



United States Department of the Interior

NATIONAL PARK SERVICE

Water Resources Division
1201 Oak Ridge Drive, Suite 250
Fort Collins, CO 80525

Technical Memorandum

To: Laura Rotegard, Superintendent, Grant Kohrs Ranch Historical Site, Deer Lodge, Montana

From: Nic Medley, Fisheries Biologist, WRD, Fort Collins, Colorado

Re: Natural resource management policy considerations to be incorporated into a feasibility study for providing fish passage at the Cottonwood Creek Diversion structure on the Kohrs-Manning Ditch at Grant Kohrs Ranch Historical Site

Date: March 9, 2011

On August 25, 1972, Congress authorized the establishment of the The Grant-Kohrs Ranch National Historic Site (Ranch; GRKO) to:

"...provide an understanding of the frontier cattle era of the Nation's history, to preserve the Grant-Kohrs Ranch, and to interpret the nationally significant values thereof for the benefit and inspiration of present and future generations."

The National Park Service (NPS), as the federal agency with management authority over the ranch, has further defined three primary purposes of the Ranch;

- Provide an understanding of the frontier cattle era of the nation's history;
- Preserve the Grant-Kohrs Ranch:
 - More than 100 years of unbroken history
 - Structures, landscape, furnishings, equipment, objects, and records
 - Operating cattle ranch
- Interpret the national significance associated with the frontier cattle era and the Grant-Kohrs Ranch.

While the primary legislative authority compels the NPS to protect the cultural legacy of this historic cattle ranch including its structures, buildings, pastures and irrigation system, the Ranch must also be managed consistent with other resource management goals, to extent possible, including goals concerning the management of its natural resources. Often, it is difficult to meet one resource management goal without

compromising another and difficult decisions have to be made based upon a clear and objective decision making process guided by law, regulation and policy.

Recently, the Ranch contracted PBS&J of Missoula MT to explore the feasibility of improving fish passage to Cottonwood Creek from the Clark Fork River (Feasibility Study: Fish Passage Project at Cottonwood Creek Diversion, January 11, 2011). Section 2.1.3 of the study contains a discussion of the historical significance of the diversion structure and the regulatory environment for its management and protection (NPS laws, regulations, policies and management plans; National Historic Preservation Act provisions), provides an interpretation of how the regulations apply to fish passage at Cottonwood Creek, and then rates two alternatives for their acceptability considering these regulatory constraints. While providing fish passage at the Cottonwood Creek diversion appears technically feasible, doing so may fundamentally change the character of the irrigation system and is perhaps inconsistent with NPS statutory obligations to fully protect the historic irrigation infrastructure, including the diversion structure.

While the policy issues related to the modifications of the irrigation system have been outlined in the draft Feasibility Study, the policy issues related to the management of natural resources have not. The primary goal of the proposed project is to design alternatives that would improve fish passage on Cottonwood Creek and aid in the restoration of the natural hydrologic function. However, in doing so, the project, in conjunction with other proposed fish passage projects in the Cottonwood Creek watershed may facilitate the potential expansion of non-native brown trout to the detriment of native west slope cutthroat trout. Providing passage to benefit non-native brown trout raises significant policy issues for the NPS that is mandated to protect native species and their habitats. Accordingly, GRKO has determined that there is a need for an analysis that considers federal laws, regulations, policies and Executive Orders regarding the management of natural resources within the Ranch.

As a first step to incorporating such an analysis into the draft feasibility study, this memo identifies (1) NPS laws, regulation and policies regarding the management and protection of natural resources, specifically those relating to the management of native and non-native species (Appendix); and (2) discusses how they may inform decisions concerning fish passage on Cottonwood Creek. Much of the following language is taken directly from the NPS Management Policies 2006, with additional language from Federal Statutes, Code of Federal Regulations and Presidential Executive Orders, and indicated as appropriate. For a more complete understanding of these regulations, the reader should review the original sources in their entirety.

A reading of the policies and associated laws, regulations and EO's identifies that NPS managers (Superintendents), when considering actions that may affect protected resources must:

- manage to avoid impairment to all park resources
- identify all important resource values in park planning documents

- use scientific and other data as a basis for making objective, informed decisions and collect data if necessary to inform future decisions concerning potential impacts to, and possible impairment of park resources
- participate in an open planning and decision making process with the public, other state and federal agencies, cooperators and partners
- document the basis for all actions/decisions relating to the management and protection of park resources and possible impacts and to, and impairment of park values
- manage parks to protect and restore native species and communities
- avoid actions that will promote the spread of non-native species
- promote activities to remove non-natives from within park boundaries and promote the restoration of native species outside park boundaries with the cooperation of states
- promote the recovery of ecosystems through the restoration of natural ecosystem functions and processes that benefit native species and communities

Fish entrainment monitoring in the Kohrs Manning Ditch, conducted by Trout Unlimited (Ref 1), indicates that the fish community of the Clark Fork River and Cottonwood Creek in the vicinity of the Cottonwood Creek Diversion contains non-native, brown trout and an assemblage of native, non-game fish (longnose dace, slimy scuplin, redbreast shiner, mountain whitefish, unidentified sucker species). Monitoring by Montana Fish, Wildlife and Parks (Ref 2)) has documented that the fish community in Cottonwood Creek within GRKO is dominated by non-native brown trout. An adult west slope cutthroat has also been documented ascending the diversion structure during its passage from the Clark Fork into Cottonwood Creek presumably to spawn after spring runoff. Further, MFWP has documented the presence of a native, genetically pure population of west slope cutthroat trout in Baggs Creek, a tributary of Cottonwood Creek, and the presence of low numbers of non-native brown trout and brook trout in mid reaches.

MFWP has indicated that it would like to manage the lower Cottonwood Creek as a mixed brown trout/westslope cutthroat trout recreational sport fishery (Ref 3) to (1) Restore the mainstem fishery by improving recruitment of trout from tributaries; and 2) Replace lost angling in the mainstem by improving sport fishing in tributaries; and has identified the limited fish passage and poor instream habitat as the two primary limiting factors.

NPS policies mandate that park units consider the potential impacts to native species and communities when determining whether a proposed action may create impacts or impairment to park resources. Of particular concern would be the potential impact that removal of a fish migration barrier and enhancement of the non-native brown trout fishery would have on both native game, and non-game fish both within GRKO and upstream of the Ranch. The following specific concerns should be considered:

1. Brown trout are a non-native predatory game fish that can have significant impacts to the abundance, age structure and species composition of the native fish

- via competition and predation (Quist and Hubert 2004). NPS policy mandates, that to the extent practicable, non-native exotic species should be removed and management activities should focus the management of native species within national park units. A non-game, native fish community exists within GRKO that the NPS is mandated to protect. An enhanced brown trout fishery is likely to have a significant impact on this natural resource value
2. Removal of all migration barriers within the Cottonwood Creek watershed will allow brown trout to move further upstream into the upper reaches, and into Baggs Creek that currently has a pure population of west slope cutthroat trout. Should this occur it is likely that there will be a negative impact to this native fish population, counter to NPS policy that mandates that we work with state agencies to extend the distribution and abundance of native populations both within and outside of park boundaries

Currently, the Fish Passage Feasibility Study evaluates two alternatives to provide fish passage at the Cottonwood Creek Diversion on the Kohrs-Manning Ditch within GRKO. However, in assessing the potential impacts of the proposed action to natural resources and the native fish community, a “No Action” alternative that “maintain or improve native fish populations in the Upper Clark Fork River drainage” (see Ref 1) might be considered that is more consistent with NPS policy mandates.

References

1. Cottonwood Creek Habitat Enhancement Project Stage I. 2010. Watershed Restoration Coalition proposal application to Montana Department of Justice, Natural Resource Damage Program.
2. Report documenting fish community sampling within the Kohrs-Manning Ditch in the vicinity of the Cottonwood Creek Diversion Structure. 2010. Trout Unlimited
3. Prioritization of Tributaries in the Upper Clark Fork River Basin for Fishery Enhancement. Draft Final. May 2010. Pat Saffel, Brad Liermann, Jason Lindstrom, and Ladd Knotek, Montana fish wildlife and Parks. Tom Mostad and Carol Fox, Montana Department of Justice, Natural Resource Damage Program

Quist MC, Hubert WA (2004) Bioinvasive species and the preservation of cutthroat trout in the western United States: ecological, social and economic issues. *Environ Sci Policy* 7:303-313

Appendix. NPS Management Policies. 2006

The opening page of “Management Policies, 2006”, outlines the need for a consistent set of policies by which units of the National Park Service will be managed;

“The national park system was created to conserve unimpaired many of the world’s most magnificent landscapes, places that enshrine our nation’s enduring principles, and places that remind us of the tremendous sacrifices Americans have made on behalf of those principles. They are the most remarkable collection of places in America for recreation and learning. Visitors can immerse themselves in places where events actually happened and enjoy some of the most significant natural and historic places in America. These are places that offer renewal for the body, the spirit and the mind. As required by the 1916 Organic Act, these special places must be managed in a special way—a way that allows them to be enjoyed not just by those who are here today, but also by generations that follow. Enjoyment by present and future generations can be assured only if these special places are passed on to them in an unimpaired condition. And that is the challenge that faces all the employees of the National Park Service. It is a challenge eagerly embraced, but employees must have the tools required to perform the job successfully. The policies contained in these pages represent one of the most important tools available. Through their judicious and consistent application, these policies will set a firm foundation for stewardship that will continue to earn the trust and confidence of the American people.”

In order to avoid any confusion regarding the importance of these policies in creating a consistent basis for the management of the national park system, the Introduction states:

“This volume is the basic Service-wide policy document of the National Park Service. Adherence to policy is mandatory unless specifically waived or modified by the Secretary, the Assistant Secretary, or the Director.”

Section 1.4.1 of NPS MP 2006; The Laws Generally Governing Park Management, describes the general legal basis for managing units within the national park system and states;

“The most important statutory directive for the National Park Service is provided by interrelated provisions of the NPS Organic Act of 1916 and the NPS General Authorities Act of 1970, including amendments to the latter law enacted in 1978. The key management-related provision of the Organic Act is as follows:

[The National Park Service] shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations hereinafter specified... by such means and measures as conform to the fundamental purpose of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations. (16 USC 1)

Congress supplemented and clarified these provisions through enactment of the General Authorities Act in 1970, and again through enactment of a 1978 amendment to that act (the “Redwood amendment,” contained in a bill expanding Redwood National Park), which added the last two sentences in the following provision. The key part of that act, as amended, is as follows:

Congress declares that the national park system, which began with establishment of Yellowstone National Park in 1872, has since grown to include superlative natural, historic, and recreation areas in every major region of the United States, its territories and island possessions; that these areas, though distinct in character, are united through their inter-related purposes and resources into one national park system as cumulative expressions of a single national heritage; that, individually and collectively, these areas derive increased national dignity and recognition of their superlative environmental quality through their inclusion jointly with each other in one national park system preserved and managed for the benefit and inspiration of all the people of the United States; and that it is the purpose of this Act to include all such areas in the System and to clarify the authorities applicable to the system. Congress further reaffirms, declares, and directs that the promotion and regulation of the various areas of the National Park System, as defined in section 1c of this title, shall be consistent with and founded in the purpose established by Section 1 of this title [the Organic Act provision quoted above], to the common benefit of all the people of the United States. The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress. (16 USC 1a-1). ”

The remainder of Section 1.4 of *Management Policies* presents the NPS’s interpretation of these key statutory provisions and specifically its obligations to manage park resources “unimpaired” consistent with the Organic Act.

Section 1.4.3; The NPS Obligation to Conserve and Provide for Enjoyment of Park Resources and Values, states:

“The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. This mandate is independent of the separate prohibition on impairment and applies all the time with respect to all park resources and values, even when there is no risk that any park resources or values may be impaired. NPS managers must always seek ways to avoid, or to minimize to the greatest extent practicable, adverse impacts on park resources and values. However, the laws do give the Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, so long as the impact does not constitute impairment of the affected resources and values. The fundamental purpose of all parks also includes providing for the enjoyment of park resources and values by the people of the United States. The enjoyment that is contemplated by the statute is broad; it is the enjoyment of all the people of the United States and includes enjoyment both by people who visit parks and by those who appreciate them from afar. It also includes deriving benefit (including scientific knowledge) and inspiration from parks, as well as other forms of enjoyment and inspiration. Congress, recognizing that the enjoyment by future generations of the national parks can be ensured only if the superb quality of park resources and values is left unimpaired, has provided that when there is a conflict between conserving resources and values and providing for enjoyment

of them, conservation is to be predominant. This is how courts have consistently interpreted the Organic Act.

1.4.4 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. The impairment of park resources and values may not be allowed by the Service unless directly and specifically provided for by legislation or by the proclamation establishing the park. The relevant legislation or proclamation must provide explicitly (not by implication or inference) for the activity, in terms that keep the Service from having the authority to manage the activity so as to avoid the impairment.

1.4.5 What Constitutes Impairment of Park Resources and Values

The impairment that is prohibited by the Organic Act and the General Authorities Act is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. Whether an impact meets this definition depends on the particular resources and values that would 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. An impact to any park resource or value may, but does not necessarily, constitute an impairment. An impact would be more likely to constitute 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. An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated. An impact that may, but would not necessarily, lead to impairment may result from visitor activities; NPS administrative activities; or activities undertaken by concessioners, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park.

1.4.6 What Constitutes Park Resources and Values

The "park resources and values" that are subject to the no-impairment standard include

- 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;
- appropriate opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing them; the park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and

- any additional attributes encompassed by the specific values and purposes for which the park was established.

1.4.7 Decision-making Requirements to Identify and Avoid Impairments

Before approving a proposed action that could lead to an impairment of park resources and values, an NPS decisionmaker must consider the impacts of the proposed action and determine, in writing, that the activity will not lead to an impairment of park resources and values. If there would be an impairment, the action must not be approved. In making a determination of whether there would be an impairment, an NPS decision-maker must use his or her professional judgment. This means that the decision-maker must consider any environmental assessments or environmental impact statements required by the National Environmental Policy Act of 1969 (NEPA); consultations required under section 106 of the National Historic Preservation Act (NHPA), relevant scientific and scholarly studies; advice or insights offered by subject matter experts and others who have relevant knowledge or experience; and the results of civic engagement and public involvement activities relating to the decision. The same application of professional judgment applies when reaching conclusions about “unacceptable impacts.” When an NPS decision-maker becomes aware that an ongoing activity might have led or might be leading to an impairment of park resources or values, he or she must investigate and determine if there is or will be an impairment. This investigation and determination may be made independent of, or as part of, a park planning process undertaken for other purposes. If it is determined that there is, or will be, an impairment, the decision-maker must take appropriate action, to the extent possible within the Service’s authorities and available resources, to eliminate the impairment. The action must eliminate the impairment as soon as reasonably possible, taking into consideration the nature, duration, magnitude, and other characteristics of the impacts on park resources and values, as well as the requirements of the National Environmental Policy Act, National Historic Preservation Act, the Administrative Procedure Act, and other applicable laws.

1.4.7.1 Unacceptable Impacts

The impact threshold at which impairment occurs is not always readily apparent. Therefore, the Service will apply a standard that offers greater assurance that impairment will not occur. The Service will do this by avoiding impacts that it determines to be unacceptable. These are impacts that fall short of impairment, but are still not acceptable within a particular park’s environment. Park managers must not allow uses that would cause unacceptable impacts; they must evaluate existing or proposed uses and determine whether the associated impacts on park resources and values are acceptable. Virtually every form of human activity that takes place within a park has some degree of effect on park resources or values, but that does not mean the impact is unacceptable or that a particular use must be disallowed. Therefore, for the purposes of these policies, unacceptable impacts are impacts that, individually or cumulatively, would

- be inconsistent with a park’s purposes or values, or impede the attainment of a park’s desired future conditions for natural and cultural resources as identified through the park’s planning process, or
- create an unsafe or unhealthful environment for visitors or employees, or
- diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values, or
- unreasonably interfere with
- park programs or activities, or
- an appropriate use, or
- the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park.
- NPS concessioner or contractor operations or services.

The general park management policy guidance clearly allows for some impacts to a particular park value when it is unavoidable when carrying out the intent of the authorizing legislation that established a park, and outlines a process that must be conducted so that NPS managers make objective and defensible decisions that avoid impairment when such circumstances occur. In the case of GRKO, the authorizing legislation suggests that the cultural resources, including the irrigation system, are the primary values for which the Ranch should be managed. However, any remaining management flexibility should be used to fully protect the remaining resource values, including its natural resources, from impairment.

Just as difficult decisions must be made concerning the prioritization and protection of different park resources, similar decisions must be made concerning different natural resource values. Policy guidance related to protecting natural resource values is provided in Chapter 4 of NPS 2006. In general;

“The National Park Service will preserve and protect the natural resources, processes, systems, and values of units of the national park system in an unimpaired condition to perpetuate their inherent integrity and to provide present and future generations with the opportunity to enjoy them.”

The intent of this language is further clarified in the introduction to Chapter 4:

“The National Park Service will strive to understand, maintain, restore, and protect the inherent integrity of the natural resources, processes, systems, and values of the parks while providing meaningful and appropriate opportunities to enjoy them. The Service recognizes that natural processes and species are evolving, and the Service will allow this evolution to continue—minimally influenced by human actions. The natural resources, processes, systems, and values that the Service preserves are described generally in the 1916 NPS Organic Act and in the enabling legislation or presidential proclamation establishing each park. They are described in greater detail in management plans specific to each park. Natural resources, processes, systems, and values found in parks include

- *physical resources such as water, air, soils, topographic features, geologic features, paleontological resources, and natural soundscapes and clear skies, both during the day and at night*
- *physical processes such as weather, erosion, cave formation, and wildland fire*
- *biological resources such as native plants, animals, and communities*
- *biological processes such as photosynthesis, succession, and evolution*
- *ecosystems highly valued associated characteristics such as scenic views*

In this chapter, natural resources, processes, systems, and values are all included in the term “natural resources.” The term “natural condition” is used here to describe the condition of resources that would occur in the absence of human dominance over the landscape. The Service manages the natural resources of parks to maintain them in an unimpaired condition for present and future generations in accordance with NPS-specific statutes, including the NPS Organic Act and the National Parks Omnibus Management Act of 1998; general environmental laws such as the Clean Air Act, the Clean Water Act, the Endangered Species Act of 1973, the National Environmental Policy Act, and the Wilderness Act; executive orders; and applicable regulations. Activities that take place outside park boundaries and that are not managed by the Service can profoundly affect the Service’s ability to protect natural resources inside the parks. The Service will act to protect natural resources from impacts caused by external activities by working

cooperatively with federal, state, and local agencies; tribal authorities; user groups; adjacent landowners; and others to identify and achieve broad natural resource goals. By working cooperatively through both formal and informal lines of communication and consultation, the Service will better achieve park management objectives and the protection of parks' natural resources."

General management concepts and obligations related to the management and protection of natural resources and are discussed in Section 4.1:

"4.1 General Management Concepts

As explained in Chapter 1 of these Management Policies, preserving park resources and values unimpaired is the core or primary responsibility of NPS managers. The Service cannot conduct or allow activities in parks that would impact park resources and values to a level that would constitute impairment. To comply with this mandate, park managers must determine in writing whether proposed activities in parks would impair natural resources. Park managers must also take action to ensure that ongoing NPS activities do not cause the impairment of park natural resources. In cases of uncertainty as to the impacts of activities on park natural resources, the protection of natural resources will predominate. The Service will reduce such uncertainty by facilitating and building a science based understanding of park resources and the nature and extent of the impacts involved. Natural resources will be managed to preserve fundamental physical and biological processes, as well as individual species, features, and plant and animal communities. The Service will not attempt to solely preserve individual species (except threatened or endangered species) or individual natural processes; rather, it will try to maintain all the components and processes of naturally evolving park ecosystems, including the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to those ecosystems. Just as all components of a natural system will be recognized as important, natural change will also be recognized as an integral part of the functioning of natural systems. By preserving these components and processes in their natural condition, the Service will prevent resource degradation and therefore avoid any subsequent need for resource restoration. In managing parks to preserve naturally evolving ecosystems, and in accordance with requirements of the National Parks Omnibus Management Act of 1998, the Service will use the findings of science and the analyses of scientifically trained resource specialists in decision-making. Park units with significant natural resources range in size from just a few acres to millions of acres and from urban to remote and wilderness settings. As integral parts of a national park system, these park units individually and cumulatively contribute to America's natural heritage and provide the places where that heritage can be better understood and enjoyed.

Science has demonstrated that few if any park units can fully realize or maintain their physical and biological integrity if managed as biogeographic islands. Instead, park units must be managed in the context of their larger ecosystems. The ecosystem context for some species and processes may be relatively small, while for others this context is vast. In any case, superintendents face the challenge of placing each of the resources they protect in their appropriate ecosystem context and then working with all involved and affected parties to advance their shared conservation goals and avoid adverse impacts on these resources. Superintendents must be mindful of the setting in which they undertake the protection of park resources. The practicability of achieving a natural soundscape may be quite reasonable at a park unit in a remote setting, but the same may not be true at a popular roadside viewpoint in the same park unit, or at a park unit in a more urban locale. Similarly, the restoration and maintenance of natural fire regimes can advance more rapidly and on a larger landscape scale in wilderness areas where considerations for public safety and the protection of private property and physical developments can usually be readily addressed. However, the restoration and maintenance of natural fire

regimes in more developed and highly visited locations with the same considerations can be extremely complicated. The goal of protecting natural resources and values while providing for their enjoyment remains the same in all cases except to the extent that Congress has directly and specifically provided otherwise. The degree to which a park can adequately restore and maintain its natural resources to a desired condition will depend on a variety of factors—such as size, past management events, surrounding land uses, and the availability of resources. Through its planning processes, the Park Service will determine the desired future conditions for each park unit and identify a strategy to achieve them. This strategy should include working cooperatively with adjacent land and resource managers, as appropriate.

The Service will not intervene in natural biological or physical processes, except

- when directed by Congress;
- in emergencies in which human life and property are at stake;
- to restore natural ecosystem functioning that has been disrupted by past or ongoing human activities; or
- when a park plan has identified the intervention as necessary to protect other park resources, human health and safety, or facilities.

Any such intervention will be kept to the minimum necessary to achieve the stated management objectives.

Natural systems in the national park system, and the human influences upon them, will be monitored to detect change. The Service will evaluate possible causes and effects of changes that might cause impacts on park resources and values. The Service will use the results of monitoring and research to understand the detected change and to develop appropriate management actions. Biological or physical processes altered in the past by human activities may need to be actively managed to restore them to a natural condition or to maintain the closest approximation of the natural condition when a truly natural system is no longer attainable. Prescribed burning and the control of ungulates when predators have been extirpated are two examples. Decisions about the extent and degree of management actions taken to protect or restore park ecosystems or their components will be based on clearly articulated, well-supported management objectives and the best scientific information available.

4.1.1 Planning for Natural Resource Management

Each park with a significant natural resource base (as exemplified by participation in the Vital Signs component of the Natural Resource Challenge) will prepare and periodically update a long-range (looking at least one to two decades ahead) comprehensive strategy for natural resource management. This long-range strategy will describe the comprehensive program of activities needed to achieve the desired future conditions for the park's natural resources. It will integrate the best available science and prescribe activities such as inventories, research, monitoring, restoration, mitigation, protection, education, and management of resource uses. The strategy will also describe the natural-resource-related activities needed to achieve desired future conditions for cultural resources (such as historic landscapes) and visitor enjoyment. Similarly, planning for park operations, development, and management activities that might affect natural resources will be guided by high-quality, scientifically acceptable information, data, and impact assessment. Where existing information is inadequate, the collection of new information and data may be required before decision-making. Long-term research or monitoring may also be necessary to correctly understand the effects of management actions on natural resources whose function and significance are not clearly understood.

4.1.3 Evaluating Impacts on Natural Resources

Planning, environmental evaluation, and civic engagement regarding management actions that may affect the natural resources of the national park system are essential for carrying out the Service's responsibilities to present and future generations. The Service

will ensure that the environmental costs and benefits of proposed operations, development, and resource management are fully and openly evaluated before taking actions that may impact the natural resources of parks. This evaluation must include appropriate participation by the public; the application of scholarly, scientific, and technical information in the planning, evaluation, and decision-making processes; the use of NPS knowledge and expertise through interdisciplinary teams and processes; and the full incorporation of mitigation measures, pollution prevention techniques, and other principles of sustainable park management.

Every environmental assessment and environmental impact statement produced by the Service will include an analysis of whether the impacts of a proposed activity constitute impairment of park natural resources and values. Every finding of no significant impact, record of decision, and National Historic Preservation Act Section 106 memorandum of agreement signed by the Park Service will contain a discrete certification that the impacts of the proposed activity will not impair park natural resources and values.

4.1.5 Restoration of Natural Systems

The Service will reestablish natural functions and processes in parks unless otherwise directed by Congress. Landscapes disturbed by natural phenomena, such as landslides, earthquakes, floods, hurricanes, tornadoes, and fires, will be allowed to recover naturally unless manipulation is necessary to protect other park resources, developments, or employee and public safety. Impacts on natural systems resulting from human disturbances include the introduction of exotic species; the contamination of air, water, and soil; changes to hydrologic patterns and sediment transport; the acceleration of erosion and sedimentation; and the disruption of natural processes. The Service will seek to return such disturbed areas to the natural conditions and processes characteristic of the ecological zone in which the damaged resources are situated. The Service will use the best available technology, within available resources, to restore the biological and physical components of these systems, accelerating both their recovery and the recovery of landscape and biological community structure and function. Efforts may include, for example

- removal of exotic species
- removal of contaminants and non-historic structures or facilities
- restoration of abandoned mineral lands, abandoned or unauthorized roads, areas overgrazed by domestic animals, or disrupted natural waterways and/or shoreline processes
- restoration of areas disturbed by NPS administrative, management, or development activities (such as hazard tree removal, construction, or sand and gravel extraction) or by public use
- restoration of natural sound-scapes
- restoration of native plants and animals
- restoration of natural visibility

When park development/facilities are damaged or destroyed and replacement is necessary, the development will be replaced or relocated to promote the restoration of natural resources and processes.”

While Section 4.1 outlines the general policy guidance for the management of natural resources, section 4.1 provides further guidance on the specific natural resource values that should be protected, specifically those related to the distribution and abundance of native and non-native species:

4.4 Biological Resource Management

4.4.1 General Principles for Managing Biological Resources

The National Park Service will maintain as parts of the natural ecosystems of parks all plants and animals native to park ecosystems. The term “plants and animals” refers to all five of the commonly recognized kingdoms of living things and includes such groups as flowering plants, ferns, mosses, lichens, algae, fungi, bacteria, mammals, birds, reptiles, amphibians, fishes, insects, worms, crustaceans, and microscopic plants or animals. The Service will successfully maintain native plants and animals by

- preserving and restoring the natural abundances, diversities, dynamics, distributions, habitats, and behaviors of native plant and animal populations and the communities and ecosystems in which they occur;
- restoring native plant and animal populations in parks when they have been extirpated by past human-caused actions; and
- minimizing human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them.

4.4.1.1 Plant and Animal Population Management Principles

The individual plants and animals found in parks are genetically parts of species populations that may extend across both park and nonpark lands. As local populations within a group of populations naturally fluctuate in size, they become vulnerable to extirpation during periods when their numbers are low. The periodic disappearance of local populations is common in some species, and the regional persistence of these species depends upon the natural recolonization of suitable habitat by individuals from the remaining local populations. Thus, providing for the persistence of a species in a park may require maintaining a number of local populations, often both within and outside the park.

In addition, some populations of vertebrate and invertebrate animals, such as bats, caribou, warblers, marine turtles, frogs, salmon, whales, and butterflies, migrate at regular intervals into and out of parks. For these migratory populations, the parks provide only one of the several major habitats they need, and survival of the species in parks also depends on the existence and quality of habitats outside the parks, including in many cases outside the United States. The Service will adopt park resource preservation, development, and use management strategies that are intended to maintain the natural population fluctuations and processes that influence the dynamics of individual plant and animal populations, groups of plant and animal populations, and migratory animal populations in parks. In addition to maintaining all native plant and animal species and their habitats inside parks, the Service will work with other land managers to encourage the conservation of the populations and habitats of these species outside parks whenever possible. To meet its commitments for maintaining native species in parks, the Service will cooperate with states, tribal governments, the U.S. Fish and Wildlife Service, NOAA Fisheries, and other countries, as appropriate, to

- participate in local and regional scientific and planning efforts, identify ranges of populations of native plants and animals, and develop cooperative strategies for maintaining or restoring these populations in the parks;
- suggest mutually beneficial harvest regulations for lands and waters outside the parks for populations that extend across park boundaries, such as resident deer or fishes; for short-distance seasonal migrant populations, such as elk or fishes; or for long-distance migrant populations, such as salmon;
- develop data, through monitoring, for use in plant and animal management programs (such as local land management decision-making for assessing resident plant and animal population trends and in international management negotiations for such far-ranging seasonal migrants as geese, whales, and marine turtles);
- present information about species life cycles, ranges, and population dynamics in park interpretive programs for use in increasing public awareness of

management needs for all species, both resident and migrant, that occur in parks; and

- prevent the introduction of exotic species into units of the national park system, and remove, when possible, or otherwise contain individuals or populations of these species that have already become established in parks.

4.4.1.2 Genetic Resource Management Principles

The Service will strive to protect the full range of genetic types (genotypes) of native plant and animal populations in the parks by perpetuating natural evolutionary processes and minimizing human interference with evolving genetic diversity.

The restoration of native plants and animals will be accomplished using organisms taken from populations as closely related genetically and ecologically as possible to park populations, preferably from similar habitats in adjacent or local areas. Deviations from this general policy may be made where the management goal is to increase the variability of the park gene pool to mitigate past, human induced loss of genetic variability. Actions to transplant organisms for purposes of restoring genetic variability through gene flow between native breeding populations will be preceded by an assessment of the genetic compatibility of the populations.

The need to maintain appropriate levels of genetic diversity will guide decisions on what actions to take to manage isolated populations of species or to enhance the recovery of populations of rare, threatened, or endangered species. All resource management actions involving planting or relocating species, subspecies, or varieties will be guided by detailed knowledge of site ecological histories and knowledge of local adaptations, ranges, and habitat requirements.

When native plants or animals are removed for any reason—such as hunting, fishing, pest management, or culling to reduce unnatural population conditions resulting from human activities—the Service will maintain the appropriate levels of natural genetic diversity.

4.4.1.3 Definition of Native and Exotic Species

Native species are defined as all species that have occurred, now occur, or may occur as a result of natural processes on lands designated as units of the national park system. Native species in a place are evolving in concert with each other. Exotic species are those species that occupy or could occupy park lands directly or indirectly as the result of deliberate or accidental human activities. Exotic species are also commonly referred to as nonnative, alien, or invasive species. Because an exotic species did not evolve in concert with the species native to the place, the exotic species is not a natural component of the natural ecosystem at that place. Genetically modified organisms exist solely due to human activities and therefore are managed as exotic species in parks.

4.4.2 Management of Native Plants and Animals

Whenever possible, natural processes will be relied upon to maintain native plant and animal species and influence natural fluctuations in populations of these species. The Service may intervene to manage individuals or populations of native species only when such intervention will not cause unacceptable impacts to the populations of the species or to other components and processes of the ecosystems that support them. The second is that at least one of the following conditions exists:

Management is necessary

- because a population occurs in an unnaturally high or low concentration as a result of human influences (such as loss of seasonal habitat, the extirpation of predators, the creation of highly productive habitat through agriculture or urban landscapes) and it is not possible to mitigate the effects of the human influences;

- to protect specific cultural resources of parks;
- to accommodate intensive development in portions of parks appropriate for and dedicated to such development;
- to protect rare, threatened, or endangered species;
- to protect human health as advised by the U.S. Public Health Service (which includes the Centers for Disease Control and the NPS public health program);
- to protect property when it is not possible to change the pattern of human activities; or
- to maintain human safety when it is not possible to change the pattern of human activities.

Or,

Removal of individuals or parts thereof

- is part of an NPS research project described in an approved management plan, or is part of research being conducted by others who have been issued a scientific research and collecting permit;
- is done to provide plants or animals for restoring native populations in parks or cooperating areas without diminishing the viability of the park populations from which the individuals are taken; or
- meets specific park management objectives.

In planning and implementing plant and animal population management actions, the Service will follow established planning procedures, including provisions for public review and comment. The Service will consult, as appropriate, with other federal land-management agencies, the U.S. Fish and Wildlife Service, the NOAA Fisheries, state wildlife management agencies, other appropriate state agencies, tribal governments, and others. Such consultation will address (1) the management of selected animal populations, (2) research involving the taking of animal species of interest to these agencies, and (3) cooperative studies and plans dealing with the public hunting and fishing of animal populations that occur across park boundaries.

The Service's cooperative conservation efforts concerning fish and wildlife management will be consistent with departmental policy articulated at 43 CFR Part 24. This departmental policy recognizes the broad authorities and responsibilities of federal and state agencies with regard to the management of the nation's fish and wildlife resources; this policy also promotes cooperative management relationships among these agencies. In particular, the policy calls on the Service to consult with state agencies on certain fish and wildlife management actions and encourages the execution of memoranda of understanding as appropriate to ensure the conduct of programs that meet mutual objectives as long as they do not conflict with federal law or regulation.

The Service will assess the results of managing plant and animal populations by conducting follow-up monitoring or other studies to determine the impacts of the management methods on non-targeted and targeted components of the ecosystem.

4.4.2.2 Restoration of Native Plant and Animal Species

The Service will strive to restore extirpated native plant and animal species to parks whenever all of the following criteria are met:

- Adequate habitat to support the species either exists or can reasonably be restored in the park and if necessary also on adjacent public lands and waters; once a natural population level is achieved, the population can be self-perpetuating.
- The species does not, based on an effective management plan, pose a serious threat to the safety of people in parks, park resources, or persons or property within or outside park boundaries.

- The genetic type used in restoration most nearly approximates the extirpated genetic type.
- The species disappeared or was substantially diminished as a direct or indirect result of human induced change to the species population or to the ecosystem.
- Potential impacts upon park management and use have been carefully considered.

Programs to restore animal species may include confining animals in small field enclosures during restoration efforts, but only until the animals have become accustomed to the new area or they have become sufficiently established to minimize threats from predators, poaching, disease, or other factors. Programs to restore animal species may also include confining animals in cages for captive breeding to increase the number of offspring for release to the wild or to manage the population's gene pool. Programs to restore plant species may include propagating plants in greenhouses, gardens, or other confined areas to develop propagation materials (propagules) for restoration efforts or to manage a population's gene pool.

4.4.4 Management of Exotic Species

Exotic species will not be allowed to displace native species if displacement can be prevented.

4.4.4.1 Introduction or Maintenance of Exotic Species

In general, new exotic species will not be introduced into parks. In rare situations, an exotic species may be introduced or maintained to meet specific, identified management needs when all feasible and prudent measures to minimize the risk of harm have been taken and it is

- a closely related race, subspecies, or hybrid of an extirpated native species; or
- an improved variety of a native species in situations in which the natural variety cannot survive current, human altered environmental conditions; or
- used to control another, already established exotic species; or
- needed to meet the desired condition of a historic resource, but only where it is noninvasive and is prevented from being invasive by such means as cultivating (for plants), or tethering, herding, or pasturing (for animals). In such cases, the exotic species used must be known to be historically significant, to have existed in the park during the park's period of historical significance, to be a contributing element to a cultural landscape, or to have been commonly used in the local area at that time; or
- an agricultural crop used to maintain the character of a cultural landscape, with rigorous review given to any proposal to introduce a genetically modified organism; or
- necessary to provide for intensive visitor use in developed areas and both of the following conditions exist:
 - Available native species will not meet park management objectives.
 - The exotic species is managed so it will not spread or become a pest on park or adjacent lands.
- a sterile, noninvasive plant that is used temporarily for erosion control; or
- directed by law or expressed legislative intent.

4.4.4.2 Removal of Exotic Species Already Present

All exotic plant and animal species that are not maintained to meet an identified park purpose will be managed—up to and including eradication—if (1) control is prudent and feasible, and (2) the exotic species

- interferes with natural processes and the perpetuation of natural features, native species or natural habitats, or
- disrupts the genetic integrity of native species, or
- disrupts the accurate presentation of a cultural landscape, or

- damages cultural resources, or
- significantly hampers the management of park or adjacent lands, or
- poses a public health hazard as advised by the U.S. Public Health Service (which includes the Centers for Disease Control and the NPS public health program), or
- creates a hazard to public safety.

High priority will be given to managing exotic species that have, or potentially could have, a substantial impact on park resources, and that can reasonably be expected to be successfully controlled. Lower priority will be given to exotic species that have almost no impact on park resources or that probably cannot be successfully controlled. Where an exotic species cannot be successfully eliminated, managers will seek to contain the exotic species to prevent further spread or resource damage.

The decision to initiate management should be based on a determination that the species is exotic. For species determined to be exotic and where management appears to be feasible and effective, superintendents should (1) evaluate the species' current or potential impact on park resources; (2) develop and implement exotic species management plans according to established planning procedures; (3) consult, as appropriate, with federal, tribal, local, and state agencies as well as other interested groups; and (4) invite public review and comment, where appropriate. Programs to manage exotic species will be designed to avoid causing significant damage to native species, natural ecological communities, natural ecological processes, cultural resources, and human health and safety. Considerations and techniques regarding removal of exotic species are similar to those used for native species (Also see Executive Order 13112 (Invasive Species))

Sec. 2. of Executive Order 13112 identifies Federal Agency Duties concerning invasive species:

- (a) Each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law,
- (1) identify such actions;
 - (2) subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them; and
 - (3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.
- (b) Federal agencies shall pursue the duties set forth in this section in consultation with the Invasive Species Council, consistent with the Invasive Species Management Plan and in cooperation with stakeholders, as appropriate, and, as approved by the Department of State, when Federal agencies are working with international organizations and foreign nations.