

RESOURCE MANAGEMENT PLAN

ACADIA NATIONAL PARK

1992

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**ACADIA NATIONAL PARK
RESOURCE MANAGEMENT PLAN**

APRIL 1992

**U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
NORTH ATLANTIC REGION**

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	- Integrated Pest Management Plan	
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LIST OF ADDENDA: MISCELLANEOUS NATURAL AND CULTURAL RESOURCE
INFORMATION (Additional items will be added by
the Park over time)

- 1 - Memorandum, Trip Report of Regional Architectural Conservator
on examination of Park structures examining masonry
deterioration.
- 2 - Memorandum, Trip Report of Regional Architectural
Conservator, Building Conservation Branch, CRC for a
condition assessment of Lightkeeper's quarters on Baker
Island.
- 3 - Ecological Inventory and Monitoring Summary for Acadia
National Park, Data Status and Group Information - Fall 1991.

I. INTRODUCTION

The Resource Management Plan (RMP) for Acadia National Park (ACAD) describes the natural and cultural resources contained within the Park as well as current or potential activities for managing those resources. A wide variety of research initiatives, baseline studies and inventories, and manipulative and protective techniques are integrated into a comprehensive management program.

ACAD preserves approximately 41,000 acres in Hancock and Knox Counties, located along the Maine coast in the northeastern United States. It consists of land on Mount Desert Island (MDI) (approximately 50% of the entire island's land mass), portions of several outlying, smaller islands, a portion of Isle au Haut to the southwest of MDI, and the Schoodic Peninsula located on Maine's mainland to the east of MDI (Figures 1 & 2). In addition, the Parks holds numerous conservation easements in the Penobscot and Frenchman Bay areas. The Park was created to perpetuate the historical traditions and natural beauty of the land-intruded portion of the Gulf of Maine. Located just north of the populated eastern seaboard, ACAD is a natural reserve heavily used as a recreational resource, receiving millions of visitors each year. Most of ACAD's land has been acquired through donation, juxtaposing public with private lands and creating a noncontiguous boundary.

The Park was originally established as Sieur de Monts National Monument by presidential proclamation (# 1339) on July 8, 1916. Woven around name changes (Lafayette National Park - 1919, Acadia National Park - 1929) and recent boundary legislation (National Park Service [NPS] 1986), most of the Park's acreage is a result of donations to the NPS by private citizens.

ACAD preserves "for the benefit and enjoyment of the people" the "downeast" Maine coast and offshore islands in the archipelago centered around MDI. This area of the New England coast was described in the original proclamation as having "great historic... and scientific interest". Clear principles and objectives for managing Park resources were established: preservation of the scenic, natural, and cultural resources while offering Park visitors an increased awareness of their natural and cultural heritage.

The most recent Statement for Management (NPS 1989) describes its significance as a mix of islands and ocean unequaled along the Atlantic coast of the United States. Natural resources, as described within the "Statement" emphasize the unique mix of temperate, deciduous, and northern coniferous forests and glacial remnants characterized by a range of granite mountains, rocky shoreline, glacial lakes, and moraines. Noteworthy natural resources within the Park include an exceptionally diverse

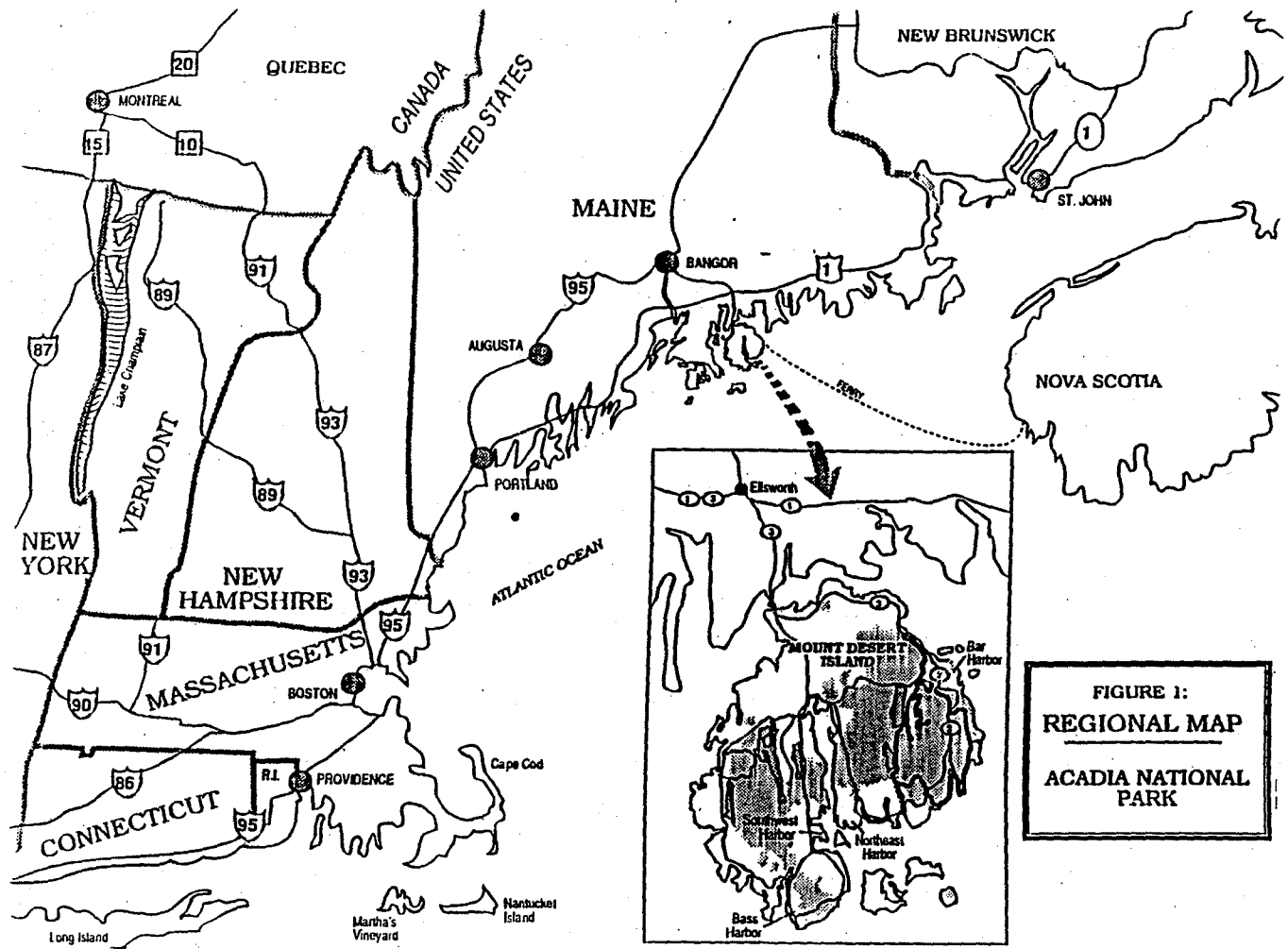


Figure 1. Regional Map depicting Acadia National Park and environs.

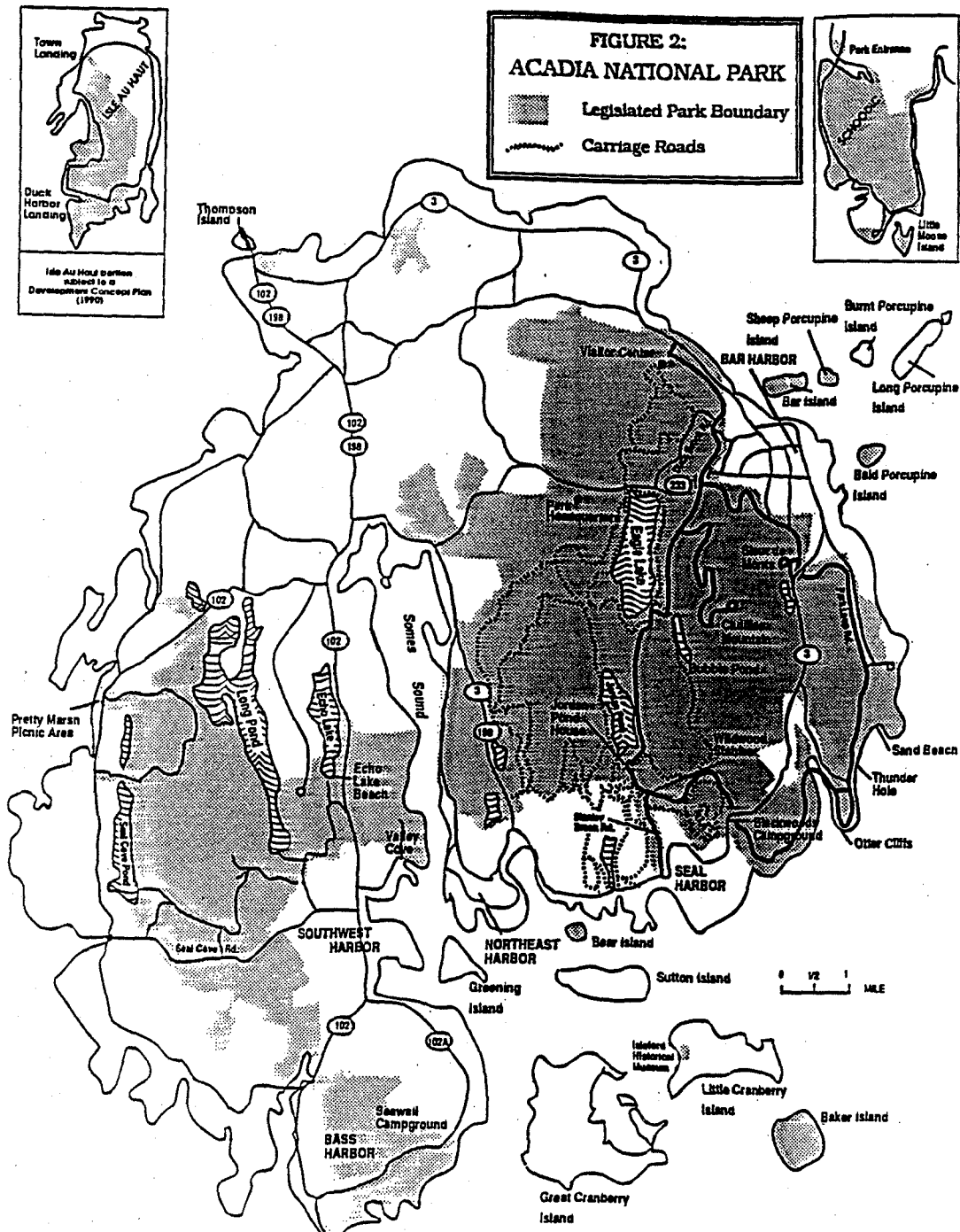


Figure 2. Boundary Map for Acadia National Park. Isle au Haut and the Schoodic Peninsula are not shown in their exact locations. Refer to text.

vegetation with small sections of old-growth forest, sub-alpine vegetation, over 50 species of mammals, and 300 bird species. Significant cultural resources include lightstations, 19th century frame buildings, a 80 km carriage road system with 17 stone bridges, and the Islesford Historical Museum.

Throughout ACAD's history, project funds from Washington and the North Atlantic Region (NAR) have resulted in a variety of scientific research and inventories (See Addenda #3); however, efficient resource monitoring and/or implementation of research recommendations have been woefully inadequate due to a lack of Park-based resource management programs. This has resulted in mostly token emergency (e.g., beaver management due to flooding on public-use roads) natural and cultural resource management and monitoring programs. Some basic species inventories and minimal curatorial operations are still lacking.

Continuing development pressures adjacent to the Park create increased fire danger, pollution, and habitat loss. Intense visitation pressures may adversely affect continued existence of local faunal and floral communities. Together, these represent a complex array of resource issues and related problems. Active management and/or manipulation of the Park's resources will likely become necessary in the face of such adverse impacts, but is contingent on a commitment from Park management and continued support from Washington and the NAR.

As ACAD approaches the 21st century, the specific objectives of this RMP are:

- 1) To maintain and understand ecosystem function in as natural a condition as possible.
- 2 Integrate the management of natural resources with the cultural heritage of the area.
- 3) To identify and delineate the entire spectrum of resources within ACAD and to insure their continued viability.
- 4) To establish and conduct efficient periodic inventory, monitoring, and assessment of the major resource systems within the Park.
- 5) Insure public access and appreciation of ACAD's resources while providing adequate protection and preservation.

II. PRESENT RESOURCE STATUS

A. NATURAL RESOURCE BASELINE INFORMATION

This overview describes present baseline information for ACAD's important natural resources. Levels of completeness of baseline data are based upon the standards for Natural Resources Inventory and Monitoring (I&M) for Level I (NPS 1991). A summary of all available information for ACAD's major resource groups is provided at the end of the RMP (see #3 in Addenda).

A potential tool for storing and analyzing baseline information on these resources is a Geographic Information System (GIS) which is now available at the Park (ARCINFO). Several thematic maps (e.g., soils, vegetation [ca. 1979], shoreline, water bodies) are now available on the GIS. Ultimately, effective implementation of this RMP will only be realized by staff use of this system and the acquisition of a dedicated GIS specialist.

1. Vegetation Resources

The Park's flora has been described in several publications and voucher specimens exist in both Park and university herbariums around the country (e.g., University of Maine at Orono, College of the Atlantic, University of Minnesota, Harvard University). A Park-wide rare plant inventory was recently completed (Greene 1990). Several plant communities (e.g., sub-alpine vegetation) and a few species are at the edge of their range or are found on only a small portion of Park-owned land (e.g., Pitch Pine [Pinus rigida], Jack Pine [Pinus banksiana], Scrub Oak [Quercus ilicifolia]) or are on the Maine state threatened and endangered plant list (e.g., [Calamagrostis stricta var. inexpansa]).

Vegetation maps developed from aerial photography flown in 1979 have been digitized and are now available the Park's GIS. Older aerial photos (ca. 1950-60) are also available. New aerial photos will become available in 1991 from the National Aerial Photography Project (U.S. Geological Survey) and the Park hopes to interpret vegetation on all photos and digitize all resulting maps. ACAD, in consultation with the NAR, provided \$5,000 of NRPP funds to the National Aerial Photography Project to conduct aerial photography of the State of Maine in FY91. As of late summer 1991, over 50% of the entire state had been flown and was scheduled for completion by fall '91. Participation in the project will allow the NPS to purchase all available photos at a reduced price. In the summer of 1991, the Park submitted requests to the NPS GIS division to purchase the necessary photos

for the Park along with digitization and photo interpretation (with ground truthing). Funding for such work is still uncertain, however.

Vegetation on MDI has been studied to determine the effects of air pollutants on various species (see Green et al. 1991 for a complete list of work on this topic).

The Park has and continues to undergo a large amount of development to accommodate increased visitation and bring facilities up to standard. Level I of the Inventory and Monitoring Standards have been met for certain aspects of the vegetation resource but not for others. For example, a rare plant inventory has been completed but only for vascular plants but there is little information on bryophytes. Adequate data are necessary to determine those areas where rare or sensitive plant species might exist so as to protect these species.

a. Fire

Fire history for ACAD shows that large fires occurred at 100-150 year intervals but the available information only goes back as far as 1500 AD. Research is now underway to extend the data base and examine fire occurrence history dating back several thousand years. This work is being done through pollen and charcoal analyses (see Patterson et al. 1983).

Currently, an approved Fire Management Plan (FMP) does not exist for the Park but is now in preparation. A large fire in 1947 burned approximately 1/3 of MDI; since that time all fires have been suppressed. General fuel inventories for the Park have been completed (Patterson et al. 1983). Site specific inventories are currently underway and will continue at various locations within the Park. Fire behavior for local plant species is virtually unknown for this part of the country as well as the utility of certain fuel reduction methods (i.e., role of prescribed fire). As a result, it remains unclear what role prescribed fire will play within the Park in the future.

The Park has an excellent long-term (> 50 years) record of climatic data. Some historical data on fire occurrence exists but data is lacking on fuel loadings and fire behavior. A new position, Fire Management Officer (FMO), was added to the Park Ranger Division in 1990. The FMO will collect detailed fuel load information and develop prescriptions for small scale management burns. Nevertheless, the current level of information, with the exception of short-term fire history, does not yet meet the Level I Standards for Inventory and Monitoring. This information is necessary before an active fire management program is implemented.

b. Threatened, Endangered, and Rare Plant Species

As noted, an inventory of rare and endangered plants has recently been completed for MDI and Isle au Haut. The Schoodic portion of the Park should also be completed in the future. This type of work is important and is the first step in establishing an efficient management program for this resource. With the completion of this work, Level I of the Inventory and Monitoring Standards will have been met. Complete species distribution maps and management plans will be necessary to insure the protection and preservation of these species.

c. Exotic Plant Species

Purple loosestrife (Lythrum salicaria) is the principal species of concern within the Park and data are now being collected to determine the effectiveness of control efforts on populations of this species. Permanent transects have been established to generate long-term data and will continue to be collected.

A list of all exotic plants is available and the location of 12 different species has been completed (McInnes 1986). This information needs to be updated to effectively monitor the distribution of these species.

2. Animal Resources

a. Mammals

Information on occurrence and management of animal species is extensive for some species while little information exists on others. Extensive data on wildlife observations exists and continues to be collected; however, the quality and accuracy of this information is suspect. Nevertheless, the entire data base has been computerized in an attempt to determine the usefulness of this data but further analysis and review is needed.

Research has periodically been conducted on beaver (Castor canadensis) and white-tailed deer (Odocoileus virginianus) (Favour 1940, Gilbert and Harrison 1982, McLaughlin 1968, Saeki 1991). Recent data are also available on river otter (Lutra canadensis) (Dubuc 1987), MDI's coyote (Canis latrans) population (Winter 1990), and the effects of browsing on vegetation by deer and snowshoe hare (Lepus americanus) (Saeki 1991). Requests have been made to inventory freshwater fish but no work has begun. A statewide inventory of reptiles and amphibians has been completed but little actual field work has been conducted specifically within the Park or on MDI. Small mammal populations have been monitored in recent years as a result of various research

projects. This data base for some groups meets NPS Level I Inventorying and Monitoring requirements but is still lacking for others.

Beaver harvests from non-Park land on MDI have declined in recent years compared to the 1970's (Maine Department of Inland Fisheries and Wildlife [MDIFW] Harvest Records). In addition, there has been a large decline in the number of active beaver colonies within the area burned by the 1947 fire compared to the 1960's and '70s (Mueller-Schwarze 1979). While subsequent hardwood regeneration provided an increased food source post-fire, questions remain as to the influence of other factors (physical land attributes, vegetation, precipitation, trapping vs. non-trapping) on this population. Information on beaver population size and historical distribution is currently being collected. Digitization of vegetation maps will better discern activity in relation to the amount of available habitat at different time periods. Given the apparent connection between beaver activity and MDI otter populations (Dubuc et al. 1990), further information on MDI beaver will hopefully assist the Park in addressing the issues of biodiversity, succession, and habitat loss on adjacent private lands.

Additional furbearer work will focus on the possible reintroduction of fisher (Martes pennanti) to Park lands. Work has begun to construct a model to examine survival rates of fisher (and selected other mammal species yet to be determined) as a preliminary step toward a fisher reintroduction on MDI (work is scheduled to finish in 1992).

b. Birds

Park staff have monitored peregrine falcons (Falco peregrinus) in recent years to determine breeding success. After several years of apparent failure, in 1990, a pair of falcons produced three young that survived the entire summer and apparently left the area as healthy birds. Detailed information on the behavior of both parents and young was collected throughout the summer. Prey remains have been collected from the nest site and analyses will be performed during 1992.

The location of bald eagle nesting sites within the Park are monitored by the MDIFW on an annual basis and maps have been produced. Research will begin in 1993 to examine the population ecology of bald eagles in Frenchman's Bay.

While data on those animal species mentioned above meet minimum Level I requirements, basic population research along with inventory and monitoring work is necessary for many others (e.g., spruce grouse [Canachites canadensis], bog lemming [Synaptomys cooperi]) as well as several entire groups (e.g., fish (see water resources section; amphibians, reptiles, many invertebrate groups). Considering the continuing development adjacent to the Park resources may become severely impacted.

c. Fish

Cold and warm water fish species, including non-native brown trout (are stocked in both Great Ponds and Park owned waters by MDIFW and this process has been on-going for many years. Stocking species lists are available and are updated annually. This information represents only what the State of Maine puts into these water bodies and should not be considered a thorough baseline inventory of this resource. In addition, the effect of this stocking on the native fish species gene pool is unknown. Data are also not available on fishing pressure or harvests for the individual species. Current information does not meet Level I I&M Standards.

a. Integrated Pest Management

Gypsy moth (Lymantria dispar) and spruce budworm (Choristoneura fumiferana) populations are monitored in cooperation with the U.S. Forest Service. This data base is extensive (see Integrated Pest Management Plan) and available on a regional basis for several parks. As a result, trends and comparative analyses can be made for the past ten years.

The Park has numerous historic structures many of which have unknown pest infestations. Carpenter ants (Camponotus pennsylvanicus) occur in several buildings each year and yellowjackets (Vespula maculifrons, V. vulgaris) honeybees (Apis mellifera), bald-faced hornets (Vespula maculata), and paper wasps (Polistes spp.) are an annual nuisance with summer visitors.

Detailed action plans for species of concern are available in the Integrated Pest Management Plan (which was approved in 1991) as well as a more detailed description of animal and plant pests found in the Park, current problems as well as an historical overview. In summary, information in this area meets minimum Level I Inventorying and Monitoring Standards.

b. Public Health and Safety

Lyme disease has recently been reported from MDI in the vicinity of Bar Harbor. The northern deer tick (Ixodes dammini), primary vector of Lyme disease in the northeast is also present on MDI. Park staff is now conducting extensive small mammal surveys to determine the distribution of this species on MDI. Ticks are also being examined for the presence of the Lyme Disease spirochete, Borrelia burgdorferi.

The presence of giardia on MDI or within ACAD is unknown at this time. Bacteria levels (coliform) for local fresh and salt water, are monitored by the state. This data is available to the Park and exceeds Level I I&M Standards.

The status of other zoonoses (e.g., tularemia, rabies) is unknown, but the state monitors such diseases and occurrence on MDI is thought to be low. The Park has met Level I of the Inventory and Monitoring Standards for Lyme Disease but not for many other public health risks previously mentioned.

3. Aquatic Resources

A large variety of water quality information has been collected within the Park and on MDI by local universities and private individuals. While study objectives for all this work has not focused around NPS management objectives, some of this data should be of use to the Park as baseline information. In addition, a recent "Scoping Report" for the proposed Water Management Plan (NPS 1990) has been compiled and reviewed the available information on the Park's water resources. This document, while not providing all the pertinent baseline information, synthesizes the most important water resource issues and provides necessary references. Of particular importance are works on the calibrated watershed and the impacts to the Bass Harbor Marsh System. These data will help explain the condition of and inputs to watersheds and the quality of sensitive aquatic resources on MDI. This will be especially important as all major watersheds that enter ACAD do not lie entirely within Park boundaries. Thus, impacts associated with increasing development including sewage disposal, increased water withdrawals, and non-point source pollution originating outside the Park may affect surface and ground water resources in these watersheds.

The Park also collects precipitation data as part of the National Acid Deposition Program (NADP) and the information exceeds Level I Inventory and Monitoring Standards.

At the request of the Maine Department of Environmental Protection (DEP) limited monitoring of basic water quality measurements is conducted within the Park in Great Ponds. Temperature and secchi disk readings have been collected for several years. Selected lakes on MDI are intensively sampled every three years for a variety of physical, chemical, and biological parameters. Water quality in both Great Ponds and Park-owned waters is presumed to be excellent (Division of Fisheries, MDIFW, pers. comm.)

In summary, baseline data for ACAD's aquatic resources is very good in some areas but almost non-existent in others. With regard to NPS Inventory and Monitoring Standards, each resource component within the Aquatic Resource category (e.g., fishery, water chemistry) must be examined individually to determine the particular standard level. A variety of references for this resource category are available and a list can be found in the Draft ACAD bibliography (Greene et al. 1991) and the water resources Scoping Report (Flora 1990).

4. Air Resources

ACAD has an extensive air quality monitoring program that is directed through the Air Quality Division in Denver. Ozone, SO₂, visibility (photo point), and particulate data are collected and an excellent, long-term data base is available. Ozone levels have occasionally exceeded the national standards in recent years. Although there have been several air quality studies conducted on MDI and IAH (Wetmore 1984, Sanchini 1986, Jagels 1986, Jagels et al. 1989), the manifestation of ozone effects on vegetation is still uncertain. A five year research effort to determine the effects of ozone on various plant species, particularly white pine (Pinus strobus) is now in progress (Eckert 1989). Overall, AACAD has accumulated a significant data base for its air resources and exceeds level I I&M Standards.

5. Geologic Resources

The geology of the Park may be defined as a combination of marine erosion, glaciation, igneous activity, and sedimentation. There has been much research conducted on ACAD's geological landscape and a wealth of information is currently available.

In terms of raw information, baseline data on much of the Park's geologic resources exceeds level I NPS Inventorying and Monitoring Standards for MDI (NPS 1989b). It should be noted, however, that little of this information has been collected with

Park management needs in mind. Much of the research has been conducted to satisfy academic inquiries and may not be immediately applicable to the needs of Park management. Nevertheless, some of the noteworthy studies that have been conducted include: Bradley 1983, Chadwick 1939, Metzger 1979, Raisz 1929.

A complete soil survey has been completed for MDI and is available for on the GIS.

6. Aesthetic Resources

Historic, scenic vistas exist within the Park along the Carriage Roads and the paved automobile roads. Many of the vistas, however, have become overgrown and due to lack of maintenance no longer exist as aesthetic resources.

Jacobson and Dominie (1988) identified viewsheds from various elevations within ACAD to areas outside the Park and is being digitized on the Park's GIS System.

Some vistas were cut by the ACAD maintenance staff in 1988 and others have been documented and can be found in the comprehensive work completed on Rockefeller's Carriage Roads (Rieley 1989). In the spring of 1990 and 91, the University of Maine's Forestry Camp reclaimed several vistas along the Carriage Road system. This work was completed under a cooperative agreement between the University and the Park.

Special funding to continue work on the Carriage Road System has been approved by Congress for FY92. It is critical that prior to any additional work on this project NEPA compliance be completed.

Baseline information on the aesthetic resources currently does not meet Level I I&M Standards. Sufficient detailed information does not exist depicting all historic vistas and concomitant floral and faunal changes that have taken place over the years.

B. NATURAL RESOURCES

This section is an overview of ACAD's significant natural resources and gives an assessment of the current condition of these resources. Categories for this section are based on topics presented in the NPS-77, Natural Resource Management Guideline (NPS 1991). It is the intent of this section to fully describe a resource's condition which includes threats to the resource as well as providing important appropriate background information.

Additional information on specific natural resources and natural resource management programs in the Park can be found either in :

- specific action plans (see list of in Table of Contents)
- Park specific research reports (see Natural Resource Bibliography, Greene et al. 1991)
- RMP project statements found later in this document.

1. Vegetation Resources

Current vegetation patterns within ACAD reflect 18th and 19th century land management practices. More recently, vegetative succession on the eastern half of MDI was severely affected by the 1947 fire. Hardwoods, often with an understory of spruce (Picea spp.), dominate where ecological succession has been altered by the fire. On the western half of the Island, however, mature spruce-fir (Abies spp.) forests dominate the landscape with heavy fuel buildups. With residential development expected to continue on MDI into the foreseeable future, the residential community/Park interface is growing. As a result, this development impacts vegetation existing under natural processes. Biodiversity, reestablishment of extirpated species, and the continued existence of endangered species may have to be sacrificed to protect human health and safety from catastrophic fire.

While the Park's natural resource management goals should be defined within an ecological as well as sociological framework, future management decisions will become increasingly difficult as remaining land on MDI outside of ACAD's boundary becomes developed and/or changes ownership.

Special status plants continue to be threatened by development, Park maintenance projects, heavy visitation experienced within the Park, and a lack of current inventory and monitoring information. Small stands of jack pine exist within ACAD's boundaries. Park management needs to determine if these stands are to be maintained or if ecological succession will be allowed to function unimpeded which may result in the possible loss of this species. Recent research (Conkey et al. 1991) has shown that this species may be lost if the current fire management practices continue. This will be addressed in more detail in the Park's FMP which is currently in preparation. A small population of scrub oaks (Quercus ilicifolia) exists along the western edge of Sommes Sound. This is another species that is also at the edge of its range in ACAD.

One other vegetation resource of particular note is a stand of virgin spruce/fir forest occupying approximately 200 acres of Western Mountain. The stand is dominated by red spruce (Picea rubens) and is very unevenly aged. Some trees are 200+ years of age and represent one of the few virgin spruce/fir forests along the entire coast of Maine (NPS 1981). Although the resources just described are not in immediate danger, current resource information is necessary to prevent those threats previously described from becoming a reality.

The main exotic plant species of concern is purple loosestrife. This species has invaded many roadsides and marshes throughout the Park threatening native systems. Effectiveness of past control work is now being determined to guide future management actions.

Several other vegetation resources at ACAD are also of concern to the NPS. Of special note are the effects of ozone on native vegetation. Despite previous research on this topic, results are inconclusive as to how ozone manifests itself in vegetation. While it is generally felt that ACAD's vegetation is being impacted, the extent is unknown.

Sensitive sub-alpine vegetation found on several mountainsides is thought to be affected by trampling from increasing visitation. Although many of these communities are endemically small, past activities have resulted in specimen loss due to the lack of attention to biological diversity and ecological processes. Research on this community began in 1991 (Foley et al. 1991).

As noted, a rare vascular plant inventory was recently completed and there are several state endangered plants within the Park. Several plants exist only in small populations within the Park (Greene 1990) and should be watched closely. Additional inventory work is necessary to cover the entire Park area. All other Park projects should be closely scrutinized to determine if impacts are to these projects are occurring.

a. Interaction of Vegetation with Beaver, Deer, and Snowshoe Hare

Research into the browsing impacts on vegetation by deer and snowshoe hare was recently completed and a final report has been submitted (Saeki 1991). Deer and hare do not appear to be overbrowsing the Park's vegetation at this time. In fact, research results suggest that these species populations are declining and are underutilizing available browse (Saeki 1991).

It is thought that beaver use of hardwoods has modified a resource that was essentially limited in recent years (as a result of the 1947 fire) to the eastern half of MDI. Although beaver harvests for MDI have declined in recent years, the total beaver impact on vegetation remains unknown at this time.

2. Animal Resources

Coyote ecology on MDI was studied to determine their interaction with and distribution relative to other MDI carnivores along with their habitat preferences (Harrison 1988). The principal investigator's willingness to provide additional data analysis at no additional cost will result in completion of a final report sometime in 1992.

Additional research is scheduled to determine the interaction of deer and coyotes on MDI (Harrison and O'Connell 1991). Work was initiated in the fall of 1991.

Beaver were a problem in recent years (1980's) as their dams flooded roads and created safety hazards. However, these problems have decreased almost to the point of being almost non-existent. While new innovative "beaver-foolers" have been used in recent years and may be partly responsible for the decline in nuisance problems, there is supporting evidence for a general decline in the number of beaver. Aerial cache surveys in 1989 along with ground-verification of activity support this contention. It is estimated that the beaver population has declined by approximately 60% since the mid-1970's.

Trapping on non-Park land is thought to be impacting the Park's furbearer resource. Effects of trapping on non-Park land and on great ponds and the impact to MDI's beaver and entire furbearer resource are unknown; however, a drop in harvest numbers further indicate this decline despite the fall of pelt prices which make it unprofitable to trap. Linkage of otter populations to the active beaver flowages (Dubuc et al. 1990) further indicate the importance of understanding the dynamics of these resources.

Lyme disease is present on MDI (Ginsberg and Ewing 1988) and its distribution is now being investigated. The threat of humans contracting Lyme disease on MDI is growing and is of concern to Park management. Apparent range extension of the northern deer tick, and the disease agent, B. burgdorferi, into coastal Maine has been documented. In addition, other Ixodes tick species are present on MDI and may also serve as a vector of Lyme disease. Very little research on these other species has been conducted but work is now underway by the Maine Medical Center in Portland, ME and ACAD's natural resource staff. Thus, collection of ticks by trapping of small mammals, incidental collections of ticks from white-tailed deer, and dragging are in progress. Three years of data were collected by the end of summer 1991. An assessment of this work will take place during the winter of 1991 and 92.

Currently, the deer tick appears to be very localized in its distribution, having been found only from a small portion of the eastern half of MDI (Hazen et al. 1991). In addition the number of infected ticks found thus far has been < 10%.

Over 20 peregrine falcons were hacked from Park land in the mid-1980's (Breen and Anderson 1992). While peregrines have returned to historical eyries since the hacking program was completed, there was no indication that this species was successfully nesting in the Park. However, in 1991, three peregrine chicks were born on a cliff near the Precipice Hiking Trail (on Champlain Mountain). This event marks the first time in over 30 years this raptor has successfully bred in the Park. Monitoring throughout the summer indicated that these young birds survived their first summer season and apparently left the area in a healthy condition. These three birds represented 1/3 of Maine's known peregrine production for 1991.

Isle au Haut is a major wintering area for the north Atlantic population of harlequin ducks (Histrionicus histrionicus). It is thought that this species is declining in the western Atlantic. Initial surveys and monitoring have shown the population to numbers approximately 400 in 1989 (Mittlehauser 1991). This survey work should continue as harlequins are now listed as a Maine species of special concern and most recently (1991) as an endangered species in Canada. In addition, the harlequin can no longer be hunted in Maine.

Several native animal species have been or are thought to be in very low numbers on MDI. Viability of these populations is in question as continuing development and changing successional patterns will likely result in a loss of habitat. If necessary, reintroductions of such species should be examined as a future possibility. Work is already underway for fisher and spruce grouse (Canachites canadensis). Wood ducks (Aix sponsa) and the bog lemming are two other species whose populations on MDI are thought to be in low numbers and more information on their status is needed. Reports of large mammals (e.g., bear [Ursus americanus], moose [Alces alces]) have been increasing in recent years. Surveys of these species are needed to determine their presence within and adjacent to the Park.

3. Aquatic Resources

Many of the watersheds within ACAD do not lie entirely within the Park's boundary. Impacts associated with development including increased water withdrawals, sewage disposal, and nonpoint source pollution may affect surface and ground water resources in these watersheds. New development must comply with rigid state and local environmental regulations.

Leachates are being monitored within Marshall Brook, a portion of the Bass Harbor estuary, by a consultant hired by the Town of Southwest Harbor. Previous studies documented the pollution of this resource due to an adjacent landfill. Impacts to the Bass Harbor Marsh system are currently under investigation and there is much conjecture regarding the condition of this resource due to human-caused pollution. Antiquated septic systems or natural eutrophication (or both) have been proposed as reasons for degradation of the marsh.

If development on MDI continues, Park-owned water bodies and Great Ponds (ground and surface waters) will be further impacted as associated pollution increases.

Fish are stocked in Park-owned water bodies by the MDIFW. Both native and non-native species are stocked (e.g., brown trout [Salmo trutta]). While the effect of this stocking has an unknown effect on the native species gene pool, the historical importance of sport fishing as an historical recreational activity on MDI and the intent of MDIFW management to accommodate sport fishing in Great Ponds and other smaller NPS owned water bodies may force the NPS to allow this to continue. Other than state stocking lists, the Park does not have any information on this resource. Baseline research and inventory work is proposed and funding is scheduled to be available in the early 1990's through the Natural Resource Protection and Preservation (NRPP) Program.

Overall, despite the initial mitigation of landfill leachates into a major water resource, and the fact that water quality in many of the water bodies (e.g., Great Ponds) on MDI is considered excellent (e.g., bacteria levels) current information regarding aquatic resources is limited to only a few sites.

4. Air Resources

Based on modeling of source determinations and back trajectory work it is generally felt that airborne pollutants carried from the eastern (Boston - Washington) and midwestern (Pittsburgh - Cleveland - Chicago) industrial corridors significantly affect ACAD's airshed. Elevated levels of ozone and sulfates are known to cause health problems for the general public and adversely affect local vegetation. ACAD issued a health alert on ozone for the first time in 1988. Data collected within the last decade (1980's) indicate air quality within and adjacent to the Park (i.e., ozone, sulfates, visibility) in recent years (1980's) was neither the nation's best or worst when considered against all other National Parks collecting similar data. In general, ACAD ranked somewhere in the middle of the group. Although the proposed Clean Air Act of 1990 will reportedly have tougher standards to adhere to compared to past legislation, mitigation of pollution agents previously mentioned will be difficult to attain as the scope of this problem goes well beyond Park boundaries.

Several power plants, all within 100 km of ACAD, have been proposed for different areas of central Maine. Impacts on the Park are being reviewed by the NPS Air Quality Division under the Clean Air Act's regulatory authority.

5. Geologic Resources

Without the effects of a catastrophic event, there are few, if any major visible impacts on ACAD's mountain ranges, its mountain ranges. Nevertheless, use of the area by man has resulted in several more subtle impacts on the Park's geologic resources. Intense use of trails has resulted in soil erosion which in turn impacts sensitive sub-alpine vegetation. Another significant resource are the mining sites in the Park where granite and/or gravel were once mined. Many of these sites have never been reclaimed and their condition is currently unknown.

Considering MDI's unique geology which includes thin and shallow soils, the island offers relatively little buffering capacity from acidic precipitation. Thus, continued acid deposition will adversely impact the geologic resource base as well as all other ecosystem components.

Sand Beach, a small sandy area on the eastern half of MDI (see Figure 1) has fluctuated in width due to prevailing environmental conditions. Monitoring has recently been set up to determine changes in the beach width. There has been little noticeable change over the almost two years of monitoring.

Sea level rise represents a potential problem for areas like Sand Beach as well as inter-tidal marshes. Although very unlikely over the short-term (100 years), this type of threat should be considered for long range management planning.

6. Aesthetic Resources

Richness of the Park visitor's experience is being impacted by obstruction of scenic vistas and panoramic views due to continuing structural development on private lands and lack of Park maintenance on vistas.

Community planning is underway and the Park needs to be fully involved to insure the future integrity of these resources. This scenario is made even more difficult due to ACAD's fragmented boundaries, where intense pressure is placed upon Park resources by outside developers.

Road modification and upgrading of visitor contact areas have been made to accommodate an increasing number of visitors. Nevertheless, high visitation impacts the Park's natural resources. Trail erosion, nonpoint source pollution, increased water use concomitant with continuing development, vegetation trampling, and increased volume of solid waste continue within a limited land base and as yet, unknown consequences.

While many visitors to MDI do not come specifically to visit the Park, once here, many experience Rockefeller's carriage road system throughout the Park. While this resource has enormous cultural significance (see cultural resources section of this Plan), restoration and preservation of this resource will undoubtedly affect the Park's natural resources. It will be incumbent on NPS management to insure the integration of careful inventorying, compliance, monitoring, and assessment procedures both prior to and during any such work.

C. CULTURAL RESOURCE BASELINE INFORMATION

The following information summarizes the status of Cultural Resource Baseline information for ACAD. Please refer to the NPS Cultural Resource Management Guideline (NPS-28), Chapter 2, Pages 3 through 22 for a complete discussion of the purpose and contents of these documents.

1. Planning Documents

- a. Preauthorization and authorization - Current and approved. No further action required.
- b. Statement for Management (SFM) - Currently out of date and in need of revision. SFM will be updated within 2 years of the completion of the General Management Plan (i.e., 1993).
- c. Outline of Planning Requirements - Currently out of date and in need of revision. OPR will be updated in conjunction with the SFM.
- d. General Management Plan - In progress with an estimated completion date of 1991.
- e. Development Concept Plan (DCP) - A DCP was completed and approved in 1989 for the Isle au Haut unit. The remainder of the Park will be addressed in the General Management Plan (GMP).
- f. Resource Management Plan (RMP) - Draft plan submitted for review and approval in 1991. New edition of Plan approved in 1991.
- g. Interpretive Prospectus (IP) - The current IP is outdated. Funding has been requested to revise the IP in concert with the GMP and has received priority #2 in NARO.

2. Servicewide inventories, lists, catalogs, and registers:

- a. Cultural Resources Bibliography (CRBIB) - The current bibliography dates from January 14, 1987 and must be updated.
- b. Cultural Sites Inventory (CSI) - needed (per conversation with NARO Archaeologist 9/25/90)

- c. List of Classified Structures (LCS) - The list of classified structures on file dates from November 25, 1986 and must be updated.
- d. National Catalog of Museum Objects - Submissions to the National Catalog of Museum Objectives were made annually; however, there will be no submission for FY90. A large backlog remains to be cataloged but there is no one to carry out this work.
- e. National Register of Historic Places - Five places have been listed on the National Register.

3. Basic Cultural Resource Documents

- a. Archaeological Overview and Assessment - An archaeological overview and assessment has never been done for ACAD but is needed. (See project statement: C-11)
- b. Archaeological Identification Studies - These studies have not been conducted but may be required following the completion of an archaeological overview and assessment.
- c. Archaeological Evaluation Studies - Same status as item "b" above.
- d. Ethnographic Overview and Assessment - This report has not been completed for the Park but is recommended.
- e. Ethnographic Oral Histories and Life Histories - These documents have never been prepared for ACAD but are needed.
- f. Ethnographic Program - This action plan may be required pending the completion of the ethnographic overview and assessment. At this time, however, it is not applicable.
- g. Historical Base Map - Historic base maps have not been prepared for ACAD but are required.
- h. Historic Resource Study (HRS) - These studies currently are needed: identifying properties eligible for inclusion on the National Register of Historic Places; documenting the significance of the Islesford collection to regional, state, and local research (while creating funding aids); and documenting the hiking trails. The National Register HRS was initiated by NARO but the contract was never completed. The Islesford collection study has been submitted for cooperating association funding for 1991. The trail study is described as a project but not funded.

1. Park Administrative History - An administrative history has not been prepared but is highly recommended (See project statement: C-18).
- j. Scope of Collections Statement is currently in need of revision. It does not cover major portions of the collection.

4. Special Resource Studies and Plans

- a. Archaeological and Ethnological Collections Studies - these studies have not been conducted despite a large collection of prehistoric artifacts. Needed (See project statement in Museum Collections Sections)!
- b. Archaeological Data Recovery Studies - A number of site studies have been completed as required by various Park development projects.
- c. Collection Management Plan (CMP)- Needed!
- d. Collection Storage Plan (CSP)- A draft collection storage plan for Islesford Historical Museum and MDI was prepared in 1989 and is pending final approval.
- e. Collection Condition Survey (CCS)- This assessment is needed; however, with no Park staff to carry on with resulting recommendations by professional conservators, it will be an exercise in frustration.
- f. Cultural Landscape Report (CLR) - A CLR was prepared for the carriage road system (Rieley and Brouse 1989). However, a wide variety of significant Park cultural landscapes remain undocumented. (See project statement: C-02).
- g. Ethnohistory - Ethnohistories have not been prepared but are recommended.
- h. Exhibit Plan - needed.
- i. Historic Furnishings Report - None have been prepared to date, but should be completed for the Carroll Farm, Storm Beach Cottage, and the Blue Duck Store.
- j. Historic Structure Preservation Guide (HSPG) - HSPG's have not been prepared for any of the structures in the Park. Preparation of these guides is one of the Park's highest needs.

- k. Historic Structure Report (HSR) - With the exception of the Carroll House, Bear Island Lightstation, and Baker Island Lightkeeper's House; these reports have not been completed but must be completed before historic preservation guides can be prepared.
- l. Social Impact Study - This subject will be addressed in the Park's GMP.
- o. Special History Study - Special History Studies have not been prepared but are recommended for the Park Loop Road and other cultural developments in the Park.
- m. Traditional Use Study - These studies have not been conducted but may be required at a later date.

D. CULTURAL RESOURCES

1. Sites

An archaeological overview and assessment has never been prepared for ACAD and is still needed, although a number of individual studies, investigations, and excavations have been conducted. Individual sites evaluated include:

Frazier Point, Duck Harbor Group, Sand Beach, Mosquito Harbor, Thompson Island, Bennett Cove, Wonderland Peninsula, and Schoodic Peninsula (excavated by the University of Maine, contract number CX2000-6-0022, May 1977).

Fernald Point (excavated by the University of Maine under contract number 6-0022-77-03, February 1980.)

St. Croix Archaeological Site, St. Croix Island International Historic Site.

In addition, David Sanger conducted an archaeological survey in 1974 and Rhodes and Naglich made archaeological investigations in 1983. The best known site (National Register) at Fernald Point, is fairly well protected from human disturbance by its location on Somes Sound with access limited by private property. There are at least 22 recorded sites (NARO and WASO RMP reviewers), not including St. Croix Island. At the current time, it would appear that the studies conducted to date are not adequate to manage the archaeological resources of the Park. A comprehensive overview and assessment is strongly recommended. (R. Hsu, NAR Archaeologist, pers. comm.).

2. Structures

An inventory of structures completed in 1984 (Arbogast) evaluated all structures in ACAD. Twenty-seven structures have been listed in the National Register and over 40 additional structures may be eligible. Structures' significance arises from associations with 19th century lifestyles (Gilley House, Lightstations, Carroll House, Blue Duck General Store), with J.D. Rockefeller's road building (carriage road bridges, gatelodges), and the formation of the Park and preservation movements (Sieur de Monts springhouse, Old Farm/Storm Beach, Islesford Museum). The remaining structures are now being evaluated for thematic nomination by a private contractor. All structures require stabilization, preservation, monitoring, cyclic maintenance,

and/or oversight to arrest or prevent deterioration. For example, slate roof tiles on the Islesford Historical Museum and the gatelodges are falling off, birds inhabit the Baker Island Lightkeeper's quarters, each rainstorm floods the Carroll House cellar, and mortar is deteriorating in carriage road bridges and gatelodges. At the present time, there is no comprehensive plan to manage and preserve important Park structures. HSR's, HSPG's, and adequate cyclic maintenance funds are critically needed.

3. Collections

ACAD has over 68,000 artifacts in three separate groupings. One group, located on MDI, contains the Carroll homestead furnishings and tools, restored carriages and carriage parts, archives, early photographs, furniture of the Park's founder, and archaeological items from road construction projects. Another group, kept on Little Cranberry Island, contains the Islesford Historical Museum collection of books, 18th and 19th century town records, documents, maritime and farming tools, furnishings, and photographs. The third grouping is stored at colleges and universities nationwide as well as the State museum. It consists of natural science and archaeological collections.

Attaining collections accountability by reducing the backlog of uncatalogued artifacts has been the one area of real progress for cultural resources at ACAD. However, continuation of this work is subject to the availability of Washington collections accountability funding distributed by the Region.

In FY90 there was no funding for any further ACAD accountability efforts, and after a year of work on "special projects" (e.g., researching and organizing carriage road blueprints, researching historic vista photos for the GMP), funded by various donations, the Park's curator resigned in frustration. Collection needs in the areas of staffing, conservation, and storage remain unanswered, although a CSP awaits only final approval.

4. Cultural Landscapes

Two 19th century homestead farm areas associated with National Register houses (Baker Island, Carroll Homestead), the nineteenth century cottage estate of the Park's founder and first superintendent, the approximately 50-mile National Register Carriage Road system with its 16 bridges and two gatelodges, and the 27-mile Park Loop Road system are all in need of cultural landscape identification, documentation and repair/maintenance prescriptions.

Beatrix Farrand, a landscape architect, designed landscaping to accompany the carriage roads as well as their original design by Frederick Law Olmstead, Jr. This was a major component of the Loop Road construction.

The following proposals could benefit from cultural landscape evaluation: in 1990 a proposal was submitted by a local sheepherder to "restore" the historic landscape of Baker Island by sheep grazing 2) there has been interest in reopening two abandoned scenic lookout/picnic areas in the Park (ca. 1930's) and 3) limited vista enhancement along a 1.4 mile section of carriage road.

E. CULTURAL CONTEXT THEMES (NPS 1987)

Thematic Framework: (Each of the following headings correspond to those found in the previously mentioned reference)

- I. Cultural Developments:
 - B: Post Archaic
 - 14. Hunters/Gatherers of the Eastern Woodlands
- II. European Colonial Exploration
 - B. French
- XIV. Transportation
 - B: Ships, Boats, Lighthouses
- XVI. Architecture
- XVII. Landscape Architecture
- XVIII. Technology/Transportation
- XXXII. Conservation of Natural Resources
 - C: Conservation Movement Matures, 1908-1941
 - 6. Origin and Development of the NPS
- XXXIII. Historic Preservation
 - D. Regional Efforts:
 - 1. New England, 20th Century
 - 2. Private Historical Societies

III. NATURAL RESOURCE MANAGEMENT PROGRAM

A. Overview of Current Programs and Needs

The priority of the Park's first comprehensive RMP (1982) was to assemble baseline data to determine the type and condition of resources that were in the Park. However, due to inadequate base funding for personnel and supplies along with limited project funds, systematic data collection has been sporadic. Although ACAD is the North Atlantic Region's (NAR) only "National Park", the natural resource program (e.g., permanent basefunded personnel, budget, and operational resources) was the smallest among the NAR's four largest natural resource oriented areas (Cape Cod, Gateway, Fire Island, and ACAD) throughout the 1980's. As a result, work continues to be reactionary based on emergency management concerns. Simply put, no pro-active work can be done until the program is properly funded and staffed.

As discussed in the other six resource categories previously listed, several critical issues need immediate attention. Due to decades of total suppression, forest fuel buildup in maturing spruce-fir forests has made fire management a critical issue. The Park must complete a comprehensive FMP for the entire Park (there is currently a plan for IAH), conduct fuel inventories, and examine the possibility of fuel reduction especially prescribed fire. In addition, there is a need to evaluate the effects of fire on other resources due to vegetation changes from fire-related work. For example, beaver populations are apparently declining on MDI and their presence has been tied to otter population levels (Dubuc 1987, Dubuc et al. 1990). The beaver decline can be partially attributed to the loss of hardwood vegetation which increased after the 1947 fire. Thus, fire plays a role in the dynamics of a variety of resources and has far reaching effects.

The current RMP is designed to accomplish several tasks: identify funding needs for new questions that have arisen from previous research and monitoring, detail those gaps of base-line data still needed, assess the status and condition of Park resources, and provide an impetus for action plans for those resources where sufficient data exist and corrective and mitigatory actions have been recommended.

As previously mentioned, there is an exhaustive inventory currently underway of all previous natural resource work conducted at ACAD. This work was funded as part of the national "Inventorying and Monitoring Initiative" in 1990 and will compile all previous research and natural resource management work

related to the Park's natural resources. This effort will provide Park managers with an overview of science and natural resource management at ACAD throughout its history. A proposal to acquire additional funds through this initiative has been submitted in FY92. This work will result in the recommendation of monitoring protocols as well as collection of baseline data on several major resources.

ACAD's natural resource management objectives over the next five years can be summarized as follows:

1. Secure base funding and add technical personnel to allow for data collection and implementation of management recommendations.
2. Complete and implement a Fire Management Plan.
3. Establish a GIS system for natural resource management activities. Integrate data for trend analysis, condition assessments, and strengthen the decision-making process.
4. Complete installation of an ecological laboratory for division personnel and scientists to work in. This will allow implementation of the actions plans listed in the Table of Contents as well as effective and efficient monitoring of Park resources. Current conditions are small and unsafe (and often do not meet OSHA requirements for many types of scientific work).
5. Prepare and implement Water Resource Management Plan.
6. Construct beaver population data base and evaluate status of population.
7. Collect baseline data through research and subsequent monitoring and develop management plans for sensitive, threatened, or endangered animal (state as well as federal) and/or plant species (found within or adjacent to the Park). This will include, for example, all plants listed on the State Threatened and Endangered Plant List (see Greene 1990), harlequin duck, northern and southern bog hemming, peregrine falcon, and bald eagle to name a few. This should also include other species whose existence on MDI or elsewhere in the Park has fluctuated or is minimal and remains questionable (e.g., jack pine - at the edge of its range; spruce grouse - population status unknown, hunting banned statewide, long considered to be extirpated from MDI; fisher - once present on MDI, now thought to be extirpated; invertebrate population at Anemone Cave).

No proj stat?
 - pitch pines
 - scrub oaks
 - rare pH mgmt plan
 - Lemmings, No. 450.
 - Bryophytes

B. LIST OF PROJECT STATEMENTS (Summary List)

VEGETATION RESOURCES

ACAD	N-08	INVESTIGATE THE ECOLOGY OF SUBALPINE VEGETATION WITHIN THE PARK
ACAD	N-09	FIRE MANAGEMENT PLAN
ACAD	N-12	ESTABLISH DATA BASE, MONITORING PROGRAM, AND EVALUATE EFFECTIVENESS OF CHEMICAL CONTROL FOR PURPLE LOOSESTRIFE
ACAD	N-24	FIRE BEHAVIOR AND FUELS MANAGEMENT EFFECTS ON VEGETATION
ACAD	N-25	FIRE INTERACTIONS: WILDLIFE/WATER/SOIL
ACAD	N-26	DEVELOP VISTA MANAGEMENT PROGRAM FOR CULTURAL LANDSCAPES
ACAD	N-37	INVENTORY SPECIES, ABUNDANCE, AND DISTRIBUTION OF LIVERWORTS AND MOSSES
ACAD	N-46	RARE AND ENDANGERED PLANT INVENTORY
ACAD	N-45	INVENTORY AND ASSESSMENT OF OLD GROWTH VEGETATION
ACAD	N-50	GLOBAL CLIMATE CHANGE
ACAD	N-52	DEVELOP VEGETATION MANAGEMENT PLAN - BAKER ISLAND

ANIMAL RESOURCES

ACAD	N-04	ABUNDANCE AND DISTRIBUTION OF CARNIVORES ON MOUNT DESERT ISLAND
ACAD	N-05	DEER/HARE EFFECTS ON VEGETATION
ACAD	N-06	FISHER REINTRODUCTION
ACAD	N-07	COYOTE - DEER INTERACTIONS
ACAD	N-14	POPULATION SURVEY OF HARLEQUIN DUCKS
ACAD	N-15	DETERMINE STATUS OF THE PARK'S BEAVER POPULATION AND HABITAT AVAILABILITY
ACAD	N-16	DEVELOP PEREGRINE FALCON AND BALD EAGLE MANAGEMENT PLANS

ACAD	N-17	INVESTIGATE NESTING ECOLOGY AND SUCCESS OF BALD EAGLES IN AND AROUND ACADIA NATIONAL PARK (I.E., FRENCHMAN'S BAY AREA)
ACAD	N-18	INVESTIGATE POPULATION DYNAMICS AND VIABILITY OF SPRUCE GROUSE WITHIN ACADIA NATIONAL PARK AND ON MOUNT DESERT ISLAND
ACAD	N-20	ESTABLISH PROTOCOLS AND INITIAL DATA BASE FOR ASSESSMENT OF IMPACTS ON ANEMONE CAVE
ACAD	N-21	INVENTORY SPECIES, ABUNDANCE, AND DISTRIBUTION OF PARK'S REPTILE AND AMPHIBIANS
ACAD	N-22	INVENTORY AND EVALUATE STATUS OF LARGE MAMMALS WITHIN THE PARK (E.G., MOOSE, BEAR)
ACAD	N-23	INVESTIGATE THE PARK'S FURBEARER POPULATION
ACAD	N-27	POPULATION STATUS OF WOOD DUCKS
ACAD	N-28	NORTHERN FLYING SQUIRREL ECOLOGY
ACAD	N-30	EFFECTS OF HUNTING ON NON-PARK LANDS ON MOUNT DESERT ISLAND GAME ANIMAL POPULATIONS
ACAD	N-47	BIODIVERSITY AND CONSERVATION OF INVERTEBRATES IN THE NORTH ATLANTIC REGION
ACAD	N-48	DETERMINE THE STATUS OF SONGBIRD POPULATIONS

AIR RESOURCES

ACAD	N-02	MAINTAIN AIR QUALITY DATA BASE THROUGH ESTABLISHMENT OF BASE FUNDING FOR MONITORING (OZONE, SO ₂ , PARTICULATES, VISIBILITY, ACID DEPOSITION)
ACAD	N-03	EFFECTS OF OZONE ON VEGETATION
ACAD	N-33	MONITORING AND MODELLING OF PHOTO-OXIDANTS

WATER RESOURCES

ACAD	N-13	INVENTORY AND EVALUATE FISHERY RESOURCES IN PARK WATERS
ACAD	N-10	DEVELOP WATER RESOURCE MANAGEMENT PLAN
ACAD	N-29	WETLAND MAPPING

ACAD	N-31	WATER QUALITY AND ECOLOGICAL EVALUATION OF BASS HARBOR MARSH
ACAD	N-32	WATERSHED NON-POINT POLLUTION DISCHARGE MODEL FOR MDI
ACAD	N-43	ESTABLISH BASELINE WATER QUALITY FOR SOMES SOUND

AESTHETIC RESOURCES

ACAD	N-39	INVENTORY RESOURCE IMPACTS ON TRAILS
ACAD	N-40	STUDY VISITOR USE OF TRAILS
ACAD	N-49	IMPACTS OF SNOWMOBILES ON TRAILS

OTHER (BASELINE DATA)

ACAD	N-11	INVESTIGATE ECOLOGY OF LYME DISEASE WITHIN ACADIA NATIONAL PARK AND ON ADJACENT LANDS
ACAD	N-19	CONSTRUCT GIS THEME MAPS FROM EXISTING USGS DLG AND DEM DATA AND NATURAL RESOURCE INVENTORY, MONITORING, AND RESEARCH DATA
ACAD	N-34	ACQUIRE NEW VEGETATION MAP AND GIS THEMATIC DATA BASE FOR ACADIA NATIONAL PARK AND SURROUNDING AREAS
ACAD	N-35	DEVELOP COMPREHENSIVE INVENTORY AND MONITORING STRATEGY AND PROTOCOLS
ACAD	N-36	COMPLETE ECOLOGICAL BASELINE INVENTORIES OF OFFSHORE ISLANDS
ACAD	N-38	COMPLETE FLORA AND FAUNA BASELINE INVENTORIES (Refer to individual resource categories for various inventories)
ACAD	N-44	CONDUCT BASIC ECOLOGICAL INVENTORIES OF CONSERVATION EASEMENTS
ACAD	N-54	PURCHASE GLOBAL POSITIONING SYSTEM

OTHER (PROGRAM MANAGEMENT)

ACAD	N-01	BASEFUND & UPGRADE ADMINISTRATION OF THE PARK'S NATURAL RESOURCE MANAGEMENT PROGRAM
ACAD	N-41	IMPLEMENT COMPREHENSIVE INVENTORY AND MONITORING PROGRAM
ACAD	N-42	DEVELOP PARK-WIDE BIBLIOGRAPHY
ACAD	N-53	SURVEY, MARK, CLEAR, AND MAINTAIN EXTERNAL PARK BOUNDARIES
ACAD	N-55	ESTABLISH RESOURCE PROTECTION PROGRAM IN BACKCOUNTRY
ACAD	N-56	
ACAD	N-57	