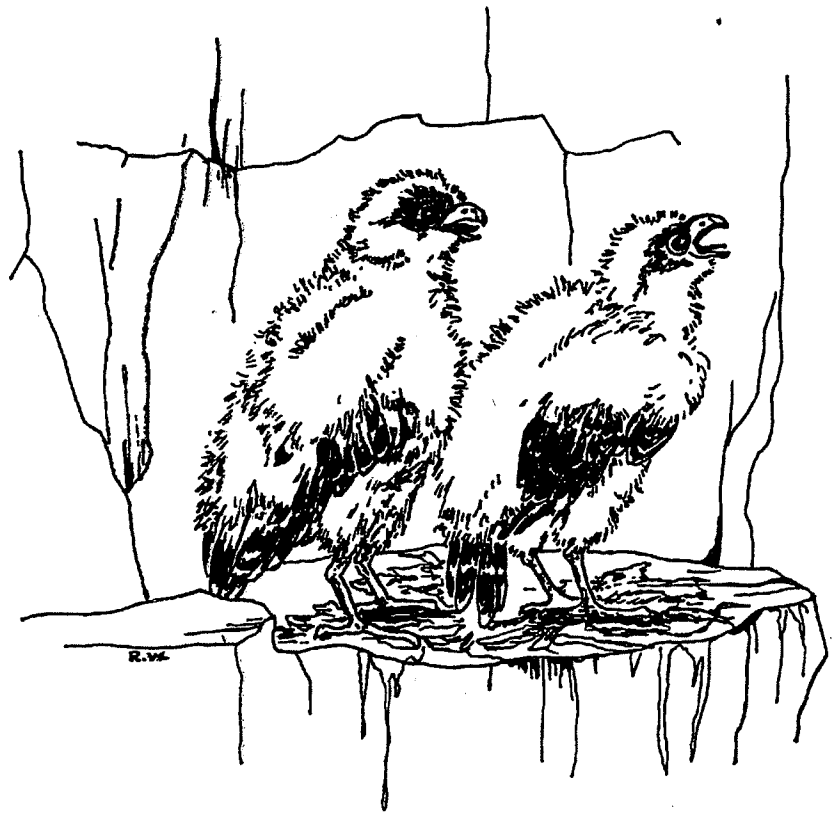


PEREGRINE FALCON MANAGEMENT PLAN



ACADIA

National Park • Maine

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ACKNOWLEDGEMENTS

This document could not have been completed without the help of many people. I would like to thank my coworkers, David Manski, Judy Hazen Connery, Bruce Connery, and Bob Breen for their overall support, encouragement, and helpful reviews at various stages of completion. I also thank Allan O'Connell, Mike Amaral, for their reviews and editorial comments. Charles Todd patiently answered all my questions and provided state data on peregrine falcons in our area and in Maine.

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INTRODUCTION

PURPOSE AND NEED

The peregrine falcon (Falco peregrinus) is an endangered species with a high public profile. It is listed under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). Several other listing actions have occurred for the different subspecies, including those in the eastern U.S. (USFWS 1991). Peregrines are known to have nested in Acadia National Park (ANP) at two locations in the 1940's and 1950's. The release program at ANP during the mid 1980's resulted in the reoccupation (1988) and successful nesting (1991-1993) at the Precipice site. Local media extensively covered the return of peregrines to the park, and there is local public support for management actions. The history and management of peregrines in ANP is described in detail later in this document.

The Resource Management Plan for ANP (National Park Service [NPS] 1993) recommended the development of management plans for all sensitive, threatened, or endangered plant and animal species. This Peregrine Falcon Management Plan is a supplement to the Resource Management Plan and provides direction for peregrine management in ANP for the next five years. Major management concerns are now nest site protection (from human disturbance, environmental contaminants, and illegal take), nest site monitoring, and public education.

The peregrine has not fully recovered in the eastern recovery area or the local region including Maine (U.S. Fish and Wildlife Service [USFWS] 1991). The first territorial pair in Maine occurred in 1987 and the first young fledged in 1988. In 1991 six territorial pairs produced ten young in Maine. In 1992 six pairs produced seven young, followed by five pairs and ten young in 1993. The Precipice site at ANP contributed significantly to this production. Of 15 historical eyries in the state, only three have been reoccupied. Based on known historical data (which is always incomplete), the other three eyries are new (Maine Department of Inland Fisheries and Wildlife [MDIFW] 1991). In New Hampshire, the number of occupied territories has remained relatively constant at 6 or 7 for the last five years, but productivity declined the past two years (USFWS 1992). The long term occupation and reoccupation of nest sites in the park will depend on the recovery of the regional population to provide replacement birds when mortality occurs.

The eastern region recovery plan update (USFWS 1991) recommended five actions:

1. protection of nesting and wintering habitat
2. a raise and release program (ended in 1992)
3. monitoring of nesting, migrating, and wintering falcons,
4. protection from illegal take, contaminants, and other adverse actions
5. continued public education.

This update also identified the following threats to the eastern peregrine population in order of their importance - direct human disturbance, predation from great horned owls, habitat alteration, illegal shooting, and localized environmental contamination.

ANP has a small but continuing role in the recovery of peregrines in Maine and the local region. The park provides permanent nest site protection and is one of only two coastal sites in New England. The other is in Boston. Half of Maine's historic peregrine nests were coastal (MDIFW 1991); thus the ANP site is of added importance in promoting statewide recovery.

AUTHORITY

The Endangered Species Act (ESA) and its various amendments are the main source of authority for protection of the peregrine falcon. Peregrines are also protected by the Migratory Bird Treaty Act (16 USC 703 et. seq.), the Migratory Bird Conservation Act (16 USC 715 et. seq.), and the Convention of International Trade in Endangered Species in Wild Flora and Fauna (16 USC 1537 et. seq.). The Federal Insecticide, Rodenticide, and Fungicide Act (7 USC 136 et. seq.) has helped reduce contaminant levels in the U.S. to the benefit of peregrines and other wildlife. Various state laws also provide some measure of protection.

Through a cooperative agreement, the USFWS has delegated much of the responsibility for management of peregrines in Maine to the Maine Department of Inland Fisheries and Wildlife (MDIFW). ANP relies on the expertise of this department's endangered species biologists. The park has worked very closely with MDIFW since the reintroduction program at ANP began in 1984. The park also must consult directly with the USFWS concerning management actions that may affect the peregrine falcon.

The NPS Management Policies (1988) describe agency responsibilities for the conservation of all federally listed species within park boundaries and the protection of their critical habitat. The NPS Organic Act (16 USC 1) provides for the protection of park resources, including the "wild life therein". Enabling legislation for ANP gives express warning "...to all unauthorized persons not to appropriate, injure, destroy, or remove any of the features or objects included within the boundaries of the Monument..." (Proclamation No. 1339, July 8, 1916, 39 Stat. 1785). The ANP General Management Plan (NPS 1992a) directs the park to coordinate cooperative efforts (e.g. research, inventory, and monitoring) with public agencies and private groups to understand and manage resources of value to the park and to protect and enhance habitats for species of special concern. Buffer areas are recommended to protect federal and state-listed species from development and use.

NPS 77, the Natural Resources Management Guideline (NPS 1992b), provides more specific policy guidelines for endangered species management. All management must be in accordance with approved recovery plans, and species must be actively managed for recovery. NPS 77 states that most wildlife management takes the form of visitor management or habitat management. Native pests can be controlled as part of endangered species management also. Supplemental feeding is also permitted under specified conditions as part of an approved resource management plan. Significant manipulative actions are discouraged unless necessary to prevent species extirpation or extinction. A primary goal should be to minimize human influences on natural animal population dynamics.

PARK AND ECOSYSTEM DESCRIPTION

ANP consists of about 41,000 acres on the coast of Maine in Hancock and Knox Counties. Most of the park is on Mt. Desert Island (MDI), with outlying portions on Isle au Haut, Schoodic Peninsula, and scattered coastal islands. Large cliffs with nearby open water and marshes for hunting and a good prey base of migratory songbirds and seabirds are the most important habitat needs of peregrine falcons (Newton 1988, MDIFW 1991, USFWS 1991). ANP contains many cliffs and open wetlands, is home to many songbirds, and its coastal location provides an abundance of seabirds within easy reach of hunting peregrines.

The park is a popular tourist destination with high levels of visitation concentrated at specific times and places. July and August are the busiest months, but records show increasing numbers in the late spring and early fall as well (NPS 1991). Fortunately, much of the critical time period for nesting falcons occurs before the arrival of summer crowds. Summer visitation, including the Memorial Day weekend, coincides with part of the nestling stage and fledging of peregrines in ANP.

Rock climbing in ANP increased significantly in the 1980's and conflicts between climbers and peregrine falcons are possible. Thus far, climbers have been cooperative and respectful of peregrine needs. Many popular hiking trails also ascend cliff faces or traverse their summits and bases. The proximity of the existing nest site to the Park Loop Road and the Precipice Trail increases public accessibility but also makes routine patrol for nest site protection easy.

RESOURCE DESCRIPTION AND CONDITION

Background

The peregrine falcon has been described as "...the most cosmopolitan naturally distributed avian species in the world and a top predator in the global ecosystem..." (Cade 1988). It is one of four bird species to attain a worldwide distribution without the help of man (Temple 1988) and is found on six continents (Peterson 1988). The peregrine, however, was never a very common bird across its North American range (Kiff 1988).

Peregrine populations in the United States declined dramatically during the 1950's. A 1964 survey of eyries found no breeding birds east of the Mississippi River (Hickey 1988). Since then, the breeding population of Falco peregrinus anatum, the subspecies in the eastern United States, has been considered extirpated (USFWS 1991). A similar survey in 1975 also found no breeding peregrines (USFWS 1979).

Use of organochlorine pesticides (primarily DDT) in the U.S. began in 1947. It is now widely accepted that eggshell thinning caused by DDE, a metabolite of DDT, resulted in widespread and rapid reproductive failure of peregrines in North America (Kiff 1988). DDE biomagnifies upward in the food chain and accumulates in the fatty tissue of predators (USFWS 1991). Chemical contamination affected peregrine populations worldwide (Peakall and Kiff 1988). Because of its position at the top of the food chain the peregrine

is a unique biological monitor of environmental health (Cade 1988).

The recovery of the peregrine falcon throughout the United States since then has been a remarkable conservation success story (Cade 1988). From 1974-1992, under the direction of the USFWS, peregrines raised in captivity by the Peregrine Fund were released in eastern states with great success. This "new" peregrine was developed from the breeding stock of five subspecies, including F.p. anatum. Reduction of contaminants to the environment greatly aided recovery. Also contributing to recovery were eyrie protection measures, contaminant analyses, public education, and continued law enforcement (USFWS 1991).

Life History

Peregrines usually reach sexual maturity by age three, although both sexes can breed in their second year. The male usually arrives at the cliff site first and uses aerial displays to attract females (USFWS 1991). In the eastern U.S. this occurs in March, and peregrines at Acadia followed this pattern in establishing their territory at the Precipice.

Up to four eggs are laid between late March and mid-April. Incubation lasts 32-34 days and is performed mostly by the female. The nest ledge and cliff are actively defended (USFWS 1991). Hatching occurs in May or June in Maine (MDIFW 1991) and the young remain in the nest about 6 weeks (Sherrod 1982). Fledging occurs in late June or early July. New pairs in Maine have been observed to start this process later, and then in succeeding years move toward a more normal chronology (MDIFW 1991). First year peregrines have a high mortality rate (Oliphant and Thompson 1988).

Although the word peregrine means "wanderer", the historic eastern population and the reintroduced birds were and are generally nonmigratory (USFWS 1991). Hacked peregrines have been described as unoriented wanderers who generally move south in winter (Barclay and Cade 1983). Peregrines hacked in Maine have been found in Connecticut, Massachusetts, New York City, South Carolina, and Venezuela. Adult peregrines have been seen at the Precipice in November, and Christmas bird counts have recorded them in our area also.

Habitat and Diet

Peregrines are mainly cliff nesters, though in some areas they use trees or even open ground (Hickey and Anderson 1969). Large prominent cliffs are preferred because of the natural advantages they provide for hunting and territorial defense (Newton 1988). These preferred cliffs usually overlook open areas where prey may stray too far from cover and find themselves subject to aerial attacks. Sheer cliffs also provide protection from mammalian predators (Newton 1988). Restoration efforts have also found peregrines taking up residency in urban areas on tall buildings and bridges, although this is not without precedent (Cade 1988). Peregrines in Maine prefer nest sites near aquatic settings (MDIFW 1991).

Peregrines also have a tendency to return to their natal area to breed and are not dispersing aggressively to unoccupied habitat (Temple 1988). Hunt (1988) believes there are a limited number of "serviceable breeding locations" for peregrines based on physiographic (cliffs) and biotic (food) factors. It may take time for a slowly expanding population of peregrines to find and occupy these sites. Suitable habitat is not a limiting factor in Maine (MDIFW 1991). The two historical sites at ANP are only seven miles apart, perhaps making reoccupation of the second site easier.

Cade (1988) noted that peregrines reoccupying historical nest sites after many years absence are using the very same cliffs and sometimes the very same ledges. Peregrines returning to ANP demonstrated this selection process at the Precipice. We might expect any second pair in ANP to settle in Valley Cove, the other historical eyrie, although several other potential sites are found in the park and local area. Changes in or loss of habitat or other forms of human activity might influence the future occupancy of historical or other suitable sites in the ANP area.

With their superb flying skills, peregrines take most of their prey while on the wing. Pigeons, jays, robins, warblers, and shorebirds such as gulls and terns are common items (USFWS 1991). A preliminary inventory of prey remains collected from nest ledges at the Precipice includes yellow shafted flicker, blue jay, American robin, common grackle, cedar waxwing, American goldfinch, an unidentified warbler, an unidentified tern, black guillemot, and laughing gull (Super 1993). Other species observed being eaten, carried, or hunted are yellowlegs, mourning dove, tree swallow, and red winged blackbird. Peregrines, possibly from ANP, have also been seen hunting successfully at the tern colony on Petit Manan Island for arctic, roseate, and common terns.

Contaminants

There is little published data for the northeastern U.S. on contaminants present in peregrines, their eggshell remains, or their prey. This is especially true for Maine. Prey remains have been collected at the Precipice site in ANP for the last three years but there has been no analysis. Some eggshell fragments were found in 1992.

An analysis of contaminant levels in peregrines from the mid-Atlantic Coast showed a wide variation, with some levels approaching those that would impair reproduction (Gilroy and Barclay 1988). Stone and Okoniewski (1988) found some individuals of certain raptor species in parts of New York State to be still threatened by DDT. Seventeen percent eggshell thinning (from pre-population crash levels) was determined to be a general threshold above which peregrine populations decline and below which they begin to recover (Kiff 1988).

Peakall and Kiff (1988) reported several studies which found coastal populations of peregrines recover more slowly because they feed on shorebirds which may have higher levels of contaminants than terrestrial prey. They felt migratory peregrines and peregrines feeding on migrant prey are also more at risk of contamination because DDT use is still high in equatorial regions. Peregrine population trends in North America, over time and space, correlate well with the introduction, use, and prohibition of DDT. In fact, a lack of

recovery in an area is a reasonably reliable indicator of still high levels of DDE (Kiff 1988).

Based on the above studies and three years of breeding success at the park, prospects for further recovery in the ANP area seem good. Nonetheless, contamination is still a potential local threat to the recovery of peregrines (USFWS 1991). Studies of bald eagles in Maine show continued evidence of contaminants (Welch 1991) and possible reproductive impairment (Owen et al 1991). Although peregrine nest failure can often be linked to an adverse weather event, should this occur now at ANP, intact eggs or dead chicks should be turned over to the USFWS for contaminant analysis.

Disturbance

Human disturbance can take many forms (e.g. construction, aircraft flights, recreation), and peregrine falcons are considered highly sensitive (Fyfe 1969). Successful nests in urban environments seem to contradict this claim, however, these nests may be more insulated from human activity than one would think. Frequency, duration, timing, location, predictability, and scope of the disturbance are all important elements influencing wildlife behavior and productivity; other considerations are wildlife characteristics such as age, sex, or nutritional state (Knight and Cole 1991). Given the degree of protection afforded the two historical eyries in ANP by virtue of their interior park locations, recreational disturbance has great potential for disrupting reproduction.

Hickey (1942) made the following observation about disturbance,

"As a general proposition, peregrines appear to be little molested by the progress of what passes for civilization below their cliffs, but frequent or prolonged visits by human beings to the top of an escarpment or cut bank may bring about interruptions in the breeding cycle, and in some cases, actual desertion of the eyrie."

Crowds of visitors to the parking area a half mile directly below the Precipice eyrie in ANP support this observation; there has been no apparent impact on reproduction for the past three years.

Generalizations about disturbance are hard to make. Snow (1972) claimed rock climbing near nest sites typically caused abandonment. However, in Yosemite National Park, Asay and Davis (1984) reported a successful nest with climbers within 200 meters of the nest. Lanier and Joseph (1989) reported on four examples of peregrine-people interactions in New Hampshire. One of these involved climbers who apparently kept a female off the nest enough in early spring to cause nesting failure. This climbing route was only a few feet from the nest. In another instance where the Appalachian Trail passes near the top of the ledge, hiker traffic caused peregrines to stop nesting and leave the area. A consistent distance-disturbance relationship has yet to be established and may not be possible given the variety in individual birds and cliff settings. Rock climbing and hiking at ANP are probably equally potent threats to successful peregrine nesting based on recreational use patterns at the historical eyrie sites. The illegal taking of nestlings for commercial or personal purposes is possible but not likely according to MDIFW biologists.

Management History

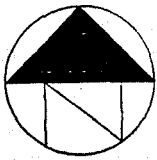
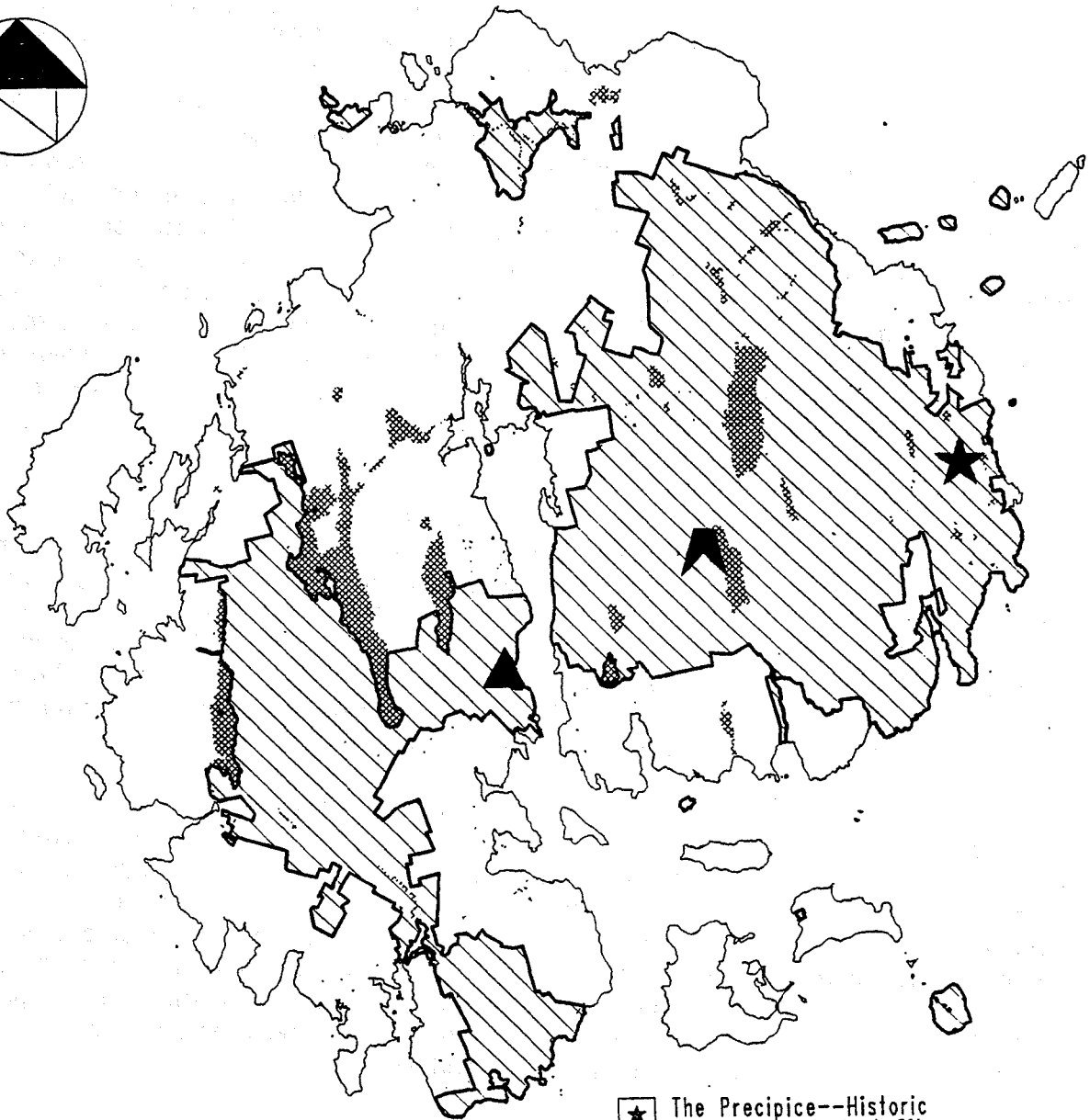
Chief Park Naturalist Paul Favour reported nesting peregrines on Eagle Cliffs in Valley Cove and the Precipice on Champlain Mountain (Figure 1) from 1936-1947 (Duley 1984). Favour left the park for the next eight years, returning in 1956 to find peregrines nesting at the Precipice but not Eagle Cliffs. It is not known if nesting at the Precipice continued during these eight years or what year the nest at Eagle Cliffs was abandoned. This is believed to be the last year peregrines produced young in the park. Peregrines and hikers apparently coexisted on the Precipice in those early years, raising questions about how and why this relationship was stable for so long. Did they co-adapt to one another? Was hiker traffic low enough during the critical time periods to cause little disturbance? Where were the actual nest ledges? We'll never know the answers. There were a few reports of solitary birds in the 1960's outside migration times. The only other unconfirmed yet reliable sighting was in June 1980 from park naturalist William Townsend who reported seeing two young at a nest site being fed by the two adults (Duley 1984). Townsend also observed two young and one adult in flight several times while guiding nature walks on Gorham Mountain in July and August. There are no records of peregrines nesting at other locations in the park such as Schoodic Peninsula or Isle au Haut.

Hacking. Active management of peregrines at ANP began in 1983. With the active support of ANP Resource Management Specialist Carroll Schell, William Drury of the College of the Atlantic evaluated the historic eyries (Duley 1984) and other potential habitats that spring as possible release sites for captive-reared peregrines. Officials from MDIFW and ANP were hoping to join the Eastern Peregrine Falcon Recovery Program coordinated by the USFWS. That fall, officials from the park, the College of the Atlantic (COA), the Peregrine Fund, and the MDIFW met to outline state strategy for reintroduction and the process of working together for peregrines.

Jordan Cliffs in ANP (see Figure 1) was selected as a high priority site in Maine for reintroduction in 1984. Jordan Cliffs is located midway between the two historic eyries and is completely protected by park lands. The cliffs are long and high like those peregrines prefer, and overlook the wide open expanse of Jordan Pond for hunting. Human use was manageable; hiker traffic went below the proposed hack site and rock climbing was minimal. A survey of the area for great horned owls, the most threatening predator of young peregrines, found none. While the park sought the return of peregrines to ANP, the greater goal was to participate in what would become a regional reintroduction of peregrines to the northeast and Maine.

From 1984-1986, 22 of 23 captive-raised peregrine chicks were successfully hacked back to the wild from Jordan Cliffs (see Duley and North 1984). Students from COA acted as attendants for the birds 24 hours a day during the six week hacking process. Hacked peregrines (presumably from ANP) were soon seen hunting 15 miles east at the tern colony on Petit Manan Island (Drennan 1986). Gulls had recently been exterminated from the island by the state to enhance tern nesting, especially roseate terns, another federally listed endangered species, and there was some concern the peregrines would severely impact the tern colony. This has not happened yet, but it is an example of the potential conflict as different agencies try to manage for two endangered species sharing the same environment.

FIGURE 1: THE PEREGRINE FALCON IN ACADIA NATIONAL PARK



- ★ The Precipice--Historic & Current Nest Site
- ▲ Valley Cove--Historic Nest Site
- ▼ Jordan Cliffs--Hack site (1984 - 86)
- ▨ Lakes & ponds
- ▨ Park legislated boundary

Peregrines released at ANP have been found nesting successfully in New York City, and at other sites in New England. The male from the pair currently nesting in the park is believed to be from the group hacked here in 1986. The band numbers were confirmed in 1988 but have not been confirmed since.

Return. In April of 1987, an intensive one day volunteer watch program looked for returning peregrines. Each year prior, park employees had watched closely because adult peregrines will attack fledglings aggressively and kill them while they are learning to fly. No peregrines were seen that day, but the next month one was seen near the hack site. Hacking was suspended at ANP and the young were released at another location in Maine. Peregrine sightings continued sporadically throughout that summer in the park.

The return of peregrines was eagerly awaited in 1988. That spring a male peregrine took up residence at the Precipice, and a female subadult later joined him. The pair displayed courtship and nesting behavior. A public closure of the area was instituted, including the popular Precipice Hiking Trail from the parking lot to the summit of Champlain Mountain and a section of the East Face Trail. The climbing area known as the Central Slabs was also closed. The major climbing area known as the South Wall remained open. The South Wall is not visible from the section of the cliff the peregrines were using most often. The female departed after a short stay and the area was reopened on June 10.

In 1989 and 1990, almost the same scenario was repeated. Only the dates of arrival and closures changed. In 1989 the area was closed from April 11 to early July. In 1990, it was late March to July 5. An unsuccessful attempt was made to foster a broad wing hawk chick at a scrape in 1990 to further cement the pairs' attachment to the site. If the peregrines had cared for it, a peregrine chick would have been substituted a week later. The cliff was checked in the fall of 1990 for scrapes and prey remains. There were several scrapes found and some prey remains were collected, but there was no evidence of eggs. There was some concern in these early years that ravens nesting at the Precipice may have contributed to the failure of peregrines to breed. Other studies have shown that peregrines and ravens can coexist as they eventually learned to at the Precipice.

The return of the peregrines each of these years sparked a period of intensive observation by park staff and volunteers for behavioral clues to nesting. Courtship and nesting behaviors were observed, but no breeding occurred. Many visitors viewed peregrines through the observation telescopes set up in the parking lot below the cliffs. Park employees told the peregrine's story and promoted the endangered species program. The subsequent success of the peregrines must be partly attributed to this active field education program combined with media coverage; both enlisted the cooperation of the public in staying out of the closed area. Public response was excellent. Only a very few persons violated the closure each year.

Nesting 1991. Peregrines returned to the Precipice on schedule in 1991 and the area was closed in early March. Daily monitoring for three months revealed courtship and nesting behavior, but nesting was not obvious. On June 19, a park employee spotted three chicks at a site on the lower cliff face. After three years of reintroducing captive-raised birds and four years of unsuccessful nesting, the cooperative efforts of the NPS, the MDIFW, the USFWS, the College of the Atlantic, and the Peregrine Fund were finally rewarded (Breen

and Anderson 1992). For the first time since 1956, naturally reared peregrine falcon chicks successfully fledged in ANP.

A media release was prepared and the story was given prominent attention in three local newspapers. The regional office provided funds for hiring a full time person to monitor the site and offer informal interpretation through the summer. An exhibit sign was installed at the trailhead to provide education also. Site bulletins were prepared as handouts for visitors and peregrines were featured in the park newspaper.

The chicks fledged on June 30 and July 1. Five peregrine falcons could be seen soaring in the area. Education programs continued. By August 30, peregrines were no longer defending the cliff or the nest site, and the area was reopened to the public. Young peregrines were observed apparently making a successful transition to hunting on their own, and have been seen near the nest site into September. Rangers descended to the nest site in September to collect prey remains.

Nesting 1992. An open ledge on the upper cliff face was chosen as the nest site in 1992. Area closure occurred in early March. Where the 1991 nest site was isolated from the Precipice Trail, the 1992 site was 50 feet below the top of the trail as seen from the parking lot and about 75 feet north of another section. The site was monitored by resource management staff and on-site education was provided by both resource management and interpretation staffs as much as possible. Education efforts continued through the local press, park newspaper, and the exhibit at the trailhead. Three chicks were again reared successfully, on a slightly earlier schedule than the previous year. The area was reopened August 21. Rangers again visited the nest site for collection of prey remains and photographs. Eggshell fragments were found in the immediate area of the scrape.

Nesting 1993. In 1993 a pair of peregrines returned to the Precipice and nested for the third year in a row. As in 1991 and 1992, the male was banded and believed a 1986 hatched bird. Friends of Acadia provided matching funds for a seasonal resource management position to monitor the nest site and provide interpretation to visitors. The monitoring data and visitor services provided significantly exceeded those of past years. Much better information on breeding chronology, prey, and general behavior was obtained. Details can be found in Super (1993) and those related to management are briefly summarized here.

The same area closure began April 9 and ended August 18. Peregrines chose the top of the lower cliff face not far above the 1991 nest site as their eyrie this year. This site is about 150-200 feet almost directly below the start of the ladders on the trail. It is easily accessible to researchers and predators although the distinction between them is not always clear to the falcons.

Signs at the trailhead were augmented by German and French translations in July in response to a closure violation. A sixth closure sign was installed about 100 feet up the trail to catch the attention of those who crossed the gate ignoring or not reading the sign there. An in-house quasi-weekly newsletter kept park employees up to date on all peregrinations. Peregrines were featured on local television and radio and in the local

press again. They also made it into the park's environmental education program in the local schools.

Unprecedented observational data on egg laying (~April 16) and hatching (~May 20) allowed the banding of peregrines for the first time at Acadia on June 12 by Michael Amaral of the USFWS and Charles Todd of the MDIFW. Park staff were able to take video footage and still photographs of the peregrine chicks at the nest site. These were used by some of the local media.

A new technique helped determine when the area was reopened in 1993. Two dawn to dusk observations were made about one week apart. The second revealed no use of the cliff by either adult or immature falcons. This technique is now recommended as standard procedure. Prey remains were collected again in September and photographs taken of the nest site.

One important lesson from the 1993 peregrine watching season was the value of frequent monitoring, especially to identify the best time for banding. Funding for peregrine monitoring at ANP has not been consistent and is usually for only one season at a time. This program needs base funding to provide the best management for peregrines.

MANAGEMENT OBJECTIVES

1. Continued successful nesting of peregrine falcons at the historic Precipice eyrie or another site.
2. Reoccupation of the historical eyrie at Valley Cove, or another site in the park, and continued successful nesting there.

The possibility of more than two pairs of nesting peregrines in ANP should not be discounted, although it is unlikely for the near future. A major question which cannot be answered by this document is when, if at all, peregrines in ANP will not need intensive management. With limited nesting habitat, a high sensitivity to disturbance, and high park visitation, peregrines may require continued active management to remain permanent residents of ANP regardless of their listing status with the USFWS. Any change in that listing status, however, will be cause to reevaluate the objectives, strategies, and actions recommended in this plan. The necessity of recreational closures should be carefully considered at that time.

MAJOR ISSUES

The major issues for peregrine management at ANP are human disturbance and contaminants; these have been discussed at greater length for peregrines in general elsewhere in this document. For the near future, continued nesting success of peregrines at the Precipice and probably any other site in the park is not assured without management intervention in the form of site protection and recreational closure. As long as the birds are reproducing as well as they have been, it can be assumed that pesticide burdens are below the threshold for impairment. However, the contaminant level of peregrine prey is unknown for the area, and could still impact nesting success if bioaccumulation occurs. There is a need for contaminant research and monitoring.

Peregrines have not yet reoccupied the Valley Cove eyrie (or any other alternate second site in the park). It is not known if the regional peregrine population is large enough to accomplish this, or whether continued success at the Precipice will eventually help repopulate Mount Desert Island with a second pair of peregrines. Continued success and expansion of peregrines remains an important goal for ANP.

MANAGEMENT STRATEGIES

Peregrine falcon management strategies are continuing to evolve as the species gains a foothold in various recovery areas like the eastern region. As a general rule, more active management in the form of reintroductions is being phased out, though there may still be a need for it in limited geographic areas. Listed below are a number of alternative management techniques which may still be valid under specific conditions as part of a sound management program.

ALTERNATIVES

reintroduction through egg translocation, replacement clutching, fostering, transplanting, or hacking (this would require close scrutiny)

banding

monitoring known nest sites for occupancy, behavior, disturbance, and productivity

distribution surveys for new nest sites in the park and local area

research on peregrine biology and behavior, including disturbance, contaminant analysis, food habits, foraging areas, and migration

education of landowners, hunters, trappers, and the general public about peregrines and their protection

nest site augmentation

land and habitat protection

patrols of nest sites and enforcement of applicable laws, including area closures

investigating reports of peregrine activity in the park and nearby lands

investigating all causes of peregrine mortality in accordance with the Eastern Regional Peregrine Falcon Recovery Plan

Reintroductions, banding, and mortality investigations should involve USFWS consultation.

RECOMMENDED STRATEGY

Management strategies must involve all program areas of resource management - inventory, monitoring, research, education, protection, and mitigation - to achieve the objectives of this plan. There is considerable overlap between these program areas.

ANP peregrine falcon management must be consistent with management throughout the State and the eastern recovery region. ANP staff must continue to work closely with MDIFW endangered species biologists who possess the expertise to advise the park on all aspects of peregrine management. Regional USFWS endangered species specialists must be consulted on proposed management actions. Through the MDIFW and the USFWS, the park must stay informed of peregrine management techniques and progress throughout the New York/New England area.

Inventory

An annual spring survey for peregrines returning to the historic nest sites and a few other suitable breeding cliffs will be made. Observations will be made from March through June to be most effective. Valley Cove will be visited once a week for a minimum of four hours in this inventory phase. Other sites will be included as time permits. If peregrines are seen, monitoring should begin.

Monitoring

Active peregrine nest sites will be monitored beginning in March for six hours per week. In May and June much more intensive monitoring is needed to pinpoint egg laying and hatching and observe the young fledglings development. Twenty to thirty hours a week is required. Behavioral observations of peregrines provide important clues about progress and productivity which might influence succeeding management actions such as banding. Peregrines will be banded each year. This supports regional efforts and can provide valuable information for future management. During this critical period, monitoring and education will not be done by the same person at the same time. Visitor distractions may result in the loss of important behavioral data. Once the young have fledged, usually around July 1, a return to six hours of monitoring per week is sufficient. To determine when a closed area can be reopened to visitors, 2-3 dawn to dusk watches will be made several days apart.

Monitoring will also include contaminant analysis performed on a three to five year cycle, or if this is not possible, analysis will be done following a loss of productivity at the Precipice or any other site. Eggs or dead chicks will be collected if this occurs, and blood samples will be collected when possible for routine contaminant analysis. Prey remains will also be collected each year to identify species composition of the local diet.

Research

Little research has been done on peregrines in Maine and the northeast because the population is still relatively new and small. Any research (or management) involving nest intrusions will occur only after careful consideration and consultation with the USFWS and MDIFW. The educational value of the Precipice site makes the risk of interference very high. All handling of peregrines for monitoring or research will be done by reputable and experienced federal or state wildlife biologists. All research activities will be performed under the supervision of reputable state, federal, or university wildlife biologists, or

otherwise highly qualified researchers.

A food habits study of prey remains and contaminant analysis of the same and of blood samples from banded chicks will be done. This information will tell how close the peregrines are to a level that might impair reproduction and how safe the local food supply is. With only one or two pairs of peregrines likely to exist at ANP, most research will be regional in scope. If intrusive research is considered, radio telemetry to determine hunting areas and migration patterns will be a high priority.

Education

Interpretation and education play a vital support role in protecting peregrines at ANP. Education strategy at ANP will maximize the opportunities presented by peregrines nesting at the Precipice site. Informing the public about the endangered species program can help protect all endangered species through understanding of their needs. Since the on site monitoring/education functions are so closely related, a coordinated interdivisional program is needed. Newspapers and local media will be kept informed of progress. In-house communication of progress should continue. Endangered species management will continue in environmental education programs.

Protection

Protection of peregrines at ANP will require the cooperation of all divisions in the park. All park employees should develop a sense of pride in the peregrines and the Precipice nest site and will be encouraged to stop for five minutes periodically as they pass by the parking lot, particularly if no one else is there. A brief check for violators of the closure is all that is needed. Any violations of the closed area will be reported immediately and responded to promptly by law enforcement personnel. This sense of pride should be transferred to the general public at every opportunity. New nest sites will merit the same protection when it is routinely easy to provide. At a more remote nest site, a more organized schedule of protective patrols will be necessary. Public use closure is expected to remain the most important and effective management action to protect peregrines from disturbance.

Mitigation

The ultimate mitigation strategy is to reduce or eliminate the entry of contaminants to the environment. This is beyond the capability of the park. However, periodic contaminant research and monitoring can be used to document the problem and to help enact and enforce legislation to reduce contaminants. Education, protection, and research should contribute to the mitigation process.

Hacking is no longer possible at ANP given the existing peregrine nest at the Precipice. Adult peregrines will prey on recently fledged young. The park is in a waiting and watching mode to see if additional peregrines breed in the park. If the Precipice site is

abandoned, then hacking becomes a potential management strategy once again, provided a source of birds still exists. The USFWS must be consulted prior to action of this kind and full compliance with the ESA and the National Environmental Policy Act would be required. Young peregrines now cost about \$1,500 each.

There is a possibility that the birds could be released into the wild, but this would require a lot of research and a lot of money. The birds would have to be trained to fly and to hunt, and they would have to be released in a suitable habitat. This would be a very expensive and time-consuming process, and it would be difficult to ensure that the birds would survive in the wild.

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SCHEDULED ACTIONS

All park actions must be in line with those recommended by the Eastern Peregrine Falcon Recovery Plan and the park should remain a visible and cooperative partner in the recovery program. Actions here are based on a five year life for this plan.

1. Continue recreational closure at the Precipice. The Resource Management Division will close the area with the assistance the Protection Division. The Resource Management Division will also prepare press releases for the closure and develop SOPs for closing and opening the site. The Protection Division will patrol the area frequently. All staff will be involved in the protection effort.
2. Continue monitoring Precipice nest site, March-August. This is the responsibility of Resource Management Division. Important or unusual observations by other staff in the course of their duties will be reported to the Resource Management Division.
3. Survey the Valley Cove site and other selected locations, including islands, regularly during March, April, and May for returning peregrines. Major responsibility for this lies with the Resource Management Division. Any observations of other park staff or visitors will be reported to Resource Management Division immediately.
4. Continue to collect prey remains from nest sites for identification (food habits study) and possible contaminant analysis. Make every effort to have analysis done through the USFWS or the Cooperative Park Studies Units of National Biological Survey. Responsibility for this depends on the availability of park staff with climbing skills.
5. If peregrines return to Valley Cove, the following trails will be closed as a minimum:
1. Valley Peak Trail from Man O War Brook Road to its junction with the St. Sauveur Mountain Trail and 2. The spur from Valley Peak Trail to the St. Sauveur Mountain Trail. Consideration will be given to closing the remainder of trails to St. Sauveur Mountain from Rt. 102 and the Flying Mountain Trail from the end of Valley Cove Road to the Man O War Brook Road. Trailhead signs with a closure map will be needed at Acadia Mtn., St. Sauveur Mtn., and Valley Cove Road Trailheads. This is a Resource Management Division responsibility.
6. Protection of a peregrine nest at Valley Cove will include vehicle patrols of the Valley Cove Road (expected to be closed to public vehicular access) and occasional foot patrols of trails. Responsibility for this lies with the Protection Division.
7. Interpretation Division staff and volunteers will strive to have someone at the Precipice providing education and viewing opportunities daily from hatching to one month after fledging. A seasonal position will be base funded for this program for the next 3-5 years at which time it will be reevaluated. If a position cannot be base funded, the park should continue to seek other sources of funding annually, such as the Challenge Cost Share Program to meet this vital need.
8. Investigate all causes of peregrine mortality within the park. This is a joint Protection Division and Resource Management Division responsibility.

STAFF RESPONSIBILITIES

SUPERINTENDENT

The Superintendent has the overall responsibility for the conservation of endangered species within the jurisdiction of the park. The role of the superintendent is to review plans, strategies and proposed action alternatives and select preferred alternatives.

DEPUTY SUPERINTENDENT

The Deputy Superintendent has the line supervisory responsibility over the Branch Chief of Natural Resources and other branch chiefs.

BRANCH CHIEF OF NATURAL RESOURCES

The Branch Chief of Natural Resources, in consultation with the MDIFW and the USFWS, is responsible for the development of plans, strategies, objectives, and action alternatives for the conservation of endangered species within the jurisdiction of the park. The Chief recommends management alternatives to the Superintendent and then carries out the approved actions to reach the stated management objectives through his or her staff and other park staff as appropriate.

WILDLIFE BIOLOGIST

The park wildlife biologist is responsible for wildlife inventory and monitoring programs and for recommending and coordinating research, education, and protection programs.

COOPERATIVE PARK STUDIES UNIT LEADER, UNIVERSITY OF MAINE

The CPSU Unit Leader of the National Biological Survey is responsible for coordinating and assuring the completion of research directed at solving management problems.

CHIEF OF INTERPRETATION

The Chief of Interpretation is responsible for integrating resource management issues into the interpretation/education programs of the park.

CHIEF OF PROTECTION

The Chief of Visitor Protection is responsible for enforcing all applicable laws for the protection of endangered species and implementing patrol strategies for specific peregrine habitats of concern.

MAINE DEPARTMENT OF INLAND FISHERIES WILDLIFE

The MDIFW has been delegated responsibility for Statewide peregrine management through a cooperative agreement with the USFWS. This includes annual nesting and productivity surveys and land protection strategies. In addition, MDIFW biologists provide expertise to the park for all aspects of peregrine management and biology.

UNITED STATES FISH AND WILDLIFE SERVICE

Through regional and field offices the USFWS provides expertise in all areas of endangered species listing, recovery, and management, and assists other Federal agencies in meeting their Section 7 ESA obligations.

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PEREGRINE EYRIE ACTIVITY FORM

CODES AND INSTRUCTIONS

WEATHER: Record all variables every hour on the hour.

WIND: For direction, use N, NE, NW, S, SE, SW, W, E.
(use Beaufort Scale to determine mph)

SKY CODES: PC = partly cloudy MC = mostly cloudy OC = overcast

PRECIPITATION: LR = light rain MR = moderate rain HR = heavy rain

BIRD A & B: Specify sex if determine, adult vs. young.

RECORDING ACTIVITY: Use left box for activity code, right block for location code.
Designate location codes on a "master" cliff diagram for all
observed perch locations.

Use T1, T2, T3, etc. for Tree Perches; L1, L2, L3, etc. for Ledge Perches

Activity Codes:

General -

OoS - Out of sight	SC - Soaring near cliff	BY - Brooding young
EAT - Eating	IN - Incubating	SY - Sheltering young
PT - Perched in Tree	IE - Incubation Exchange	FY - Feeding young
PL - Perched on Ledge	RPC - Retrieve prey from	PR - Preening
AE - At eyrie, activity	cache	SP - Stoop on Prey
unknown	PPC - Place prey in cache	

Territorial and Defense Behavior

VOCALIZATIONS:

SI (species code) Stoop on intruder	WaC - Wailing call
CI (species code) Chase intruder	CrC - Creaking call
RI (species code) Rise toward intruder	CaC - Cacking call
	WhC - Whining call

Courtship Activities:

CH - Cooperative Hunting	COP - Copulation
HC - High Circling	FBL - Fly-By and Landing display
UF - Undulating Flight	LD - Ledge display
F-8 - Figure-8 Flight	MLD - Mutual ledge display
FR - Flight Rolling	FT - Food transfer
ZF - Z-Flight	FT-DA - Direct aerial food transfer
TG - Talon Grappling	FT-IA - Indirect aerial food transfer
MR - Mutual Roosting	FT-T - Food transfer in tree
NS - Nest Scraping	FT-L - Food transfer on ledge
HWD - Hitched Wing Display	

ACTIVITIES OF YOUNG:

WF - Wing flapping
ML - Moving about on ledge
FC - Food calls

1) The Window
2) The Pinnacles
3) Balance Rock
4) The Three Pines

5) Lone Pine
6) "Frank's Nest Site"
7) Top of Trail
8) Triangle Ledge

9) X-mas Tree
10) Short Snag (in pines)
11) Raven's Nest-1990
12) Nest Scrape-1990

