An Effective Management Plan for the Exotic Mountain Goats in Olympic National Park

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ABSTRACT: The process of selecting a management alternative for dealing with the exotic mountain goat in Olympic National Park promises to be successful. Cooperation among agencies, park staff, the public, and interest groups facilitated a compromise solution for this controversial resource management problem. National Park Service (NPS) efforts to deal with this issue have succeeded because park managers have recognized that proficiency in biological management alone was not sufficient and that competence of Olympic National Park managers in dealing with the public and with other government agencies was essential. The public education effort went beyond park boundaries and communicated an environmental ethic about park values, regulations, and management problems. The NPS needs to take a more active role in external land use planning and decisions beyond park boundaries which affect park resources. A biosphere concept of management can help alleviate or mitigate such impacts.

INTRODUCTION

The National Park Service (NPS) has produced a potentially successful management plan to remove and control mountain goats in Olympic National Park with cooperation from the Washington Department of Wildlife and managers of Olympic National Forest. This paper explores the National Park Service's success in adopting an acceptable management plan for the mountain goats in Olympic National Park.

The mountain goat (*Oreamnos americanus*) is an exotic species in Olympic National Park. As defined by National Park Service management policies (1988a), "exotic species are those species that occur in a given place as a result of a direct or indirect, deliberate or accidental action by humans." Since its introduction more than 60 years ago the mountain goat has been detrimental to the native flora of the park. Exotic species cause numerous biological problems to our national parks and other wild areas. Introduced mammals may be detrimental to native flora and fauna, since they may compete for resources needed by native animals.

Herbivores are perhaps the best example of exotics that may have detrimental effects. Ungulates may overgraze, trample, and wallow which may accelerate soil erosion, disrupt native species, and upset and alter native flora and fauna in the national parks. Introduced herivores may cause some plant species to decline and may encourage more tolerant native or introduced plants (Coblentz 1978). Native fauna may experience added competition from exotic herbivores seeking food and shelter. Often these changes will adversely modify ecosystems that have taken thousands of years to evolve. Problems created by exotic animals released into protected ecosystems are well documented (Courtenay 1978, National Park Service 1978, 1988a, 1988b, Goigel and Bratton 1983).

The mountain goat is only one of many exotic animal species in our national parks. Other exotic ungulates include feral burros in Grand Canyon National Park, Death Valley National Monument, and Bandalier National Monument; European wild boar in Great Smoky Mountains National Park; and feral goats and pigs in Hawaiian national parks.

The National Park Service now has strict policies against the introduction of exotic animals; however, many exotics were introduced before these policies were adopted. Removing existing exotics is difficult, not only technically but because of social-political support for their continuance. In some instances the exotics may be a recognized part of management regimes on lands beyond the park boundaries (Coggins 1987). Exotic animal species that cannot be hunted in a park are often considered huntable game outside the park on other multiple use public lands and private lands. Also, the exotic species may have become an attraction itself, as is the case with mountain goats in Olympic National Park.

To remove exotics from parks and keep them out, the National Park Service must supplement its technical efforts by cooperating with other agencies and involving the interested public. This is an account of a successful procedure used by the National Park Service in developing an acceptable goat-removal management plan with outside agencies and the public.

NATIONAL PARK SERVICE POLICIES

The National Park Service was established in 1916 as a result of the Organic Act of 1916, which states the purpose and mission of national parks as follows:

> To conserve the scenery and the natural and historic objects and wildlife therein, and to provide for the enjoyment of the same in such manner and by such a means as will leave them unimpaired for the enjoyment of future generations (National Park Service 1988a).

Exotic animal species have proven to be a potential threat to the National Park Service's ability to carry out this mission.

Wildlife management policies in the national park system have been influenced by the Leopold Report, which was prepared by a group of noted scientists and wildlife managers appointed by the Secretary of the Interior (Leopold et al. 1963). Many recommendations in this report, including those regarding the control of exotic species, have since been accepted as management policy. As a result of its recommendations, non-native species may no longer be introduced into designated natural areas within the national parks. Where they have become established, or are invading an area, they must be removed. A management plan to control them must be developed (Owen 1972, Wauer and Supernaugh 1983). Since release of the Leopold Report, a series of administrative directives have given increasing guidance to park managers on their responsibilities for controlling exotic species (National Park Service 1988a).

HISTORY OF MOUNTAIN GOATS ON OLYMPIC PENINSULA

Twelve mountain goats from Alaska and British Columbia were introduced between 1925 and 1929 near Lake Crescent in the Olympic Mountains. With the goal of providing huntable game, the introduction was a joint project of the local hunters' club and the Clallam County Game Commissioner (Webster 1925, Moorhead and Stevens 1982). These introductions were approved by the USDA Forest Service, which managed the area. In 1938 most of the Olympics were transferred to the jurisdiction of the National Park Service, which generally prohibits hunting.

In the decades after the National Park Service took control, the exotic goats multiplied and dispersed throughout the Olympic Mountains. The goat population was estimated at 400 during the 1970's. In 1980 the population had grown to an estimated 700 (Moorhead 1976, Stevens 1980).

OLYMPIC PENINSULA ISOLATION

In spite of their presence in the nearby Cascade Mountains, mountain goats never colonized the Olympic Mountains due to the geographical isolation of the Olympic Peninsula. The Olympic Peninsula is created by the waters of Puget Sound, the Strait of Juan de Fuca, and the Pacific Ocean. The fourth side is a lowland valley (Figure 1).

The isolation of Olympic National Park has allowed life forms to evolve relatively independently from outside influences; some plants and animals have developed distinct genetic forms. The area has been called a biological refugium, where evolution of endemic plant and animal species is a continuing pro-

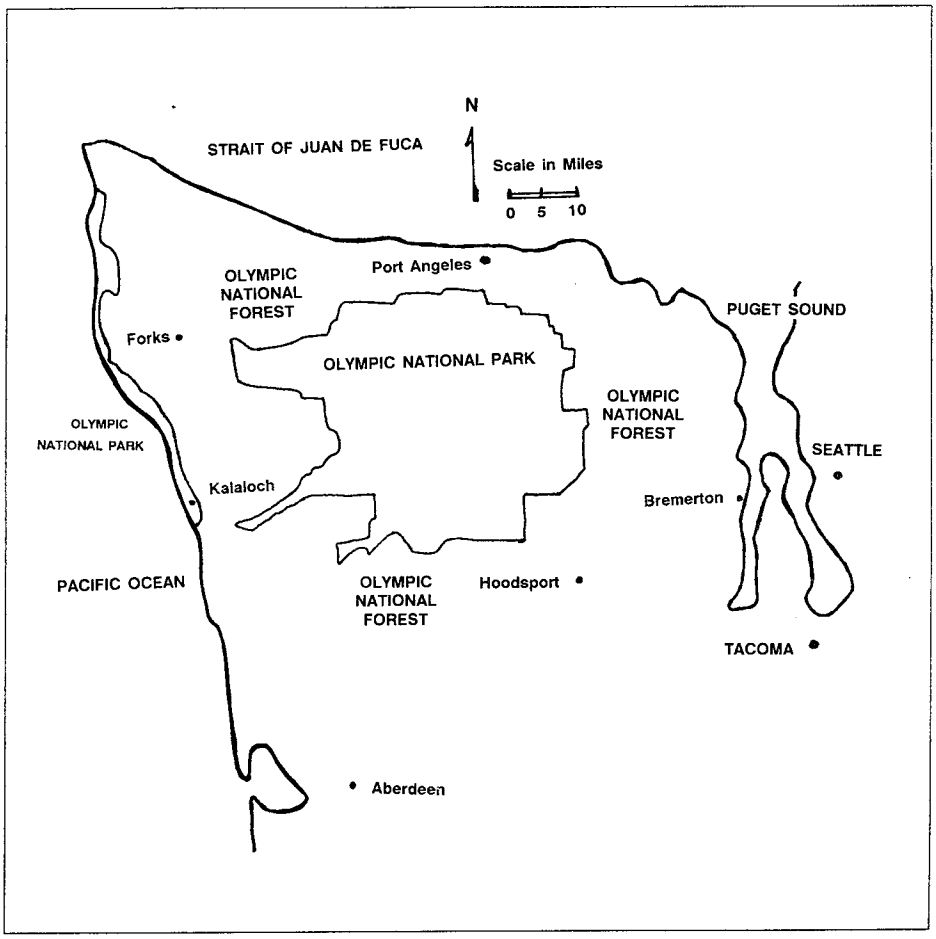

FIGURE 1. The Olympic peninsula.

cess. Natural areas like Olympic National Park are managed to preserve significant natural environments.

ENVIRONMENTAL IMPACTS

During the summer, mountain goats inhabit subalpine and alpine vegetation zones; their grazing changes the vegetation and erodes shallow soils. The number of plant species is reduced allowing yarrow, thistle, and other unpalatable plants to invade disturbed areas (Reid 1983, Schreiner pers. comm.). Studies by Driver et al. (1977, 1978, 1979), Stevens (1979, 1980, 1982, 1983), Bliss et al. (1983), Aho et al. (1982, 1983), and Houston et al. (1984, 1986) showed damage to native plants from goats feeding, bedding, trampling, wallowing, and dust bathing, with resulting soil loss and changes in the natural subalpine community. As the goat population continues to grow, these environmental impacts will worsen. Plant community changes caused by exotic goats may affect other herbivores, birds, and insects. Goats may compete with endemic animal species for food, cover, and suitable habitat. Other plants and animals may be affected by introduced goats. Plant cover and density are affected by goats (Pike 1981). Mountain goats compete for food with other animal species, such as the Olympic marmot (Wood 1973), deer, birds, and invertebrate species that depend on similar vegetation (National Park Service 1987b).

These changes are of major concern to the National Park Service. The management goal is to slow or stop soil erosion caused by mountain goats and to allow reestablishment of native vegetation. Managers have responded with research, outreach to the public, and cooperation with other agencies on management plans to help solve the mountain goat problem.

SOCIAL-POLITICAL SITUATION

As with most important decisions on public lands, decisions in Olympic National Park affect many different groups, from out-of-state visitors to local residents to special groups such as hunters, animal enthusiasts, and persons interested in native plants.

Park management must base its decisions on NPS policy and laws. In doing so, park managers must consider not only scientific research, but also public concerns, including both safety and aesthetics. Managers must consider the desires of other agencies and the feasibility of implementing the alternatives, as well as budget and personnel constraints.

The National Park Service is adversely affected by many external and internal problems that require an ecosystem management approach. Agee and Johnson (1988a, 1988b) recommend that park and wilderness mangers clearly define problems; promote cooperation with different agencies; exhibit sensitivity to different mandates and objectives; and recognize social, political, and environmental issues. They also suggest setting long-term goals and flexibility to ensure management success.

1981 ENVIRONMENTAL ASSESSMENT

In 1981 the National Park Service released an environmental assessment on the mountain goat issue. Three management alternatives were presented for public involvement and review: (1) no action; (2) establish an experimental program to control the mountain goats and limit their impact; and (3) remove the goats to restore the native environment.

Assistant Superintendent Don Jackson of Olympic National Park facilitated 24 public meetings where park managers presented an explanation of the affected environment, an overview of the management alternatives, and a discussion of the environmental consequences of each. Numerous audio-visual aids were used at the meetings. Following these public meetings, park managers explored one of these management alternatives, developing an experimental capture program. Under this experimental program, more than 200 goats were removed from the park between 1981 and 1986. More than 90 percent of these were successfully live-captured.

Other control techniques considered were sterilization, opening the park to public hunting, fencing park boundaries, introducing predators, and using biocides. Some of these were counter to NPS policies or in violation of federal laws or were judged not effective or too costly. During this time research continued on population distribution and density and soil and vegetation impacts. The National Park Service was wise not to select a management plan immediately but to engage in a broad-based effort to further its own understanding of the problem and to inform the public.

The goat population on Olympic Peninsula was estimated at 1200 in 1983 (Houston et al. 1986). Complicating the management problem of 1000 goats in the park were the remaining 200 residing in adjacent Olympic National Forest. Their proximity to the eastern, northern, and southern boundaries allowed frequent movement back and forth (Figure 2).

1987 ENVIRONMENTAL ASSESSMENT

In 1986 and 1987 Olympic National Park managers recognized the political reality that a huntable population of mountain goats would be maintained on Olympic National Forest. They developed four alternatives concerning this problem: no action, limited control of goats, removal of goats from the park, and the maintenance of a goat-free core with population control on the eastern boundary. After considering the social concerns of groups ranging from the Native Plant Society (concerned with endangered and sensitive endemic plants) to hunters (concerned with maintaining a sufficient population of huntable goats) the NPS chose the alternative that would limit, but not eliminate, environmental damage along the eastern boundary and eventually restore natural conditions in the core

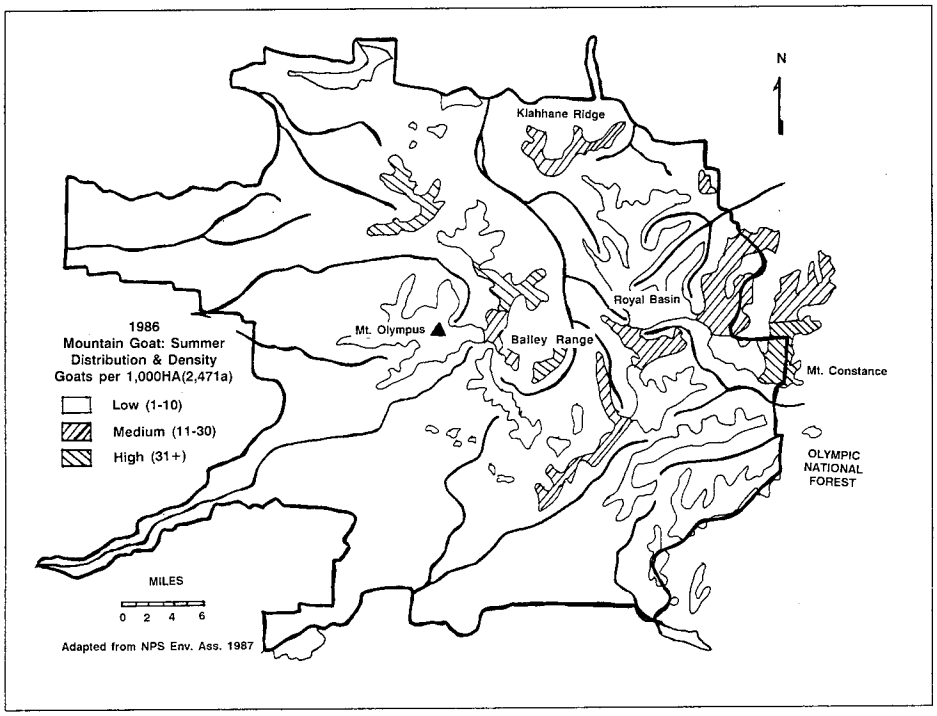

FIGURE 2. Summer distribution and density of mountain goats in Olympic National Park, 1986. Numbers are in goats per 1000 ha.

area. The Washington Department of Wildlife and USDA Forest Service supported this plan.

POLITICAL REALITY AND COMPROMISE

The USDA Forest Service wanted to provide sport hunting on its lands, and the Washington Department of Wildlife favored mountain goat hunting. Neither one would support the NPS in eliminating all goats in the park. The Washington Department of Wildlife (WDW) and the USDA Forest Service were willing to support the NPS if goat hunting was preserved on the Olympic Peninsula and would support a live-capture program of goats for transfer into native ranges in Washington. The NPS, the USDA Forest Service, and the WDW depend on each other's cooperation. The success of the removal and control program requires interagency coordination, continued research, and cooperation by the public. A long-term commitment by managers is also needed, since the goat herd that took more than 60 years to become established will not be removed in a few years.

The method selected for control was live capture for three years followed by shooting. According to the National Park Service (1987b) captured mountain goats will be transferred to the WDW for relocation into native mountain goat range in Washington and other western states. The live-capture method (estimated cost is $300 to $1200 per goat) will be used until it is no longer effective or safe. Goats shot by NPS biologists or rangers will be left on the site. The control program for eastern park subpopulations will be developed by the NPS in consultation with the WDW and managers of Olympic National Forest.

MANAGEMENT ON ADJACENT LANDS

The NPS does not control the mountain goat habitat adjoining the eastern, northern, and southern park boundaries. The adjacent Olympic National Forest lands are managed to maintain a mountain goat population large enough to sustain an annual sport hunt. Olympic National Forest supports a healthy population of approximately 200 mountain goats that move in and out of the park along the eastern boundary. In 1984 some mountain goat habitat areas in Olympic National Forest were designated as wilderness areas. USDA Forest Service policy does not require the removal of exotic species from wilderness areas, but does prohibit the introduction of new species or the enhancement of exotic populations already there (National Park Service 1987b, Grays Marsh pers. comm.).

A special-permit bow hunt for mountain goats has been in effect annually since 1967. Hunters want to continue to hunt goats on Olympic Peninsula even though only about 5 percent (6 to 10 goats a year) of the state harvest occurs here (National Park Service 1981, Burger 1987, Johnson pers. comm.).

PUBLIC PARTICIPATION PROCESS

Olympic National Park held 16 public meetings over a three-month period in late 1987 and early 1988 to discuss research results. The public was given the opportunity to learn more about the proposed management alternatives, how they would be carried out, and the possible environmental impacts of these actions. A slide/tape presentation was followed by a brief management hsitory. A question and answer period and discussion with park staff followed.

Due to the controversial nature of this problem, every opportunity was made to elicit individual opinions and comments. Comments were recorded for later staff review. An overhead projector was used to illustrate and communicate management alternatives and impacts. A nine-page pamphlet including a public response questionnaire (National Park Service 1987a) on mountain goat management was given to each person at the meetings or mailed to those desiring more information. In addition, an 88-page Environmental Assessment (National Park Service 1987b) was available. National Park Service, USDA Forest Service, and Washington Department of Wildlife personnel, as well as university researchers and scientists, were consulted in the preparation of the document.

Public reaction varied; there were differences of opinion about the proposed plans. In general, all agreed that mountain goats should be removed. Removal methods, however, caused considerable debate, particularly to what extent sterilization, live capture, or shooting should be used. Approximately 84 percent of those writing letters preferred a goat-free park. Approximately 68 percent of respondents favored shooting only, or a capture and shoot program. The park's public participation process was well conceived and carried out openly (National Park Service 1988b).

AN OPEN PROCESS

The 1987-1988 NPS mountain goat environmental assessment process was more successful than previous efforts. The park's success lay with the commitment of their staff to fully research this problem; to establish good working relationships with university researchers, agency personnel, and the public; and to coordinate with the managers of surrounding lands.

The 1987 public participation process increased the possibility of better cooperation between the managers of the WDW and Olympic National Forest. National Park Service managers felt there was greater public involvement and support in 1987 than in 1981. The park's research identified conflicts, provided practical alternatives and solutions, and enhanced public understanding of the situation.

An open planning process, emphasizing education of the public through well-run public meetings and printed materials (pamphlet, questionnaire, and Environmental Assessment) contributed to the success by encouraging communication. An impressive number of people (an average of 40 people attended each of the 16 meetings) responded in the public participation process (Carlquist 1989).

The park staff identified and solved many apparent conflicts with outside agencies and groups by sharing problems early in the process, which led to open and honest communication. In setting realistic goals, the park staff limited opposition and worked toward solutions.

A PUBLIC RELATIONS SUCCESS

The National Park Service selected this case to use at the 1989 Park Service's Albright Training Center to teach park personnel how to deal with controversial resource management problems. Park managers have recognized that biological knowledge alone is not sufficient; institutional proficiency in dealing with the public and with other public agencies is also essential. Some reasons for Olympic National Park's good public relations include the fact that park managers defined goals early in the process and adopted a realistic management strategy. They also formed a technical and general advisory council to monitor the effectiveness of the plan.

Public relations success is attributed to communicating the needs of a variety of user groups and to working out alternatives to meet the needs of other agencies. As a result, public input supplied the park managers with a favorable opinion on the NPS's preferred alternative.

POLICY IMPLICATIONS

This study shows the need for cooperation among agencies to ease conflicts that have an impact on park resources. The NPS, USDA Forest Service, and WDW have mandates to coordinate their land use plans and communicate closely on issues of mutual concern. The NPS should take a more active role in land use planning with agencies such as the USDA Forest Service that have adjoining lands, to convince them to build protection into their plans. Technical and scientific information should be used to make federal land management decisions (Stottlemyer 1981, Mott 1988). The NPS has public support for its policies; few agencies would want to be accused of willfully damaging national parks.

The NPS often fails to use fully many pro-environmental laws, such as the National Environmental Policy Act, to influence management on adjacent lands. This may be because professional managers prefer making their own judgments about resources and do not feel comfortable overriding decisions on other managers' lands. Unfortunately this works against the preservationist agency and for the multiple-use agencies in today's expanding resource development. In another example, Glacier National Park, disagreements among the USDA Forest Service, the Bureau of Indian Affairs, and the Bureau of Land Management may harm wildlife, air, and watersheds of the park, resulting in degradation and loss of environmental quality (Sax and Keiter 1987).

Stronger legislation is needed to give the NPS more authority to implement its policies of protecting vital resources from adjacent public lands whose resource development may threaten national parks (Newmark 1985).

ECOLOGICAL MANAGEMENT

The National Park Service must adopt an ecological management strategy to deal with exotic species. Park managers often have been slow in controlling exotics that threaten park resources. The NPS often is forced to delay making ecologically sound decisions due to public controversy, outside agency conflicts, lack of political will, and lack of money to implement the plan (White and Bratton 1980). Many parks that now have serious problems with exotic species were established at a time when ecological awareness of the management of natural resources and exotic species was rudimentary.

To maintain and improve the integrity of natural resources in park ecosystems, a cooperative integrated approach is needed. Such a cooperative approach is recommended by the United Nations Man and the Biosphere (MAB) program, an international scientific program dealing with interactions of people and their

environments (Machlis and Tichnell 1985, Agee and Johnson 1988a). A biosphere reserve concept of management beyond park boundaries can help alleviate and mitigate impacts that affect park resources. The biosphere reserve approach can integrate valuable biotic resources in parks, giving security from external and internal threats by protecting genetic diversity and species richness (Allen 1980, Batisse 1986, Agee and Johnson 1988b).

INTERPRETATION AS A MANAGEMENT TOOL

Park staff and interpreters have given public programs on mountain goat problems to increase public knowledge. Sound interpretive programs for educating and informing the public should be emphasized in future park management.

Formal public meetings using interpretive media began in 1977, possibly earlier. Both public and agency involvement in the 1981 Environmental Assessment facilitated the process, strengthened interagency relations, and increased education of the public for the 1987 Environmental Assessment, which led to the Decision of Record on March 18, 1988. In this case, the scope of public education went beyond park boundaries.

CONCLUSIONS

After more than 10 years of in-depth research on the Olympic mountain goat, a potential solution was conceived, based on both biology and politics. The park managers would have preferred eliminating all of the goats within the park and on adjoining lands but realized they could neither control the goats on USDA Forest Service lands, nor meet the management objective of the Washington Department of Wildlife.

The ultimate decision was a compromise. Based on research, enabling legislation and NPS policies, public opinion, and knowledge of the situation, the decision to control mountain goats along the eastern border and eliminate mountain goats in the core park area seems practical and promises to be successful.

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