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National Park Service Management Policies for the National Park System

Introduction

National Park Service (NPS) policies for management of animals in units of the National Park System devolve from national park history, evolution of science, and changing human values. This paper summarizes the framework within which NPS animal management policies have developed, provides a brief statement of the content of today's Servicewide policy guidance, and suggests a stage for discussion of changes that might be made to that guidance in the future.

Framework Within Which Policy Has Developed

Today's animal management policies reflect the history of the National Park System, the legislative oversight applied to park management, and the administrative interpretation of that oversight.

Historical framework. History provides an important perspective. The first area of what are today called units of the National Park System was identified in 1790, at the end of the 18th century. The first place called a "national park" was created in 1872, toward the end of the 19th century. The creation of NPS as the manager of national parks and the emergence of ecology as a science useful to the management of national parks did not occur until part way through the 20th century. And now, at the approach of the 21st century, the explosion of scientific knowledge and burgeoning of the human population challenge us to learn from that history as we plan for the future.

National parks have no innate existence—they are solely the expression of human values. In the USA, national parks result from congressional decisions that integrate the human values, desires, and support extant at the time. As these values, desires, and support with respect to national parks change over time, so too does congressional direction about establishment, extinguishment, and support for parks. In turn, because the role of the administrative branch in our system of federal government is to carry out the directions provided by Congress, so too does the administrative policy for, and management of, national parks change over time.

Statutory development of policies for managing animals in national parks. Congress early in its

history established several areas that ultimately became part of today's National Park System. However, it was not until enactment of the Yellowstone Act in 1872 that Congress provided some statutory direction about how the animals of parks should be managed. This first direction responded to the concerns of the time—human harvesting of ungulates—by directing the manager of Yellowstone (the secretary of the interior) to protect "against the wanton destruction of fish and game" and to retain, in their natural condition, all timber, mineral deposits, natural curiosities, or wonders within the national park. At the same time, in recognition of an interest group that strongly supported creation of the national park, Congress also directed that fish in the park could be harvested by hook and line.

The 1872 Yellowstone Act thus established two basic principles regarding animal management in parks: protect animals from harvest and retain them in their natural condition. Subsequent statutes provided amendatory guidance as Congress both dealt with emerging circumstances at Yellowstone and also created additional national parks. The concept of surplus animals emerged, and some parks received authorization to remove surpluses of selected species of ungulates. The realization arose that some animal and plant life could be detrimental to the use of parks, and a general authorization was established to destroy such animal and plant life. Large-sized predators bore the brunt of this authorization for several decades and were exterminated from many parks. Today, exotic animals experience the application of this authorization. The anomaly of fish remains: for many decades exotic species of fish were freely planted—a practice which continues even up to today in some parks—even though such species have the capacity to be detrimental both to non-fishing uses of parks and to retaining native plants and animals in their natural condition.

The 1916 act which established NPS to administer national parks, monuments, and reservations chose different words for animals ("natural ... objects," "wild life") and added authorization for the new service to establish rules and regulations to guide use and management of parks. It also permitted livestock grazing as a possible use. Over time, subsequent legislation addressing the needs of individual parks added hunting and trapping as appropriate uses of animals in some parks, such as for managing elk populations in Grand Teton National Park or continuing the recreational use of game animals and fur-bearers in national seashores and lakeshores.

By 1970, Congress formally recognized that, although there was by then a large diversity of parks that had many unique purposes, there also is an underlying theme held by

all of the parks that warranted putting all of them into a single National Park System. Congress expanded this theme in 1978 by directing that "the protection, management, and administration of these areas ... shall not be exercised in derogation of the values and purposes for which these various areas have been established...."

Other, more broadly cast legislation provides additional guidance for NPS treatment of animals found within units of the National Park System. The Migratory Bird Treaty Act and the Eagle Protection Act protect these classes of birds wherever they occur, including within units of the National Park System. The Marine Mammal Protection Act focuses attention on conserving the marine mammals that occur in parks. The Endangered Species Act emphasizes preventing the loss of those animal species that are threatened with extinction. The Wild Free-Roaming Horse and Burro Act is worded carefully to not include units of the National Park System within its sphere of influence. The Clean Air Act Amendment focuses attention on air quality-related values, which can include animals.

The statutory framework thus developed over the past hundred years establishes that animals are important parts of parks and that, for the most part, these animals are to be conserved unimpaired in their natural conditions for the use of present and future generations of people.

Administrative development of policies for NPS management of animals. Over time, national park management policies for animals have reflected the statutory direction given by Congress, what was known about the biology of the animals being managed, and what human interests there were in having the animals be managed. In the early years, the management interest focused on a few species, primarily ungulates and fish, and the management effort focused on getting rid of predators, protecting habitat from fire, and adding new species of fish. Prodded by the new science of ecology, NPS's attitude toward predators changed, it developed a recognition that exotic species could be detrimental to maintaining natural conditions, it slowly evolved an antipathy toward planting of fish in park waters, it moved from equating fish and game or "wildlife" as animals to recognizing that all "wild life" in the animal kingdom are animals, and it came to recognize that fire is naturally a part of animal habitat in some circumstances.

While many early expressions of policy regarding animals were written by individual parks, NPS began publishing Servicewide expressions of policy by the 1930s in the publications of George Wright and his colleagues and in a 1933 article by the director which addressed exotic animals. The Leopold Report of

1963 provided the underpinning for a secretarial directive regarding animal management that ultimately became published in 1970 in the NPS's three-volume administrative policies. This version of policy was updated, revised, and expanded in three subsequent single-volume publications (in 1975, 1978, and 1988). The 1988 management policies received some degree of public review and comment before being formally adopted. In all cases from George Wright on, NPS scientists working in consultation with other government and academic scientists played active roles in the development and expression of agency policies for managing animals in parks.

The National Environmental Policy Act of 1969 (NEPA) added a significant new procedure to federal government decision-making by adding formal ecological assessment and public involvement to management planning. Although not directly applicable to NPS policy formulation, the NEPA procedures can influence agency policy when NEPA analysis of proposed management actions reveals that an underlying policy is flawed and needs to be amended to permit a resource-appropriate management practice.

Influence of an evolving science on NPS animal management policy formulation. Within the context of conserving natural objects for human use, early park animal management programs applied the science of the day to increase the supply of ungulates, decrease the populations of the predators that fed on them, and reduce the wildfire that destroyed their habitats, as well as to stock fish that humans would find enjoyable to catch. As experience with these animal management practices began to accumulate, the concept of retaining parks as much as possible in their natural condition stimulated an entry point for scientists to question the then-current wisdom of how parks were to manage park animal populations.

One early question raised by the scientific community concerned the practice of trying to eliminate predators from parks. The resulting discourse over a several-decade period led to a policy change and the recognition that predators are every bit as much to be protected as other kinds of animals. With further evolution of this thought, predators today are considered animals that are to be restored to, and maintained in, parks wherever possible.

Another early question of the scientists concerned the legitimacy of exotic species occurring in parks, a question that led to the conclusion that exotics do not belong in natural areas. This conclusion stimulated early action to eliminate exotic terrestrial animals, followed by actions to eliminate exotic plants and, ultimately, exotic fish.

Growth of the science of ecology stimulated thought regarding animal

population regulation, animal population carrying capacity, the role of lightning-ignited fire in natural areas, and the interrelationship of plants, animals, and the physical environment in ecosystems. Each of these lines of research has become incorporated into today's NPS management policies, principally in the fundamental precept that "natural resources will be managed with a concern for fundamental ecological processes as well as for individual species and features." More recently, the focus of the scientific community on habitat fragmentation and global change is reflected in policy developed to address migratory species, genetic resources, a biogeographic-area scale of focus for research, an increased emphasis on involving park neighbors in cooperative regional planning to integrate parks into their regional environments, and encouragement to engage in cooperative management of natural resources.

Current NPS Animal Management Policies

NPS has designed the current animal management polices to address the circumstances of all animals found in each of the 376 parks. The policies therefore provide general guidance together with specific advice on types of animal management concerns that could arise in each of the four major management zones into which parks may be divided. This general guidance and specific advice are constructed to accommodate the great diversity of park purposes as identified in general legislation, park enabling legislation, and park establishment proclamations. The guidance and advice also are constructed to fit within statutory and policy requirements that guide implementation procedures. In addition, the guidance and advice are intended to respond to the current precepts of science.

Policy elements. NPS seeks to perpetuate native animal species in natural ecosystems operating within the constraints of animal population dynamics as influenced by natural processes operating within evolving park ecosystems. These native animal species and natural processes are part of a recognized suite of natural resources and values that include plants, animals, water, air, soils, topographic features, geologic features, paleontological resources, and aesthetic values, such as scenic vistas, natural quiet, and clear night skies. NPS specifically recognizes that evolution of native species and natural change in ecosystems are integral parts of the functioning of natural systems and so seeks to ensure that natural processes are able to operate without human interference wherever possible. NPS considers native animal species to be those that as a result of natural processes occur or occurred on lands now designated as a park. In contrast, NPS treats as ex-

otic, or non-native, species those that occur in a given place as a result of direct or indirect, deliberate or accidental actions by humans, with the result that the manipulated species occurs in a place where it has not evolved with the species native to the place and therefore is not a natural component of the ecological system characteristic of that place.

NPS does not explicitly define "natural" or "natural processes." It does identify in its management policies the arena being considered and provides examples of natural resources. The 1906 Antiquities Act speaks of objects of scientific interest, the 1916 National Park Service refers to natural objects and wild life, and the 1970 General Authorities Act identifies the superb environmental quality of the parks. NPS management policies recognize the existence of tangible natural features (animals, plants, water, etc.) and intangible natural attributes (natural quiet, sounds of nature, scenery, etc.). The management policies provide examples of natural resources, such as a site that illustrates the characteristics of a landform, landscape, or biotic area, a diversity of ecological components, a refuge necessary for the continued survival of a species, an ecological or geological benchmark associated with research and scientific discovery, and the components of natural resources listed in the previous paragraph. The management policies also identify a number of situations in which the resource does not exist in a natural condition due to the effects of human actions, such as harvest, removal, destruction, harassment, or harm to animals, unnatural concentrations of native species, presence of exotic species, habitat damage, loss of appropriate levels of genetic diversity, extirpation of native species, loss of fire as a natural process, loss or decline in quality or action of water as a habitat and natural process, loss of natural shoreline processes, or loss of vegetation, wildlife, or water quality due to polluted air. These examples tie "natural" and "natural processes" to science, and, drawing from a dictionary definition of "natural," relate them to "pertaining to, in accordance with, or determined by nature," where "nature" is the "system of all phenomena in space and time, the physical universe," or, in another definition, "man's native, or original state, the condition of simple, primitive man," so that a "natural process" is "any phenomenon which shows a continuous change in time."

The core of the NPS policy approach thus deals with what is the human role in nature and in the perpetuation of nature. Currently, this approach focuses on preventing modern humans from altering nature and natural processes in parks, on restoring those elements that humans in the recent past have altered, and, to a much lesser degree, on attempting to estimate how past, present,

and future human alterations will affect the future natural evolution of nature and natural processes in the parks. Despite a great deal of rhetoric available to it, NPS has not developed a comprehensive policy resolution for determining when to consider that humans and their actions occur within the nature and natural processes of parks and when they do not. To date, NPS has established informally, but not in its management policies, a more-or-less accepted policy inference that "technological humans"—generally, those who developed the country after the discovery of the New World by Europeans—are to be considered not part of the nature and natural processes that NPS is to perpetuate. NPS provides no formal policy assessment of the role of pre-Columbian Native Americans in the evolution of the nature and natural processes of today's parks, leaving an implication that, for the purposes of management today, the pre-Columbian Native American role may have been more within, than without, what was natural.

In applying this overall policy framework to today's management of nature and natural processes, the NPS management policies address animal, plant, genetic, extirpated, exotic, pest, fire, water, air, sound, light, weather, and geologic resource concerns. The management policies require similar management approaches to be taken in each of the four major management zones in parks ("natural," "cultural," "park development," and "special use") wherever appropriate and possible, but recognizes that the specific purposes of each zone may require some adjustments or exceptions. Parks are to perpetuate the native animal and plant life as part of their natural ecosystems. Individual animals may be removed where: (1) hunting and trapping are permitted by law; (2) fishing is not prohibited by law; (3) animal population control is required for park ecosystem maintenance; (4) animal control is necessary to protect humans, property, or landscaped areas; (5) animal harvesting is part of approved research projects; or (6) live removal is used to restore populations of the species to other areas. Animal and plant populations and landscapes are to be controlled by natural processes as much as possible. When natural processes are not effective due to interfering human activities that, themselves, cannot be controlled, or where other resource needs such as efforts to recover threatened or endangered species or to restore extirpated species require intervention, active management programs may be conducted to bring the native animal and plant populations to their desired conditions. Where harvesting of native terrestrial or aquatic animals is allowed, management generally is to focus on maintaining the populations of these species at a natural level and protecting the integrity of the natural

ecosystems that support them. Management of native migratory species is to focus on preserving their populations and habitats within the parks and cooperating wherever possible with other land managers to ensure their preservation outside the parks. Management may not introduce exotic species into natural zones, and may introduce exotic species into other zones only under very controlled conditions that meet the specified purposes of those zones. In general terms, management is to exert the least manipulation of native species and natural processes within natural zones, and in cultural, park development, and special-use zones may exert only narrowly selected manipulations of the components and processes of ecosystems according to the specific requirements individually established for each individual element of these three zones.

Implementing current management policies. NPS has developed a formal process by which parks implement the management policies. The overall guidance appears in the *Management Policies* book itself (NPS 1988). In recent years, this overall guidance has been interpreted in the NPS natural resource management guidelines, which provide greater detail and identify responsible officials for various levels of action.

Parks apply the NPS policies through a sequence of iterative planning steps, which often are developed out of synchronization because of different scheduled update cycles. The broadest planning activity is a given park's general management plan, which focuses on the broad purposes of the park, the mix of development and preservation emphases appropriate to the park's purposes, the preferable site locations for developments, and the preferred levels of intensity of human activities in the developments. The park resource management plan assesses the current condition of park natural and cultural resources, establishes what are the desired conditions for those resources, identifies management actions needed to bring substandard resources up to the desired condition, identifies information gaps and research and inventory actions needed to fill them, and prescribes actions needed to monitor the condition of the resources and to maintain those that require active management. The action plan provides detailed strategies for bringing specifically identified resource components up to their desired condition.

In preparing these plans and conducting the actions they prescribe, NPS management policies expect park resource managers to utilize the results of both applied and basic research, as appropriate, to determine causes of resource management problems, predict impacts of resource uses and related activities, develop methods to restore damaged resources, develop strategies to avoid

adverse impacts, and to further their understanding of the components, condition, and significance of park ecosystems. Further, the management policies expect NPS resource managers to cooperate with the research community within the overall requirements for resource protection and visitor use. Finally, the management policies require that the results of research conducted in parks be made available to park managers, the scientific community, and the public through technical publications and the popular media, including park interpretation and environmental education programs.

NPS draws on the guiding principles and statutory requirements of NEPA to produce an open, fact-based planning and decision-making process. Having sought to inform interested groups through park interpretation programs and interpretive and technical publications, NPS relies on scoping and document review activities to bring the interested parties into decision-making. The park resource management plan identifies the conceptual framework for the animal management program, identifies the priorities in which individual projects likely will be undertaken, and forecasts the level of NEPA compliance likely to be required for each. The park initiates the appropriate form of NEPA compliance shortly before, or in conjunction with, the allocation of funds to conduct a project, with the specific management action to be adopted being determined through the NEPA-guided analysis of alternatives.

Rarely, situations occur where NPS must institute an animal management action that is not consistent with the published policies. Because it is the NPS director who formally adopts the management policies, only the director may waive policy in such circumstances. The director issues such waivers only on a case-by-case basis, and only when the waiver request is well-supported with resource and park-use information and accompanied by an analysis of alternatives.

The Challenge to Scientists for Developing Future Management Policies

NPS management policies were last revised in 1988. Since then, NPS has adopted a streamlined policy and guidance promulgation system. The policies today are ripe for review and possible revision to incorporate new scientific information and newly emerging values of the American people. The evolution from the current management policies for the National Park System to whatever future policies will appear clearly will start from the body of law, science, and human values that exists today. Paramount in current law and resulting policy are the terms "natural condition," "unimpaired," and "non-derogation of the values and purposes" for which the parks were

created. The findings of current science regarding (for example) long-distance transport of pollutants, spread of exotic species, extirpation of native species, and fragmentation of natural landscapes support the belief that nowhere in the world is it possible to find ecological systems that truly are unimpaired by effects of human activities and that continue to exist in their natural condition. Further, it is likely that no unit of the National Park System is free of derogation of its values and preservation purposes while being developed for the enjoyment of present and future generations of people.

Given these realities, the future evolution of National Park System management policy would benefit greatly from continued scientific examination of fundamental park concepts, including "natural condition," "unimpaired," and "non-derogation." While such examination will require analyses in both the natural and social sciences, it is unlikely that any of these analyses can be constructed from the experimental approach characteristic of the scientific method. Despite the immediate unavailability of its principal tool (the experimental method) for directly exploring animal management in parks, the scientific community can contribute a great deal by focusing on how to identify and develop science-based standards for evaluating whether or not natural conditions, unimpaired states, and non-derogation of values and purposes are being advanced or not for any given change in policy. To achieve the capability for identifying and developing such standards, the scientific community can use the experimental method in surrogate locations to further understand how ecosystems work, how animal population dynamics are influenced by intrinsic and extrinsic factors, and in what ways human actions both within and outside parks are changing the natural environments within which park animal populations have evolved. Scientists can use this better understanding to construct models about park animal populations and the ecosystems that support them, and then to test the models and the underlying assumptions using the long-term monitoring programs that parks are establishing.

Thus, there is a significant and unique role for scientists to play in the evolution of park animal management policies. For scientists to exert that role effectively, they need to bring their knowledge of parks up to the same levels as their knowledge of their science. There are many ways for scientists to become involved that will increase their knowledge of the parks: designing and conducting research within the necessary constraints of working in parks, encouraging graduate students to perform their research in parks, using park animal management examples in their teaching, providing technical assistance to parks that are

preparing and revising resource management plans and project statements, designing and conducting research projects that directly respond to the research needs identified in resource management plans, regularly reviewing NEPA and interpretive documents from the scientific perspective, and providing technical assistance to employees.

There also is a role for scientists to play in policy development—a role that is not unique to scientists. Scientists, like all other citizens, bring their own value systems to policy decisions regarding parks and the animals they support. While it is important for scientists to express the management approaches that they prefer because of their own value systems, it is critical that they separate their value-based recommendations from their factual, scientific analyses of alternative future scenarios. The evolution of NPS management policies for animals reflects, and demonstrates the importance of maintaining, this separation. Scientists originally supported destruction of predators, introduction of exotic fish and other animals, and exclusion of natural fire because of the value they placed on other park resources and uses. As scientists learned more about natural systems through their studies in parks and elsewhere, their science unveiled the ecological roles and significance of predators, native species, and natural fire. That scientific revelation in turn informed value systems that underwent change, and ultimately induced changes in NPS management policies for animals.

Parks are for the Long Term

In developing science-based standards for future policy formulation, the science community can increase the value of its effort by focusing objective effort on identifying probable resource and human enjoyment outcomes of alternative policy choices for managing animals in parks. In creating this focus, it will be important for the science community to remember that parks are for future generations of people as well as for today. Furthermore, not only do some individual animals live for a hundred years or more, populations of animals may experience cycles in size that could span even longer time periods, and the vegetation within which the animals live may include plant species that have life spans of multiple centuries. In responding to this longer-term view of both human enjoyment of parks and the population dynamics of the animals inhabiting them, the scientific community can make a major by developing jointly with the parks an integrated, comprehensive, coordinated, and hypothesis-based program of long-term ecological monitoring.

Conclusion

National parks and the National Park System are human constructs that evolve as the interests and values of the humans that made them

change over time. NPS management policies evolve in response to these changes, as influenced by the changing human understanding, gained through science, of how park resources are structured and function over time and of how human activities influence them. Scientists offer two kinds of contribution to the evolution of NPS management policies: the injection of their personal interests and values (legitimate biases) into the selection of desired management outcomes, and the application of their unbiased scientific knowledge to improving the understanding of the structures and functions of park resources over time. The unique and important role of the scientist is this provision of unbiased information and analysis.

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