bison on sensitive resources, particularly outside the House Rock Wildlife Area. According to the Final Environmental Impact Statement for the *Kaibab National Forest Land and Resource Management Plan*, USFS management of bison in adherence to the plan’s guidelines will keep bison numbers at a level that will minimize potential damage to sensitive habitats and wilderness (USFS 2014). Also, according to the Final Environmental Impact Statement for the *Kaibab National Forest Land and Resource Management Plan*, USFS management is expected to ensure that cultural resources, including known traditional cultural properties will be preserved, protected, or restored (USFS 2014). Therefore, impacts to resources on adjacent lands will not be significant.

**CONCLUSION**

As described above, the selected alternative will not have a significant effect on the human environment in accordance with Section 102(2)(C) of NEPA. Therefore, it has been determined that an EIS is not required for this project and therefore will not be prepared.

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- Attachment A—Non-Impairment Determination
- Attachment B—Errata
- Attachment C—Response to Substantive Public Comments

## ATTACHMENT A: NON-IMPAIRMENT DETERMINATION

### INTRODUCTION

This non-impairment determination has been prepared for the selected alternative, as described in the Finding of No Significant Impact for the Initial Bison Herd Reduction Environmental Assessment (EA).

By enacting the National Park Service (NPS) Organic Act of 1916 (Organic Act), Congress directed the US Department of the Interior and the NPS to manage units “to conserve the scenery, natural and historic objects, and wildlife in the System units and to provide for the enjoyment of the scenery, natural and historic objects, and wildlife in such manner and by such means as will leave them unimpaired for the enjoyment of future generations” (54 U.S.C. 100101).

NPS *Management Policies 2006*, section 1.4.4, explains the prohibition on impairment of park resources and values:

While Congress has given the Service the management discretion to allow impacts within parks, that discretion is limited by the statutory requirement (generally enforceable by the federal courts) that the Park Service must leave park resources and values unimpaired unless a particular law directly and specifically provides otherwise. This, the cornerstone of the Organic Act, establishes the primary responsibility of the National Park Service. It ensures that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them.

An action constitutes impairment when its impacts “harm the integrity of park resources or values, including the opportunities that otherwise will be present for the enjoyment of those resources or values” (NPS *Management Policies 2006*, section 1.4.5). To determine impairment, the NPS must evaluate the “particular resources and values that will be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts” (section 1.4.5).

National park system units vary based on their enabling legislation, natural and cultural resources present, and mission. Likewise, the activities appropriate for each unit and for areas in each unit also vary. For example, an action appropriate in one unit could impair resources in another unit.

As stated in the NPS *Management Policies 2006* (section 1.4.5), an impact on any park resource or value may constitute an impairment, but an impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; or
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or

- identified in the park's general management plan or other relevant NPS planning documents as being of significance.

The significance and importance of each resource, based on the enabling legislation and recently completed foundation document for the Grand Canyon National Park (the park), is discussed under the analyzed resource sections below.

The resource impact topics carried forward and analyzed for the NPS selected alternative in the environmental assessment and for which an impairment determination is contained in this attachment are bison, water resources in the karst landscape, bison-affected vegetation, soils, wildlife and wildlife habitat other than bison, special-status wildlife species, and cultural and tribal resources. A non-impairment determination is not made for wilderness or visitor use and experience because they are not generally considered to be park resources or values subject to the non-impairment standard established by the Organic Act and clarified further in Section 1.4.6 of *NPS Management Policies 2006*. Each resource or value for which non-impairment is assessed and the reasons why impairment will not occur is described below.

## **BISON**

Nonlethal culling, lethal culling, hazing and herding, and construction of localized fencing are all expected to disrupt some bison activities and cause physiological stress to animals during implementation of the selected alternative. These reduction activities will create noise in excess of natural sound conditions as a result of additional vehicle trips on park roads during the primary bison removal season, the presence of teams for lethal culling and carcass handling, helicopter and fixed-wing flights, and the construction of corrals and fences. In addition, the presence of processing teams, the forced movement of bison, and the congregation of bison near corrals will also create stressors along travel corridors, at lethal culling sites, and in/adjacent to corral sites. Although lethal and nonlethal culling are only expected to affect bison within 0.5 to 1 mile of the areas where actions are taking place and hazing and herding will only be used periodically, using these actions repeatedly during initial reduction, sometimes during important periods in the bison life cycle (e.g., calving and breeding seasons) could result in physiological stress that is more widespread across the herd, influence movement and distribution of the House Rock bison herd, and affect reproductive success that could slow population growth. During initial reduction, when combined with other cumulative actions that temporarily disrupt bison foraging, water use, behavior, and dynamics (e.g., prescribed fire, and hunting outside the park), the reduction actions associated with the selected alternative would have a noticeable contribution to adverse cumulative effects on the bison herd. However, during this time bison foraging, water use, behavior, and dynamics will stabilize, the bison herd will still be present on the landscape, and once the reduction actions are complete, these disruptions will cease.

Ultimately, reducing the House Rock bison herd to fewer than 200 animals will result in a bison herd density and abundance that will be better balanced with available resources on the North Rim. Once fewer than 200 bison remain, decreased competition within the species will likely ensure that all animals are able to satisfy forage and water needs, which will reduce competition and associated physiological stress for the House Rock bison herd and may lead to increased survival rates. Behaviors, movement, and group dynamics anticipated under the selected

alternative will reflect the substantial variability that bison exhibit and will not necessarily influence survival of the House Rock bison herd at a population level. In addition, once the reduction is achieved, the selected alternative will have substantial contributions to an overall beneficial cumulative effect to bison when combined with the other cumulative actions.

The selected alternative is expected to improve conditions for the bison at the herd level. Although individual bison will experience adverse effects, the actions proposed for initial reduction will not preclude current and future generations from having the opportunity to experience bison. For these reasons, the implementation of the selected alternative will not impair bison in the park.

### **WATER RESOURCES IN THE KARST LANDSCAPE**

During initial reduction of the bison herd, there will be limited potential for adverse impacts to the seeps, springs, sinks, lakes and ponds on the rim of the canyon that provide opportunities for plants and animals to flourish in the arid environment and local aquatic recharge to the Colorado River, a central natural feature of the park. For example, lethal culling activities will be directed away from the water resources, and corral sites will not be placed within 200 feet of water resources, so direct physical disturbance from these activities will be limited and adverse impacts on water quality will be minimized and hydrologic impacts are not expected. Other tools, such as hazing and herding, will be transient and will not affect hydrology or water quality in any meaningful way. During fence construction or maintenance, any potential for impacts will be very limited because fencing will occur on the periphery of springs and seeps and silt control devices will be used as needed.

Any limited impacts to water resources will be localized to the area(s) where the activity takes place. Although the same water sources could be affected more than once during initial bison herd reduction, water resources sites are expected to recover naturally within a year to a few years because the disturbance is not expected to be widespread; natural revegetation or soil biological activity will occur; and restoration activities, such as soil aeration and revegetation, would take place as needed, depending on the amount of compaction and disturbed vegetation. In addition, monitoring of resource response during implementation will provide insights as to whether or not specific water resources are being impacted, and this information can be used to adjust management actions to avoid these areas in the future. As a result of these mitigation measures, impacts during implementation of the selected alternative will not fundamentally alter these resources, which as noted in the park's foundation document, contribute to the significance of the park and are considered essential to achieving the purpose of the park and maintaining its significance; and they will be available for current and future visitors to enjoy.

Although the selected alternative will contribute minimal cumulative adverse impacts from the management actions taken, it will add important cumulative beneficial effects to water resources because of the reduction in impacts from bison grazing, trampling, and wallowing as a result of the reduced number of bison on the landscape. As the bison herd is reduced to fewer than 200 bison, existing stresses on these water resources will also be reduced, and their condition, function, and water quality will improve, especially in those sites that are fenced to exclude bison because soils, riparian vegetation, and standing water resources would return to a nearly undisturbed state from bison over time; and the resulting House Rock bison herd would be small



enough to have little impact on most of the hydrologic resources of the area. As a result, water resources in the karst landscape will not be impaired as a result of implementing the selected alternative, and current and future generations will continue to have the opportunity to experience waters in the karst landscape once initial reduction of the herd is complete.

## **BISON-AFFECTED VEGETATION**

The primary impact to vegetation during implementation of the selected alternative will be from ground disturbance associated with the installation and use of corrals for nonlethal culling. These activities are expected to result in the temporary loss of approximately 2 acres in and around each corral (for a total of 10 acres per year). Surveys for sensitive vegetation will ensure such plants are avoided, and the disturbed areas will be revegetated, so that impacts do not persist into the future once management actions are stopped. This amounts to temporary disturbance of 0.07% of grassland habitat per corral, which is approximately 3.5% of the total available grassland habitat on the North Rim. Lethal culling activities, hazing and herding, and localized fence construction may also result in localized loss or damage to vegetation from trampling or crushing of plants or dispersal of exotic plant seeds. These areas are expected to recover through natural growth. Any potential for the spread of exotic plants will be addressed through invasive plant treatment efforts. As a result, actions will not affect vegetation at a community level, and meadows and grasslands on the North Rim, which are iconic features of this part of the park and integral to the landscape and biodiversity fundamental to the park, will be present for the enjoyment of current and future generations during and after implementation of the selected alternative.

Although the selected alternative will contribute minimal cumulative adverse impacts from the management actions taken, it will add important cumulative beneficial effects because of the reduction in impacts to vegetation caused by bison grazing, trampling, and wallowing as a result of the reduced number of bison on the landscape. Presently, the meadows and grasslands on the North Rim are over-grazed in many areas. Reducing the House Rock bison herd will reduce impacts on these areas by reducing the amount of forage consumed, the amount of vegetation lost to trampling and wallowing, and the likelihood the bison herd will pioneer into other areas, resulting in long-term benefits for bison-affected vegetation. Exclusion fencing will encourage vegetation growth within the fenced areas, resulting in additional benefits to vegetation. Bison-affected vegetation communities will function in a healthy manner and be able to be experienced by current and future generations. Therefore, bison-affected vegetation will not be impaired as a result of implementing the selected alternative.

## **SOILS**

The presence of the growing House Rock bison herd on the Kaibab Plateau has resulted in overgrazing of vegetative cover and increased soil exposure and compaction. Bison activities, such as wallowing, trampling, and trailing, have disturbed the topmost layers of soil, leading to increased erosion and loss of riparian vegetation and species diversity. As described in the EA, for vegetation, the primary impacts to soils, including biological soil crusts, during implementation of the selected alternative will be from ground disturbance associated with the installation and use of corrals for nonlethal culling. These activities are expected to result in the temporary disturbance of approximately 2 acres in and around each corral (for a total of 10

acres). However, the disturbed areas will be aerated and revegetated to assist with soil recovery. Access to lethal culling areas will be restricted to established roads. Lethal culling teams will follow bison trails as they move; therefore, the potential to disturb soil will be minimized. Impacts of installation and maintenance of exclusion fencing will be minimal because fencing will affect limited areas, and silt control devices will be used as needed. As a result, any limited impacts will be localized to the area(s) where the activity takes place, and although the same sites could be affected more than once during initial reduction, they are expected to recover naturally within a year to a few years because the disturbance is not expected to be widespread; natural revegetation or soil biological activity will occur; and restoration activities, such as soil aeration and revegetation, would take place as needed, depending on the amount of compaction and disturbed vegetation. As a result, soils, which as noted in the park's foundation document are related to the fundamental geologic features and processes of the park, will remain in relatively good condition and will be present to be enjoyed by current and future generations during and after implementation of the selected alternative.

Although the selected alternative will contribute minimal cumulative adverse impacts from the management actions taken, it will add important cumulative beneficial effects because of the reduction in impacts to soils caused by bison grazing, trampling, wallowing, and defecating as a result of the reduced number of bison on the landscape. An overall beneficial cumulative impact is expected, and the selected alternative will contribute substantially to this overall cumulative impact. For example, as the House Rock bison herd becomes smaller, the severity and spatial extent of impacts to soil will lessen. Exclusion fencing around seeps and springs will provide an overall beneficial impact to soil by reducing trampling and wallowing in these sensitive areas. Over the long term, soils will improve and will continue to be available to be experienced by current and future generations. Therefore, soils will not be impaired as a result of implementing the selected alternative.

## **WILDLIFE AND WILDLIFE HABITAT**

The North Rim provides habitat for a diverse range of wildlife, including small mammals, carnivores, ungulates, birds, reptiles, and amphibians. Common wildlife species are likely to be temporarily affected during implementation of the selected alternative as a result of the noise that will exceed the natural sound conditions and thresholds for disturbance to/displacement of wildlife associated with the presence of people, the use of vehicles and aircraft, and the discharging of firearms during lethal culling. In addition, the presence of processing teams, the forced movement of bison, and the congregation of bison near corrals will also displace wildlife along travel corridors, at lethal culling sites, and in/adjacent to corral sites.

Reduction activities could also cause an increase in the trampling of some small species as well as accidental shootings of wildlife, which will result in mortality of individual wildlife. Additionally, if all corrals are used in a given year, approximately 10 acres of meadow vegetation within the immediate footprint of the corrals will be trampled and/or removed, including vegetation along any off-road access needed to remove bison from the corrals. In some cases, these management actions will occur during spring/summer, which are important breeding or nesting times. Some impacts could also occur during the fall and winter from lethal culling and limited hazing/herding, although some species will migrate away from the North Rim during these times or become less active, or hibernate, which will limit the number of animals affected.

These disruptions, mortality of individual wildlife, and habitat degradation will have adverse effects that could lead to reduced wildlife population numbers on the North Rim during initial reduction. Disturbances will generally last less than 1 day to several days to weeks. However, lethal and nonlethal culling and hazing and herding could all occur each year until fewer than 200 bison remain. Although lethal and nonlethal culling could occur at the same time, there will be purposeful efforts to ensure the actions are separated geographically. Although the selected alternative could result in a reduction in wildlife population numbers on the North Rim during implementation, the affected wildlife are common species found in the area, and disturbances are expected to be limited to certain locations on the North Rim which will limit the extent of the area/time during which wildlife may be affected. With the exception of instantaneous noise related to the discharge of firearms, large portions of the action area would still maintain background noise levels during culling activities. Non-lethal culling will result in the direct loss of less than 5% of the meadows found in the action area, but these meadows will be restored once the corrals are no longer needed. Displaced/disturbed animals are expected to return/recover when bison reduction activities are complete and revegetation occurs. As a result, adverse impacts under the selected alternative will not affect the overall status or stability of the North Rim wildlife populations, which, as noted in the park's foundation document, are fundamental to the purpose and significance of the park, and common wildlife species will be available for current generations to enjoy during implementation of the management actions.

Although the selected alternative will contribute minimal cumulative adverse impacts from the management actions taken, it will add important cumulative beneficial effects because of the reduction in impacts from bison grazing, trampling, and wallowing as a result of the reduced number of bison on the landscape. For example, a reduced bison herd population will reduce competition for forage and water sources, provide more grass and forbs available in meadows, increase water quality for reptile and amphibian habitats, and improve overall habitat conditions. Wildlife species would benefit in the long term from the reduction of the House Rock bison herd, and current and future generations will continue to have the opportunity to experience park wildlife. Therefore, wildlife or wildlife habitat will not be impaired as a result of implementing the selected alternative.

### **SPECIAL-STATUS WILDLIFE SPECIES**

In keeping with the park's purpose to preserve and protect the Grand Canyon's unique natural and cultural features, special-status species have been identified as a fundamental resource in the park, and four of these species occur on the North Rim of the park: Mexican spotted owl (*Strix occidentalis lucida*), California condor (*Gymnogyps californianus*), northern goshawk (*Accipiter gentilis*), and northern leopard frog (*Lithobates pipiens*).

Minimal impacts could occur as a result of noise disturbance from people, vehicles, helicopters and fixed wing airplanes, and the discharge of firearms; and from bird-aircraft strikes. However, measures such as distance buffers and surveys will be used to minimize any impact on condors, Mexican spotted owls, and northern goshawks. Amphibians such as the northern leopard frog have a higher noise tolerance than mammals and birds (FHWA 2004), and reduction activities in water sources, including the immediate adjacent wetland vegetation, will be avoided to the extent possible (NPS, Holm, pers. comm. 2016m) by waiting for the bison to move away from water

sources before discharging firearms. The selected alternative may provide benefits to the California condor in terms of a short-term increase in forage associated with lethal culling of the bison, and this change could positively affect condor survival and reproductive success. As a result, with the mitigation proposed, it is unlikely that these impacts will affect important breeding, nesting, or foraging behaviors or reduce the reproductive success or survival of any of the special-status species analyzed, and the species will continue to be found on the North Rim during and after implementation of the selected alternative. Because of the limited nature of impacts that are expected to special-status wildlife species and the mitigation that will be applied to these resources, the US Fish and Wildlife Service concurred with the NPS determination that the selected alternative may affect, but is not likely to adversely affect, listed species under Section 7 of the Endangered Species Act.

Ultimately, impacts such as bison grazing, trampling, and wallowing in meadows and around water sources will decrease as a result of the smaller number of bison anticipated under the selected alternative (fewer than 200). This will result in more forage, more cover, and improved water quality that will benefit special-status species such as the northern leopard frog, Mexican spotted owl, and northern goshawk prey species. Special-status species that rely on grassland and meadow habitat or water resources and wetland-associated vegetation could experience long-term, beneficial impacts. The northern leopard frog, which relies on grassland/meadow habitat and the limited water resources found throughout the action area, will also benefit in the long term from the reduced size of the House Rock bison herd, increasing the prevalence of this species in the area.

Although the selected alternative will contribute minimal cumulative impacts from the management actions taken, it will add important cumulative beneficial effects because of the reduction in impacts from bison grazing, trampling, and wallowing as a result of the reduced number of bison on the landscape. As a result, current and future generations will continue to have the opportunity to experience these unique species. For these reasons, special status species will not be impaired as a result of implementing the selected alternative.

## **CULTURAL AND TRIBAL RESOURCES**

Cultural and tribal resources considered in the bison reduction environmental assessment include the North Rim Entrance Road cultural landscape, archeological resources (i.e., prehistoric and historic structures), and traditional cultural properties and ethnographic resources, which can be a combination of natural and cultural resources. The park's purpose states specifically that the park was created to preserve and protect these important unique resources, many of which are considered fundamental resources.

While management actions could lead to some impacts in areas that are subject to ground disturbance they will be mitigated by undertaking appropriate avoidance and restoration activities. Adverse effects to the North Rim Entrance Road Corridor Cultural Landscape from bison reduction activities are expected to be limited to mainly the Little Park corral site and only be in place for the time needed for the capture operations to occur. Impacts will be minimized by use of appropriate mitigation and restoration activities that will be undertaken following project implementation, such as reseeding. Adverse effects from bison reduction activities on tribal and

ethnographic resources will be limited to only certain times of the year and certain locations, and effects will be minimal especially if appropriate avoidance and restoration activities are undertaken following project implementation. During the reduction actions, procedures will be implemented to avoid trampling or congregating on potential archeological sites, including surveying and avoiding placing corral sites on known resources; and focusing lethal culling or herding efforts will be from such sites, so the potential for impacts is minimized. Although the impacts to cultural and tribal resources could affect the integrity of these resources, ongoing consultation with the Arizona State Historic Preservation Office after the EA was completed resulted in a determination by the National Park Service that there would be *no adverse effect* to historic properties under Section 106 of the National Historic Preservation Act. Such a determination indicates that the selected alternative will not diminish the integrity of the resources (36 CFR 800.5(a)(1)). The Arizona State Historic Preservation Office concurred with this determination on June 21, 2017.

Although new impacts can still be expected, the bison herd reduction will reduce the number of new or exacerbated impacts on these cultural and tribal resources, creating an overall beneficial impact, particularly to archeological sites. Herd reduction will allow Little Park Meadow and Little Park Lake, both elements of the North Rim Entrance Road cultural landscape, to recover, and the integrity of the resources will not be diminished. Although the selected alternative will contribute minimal cumulative adverse impacts from the management actions taken, it will add important cumulative beneficial effects because of the reduction in impacts from bison grazing, trampling, and wallowing as a result of the reduced number of bison on the landscape. Current and future generations will continue to have the opportunity to experience the park's important cultural resources. Therefore, cultural and tribal resources will not be impaired as a result of implementing the selected alternative.

## **SUMMARY**

The National Park Service has determined that implementation of the selected alternative will not constitute an impairment of the resources or values of the park. This conclusion is based on consideration of the park's purpose and significance, a thorough analysis of the environmental impacts described in the environmental assessment, comments provided by the public and others, and the professional judgment of the decision maker guided by the direction of the NPS *Management Policies 2006*.

## ATTACHMENT B: ERRATA

### Introduction

**Page 1, Introduction** - The 'Introduction' section of the EA has been revised to read: "Furthermore, other agencies involved with management of bison *or their habitat* on the Kaibab Plateau (see figure 1)—the US Forest Service (USFS), the Arizona Game and Fish Department, and the Bureau of Land Management (BLM)—are also concerned about resource damage from an over-abundant bison population and that they cannot meet their bison management goals if the population continues to grow (see "Cooperative Management of the House Rock Bison Herd" section later in this chapter)."

### Chapter 1: Purpose of and Need for Action

**Page 3, Background, paragraph 2, line 3**—text has been changed to read "that *some* bison"

**Page 3, Purpose Of and Need for Action, first paragraph on page, line 4**—text has been revised to read "The Arizona Game and Fish Department, *under the State's authority*, manages bison in this area as a free-ranging herd *in concert with* the US Forest Service's *mission to sustain the health, diversity, and productivity of the nation's forest*".

**Page 9, Special-Status Wildlife Species, paragraph 2, line 4**—text has been revised to read "bison herd could benefit the *Mexican spotted owl, goshawk and northern leopard frog* and their habitats..."

**Page 9, Special-Status Wildlife Species, paragraph 1, line 8**—text has been revised to read "only *the* special-status wildlife species *listed below* are included for further analysis..."

**Page 9, Wilderness Character, paragraph 2, line 1**—text here and throughout the EA has been changed from "recommended" to "proposed" wilderness. This change has been made to reflect the correct status of the North Rim wilderness, as a Record of Decision has been signed, a Federal Register notice has been completed, and the Director of the National Park Service has evaluated and forwarded the wilderness recommendation to the Secretary, but the Secretary has not evaluated and forwarded the proposed wilderness to the President.

### Chapter 2: Alternatives

**Page 18, Alternative 2: Proposed Action (Preferred Alternative), Overview, paragraph 3, line 2**—text has been revised to read "(2) targeted exclusion fencing in very sensitive areas, *such as springs and seeps or archeological sites*, and..."

**Page 18, Alternative 2: Proposed Action (Preferred Alternative), Overview, paragraph 1, line 9**—text has been revised to read "any additional NEPA reviews *at that time* that may be needed..."

**Page 18, Alternative 2: Proposed Action (Preferred Alternative), Overview, paragraph 5, line 6**—the bulleted list of standard operating procedures related to California condors and Mexican spotted owls is replaced with the following based on consultation with the USFWS:

- *Prior to the start of any bison management activities for the year, GCNP's Wildlife Department will be contacted for any new information related to California condors and Mexican spotted owls and their status near the project area. Sensitive species maps will be updated annually with any new information to ensure consistency with the about measures and the Wildlife Department will disseminate to the park's aviation staff,*
- *Keep areas free of trash and other materials.*
- *Provide all personnel with education information about California condors and Mexican spotted owls before field work commences. This educational information will emphasize appropriate interactions with condors.*
- *Record and report immediately any California condor or Mexican spotted owl presence in the project area to the GCNP Wildlife Department.*
- *Avoid any California condors that arrive at any area of human activity associated with bison management activities and notify GCNP Wildlife Department immediately. Only permitted personnel will haze the birds from the area as necessary.*
- *GCNP will continue to work closely with The Peregrine Fund, U.S. Fish and Wildlife Service, and AGFD to determine California condor use patterns and breeding sites.*
- *Bison reduction activities will not occur within 0.5 miles of active California condor nesting sites.*
- *California condors that arrive at any area of human activity associated with proposed actions to reduce the House Rock bison herd abundance would be avoided. Staff and volunteers would notify the park's Wildlife Program Manager or Park Dispatch. Activities would cease until the condor(s) leaves the area on its own accord or qualified personnel are available to haze them from the area. Only qualified personnel are permitted to haze birds.*
- *Only non-lead ammunition will be permitted.*
- *Staff and volunteers would be instructed to inform the park's Wildlife Department if a Mexican spotted owl is encountered at any time during the implementation of bison reduction activities. If a Mexican spotted owl is identified in the action area, activities within 0.5 miles of the owl's initial location would cease until additional discussion between GCNP and USFWS occur.*
- *Bison reduction activities would not occur within 0.5 miles of known Mexican spotted owl nest/root locations during their breeding season (March 1-August 30).*
- *Locate areas associated with bison management activities, at least 1,200 feet from the boundary of any designated Mexican spotted owl Protected Activity Center (PAC) during the owl breeding season (March 1-August 30).*

- *As resources allow, GCNP will continue to survey potential Mexican spotted owl habitat and known PACs for owl presence and breeding activity.*
- *Inform all field personnel who implement any portion of the proposed action about Mexican spotted owl and California condor regulations and protective measures.*

**Page 25, Timing of Lethal Culling Efforts, paragraph 2, line 3**—text has been revised to read “Lethal culling would target animals that would accomplish population reduction and resource protection goals, as informed by the data collected during bison and resource monitoring. In addition, animals may be selected, as appropriate, for tribal use.”

**Page 30, Herd Composition, paragraph 1**—text has been revised to read “As noted above, lethal culling will target animals that will accomplish population reduction and resource protection goals, while allowing for the selection of certain animals for tribal use. In addition, where possible, implementation of the proposed action would seek to remove animals from across all subpopulations and a range of age classes. The initial sex ratio goal will be considered at the end of the initial reduction phase and will be informed by International Union for the Conservation of Nature (IUCN) guidelines.”

**Page 34, Mitigation Measures**—a new subheading, *Noise*, has been added and includes the following mitigation measures: “*The NPS could consider the use of noise-suppressors on firearms.*”

While this could reduce noise associated with firearm discharge by about 30 dB, suppressors are somewhat uncommon among members of the public, and are not likely to be widely available or used. Therefore, although there could be some reduction in noise-related impacts to ‘Bison’, ‘Other Wildlife and Wildlife Habitat’, ‘Special Status Wildlife’, ‘Wilderness’, and ‘Visitor Use and Experience’ from this mitigation measure, most shooting is expected to be done without noise suppressors, with related impacts as described in the EA.

**Page 34, Mitigation Measures**—a new subheading, *Cultural Landscapes*, has been added and includes the following mitigation measures: “*Active mitigations for cultural landscapes could include activities such as seeding and replanting native vegetation in denuded areas, encouraging bison movements to other areas by limiting access to perennial water sources, and establishing temporary fencing in areas where vegetation restoration work has taken place. If these measures are used they would further reduce the duration and intensity of impacts described in Chapter 4: Environmental Consequences, and facilitate the realization of the benefits noted.*”

**Page 36, Fertility Control, paragraph 1, line 8**—text has been revised as follows: “For example, Powers and Moresco (2015) state that if the timeline for wildlife population reduction is short (<5 years), fertility control alone is not likely to be a successful reduction strategy. Meanwhile,



the *current or potential future impacts to other park resources and values would not be reduced, resulting in prolonged impacts that can be avoided with other alternatives. As such, not only does fertility control not meet the purpose and need, it is duplicative with other alternatives that are less environmentally damaging*, therefore, a fertility control alternative was dismissed from further consideration.”

### **Chapter 3: Affected Environment**

**Page 39, House Rock Bison Herd, paragraph 3, line 3**—text has been revised to read “similarly *semi-arid environments*”

**Page 41, House Rock Bison Herd, paragraph 1, line 9**—text has been revised to read “After the 2016 Fuller Fire...”

**Page 42, Water Resources in the Karst Landscape, paragraph 1, line 9**—text has been modified; “relatively” has been removed and text has been revised to read “area is *semi-arid*;”

**Page 43, Figure 8: Seeps, Springs, Lakes, and Ponds in the Action Area**—the figure will be revised to change “Swamp Pond” to “Swamp *Lake*.”

**Page 49, Bison-Affected Vegetation, 5<sup>th</sup> line on page**—text has been revised to read “*Gambel oak*...”

**Page 50, Soils, paragraph 1, line 3**—text has been revised to read “Natural Resource Conservation Service”.

**Page 50, Bison-Affected Vegetation, 12<sup>th</sup> line on page**—text has been revised to read “smooth *brome* (*Bromus inermis*), *cheatgrass*, or drooping *brome*...”

**Page 53, Reptiles and Animals, Paragraph 3, line 1**—text has been revised to read “because of *semi-arid conditions*...”

**Page 54, Mexican Spotted Owl, Paragraph 2, line 4**—“BLM-administered lands” has been deleted. The EA text now states: “Furthermore, critical habitat is located on adjoining USFS-administered lands (NPS, Palarino, pers. comm. 2015b; NPS 2016e).”

**Page 56, California Condor, paragraph 3, line 1**—text is updated to read “While this species is considered a federally endangered species, the park is completely within the experimental population boundaries; therefore, all condors within park boundaries are protected as a threatened species because the it is protected as a threatened species on park lands. The California condor is also a proposed species on neighboring USFS-administered lands. No designated critical habitat for this species is present in the action area (NPS, Palarino, pers. comm. 2015b).”

**Page 58, Archaeological Resources (Including Prehistoric and Historic Structures), 4<sup>th</sup> line on page**—text has been revised to read “along cliff faces *where* the bison may seek...”

**Page 58, Archeological Resources, paragraph 2, line 8**—text revised to read “Examples of adverse effects noted in the report include artifact concealment, displacement or breakage of artifacts, and damage to prehistoric structures, often in combination, as a result of trampling, wallowing, and other bison behavior (NPS 2014c). In a second study, involving a literature review and spatial (GIS) modeling of archaeological site types and their vulnerability to bison effects in the bison use range sites, researchers found that site types most at risk from bison disturbance were those types most sensitive to ground disturbance, such as artifact scatters (historic and prehistoric), roasting features, and other archaeological site types that consist of surface remains that are not well-secured to the ground. Of the 307 sites reviewed in this study, 50% (153 sites) were types that are vulnerable to the effects of bison. Monitoring is ongoing to establish the actual numbers of sites being affected by bison presence and refining which site types are most at risk (NPS 2016e).”

**Page 61, Wilderness Character, paragraph 3, line 4**—text has been modified; “Area” has been deleted and text has been revised to read “Saddle Mountain Wilderness (NPS 2015g).”

**Page 63, Figure 19, Legend**—the figure will be modified to include a cross-hatching feature to the Action Area depicted in the legend.

## **Chapter 4: Environmental Consequences**

**Page 70, Flights over the park, lines 6 through 8 of the bullet**—text has been modified; “see figure 19 in chapter 3” has been deleted. The text has been revised to read “westward to the base of the Dragon *Head* (a land formation between Bright Angel Point and Point Sublime), and then exit the action area to the southwest along the Dragon *Head*”.

**Page 71, Past, Present, and Reasonably Foreseeable Actions in Kaibab National Forest and House Rock Wildlife Area, Public Hunting, line 3 of bullet**—text has been modified; “could possibly” has been deleted and text has been revised to read “Bison hunting currently occurs on Kaibab National Forest land and *would* occur on...”

**Page 74, Cumulative Impacts, paragraph 2, line 5**—text revised to read: “Alternative 1 could have some adverse impacts on individual bison as a result of a growing House Rock bison herd and its increasing demands on forage and water resources, as well as physiological stress and changes in behavior, movement, and group dynamics as a result of increased competition. However, those changes are unlikely to influence survival or mortality where the population is affected. Therefore, the overall cumulative effect on the House Rock bison herd would be beneficial. The incremental effect of alternative 1 when added to these other past, present, and reasonably foreseeable impacts would be considerable given its allowance of the bison population to continue to grow.”

**Page 75, Nonlethal Culling, paragraph 2, line 18**—text has been revised to read “culling would occur *in* areas near...”

**Page 78, Conclusion, first full paragraph on page, line 6**—text has been revised to read “beneficial impacts as a result *of* improved habitat conditions...”

**Page 78, Conclusion, first line on page**—text has been revised to read “where actions are *taking* place...”

**Page 85, Cumulative Impacts, paragraph 1, line 8**—text has been revised to read “nutrients in a *semi*-arid ecosystem...”

**Page 87, Impacts of Alternative 2 on Bison-Affected Vegetation, Resulting Bison Population, first paragraph, 6<sup>th</sup> line on page**—text has been revised to read “adverse impacts (also as described *in* the affected environment)...”

**Page 87, Impacts of Alternative 2 on Bison-Affected Vegetation, Resulting Bison Population, first paragraph, line 4**—a double comma has been corrected and removed.

**Page 92, Impacts of Alternative 2 On Soils, Resulting Bison Population, lines 2 and 5**—text has been revised; “And” at the start of both sentences has been deleted.

**Page 99, Cumulative, paragraph 3, line 4**—text has been revised, the extra comma has been deleted.

**Page 102, Nonlethal Culling, second sentence of the last paragraph**—the sentence, “Wildlife that use the water and bait at the corral sites (e.g., mule deer, birds) might also benefit from improvements in fitness during the days/weeks that the corrals are in use” has been deleted from the text.

**Page 103, Lethal Culling, first full paragraph on page, line 11**—text has been modified; “be” has been deleted and the text has been changed to read “to September, but only one team would be working...”

**Page 106, Conclusion, first full paragraph on page, line 15**—text has been modified; “the” has been deleted and text has been changed to read “during these times (e.g., mule deer, birds),”

**Page 107, Methods and Assumptions, paragraph 1, line 9**—text updated to read “This analysis is informed by adherence to the Endangered Species Act, Migratory Bird Treaty Act, other federal wildlife laws and NPS management policies related to the management of species listed under state laws.”

**Page 109, Northern Goshawk, paragraph 1, line 8-9**—text has been updated to read “If these prey species make up a large portion of a goshawk’s diet, impacts on reproductive success could occur. *Because goshawks use riparian areas for both nesting and foraging, reductions caused by livestock grazing can negatively affect habitat for goshawk prey and reduce or eliminate foraging habitat potential (Graham et al. 1999).*” The following reference has also been added to the reference section: Graham, R. T., R. L. Rodriguez, K. M. Paulin, R. L. Player, A. P. Heap, and R. Williams. 1999. The northern goshawk in Utah: habitat assessment and management

recommendations. Gen. Tech. Rep. RMRS-GTR-22. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 48 pp.

**Page 110, Cumulative Impacts, paragraph 1, line 2**—text updated to read “Prescribed fires could affect owls and goshawks as a result of the temporary reduction in cover habitat for understory prey species, although owl and goshawk territories would be avoided to the extent they are known. In addition, once vegetation has recovered after the fire, it is expected this habitat and the understory prey species will increase and provide more prey for owls and goshawks.” **The same text was updated on Page 118, Cumulative Impacts, paragraph 1, line 7.**

**Page 114, Mexican Spotted Owls, paragraph 2, last line**—text has been changed to “and fenced areas would be small.”

**Page 116, Northern Goshawk, 2<sup>nd</sup> paragraph on page, line 9**—text has been modified; “known” has been removed and the text has been changed to read “(at unknown altitudes...)”

**Page 117, Northern Leopard Frog, Resulting Bison Population, paragraph 1, line 5**—text has been modified; “and” has been deleted and text has been changed to read “degradation of habitat) impacts on to...”

**Page 120, Conclusion, Impacts on Special-status Wildlife Species on Adjacent Lands, paragraph 1, line 9**—text has been changed to read “under the no-action *alternative*.”

**Page 122, Impacts of Alternative 1 (No Action) on Archeological Resources and Historic and Prehistoric Structures, paragraph 1, line 5**—text has been changed from “Walhalla Plateau after the seeking forage...” to “Walhalla Plateau after seeking forage...”

**Page 122, Impacts of Alternative 1 (No Action) on Archeological Resources and Historic and Prehistoric Structures, paragraph 1, line 6**—text has been changed to read “Fuller Fire just north of the Walhalla Plateau in 2016...”

**Page 123, Cumulative Impacts, paragraph 1, line 6**—text has been changed to read “fire such as wooden...”

**Page 123, Cumulative Impacts, paragraph 1, line 7**—text has been revised to read, “Although both the Park and the Kaibab National Forest conduct cultural surveys prior to utilizing any prescribed fire, and every effort is made to protect fire-sensitive archaeological sites from damage due to fire, prescribed fire can infrequently affect certain types of archeological sites and historic and prehistoric structures by burning wooden items, causing glass artifacts to melt or shatter, and by causing rock writing to exfoliate from rock faces or to be covered with soot and obscuring the rock writing elements (NPS 2011a).”

**Page 124, Conclusion, last line in section**—text has been modified; “based” has been deleted and text has been revised to read “would be considerable, and overall cumulative impacts would be adverse.”

**Page 125, Impacts of Alternative 2 on Archeological Resources and Historic and Prehistoric Structures, Lethal Culling, line 9**—text has been modified, “for some reason” has been deleted.

**Page 125, Impacts of Alternative 2 on Archeological Resources and Historic and Prehistoric Structures, Resulting Bison Population, 10<sup>th</sup> line on page**—text has been changed from “impacts under alternative is expected...” to “impacts under *this* alternative *are* expected...”

**Page 126, Section: Alt. 2 - Lethal Culling, first full paragraph, lines 1, 5, 8**—text has been changed to “*could*” instead of “would”

**Page 126, Impacts of Alternative 2 on Archeological Resources and Historic and Prehistoric Structures, Hazing and Herding, paragraph 2, line 5**—text has been modified; “and” has been removed and text has been changed to read “direct, site specific impacts that”

**Page 126, Impacts of Alternative 2 on Archeological Resources and Historic and Prehistoric Structures, Lethal Culling, first full paragraph on page, line 10**—text has been changed from “enable” to “*enables*.”

**Page 128, Impacts of Alternative 1 (No Action) on the North Rim Entrance Road Corridor Cultural Landscape, paragraph 1, line 3**—text revised to read “Bison effects include trailing into meadows and to water sources, over-grazing of native vegetation, trampling, bedding, and wallowing, which result in denuded areas, mud pits in areas where vegetation has been stripped. These impacts would create conditions that could facilitate the spread of exotic species and overall vegetation species composition changes which would degrade the cultural landscape by altering the viewshed across the Little Park Meadow area that is intended to be a continuous expanse of native vegetation. These effects are similar to those described for the no-action alternative for soils and vegetation.”

**Page 129, Conclusion, Paragraph 1, line 5**—text has been changed from “for their ecological values...” to “for *its* ecological values...”

**Page 129, Conclusion, paragraph 1, line 9**—text revised to read “Loss of meadow vegetation, the presence of exotic species, and the development of wallows from bison overuse of the area has, and could continue to diminish the integrity of the property with the potential to affect its National Register significance.”

**Page 130, Lethal Culling, Paragraph 2, line 2**—text has been changed to read “boundaries of *the* cultural landscape...”

**Page 130, Lethal Culling, Paragraph 1, line 7**—text has been changed from “have not” to “*has* not.”

**Page 132, Traditional Cultural Properties, paragraph 3, line 6**—text has been added in parentheses (*having the ability to sense or feel*) after the word “sentient.”

**Page 133, Cumulative Impacts, Paragraph 1, line 7**—text has been changed to read “fire, such as wooden buildings...”

**Page 133, Traditional Cultural Properties and Ethnographic Resources, last sentence in section**—text has been revised to read “... “Water resources in the Karst Landscape,” “Bison-Affected Vegetation,” “Soils,” “Wildlife and Wildlife Habitat,” and “Wilderness Character” would...”

**Page 137, Conclusion, paragraph 1, line 6**—the comma has been removed and the text has been changed from “would be, limited” to “would be limited”.

**Page 139, Cumulative Impacts, paragraph 2, line 5**—text has been changed to: “existing populations *of plants and animals that are not fire-adapted.*”

**Page 142, Bison Herd Reduction Tools – Natural, paragraph 1, line 8**—text has been changed to read “protocols *which* would...”

**Page 148, Impacts of Alternative 1 (No Action) on Visitor Experience, paragraph 2, line 9**—text has been changed from “relative short” to “*relatively* short.”

**Page 148, Impacts of Alternative 1 (No Action) on Visitor Experience, paragraph 2, line 6**—text has been changed from “there cars” to “*their* cars.”

**Page 149, Impacts of Alternative 1 (No Action) on Visitor Use and Experience, after last paragraph on the page**—a new section on ‘Impacts on Visitor Use on Adjacent Lands’ has been added as follows: *There could be some impacts on the Kaibab National Forest visitors from the no action alternative as a result of the projected growth of the bison population. These include the potential for increased opportunities for hunting and viewing bison, and an increased potential for bison-human and bison-vehicle interactions. This could have both beneficial and adverse effects on visitors to Kaibab National Forest lands adjacent to the park similar to those described for park visitors.*

**Page 152, Section: Cumulative Impacts, paragraph 2, last line on page**—text has been changed from “responsible while reduction actions are taking place” to “*more noticeable* while reduction actions are taking place”.

**Page 153, Impacts of Alternative 2 (Preferred Alternative) on Visitor Use and Experience, after last paragraph on the page** – a new section on ‘Impacts on Visitor Use on Adjacent Lands’ has been added as follows: *There could be some impacts on the Kaibab National Forest visitors from the alternative 2. While the majority of management actions will be taken on the North Rim away from the park boundary, during initial reduction activities, it is possible that lethal and non-lethal culling activities could occur near the park boundary with the Kaibab National Forest. As a result, visitors to the lands adjacent to the park could experience impacts similar to those park visitors might experience, including noise, visibility and presence of park and cooperating agency staff, and increases in traffic, for the duration of the initial reduction period. Because of the increase in bison movement expected during these times, there could also be increased opportunities for hunting and viewing bison, and an increased potential for bison-*

*human and bison-vehicle interactions. This could have both beneficial and adverse effects on visitors to Kaibab National Forest lands adjacent to the park similar to those described for park visitors. Once the House Rock bison herd is reduced to fewer than 200 animals, it is expected visitors to adjacent lands would continue to have opportunities for bison viewing and hunting, and resource conditions in bison viewing areas outside of the park could improve. In addition the resulting bison population size under alternative 2 could result in reduced potential for safety concerns such as bison-vehicle collisions, vehicle-vehicle collisions, and bison-human interactions.*

## **Chapter 5: List of Agencies and Tribes Consulted**

**Page 155, Chapter 5: List of Agencies and Tribes Consulted**—text has been changed to read “Bureau of Land Management – Arizona Strip *Field Office*.”

## **Chapter 6: References**

**Page 165, Chapter 6: References, third reference on page**—text has been changed to read “coordinates for the collared bison that had moved on to the Walhalla Plateau with other bison after the 2016 Fuller Fire...”

## **Chapter 7: Acronyms and Abbreviations**

**Page 171, Chapter 7: Acronyms and Abbreviations**—the following acronyms have been added to the text:

*GRCA—Grand Canyon National Park*

*KNF—Kaibab National Forest*

*CEQ—Council on Environmental Quality*

*FHWA—Federal Highway Administration*

*USDA NRCS—US Department of Agriculture, Natural Resources Conservation Service*

*USGS—US Geological Survey*

## **Appendix A**

**Page 178, Appendix A, third row under "Mammals"**—species common name has been changed to “*House Rock Valley Chisel-toothed Kangaroo Rat*.”

## ATTACHMENT C: RESPONSE TO SUBSTANTIVE PUBLIC COMMENTS

### Purpose and Need: Scope of the Analysis

**Concern 1:** NPS failed to disclose sufficient credible evidence to support its purpose and need statement or consider other possible sources of the impacts attributed to bison.

**Response:** As required by 40 CFR 1502.13, NPS briefly specifies the underlying purpose and need for the action in the EA and explains that it is proposing to take action because it is concerned about the current and potential future impacts of an expanding bison population on the sensitive resources of the North Rim. The current bison population abundance is already higher than what is recommended by inter-agency scientists (i.e., 200 bison) to protect park resources and values (Plumb et. al 2016), and the proposal to take action now is consistent with section 4.1 of NPS *Management Policies 2006*, which guides NPS to manage the components and processes of park ecosystems for natural conditions and to prevent resource degradation and any subsequent need for restoration. Courts have also ruled that the NPS Organic Act (54 USC 100101 et seq.) does not require the Secretary of the Interior to wait until damage has taken its toll before taking action to control the impacts of overabundant wildlife.

While not captured in the purpose and need section of the EA, the description of the current and potential effects of bison are described in detail in “Chapters 3: Affected Environment” and “Chapter 4: Environmental Consequences.” These descriptions are based on best available information, including a variety of site-specific reports and papers; reports and papers relevant to the effects of other large herbivores on resources in similar environments; observations and opinions of park and agency subject matter experts; and consultations with other agencies and tribes. These descriptions meet the requirements to use information of “high quality” and professional integrity (40 CFR 1500.1; 1502.24), and that when information/data are limited, to summarize existing credible scientific evidence and to predict impacts based on this evidence (40 CFR 1502.22(b)).

Although the commenter suggested that climate change, including changes in temperature and precipitation, issues of air quality, exotic or invasive species, or pathogens/disease could be other factors affecting park resources, these issues were not raised during scoping. Furthermore, the commenter provides no evidence that these factors, and not bison, could be causing impacts. While many natural and anthropogenic factors could affect similar resources as those affected by bison, park subject matter experts note that these other factors do not result in the wallows and soil disturbance in the meadows, bison trails and soil disturbance throughout the North Rim, vegetation loss from grazing, water consumption and trampling of vegetation and soils at watering sites, defecating and urinating in the water, and trampling archeological sites. Even if the case could be made that these other factors have related impacts that should be examined and addressed, courts have routinely ruled that it is up to the agency when drawing lines about decisions that need to be made; how to handle potentially related, yet discrete, issues; and whether or not to explore potentially related subjects in more detail (see *Grunewald v. Jarvis*, 776 F.3d 893 (D.C. Cir. 2015)).



## **Purpose and Need: Park Legislation/Authority**

**Concern 2:** One commenter questioned how reducing the bison herd would protect park values.

**Response:** The NPS *Management Policies* (NPS 2006a) defines park values as “the park’s scenery, natural and historic objects, and wildlife, and the processes and conditions that sustain them, including to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures, and objects; museum collections; and native plants and animals;” and “appropriate opportunities to experience enjoyment of the above resources.” Currently, the large bison population is negatively affecting these park resources and values, including water, native plants, soils, and archeological sites (see generally pages 78-80, 83-85, 90-91, and 120-135). Adverse impacts caused by bison on park values affect the park’s availability to provide appropriate opportunities for visitors to enjoy the natural conditions of the park. Reducing the bison herd in GRCA will protect park values by reducing the types, level, and distribution of impacts associated with high concentrations of bison in the park.

**Concern 3:** One commenter stated that culling bison conflicted with park regulations and management, the Organic Act, and the Grand Canyon Establishment Act of 1919, and that NPS lacks the authority to carry out the reduction.

**Response:** As described on page 4 of the EA, NPS has authority to manage wildlife populations and habitats on lands under its jurisdiction under the NPS Organic Act and other authorities (54 USC 100101 et seq.). The Secretary of the Interior maintains discretion to “provide for the destruction of such animals and plant life as may be detrimental to the use of any System unit” (54 USC 100752). It is unclear what provision of the 1919 enabling legislation for Grand Canyon National Park the comment is referring to. That statute states (in section 2) that the “administration, protection, and promotion of said Grand Canyon National Park shall be exercised, under the direction of the Secretary of the Interior, by the National Park Service, subject to the provisions of the Act of August twenty-fifth, nineteen hundred and sixteen, entitled ‘An Act to establish a National Park Service, and for other purposes,’” which is in reference to the Organic Act. As the EA also notes, the wildlife management policies of NPS are found in section 4.4 and other provisions of NPS *Management Policies* (NPS 2006a). The courts have consistently and repeatedly upheld this authority in situations such as these.

**Concern 4:** One commenter noted that the EA conflicts with the 2010 Foundation Document that states that bison are a nonnative species. Another commenter expressed concern that the park should not be considering bison management because it is not discussed in the 1995 *Grand Canyon National Park General Management Plan*, and NPS has failed to provide legal justification for the use of lethal means.

**Response:** Throughout the NEPA review for bison management at the park, it has become clear that the science applicable to bison in this area is less developed than the science

applicable to bison elsewhere in their historical range. A number of peer-reviewed studies on the nativeness of bison in this part of the United States have been written; however, there are differences of opinion regarding whether or not the Kaibab Plateau is within the historical range of plains bison and, therefore, differences of opinion about the nativeness and/or historic distribution, abundance, and temporal occupancy of bison on the Kaibab Plateau. However, the NEPA process and this EA are not intended to, nor do they need to, address such differences of opinion and settle the question of bison nativeness and historical range.

Rather, NPS is committed to continued dialogue with American Indian tribes, other federal and state agencies, and other stakeholders, as appropriate, regarding any long-term, landscape-scale, ecological and cultural role of bison across the multijurisdictional Kaibab Plateau, which would then inform long-term planning for bison management, which is outside the scope of this EA.

With regard to the park's 1995 *General Management Plan*, the commenter is correct in that it does not contemplate the need for bison herd reduction. The purposes of the *General Management Plan* are to specify resource conditions and visitor experiences to be achieved and provide the basic foundation for decision-making regarding the management of the park. In the case of Grand Canyon, the *General Management Plan* provides objectives (desired conditions) for natural and cultural resources that help guide more detailed, implementation level planning that may be needed in the future. While it also outlines some actions that could be taken to meet these objectives, NPS could not have anticipated the need for bison management given, as noted on page 3 of the EA, the bison herd did not start to become a concern for NPS until the late 1990s after the *General Management Plan* was developed. While not specifically mentioned, NPS believes the proposal to reduce the herd is consistent with the stated objectives of the *General Management Plan* related to natural and cultural resources.

NPS's legal authority for lethal removal is well-established, as discussed on page 4 of the EA and in response to other comments, and courts have consistently and repeatedly upheld this authority in situations such as these.

### **Proposed Action: Toolbox Approach to Quickly Reduce Bison**

**Concern 5:** A commenter stated that NPS fails to consider a reasonable range of alternatives because only two alternatives are analyzed, and fertility control options were dismissed. The commenter indicated that only analyzing two alternatives in detail does not satisfy the requirements of NEPA, and NPS needs to explain why these were the only two alternatives carried forward.

**Response:** As described in the NPS NEPA Handbook, CEQ's 40 Most Asked Questions Concerning NEPA Regulations (Question 1a), and the Department of the Interior's NEPA regulations (43 CFR 46.420(c)), the term "range of alternatives" refers to the set of all reasonable alternatives analyzed in detail, as well as other alternatives considered but eliminated from detailed analysis. With this in mind, NPS considered a total of 11 different alternatives/alternative elements. The "Alternatives Considered but Dismissed" section of

chapter 2 explains why nine of these alternatives/alternative elements were not carried forward, including consideration of fertility control, and explains why only two alternatives were carried forward. Also, as noted in the NPS NEPA Handbook, there are no regulatory requirements to consider a minimum number of alternatives in an EA.

With regard to fertility control, the commenter suggested that NPS should not dismiss this tool and should consider an alternative that combines this tool with other non-lethal management options (see Concern 24 and 46). However, as described in the EA and in the response to those other concerns, fertility control, even if combined with other non-lethal tools, would not meet the purpose and need to quickly reduce bison abundance, would be duplicative with other alternatives that are less environmentally damaging, and would not meet AGFD goals for bison management, including hunting opportunities outside the park.

**Concern 6:** Commenters recommended setting time periods for bison reduction activities, including reducing the buffalo herd only when the North Rim is closed to visitation and conducting more reductions from September through December and fewer between January and August to affect seasonal movement of the bison.

**Response:** As stated on page 1 of the EA, the purpose is to (1) quickly reduce bison population density in collaboration with other agencies with jurisdiction for bison management on the Kaibab Plateau, and (2) protect park resources and values from the impacts of a steadily growing bison population. The plan is not intended to establish seasonal movements of the herd. In terms of setting explicit time periods for reduction, pages 20 and 25 of the EA describe the periods for nonlethal and lethal culling, respectively. To meet the goal of completing reduction efforts as quickly as possible, some activities will need to occur when the park is open and when bison are most accessible. However, the frequency and intensity of actions during this time are expected to be less compared to other periods of the year.

**Concern 7:** A commenter questioned the proposed timeframe for the lethal removal and suggested that no timeline was developed to support the 3- to 5-year implementation schedule. The commenter indicated that it is not clear why it would take 3 years to reduce the herd by two-thirds, but far longer to eliminate it altogether. The commenter suggested that the park limit reduction efforts to 2 years, at which time a long-term plan should be in place.

**Response:** While NPS is interested in reducing the herd as quickly as possible, modelling of the removal of bison via corralling and lethal culling combined suggest that the population can be reduced to below 200 within 3 to 5 years (Sturm and Holm 2015). A description of this model and the model spreadsheet has been posted to the following website for public information: [https://parkplanning.nps.gov/grca\\_bison\\_ea](https://parkplanning.nps.gov/grca_bison_ea). However, it is also important to note that the 3- to 5-year timeline described in the EA is an assumption for the purposes of the analysis, and a number of factors could ultimately influence the timelines for completing the initial reduction of the bison herd, as described in detail beginning on page 19 of the EA. Total elimination of the bison herd is not being considered in this EA. Total elimination would likely take longer than 3 to 5 years because bison could learn to avoid the corrals and react to

culling efforts by either leaving the park or becoming much harder to find within the North Rim landscape.

**Concern 8:** Commenters expressed concern about using lethal and non-lethal methods simultaneously and requested non-lethal methods be exhausted before lethal methods are used to reduce the herd size. Other commenters felt that capture and removal should be the focus of initial reduction activities or should be the preferred alternative because lethal removal seems unnecessarily costly and seems to favor AGFD's desire to promote hunting.

**Response:** Non-lethal efforts (corralling) may be an effective way to remove a substantial number of bison; however, this activity is limited to a small number of sites that the bison must be attracted to, and over time they may learn to avoid these sites. In addition, there may not always be enough willing recipients or the logistical means to remove a large number of bison from corralling. Therefore, lethal efforts are needed so NPS can remove bison that it is not able to capture. Lethal removal, as defined on page 23 of the EA, is described as lethal culling. As described it is a wildlife management action and is not synonymous with hunting, as it lacks certain aspects of hunting (e.g., fair chase); therefore lethal culling does not further AGFD's mission to promote hunting.

**Concern 9:** Commenters stated that the herd sex ratio target should increase from a 1:1 sex ratio to one favoring males, noting the reduction should first target females with the highest reproductive potential.

**Response:** In light of the comments received, the NPS has removed reference to the 1:1 sex ratio target from the EA, as it could limit the effectiveness of the reduction activities. Rather, as already described on page 30 of the EA, the target age and sex ratios for removal would be determined using an adaptive approach during annual operations planning. International Union for the Conservation of Nature (IUCN) guidelines for bison herd sex ratios will be considered at the end of the initial reduction phase.

**Concern 10:** Commenters stated that the park should be explicit about the desired minimum number of bison that could be sustainable in the park to ensure extirpation of the herd does not occur under this plan.

**Response:** The NPS has no intention to extirpate the bison herd as a result of implementing the selected alternative. As described on page 5 of the EA (emphasis added): "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." In addition, an alternative that completely eliminates bison was dismissed from detailed analysis because this "would represent a decision about long-term management that is outside the scope of this environmental assessment" (see page 35 of the EA).

The determination of the minimum number of bison that could be sustainable is outside the scope of this EA, which is solely focused on NPS actions to initially reduce the House Rock bison herd on the North Rim of the park to a level that would protect park resources and values. Identifying a minimum number will be accomplished through long-term planning and

will involve continued dialogue with American Indian tribes, other federal and state agencies, and other stakeholders, as appropriate, regarding any long-term, landscape-scale, ecological and cultural role of bison across the multijurisdictional Kaibab Plateau.

**Concern 11:** Several commenters stated that NPS needs to develop accurate estimates of current bison numbers. Additionally, one commenter suggested establishing baseline estimates and specific thresholds that trigger future management actions.

**Response:** Working with the University of Montana, AGFD is developing an integrated population model for bison on the Kaibab Plateau in Arizona. The model combines what is known of bison ecology (e.g., reproductive, survival, and natural mortality rates) with harvest data, road collision data, wounding loss, and estimates of survival from the literature with aerial surveys of the bison population for estimating the size of the House Rock bison herd. Because data on vital rates are largely absent, the model relies on previously published work and synopses of well-studied bison populations. AGFD and NPS expect this new model, when available, will provide a better estimate of the bison population size, with associated confidence intervals, and that it will be used as the starting point to track against known bison removals from both non-lethal and lethal methods to provide some reliable indication of when enough bison have been removed to reach fewer than 200 bison. When the model becomes available, new data from observations of the remaining bison can be used to verify that the target population has been achieved.

Regarding thresholds for future management, as noted on page 33 of the EA, NPS will collect data to develop desired conditions for natural and cultural resources and will use those resources to inform future decisions concerning additional bison management actions that could be subject to additional planning and compliance. Table 3 in the EA provides examples of the resources that NPS may monitor and indicators the park might use.

**Concern 12:** One commenter stated that the EA must include an agreed upon annual operation plan that describes which tools would be used and under what conditions. One commenter requested that information regarding the bison herd should be provided annually to the public.

**Response:** As noted on page 19 of the EA, the NPS will work with AGFD and other partners to develop an annual operations plan that will address the sequencing of management tools to meet annual reduction goals. The NPS will also consider ways to keep the public informed about the progress of the initial reduction actions.

### **Alternatives Concept: Lethal Culling**

**Concern 13:** Multiple commenters asked NPS to clarify the structure of the culling teams, including the number of people for carcass processing per culling team, who might be used, and how skilled volunteers would be identified/selected.

**Response:** As described on pages 23 to 25 of the EA, each lethal culling team that uses volunteers will consist of one NPS team leader and up to four volunteers. Team leaders will

make all removal decisions regarding location and age/sex of individual bison to be removed during each lethal culling period. The role of the other team members will be determined during pre-reduction training that will be required. In addition, up to five additional people could accompany each of the four non-NPS team members (i.e., up to 20 additional people) to assist with carcass processing and removal. Other agency personnel and contractors could also be used to cull bison in limited circumstances.

Skilled volunteers will be members of the public, and along with tribal members who also participate, will meet a number of predetermined requirements, including a demonstrated level of firearm proficiency and knowledge of public safety and protection policies established. The EA does not describe how volunteers will be identified/selected, because there is no potential for environmental effects from these actions. However, the park anticipates working with AGFD and other partners to establish a lottery for a controlled number of skilled volunteers to assist with the culling effort; and will announce more details in advance of any lethal culling activities.

**Concern 14:** A commenter objected to the “capture and ship to slaughter” method of lethal removal because it is counter to the North American Model of Wildlife Conservation, which guides all wildlife management decisions in Arizona.

**Response:** Capturing bison for the purposes of slaughter is not under consideration as an initial bison herd reduction method.

**Concern 15:** A commenter suggested using archery or noise suppressors on firearms to mitigate noise impacts and provided specific suggestions concerning how to best use these tools.

**Response:** Per input from AGFD, firearms are more effective at removing animals from a longer distance than archery equipment and will be more efficient and effective over time at removing bison compared to archery. Therefore, while NPS recognizes that using archery would be quieter than using firearms, the purpose is to reduce the herd quickly; therefore, NPS intends to use firearms and not allow archery at this time. In addition, NPS could consider the use of suppressors to minimize noise impacts of firearms. However, a federal tax stamp is required to legally own a suppressor, making them somewhat uncommon in the general public and unlikely to be used widely. Nonetheless, this option has been added as potential mitigation measure in chapter 2 via the errata to the EA, and the relevant impacts analysis has been updated to acknowledge this potential.

**Concern 16:** Commenters expressed multiple opinions about using professionals rather than skilled volunteers to cull the herd. One commenter indicated that it would be preferable for the park to use professionals because otherwise there would be too many “hunters” in the park. Other commenters noted that that using professionals would be a waste of financial resources.

**Response:** The park anticipates establishing a lottery for a controlled number of volunteers to assist with the culling effort. The number of culling teams operating at any one time is described on page 25 of the EA. All lethal culling will be supervised by NPS staff and

performed only by individuals who satisfy rigorous marksmanship and safety requirements to be developed by the park in collaboration with AGFD. This is quite different than hunting, and as described on page 35 of the EA, will be a non-recreational conservation tool that will be very controlled and structured. Despite potential costs, the park feels it is important to retain the option to use agency personnel/contractors if determined necessary.

**Concern 17:** A commenter opposes lethal removal below the rim because of the resources necessary to recover carcasses.

**Response:** As noted on pages 27 and 30 of the EA, shooting bison below the rim is not recommended. The EA also notes that removal of carcasses below the rim will be unlikely; however, the EA provides an analysis of the helicopter operations that would be required, should they occur. Helicopters may also be used to herd or haze bison away from rim edges, further reducing the potential for bison carcasses below the rim.

**Concern 18:** Commenters suggested that snow machines be provided by NPS and that volunteers be trained to use them safely.

**Response:** If volunteers or NPS staff use snow machines, they will be utilized in accordance with applicable NPS policies. Specific requirements will be included in an implementation plan and a safety plan. Any employee or volunteer using a snow machine will be provided with appropriate training.

**Concern 19:** One commenter asked how long it would take a field team to process an adult bison carcass and how this would drive the rate of lethal removal.

**Response:** Based on conversations with AGFD, it is estimated that field team could completely field dress a bison in about 2 hours. Transportation time of the bison meat out of the field would then depend on the location where it was culled and whether it was being transported by foot or with stock animals and would likely have more of an impact on the rate of removal than field dressing would. However, in an attempt to minimize the impact, the individuals involved in processing and removing bison will not be the same individuals who will be involved in shooting, as described on page 26 of the EA.

### **Alternatives Concept: Hunting in the Park**

**Concern 20:** Many commenters advocated allowing AGFD to manage public hunting in the park, consistent with the North American Model of Wildlife Conservation and its recommended use of hunting to manage wildlife populations. Some of these commenters indicated that other park units use hunting for elk (Grand Teton National Park) and deer (Chincoteague and Assateague National Seashore), and that a large number of national park system acreage legally allows hunting, so it should be allowed at Grand Canyon National Park, possibly by amending the enabling legislation. Another commenter stated that Congress had recently passed legislation to allow depredation hunting on national park lands and noted that Yellowstone National Park allows hunts. Other commenters questioned the rationale for dismissing public hunting in the park. One commenter asserted that the rationale for

dismissing hunting in the park is arbitrary and capricious and violates NEPA. The commenter further noted that public hunting could be authorized if NPS is willing to request it. Another commenter noted that eliminating hunting as an option simply because it is prohibited under current NPS/Department of the Interior rules and regulations is short-sighted and seems like an easy way to dismiss a cost-effective management tool that is, at its essence, the same as “lethal culling.”

**Response:** Although the use of skilled volunteers to assist with lethal culling was retained in the preferred alternative, the use of skilled volunteers does not constitute hunting because lethal culling of bison is a non-recreational conservation tool used to reduce and control wildlife populations that have exceeded management objectives and have detrimental impacts on park resources. A detailed discussion of the reasons for dismissal is included in “Chapter 2: Alternatives Considered but Dismissed from Detailed Analysis” on page 35 of the EA.

Longstanding NPS regulations (36 CFR 2.2(b)) and policy prohibit hunting except in specific units where it is expressly authorized by federal statute. Grand Canyon National Park is not such a unit. While there are a number of NPS units that allow hunting (including Assateague Island National Seashore), none of them use public hunting as a substitute for culling or other management actions that may be necessary. Hunting is not allowed at Grand Teton National Park, but pursuant to special statutory authority, it allows state-licensed hunters to participate in controlled elk reductions in coordination with the state of Wyoming. These suggestions, therefore, would not meet the purpose and need of this plan and are beyond the scope of the EA.

**Concern 21:** Commenters suggested that tribal members be given priority to hunt or cull bison in the park. Some commenters expressed concern that only tribal use of bison parts is considered and asked that NPS explain its rationale. Commenters also suggested that others, such as wounded warriors, should also get priority as skilled volunteers.

**Response:** Tribes are sovereign nations with unique and special status that maintain government-to-government relationships with the federal government. The park manages lands that were part of tribal traditional homelands. Tribes traditionally associated with the Grand Canyon will be provided an opportunity to participate in lethal culling activities and to participate in designing the culling program for tribes. All others would be able to apply through a lottery system. Tribes can use bison parts for cultural purposes, and tribes and other organizations can use them for educational purposes. Only non-monetary uses are allowed. (See the “Carcass Handling and Disposition” section in chapter 2 on page 25 of the EA).

**Concern 22:** Commenters suggested that AGFD amend its hunt for Unit 12A.

**Response:** Game Management Unit 12A includes all of the Kaibab Plateau and associated winter range on the east and west side of the Kaibab Plateau. The Arizona Game and Fish Commission includes all land in Arizona within game management units regardless of jurisdiction and has authority to amend open and closed areas and designated Game Management Units where it has authority to manage wildlife. Although Game Management Unit 12A includes the park, hunting is not permitted in the park, and NPS has the authority to



manage wildlife within the park. As such, the park will work with AGFD to maximize the hunting opportunities adjacent to the park boundary in the Kaibab National Forest. This effort will include coordinating the AGFD hunt structure and the park bison reduction project; the details of this effort would be described in an annual implementation plan.

### **Alternatives Concept: Reproductive Control**

**Concern 23:** Commenters expressed opposition to methods of reproductive control because they are ineffective and costly.

**Response:** As noted on page 35 of the EA, use of fertility control was dismissed as an alternative to quickly reduce the density of the House Rock bison herd. The dismissal specifically states that fertility control techniques are often uneconomical or infeasible for practical implementation and require a long period of time to achieve population reductions.

**Concern 24:** One commenter stated that the NPS should not have dismissed fertility control. The commenter notes that this tool would not cause an immediate reduction in the bison herd, but that with enough money and staff, it could gradually result in a reduction in bison numbers.

**Response:** As stated in the EA on page 35 and 36, and as the commenter acknowledges, fertility control is not likely to meet objectives to quickly (in less than 5 years) reduce the bison herd (as noted in Powers and Moresco 2015). In addition, as the EA points out, because fertility control would only gradually reduce the bison herd, the population would remain above 200 animals for much longer when compared to other alternatives. As a result, the current or potential future impacts to other park resources and values would not be reduced, resulting in prolonged impacts that can be avoided with other alternatives. As such, not only does fertility control not meet the purpose and need, it is duplicative with other alternatives that are less environmentally damaging, and has therefore appropriately been dismissed from the range of reasonable alternatives. This additional information has been added to page 36 in support of this response.

### **Alternatives Concept: Future Management**

**Concern 25:** Commenters questioned the long-term management of the bison herd, requesting additional information to ensure a large cull would not be needed in the future and that the short-term plan would not become the long-term plan. Commenters requested NPS work with the Bureau of Land Management (BLM), the US Forest Service (USFS), and AGFD to create fully funded, long-term adaptive management solutions, with some commenters indicating this should involve tools to ensure bison do not become reestablished in the park and others indicating that NPS should eliminate bison from the park and not commit to maintaining a bison herd in the park as part of this EA. One commenter noted that the bison will only stay out of the park if the lands outside the park are attractive for them to stay, which may require improvements to water and range conditions. Another commenter suggested the development of a wildlife corridor for bison from the lowlands east of the Kaibab Plateau and then farther to the west of the plateau. Another commenter felt NPS should continue the long-term bison

management planning process because (1) there is much to learn about bison; (2) any short-term management could influence long-term management; and (3) multi-agency management decisions regarding bison in northern Arizona are inconsistent.

**Response:** As noted in the EA, the proposed NPS actions are for initial reduction of the House Rock bison herd to a level that would protect park resources and values. While the tools considered in this EA might be the same tools used by the park for any potential future management, NPS would complete, as appropriate, any additional NEPA reviews that may be needed to support management beyond the initial reduction. Also, as evidenced by its cooperating agency status on the EA, and as noted throughout the document, especially the section on “Collaborative Management of the House Rock Bison Herd,” NPS intends to work with adjacent landowners, tribes, and other stakeholders on both the initial reduction efforts and any appropriate long-term planning and management of the House Rock bison herd. This includes a commitment to monitoring both the effectiveness of reduction tools, the bison population, and the response of other resources during the initial reduction phase to learn more about bison and inform potential long-term adaptive management planning.

The EA also includes a commitment to continuing ongoing dialogue with cooperators regarding any appropriate long-term, landscape-scale, ecological and cultural role of bison across the multijurisdictional Kaibab Plateau, which would inform any future decisions about managing a herd on the North Rim and adjacent lands, which are outside the scope of this EA. Although AGFD and USFS are considering some small-scale actions at this time (e.g., habitat and fence improvements at House Rock Wildlife Area [HRWA] described in chapter 4 of the EA; developing additional water sources adjacent to the park), decisions about management actions that could affect distribution of the bison herd on the Kaibab Plateau, including any proposals to eliminate bison from the park, prevent bison from becoming reestablished in the park, or to create migration corridors, would require agencies with jurisdiction outside the park to approve them and are beyond the scope of the initial reduction efforts proposed in this EA. Therefore they are not considered as NPS proposed actions in this initial bison herd reduction EA.

### **Alternatives Concept: Cost of Alternative Actions**

**Concern 26:** Commenters requested that NPS provide cost details for the various alternatives, including comparing lethal culling and capture and removal to the use of hunting in the park; they also requested that NPS provide the costs of individual elements of the proposed actions. Commenters suggested that cost needs to be a factor in the decision-making process. One commenter requested a cost comparison between culling and capture versus a managed hunt.

**Response:** The purpose of NEPA documents is to analyze environmental effects so that these environmental analyses can be considered in concert with economic and other factors as part of the decision-making process. The NPS is committed to seeking funding for implementing the selected alternative, and as only one action alternative is presented, there are no other action alternatives to compare costs to. In addition, analyzing and disclosing the cost of implementing different alternatives is not a requirement under either CEQ or DOI NEPA regulations, and because hunting is not authorized in the park and was dismissed, the cost of

hunting compared to nonlethal and lethal culling is not relevant to the decision. Therefore, costs were not included in the EA.

### **Alternatives Concept: Reintroduction of Predators**

**Concern 27:** Commenters suggested reintroducing predators, including wolves, mountain lions, and grizzly bears to reduce the bison population. Commenters indicated that the rationale for dismissal in the document regarding the reintroduction of wolves is not sufficient. One commenter stated that introducing wolves would have positive impacts on vegetation, water quality, and archeological sites.

**Response:** The purpose of this EA is to quickly reduce bison population density. As discussed on page 36 of the EA, wolves and other predators would not be effective in reducing the population to less than 200 animals in the short term time frame for reduction anticipated by the EA (potentially achievable in 3 to 5 years). As a result, the NPS considered but dismissed wolf reintroduction as an alternative carried forward for detailed analysis. However the NPS may consider the role of predators in longer term planning and decisions which are outside of the scope of this EA. [EQD NOTE: the issues raised re: the experimental population boundary still need to be addressed.]

**Concern 28:** One commenter stated that the EA does not currently describe wolves in the carnivores section and indicated that the document should include this information.

**Response:** The EA does not contain information on wolves because wolves are not an existing part of the carnivore population in the park. Only one wolf sighting has been confirmed in the park in recent years, and it was eventually shot outside the park. Therefore, adding wolves to the carnivore description of the affected environment would not be an accurate representation of the current condition.

### **Alternatives Concept: Herding onto Adjacent Lands**

**Concern 29:** A commenter advocated increasing pressure on bison inside the park by herding them out of the park to other water sources on other lands where they can be hunted. One commenter suggested a focus on fencing water sources in the park in conjunction with herding, while another commenter suggested using herding dogs.

**Response:** Hazing and herding by people on foot and horseback, using soft-handling methods and actions that startle bison to encourage the animals to move toward or away from a location, will be used (see page 30 of the EA). Hazing and herding will be used primarily as a tool to encourage movement within the park and to aid in nonlethal and lethal culling activities. Herding on foot or horseback is only viable in certain areas of the North Rim, such as meadows, and therefore is a technique that NPS is unlikely to implement on a regular basis.

NPS may place exclusion fencing at local water sources in the park, as discussed on page 31 of the EA. Fencing would be necessary primarily while the reduction of the House Rock bison herd is taking place but may be left in place to help redistribute bison that remain in the park.

Water sources outside of the park may become more attractive to bison as water sources in the park are fenced, and bison may migrate to adjacent lands. NPS will continue to work with its cooperators, including AGFD and USFS, on the use of herding to move bison off park lands, but this is not a stated goal of the EA. NPS will coordinate culling activities occurring inside the park with AGFD and USFS management actions (e.g., hunting and habitat improvement on national forest system lands) outside the park in an attempt to support each other's goals, including bison hunting and viewing opportunities. Any future actions proposed to manage bison habitat on forestlands that are not covered under the 2014 *Kaibab National Forest Land and Resource Management Plan* will be scoped with the public and assessed at the appropriate level as required under NEPA.

NPS considered but dismissed the use of dogs to haze or herd bison into areas where they could be corralled or lethally removed or to move the bison off the park. A detailed discussion of this dismissal can be found on page 36 of the EA.

### **Alternatives Concept: Carcass Disposal**

**Concern 30:** Commenters provided feedback regarding distribution of the bison meat. Some commenters proposed that skilled volunteers should receive an equitable portion of the meat, and others suggested that all or a portion of it be given to food banks or tribes; some commenters stated that it should be sold locally. Some commenters indicated that bison hides and skulls or entire carcass should be given to the individual who culls the bison from the park, or that NPS should sell the hides and skulls to collect revenue to pay for future bison management.

**Response:** As stated on page 25 of the EA, NPS will donate salvageable meat to the teams of volunteers who participated in lethal culling and removing carcasses from the field, food banks, and designated tribal members. In terms of the disposition of hides and skulls, please see the response to concern 21. Although NPS likely has the authority to sell bison meat or parts, sale could present additional logistical hurdles. In any event, whether NPS sells or donates meat or parts is not relevant to environmental impacts and does not require detailed discussion or resolution in the EA. At this time, NPS plans to donate all salvageable meat and bison parts.

**Concern 31:** Commenters indicated that the carcasses should be left for scavengers, specifically condors, and should not be removed by mechanized means.

**Response:** As requested by commenters, organs and gut piles may be left for scavengers (page 25 of the EA); however, all reasonable efforts would be used to remove salvageable meat for beneficial human use and removal of carcasses for use by tribal partners or federal or state agencies, taking into consideration human and pack animal safety, logistics for accessing remote sites, environmental conditions, potential for resource damage, the likelihood of meat spoilage, the availability and cost of the park helicopter to assist while meeting the requirements for helicopter use (described in the 'Access to Sites and Reconnaissance' and 'Mitigation Measures' section), and the Wilderness Act Minimum Requirements Analysis.

### **Alternatives Concept: Fencing the Park Boundary**

**Concern 32:** Commenters suggested constructing a fence around the park boundary or around archeological resources after herding bison away from the area to prevent them from returning.

**Response:** As noted on page 31 of the EA, local exclusion fencing will be used to protect sensitive resources, including archeological sites. Page 36 of the EA discusses the rationale for dismissing an alternative that would include fencing the entire park border (e.g., greater environmental impacts on wildlife movement and wilderness and would not achieve the purpose and need to reduce the House Rock bison herd quickly). As a result, it is not under consideration at this time.

### **Alternatives Concept: Complete Removal of Bison Herd**

**Concern 33:** Multiple commenters supported the removal of all bison from the park for various reasons such as damage to natural and cultural resources, concern over nativeness, cost, and conflicts with NPS policy. One commenter requested that NPS expand its analysis to an interagency scope, specifically to include complete removal of bison from all lands except those within the HRWA.

**Response:** As explained on page 35 of the EA, NPS dismissed the complete removal of bison from the park from consideration in this EA. The EA focuses on NPS actions to initially reduce the House Rock bison herd on the North Rim of the park to a level that would protect park resources and values. Complete removal of the bison from the park would prejudice decisions about long-term management of abundance and distribution of the bison on the Kaibab Plateau. As a result, any decisions about the future abundance and distribution of the bison herd in the park or on adjacent lands, which would also require agencies with jurisdiction outside the park to approve them, would be addressed in a long-term planning process that provides opportunity for continued dialogue with American Indian tribes, other federal and state agencies, and other stakeholders, as appropriate, regarding any long-term, landscape-scale, ecological and cultural role of bison across the multijurisdictional Kaibab Plateau. Such dialogue would inform the identification of long-term bison abundance and distribution goals, which are outside the scope of this EA.

### **Alternatives Concept: Non-lethal Culling with Capture and Relocation**

**Concern 34:** Commenters indicated that bison capture and relocation must be done under the direction of AGFD, and that the state has interest over transport of wildlife across state boundaries. Another commenter noted that capture and removal should not be used alone because it would not result in the redistribution of bison off the park, and the bison would continue to remain in the park, avoiding hunting pressure. The commenter advocated that the use of lethal and nonlethal removal should be balanced. Other commenters stated that nonlethal culling through capture and removal is not sustainable, can cause high levels of stress for the animals, is not economical, and can involve significant costs.

**Response:** As noted in chapter 2 of the EA (see page 20), NPS will work with partners, including AGFD, to use nonlethal and lethal culling concurrently to reduce the abundance of the House Rock bison herd. And, as noted on page 20 of the EA, any transportation of bison to out-of-state destinations would comply with state requirements for the transport of animals across state lines. In addition, nonlethal culling of bison as a stand-alone tool was dismissed from detailed analysis, as described on pages 36–37 in the EA. It is important to point out, however, that while these tools are expected to create conditions that may make bison move outside the park; this is not part of the purpose for taking action or a stated goal of the actions. Any management of bison distribution in and adjacent to the park would be subject to additional planning and compliance as part of a long-term, interagency bison management plan that requires additional dialogue with American Indian tribes and other federal and state agencies to assess the ecological and cultural roles of bison across the multijurisdictional Kaibab Plateau.

Bison will experience some impacts as a result of nonlethal culling activities, as described in detail on pages 75 and 77 of the EA, but as explained in the FONSI, these impacts will not be significant. Additionally, based on the findings of the Sturm and Holm model (which has been posted to: [https://parkplanning.nps.gov/grca\\_bison\\_ea](https://parkplanning.nps.gov/grca_bison_ea)), NPS believes that nonlethal culling, when used in conjunction with lethal culling, is a reasonable and sustainable approach to removing approximately 275 bison in the near term. While this number is the basis for the analysis in the EA, NPS would work with its partners to develop a mutually agreed upon annual operations plan that outlines the sequencing of tools and identifies the actual number of animals the agencies would seek to remove each year by each tool to decrease the population as quickly as possible. This and the reduction tool effectiveness monitoring would ultimately determine how many animals would be removed by which tool.

**Concern 35:** Commenters questioned the rationale for dismissal of using only capture and removal of bison to reduce the herd.

**Response:** Page 36 of the EA details why capture and removal methods were not considered as a standalone alternative. Specifically, as a standalone method, capture and removal would take too long or be too difficult to implement in a timely fashion and would not meet the purpose and need of the EA to quickly reduce the House Rock bison herd. Modelling (Sturm and Holm 2015, which has been posted to: [https://parkplanning.nps.gov/grca\\_bison\\_ea](https://parkplanning.nps.gov/grca_bison_ea)) indicates, using nonlethal culling methods alone would require approximately 8 years to reduce the herd.

**Concern 36:** Some commenters volunteered to accept bison, and others had suggestions for capture and relocation to zoos, tribal lands, private farms, other national parks, and elsewhere. One commenter wanted guidelines developed for willing recipients. One commenter suggested that the bison be moved to tribal lands with climate similar to the North Rim; another suggested working with InterTribal Buffalo Council to identify tribes that would be willing to take the bison. Commenters provided suggestions for tribal involvement, including moving the herd to nearby reservations and allowing it to be hunted, then allowing the tribes to use the meat and hides. Commenters provided suggestions for using relocation to boost the genetic

pool of other herds. One commenter questioned whether moving bison elsewhere is appropriate given the genetic composition of the herd.

**Response:** As stated on page 20 of the EA, all captured bison will be transferred to a variety of willing recipients, including tribes, the state of Arizona, other federal agencies, and non-governmental entities. While the NPS will also enter into agreements with willing recipients, which could address management of bison in subsequent releases, the NPS has no jurisdiction for bison management on non-NPS lands.

Whether or not willing recipients want to accept bison from this herd, and the role of captured bison in a destination herd, is up to the entity receiving and managing that herd and is beyond the scope of this EA.

**Concern 37:** Commenters suggested keeping family groups intact.

**Response:** As noted on page 30 of the EA, to the greatest extent possible, preferential removal of related individuals would be avoided.

**Concern 38:** Commenters expressed concern that bison moved to HRWA would not stay there. They asked how the bison could be discouraged from returning, and they requested more information about how AGFD would keep the bison in the HRWA pasture. Another commenter suggested NPS should be explicit about what site fidelity is and requested a fence be built in HRWA.

**Response:** In general, when the EA discusses site fidelity at House Rock Wildlife Area (HRWA), it is referring to developing familiarity with breeding, calving, foraging, and watering areas and returning to use them in the future. However, any actions at HRWA to develop this site fidelity are not within the jurisdiction of NPS. Rather, management of bison on the Kaibab National Forest is a joint effort between the AGFD (responsible for managing wildlife) and USFS (responsible for managing the land and wildlife habitat). USFS actions are guided by the 2014 *Kaibab National Forest Land and Resource Management Plan*. According to the plan, bison should be actively managed (e.g., by hunting, trapping, fencing, and herding) so that the herd is concentrated within the HRWA; and the bison herd size should be kept in balance with ecological conditions so impacts on sensitive resources are minimized, especially outside of HRWA. According to AGFD, studies show bison have strong fidelity to calving and breeding areas and young bison develop site fidelity to new areas better than adult bison do. As a result, in addition to the management actions described in the “Cumulative Impact Scenario” in chapter 4 of the EA, AGFD is considering establishing bison site fidelity to HRWA by releasing new, young, and naïve bison that have not been to Grand Canyon National Park and held in a new 4,000 acre pasture at HRWA through two calving and breeding cycles.

In addition, although AGFD and USFS are considering some small-scale actions at this time (e.g., habitat and fence improvements at HRWA described in chapter 4 of the EA; developing additional water sources adjacent to the park), decisions about management actions that could affect distribution of the bison herd on the Kaibab Plateau, including any proposals to prevent

bison from becoming reestablished in the park are beyond the scope of the initial reduction efforts proposed in this EA; would need to take into account future discussions regarding any appropriate long-term, landscape-scale, ecological and cultural role of bison across the multijurisdictional Kaibab Plateau; and would require agencies with jurisdiction outside the park to approve them. Therefore they are not considered as NPS proposed actions in this initial bison herd reduction EA. Any future actions proposed to manage bison habitat on forestlands not covered under the 2014 *Kaibab National Forest Land and Resource Management Plan* will be publicly scoped and assessed at the appropriate level per NEPA requirements.

**Concern 39:** One commenter wondered about the distance required to prevent bison from returning to the park.

**Response:** Bison are highly mobile and can traverse large expanses of land in relatively brief intervals of time. For example, Yellowstone bison can travel more than 30 kilometers in a single day (Meagher 1989). Bison in the greater Wood Buffalo area travel up to 50 kilometers annually from their center of activity and range over areas of approximately 180 to 1,440 square kilometers (Larter and Gates 1990). Adult male bison may travel considerable distances and colonize new habitat in previously unoccupied areas, especially when bison densities get relatively high (Plumb et al. 2014).

Nonetheless, the EA focuses on NPS actions to initially reduce the House Rock bison herd on the North Rim of the park to a level that would protect park resources and values. As a result, any decisions about the distribution of the bison herd in the park or on adjacent lands, which would also require agencies with jurisdiction outside the park to approve them, would be addressed in a long-term planning process that provides opportunity for continued dialogue with American Indian tribes, other federal and state agencies, and other stakeholders, as appropriate, regarding any long-term, landscape-scale, ecological and cultural role of bison across the multijurisdictional Kaibab Plateau.

**Concern 40:** A commenter expressed concern about the timing of the capture and removal activities, noting that the fall capture is planned during rut, and it could be dangerous to capture the bison with rutting bulls and cows in estrus. Another commenter questioned how easy or how safe it would be to capture and transport bison.

**Response:** Based on NPS observations, the peak of rutting on the North Rim is in July and early August. As a result, most corralling will occur outside of the rut. Regardless, the park will develop a corralling safety plan that will consider the timing of corralling operations in relation to the rut. NPS successfully and safely captured and transported bison from the North Rim in early July 2014 and will use trained individuals with expertise in such operations in the future.

### **Alternatives Concept: Managing Water Access for Bison**

**Concern 41:** Commenters recommended fencing water sources, bedding areas, or prime feeding areas. Specifically, commenters suggested fencing as an alternative approach before resorting to lethal removal. One commenter disagreed with the use of fencing around water



sources and noted that fencing would not be successful and would require ongoing maintenance and funding. The commenter also indicated that bison may still damage the habitat surrounding the fence.

**Response:** NPS may place exclusion fencing at local water sources in the park, as discussed on page 31 of the EA. Fenced areas would be limited and would be typically constructed for the protection of highly sensitive resources (e.g., springs and seeps or archeological sites). Other fencing could be used in areas with evidence of high bison use of the area (e.g., archeological sites). NPS is not considering fencing bedding areas or prime feeding areas at this time because this would require an extensive amount of fencing on the North Rim to effectively exclude bison from the park. As discussed on page 36 of the EA, extensive fencing, including a border fence, would have too great an environmental impact on wilderness and other wildlife movement and was dismissed from further consideration. In addition, construction of a border fence or fencing around bedding and feeding areas would not accomplish the objective to quickly reduce the House Rock bison herd to a lower level and density and therefore would not be used as an alternative approach in lieu of or before culling methods.

As discussed above, exclusion fencing may be used at local water sources in the park. Fencing would be necessary primarily while the reduction of the House Rock bison herd is taking place but may be left in place to help redistribute bison that remain in the park. In the event that fencing is no longer useful, is cost prohibitive, or is not distributing bison away from park resources, NPS may remove fencing as necessary. Impacts from fencing are discussed in chapter 4 of the EA. As the commenter noted and as described in the analysis in the EA, bison may still damage habitat surrounding fencing; however, a reduction in the density and abundance of the bison herd on the North Rim would reduce impacts in and around sensitive resources, such as seeps, springs, and lakes, and the adverse impacts would not be significant, as described in the EA.

### **Alternatives Concept: Attractants**

**Concern 42:** Commenters did not support the use of attractants, such as salt licks, because they could habituate the bison or cause them to spend more time in the park.

**Response:** To ensure successful non-lethal culling (corralling) efforts, the park may need to use attractants, including salt licks. These attractants would be used for a short period immediately prior to corralling and removed following each corralling effort. The park does not anticipate corralling more bison than can be transported to willing recipients, thus bison that remain on the landscape should not be habituated to either corrals or attractants.

### **Alternatives Concept: Other/New Alternatives or Elements**

**Concern 43:** Commenters recommended that NPS consider additional bison abundance goals above 200 animals.

**Response:** The purpose and need for the initial reduction of the House Rock bison herd is related to concerns about the NPS's ability to protect park resources and values from impacts of bison; other agencies are also concerned about their ability to meet bison management and resource protection goals outside of the park, as described in the Kaibab National Forest Land and Resource Management Plan (USFS 2015). As described in the EA, an inter-agency report (Plumb et al. 2016) recommends a maximum of 200 bison to avoid impacts on park resources and to support partner goals for a free-ranging bison population that allows for public bison hunting and viewing opportunities on the Kaibab National Forest. Therefore, suggestions regarding bison abundance goals above 200 animals would be inconsistent with these recommendations, may not protect park resources and values or other agency management goals, and would, therefore, not meet the purpose and need for action.

**Concern 44:** Commenters provided additional options for live capture and distribution of the bison herd, including live capture with a special hunt at HRWA.

**Response:** Although AGFD recognizes it might be necessary from time to time to selectively remove bison using hunters until site fidelity to HRWA is established and as part of any long-term adaptive management of the House Rock bison herd, AGFD actively avoids game management actions that result in "put and take" of wildlife (i.e., releasing of captured animals into fenced enclosures for hunting purposes). Such actions violate the Arizona Game and Fish Commission's Fair Chase Policy and are not described as eligible for funding under the Pittman-Robertson Wildlife Restoration Act.

**Concern 45:** Commenters requested habitat modification be considered, including restoring the historical plains bison habitat or designating the North Rim as a refuge area.

**Response:** The EA focuses on NPS actions to initially reduce the House Rock bison herd on the North Rim of the park to a level that would protect park resources and values. Proposals to improve historical Great Plains habitat are, therefore, outside the scope of this EA and would not meet the purpose and need for the initial herd reduction at the park. Redesignating the North Rim of the park as a National Wildlife Refuge managed by the USFWS, even leaving aside the logistical concerns, would not address the protection of natural and cultural resources and values such as wilderness and visitor experience. As a result, this option is also outside the scope of the EA and would not meet the purpose and need for initial herd reduction. NPS policy related to wildlife management, which includes population management as appropriate and the authorization of the Grand Canyon Game Preserve, is sufficient, and additional designations or status as a refuge are not needed.

**Concern 46:** A commenter suggested evaluating a fully nonlethal alternative that combines capture and removal for placement in sanctuaries, the restoration or improvement of bison habitat on federal and state lands adjacent to the park (i.e., using prescribed burning, habitat manipulation, artificial plantings to create ideal bison habitat, and other proven techniques), hazing or herding (using so-called soft techniques) to move select bison groups off park lands, non-lethal management of bison on lands outside of the park, and selective fencing to immediately protect natural and/or cultural resources. Other commenters also suggested that

NPS work with adjacent land managers (e.g., USFS and BLM) to develop water holes and pasture on non-NPS lands.

**Response:** The EA focuses on NPS actions to initially reduce the House Rock bison herd on the North Rim of the park to a level that would protect park resources and values. Although NPS, AGFD, and USFS are considering some of the ideas proposed by the commenter at this time (e.g., capture and removal of live bison, fencing sensitive resources in the park, habitat and fence improvements at HRWA [described in chapter 4 of the EA] and developing additional water sources adjacent to the park), modelling (Sturm and Holm 2015, which has been posted to: [https://parkplanning.nps.gov/grca\\_bison\\_ea](https://parkplanning.nps.gov/grca_bison_ea)) has shown that a combination of lethal and nonlethal management tools, including hunting outside the park, is necessary to quickly reduce the bison herd; capture and removal alone will not meet initial population goals. As described on page 37 of the EA, Sturm and Holm (2015) estimated that it could take approximately 8 years to reach 200 bison using nonlethal methods as a stand-alone tool; bison population growth, distribution, and increased wariness of the corral sites would make it difficult to reduce the House Rock bison herd below that number; and the herd would begin to grow again, so that at 15 years, the population would be back up to more than 400 bison post-calving. This model has been posted to [https://parkplanning.nps.gov/grca\\_bison\\_ea](https://parkplanning.nps.gov/grca_bison_ea). In addition, lawful hunting is used to regulate wildlife populations nationwide on most federal and state land outside national parks; and in Arizona, AGFD will continue to use hunting to manage wildlife outside Grand Canyon National Park in accordance to the North American Model of Wildlife Management. As such, any alternative that relies solely on nonlethal capture and removal inside and outside the park would not meet the purpose and need to quickly reduce bison abundance and would be inconsistent with AGFD goals and tools for wildlife, including bison, management. Therefore, this alternative was not considered further.

**Concern 47:** One commenter recommended that NPS should work with USFS to identify corral locations outside the park boundary.

**Response:** Management of bison on the Kaibab National Forest is a joint effort between the AGFD and USFS. USFS actions are guided by the 2014 *Kaibab National Forest Land and Resource Management Plan*. According to the plan, the free-ranging herd should be actively managed (e.g., by hunting, trapping, fencing, and herding) so that it is concentrated within the HRWA, and the bison herd size should be kept in balance with ecological conditions so impacts on sensitive resources are minimized, especially outside of HRWA. Therefore, any proposal for live capture and removal on USFS lands would be subject to Arizona Game and Fish Commission approval, managed by AGFD, and require USFS to meet any associated compliance requirements. As a result, this is outside the scope of the NPS proposed action considered in this EA. While the Arizona Game and Fish Commission has in the past occasionally relocated wildlife and while potential bison capture sites have been identified on USFS land, there are currently no plans to capture bison on the Kaibab National Forest

**Concern 48:** One commenter suggested surveying visitors that stop to observe or otherwise interact with bison.

**Response:** The NPS may consider a visitor survey in the future and results of a survey may be used in long term planning and decisions, which are outside of the scope of this EA.

**Concern 49:** One commenter suggested including the management concepts suggested in Plumb et al. 2016 in the EA.

**Response:** The Plumb et al. 2016 report was developed with an eye toward potential future interagency management of bison across the multijurisdictional Kaibab Plateau. Regardless, the actions proposed by NPS to initially reduce the House Rock bison herd on the North Rim of the park are consistent with one of the key findings of the report, which suggests initial population reduction to reach population objectives would be best achieved in the near-term via combined approaches. In addition, the proposed initial reduction of the herd to fewer than 200 animals is also consistent with the recommended bison abundance in the report. However, any decisions about managing bison abundance and distribution beyond initial reduction would also require agencies with jurisdiction outside the park to approve them and would be addressed in a long-term planning process that provides opportunity for continued dialogue with American Indian tribes, other federal and state agencies, and other stakeholders, as appropriate, regarding any long-term, landscape-scale, ecological and cultural role of bison across the multijurisdictional Kaibab Plateau. Such dialogue would also inform development of long-term bison abundance and distribution goals, which is outside the scope of this EA.

**Concern 50:** One commenter suggested it would be less expensive to provide supplemental feed to preserve bison.

**Response:** As stated on page 1 of the EA, the purpose of the EA is to (1) quickly reduce bison population density in collaboration with other agencies with jurisdiction for bison management on the Kaibab Plateau, and (2) protect park resources and values from the impacts of a steadily growing bison population. The use of supplemental feed would be contrary to NPS policy and would not meet the purpose of quickly reducing the bison population density. In fact, it could improve bison health and increase reproduction, further exacerbating impacts on park resources in the future.

**Concern 51:** One commenter suggested eliminating predator hunts to allow for bison predation.

**Response:** No hunting occurs in Grand Canyon National Park. Nonetheless, a long running study examining cougar prey kill sites (~250 kill site visited) on the North Rim found no evidence of bison predation by cougars. Coyotes are not very likely to be a significant predator of bison either.

**Concern 52:** A commenter suggested the NPS limit off-road travel to times of year when soils are dry to reduce risk of compaction.

**Response:** As described in “Chapter 2: Alternatives” the NPS expects to conduct only a limited amount of off road vehicle travel associated with non-lethal culling (corralling)

activities. The NPS will minimize impacts by considering weather and soil condition when planning capture and removal and any associated off-road travel.

**Concern 53:** One commenter stated that the EA does not include an analysis of introducing bison into more productive habitats so that migratory behavior of the species can be restored.

**Response:** As stated on page 1 of the EA, the purpose of the plan is to (1) quickly reduce bison population density in collaboration with other agencies with jurisdiction for bison management on the Kaibab Plateau, and (2) protect park resources and values from the impacts of a steadily growing bison population. The redistribution of bison to more productive habitat and reestablishing seasonal movements would not result in a reduction in the herd size on NPS lands. Therefore, this approach would not meet the purpose of quickly reducing the bison population density.

### **Alternatives Concept: Public Hunting outside the Park**

**Concern 54:** Commenters expressed concern that hunting outside the park has been ineffective in controlling the population, and the issuance of more permits is necessary.

**Response:** Although hunting outside the park is not within NPS jurisdiction or the scope of the NPS proposed actions considered in the EA, AGFD notes that, prior to the bison moving onto the North Rim of the park, AGFD was able to effectively control the bison population through hunting, for a population estimate of about 100. Once the bison moved onto the park and became less available, hunting became a less effective tool. AGFD has adapted hunting season approaches over the past decade to best address the available bison population with the intent of population reduction. Simply increasing the total number of hunting permits would not be effective if bison are not available to hunters.

### **Alternatives Concept: Hazing and Herding**

**Concern 55:** Commenters provided specific hazing and herding suggestions to move the bison from the park, specifically during AGFD hunting periods, and to discourage them from reentering. Techniques suggested included flashing lights, loud sounds, human-like presence, human pressure, and using helicopters or horses.

**Response:** While bison are difficult to herd, the park may perform limited hazing/herding under certain appropriate circumstances. In these situations, the park may utilize methods such as the use of helicopters. However, NPS anticipates that some methods of herding would be ineffective in this situation and, thus, does not consider using them (e.g., difficult terrain limits the use of horseback riding, heavily forested areas create safety issues; and dog herding is ineffective in moving bison and dangerous for the dogs, as described on page 36 of the EA). In addition, certain hazing methods would have too great of an impact in this area of proposed wilderness because of their impacts on wilderness character (e.g., flashing lights, dog whistles, or moving signs).

**Concern 56:** Commenters raised concerns regarding the use of a helicopter for hazing, noting that hazing techniques may cause bison to jump to their deaths on the Powell Plateau. Commenters also indicated that hazing alone would not be a sustainable strategy.

**Response:** The park will only use helicopters under limited circumstances in locations and in a manner that would not result in bison leaping off cliffs. NPS will carefully evaluate any helicopter use on the Powell Plateau and will consider the input of AGFD in such an effort in order to minimize accidental bison injuries or mortalities. In addition, hazing would not be used as a standalone strategy but would be combined with other reduction tools as described on pages 30-31 of the EA.

### **Alternatives Concept: Tribal Collaboration**

**Concern 57:** Commenters suggested that NPS consult with all tribes associated with the park to determine if they would like to participate, if there are aboriginal hunting rights associated with the tribes, and if the tribes feel that bison are affecting archaeological sites.

**Response:** The park has and will continue to consult with all the traditionally associated tribes regarding their interests in live animals, participating in lethal culling, and receiving bison meat and parts. There are no tribal treaties with reserved aboriginal hunting rights for Grand Canyon. The park has and will continue to consult with tribes regarding bison impacts on archaeological sites and other cultural resources.

### **Alternatives Concept: Prescribed Burning**

**Concern 58:** Commenters suggested the use of prescribed fire as a tool to manage bison movement and habitat.

**Response:** As stated on page 1 of the EA, the purpose of the plan is to (1) quickly reduce bison population density in collaboration with other agencies with jurisdiction for bison management on the Kaibab Plateau, and (2) protect park resources and values from the impacts of a steadily growing bison population. The use of prescribed fire would improve bison habitat and redistribute them on the landscape but would not result in a reduction in the herd size on NPS lands. Therefore, prescribed fire would not meet the purpose of quickly reducing the bison population density.

### **Affected Environment: Special Status Species**

**Concern 59:** A commenter noted that Kaibab bladderpod (*Lesquerella kaibabensis*, now *Physaria kaibabensis*) may occur in the Basin within the North Rim study area, and the park should reexamine to see if it needs to be studied in the EA.

**Response:** In summer 2016, surveys were conducted by Grand Canyon National Park's Vegetation Program and University Affiliated Botanists in the Basin of the North Rim, and Kaibab bladderpod (*Physaria kaibabensis*) was not found.

**Concern 60:** A commenter indicated that the statement in the EA about the California condor population being experimental throughout Arizona is not entirely accurate and should be changed to reflect that the northern boundary for this population stops at Interstate 15; California condors north of Interstate 15 are endangered.

**Response:** As the commenter notes, the experimental population has specific identified boundaries within Arizona. For the purpose of this EA, the action area within the park is completely within the experimental population boundaries; therefore, all condors within park boundaries are protected as a threatened species. The text on page 56 regarding the status of the California condor has been updated to clarify this status.

**Concern 61:** A commenter noted that the Arizona Strip lands do not contain Mexican spotted owl-designated critical habitat, and the reference should be corrected.

**Response:** The reference on page 54 of the EA to “BLM-administered lands” has been deleted.

**Concern 62:** One commenter noted that the sentence on page 53 on Endangered Species Act consultation is misleading—and that the Endangered Species Act does not require that impacts on all federally listed, threatened, or endangered species be examined, but it does require that any action authorized, funded, or carried out by such agency does not jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species. The commenter asks that the sentence be revised to clarify the requirements of the act.

**Response:** The EA is referring to relevant laws and other policies related to the NPS duty to examine impacts to a variety of special-status species. This includes the requirement in Section 7 of the Endangered Species Act for federal agencies to examine the impacts of their actions on federally listed threatened and endangered species to ensure they are not likely to jeopardize the continued existence of those species or adversely modify or destroy critical habitat. Although not specifically explained in the EA, the sentence is still accurate as written.

**Concern 63:** One commenter noted that the Kaibab squirrel also inhabits ponderosa pine forests on the Uinkaret Plateau of the Arizona Strip (not just on the Kaibab Plateau).

**Response:** The text in question (see page 13 of the EA) was not intended to imply that the Kaibab squirrel exclusively inhabits the Kaibab Plateau. Rather the text was meant to indicate that the species only occupies ponderosa pine forests, including those of the Kaibab Plateau and the action area. Because this area is the focus of the EA analysis, and the locations noted by the commenter are outside the action area, they are not mentioned.

**Concern 64:** One commenter noted the potential for impacts on special-status species is not supported with adequate proof, and the EA fails to provide adequate data for special-status species to determine the likelihood of impacts.

**Response:** The descriptions of the current and potential effects on special-status species in “Chapter 3: Affected Environment” and “Chapter 4: Environmental Consequences” are based

on best available information, including a variety of reports; observations and opinions of park and agency subject matter experts; and consultations with other agencies. These descriptions meet the requirements to use information of “high quality” and professional integrity (40 CFR 1500.1; 1502.24), and that when information/data are limited, to summarize existing credible scientific evidence and to predict impacts based on this evidence (40 CFR 1502.22(b)). While NPS and CEQ NEPA guidance encourages agencies to be focused and concise in their NEPA analyses, the Biological Assessment prepared to complete ESA section 7 consultation with USFWS contains additional information. That Biological Assessment and the USFWS concurrence with the NPS determinations have been posted to: [https://parkplanning.nps.gov/grca\\_bison\\_ea](https://parkplanning.nps.gov/grca_bison_ea).

### **Affected Environment: Cultural and Tribal Resources**

**Concern 65:** Commenters suggested necessary information about bison population demographics (e.g., age structure, sex ratio, population growth rate, genetics, sub-herds and social groups, movement patterns, and disease) is missing and needed to fully understand the impacts of management actions on bison.

**Response:** The EA was prepared to be consistent with NPS and CEQ NEPA guidance to remain focused on important issues, to address issues at a level of detail commensurate with the importance of impacts, and to provide sufficient information to conclude that the action would not result in significant impacts to the human environment. Because age structure and sex ratio are not issues that were raised during scoping, and NPS is clear in chapter 2 that it will take steps to manage for appropriate age classes and sex ratios as part of the initial reduction effort, this information was not presented. Projected population growth is described throughout the EA, and by its very nature, the population growth rate will be changed as a result of taking action to reduce the herd. Consistent with the guidance noted above, additional information and analysis beyond what is presented in the EA is not needed as the herd will still reproduce and grow during and after initial reduction so impacts on the bison herd will not be significant, as noted in the FONSI. Bison genetics and disease are explicitly addressed in the “Issues and Impact Topics not Retained for Additional Analysis” section of chapter 1. Sub-herds, social groups, and movement patterns are all described in the bison section of chapter 3 and analyzed, as appropriate consistent with NPS and CEQ NEPA guidance.

**Concern 66:** Commenters suggested that bison should be considered a contributing factor to the North Rim Entrance Road Corridor Cultural Landscape, regardless of their absence during the period of significance for cultural landscapes.

**Response:** Bison were not grazed in Little Park Meadow and along the North Rim Entrance Road during the historic period. The two locations within the park where attempts were made to keep and graze bison were the Walhalla Plateau/Greenland Lake area and Uncle Jim Point. Both locations are unassociated with the North Rim Entrance Road and are not part of that cultural landscape area.

Objects that contribute to a National Register nomination as contributing elements must be part of the historic context under which the property is nominated. Bison were not associated



with the historic context, the period, place, or events that make the North Rim Entrance Road eligible for the National Register and therefore cannot be considered contributing elements of the district and cultural landscape.

### **Affected Environment: Bison-Affected Vegetation**

**Concern 67:** One commenter noted that the photographs used in the “Bison-Affected Vegetation” affected environment section need more information, including a more precise timeframe of when the pictures were taken.

**Response:** Although the exact dates of the pictures are unknown, the general seasonal timeframe of each picture is similar based on the presence of green vegetation (i.e., grass species).

**Concern 68:** One commenter noted that the EA does not include any species-specific information about plants preferred by bison, including distribution, abundance, vitality, and productivity since bison occupied the park. The commenter also noted that the EA does not include information on other factors, such as recent changes in precipitation patterns or amount, ambient temperatures, or plant pathogens that may have contributed to a reduction in vegetation.

**Response:** Although the EA does not assess impacts at the plant species-specific level, it assesses impacts at the plant community level (i.e., meadows and grasslands, shrublands, and wetland associated vegetation). However, page 48 of the EA identifies specific species that are found in these communities like blue and black gramma, big galleta, and others. Similar species are identified for the other vegetation community types. The EA describes the types of vegetation communities in which the park has documented disproportionate use by bison (pages 46-50). The vegetation community is the appropriate level for assessing impacts by bison, as the bison have not been documented selecting for particular species within a plant community. Page 84 of the EA describes the types of impacts that NPS has observed and expects to increase associated with a growing bison population. Upon implementation of the preferred alternative and associated monitoring, NPS will likely collect some species-specific information that may assist in the planning for long-term, adaptive management, which is outside the scope of this EA.

While changes in temperature and precipitation, issues of air quality, exotic or invasive species, and pathogens/disease could be other factors affecting park resources, those issues were not raised during scoping, which is why they were not discussed in the EA. Whatever their effects, it is clear that bison, cause impacts. Park subject matter experts note that these other factors do not result in the wallows and soil disturbance in the meadows, bison trails and soil disturbance throughout the North Rim, vegetation loss from grazing, water consumption and trampling of vegetation and soils at watering sites, defecating and urinating in the water, and trampling archeological sites. The purpose and need for this plan accordingly focuses on bison.

**Concern 69:** One commenter disagreed that native vegetation on the North Rim could experience beneficial impacts from bison because bison are nonnative to the area. The commenter requested that this beneficial impact analysis be removed from the EA.

**Response:** Regardless of opinions regarding nativeness, this statement is appropriate because compensatory additive growth in plants subjected to herbivory may occur wherein plant physiology is modified favorably for overall seasonal plant growth and total yield (McNaughton 1983). In some landscapes, bison are recognized as keystone species, where their herbivory, in concert with other ecological processes such as fire, can increase overall nitrogen cycling through vegetation systems, and result in increased vegetation diversity and spatial heterogeneity (Knapp et al. 1999). For example, aboveground productivity of vegetation grazed by bison was higher than ungrazed vegetation at Yellowstone National Park (Frank and McNaughton 1993).

### **Affected Environment: Visitor Use and Experience**

**Concern 70:** Commenters stated that the EA fails to provide meaningful visitor use data for the North Rim and information about how bison may have affected visitor use.

**Response:** Issues related to overall visitation to the North Rim as a result of a growing bison population and/or initial bison herd reduction were not raised previously, which is why only limited visitor use data were presented in the EA. Rather, visitor use issues raised through scoping were focused on the potential for closures to affect access to particular areas of the North Rim during implementation of the preferred alternative. As a result, consistent with CEQ regulations and NPS NEPA guidance, NPS focused its analysis on the most important issue and did not amass needless detail regarding an issue that was not raised during scoping. Additionally, NPS considers it speculative to say that bison abundance is driving visitation to the North Rim, and the commenter provides no evidence of that this might be the case. Regardless, NPS will consider ways to improve understanding of visitor perceptions of bison in the park as a way to inform any long-term management planning, which is outside the scope of this EA.

### **Affected Environment: Wilderness Character**

**Concern 71:** A commenter asked if the presence of bison would contribute to the park's natural wilderness character.

**Response:** Guidance regarding wilderness character considerations (e.g., Keeping it wild 2: an updated interagency strategy to monitor trends in wilderness character across the National Wilderness Preservation System, available at [https://www.fs.fed.us/rm/pubs/rmrs\\_gtr340.pdf](https://www.fs.fed.us/rm/pubs/rmrs_gtr340.pdf)) suggests that "The Natural Quality is preserved when there are only indigenous species and natural ecological conditions and processes, and may be improved by controlling or removing non-indigenous species or by restoring ecological conditions." As noted in response to other concerns (e.g., Concern 72) there are differences of opinion about the nativeness and/or historic distribution, abundance, and temporal occupancy of bison on the Kaibab Plateau. Therefore, impacts could be beneficial or adverse depending on whether or not bison are

considered native species in this part of the United States, a determination which is outside the scope of this EA.

### **Affected Environment: Bison**

**Concern 72:** There were multiple comments on the nativeness of bison in the vicinity of the North Rim. Some commenters supported the position that the bison are exotic hybrid animals that are descendants of those bred with cattle in the early twentieth century, and that there is extensive genetic introgression with cattle genes. Some commenters presented information that bison were not present on the North Rim, although they were abundant more generally in the western United States. Commenters further noted that the introduction of these bison to the park was never intended; they escaped from the HRWA where they had been managed.

One commenter questioned the findings offered by the Wakeling genetic study that although some mitochondrial cattle DNA remains in the herd's genetic makeup, there are low levels of cattle chromosomal DNA, the source of heritable traits, and therefore the amount of cattle introgression is very low. The commenter stated that because studies have not been done to examine phenotypic traits, heredity, or behavior in this herd, it is unknown whether the bison are hybrids and noted that this herd should not be considered a conservation herd. A commenter also suggested that the proper scientific name for this herd, because they are hybrid, should be *Bison X Bos taurus Linnaeus*, and the EA should reflect this.

In support of nativeness and the appropriateness of the bison herd on the North Rim, commenters provided sources for the history of the bison in the western United States (*Westward Expansion* by Ray Billington 1967). Commenters noted that cattle introgression is very common with many bison herds and should not be an issue. Another commenter noted that bison are a "near-threatened" species according to the IUCN report, and USFWS should decide whether this is a subspecies of bison that should be protected. Commenters alleged that tribal oral histories suggest bison may have been in the area and should be considered to be native.

**Response:** Throughout the NEPA review for bison management at the park, it has become clear that the science of bison in this area is less developed than the science of bison elsewhere in their historical range. Despite a number of peer-reviewed studies on the nativeness of bison in this part of the United States, there are differences of opinion regarding whether or not the Kaibab Plateau is within the historical range of plains bison, and, therefore, differences of opinion about the nativeness and/or historic distribution, abundance, and temporal occupancy of bison on the Kaibab Plateau. However, the NEPA process and EA are not intended to, nor do they need to, address such differences of opinion and settle the question of bison nativeness and historical range.

Rather, NPS is committed to continued dialogue with American Indian tribes, other federal and state agencies, and other stakeholders, as appropriate, regarding any long-term, landscape-scale, ecological and cultural role of bison across the multijurisdictional Kaibab Plateau. Such

dialogue would then inform long-term planning for bison management, which is outside the scope of this EA.

**Concern 73:** Commenters requested more information about bison population modeling, seasonal distribution, and the extent of bison movement in the park. These commenters requested that the bison population model be included as an appendix in the EA.

**Response:** Bison movement and distribution relevant to the analyses in this EA are described in the affected environment of the EA (see pages 39 to 41, including figure 5) and are focused on the issues discussed in chapter 1. The model has been posted to:

[https://parkplanning.nps.gov/grca\\_bison\\_ea](https://parkplanning.nps.gov/grca_bison_ea)

**Concern 74:** One commenter stated that NPS should work with USFWS to conduct a genetic review of the herd to determine if it is a subspecies subject to the Endangered Species Act.

**Response:** This EA focuses on reducing the House Rock bison herd to a level that would protect park resources and values. As such, any review of the herd under the Endangered Species Act is outside the scope of this NEPA review. However, NPS will continue to engage in dialogue with American Indian tribes and other federal and state agencies to assess the ecological and cultural roles of bison across the multijurisdictional Kaibab Plateau and to understand the genetics of the animals as they relate to potential future management of the herd.

**Concern 75:** A commenter stated that although mountain lions are described as part of the affected environment, the EA lacks any discussion on their potential predation of bison.

**Response:** A long running study examining cougar prey kill sites (~250 kill site visited) on the North Rim found no evidence of bison predation by cougars.

## **Impacts: Cultural and Tribal Resources**

**Concern 76:** A commenter asked about the active management strategies that would be used to protect cultural resources on the Kaibab National Forest. The commenter further questioned how active management would minimize impacts on sensitive resources. The commenter asked if a Class III survey has been completed for the cultural sites on USFS lands.

**Response:** The Kaibab National Forest does not have an “active management strategy” in place at this time to protect cultural resources that could be affected from an increased number of bison that may enter the forest from the park. However the agency is working with AGFD officials to identify/develop environmentally and culturally suitable locations for human-made water sources on USFS lands along the USFS/NPS boundary that would potentially draw bison away from natural waters, thereby protecting sensitive resources (including any cultural resources) that might be located at these natural water sources. Additionally, the Kaibab National Forest is collaborating with the AGFD on future management strategies to protect

cultural resources within the HRWA, once a reduced herd of bison is relocated to the wildlife area.

The Kaibab National Forest has completed intensive cultural resource surveys along portions of the USFS/NPS boundary associated with previous agency undertakings. However, a survey has not been completed for all adjacent areas or across the Kaibab Plateau at large.

**Concern 77:** Commenters questioned what mitigation measures would be used to protect cultural and tribal resources in the park.

**Response:** Please see page 34 for mitigation measures proposed related to bison management activities. Specific mitigations for the cultural landscape have also been added to the EA via errata.

**Concern 78:** One commenter questioned whether the presence of exotic species under alternative 1 would contribute cumulative adverse effects to the cultural landscape and suggested that the topic be discussed in the EA.

**Response:** The presence of exotics, which does have the potential to adversely affect the cultural landscape, is not an action subject to cumulative impacts analysis. Rather, the potential to create conditions that facilitate the spread of non-native species, as described in the “Bison-Affected Vegetation” analysis, is primarily related to the size of the bison population expected under alternative 1. Therefore, text has been added to the alternative 1 cultural landscape impact analysis and conclusion on page 128 and 129 to acknowledge this.

**Concern 79:** One commenter questioned how prescribed fires and/or vegetation/habitat restoration would affect cultural resources.

**Response:** Although both the park and the Kaibab National Forest conduct cultural surveys prior to using prescribed fire and every effort is made to protect fire-sensitive archeological sites from damage due to fire, damage, though infrequent, does occasionally occur. As such, the archeological resource cumulative analysis in the EA has been updated to reflect this.

**Concern 80:** One commenter questioned the accuracy of the estimate included in the EA for the number of archeological sites in the study considered at risk from adverse impacts by bison activities. The commenter suggested that fewer than 10% of the sites surveyed should be adversely affected, while the document indicates that 50% of sites would be affected.

**Response:** The archeological resource analysis of the EA has been updated to clarify that two different studies were used to generate the numbers in question. The first study was an initial investigation to determine whether bison were affecting archaeological sites on the North Rim and to determine what kinds of effects were occurring. Twenty-four sites were examined. Of the 24, two sites (or 8.333%) of sites in the 2014 study showed adverse effects from bison activities (NPS 2014c).

The second study involved a literature review and spatial (GIS) modeling of archaeological site types and their vulnerability to bison effects in the bison use range. From this literature

review and GIS modeling, sites most at risk from bison disturbance are those most sensitive to ground disturbance, such as artifact scatters (historic and prehistoric), roasting features, and other archeological site types that consist of surface remains that are not well-secured to the ground. Of the 307 sites reviewed in this study, 50% (153 sites) are types that are vulnerable to the effects of bison. Monitoring is ongoing to establish the actual number of sites being affected by bison presence and to refine which site types are most at risk.

**Concern 81:** One commenter stated that the document fails to provide a site by site analysis of bison impacts on the cultural and tribal sites in the park and further stated that evidence of bison presence and impacts should be given for each site. Additionally, the commenter suggested that bison impacts on tribal and cultural resources should not necessarily be considered because bison are believed to be natural and native to the area.

**Response:** As described on page 58 of the EA, NPS conducted its first bison effects monitoring in 2014 (NPS 2014c). The first study was an initial investigation to determine whether bison were affecting archaeological sites on the North Rim and to determine what kinds of effects were occurring. Twenty-four sites were examined. Of the 24, two sites (or 8.333%) of sites in the 2014 study showed adverse effects from bison activities (NPS 2014c).

As noted in response to Concern 80, the text on page 58 of the EA has been clarified to indicate the results of a second study that involved a literature review and spatial (GIS) modeling of archaeological site types and their vulnerability to bison effects in the bison use range.

As noted in response to previous comments, there are differences of opinion regarding the historic range of bison. Nonetheless, regardless of the nativeness of the bison, Federal laws and NPS policy direct management and preservation of cultural resources in the national park system. Among these laws and policies, the National Historic Preservation Act of 1966 states in part (54 U.S.C. 306102(b)(2)) that an agency's historic preservation program shall ensure that "historic property under the jurisdiction or control of the agency is managed and maintained in a way that considers the preservation of their historic, archeological, architectural, and cultural values." Further, NPS *Management Policies 2006* (65:5.3.1) guide NPS to "Employ the most effective concepts, techniques, and equipment to protect cultural resources against theft, fire, vandalism, overuse, deterioration, environmental impacts, and other threats without compromising the integrity of the resources." As such, monitoring is ongoing to establish the actual numbers of sites being affected by bison presence and to refine which site types are most at risk. As investigations continue, trends and comparisons of site disturbances and vulnerabilities will become more resolved. Data from these continuing studies and field examinations will be used to inform any long-term bison management planning, which is outside the scope of the EA.

## **Special Status Wildlife Species**

**Concern 82:** One commenter noted that California condors are very curious and may be attracted to areas of human activity, so the statement in the EA that condors may avoid humans could be inaccurate. Additional comments on impacts on condors include changing

the term “fresh meat” on page 108 to carrion, considering the use of non-lead ammunition to facilitate conservation of the species, and disclosing benefits that condors may receive from scavenging gut-piles.

**Response:** While at times California condors may be attracted to areas of human activity, they also could potentially be disturbed by human activity, especially with loud disruptions such as gun fire and vehicles. Because the actions associated with this project are not expected to result in a large increase in human activity in concentrated areas beyond what currently occurs on the North Rim, NPS does not anticipate frequent condor attraction to project locations. However, the NPS analysis considers the potential for condor attraction, and appropriate mitigation requirements (see page 18) have been included in the project to protect condors and minimize impact if this behavior does occur.

Regarding use of the term fresh meat, this information comes from the source cited (NatureServe 2015) in chapter 3.

A mitigation requirement of this project is that lead-free ammunition will be required. This is first stated in the EA on page 24 and again throughout the document. The EA also expresses the beneficial impact on condors throughout the document but specifically on page 117, where it includes the statement: “there would be short-term, beneficial impacts because lethal culling activities would result in an increased incidence of gut piles and other sources of carrion left from bison carcasses.”

**Concern 83:** Commenters requested additional information regarding Mexican spotted owls, including the rationale for stating why the impact on the Mexican spotted owl would not affect reproduction or survival and clarifying pre-dawn or dusk culling activities when the owls are actively foraging.

**Response:** Please refer to the Biological Assessment for additional details pertaining to Mexican spotted owls (pages 21-26). All known Mexican spotted owl breeding, nesting, and fledging activity occurs below the rim of the canyon and are well outside of the action area. Rarely, Mexican spotted owls have been observed foraging above, but close to the rim of the canyon. Additionally, all actions associated with this EA will not occur less than 1,200 feet from Mexican spotted owl Protected Activity Center boundaries. This allows a protective buffer from all Mexican spotted owl breeding and foraging areas below the rim, and in some cases above, regardless of the time of day. As a result Grand Canyon National Park determined there may be impacts to Mexican spotted owls, but we do not anticipate these impacts to adversely affect the species.

**Concern 84:** A commenter requested that the EA reference state laws because the definition of special-status wildlife species includes state-listed species.

**Response:** The text of the EA has been updated per the comment.

**Concern 85:** A commenter requested that NPS provide information about why the alternatives would not affect the Kaibab squirrel and why bison would not use sentry milk-vetch habitat.

**Response:** Please see appendix A of the EA for an explanation as to why these species were not further analyzed for this project. Grand Canyon National Park has received new information showing some potential for bison impacts in sentry milk-vetch locations on the North Rim. Following the Fuller Fire of 2016, bison have been observed on the Walhalla Plateau and recent telemetry data (winter 2017) shows them in areas of sentry milk-vetch habitat. Sentry milk-vetch is found in remote locations of the North and South rims. It is very isolated to the extreme canyon edge preferring sparse Kaibab limestone habitat. Within the action area, sentry milk-vetch is only found on the Walhalla Plateau. Although bison have recently been documented on the plateau, recent observations indicate bison are not directly impacting the milkvetch sites (i.e., no trampling, wallows, or feces were observed at the sites). In addition, no actions are proposed in areas containing sentry milk-vetch, and the EA includes the potential to fence sensitive plants as a mitigation measure. Therefore, the proposed actions are not anticipated to negatively impact the sentry-milkvetch, and a reduction of the bison herd and localized fencing may have beneficial impacts.

**Concern 86:** A commenter indicated that livestock grazing has not affected the northern goshawk very much over a long period, citing a paper by Reynolds et al. 1999 titled “Long-Term Demography of the Northern Goshawk in a Variable Environment.” As a result, the commenter questioned the statement in the EA that “a reduction in the bison herd may benefit this species” and requested this statement be retracted.

**Response:** Livestock grazing has been linked to goshawk habitat and prey reductions in Utah and Nevada (see Graham, R. T., R. L. Rodriguez, K. M. Paulin, R. L. Player, A. P. Heap, and R. Williams. 1999. The northern goshawk in Utah: habitat assessment and management recommendations. Gen. Tech. Rep. RMRS-GTR-22. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 48 pp). Therefore, it can be assumed that similar impacts from bison grazing would occur in the action area, and the analysis in the EA has been updated to include this citation. However, the analysis also caveats the conclusion because adverse impacts on goshawk would be based on whether they are prey limited as a result of bison grazing.

Additionally, NPS subject matter experts reviewed the Reynolds et al. 1999 paper, and determined it is a 20-year study related to the effects of fire management, drought, and timber harvest on goshawks that does not examine the effects of livestock grazing; therefore, it does not offer insights into potential effects of bison grazing.

**Concern 87:** A commenter requested that a distinction be made between short- and long-term effects of prescribed fire on Mexican spotted owls and northern goshawks in the cumulative impacts discussion. The commenter asserted that short-term effects would be adverse, while long-term effects would be beneficial, once the vegetation has recovered and increased post-fire.

**Response:** NPS has modified its cumulative impacts analysis to disclose that short-term impacts from prescribed fire would be adverse from reductions in prey habitat, but that over the long term, prey habitat would improve and provide benefits to both goshawks and owls.



## **Wildlife or Wildlife Habitat (not including bison)**

**Concern 88:** A commenter stated that the EA fails to provide in-depth information on the wildlife species potentially impacted by bison.

**Response:** Similar to the approach used for assessing impacts to bison-affected vegetation, the NPS examined impacts to classes of wildlife rather than specific species (with the exception of special status wildlife species). These wildlife classes are described on pages 51-53 of the EA and include some specific species within each class. For example, under the mammal class, the EA lists several small mammal species such as deer mice and western harvest mouse, among others. The NPS does not monitor all species of wildlife within park units, with the exception of special-status species. However, the EA relies on projected impacts from bison on habitat communities and the relationship of that habitat to other wildlife species. It also examines the adverse or beneficial impacts high concentrations of bison can have on other species life requisites (e.g., food availability, breeding habitat; see pages 97-99). The NPS has determined that this is an appropriate level of analysis for assessing impacts of a high population of bison to other wildlife species.

## **Bison-Affected Vegetation**

**Concern 89:** One commenter suggested reviewing information from a USFWS website related to the effects of grazing ungulates on ecosystems: (<https://www.fws.gov/invasives/staffTrainingModule/methods/grazing/impacts.html>).

**Response:** Upon reviewing the recommended website, which addresses the effects of herbivory, physical impacts (e.g., hoof action, wallowing), and deposition (e.g., nutrient cycling) of grazing ungulates, the National Park Service believes the impact analysis presented in the EA is consistent with the information on the webpage. In addition, the EA identifies the need for long-term habitat monitoring that could include reference conditions from grazed and un-grazed areas on landscapes of the Kaibab Plateau to better understand the role of bison as a grazing ungulate on the ecosystems of the North Rim.

**Concern 90:** One commenter stated that the EA mentions increased pressure on shrub habitats but does not analyze the concept in detail in the effects of Alternative 1. The commenter suggested either removing the information on shrub habitats or adding it to the analysis.

**Response:** Page 84 of the EA briefly describes the potential impacts of an increasing bison herd on shrub habitat. Although NPS has not studied impacts from bison on shrub habitat, it has observed bison using these areas. Per CEQ and NPS guidance, an EA is meant to be a brief and concise document at a level of detail limited to that necessary to demonstrate that the proposed action would not result in significant impacts. The brief analysis of impacts on shrubs is consistent with this guidance.

**Concern 91:** Commenters suggested that the NPS further acknowledge fire impacts; one commenter requested that the EA include a sentence in the vegetation impact analysis acknowledging the influence of exotic species as increasing susceptibility of North Rim

forests. Another commenter discussed the impacts of bison on fire regimes, specifically noting that bison would prevent the fire management program from operating successfully.

**Response:** Regarding the impacts of bison on fire regimes, the EA briefly discusses the potential impacts of bison on fire regimes on pages 89 and 139, as related to bison-affected vegetation and wilderness character, respectively. It is expected that under the no action alternative, increased bison grazing would reduce the amount of fine fuels thereby reducing the effect of fire in grassland and meadow habitats. Under the proposed action, it is expected that the reduction of bison would eventually result in impacts similar to those experienced prior to bison moving onto the North Rim. In terms of the effectiveness of the fire program, it will depend on the vegetation type to which it is being applied (for example, there are different approaches taken to managing the ponderosa forests compared to the spruce-fir habitat), and objectives of the prescribed treatment.

**Concern 92:** One commenter stated that conclusions in the EA regarding bison overgrazing, trampling, and wallowing and facilitating the spread of exotic plant species are not adequately substantiated by data specific to the park or by peer-reviewed literature. A commenter suggested that NPS should further analyze bison impacts on park resources before proceeding with lethal bison removal. Another commenter also suggested that NPS look at impacts in the context of other natural and anthropogenic factors that could be causing changes in vegetation characteristics to understand the contribution of bison to these effects.

**Response:** Although the commenter suggested that other natural and anthropogenic factors could also be impacting park resources, these issues were not raised during scoping and were, therefore, not included in the EA. Furthermore, the commenter provides no evidence that these factors, not bison, could be causing impacts. While NPS recognizes many natural and anthropogenic factors could affect similar resources as those affected by bison, park subject matter experts note that these other factors do not result in the wallows and soil disturbance in the meadows, bison trails and soil disturbance throughout the North Rim, vegetation loss from grazing, water consumption and trampling of vegetation and soils at watering sites, defecating and urinating in the water, and trampling archeological sites. Even if the case could be made that these other factors have related impacts that should be examined and addressed, the courts have routinely ruled that it is up to the agency when drawing lines about decisions that need to be made; how to handle potentially related, yet discrete, issues; and whether or not to explore potentially related subjects in more detail (see *Grunewald v. Jarvis*, 930 F. Supp. 2d 73 (D.D.C. Mar. 14, 2013)).

## **Wilderness Character**

**Concern 93:** Commenters disagreed with the potential use of vehicles, including helicopters, and installation of structures (e.g., corrals) in recommended wilderness. Some commenters also expressed concern about the effects on the untrammeled character of the recommended wilderness and impacts during winter when the North Rim is quietest. In addition, commenters noted the lack of a Minimum Requirements Analysis or other explanation of why these activities are needed in recommended wilderness areas.

**Response:** The park will minimize the use of any motorized vehicles in this area of proposed wilderness; very few helicopter trips would be authorized and only under extraordinary circumstances, and any other vehicles will only be allowed to operate on existing roads. Prior to the use of any motorized equipment, the park will perform Minimum Requirement Analysis and follow strict guidelines therein.

## **Other Park Resources**

**Concern 94:** A commenter suggested that NPS should analyze environmental justice in detail because impacts would be beneficial.

**Response:** CEQ regulations and NPS NEPA guidance encourages agencies to focus on significant environmental issues and to dismiss other issues with as much detail as needed to demonstrate there is no potential for significant adverse impacts. A detailed dismissal of environmental justice is included in the EA on page 13, and this dismissal is consistent with guidance in the NPS NEPA Handbook for the following reasons: (1) this issue was not raised as a point of contention by the public during scoping, (2) impacts related to environmental justice are beneficial and are not central to the proposal, and (3) detailed analysis is not needed for the decision-maker to make a reasoned choice between alternatives.

**Concern 95:** One commenter suggested the EA analyze impacts on visitor use on adjacent lands.

**Response:** Based on discussions with USFS, there could be some impacts on the Kaibab National Forest visitors during the initial bison herd reduction. These include the potential for increased opportunities for hunting and viewing bison and an increased potential for bison-human and bison-vehicle interactions. This could have both beneficial and adverse effects on visitors to USFS lands adjacent to the park similar to those described for park visitors beginning on page 150 of the EA. This information has been added to the EA.

## **General Resources**

**Concern 96:** One commenter stated that the EA needs to better acknowledge potential adverse impacts of the smaller bison herd on other resources. Another commenter indicated monitoring is needed to understand the impacts of bison on other resources.

**Response:** The EA does acknowledge that bison will have ongoing impacts to park resources and values; however, the basis for the impact analysis is a comparison to current conditions, and consistent with CEQ and NPS guidance, the EA focuses on the important issues related to the benefits expected from the initial reduction of bison to less than 200 animals on the North Kaibab Plateau as described in “Chapter 4: Environmental Consequences.” However, how and how quickly park resources will respond to fewer bison on the landscape is uncertain. Therefore, NPS will implement a monitoring program to evaluate how resources are responding to bison reduction actions. NPS will work with its partners to identify desired conditions for the resources and would use the monitoring information to inform future

decisions concerning additional bison management actions. For more information see page 33 of the EA.

## Adjacent Lands

**Concern 97:** A commenter suggested the NPS analyze impacts of taking action on Kaibab National Forest resources because bison are affecting and will continue to affect resources on adjacent lands.

**Response:** While the commenter requested additional information be included in chapter 3 to describe resources on adjacent lands, such information has been briefly summarized, where appropriate, as part of the analysis of impacts to adjacent lands in chapter 4. As noted in the “Area of Analysis” section of chapter 4 of the EA, the continued increase in the bison population under alternative 1 and management actions proposed under alternative 2 could cause more bison (compared to current conditions) to move on to USFS lands adjacent to the park. Therefore, when relevant, the impact analysis conclusions in chapter 4 address the potential for indirect impacts on adjacent areas of the Kaibab National Forest.

## Visitor Use and Experience

**Concern 98:** Commenters felt that the opportunity to view bison and non-lethal capture operations should be included as a beneficial impact to visitor experience. One commenter also felt the wilderness recreational value of encountering a bison in the backcountry should be acknowledged.

**Response:** The conclusions of alternatives 1 and 2 (see pages 149 and 152) both acknowledge the benefit that the opportunity to view bison will have for visitors, although that opportunity will be decreased under alternative 2. With regard to wilderness recreational value, the National Park Service has assessed impacts related to relevant elements of wilderness character (untrammelled, natural, solitude or primitive and unconfined recreation), consistent with interagency guidance (e.g., *Keeping it Wild 2*). As such, the “recreational value” of seeing wildlife was addressed in the analysis of visitor use and experience and not wilderness. Due to safety concerns related to staff, visitors, and bison themselves, capture operations will not be open for public viewing, and therefore, will not be a visitor experience during initial reduction efforts.

**Concern 99:** Commenters disagreed with the discussion of potential adverse impacts from the reduced potential to view bison in the park, noting it is not the NPS’s mission to provide habitat for what the commenters consider to be a nonnative species.

**Response:** As stated on page 11 of the EA, visitors have become accustomed to seeing the bison herd on the North Rim in recent years, and many enjoy seeing bison regardless of the nativeness question. Therefore, the impacts of both a growing bison herd and a reduced bison herd are described in detail in chapter 4 of the EA, and any actions that result in a reduction of the herd or that limit access to bison viewing have the potential to adversely affect the

experience of those visitors who enjoy seeing bison, regardless of the nativeness question, and giving consideration to the purpose of the park and the NPS mission.

**Concern 100:** One commenter suggested the EA does not adequately analyze negative public perception that may result from hazing, herding, and lethal/non-lethal culling and should better acknowledge the mitigation associated with conducting lethal culling primarily during the visitor off-season. Another commenter stated that no specific data documenting any reported visitor issues attributable to bison are disclosed in the EA; specifically, there is no bison-vehicle collision data presented. The commenter suggested that without such data, it is impossible for the public to assess the severity of the alleged impacts of bison on visitor use and experience.

**Response:** As noted on page 147 of the EA, the impact analysis for visitor use and experience focuses on the types of visitor uses that could be affected as a result of the expected size of the House Rock bison herd and the effects on visitor use related to bison reduction actions. While the NPS recognizes that some people will have negative perceptions of the proposed management actions, these sorts of possible psychological impacts are not within the scope of a NEPA review and were not included (see, e.g., *Grunewald v. Jarvis*, 776 F.3d 893 (D.C. Cir. 2015))

The visitor use and experience issues related to bison-human and bison-vehicle interactions described in the EA (see page 11) were raised as issues during scoping and it was determined they should be carried forward for analysis. Although limited quantitative data exist, the affected environment and impact analysis is based on best available information from park staff, including a 2014 report on bison management activities (NPS 2015a) that documented the number of bison-vehicle collisions that resulted in bison deaths (seven) and observations of park subject matter experts regarding bison use of popular backcountry areas. The National Park Service recognizes this could be an area where more information could inform future management decisions, which are outside of the scope of this EA, and may consider a visitor survey in the future.

## **Water Resources in the Karst Landscape**

**Concern 101:** One commenter requested that language about soil quality and soil bulk density be moved from the water resources section to the soils section because they are not water resources. The commenter stated that soil aeration and erosion are not water resources issues.

**Response:** The soil impacts these mitigation measures are intended to address are directly related to concerns about turbidity of water resources, flow paths and recharge in the karst landscape, and general water quality. Therefore, no change has been made to the EA.

**Concern 102:** A commenter stated that the EA does not provide data on changes in water turbidity, recharge rate, erosion, soil instability, water percolation rates, and water quality or annual precipitation on the North Rim in areas used by bison, which should be provided for the analysis of effects. The commenter noted that the park should have monitoring data from both pre- and post-bison return to the North Rim area to provide evidence of changes to water

characteristics that are attributable to bison. The commenter further stated that without this data, NPS is simply speculating about impacts from bison on water resources.

**Response:** As noted in previous response to comments, the current and potential effects of bison are described in detail in “Chapter 3: Affected Environment” and “Chapter 4: Environmental Consequences” of the EA. These descriptions are based on best available information, including a variety of site-specific reports and papers; reports and papers relevant to the effects of other large herbivores on resources in similar environments; observations and opinions of park and agency subject matter experts; and consultations with other agencies and tribes.

## **Bison**

**Concern 103:** A commenter indicated that NPS is inconsistent in its discussion of bison genetics, noting that the EA discusses the potential for the herd to suffer genetic decline over time, considers how to protect the genetic diversity of the herd, yet the topic is dismissed. The commenter also questions if best available science has been considered. Another commenter questioned why bison genetics are included in the cumulative impacts, because long-term changes in genetic make-up of the herd would contribute to the cumulative scenario.

**Response:** Applying the guidance in the NPS NEPA Handbook regarding issues to retain versus issues to dismiss from further analysis, NPS concluded that bison genetics are not a significant issue. While one test for the importance of an issue is whether or not the issue is a big point of contention with the public, in this case, based on public comments received during scoping and on the EA, cattle gene introgression was the big point of contention, not the impacts of the actions proposed by NPS. The issue of cattle gene introgression, however, is a long-term management issue, and is, therefore, outside the scope of this EA, which focuses on NPS action to quickly reduce the House Rock bison herd on the North Rim to protect park resources and values. Regardless of the reason the issue was dismissed, a more involved explanation of the current conditions regarding genetics, the potential for genetic impacts, and the mitigation that would be used, as appropriate, was presented in discussing why this issue would not be carried forward for further analysis. This analysis is consistent with CEQ regulations and NPS NEPA guidance that encourages agencies to focus on significant environmental issues and to dismiss other issues with as much detail as needed to demonstrate there is no potential for significant impacts.

Also, NPS NEPA guidance notes that cumulative actions are limited to human actions—meaning they are attributable to specific individuals or entities; and past actions should only be considered if they are having ongoing impacts on the resource. While the residual cattle gene introgression of the herd is attributable to specific actions taken in the early 19th century, as explained in the EA, this does not continue to have any meaningful impact on the bison herd, as explained in the genetics dismissal of chapter 1 (see page 12).

## **Park Operations: Non-Park Guiding Policies, Regs, and Laws**

**Concern 104:** Several commenters indicated that the herd was purchased for the citizens of Arizona and belongs to the state because all wildlife in Arizona, with some exceptions, belongs to the state. Commenters stated that the herd has been managed under state statutes and should be managed under those same statutes (ARS Title 17 was quoted). Another commenter requested that NPS clarify which Arizona statutes it is referring to in the EA. This same commenter purported that Arizona statutes do not define this herd as wildlife but as stray animals in the park.

**Response:** As noted previously, NPS has authority to manage all wildlife within Grand Canyon National Park and will manage bison in collaboration with AGFD. In addition, although state statutes regarding the classification of bison are not binding on NPS lands and not relevant to this EA, according to AGFD, the House Rock bison are classified as wildlife, and more specifically as big game, in Arizona (see Arizona Revised Statutes 17-101 and 17-102).

**Concern 105:** A commenter asked that NPS clarify in the 'Introduction' section that BLM has jurisdiction over habitat management and not management of the animals, which is the jurisdiction of AGFD on BLM lands.

**Response:** The introduction to EA has been updated in response to the comment.

**Concern 106:** Commenters stated that the current herd location in Kaibab National Forest is not consistent with the *Kaibab National Forest Land and Resource Management Plan* or the *Grand Canyon Trust's Grazing Plan* on the North Kaibab Ranger District. These commenters asserted that the proposed action is also inconsistent with these plans and does not detail how the herd would be concentrated in HRWA, which is where the plan says the herd would be concentrated. The commenters requested that USFS involve its livestock grazing permittees in any decisions that could affect forage, water, or improvements to the range, particularly those adjacent to the park.

Other commenters stated that the EA fails to mention that the *Kaibab National Forest Land and Resource Management Plan* includes desired conditions and guidelines that state that bison are a desired introduced wildlife species in the designated HRWA, that bison should be managed so that the herd is concentrated in the HRWA, and that active management should be used to minimize impacts from bison on sensitive resources, especially outside the HRWA. A commenter contends that if the bison are allowed outside the HRWA, NEPA review must be conducted to determine whether bison should be allowed on the Kaibab National Forest.

**Response:** USFS actions are guided by the 2014 *Kaibab National Forest Land and Resource Management Plan*. According to the plan, bison should be actively managed (e.g., by hunting, trapping, fencing, or herding) so that the herd is concentrated in the HRWA and kept in balance with ecological conditions so impacts on sensitive resources are minimized, especially outside of HRWA. This text on page 5 of the EA, and throughout chapter 4 of the EA in the analysis of impacts to adjacent lands, is consistent with this guidance.

In addition, although AGFD and USFS are considering some small-scale actions at this time (e.g., habitat and fence improvements at the HRWA described in chapter 4 of the EA; developing additional water sources adjacent to the park), decisions about management actions that could affect distribution of the bison herd on the Kaibab Plateau, including any specific proposals to concentrate bison in the HRWA, would need to take into account future discussions regarding any appropriate long-term, landscape-scale, ecological and cultural role of bison across the multijurisdictional Kaibab Plateau and would require agencies with jurisdiction outside of the park to approve them. Therefore, they are not considered as NPS proposed actions in this initial bison herd reduction EA. Any future actions proposed to manage bison habitat on forestlands not covered under the 2014 *Kaibab National Forest Land and Resource Management Plan* will be publicly scoped and assessed at the appropriate level per NEPA requirements.

### **Park Operations: Bison Conservation Initiative**

**Concern 107:** Commenters asserted that the Department of the Interior’s *Bison Conservation Initiative* is not relevant to this action because it does not include a plan for the Grand Canyon herd of bison and the North Rim is not suitable habitat.

**Response:** The *Bison Conservation Initiative* (2008) provides vision and key areas of consideration by agencies for bison conservation and does not provide management plans for any of the 19 bison herds that reside on Department of the Interior lands. Rather, the *DOI Bison Report* (2014) does identify Grand Canyon National Park as within the bison historical home range and denotes ongoing bison management planning by the park with state, federal, and tribal partners.

### **Cumulative Actions and Impacts**

**Concern 108:** Given the reference to beneficial effects in a number of places, a commenter stated that the cumulative impact analysis for bison under alternative 1 does not seem to support the conclusions that overall cumulative effects would be adverse, and why the incremental cumulative adverse impacts from the proposed action would be considerable.

**Response:** NPS has updated the bison cumulative impact analysis under alternative 1 to reflect an overall beneficial cumulative effect and the contributions alternative 1 would provide as a result of the anticipated growth of the bison population.

### **Consultation and Coordination: General Comments**

**Concern 109:** Commenters requested consultation with additional stakeholders, including sportsmen, private ranchers, USFS, BLM, the Grand Canyon Trust, and USFWS. Multiple commenters suggested that NPS work with AGFD to manage the bison population and reduction process.

**Response:** As evidenced by their cooperating agency status on the EA, and as noted throughout the document, especially the section on “Collaborative Management of the House



Rock Bison Herd,” NPS intends to work with adjacent landowners, tribes, and other stakeholders, including AGFD, on both the initial reduction efforts and any appropriate long-term planning and management of the House Rock bison herd. This includes a commitment to continuing ongoing dialogue with cooperators regarding any appropriate long-term, landscape-scale, ecological and cultural role of bison across the multijurisdictional Kaibab Plateau, which would inform any future decisions about managing a herd on the North Rim and adjacent lands. Therefore, while the tools considered in this EA might be the same as tools used by the park for any potential future management, NPS would complete, as appropriate, any additional NEPA reviews that may be needed to support management beyond the initial reduction. Any future actions proposed to manage bison habitat on forestlands not covered under the 2014 *Kaibab National Forest Land and Resource Management Plan* would be publicly scoped and assessed at the appropriate level per NEPA. These processes would also involve dialogue with adjacent landowners, tribes, and other stakeholders such as those listed by the commenters.

**Concern 111:** One commenter suggested that the bison herd and landscape monitoring programs should be coordinated to ensure efforts address all stated knowledge gaps.

**Response:** Management and monitoring activities will be performed holistically, with consideration of how to maximize critical data collection regarding landscape integrity, ecological functioning, and the behavior of large mammals. NPS envisions that some of this data could be collected in collaboration with academic institutions and performed by graduate students under the oversight of knowledgeable professors.

## **Other NEPA Issues: General Comments**

**Concern 112:** A commenter was concerned that comments about NPS policy are not allowed.

**Response:** NPS provided guidance in its public materials regarding how to make helpful comments and noted that comments that “agree or disagree with laws, regulations, or NPS policy” were not helpful. The intent of this guidance was to encourage stakeholders to submit substantive comments regarding NPS policy related to this proposed action and EA, which some stakeholders did do.

**Concern 113:** Commenters felt that the EA does not provide enough information about how the starting bison population abundance was estimated; how bison population abundance would be estimated during initial reduction activities; or what the carrying capacity for bison is on this landscape. Commenters also requested more information on bison population model inputs and suggested without this information, it is unclear how a population viability analysis could be conducted or how NPS would know how many bison need to be removed and when the initial herd reduction goals are met. Other commenters suggested bison population modeling could be repeated and updated in the future if there is a solid and ongoing bison monitoring program.

**Response:** Until 2005, the House Rock bison herd spent the majority of the time on the HRWA, where they were highly visible and easily counted because of the open habitat. After

2005, the bison began spending more time off HRWA in denser forest habitat, making them difficult to survey and leading to partial counts. AGFD began using a POPII modeling program to estimate the bison population, which is a good model for determining population trends (i.e. increasing, decreasing, stable), but it does not generate confidence intervals for population estimates. These counts and modeling form the basis of the initial population estimates described in the EA. Working with the University of Montana, the AGFD is developing an integrated population model for bison on the Kaibab Plateau in Arizona. The model combines what is known of bison ecology (e.g., reproductive, survival, and natural mortality rates) with harvest data, road collision data, wounding loss, and estimates of survival from the literature with aerial surveys of the bison population for estimating the size of the House Rock bison herd. Because data on vital rates are largely absent, the model relies on previously published worked and synopses of well-studied bison populations. AGFD and NPS hope this new model, when available, will provide a better estimate of the bison population size, with associated confidence intervals, and that it will be used as the starting point to track against known bison removals from both nonlethal and lethal methods, providing some reliable indication of when enough bison have been removed to reach fewer than 200 bison. At that time, new data from observations of the remaining bison can be reinserted into the model to verify that the target population has been achieved.

Ultimately, this model, along with data collected during the initial reduction effort and continued dialogue with American Indian tribes, other federal and state agencies, and other stakeholders, as appropriate, regarding any long-term, landscape-scale, ecological and cultural role of bison across the multijurisdictional Kaibab Plateau, would inform any decisions about the long-term management of bison abundance, including carrying capacity and population viability, which are outside the scope of this EA.

**Concern 114:** Commenters requested that the name of the herd be changed from the House Rock bison herd to the Grand Canyon bison herd because a new herd with site fidelity to HRWA will be established in the future.

**Response:** There is no formal nomenclature for the bison herd on the North Rim, so the EA used the term “House Rock bison herd” to identify this herd and its origins for the purpose of this NEPA review only. Therefore, no change has been made to the EA.

**Concern 115:** A commenter stated that the EA is inadequate because it does not include any site-specific data and describes impacts that are speculative.

**Response:** As noted in previous responses to comments, the current and potential effects of bison are described in detail in “Chapter 3: Affected Environment” and “Chapter 4: Environmental Consequences” of the EA. These descriptions are based on best available information, including a variety of site-specific reports and papers; reports and papers relevant to the effects of other large herbivores on resources in similar environments; observations and opinions of park and agency subject matter experts; and consultations with other agencies and tribes.

**Concern 116:** One commenter felt the EA analysis was inadequate because it does not define or establish measurable metrics for the impact threshold terms used in the EA and relies too heavily on evidence that is unpublished or not peer-reviewed.

**Response:** Neither CEQ nor NEPA regulations require the use of impact thresholds or measurable metrics to define the severity of impacts. NPS is applying the CEQ NEPA regulations and taking the “hard look” required by the courts by providing narrative descriptions of direct, indirect, and cumulative effects and considering mitigation associated with the alternatives that lead to a rational conclusion based on the facts found. In addition, NPS has applied plain language standards by using descriptors that are commonly understood when describing the magnitude or nature of an impact, and that such terms do not warrant specific definition.

### **Other NEPA Issues: Transition from EIS to EA**

**Concern 117:** One commenter felt that NPS should have prepared an environmental impact statement (EIS) for the initial bison herd reduction. The commenter believes the proposed action triggers several of the significance considerations found in the CEQ NEPA regulations at 40 CFR 1508.27, that indicate the need to prepare an EIS for the initial bison herd reduction. Furthermore, the commenter felt that NPS attempted to reduce the scope of its analysis to focus only on an initial herd reduction to avoid the need to prepare an EIS.

**Response:** NPS believes the commenter has misinterpreted the switch from an EIS to an EA and has misinterpreted and misapplied the CEQ significance criteria in assessing whether or not an EIS is needed for the initial bison herd reduction.

With regard to the switch from an EIS to an EA, in spring 2014, the NPS initiated public scoping for a planning and EIS process to develop a long-term, coordinated approach to manage the current and future impacts of bison on the park’s natural and cultural resources. However, given the steady growth of the herd and concerns from NPS, AGFD, and USFS resource specialists, the agencies agreed that long-term management planning should be set aside so that recommendations to immediately reduce the bison population could be analyzed and implemented. As such, in spring 2016, NPS conducted scoping on a proposed action to quickly reduce the bison herd, and, based on internal, agency, and public scoping, did not believe there was a potential for significant impacts from the proposed actions. Therefore, and consistent with CEQ regulations and guidance, as well as NPS NEPA guidance, NPS identified an EA as the appropriate NEPA pathway for the proposal to quickly reduce the size of the bison herd.

With regard to CEQ significance criteria, the commenter attempts to demonstrate that NPS action triggers several of the criteria. The commenter notes that the EA clearly demonstrates the potential for both adverse and beneficial effects; however, this does not mean an EIS is needed, and in fact, the comment leaves out the more relevant text of this criteria that requires agencies to examine the potential significance of adverse effects regardless of whether or not a proposal would have an overall benefit. NPS has clearly analyzed both beneficial and adverse

effects, and as described in the FONSI, does not believe any adverse effects will be significant.

With regard to the fact that Grand Canyon, by its very nature, has unique characteristics, the commenter does not provide any information as to why this means an EIS is needed. As noted in the NPS NEPA Handbook, while most actions taken by NPS affect park lands that protect many of the unique characteristics mentioned in the referenced criteria, this does not mean that an EIS must be prepared for every action that NPS takes. Rather, when assessing whether an impact would be significant, the agency considers the magnitude of the impact in the context of the particular resource. This guidance has been applied in preparing the EA and FONSI.

The commenter refers to opposition to lethal culling of bison as indication that impacts are “highly controversial.” However this CEQ criterion is not related simply to opposition to a proposal but rather to the existence of a substantial dispute over the nature of the environmental impacts (e.g. substantial dispute within the scientific community about the effects of a proposed action would indicate that the effects are likely to be highly controversial and therefore likely significant; no such dispute has occurred related to the proposed actions in this EA).

With regard to highly uncertain or unique or unknown risks, the commenter indicates NPS does not entirely understand the potential impacts, and, therefore, an EIS is needed. However, as noted in the NPS NEPA Handbook, there will often be some uncertainty about the impacts of management actions and some level of associated risk. The focus of this consideration is on high levels of uncertainty and risks that are unique or unknown, which would make it difficult or impossible to reasonably predict impacts of an action. As noted in previous comments, the current and potential effects of bison are described in detail in “Chapter 3: Affected Environment” and “Chapter 4: Environmental Consequences” of the EA based on best available information, including a variety of site-specific reports and papers; reports and papers relevant to the effects of other large herbivores on resources in similar environments; observations and opinions of park and agency subject matter experts; and consultations with other agencies and tribes.

The commenter also believes the initial bison herd reduction will establish a precedent for long-term management and, therefore, an EIS is required. However, the commenter does not acknowledge the reference to “precedent for future actions with significant effects” in this factor and offers no evidence as to why this short-term plan, which is focused on initial reduction, sets a precedent for the long-term term plan or why they believe the long-term plan will have significant effects and therefore why an EIS needs to be prepared for the initial bison herd reduction.

The commenter also states that initial bison herd reduction may have individually insignificant, but cumulatively significant impacts, but offers no basis for this opinion. Based on the analysis in the EA, the NPS has concluded in the FONSI that there is no potential for significant adverse cumulative effects, and NPS management actions will actually contribute to substantial beneficial cumulative effects once the bison herd is reduced. The commenter

also notes a long-term plan could have significant adverse cumulative impacts, but no evidence is provided as to why, and regardless, such analysis is outside the scope of this EA.

The commenter invokes the factor related to the potential to adversely affect cultural resources eligible for listing in the National Register of Historic Places or to cause the loss or destruction of significant scientific, cultural, or historical resources, but provides no discussion of why it thinks this applies. While NPS acknowledges some limited potential for impacts on listed cultural resources, with the mitigation proposed, it does not believe any of these impacts would be significant, as described in the EA and FONSI. In addition, NPS believes that in the end, cultural resources will benefit from fewer bison on the landscape. NPS also received concurrence from the Arizona State Historic Preservation Office with a determination of no adverse effects under Section 106 of the National Historic Preservation Act, further supporting the lack of any potential significant impacts.

Finally, the commenter believes the initial herd reduction is not consistent with the NPS Organic Act, associated regulations, the Grand Canyon National Park Establishment Act of 1919, and the Wilderness Act and implies that this is evidence that the NPS is threatening to violate federal law or requirements for the protection of the environment. However, as noted in response to previous comments, these authorities clearly allow NPS to manage wildlife in situations such as these. With regard to the Wilderness Act, NPS acknowledges that prohibited uses are considered as part of the selected alternative. However, these uses will only be implemented if a Minimum Requirements Analysis demonstrates they are needed to administer the area as wilderness, which is consistent with the requirements of section 4(c) of the Wilderness Act.

## Editorial

**Concern 118:** Commenters suggested spelling, grammar, and other editorial comments to the EA and identified missing citations.

**Response:** NPS has addressed all appropriate editorial comments in the errata, which details specific changes that were made in the document. A few suggested changes were not made for various reasons, as described below:

1. Several comments suggested adding “recommended” before “wilderness” in several places. This was not done because as explained on page 61 of the EA, “Nearly all of the North Rim is included as recommended wilderness and is referred to throughout this environmental assessment as “wilderness.”
2. Some suggested changes to use of some acronyms (NPS, AGFD, e.g.) were not done because the use of acronyms in the document follows the NPS *Style Guide*, which specifies when acronyms should be used and when the full term should be spelled out, depending on their use as nouns or adjectives. Therefore, there may be places where the entire term is spelled out and others where the acronym is used in the same paragraph.

3. A comment that “nonlethal” is not one word did not lead to any change because the NPS *Style Guide* does not support the use of hyphenated terms, as indicated by preferred terms as listed in the guide such as nonnative and nonfederal.
4. A comment that asked for missing technical number and date on a citation for the Greater Grand Canyon Landscape Assessment did not lead to any change because the report has not yet been published, and the draft is what is cited in the EA.
5. A comment that stated that on page 75, paragraph 2, line 19 the phrase “no discernible effects on breeding success” was contradictory to what was written on pages 77 and 78, did not lead to any change because the statement as expressed in the EA was in reference only to impacts associated with nonlethal culling. Pages 77 and 78, as part of the conclusion, state a different effect to breeding success, as a result of the combined methods of Alternative 2, which include a combination of nonlethal culling, lethal culling, and hazing, as well as associated cumulative impacts.
6. Two comments which stated that two DOI documents, dated 2008 and 2014, were not cited in Chapter 6: References, did not lead to any changes. Both documents are cited in Chapter 6, on page 168, under “US Department of Interior (DOI)”.