National Park Service
U.S. Department of the Interior

Acadia National Park
Maine

Duck Brook Road Rehabilitation

Environmental Assessment



U.S. Department of the Interior
National Park Service

Environmental Assessment
Duck Brook Road Rehabilitation

Acadia National Park
Bar Harbor, Maine
July 17, 2002

Proposed Action:
The National Park Service (NPS) proposes to make improvements to Duck Brook Road in Acadia National Park. In the preferred alternative, the roadway width would remain the same while drainage problems and the road structure would be upgraded to make the road safer and structurally sound. Parking facilities near the approach to the historic carriage road system at Duck Brook Carriage Road Bridge would be better defined to protect the adjacent cultural landscape. This document assesses the impacts related to the proposed preferred roadway improvements and parking organization and alternatives to the preferred design. The preferred alternative would result in minor impacts to vegetation and wildlife habitat, wetlands and water resources, viewsheds, visitor experience, and roadways and utilities

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Note to Reviewers and Respondents:
If you wish to comment on the Environmental Assessment, you may mail comments by August 16, 2002 to the name and address below. Please note that names and addresses of people who comment become part of the public record. If you wish for us to withhold your name and/or address, you must state this prominently at the beginning of your comment. We will make all submissions from organizations, businesses, and individuals identifying themselves as representatives or officials of organizations or businesses available for public inspection in their entirety.

Superintendent
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Comments submitted via electronic mail may be addressed to judy_hazen_connery@nps.gov until August 16, 2002.

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1 Introduction: Purpose & Need

1.1 Introduction

The Duck Brook Road Rehabilitation Project described in this environmental assessment (EA) has two principal components: rehabilitating Duck Brook Road from its intersection with Route 233 to the West Street Extension and improving parking at the approach to Duck Brook Carriage Road Bridge. Rehabilitating the road would correct drainage problems and improve the surface of the roadway. Improving the parking would eliminate haphazard parking at the bridge approach, allowing the distinctive character of the carriage road bridge and surroundings to be seen.

This EA describes alternative treatments and analyzes the resulting impacts on the human environment. It has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended, regulations of the Council on Environmental Quality (40 CFR 1508.9), and *NPS Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision-making*. It is important to note that while this EA will address NEPA requirements, it does not complete the requirements of the National Historic Preservation Act (NHPA) of 1966, as amended. In compliance with Section 110 of NHPA and the NPS Servicewide Programmatic Agreement, the NPS regional cultural resource advisory team will initiate consultation with the Maine State Historic Preservation Office (SHPO) to evaluate the Duck Brook Road site for eligibility in the National Register of Historic Places. While no formal determination of eligibility has been made to date, the NPS staff is of the opinion that Duck Brook Road itself does not meet the criteria for listing in the National Register; however, the adjacent carriage roads, including Duck Brook Carriage Road Bridge, are listed on the National Register. The Paradise Hill Road Bridge is a contributing element of the Park Loop Road, which is eligible for listing in the National Register and passes over Duck Brook Road. Therefore, NPS will consult with the SHPO prior to initiating the project, as required by Section 106 of the NHPA.

1.2 Project Background

1.2.1 History and Significance of the Park

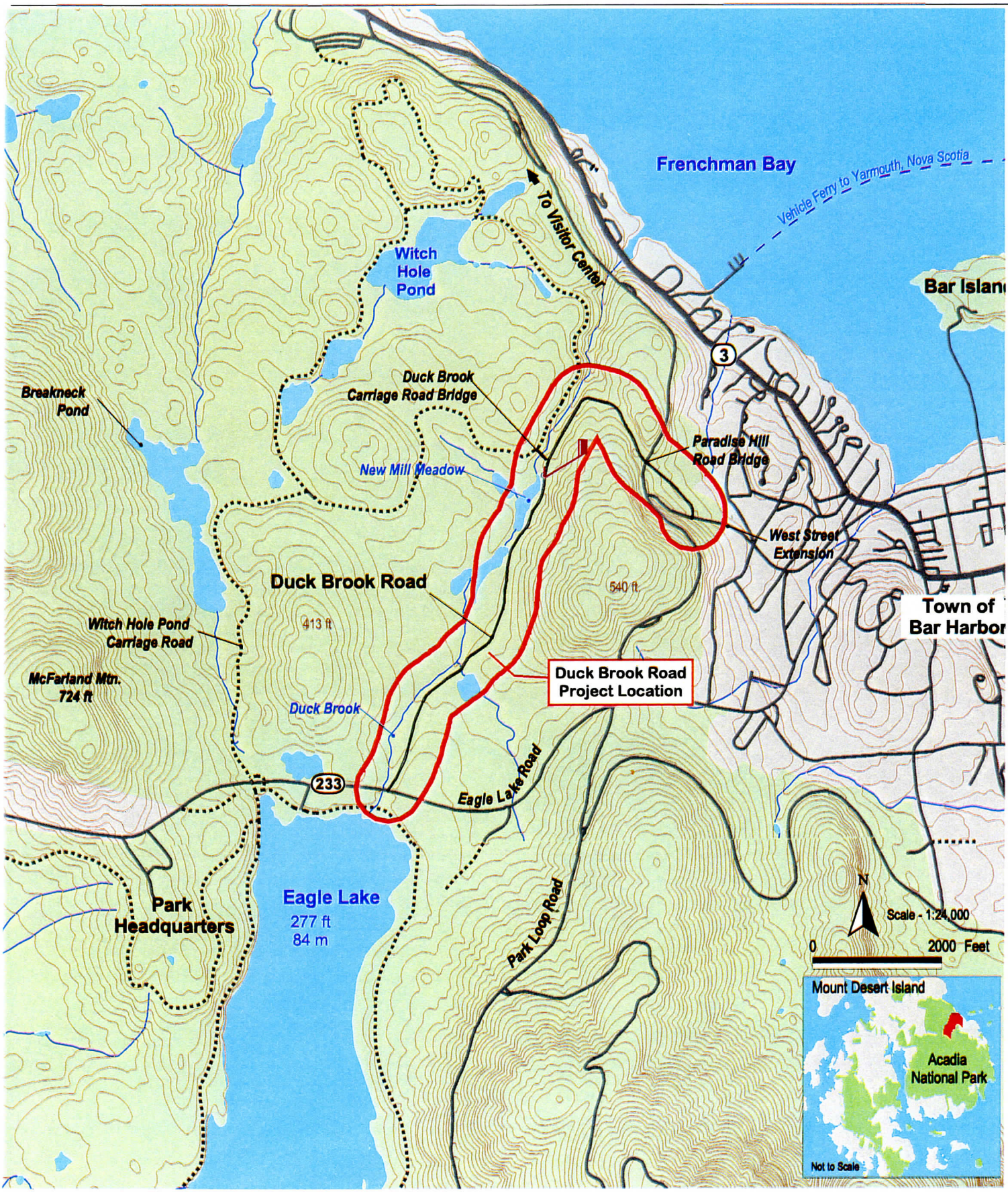
Acadia National Park is located in the mid-coast region of Maine, approximately 45 miles southeast of Bangor (Figure 1). Archeological evidence suggests Native Americans occupied Mount Desert Island at least seasonally for several thousand years prior to the arrival of Europeans. European settlement of the area dates to the early 17th century, when French explorers and missionaries landed at Mount Desert Island. By the mid-18th century, the British had taken control of the area, and Maine remained part of Massachusetts until 1820. In the mid-1800s, Mount Desert Island became a destination for tourists, popularized by the paintings and stories of the "rusticators," artists and journalists who glorified the rustic beauty of the Island. To preserve the natural landscape of the Island from growing development, a group of local citizens led by Charles W. Eliot and George Dorr established the Hancock County Trustees of Public Reservations, acquired 5,000 acres on Mount Desert Island, and offered the land to the federal government. In 1916, President Wilson announced the creation of Sieur de Monts National Monument, which in 1919 became Lafayette National Park, the first national park east of the Mississippi River. In 1929, the park name changed to Acadia National Park. Today, Acadia National Park encompasses approximately 35,000 acres on Mount Desert Island, Schoodic Peninsula, and surrounding islands.

1.2.2 Duck Brook Road

Duck Brook Road is located in the northeast section of the portion of the park on Mount Desert Island, west of the village of Bar Harbor (Figure 2). Constructed in about 1901, Duck Brook Road pre-dates the park and has also been referred to as Town Road, New Mill Meadow Road, and New Eagle Lake Road. The road was originally built by the Brewer Ice Company to provide a relatively flat route for horse-drawn wagons or sleds to transport ice from Eagle Lake to Bar Harbor.

The Bar Harbor Water Company had been incorporated in 1874 and supplied municipal water for the Town of Bar Harbor. In 1936, a seasonal pump station was constructed downstream from Eagle Lake, the main source of drinking water for Bar Harbor. The pump house along with an accompanying storage tank was located near the outlet of New Mill Meadow along Duck Brook Road and provided water to the local residents and businesses during the July and August peak season. In addition to providing ice and supplying water, Duck Brook and Duck Brook Road were part of at least one milling operation. As a means of supplying energy to the site, a dam was constructed between the site of the present day pump station and Duck Brook Carriage Road Bridge. Portions of the dam remain, but there are no extant mills.

During frequent visits to the area, John D. Rockefeller, Jr. recognized the unique natural features and scenic beauty of Acadia were worth capturing. Between 1910 and 1940, he established almost 60 miles of roadway to allow carriage travel and connected them with17 stone bridges to create a network of carriage roads (Roberts 1990). Duck Brook Carriage Road Bridge, one of these rustic bridges, was built to provide access to the carriage road system via Duck Brook Road. In 1939, the lands including and surrounding Duck Brook Road were deeded from the Bar Harbor Water Company to John Rockefeller, Jr. and were subsequently transferred to the federal government to be incorporated into Acadia National Park.



Project Location
Roads
Carriage Road
Topography (CI = 20 ft.)
Park Land

NATIONAL PARK SERVICE
Acadia National Park
Duck Brook Road

Project Location
Figure 2

Today, Duck Brook Road is approximately two miles long, runs roughly north-south, and is accessed from the Paradise Hill Road and Route 233 (Figure 3). The road is designated two-way and is still used to access the historic carriage road system via Duck Brook Carriage Road Bridge, although the section of the road between the bridge and West Street Extension is closed in the winter. The Bar Harbor Water Company was sold to the Town of Bar Harbor in October 2001, and the Bar Harbor Department of Public Works operates and maintains a pump station, storage tanks, and pipeline, which require daily access for maintenance and use. Duck Brook Road provides the only access to these facilities. Duck Brook Road also provides access to the carriage road system to visitors on bicycles coming out of Bar Harbor.

1.2.3 Plans Outlining Management Goals

Acadia National Park General Management Plan

The park's mission is based on park legislation and the *Acadia National Park General Management Plan* (NPS 1992):

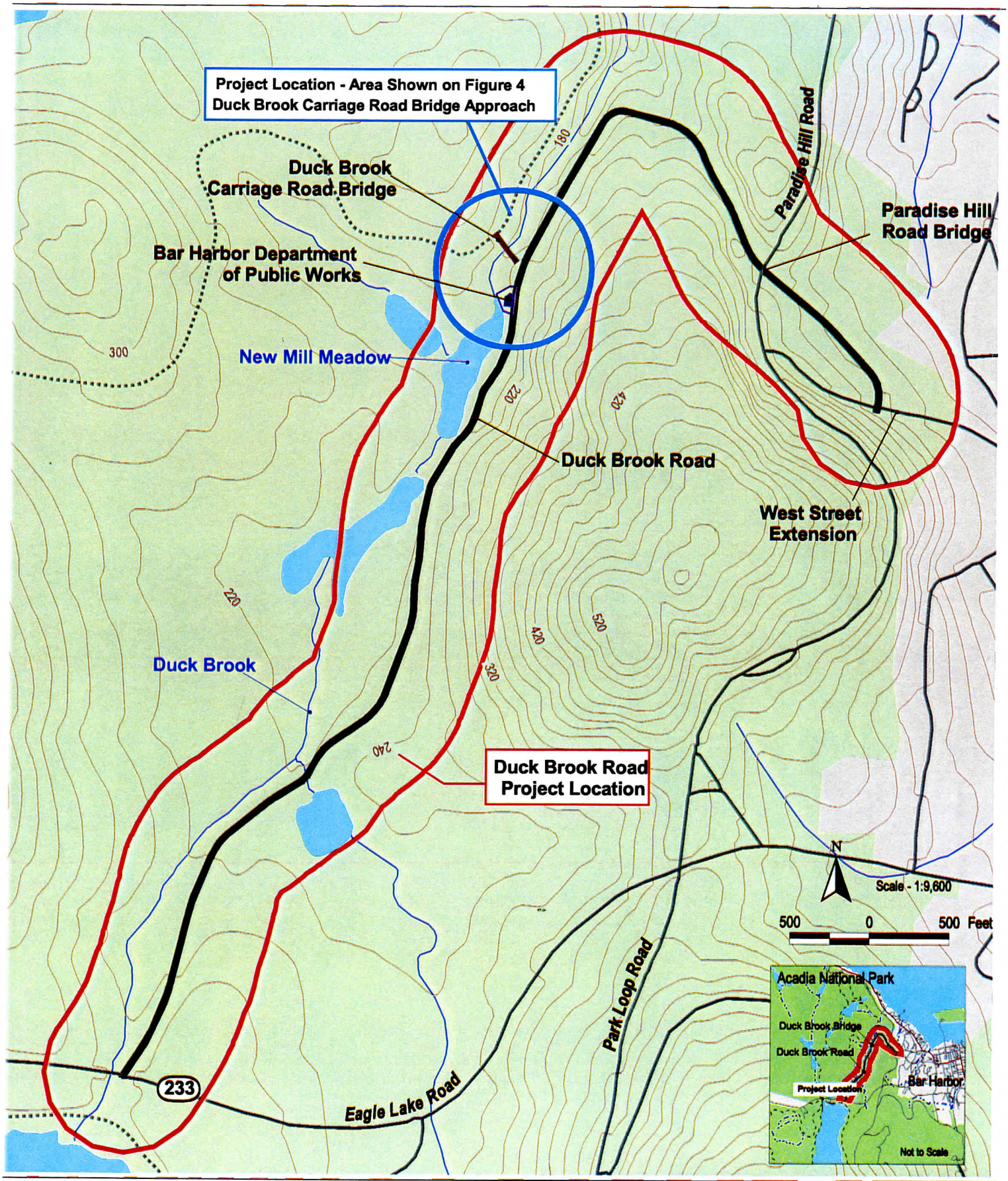
> "The National Park Service at Acadia National Park protects and preserves outstanding scenic, natural, scientific, and cultural values for present and future generations. These resources include a glaciated coastal and island landscape, biological diversity, clean air and water, and a rich cultural heritage. Acadia National Park also offers opportunities for high-quality non-consumptive recreation education, and scientific research."

This mission statement was formally adopted in the Acadia National Park Strategic Management Plan (NPS 1997), which identified three primary purposes for the park:

- To protect and conserve the land and water resources, the scenery, the natural and historic objects, the wildlife, and the wild character of the park.
- To promote and regulate the use of the park for the benefit and enjoyment of the public in such a manner and by such means as will leave park resources unimpaired for the enjoyment of future generations.
- To protect and preserve the scenic, ecological, historical, archeological, and cultural resources of the Acadian archipelago and to limit development of the islands and conserve their natural qualities and traditional resource-based land uses.

The General Management Plan articulates a series of specific management goals for the park. Of particular relevance to this EA, these include:

- To provide for a variety of high-quality, resource-related visitor experiences while ensuring a safe and positive social environment.
- To protect, preserve, and restore, as appropriate, the cultural heritage of Acadia National Park, including archeological, historic, curatorial, and cultural landscape resources.
- To manage visitor impacts by limiting parking to the capacity of existing lots.



Project Location
Project Location (see Figure 4)
Roads
Carriage Road
Topography (CI = 20 ft.)
Park Land

NATIONAL PARK SERVICE
Acadia National Park
Duck Brook Road

Duck Brook Road
Figure 3

Statement for Management Planning Implementation Report

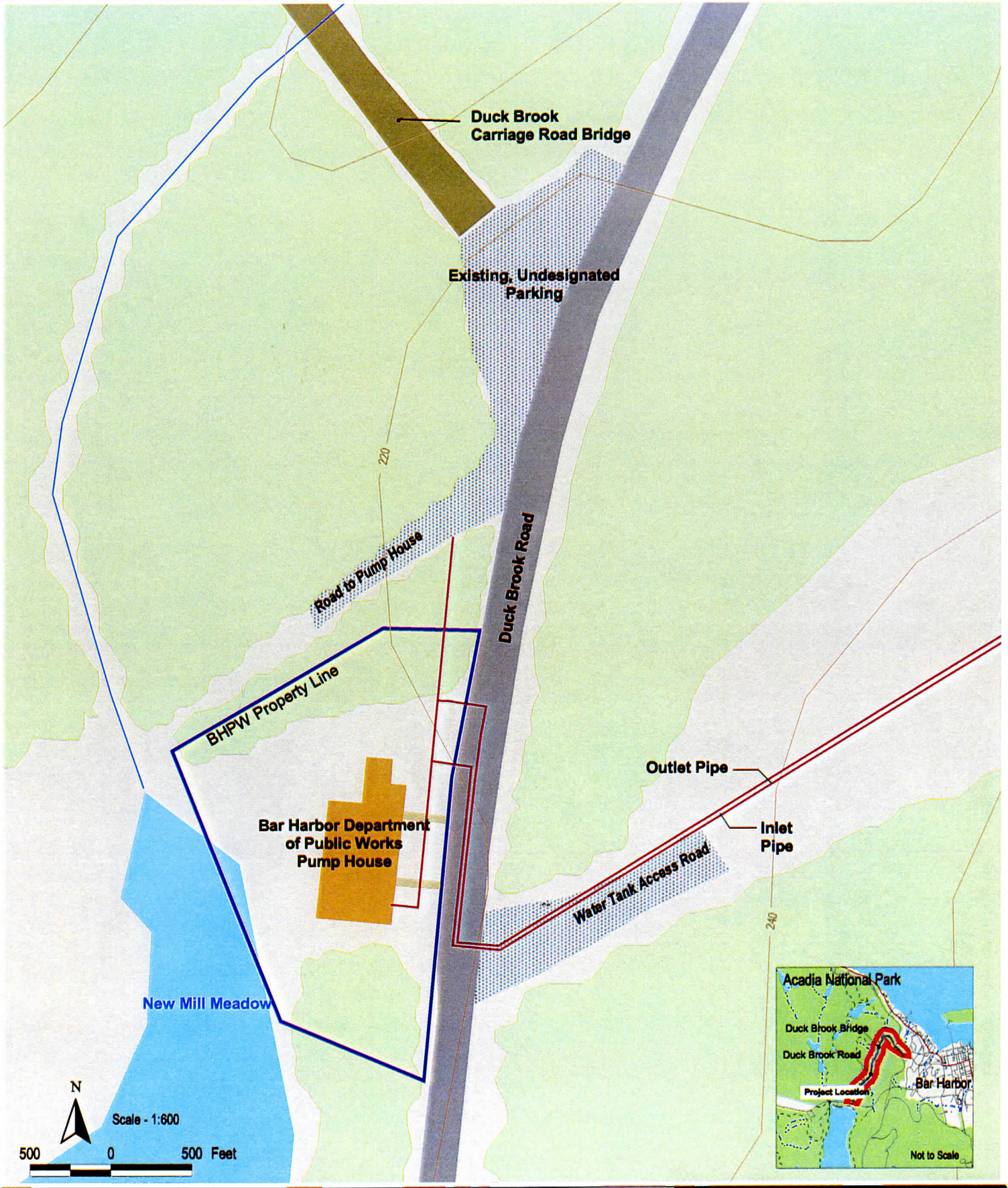
In addition to the General Management Plan (GMP), the *Statement for Management Planning Implementation Report* (NPS 1995), an implementing document for the General Management Plan, reiterated the goals of the GMP, including maintaining the existing capacity of parking lots. The intent is to retain current use levels and the existing naturalness and solitude of portions of the park, including the Duck Brook Road area.

1.3 Purpose and Need for Action

Duck Brook Road has deteriorated over time and contains areas of broken pavement, exposed rocks and surface material, numerous potholes, and several exposed culverts. The road surface has severely deteriorated over the past 20 years, and portions of the road are eroding and threatened, especially within the southern section from State Route 233 to Duck Brook Carriage Road Bridge. The segment of the road between Duck Brook Carriage Road Bridge and West Street Extension was realigned and repaired in 1988 and is in slightly better condition. During heavy rains and high waters, Duck Brook overtops and floods Duck Brook Road, at one location in the southern section (see photos, Appendix C). This diversion occurs often, as debris fills in between the town water pipes where they cross the brook and forces water to overtop the stream bank, creating safety hazards and floodwaters on the road, as well as causing erosion and siltation of the brook. The diverted stream flows overland to the edge of Duck Brook Road, then flows along the edge of the road, and eventually flows back into Duck Brook near its confluence with a tributary stream. In addition to flooding over the road surface, the water has severely damaged the shoulder and edge of pavement of Duck Brook Road, narrowing the road surface and creating a gully along its edge. Sand, gravel, and asphalt have washed into Duck Brook as a result of this flooding.

Duck Brook Road is used by a variety of groups, including motorists, bicyclists, and pedestrians in peak season months and by pedestrians, snowshoers, and skiers in the winter, to access the carriage road system via Duck Brook Carriage Road Bridge. The road experiences, however, a relatively low volume of vehicular traffic (less than 400 average daily trips) and is classified a rural, recreational and scenic road by the American Association of State Highway and Transportation Officials (AASHTO) standards (2001). Designed for speeds of approximately 35 miles per hour (25 mph posted), the narrowness of the road and the condition of the pavement typically limit speeds to an even slower rate. Bicyclists rent bikes from rental outlets in Bar Harbor and use the road to access the carriage road system, riding directly from the Town by way of West Street Extension. The road surface is rough, and the road itself is narrow, with shoulders 6 to 12 inches wide, and at 16 feet wide, Duck Brook Road does not meet minimal NPS and Federal Highway Administration standards for a connector road with two-way traffic.

Duck Brook Road provides the only access to the Bar Harbor Department of Public Works pump station and storage tank, and public works employees access the site daily to service the facilities. Local residents and park visitors, however, wishing to access the carriage road system from the Town of Bar Harbor or from Route 233, park near the approach to the Duck Brook Carriage Road Bridge (Figure 4). There is no



NATIONAL PARK SERVICE
Acadia National Park
Duck Brook Road

Approach to Duck Brook Carriage Bridge
Figure 4

designated parking in this area, and these cars are generally poorly organized and can block the entrance to the public works facilities, interfering with maintenance of the water supply for the Town of Bar Harbor. The haphazard arrangement of cars at the approach to the bridge can also restrict emergency vehicle access to the carriage road system, presenting a potential safety hazard for visitors using the carriage roads as well as a fire hazard. Random parking also detracts from the overall visual landscape of the historic bridge and has resulted in erosion and loss of vegetation.

To address these needs and correct existing deficiencies in roadways and utilities, the NPS proposes to improve the road structurally, primarily by correcting drainage problems, and to more clearly define a parking area near Duck Brook Carriage Road Bridge, while maintaining the rustic character of the road and bridge. The goals of the project are to improve safety for visitors traveling along the roadway, ensure year-round access to the Town of Bar Harbor Department of Public Works facilities along Duck Brook Road, and better protect natural and cultural resources.

1.4 Planning Issues

The following issues have been identified from previous planning efforts and field reconnaissance at the Duck Brook Road site. Issues consider the effect of the alternatives on a physical, biological, social, or economic resource and help determine potential impact topics.

Wetlands and Water Resources. Duck Brook and its associated wetlands are located adjacent to the project area and could be affected by improvements to the drainage system, widening the roadway, or moving existing utility lines. Regulations at the state and federal levels require project development to avoid first and then minimize impacts to these sensitive resources.

Amphibian Protection. Vernal pools, which provide breeding habitat for four-toed salamanders and other amphibians, exist along the project corridor. The project must therefore be sensitive to amphibian breeding seasons and migratory patterns.

Cultural Resources. The carriage road system and Duck Brook Carriage Road Bridge are listed in the National Register of Historic Places. The cultural landscape of the site should be preserved as much as possible to maintain the character of the roadway. Viewsheds to and from the Duck Brook Carriage Road Bridge, the carriage roads, and the Paradise Hill Road Bridge (under which Duck Brook Road passes) are important to the rustic character of the park and are a valuable part of the visitor experience to the site. The parking area should be designed to respect these viewsheds.

Access to the Bar Harbor Water Department Facilities. Access to the Bar Harbor Water Department facilities along Duck Brook Road must be maintained year-round and throughout the construction process.

Drainage, Flooding, and Sedimentation. Poor drainage and flooding (see photos, Appendix C) have contributed to deterioration of the surface of the road over the past several years. A thorough analysis of the drainage system is necessary to determine corrective actions and ensure that the problems are solved.

Safety. Duck Brook Road is in poor condition and poses a potential safety hazard to bicyclists and pedestrians using the road to access the carriage road system. Further, the undesignated parking that occurs at the approach to Duck Brook Carriage Road Bridge can jeopardize the safety of visitors using the carriage roads by blocking emergency vehicle access.

Timing of Construction. Construction has the potential to affect visitor experience and natural resources, including nesting raptors and amphibians. To protect the visitor experience and resources, construction should not take place during the summer season.

1.5 Impact Topics

The following impact topics were chosen to be evaluated based on the Council on Environmental Quality's NEPA regulations and NPS Director's Order 12, by assessing the issues raised during regulatory and other scoping meetings, and by observing the potentially affected resources at the project site. These include: topography and soils; wetlands and water resources; vegetation, wildlife, and wildlife habitat; cultural resources; visitor use and experience; and roadways and utilities.

1.6 Impact Topics Considered but Dismissed from Further Analysis

The following topics would not be affected by the proposed action and were eliminated from further evaluation. They are briefly discussed below but will not be analyzed in detail in this document.

1.6.1 Ethnographic Resources

Ethnographic resources are defined by NPS as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it" (*Director's Order 28: Cultural Resource Management Guideline*). Consultation is currently ongoing with Native American tribes regarding proposed projects at the park. In addition, Acadia National Park will be conducting ethnographic research in partnership with representatives of the federally recognized tribes in Maine over the next two years to identify ethnographic resources and places of religious or cultural importance within the park. These groups include the Passamaquoddy Tribe - Indian Township; Passamaquoddy Tribe – Pleasant Point; Penobscot Nation; Houlton Band of Maliseet Indians; and Aroostook Band of Micmacs. Due to the narrow focus of this road rehabilitation project, it is not anticipated, however, that ethnographic resources would be impacted by this project.

1.6.2 Indian Trust Resources

The project area is not considered an Indian Trust Resource, and the proposed action does not conflict with American Indian interests.

1.6.3 Floodplains

Duck Brook Road is located within an area that is not subject to normal flooding from a 100-year flood (FEMA 1988), and the proposed action would not affect floodplain functions or values. A coastal flood hazard area exists along the coast of Frenchman Bay and at the mouth of Duck Brook with a 100-year flood elevation of 15 feet. The elevation of the project area is substantially higher, averaging approximately 240 feet.

1.6.4 Prime or Unique Farmland

Prime or unique farmland is defined as soil that produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. Although there are twelve soils that support prime farmland in the Hancock County area (NRCS 1998), the project area consists of Schoodic-rock outcrop-Naskeag complex soils and these are not prime farmland soils.

1.6.5 Geology

Granite underlies most of Acadia National Park, including much of Mount Desert Island, Isle au Haut and all of the park holdings on the Schoodic Peninsula. This bedrock makes up the high elevations, shorelines, and steep valleys that give the park its character. Granites at Acadia vary slightly in texture, color, percentages of accessory minerals and chemical composition, and a number of different types have been described and mapped in the park (Gilman et al. 1988). The granite underlying most of Mount Desert Island is a pink coarse-grained hornblende granite that contains occasional biotite. Gabbro-diorite bedrock borders the granites on Mount Desert Island and Isle au Haut. A variety of older stratified rocks make up the margins of these islands. On Mount Desert Island, these include a schist, a siltstone/sandstone formation, and a volcanic series of tuff, felsite, and interbedded volcanic and sedimentary rocks. In addition, a shatter zone exists at the contact between Mount Desert Island coarse-grained granite and the older stratified rocks of the Bar Harbor Formation.

1.6.6 Wild and Scenic Rivers

No federal wild and/or scenic rivers are located within the project area.

1.6.7 Air and Noise Quality

The Clean Air Act of 1963, as amended, and associated NPS policies require the NPS to protect air quality in parks. Located along the mid-coast of Maine, Acadia National Park is downwind from large urban and industrial areas in states to the south and west. Periodically, high concentrations of air

pollutants blow into the park from these areas. Acadia is considered a Class I area under the Clean Air Act, which means that the park deserves the highest level of air-quality protection. Summer ozone levels occasionally exceed federal health standards, and the effects of atmospheric deposition are a major concern at the park. Acid precipitation (rain, snow, and fog) can be a major influence on lake and stream chemistry, cause nutrient enrichment in estuaries, and affect sensitive vegetation.

Although improvements to Duck Brook Road would require use of heavy equipment during construction, emissions and dust associated with these activities would be short-term and negligible in a local and regional context. Excavation of the road and use of heavy equipment for grading would occur during the construction period and would result in a temporary increase in noise levels in the area. These levels, however, would return to normal once the project was completed.

1.6.8 Socioeconomic Resources/Environmental Justice

The economies of the communities surrounding the park are based on professional services, fishing, boat building, construction, educational research, and tourist services and sales. Visitors to the park have a large fiscal impact on the surrounding communities, and during the summer, there is a noticeable shift in emphasis to visitor-service industries. Although some visitors rent bicycles in Bar Harbor and use Duck Brook Road to access the carriage road system, this is a small percentage of the total visitation to the park. Work proposed at Duck Brook Road would not affect the overall socioeconomic impact of the park on surrounding areas.

Federal agencies must implement actions to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies and activities on minority and low-income populations. The project is located within the boundaries of the Acadia National Park and would not cause the displacement of any residents, nor would it eliminate jobs outside of the park. The project would not disproportionately affect low income or minority populations.

1.7 Regulatory, Management, & Legislative Considerations

Appendix A contains a complete list of the federal and state regulations and guidelines related to this project, as well as the applicable NPS guidelines and Director's Orders.

2 Alternatives

2.1 Introduction

The purposes of this project include improving the drainage, surface, and in some cases the bed of Duck Brook Road and defining a parking area near the approach to Duck Brook Carriage Road Bridge. The project, however, also must consider maintaining the rustic character of the road and bridge, allowing year-round access to the nearby Bar Harbor Department of Public Works facilities, and minimizing impacts to natural and cultural resources.

This EA considers three alternatives for the Duck Brook Road Rehabilitation:

- Alternative A – No Action
- Alternative B – Minor Road Rehabilitation with Parallel Parking Spaces
- Alternative C – Major Road Rehabilitation with Head-in Parking Area

2.2 Alternative A–No Action Alternative

This alternative would retain the roadway, drainage, utilities, and parking essentially in their existing conditions. No substantive changes would be made to improve the road, the drainage systems, or parking. The road would continue to deteriorate with loss of surface material, increased potholes, and further flooding. The existing informal parking near the approach to Duck Brook Carriage Road Bridge would persist as well. Under this alternative, the roadway and drainage would be repaired incrementally as funds became available; however, funding would be insufficient to do large-scale repair or rehabilitation, or to solve major structural issues, and over time the road could become unsafe for visitors as deterioration continues. Deterioration could become so severe that the NPS would be forced to close the road to visitors. Current NPS maintenance practices would continue.

2.3 Alternative B–Preferred Alternative

Alternative B (Figure 5) would include rehabilitating Duck Brook Road from Route 233 to West Street Extension. The paved surface of the road over this approximately two-mile section would be kept at its

current width of 16 feet. Rehabilitation would include replacing drainage culverts under Duck Brook Road, constructing new drainage ditches along the east side of the road to capture water and divert it under the road, reconstructing the road base, and repaving. Rehabilitating the road and its drainage system would include raising the road profile no more than 12 inches to accommodate 8 inches of reclaimed aggregate, a 4-inch aggregate base, and 4 inches of asphalt paving. Two, one-foot gravel shoulders would provide structural support for the edges of the paved travel lanes. Side slopes from the edge of the shoulders to the toe of slope would be minimized, with a 2:1 (horizontal to vertical) ratio. Alternative B would have an average construction zone width of approximately 24 feet, wider in areas where drainage ditches or steep slopes occur. These improvements would minimize future maintenance requirements for the roadway. New directional signs would be installed as needed.

Flooding and erosion problems where Duck Brook currently overflows its banks would also be improved. The ditch along the west side of Duck Brook Road at this location would be lined with stone, and the small culvert that conveys water under the berm containing the pipes would be enlarged.

Alternative B would also require that the existing overhead power line and poles along the east side of the road in the southern section be relocated outside of the roadway construction limits. These poles provide electrical and telephone service to the Bar Harbor Department of Public Works facilities. Relocation would be completed by the Bangor Hydroelectic Company, owner of the power lines.

The rough, angular coping stones along the northern section of the road, between Duck Brook Carriage Road Bridge and the Paradise Hill Road Bridge, would be reset with wider spacing (approximately 2 feet) to conform to similar placements along the adjacent carriage road system. Newer, rectangular cut, incongruous stones placed in the 1980s would be removed.

Alternative B would also include formalizing the parking that occurs around Duck Brook Carriage Road Bridge. The existing informal gravel parking area at the bridge would be removed and the area landscaped with native species such as balsam fir (*Abies balsamea*), sheep laurel (*Kalmia angustifolia*), and lowbush blueberry (*Vaccinium angustifolium*) to restore vegetative cover and develop a more natural setting around the bridge. Only a travel lane would remain, to provide vehicle access to the carriage roads for emergency and administrative uses. Coping stones would line the narrowed area to deter vehicles from parking close to the bridge. To approximate the existing capacity and use, parallel parking spaces would be constructed for about 10 passenger vehicles on the east side of Duck Brook Road. The spaces would begin approximately 25 feet north of Duck Brook Carriage Road Bridge and continue south for 200 feet, ending just north of the water tank access road. The parallel parking spaces would extend 8 feet from the shoulder of the road into Great Hill. This alternative would accommodate existing parking levels but remove these cars from parking directly adjacent to the historic bridge and obstructing access to and views of the bridge.

A bus stop for future use by the Island Explorer could be added. The stop could consist of a sign, placed near the approach to Duck Brook Carriage Road Bridge. The sign could be designed so as not to impose on the landscape or views from the bridge or adjacent carriage road system.

Appropriate mitigative measures would be taken during construction to minimize impacts to adjacent areas, natural resources, and visitors. These would include erosion and sediment controls, revegetation with native species, and timing construction so as not to interfere with peak visitor season or amphibian migrations. Mitigative measures are detailed in the appropriate impact sections in "Chapter 3: Affected Environment & Environmental Consequences." The cost associated with Alternative B would be approximately $1,200,000.

2.4 Alternative C

Alternative C (Figure 6) calls for upgrading and widening Duck Brook Road to meet NPS and Federal Highway Administration standards for width, slope, and curve radius. This alternative would better accommodate two-way vehicular traffic, bicycles, and potential future shuttle bus service. As required by AASHTO (American Association of State Highway and Transportation Officials) standards for rural recreational and scenic roads with low traffic volumes and speeds, Duck Brook Road pavement would be widened to 18 feet with two, one-foot gravel shoulders. All trees and obstructions, such as ledge outcrops, trees, and utility poles within 7 to 10 feet of the road edge, would be removed to improve safety. The gravel shoulders would provide structural support for the edges of the paved travel lanes. Other geometric improvements, including excavating to lower the grade of the road and changing the curvature of the road to improve vertical and horizontal sight distances at some locations, would be required. Other measures to reduce traffic speeds would be used in areas of concern, including the curve north of Duck Brook Carriage Road Bridge. These measures would include signage or rumble strips. Rehabilitation would include replacing drainage culverts under Duck Brook Road, constructing new drainage ditches along the east side of the road to capture water and divert it under the road, reconstructing the road base, and repaving. Blasting would likely be required for ledge removal and modifications to the vertical profile of the road. Side slopes adjacent to the road would be graded to a ratio of 4:1 (horizontal to vertical), allowing an area for drivers to recover if their vehicle swerved off of the road. New directional signs would be installed as needed. Alternative C would have an average construction zone width of 44 feet.

Due to the presence of sensitive wetlands, particularly the New Mill Meadow wetland system along the west side of the road, all widening would be done on the east side. Widening would include filling for road construction, culvert extension, and ditch construction. Widening Duck Brook Road, particularly in the central section immediately north of Duck Brook Carriage Road Bridge, where Duck Brook Road and the carriage road run parallel along the two rims of the Duck Brook ravine, would require a substantial cut into the hillside east of the road and removal of vegetation on this slope.

Flooding and erosion problems where Duck Brook currently overflows its banks would also be remedied. The ditch along the west side of Duck Brook Road at this location would be lined with stone, and the small culvert that conveys water under the berm containing the pipes would be enlarged.

Alternative C would also require that the existing overhead power line and poles along the east side of the road in the southern section be relocated outside of the roadway construction limits. These poles provide electrical and telephone service to the Bar Harbor Department of Public Works facilities. Relocation

would be done by the Bangor Hydroelectric Company, owner of the power lines. Tall vegetation would be cut to provide clearance for placing the poles. The areas directly adjacent to the utility lines would be maintained to favor low-growing shrubs and ground cover.

As with Alternative B, the coping stones along the northern section of the road, between Duck Brook Carriage Road Bridge and the Paradise Hill Road Bridge, would be reset with wider spacing (approximately 2 feet) to conform to the similar placements along the carriage road system, and newer, incongruous stones would be removed.

Alternative C also includes a component for formalizing the parking that occurs around Duck Brook Carriage Road Bridge. The existing informal gravel parking area at the bridge would be narrowed and landscaped with native species such as balsam fir, sheep laurel, and lowbush blueberry, to restore the vegetative cover and develop a more natural setting around the bridge. Coping stones would line the narrowed area to deter vehicles from parking close to the bridge. This alternative would provide head-in parking for about 10 passenger vehicles on the east side of Duck Brook Road. These spaces would begin south of the bridge and extend to approximately 100 feet. This formalized gravel parking area would extend approximately 30 feet into the side of Great Hill and would require a retaining wall on the east side of the parking area, which would be composed of rustic granite blocks.

Mitigative measures would be taken to minimize impacts to natural and cultural resources adjacent to the project area and to visitors. These would include use of erosion and sediment controls during construction and timing construction to avoid the peak visitor season and amphibian migrations. These measures and others are discussed in greater detail in the appropriate impact sections of "Chapter 3: Affected Environment & Environmental Consequences." The cost associated with Alternative C would be approximately $2,500,000.

2.5 Alternatives Considered but Rejected

Four alternative parking configurations were considered but rejected because of feasibility, safety concerns, or negative impacts to cultural resources. Each of these included a combination of parallel parking and head-in parking near Duck Brook Carriage Road Bridge.

The first alternative provided a combination of parallel parking and head-in parking near Duck Brook Carriage Road Bridge for up to 10 passenger vehicles. Six head-in parking spaces would have been delineated on the west side of Duck Brook Road, just south of the entrance to the bridge and adjacent to the pump station. These spaces would have been outlined with parking stones and lines to clearly indicate the spaces. Two of the spaces would have been reserved for Department of Public Works personnel who utilize the area for maintenance and deliveries. Four parallel parking spaces would have been delineated along the east side of the road, beginning approximately 100 feet south of the approach to the bridge and extending 90 feet south to the water tank access road.

The property adjacent to the pump station is owned by the Town of Bar Harbor and contains two functioning but deteriorating valve manholes. Two of the head-in parking spaces would be located over the manholes and could cause damage to these water supply facilities when driven over or when plowed in winter. Further, several trees would be removed in order to accommodate the head-in parking spaces adjacent to the bridge as well as the parallel spaces along the east side of the road. The trees along the bridge provide critical screening to the carriage road and bridge from the pump station as well as traffic along Duck Brook Road.

A second alternative consisted of five head-in parking spaces at the approach to the bridge, two on the south side and three on the north side of the existing gravel area, with an opening between them to allow pedestrians, bicyclists, and maintenance vehicles to access the carriage road system. An additional five parallel parking spaces would be constructed along the east side of the road, between the bridge and the water tank access road. The third alternative included five head-in parking spaces at the entrance of the bridge and five head-in spaces placed along the east side of the road, between the bridge and the water tank access road. None of these alternatives would meet the project goals of removing parking from the approach to the bridge, improving safety for visitors accessing the carriage road system, preserving uninhibited access to the pump station and facilities, and restoring the rustic setting of the carriage road system and the historic bridge.

A fourth alternative was considered that would have moved the parking area south to near the intersection of Duck Brook Road and Route 233. This alternative was rejected because it would not provide access to the carriage road system and would not prevent parking at the Duck Brook Carriage Road Bridge.

2.6 Preferred Alternative

Alternative B is the Preferred Alternative because it meets the purpose of the project while limiting adverse impacts to cultural and natural resources and to the visitor experience. Alternative B effectively meets the purpose and need by improving the structural and drainage problems of the road, formalizing parking, enhancing safety for visitors using the roadway, and by retaining the existing character of the road, the bridge, and their associated landscapes. Additionally, these improvements would be achieved while minimizing impacts to natural and cultural resources.

Alternative A, No Action, would not address the established needs or meet the purpose of the project, as no improvements to the roadway would be made. Duck Brook Road would continue to deteriorate structurally and would pose a safety hazard to motorists, bicyclists, and pedestrians using the road as a result of the condition of the road. Periodic flooding caused by poor drainage would continue to cause siltation of Duck Brook. Further, undesignated parking at the approach to Duck Brook Carriage Road Bridge would continue and could lead to disruption of access to the carriage road system and to the Bar Harbor Department of Public Works facilities nearby. The unsightly parking would also continue to degrade the quality of the viewsheds from Duck Brook Carriage Road Bridge and the carriage roads.

Although Alternative C would also meet the project purpose and fulfill identified needs, the associated impacts and costs are more substantial than for Alternative B. Widening the road an additional two feet with 4:1 side slopes would lead to greater impacts to vegetation and wetlands adjacent to the roadway, as well as changing the rustic character of the road.

2.7 Environmentally Preferred Alternative

The Environmentally Preferred Alternative is defined by the Council on Environmental Quality as "the alternative that will promote the national environmental policy as expressed in the National Environmental Policy Act [Section 101 (b)]. Section 101 (b) states that the Environmentally Preferred Alternative should:

- "Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
- Ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.
- Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice.
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources."

Based on the analysis of impacts of the alternatives, Alternative B has been identified as the Environmentally Preferred Alternative. As noted above, Alternative B best meets the purpose of the project by rehabilitating the roadway and minimizing the adverse impacts on cultural and natural resources and visitor experience. Impacts to viewsheds and cultural landscape would be decreased by minimizing the amount of vegetation removed for placement of the parallel parking spaces. Because the roadway would not be widened, there would be only minor impacts to wetlands and water resources in the vicinity of the project, and impacts from construction would be mitigated through the use of erosion and sediment controls. Impacts to visitor experience would be beneficial and moderate as a result of safety improvements to the roadway and removal of haphazard parking at the approach to the Duck Brook Carriage Road Bridge. Alternative A would result in continued adverse impacts to natural and cultural resources as present conditions of roadway flooding and undesignated parking persist and would not meet the project purpose. Alternative C would have a greater adverse impact on the natural and cultural resources because the road would be widened and additional changes made to the road's profile.

3 Affected Environment & Environmental Consequences

3.1 Introduction

This chapter describes the existing environmental conditions in and around the project site. Because there are few resources affected by the proposed action, the environmental consequences of the alternatives are also analyzed in this chapter. The chapter is organized by resource topic: the existing conditions are described, followed by a discussion of probable impacts of each of the three alternatives. Cumulative impacts, an analysis of impairment, and a brief conclusion can be found at the end of each of the major resource sections. Appendix A provides a table of laws, regulations, and guidelines applicable to this project (Table A).

3.2 Methodology for Assessing Impacts

Potential impacts are described in terms of type (beneficial or adverse), context (site-specific, local, or regional), duration (short-term or long-term), and intensity (negligible, minor, moderate, or major). Because definitions of intensity (negligible, minor, moderate, or major) vary by impact topic, intensity definitions are provided separately for impact topics:

Natural Resources

Analysis of impacts to natural resources was based on research, scientific literature, professional judgment, and field observations of resources. When determining the intensity of impacts, the following terminology was applied:

Negligible: impact is at the lowest levels of detection, barely measurable with no perceptible effects.

Minor: impact is slight but detectable, with few perceptible effects, and localized in area.

Moderate: impact is readily apparent and measurable. The resource might deviate from normal levels, but would remain viable.

Major: impact is severely adverse or exceptionally beneficial. The change is readily apparent, and the resource would be permanently altered from existing conditions.

Cultural Resources

The following impact indicators were used to determine impacts to cultural resources, including cultural landscape and viewsheds.

Negligible: impact(s) is at the lowest levels of detection - barely perceptible and not measurable.

Minor: impact is measurable or perceptible, but is slight and localized within a relatively small area of a site.

Moderate: impact is measurable or perceptible and changes one or more features of a cultural resource but does not diminish the integrity of the resource.

Major: impact is substantial, noticeable, and permanent. The impact changes a feature of the resource and diminishes its integrity.

Visitor Use and Experience

The ability of the visitor to effectively access and safely use the project area was the basis for determining potential impacts of each alternative. The intensities of the impacts are defined as:

Negligible: the impact is at the lowest level of detection – barely perceptible and not measurable.

Minor: the impact is slight but detectable and would affect few visitors.

Moderate: the impact is readily apparent and would affect many visitors.

Major: the impact is severely adverse or exceptionally beneficial and would affect most visitors.

Impairment

In addition, the National Park Service's *Management Policies* (2000) require analysis of potential effects to determine whether or not actions would impair park resources. A fundamental purpose of the NPS, as provided for in its Organic Act (1916) and reaffirmed by the General Authorities Act (1970), as amended 1978, and recognizing a national park system, begins with a mandate to conserve park resources and values. However, the laws do give the National Park Service the management discretion to allow impacts to park resource and values when necessary and appropriate to fulfill the purposes of the park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited

impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including opportunities that otherwise would be present for the enjoyment of those resources and values. An impact would be more likely to constitute an impairment to the extent it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- Identified as a goal in the park's general management plan or other relevant NPS planning documents.

Impairment may result not only from NPS activities in managing the park, but also visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park. A determination on impairment is made in the "Cumulative Impacts, Impairment, and Conclusions" section under each impact topic.

Cumulative Impacts

The Council on Environmental Quality (CEQ) regulations, which implement the NEPA, require assessment of cumulative impacts in the decision making process for Federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7).

Cumulative impacts were determined by combining the impacts of the alternatives with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects at Acadia National Park and, if applicable, the surrounding region. There are a number of other recent, planned, or underway projects within Acadia National Park that could contribute to cumulative impacts but would improve the quality of visitor experience and reduce the level of environmental impact associated with park operations. These include:

- Constructing a water storage tank for the Bar Harbor Water Company (now Town of Bark Harbor Department of Public Works), adjacent to Duck Brook Road (completed)
- Rehabilitating certain other park roadways
- Rehabilitating certain park trails
- Repointing the carriage road system bridges within the park, including Duck Brook Carriage Road Bridge
- Rehabilitating visitor facilities at Sand Beach
- Rehabilitating Seawall Campground and Picnic Area
- Rehabilitating Blackwoods Campground

3.3 Natural Resources

For natural resources, impacts were assessed for wetlands and water resources; vegetation, wildlife, and wildlife habitat; and rare, threatened, and endangered species. Resources dismissed from further consideration were discussed in Chapter 1 of this document.

3.3.1 Topography and Soils

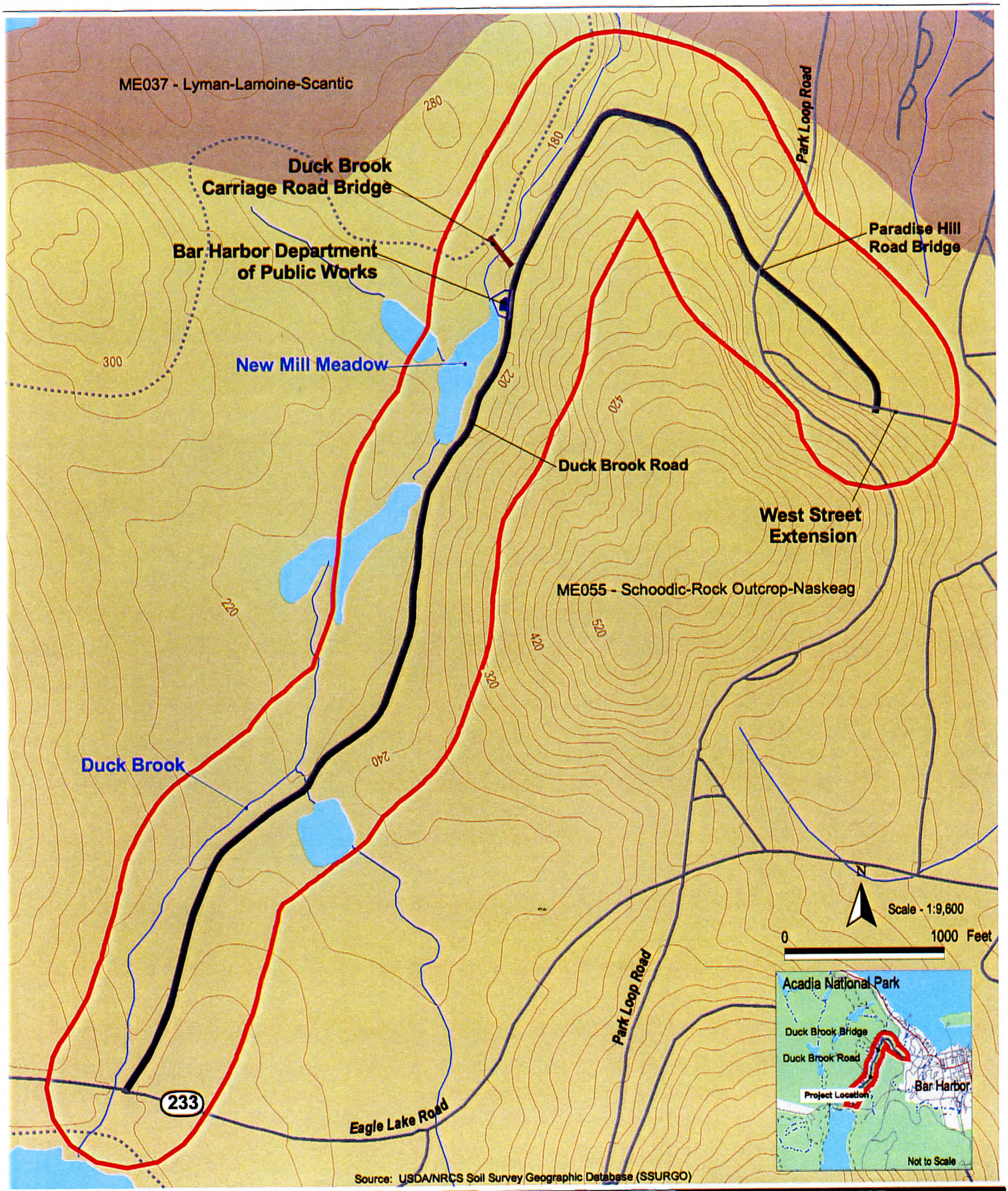
The soil along Duck Brook Road consists of the Schoodic-rock outcrop-Naskeag association (Figure 7). These soils originated from glacial till. Schoodic soils are very shallow, nearly level to very steep, and excessively well drained, and can be found on ridges and summits. The surface is very gravelly, fine sandy loam that is easily blown away once exposed. Rock outcrop consists of exposed bedrock on the crests of ridges and mountains and on steep side slopes of moderately deep to bedrock, and on steep side slopes of mountains. Naskeag soils are moderately deep to bedrock, range between nearly level and gently sloping, and are poorly drained. These soils are found in depressions between shallow till ridges (NPS 2001a).

3.3.2 Wetlands and Water Resources

Water resources associated with the park include 14 Great Ponds (larger than 10 acres), 9 smaller ponds, more than two dozen streams named on the U.S. Geological Survey topographic maps, and 10 named wetland areas (NPS 1999). This totals approximately 2,600 acres of lakes and ponds and approximately 4,127 acres of wetlands. The interior of Mount Desert Island is drained by 12 major watershed systems, which are aligned roughly parallel to the north-south orientation of the ridge and valley geology that resulted from glacial action. Acadia National Park's drainages are small, short and steep, averaging less than 3 miles (5 km) from headwaters to the sea. Average annual precipitation of 55 inches (140 cm) and frequent sea fog maintain water levels through much of the year. Streamflows, however, are usually very low in late summer and early fall because of rapid runoff and poor moisture retention by the upland soils. November has the most rainfall, which increases lake levels and stream discharge in late fall.

Duck Brook, one of the park's major watershed systems, drains approximately 1,498 ha (3,700 ac), and is the outlet of Eagle Lake, a 436-acre Great Pond. Duck Brook parallels Duck Brook Road from State Route 233 north for approximately 1 mile, and eventually discharges north into Frenchman Bay. Wetlands and streams located in close proximity to Duck Brook Road provide wildlife habitat and contribute to the visual and scenic features of the road.

Biological inventory and monitoring data for streams in Acadia National Park are limited. Surveys have been conducted in Duck Brook for mayflies (*Ephemeroptera* sp.) and rotifera. Duck Brook was found to have the most diverse mayfly populations of streams sampled on Mount Desert Island (Kahl et al. 1999). These species, which are especially sensitive to low pH, may provide a warning system and show the relative intensity of pollution due to atmospheric deposition and acidification. Studies of fish within the park, particularly brook trout, are ongoing (Kahl et al. 1999). The Maine Department of Inland Fisheries and Wildlife (MDIFW) currently stocks game fish in several lakes and ponds within the park.



Project Location
Roads
Carriage Road
Topography (CI = 20 ft.)

Soil Mapping
ME037 - Lyman-Lamoine-Scantic
ME055 - Schoodic-Rock Outcrop-Naskeag

NATIONAL PARK SERVICE
Acadia National Park
Duck Brook Road

Soil Mapping
Figure 7

Brook trout (*Salvelinus fontinalis*) and Atlantic salmon (*Salmo salar*) have been stocked in Eagle Lake. MDIFW reports that Duck Brook supports a moderate population of brook trout (pers comm. 2002).

The National Wetlands Inventory (NWI) has recently updated its wetland mapping in the Acadia National Park region (Calhoun et al. 1994). The NWI classifies wetlands for the purposes of regulation, habitat evaluation, inventory and management. Wetlands in Acadia National Park (Figure 8) are diverse, and include marine aquatic beds, intertidal shellfish flats, salt marshes, freshwater marshes, forested wetlands, and peatlands. For the purposes of this EA, wetlands are also classified according to the system described in Cowardin et al. 1979. According to the NWI, wetlands comprise over 10 percent of the Acadia National Park holdings and cover approximately 4,175 acres, not including the linear wetlands of marine or riverine systems. The predominant freshwater wetland system for Acadia National Park is palustrine, which covers 2,618 acres. Palustrine wetlands are characterized by persistent vegetation such as sedge meadows, cattail marshes, or wooded swamps. A large diversity of plant communities and overall species abundance occurs in palustrine wetlands owing to the wide range of settings within which these wetlands form. In Acadia, palustrine wetlands are dominated by scrub-shrub (dominated by high or low shrubs) and forested communities (dominated by evergreens, hardwoods, or a mixed community) and the majority are less than 1 acre in size.

New Mill Meadow wetland (108 acres) is one of the largest wetlands within the park, and is immediately west of Duck Brook Road. Other wetlands are associated with Duck Brook, which flows northward out of Eagle Lake parallel to and west of Duck Brook Road. Duck Brook is bordered by palustrine forested wetlands (PFO) dominated by balsam fir, spruce (*Picea* sp.), red maple (*Acer rubrum*), and northern white cedar (*Thuja occidentalis*), which extend in some locations to the base of the slope of the existing road. Shrub swamps dominated by winterberry (*Ilex verticillata*), meadowsweet (*Spiraea* sp.), and alder (*Alnus* sp.) occur along the edges of the brook and New Mill Meadow, and there are also shrub-dominated peatland wetlands on the west side of the New Mill Meadow wetland. Palustrine emergent marshes (PEM) dominated by emergent plant species (cattails (*Typha angustifolia*), sedges, and grasses) occur in some locations along Duck Brook and border an unnamed tributary to Duck Brook, east of the road. These more open wetlands are greater than 50 feet from the road, and are not easily visible due to the dense vegetation between the road and the wetland.

Wetlands occur along both sides of the southern section of the road. The wetlands to the east are generally small palustrine forested wetlands dominated by spruce and fir, with some northern white cedar in the overstory and sphagnum moss and sedges in the herbaceous layer. Close to the road, poor drainage has resulted in the impoundment of small pools dominated by sheep laurel. In 2002, one of these small pools supported spotted salamander (*Ambystoma maculatum*) egg masses and functions as a vernal pool. Other similar impoundments may also provide vernal pool habitat. Several small culverts convey intermittent (seasonal) flows under the road, from east to west. Small, well-defined palustrine forested wetlands occur west of the road in excavated areas between the road and the water line berm. The southernmost of these is an isolated pool that contains vegetation indicative of permanent water, including water lilies (*Nuphar* sp.) and bur reed (*Sparganium* sp.). Several egg masses of spotted salamander were observed in this wetland in April 2002, demonstrating that it functions as a vernal pool.

In the central segment of the project, Duck Brook flows through the New Mill Meadow wetland. There are a series of outstanding open views of these wetlands from the road. The upper wetland is a large beaver impoundment confined by an inactive curving beaver dam, containing palustrine emergent wetlands and open water. The open water and emergent vegetation provide high quality habitat for waterfowl and wildlife. A heath-like open shrub wetland extends further to the west. Below the beaver dam, Duck Brook flows in a more well-defined channel through a shrub (alder) swamp, classified as a palustrine scrub-shrub wetland (PSS) to the lower wetland. The lower wetland is also a large expanse of open water and palustrine emergent marsh, with a large active beaver lodge on the east side. The lower wetland is confined by an old mill dam just below the pump station. These wetlands provide high quality wildlife habitat and aquatic habitat due to their large size, connectivity with other wetlands, and interspersion of open water and vegetated wetlands.

North of New Mill Meadow, Duck Brook flows into a deep ravine well away from the road. Wetlands also occur on both sides of the road north of the Paradise Hill Road Bridge. Wetlands on the east side are confined to a drainage ditch. The wetlands on the west side contain seasonal standing water pools, with dense shrub borders (palustrine scrub-shrub wetlands, PSS) and provides vernal pool habitat (Connery pers comm. 2002). A stream flows north along the west side of the road then diverges away from the road in a man-made channel.

Wetland Functional Values Assessment

A functional values assessment was performed for the wetlands within the Duck Brook Road corridor. The purpose of the assessment was to determine the ability of each wetland to protect the environment. The methodology used was developed by the U.S. Army Corps of Engineers (New England District) as described in *The Highway Methodology Workbook Supplement, Wetland Functions and Values - a Descriptive Approach* (1995). This assessment technique is a simple way to determine whether a wetland provides a particular function or value, and which of these are the principal or most important functions or values of that wetland.

Six wetlands were considered in this assessment (Figure 8):

1. Duck Brook and its bordering wetlands, between Route 233 and New Mill Meadow
2. An intermittent stream and its bordering wetlands, tributary to Duck Brook Road and east of the road
3. An isolated wetland west of Duck Brook Road, between the road and the water line berm
4. An isolated wetland west of Duck Brook Road, between the road and the water line berm
5. New Mill Meadow
6. A wetland system, bordering an intermittent stream, north of the Paradise Hill Road Bridge.

Table 1 Wetland Functions and Values

	Wetland					
Function/Value	**1**	**2**	**3**	**4**	**5**	**6**
Groundwater recharge/discharge	+	+	-	-	+	+
Floodflow alteration	+	P	+	+	P	+
Fish and shellfish habitat	P	+	-	-	P	-
Sediment/toxicant/pathogen retention	+	P	-	-	P	P
Nutrient removal/retention/transformation	+	P	-	-	P	+
Production export	+	+	-	-	P	+
Sediment/shoreline stabilization	P	+	-	-	+	+
Wildlife habitat	P	P	P	+	P	P
Recreation	+	+	-	-	+	-
Education/scientific value	+	+	+	-	+	+
Uniqueness/heritage	+	+	-	-	+	-
Visual quality/aesthetics	+	P	+	-	P	-
Endangered species habitat	P	P	-	-	P	-

+ = Function/value occurs in the wetland

- = Function/value does not occur in the wetland

P = principal function/value of the wetland

Duck Brook, its associated wetlands, and the wetlands bordering a tributary intermittent stream provide all of the typical wetland functions and values, since these contain an intermittent or perennial waterbody, a well-developed wetland plant community, are visible from a traveled road, provide wildlife and fish habitat, and occur in an undeveloped forested landscape. The wetlands associated with Duck Brook provide fish habitat, shoreline stabilization, wildlife habitat, and endangered species habitat (four-toed salamanders) as the principal or most important functions. The wetlands associated with the tributary stream, which have a constricted outlet, also provide floodflow alteration, sediment retention, and nutrient retention, and provide aesthetic values due to the views of the open marsh that are available from Duck Brook Road. The two small isolated wetlands between the road and the water line berm provide relatively few functions because they lack connection with a waterbody and are only seasonally flooded. The southernmost and larger of these wetlands provides vernal pool habitat and therefore has a principal function as wildlife habitat. New Mill Meadow wetland, a large and diverse wetland system with a constricted outlet and permanent open water, is visible from Duck Brook Road and provides numerous important or principal functions (floodflow alteration, sediment retention, nutrient retention, production export, wildlife habitat, visual quality, and endangered species habitat). The small wetlands north of the Paradise Hill Road Bridge occur on both sides of Duck Brook Road, and receive and convey runoff from the road system in an intermittent stream. A portion of this wetland contains a dense shrub swamp and provides vernal pool habitat. This wetland therefore provides sediment/toxicant retention and wildlife habitat as its principal values.

Effects of Alternative A

Alternative A would result in no changes to wetlands and water quality along the Duck Brook Road corridor. Continuing erosion from floodwaters would result in the deposition of sediment in Duck Brook and its associated wetlands.

Effects of Alternative B

Alternative B would result in minor impacts to wetlands and water resources. Rehabilitation of the road and drainage system would require work in proximity to wetlands and would require the placement of fill in small portions of the wetlands immediately adjacent to the road in the southern section of the project. Raising the road elevation 12 inches would require the placement of fill approximately 2 feet from the existing toe of slope, and would fill small portions of the forested wetlands that border the road in this section. A total of approximately 0.43 acres of wetlands, in 22 locations, would be affected. Impacted areas would be narrow strips along the edge of the existing road, and would not affect the functions and values of the wetlands. This estimate is high, and is expected to be reduced even further following precise delineation of wetland resource areas and final roadway design. Drainage improvements, including the constructing new drainage ditches and replacing culverts, could result in temporary minor impacts to wetlands adjacent to the road. Although there is a possibility that replacing culverts could adversely alter the hydrology of the small wetlands on the east side of the road, these impacts would be minimized by replacing with culverts of the same size and at the same elevation as the existing culverts. The areas adjacent to the road, excavated to improve drainage, would be allowed to recover and would be likely to function as temporary pools providing seasonally important habitat.

Use of sediment and erosion control structures, regular inspection, and maintenance of erosion controls would prevent sedimentation into Duck Brook and adjacent wetlands.

Alternative B would result in a minor increase of approximately 1,800 square feet (roughly 9 feet by 200 feet) in impervious area in the vicinity of the Duck Brook Carriage Road Bridge entrance. This increase would not be anticipated to result in increased rates or volumes of stormwater runoff to Duck Brook. No additional parking would be created; therefore, this alternative would not result in an increase in stormwater contaminants from vehicles or runoff.

Effects of Alternative C

Alternative C would result in moderate impacts to wetlands. The widening of the road would impact wetlands due to filling for road construction, culvert extension, and ditch construction. One small vernal pool adjacent to the road, which provides breeding habitat for amphibians, would be lost. Rehabilitating the road and drainage system would require work in proximity to wetlands and would require placing fill in small portions of the wetlands immediately adjacent to the road in the southern section of the project. Raising the road elevation and widening the pavement would require placing fill and would fill small portions of the forested wetlands that border the road in this section. A total of approximately 0.66 acres of wetlands, in 24 locations, would be affected. This estimate is high, and is expected to be reduced following precise delineation of wetland resource areas and final roadway design. Drainage

improvements, including constructing new drainage ditches and replacing culverts, may result in temporary minor impacts to wetlands adjacent to the road. Although there is a possibility that replacing culverts could adversely alter the hydrology of the small wetlands on the east side of the road, these impacts would be minimized by replacing with culverts of the same size and at the same elevation as the existing culverts.

Use of sediment and erosion control structures, regular inspection, and maintenance of erosion controls would prevent sedimentation into Duck Brook and adjacent wetlands.

Alternative C would increase impervious surface with approximately 2,700 square feet (30 feet by 90 feet) of pavement in the vicinity of the Duck Brook Carriage Road Bridge. This increase would not be anticipated to result in increased rates or volumes of stormwater runoff to Duck Brook. No additional parking capacity would be created; however, the 25 percent increase in pavement width could increase the volume and velocity of runoff from the road, which could result in increased erosion of stream channels downgradient of the road, negatively affecting wetlands and water quality.

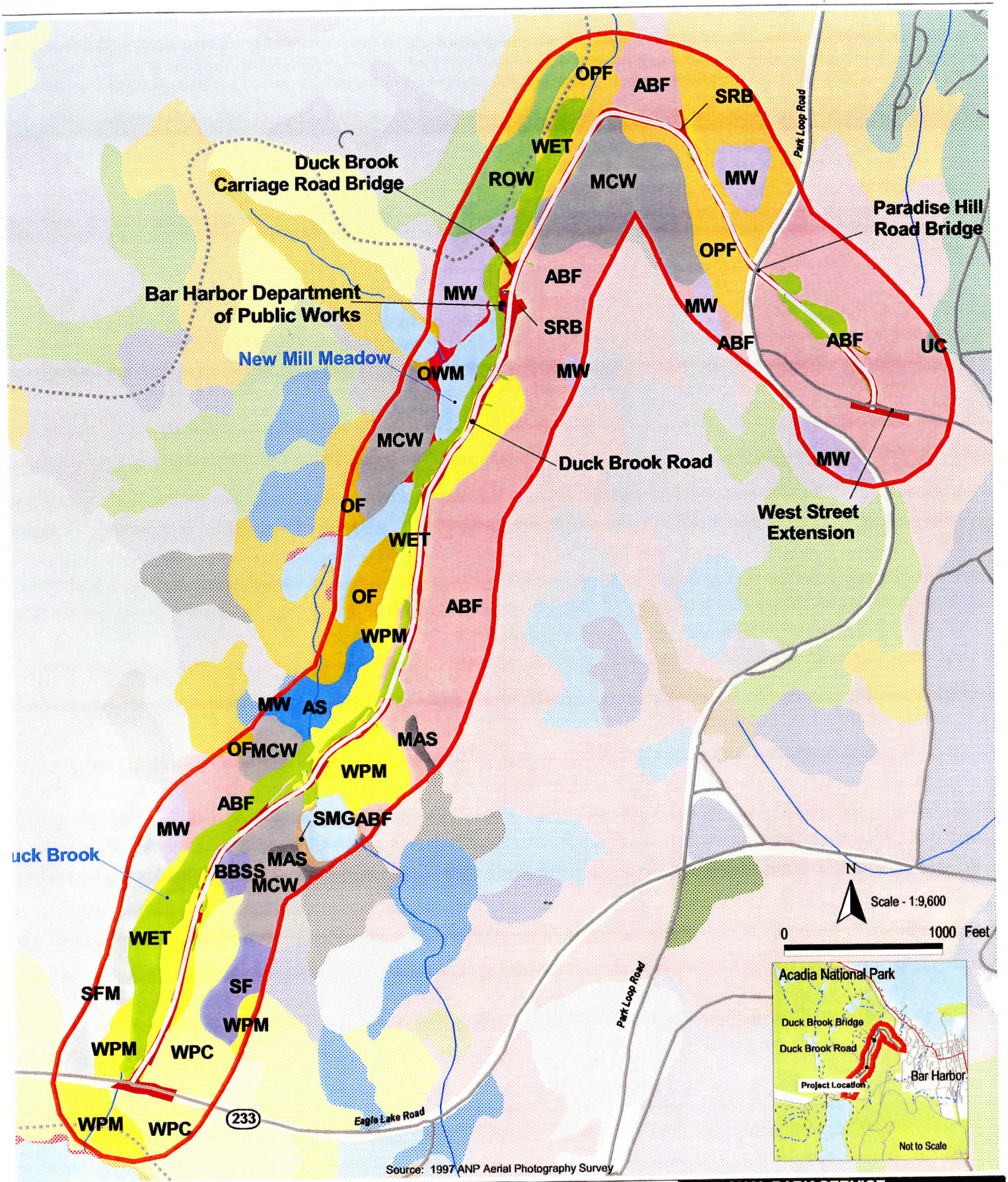
3.3.3 Vegetation, Wildlife, and Wildlife Habitat

Vegetation Communities and Plant Species

Natural vegetation along Duck Brook Road includes both upland and wetland communities. The road passes through a forested landscape throughout most of its length. Along the southern portion of the road, these primarily upland forests are dominated by mixed vegetation, with canopy species including red maple, red oak (*Quercus rubra*), white pine (*Pinus strobus*), balsam fir, spruce, and birch (*Betula* sp.). One area east of the road contains a more open plant community of exposed ledge with scattered small pines (*Pinus* sp.) and gray birch (*Betula populifolia*), with sparse vegetation of lowbush blueberry, mosses, and reindeer lichen (*Cladonia* sp.). A utility line, with wooden poles, is located along the east side of the road south of the Bar Harbor Department of Public Works pump house. Trees and tall shrubs have been cleared for a distance up to 20 feet from the pavement edge to accommodate this power line. Trees occur up to the edge of the pavement on the west side of the road.

The central section of Duck Brook Road passes through a drier forest with very rocky sloping soils, dominated by deciduous species, primarily by red oak, with some red maple and beech (*Fagus grandifolia*). Trees are generally small (2 to 4 inches in diameter), with a few larger individuals up to 12 inches in diameter. Shrubs include balsam fir, sheep laurel, lowbush blueberry, and wild raisin (*Viburnum nudum* var. cassinoides). Herbs in this community include sedges (*Carex umbellata*), mayflower (*Epigaea repens*), wintergreen (*Gaultheria procumbens*), partridgeberry (*Mitchella repens*), grasses (*Oryzopsis asperifolia*) and bracken fern (*Pteridium aquilinum*).

In the northern portion of the project, from the Paradise Hill Road Bridge to West Street Extension, the road passes through a young secondary-growth forested area dominated by bigtooth aspen (*Populus grandidentata*), gray birch, white ash (*Fraxinus americana*), and red maple.



Project Location
Roads
Carriage Road
Topography (CI = 20 ft.)
Water

ABF Aspen Birch Forest/Woodland
AS Streamside Alder Thicket Shrubland
BBSS Heath Summit Sparse Shrubland/ Dwarf Shrubland Mosaic/Complex
MAS Hardwood Seepage Swamp
Mixed Conifer Woodland
MCW Mixed Conifer - Deciduous Woodland
OF Mixed Tall Sedge Fen; Sedge - Leatherleaf Fen Mosaic/Complex
OPF Oak - Pine Forest
OWM Eelgrass Bed; Tidal Creek, Ruppia, Lacustrine Shallow Bottom Complex
ROW Red Oak Woodland
SF Maritime Spruce - Fir Forest
SFM Spruce - Fir - Red Maple Forest; Spruce - Yellow Birch Forest
SMG Graminoid Swale/Drawdown Pond; Tussock Sedge Meadow; Cattail Marsh; Bluejoint - Mixed Graminoid Meadow; Bulrush Deepwater Marsh
UC Commercial Services
WPC White Pine - Mixed Conifer Forest
WPM White Pine - Norther Hardwoods - Red Oak Forest; Early Successional Oak - Pine Forest
SRB Shrubs
WET Wetlands

NATIONAL PARK SERVICE
Acadia National Park
Duck Brook Road

National Vegetation Classification System Mapping
Figure 9

Rare, Threatened, and Endangered Species

According to the U.S. Fish & Wildlife Service, MDIFW, and information in National Park Service documents and files, at least 47 listed species of wildlife and two species proposed for federal listing inhabit Maine and adjacent waters. Only nine of these species, however, have been documented in or adjacent to the park.

Two animal state species of concern have been documented to occur in the project area. Neither species is officially listed on the Maine Endangered Species List (Title 12 M.R.S.A, Section 7753 paragraph 3), but both are considered rare within the state.

Four-toed salamanders *(Hemidactylium scutatum)* are rare in the state, with fewer than 100 populations, and occur along Duck Brook Road. These are the smallest salamanders found in Maine, occupying land adjacent to or within wetlands with hummocks of grasses, sedges, or sphagnum moss adjacent to slow-moving streams or pools of standing water. Tolerant of acidic conditions, four-toed salamanders prefer wetlands dominated by sphagnum moss and generally nest in cavities within moss, stumps, rotten logs, or leaf litter in the vicinity of water where larvae, upon hatching, may fall into the water. Salamanders move to nesting sites in early spring, where females lay eggs from mid-April into June and remain with the eggs throughout the 38 to 60 day incubation period. The larval period is six to eighteen weeks, depending on conditions. The diet of four-toed salamanders consists of ticks, spiders, springtails, midges, ground beetles, rove beetles, fly larvae, parasitic wasps, ants, earthworms, and snails.

Spring surveys by park staff in 1994, 1996, and 1997 revealed four-toed salamanders were one of several amphibian species that use at least three crossing areas along Duck Brook Road (Woodward & Curran 2000). Crossing areas are apparently used to access breeding areas in New Mill Meadow and have been documented to occur approximately 50 feet south of the pump station, 150-200 feet south of the pump station, and approximately one-half mile south of the pump station. Four-toed salamanders move throughout the year, whenever there is no snow cover, as well as during breeding season. Animals typically move at night during or following rain, because their skin must remain moist.

Marsh hawks, or northern harrier (*Circus cyanus*) have been observed to breed in the New Mill Meadow wetland system. These large migratory hawks are also considered rare in Maine. Harriers are birds of open lands and hunt in marshes, salt marshes, dunes, fields, and pastures, feeding on small mammals (particularly meadow voles), insects, and ground-nesting birds. Nests are typically hidden in dense shrub thickets.

There are no unique plant communities or state-listed rare plant species within the Duck Brook Road corridor, although one rare plant species, Nantucket shadbush (*Amelanchier nantucketensis*) is known to occur along the carriage roads near Duck Brook Carriage Road Bridge.

Effects of Alternative A

Alternative A would result in no changes to vegetation or wildlife populations along the Duck Brook Road corridor, although continued erosion of Duck Brook Road may affect water quality and fish habitat in Duck Brook. Uncontrolled parking along the edge of Duck Brook Road near the bridge has resulted in erosion of the bank and loss of vegetation, which would continue with this alternative.

Effects of Alternative B

Alternative B would result in the minor loss of vegetation along Duck Brook Road. Based on the assumed footprint of construction of Alternative B, approximately 3.85 acres of natural vegetation would be altered by construction. These areas would be revegetated following construction to restore a native shrub plant community along the roadway. The construction of parallel parking spaces along Duck Brook Road would result in the loss of approximately 1,800 square feet of upland forest vegetation.

This alternative would also require that the existing overhead power line and poles be relocated outside of the roadway construction limits. The actual construction limits and new pole locations cannot be accurately determined until the completion of the final design and field review. While woody vegetation would be removed from the roadside, there would be no overall loss of vegetation as a result of moving power lines, although there could be some shift in community types along the edge of Duck Brook Road, from forested to shrub-dominated, as vegetation recovers from this temporary disturbance.

Roadway reconstruction, as a result of soil disturbance and the need to import topsoil to stabilize and revegetate the disturbed slopes along the road, could result in the introduction of non-native species and invasive species. Mitigation measures incorporated into the design of the road (park inspection and approval of topsoil sources as being free of invasive species; use of park-developed native seed mixtures and seedlings) would reduce the potential for introducing undesirable species that are not currently part of the vegetation community. The area would be monitored for infestations of exotics and treated using an integrated pest management approach to reduce the occurrence of non-native species.

Road work is anticipated to result in temporary minor impacts to wildlife species during construction. Noise and human activity would be introduced into a quiet corridor currently used by low volumes of vehicular traffic and occasional pedestrians and cyclists, and could result in the temporary displacement of wildlife species from areas close to the road.

Erosion and sediment control barriers, placed along both sides of the construction zone to protect adjacent wetlands, could also interrupt the movement of small mammals, reptiles, and amphibians during the construction period and could result in a short-term adverse impact if barriers were in place during the amphibian breeding season. Proposed mitigation measures, including creating gaps in the erosion control barrier, would minimize these impacts. Impacts to migratory movements of amphibians across the road would be negligible, because the road elevation would increase only slightly (a maximum of 12 inches) and pavement width would not be increased. Amphibians would continue to be able to cross Duck Brook Road to move between areas of suitable habitat, or to access breeding habitat, because there would be no change in roadway width. As with existing conditions, amphibians primarily cross the road on wet

nights. There would be no increased risk of mortality from automobiles, as the road rehabilitation has been designed to not increase vehicular traffic volumes or speeds. The use of sediment and erosion control measures, with regular inspection and maintenance, would prevent silt from disturbed soil areas migrating into wetlands and streams, with a potential temporary minor adverse effect on aquatic wildlife habitat and fish.

The loss of trees due to road reconstruction and utility relocation would result in a negligible loss of habitat for birds or other wildlife, however, because ample habitat is available in the forests surrounding the project corridor. The loss of vegetation in the center section of the project, on the steep slope between the road and the New Mill Meadow wetland, could temporarily reduce the screening vegetation adjacent to the wetland.

Effects of Alternative C

This alternative would have moderate adverse impacts to vegetation and wildlife habitat. Alternative C would result in the minor loss of vegetation along Duck Brook Road. Based on the assumed footprint of construction for Alternative C, approximately 5.42 acres of natural vegetation would be altered by construction. There would be a permanent loss of approximately 0.5 acres of natural vegetation as a result of the widened road surface. The remainder of the construction area would be revegetated to restore a native shrub plant community. The construction of a parking area along Duck Brook Road would result in the loss of approximately 2,700 square feet of upland forest vegetation extending 25 feet from the existing pavement into the wooded community.

This alternative would also require that the existing overhead power line and poles be relocated outside of the roadway construction limits. The actual construction limits and new pole locations cannot be accurately determined until the completion of the final design and field review. While woody vegetation would be removed from the roadside, there would be no overall loss of vegetation as a result of moving power lines, although there could be some change in community types as vegetation is replaced.

Roadway reconstruction, as a result of soil disturbance and the need to import topsoil to stabilize and revegetate the disturbed slopes along the road, could result in the introduction of non-native species and invasive species. Mitigation measures incorporated into the design of the road (inspection and approval of topsoil sources as being free of invasive species; use of the park-developed native seed mixture, and use of straw, rather than hay, in mulch and erosion controls) would reduce the potential for the introduction of undesirable species that are not currently part of the vegetation community. The area would be monitored for exotics and treated if infested.

Road reconstruction is anticipated to result in temporary minor impacts to species during construction. Noise and human activity would be introduced into a quiet corridor currently used by low volumes of vehicular traffic and occasional pedestrians and cyclists and could result in the temporary displacement of wildlife species from areas close to the road.

Erosion and sediment control barriers, placed along both sides of the construction zone to protect adjacent wetlands, could also interrupt the movement of small mammals, reptiles, and amphibians during the construction period and could result in a short-term adverse impact if barriers were in place during the amphibian breeding season. Proposed mitigation measures, including creating gaps in the erosion control barrier, would minimize these impacts. There could be minor adverse impacts to migratory movements of amphibians across the road because the road elevation would increase and pavement width would be increased by up to two feet. The use of sediment and erosion control measures, with regular inspection and maintenance, would prevent silt from disturbed soil areas migrating into wetlands and streams, with a potential temporary minor adverse effect on aquatic wildlife habitat and fish.

The loss of trees due to road reconstruction and utilities relocation would result in a negligible loss of habitat for birds or other wildlife; however, ample habitat is available in the forests surrounding the project corridor. The loss of vegetation in the center section of the project, on the steep slope between the road and the New Mill Meadow wetland, could temporarily reduce the screening vegetation adjacent to the wetland.

A wider, straighter road in this relatively remote rural location could result in higher vehicular speeds, which could adversely affect wildlife by increasing roadway noise and increasing roadkill mortality.

3.3.4 Cumulative Impacts, Impairment, and Conclusions

The No Action Alternative would have a minor, long-term, adverse effect because continued uncontrolled parking along Duck Brook Road could lead to a loss of vegetation in the upland forested area. Alternatives B and C would both result in the minor loss of vegetation in areas immediately adjacent to the road but would not affect unique communities or rare species. Alternative B would result in slightly less permanent loss of vegetation (approximately 800 square feet less than Alternative C) as a result of parking area construction. Construction of the Bar Harbor water storage tank adjacent to Duck Brook Road recently resulted in the loss of approximately 1 acre of hardwood forest, a habitat type common on Mount Desert Island. The contribution to cumulative impacts overall associated with Alternatives B and C would be minor or negligible. Over time, disturbed areas would become revegetated with native woody species. Mitigation measures proposed would minimize the potential for the introduction of invasive species along the road corridor.

Alternative A would have a negligible or minor, long-term, adverse effect resulting from soil erosion and deposition of silt in Duck Brook. Alternatives B and C would have similar impacts to wetlands and water resources, with minor losses of wetlands adjacent to the existing road. Alternative C would affect a larger area of wetlands (0.23 acre) than Alternative B. Indirect impacts to wetlands would be avoided and minimized through the use of sedimentation and erosion controls during construction.

Alternatives B and C would result in negligible losses of upland forest vegetation as a result of road improvements and utility relocation, but would not affect wildlife populations. Alternatives B and C could also result in short-term adverse effects to wildlife habitat due to construction noise and activity,

and could interrupt amphibian migration to breeding sites in wetlands and vernal pools adjacent to the road during construction. Mitigation measures included in these alternatives would minimize adverse effects. Because suitable vernal pool and wetland habitats available for use by vernal pool-dependent and other amphibians are common and occur throughout the study area, no localized population reductions, shifts, or extinctions are likely to occur.

The No Action Alternative would not result in new or increased impacts to wildlife or wildlife habitat. Use of the existing road is likely to have negligible adverse effects to wildlife populations due to noise, human activity, and roadkill mortality. Alternative B would not be expected to increase these effects, as traffic volumes and speeds would not increase as a result of the road reconstruction. Alternative C could result in increased traffic volumes and speeds, which could affect wildlife populations by increasing mortality or causing wildlife to avoid the road corridor.

The action alternatives would not result in impairment of wetlands, water resources, vegetation, or wildlife resources.

3.4 Cultural Resources

In compliance with Section 110 of the NHPA and the NPS Servicewide Programmatic Agreement, the NPS regional cultural resource advisory team has initiated the process of determining the National Register eligibility of Duck Brook Road. This process is taking place concurrently but independently of this EA. While no formal determination of eligibility has been made to date on Duck Brook Road itself, the NPS staff is of the opinion that it does not meet the criteria for listing in the National Register. The carriage road system, including Duck Brook Carriage Road Bridge, is listed in the National Register. The Paradise Hill Road Bridge is a contributing element of the Park Look Road, which is eligible for listing in the National Register. Therefore, in compliance with Section 106 of the NHPA, the NPS cultural resource advisory team will consult with the Maine State Historic Preservation Office (SHPO) to assess, and mitigate as appropriate, project impacts to nearby cultural resources. Cultural resources specific to this project consist of viewsheds to and from segments of the carriage road system, including Duck Brook Carriage Road Bridge, and potential archeological resources.

Archeology

The *Environmental Assessment for the Bar Harbor Water Company Proposed Water Storage Tank* (Woodard & Curran 2000) states that the NPS and the SHPO concurred that there were no cultural resources, including archeological resources, of note at the site of the proposed water tank. The potential for archeological discoveries in this area is low because of the rocky soils and shallow bedrock. Because the proposed roadway work would take place primarily in previously disturbed areas and where the soils are very stony and rocky, the likelihood of archeological finds is low. For proposed work in previously undisturbed areas, the NPS would engage a state-certified archeologist in the summer of 2002 to conduct an archeological assessment of the site to determine the potential for any archeological remains. If deemed necessary, an archeological survey would be carried out in consultation with the SHPO in compliance with Section 106.

Cultural Landscapes

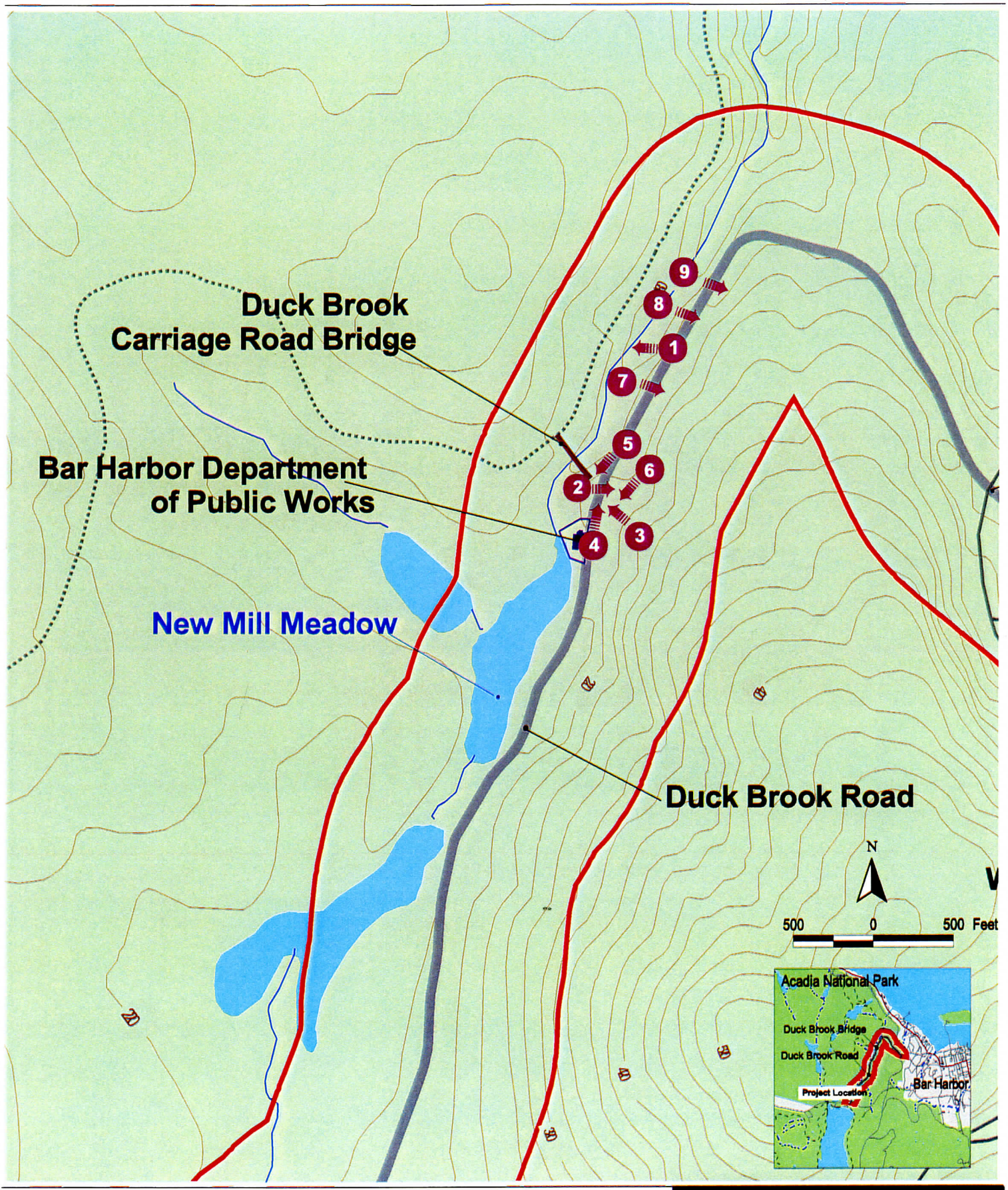
Paradise Hill Road and Park Loop Road make up the Acadia Byway, designated an All-American Road by the FHWA National Scenic Byways Program in 2000. The roads are also listed as Maine State Scenic Byways by the Maine Department of Transportation. Duck Brook Road passes beneath Paradise Hill Road, which is eligible for listing in the National Register as part of Park Loop Road, constructed in 1952.

Roadside boulders are used in two areas as vehicle barriers for safety and to prevent roadside parking. These contribute to the rustic nature of the road. These stones are predominately found along the northern section of the road. The original stones were laid in the early 1930s and are primarily gray granite cut in irregular patterns. Additional stones were placed along the road over time, but these stones are distinct from the older ones by their uniform rectangular shape and pink color.

Duck Brook Carriage Road Bridge is one of 17 rustic stone-arch bridges built as part of the network of 57 miles of carriage roads during the 1920s and 1930s. Listed in the National Register of Historic Places in 1979, these bridges were constructed of rough-cut Maine granite and all have barrel or modified Gothic arches. Constructed in 1929, Duck Brook Carriage Road Bridge was the eleventh bridge built and is one of only two triple arch bridges. It is considered to be "the most sophisticated, with its cream-colored stone and corbeled viewing platforms" (Roberts 1990). The carriage road system is considered America's finest example of broken stone roads. The distinctive features of the carriage roads and connecting bridges help to establish the architectural and landscape character of Acadia (Meier and Terzis 2001). As a result, the Section 106 review process would focus on avoiding impacts to the carriage road system and its resources, specifically the Duck Brook Carriage Road Bridge and associated viewsheds.

Viewsheds to and from Duck Brook Carriage Road Bridge and the carriage roads are important to the rustic character of the park and are a valuable part of the visitor experience at the site. A visual record of the existing viewsheds was compiled by traveling Duck Brook Road, Duck Brook Carriage Road Bridge, and the adjacent carriage roads and systematically recording through photography the viewsheds as experienced by visitors. The viewsheds described here are depicted on Figure 10 and photographically in Appendix D.

- Viewshed 1 is taken from Duck Brook Road and shows the view of the carriage roads across Duck Brook. Viewshed 2 shows the view from Duck Brook Carriage Road Bridge to the proposed new parking area.
- Viewsheds 3 and 5 depict the approach to Duck Brook Carriage Road Bridge and the undesignated parking that occurs there.
- Viewshed 4 looks north along Duck Brook Road towards the site of the proposed new parking area.
- Viewshed 6 shows the view of the Bar Harbor Department of Public Works facilities looking south along Duck Brook Road.
- Viewsheds 7, 8, and 9 show Duck Brook Road as seen from the carriage roads.



Project Location
Roads
Carriage Road
Topography (CI = 20 ft.)
Park Land
5 Photo Station / Viewshed

Acadia National Park
Duck Brook Road

Viewsheds
Figure 10

3.4.1 Effects of Alternative A

Currently, parked vehicles compromise the historic setting of Duck Brook Carriage Road Bridge and intrude upon the scenic viewsheds of and from the bridge and sections of the carriage road. Uncontrolled parking has resulted in an eroded, unvegetated bank and loss of natural vegetation in the vicinity of the bridge, which would continue. In addition, there currently is a mix of historic and nonhistoric granite coping stones lining the segment of Duck Brook Road north of the bridge. This mix of historic rustic coping stones and rectangular shaped (nonhistoric) stones is visible from the carriage road, and impacts the historic setting and viewshed of the carriage road system. The No Action Alternative would continue to have a minor adverse impact on the cultural resources and historic setting of the site. In addition, Alternative A has the potential for additional uncontrolled parking along Duck Brook Road, resulting in stronger visual impacts to the views from the carriage road system.

3.4.2 Effects of Alternative B

Alternative B would result in the removal of vehicles parked at the entrance to the carriage road system at Duck Brook Carriage Road Bridge. The 10 parallel parking spaces would be located opposite and south of the bridge, on the east side of Duck Brook Road. The removal of vehicles from the entrance to the bridge and revegetation and landscape plantings would aid in the restoration of the historic setting of Duck Brook Carriage Road Bridge. Additionally, the removal and resetting of the granite coping stones would further aid in restoring the historic setting of the bridge. Despite their removal from the entrance to the carriage road system at the bridge, vehicles utilizing the parallel parking spaces would still be visible from the bridge and segments of the carriage road system; however, the visual impacts associated with the parallel parking would be negligible.

The roadway improvements associated with Alternative B would require the removal of trees and vegetation along Duck Brook Road, slightly impacting the viewsheds from the carriage road system looking across Duck Brook north of the bridge. A strip of trees, approximately 10 feet in width, would be cleared along the edge of the road. This clearing would have a negligible effect on the viewshed. A wooded area more than 200 feet wide would remain and would continue to block views of the new water storage tank from the Duck Brook Carriage Road Bridge and carriage road.

3.4.3 Effects of Alternative C

Alternative C would also result in the removal of vehicles parked at the entrance to the carriage road system at Duck Brook Carriage Road Bridge. The 10 car parking area would be located approximately 100 feet south of the bridge, on the east side of Duck Brook Road. The removal of vehicles from the entrance to the bridge and revegetation and landscape plantings would aid in the restoration of the historic setting of Duck Brook Carriage Road Bridge. Additionally, the removal of the nonhistoric coping stones would further aid in restoring the historic setting of the bridge. Despite their removal from the entrance to the carriage road system at the bridge, vehicles utilizing the parking area would still be visible from the

bridge and segments of the carriage road system, however the visual impacts associated with the parking area would be negligible.

Similar to Alternative B, the roadway improvements associated with Alternative C would require the removal of a swath of trees and vegetation along Duck Brook Road, impacting the viewsheds from the carriage road system looking across Duck Brook. Due to the greater level of impact of the roadway improvements associated with Alternative C, it is expected that there would be a greater number of trees and a larger amount of vegetation removed on the slope above the road. Additionally, a strip of trees, approximately 40 feet in width, would be cleared along the edge of the road for the parking area. This clearing would have a minor impact on the viewshed. A wooded area more than 100 feet wide would remain and would continue to block views of the new water storage tank from Duck Brook Carriage Road Bridge and the carriage road. Further, roadway widening would impact views from Paradise Hill Road Bridge/Park Loop Road. Therefore, the impacts to the carriage road system viewsheds associated with Alternative C would be greater than with Alternative B.

3.4.4 Cumulative Impacts, Impairment, and Conclusions

Alternative A could have a long-term, adverse effect since continued uncontrolled parking at the entrance to the carriage road system at Duck Brook Carriage Road Bridge would continue to detract from the bridge's historic setting, and continue to intrude upon the viewsheds of and from the bridge and the carriage road system. Furthermore, the current mix of historic and nonhistoric granite coping stones lining Duck Brook Road north of the bridge would continue to adversely impact the historic setting and viewsheds of the carriage road system. Alternative A could result in additional uncontrolled parking along Duck Brook Road, further intruding upon the viewsheds from the bridge and segments of the carriage road system parallel to Duck Brook Road.

Alternatives B and C would both result in the removal of vehicles parked at the entrance to Duck Brook Carriage Road Bridge and the carriage road system, as well as restoring the natural setting of the bridge with native landscape plantings and removing the nonhistoric coping stones. Vehicles would still be visible from the bridge and segments of the carriage road system, however, the visual impacts associated with the parallel parking and parking area would be negligible. There would be no cumulative impacts to the viewsheds when considered in combination with the recent construction of the Bar Harbor water storage tank, and no increase in the visibility of this tank from the carriage roads.

The roadway improvements associated with Alternatives B and C would require the removal of an undetermined number of trees and shrub vegetation along Duck Brook Road, affecting the viewsheds from the carriage road to varying degrees. Alternative C is anticipated to require more substantial earthwork and the removal of a larger area of established vegetation, and would have a greater impact to the carriage road system viewshed.

The action alternatives would not result in an impairment of cultural resources because they do not include any irreversible or irretrievable adverse impacts. It is believed that the Duck Brook Road vicinity

is unlikely to yield significant archeological resources due to site conditions and previous roadway construction activities. However, prior to any ground disturbing activities at Duck Brook Road, the NPS will engage a state-certified archeologist to conduct an archeological assessment of the site to determine the potential for any archeological remains. If deemed necessary, an archeological survey would be carried out in consultation with the SHPO in compliance with Section 106 of the NHPA.

3.5 Visitor Experience and Use

Roughly 15-18% of people using the carriage roads use Duck Brook Road and Duck Brook Carriage Road Bridge to access the system, making it the second most used entrance (Jacobi pers comm. 2002); however, there is no designated parking or vault toilets as are found at Eagle Lake and other formal entrances to the carriage road system. The road is used year-round by park visitors who come to walk, bike, or cross country ski on the carriage road system, though the majority of visitors using the road use it to access the carriage roads by bike. Duck Brook Road, however, is gated and closed north of the carriage road bridge once snow or ice occur. This closed portion of the road, along with a closed portion of West Street Extension, is used as a walking and skiing route when it is car-free. The remainder of Duck Brook Road south of the carriage road bridge is plowed by the NPS. Because of the close proximity of Duck Brook Road to Bar Harbor, it is heavily used by local residents as a recreational area, particularly in the off-season, and visitors who rent bicycles at one of the three rental companies in downtown Bar Harbor use Duck Brook Road as the shortest route to the carriage roads. The dilapidated condition of the roadway detracts from the scenic nature of the surrounding area and the historic carriage road system and results in a negative visitor experience for motorists and bicyclists. A portion of the road currently floods due to the overflow of Duck Brook, creating unsafe conditions for travelers.

At the approach to Duck Brook Carriage Road Bridge there is an informal gravel area, which fans out from the bridge and provides parking along the road. As there are no formal parking spaces, visitors park along the edge of the road and in the access driveways to the nearby pump station and bridge, narrowing the width of the traveled way. Further, random parking has created an unsightly, eroded bank along the road's edge. Vehicles can be seen directly from the bridge, as well as from the historic carriage road, and detract from the historic viewshed of the area.

3.5.1 Effects of Alternative A

The No Action Alternative would retain Duck Brook Road in its current condition. The pavement would continue to deteriorate, eventually making use of the road by motorists and bicyclists difficult and unsafe. The quality of the visitor experience would continue to decline. Alternative A would lead to a continued decline of the quality of the visitor experience at the site and would offer no long-term benefits. Current road conditions would continue to have a minor adverse impact on bicycle access because people would be deterred from riding the road in its poor condition. Over time, deterioration could result in the road becoming closed to bicycles.

3.5.2 Effects of Alternative B

Rehabilitation of Duck Brook Road would assure that visitors would have continued access to Duck Brook Carriage Road Bridge and the carriage road system. Alternative B would have a moderate beneficial impact on the visitor experience through improving the physical condition of Duck Brook Road, providing a safer roadway access to the carriage roads from Bar Harbor and Route 233 for both motorists and bicyclists. Also, haphazard parking along the side of the road would not interfere with travel on the road, adding to safety for visitors. Correcting drainage along the road and eliminating flooding would also have a moderate beneficial impact on visitor experience.

Visually, the visitor experience would be improved, allowing visitors to enjoy the setting of the road, bridge, and carriage road system. The viewshed along the road would benefit from actions proposed in Alternative B, as parking for the access to the bridge and carriage road system would be less intrusive. The gravel area adjacent to the bridge would be narrowed and landscaped with native species to restore the vegetative background and natural setting of the bridge.

Improving the road condition could have a minor beneficial impact on the bicycle rental operations of Bar Harbor. Easier access to the carriage road system and a safer ride might encourage more visitors to explore the park on bicycles. Increased rentals would result in a minor increase in revenue generated for the Town.

Alternative B could have temporary adverse impacts on visitors and residents as a result of partial closure of the road during construction. Timing of construction and the duration of road closure would minimize these impacts.

3.5.3 Effects of Alternative C

Alternative C would result in similar major benefits to visitor experience from safety improvements along the roadway corridor and visual enhancement of the natural and historic setting of Duck Brook Carriage Road Bridge and carriage roads. Minor beneficial impacts could result to the bicycle rental operations of Bar Harbor, easier access to the carriage road system and a safer ride might encourage more visitors to explore the park on bicycles. However, higher traffic volumes and speeds potentially associated with Alternative C could have an adverse impact on bicyclist safety or comfort.

Alternative C would also have temporary adverse impacts on visitors and residents as a result of partial closure of the road during construction. Timing of construction and the duration of road closure would minimize these impacts.

3.5.4 Cumulative Impacts and Conclusions

Alternative A would continue to contribute to a long-term adverse affect on visitor use, safety, and the visitor experience by limiting the road access available to all visitors and maintaining low quality conditions along the road. Travel would become increasingly difficult for motorists and bicyclists. Alternatives B and C would both improve the physical condition of the road, which would benefit these

users, and would formalize parking, reducing parking on the roadway. Both alternatives would result in temporary impacts from road closure during construction, which could be mitigated or minimized by the timing of construction. Cumulative effects on the visitor experience from this project and rehabilitation of the Duck Brook Carriage Road Bridge would be minimized by coordinating the timing of both activities to minimize the duration of construction and reduced access.

3.6 Roadways and Utilities

The supply of water to the Town of Bar Harbor, including the park Visitor Center, comes directly from Eagle Lake and the pipes and storage capacity needed to transport it are accessed via Duck Brook Road. The existing water system consists of a 20-inch metal pipe (installed in 1909), a 16-inch metal pipe (installed prior to 1909), and a 14-inch metal pipe (installed in 1904) north of the pump station. The pipes south of the pump station were relined with concrete. These pipes are located under the paved surface of Duck Brook Road for approximately 1 mile of its length, both south and north of the pump station. The Town's pump station, storage tank, and the water pipes located along or under sections of the road provide a critical path in the continued supply and function of Bar Harbor's drinking water. The Town requires uninterrupted access to this facility.

Overhead power lines, owned by the Bangor Hydroelectric Company, supply the pump station and run along the east side of the road from State Route 233. These overhead poles also carry telephone service to the pump station.

NPS personnel use Duck Brook to access the carriage road system at Duck Brook Carriage Road Bridge for maintenance and emergency vehicle access in the event of an accident or fire on the loop system north of Eagle Lake. Park staff maintain the road currently by patching the pavement as needed and placing temporary barriers at flooded locations.

3.6.1 Effects of Alternative A

Alternative A would not result in any change in the access to or disruption of water or utilities to the Town of Bar Harbor. Continued deterioration of Duck Brook Road could affect water pipes that lay under the road and could have a long-term impact on the maintenance of the overhead power line poles, increasing the annual maintenance requirements of the park. Additional flooding could affect access to the pump station facilities.

3.6.2 Effects of Alternative B

Temporary minor adverse impacts on Bar Harbor Department of Public Works operations could occur during construction because the road would be partially closed, possibly necessitating a longer travel time for maintenance vehicles. However, as the existing road is closed from the Duck Brook Carriage Road Bridge to West Street Extension throughout the winter months, this would not substantially affect current operations. The temporary loss of electrical power while the overhead powerlines are relocated could also

have a minor adverse effect. Construction activities to rehabilitate the road could result in breaking water pipes, separating pipe joints, damaging the concrete lining, or could dislodge sediments as a result of vibratory compaction of the new roadbed material, particularly in locations where there is insufficient cover over the pipes. Temporary minor adverse impacts could also result from the pipes being exposed to weather conditions that could stress the pipes from repeated freezing and thawing. These actions could result in disruption of the drinking water supply to the Town of Bar Harbor, as well as fire protection, while the pipes are being repaired.

Minor long-term benefits to park operations would result from decreased maintenance requirements for the roadway because frequent patching would not be required and the road would not flood regularly.

3.6.3 Effects of Alternative C

Impacts would be the same as those in Alternative B. Temporary minor adverse impacts on Bar Harbor Department of Public Works operations could occur during construction since the road would be partially closed, necessitating a longer travel time for maintenance vehicles. The temporary loss of electrical power or damage to water pipes during construction would result in a minor adverse impact.

Minor long-term benefits to park operations would result from decreased maintenance requirements for the roadway, since frequent patching would not be required, and the road would not flood regularly.

3.6.4 Cumulative Impacts and Conclusions

Alternatives B and C could result in short-term adverse effects on the operations of the Bar Harbor Department of Public Works when sections of the road close during construction. Rehabilitating the road could result in major temporary adverse impacts when removing the current surface material and exposing the pipes. Temporary minor adverse impacts to the water supply system could also result from the pipes being exposed and weathering, requiring repairs or replacement. These actions could have an adverse impact on the Town of Bar Harbor as a result of the proposed project. If water pipes were damaged during construction, water service to Bar Harbor would be disrupted and the cost of the project to the NPS would be increased. Future pipe repairs or replacement by the Town of Bar Harbor, if needed, would require the Town to repair or replace disturbed sections of the road, with potential short-term impacts to visitor use or access to the carriage road system. Long-term benefits to the park would result from reduced maintenance requirements.

3.7 Conclusion

As identified within the "Cumulative Impacts, Impairment, and Conclusions" sections under each resource, no impairment to park resources would result from the proposed alternatives. This is mainly due to the fact that most impacts related to the alternatives are either negligible or minor. Table 2 summarizes and compares the impacts of the proposed alternatives.

Table 2: Summary of Environmental Consequences			
Resource	**Alternative A**	**Alternative B**	**Alternative C**
Wetlands and Water Resources	Continuing erosion from floodwaters would result in depositing sediment in Duck Brook and its associated wetlands	Impacts to 0.43 acres of wetlands from placement of fill 2 feet from edge of pavement.	Impacts to 0.66 acres of wetlands from fill.
Vegetation, Wildlife, & Wildlife Habitat	Continued disturbance to vegetation from undesignated parking. Four-toed salamander habitat continues to be silted in.	Minor adverse impact to 3.85 acres of vegetation, specifically where parallel parking spaces occur. Salamanders could be temporarily disturbed, but siltaton of habitat would be stopped.	Moderate adverse impact to 5.42 acres of vegetation along the east side of the road for widening. Salamanders could be disturbed and migration could be impacted by widening road.
Cultural Resources	Continued visual impacts of vehicles at the entrance to the carriage road system at Duck Brook Carriage Road Bridge.	Removing vehicles from the entrance to the carriage road system at Duck Brook Carriage Road Bridge, revegetation, and removal and resetting coping stones would aid in the restoration of the historic setting of Duck Brook Carriage Road Bridge. Minor improvement to viewshed from Duck Brook Carriage Road Bridge by providing organized parking. Archeological impacts unknown.	Removing vehicles from the entrance to the carriage road system at Duck Brook Carriage Road Bridge, revegetation, and removal and resetting coping stones would aid in the restoration of the historic setting of Duck Brook Carriage Road Bridge. Minor improvement to viewshed from Duck Brook Carriage Road Bridge by providing organized parking. Archeological impacts unknown.
Visitor Experience	Continued deterioration of the road and confusion about parking places. Safety hazards from condition of road and parking.	Parking provided by designating parallel spaces southeast of Duck Brook Carriage Road Bridge. Duck Brook Road made safer for visitors.	Parking provided by designating head-in spaces southeast of Duck Brook Carriage Road Bridge. Duck Brook Road made safer for visitors.
Roadways and Utilities	Continued deterioration of the roadway and potential impact water pipes beneath it. Continued drainage problems and flooding of road.	Improved roadway surface and drainage result in reduced maintenance costs for the park.	Improved roadway surface and drainage result in reduced maintenance costs for the park.
Costs		**$1,200,000**	**$2,500,000**

4 Consultation & Coordination

4.1 Introduction

The National Environmental Policy Act requires federal agencies preparing environmental assessments to consult with stakeholders, including the general public and related agencies, early in the planning process to identify issues and concerns. This chapter documents the consultation held to date for rehabilitating Duck Brook Road. To ensure the proposed improvements' compliance with the requirements of regulatory agencies, a list of potentially necessary permits is included in this section, as well.

4.2 Brief History of Planning and Public Involvement

The development of the park's General Management Plan (GMP) beginning in 1989 provided opportunity for significant public involvement, including several public meetings. During these meetings, concerns were raised regarding the proposed restriction of a portion of Duck Brook Road to bicycle traffic only. Although the GMP states that "a portion of Duck Brook Road will be designated for bicycle use only to make the carriage road system more easily accessible to bicyclists," (NPS 1992) in light of opposition voiced through the public involvement process, no actions were taken to implement this recommendation.

On May16, 2000, NPS and Federal Highway Administration (FHWA) held a field review as part of the planning process for the project at Duck Brook Road. Based on the findings of this review, as well as the low accident history of the road and the very low average daily use, it was concluded that rehabilitating the road with no major changes should be considered as an alternative.

The NPS has consulted with the Bar Harbor Department of Public Works, formerly Bar Harbor Water Company, regarding replacing portions of waterlines that traverse beneath Duck Brook Road. At this point, however, there are no plans for this work.

As the planning process moves forward, public involvement is being sought by issuing this environmental assessment for a 30-day public review and comment period.

4.3 Interagency Coordination

In completing this EA, the National Park Service has solicited comments from federal, state, and local agencies with interests in the project area, including:

- Bar Harbor Department of Public Works
- Coastal Program, Maine State Planning Office
- Maine Department of Environmental Protection
- Maine Department of Inland Fisheries and Wildlife
- Maine State Historic Preservation Office
- Town of Bar Harbor
- U.S. Army Corps of Engineers
- U.S. Fish & Wildlife Service

Please see Appendix B for copies of written correspondence with agencies.

4.4 Compliance

Clean Water Act of 1972

The purposes of the Clean Water Act (CWA) are to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." To achieve this goal, the U.S. Army Corps of Engineers (COE) has been charged with evaluating federal actions that result in potential degradation of waters of the U.S. and issuing permits for actions consistent with the CWA. A description of the COE's CWA program is contained in 33 CFR 320-330.

The minor wetland alterations associated with Duck Brook Road rehabilitation would require review under the CWA and are anticipated to comply with the conditions of the Programmatic General Permit issued for Maine by the COE. The COE (Mahaney pers comm. 2002) has noted that because proposed work would impact wetlands, a letter from the COE confirming the project's eligibility under the Programmatic General Permit for Maine would be required. This would be issued after all compliance for impacts to threatened or endangered species and cultural resources has been completed.

Coastal Zone Management Act of 1972 (CZMA)

This document will serve as the Consistency Determination under CZMA section 307(c) and 15 CFR Part 930, sup-part C, for the Duck Brook Road improvements. The information in this determination is provided pursuant to 15 CFR section 930.39. Based upon information, data, and analysis given in this report and additional information to be submitted subsequently in support of permit applications, the NPS finds the Duck Brook Road improvements project consistent to the maximum extent practicable with the enforceable policies of the Maine Coastal Program and would acquire all necessary permits to conduct

work within the coastal zone. CZMA concurrence would not be effective and no work would begin until all such approvals are obtained.

Endangered Species Act of 1973, as amended (16 USC 1531 et seq.)

Section 7 of the Endangered Species Act (ESA) requires that a federal agency consult with the U.S. Fish & Wildlife Service (USFWS) or the National Marine Fisheries Service on any action that may affect endangered or threatened species or candidate species, or that may result in adverse modification of critical habitat. Consultation with USFWS (Russell pers comm. 2002) has indicated that the proposed project would not have an adverse effect on federally listed threatened species or species of special concern because there are no known federally listed species in the vicinity of the project location.

National Historic Preservation Act of 1966, as amended (16 USC 470 et seq.)

Compliance requirements for the treatment of cultural resources as outlined in Sections 110 and 106 of the National Historic Preservation Act (NHPA), and the NPS Programmatic Agreement, have been initiated concurrently and independently of this EA. The project is currently under review by the park's cultural resources program manager and the NPS cultural resource regional advisory team. As outlined in Section 110, Duck Brook Road is being evaluated for eligibility to the National Register of Historic Places. Preliminary research indicates that the road is not historically or architecturally significant enough to warrant inclusion; however, a formal determination will be made in consultation with the SHPO.

The NPS will also consult with the SHPO under Section 106, which applies to this undertaking mainly due to the project's proximity and potential effect on a National Register-listed property, in this case, the historic carriage road system and the Duck Brook Bridge. In addition, the NPS has engaged a state-certified archeologist to conduct an assessment of the project area to determine the potential for any archeological remains. Although the likelihood of discovery is low due to the nature of the terrain, which consists primarily of exposed ledge and wetlands, the NPS will submit its findings to the SHPO and seek concurrence as outlined in Section 106.

Maine Natural Resources Protection Act (38 M.R.S.A. Section 480)

Rehabilitating the roads and utilities along Duck Brook Road would require work in areas adjacent to wetlands and, in some locations, would require minor and temporary alterations to wetlands. The project would therefore require authorization under the Maine Natural Resources Protection Act (NRPA), under authority of the Maine Department of Environmental Protection (MDEP). There are two permitting programs under the NRPA: permit-by-rule (PBR) and full permitting. Permit-by-rule covers most minor activities such as installing bridges and culverts in rivers, streams, or brooks; filling or disturbing soil within 100 feet (but greater than 25 feet) of a water body or wetland; and moving rocks or vegetation

along the shoreline. Based on this description, the minor alterations, soil disturbance adjacent to wetlands, and maintenance/replacement of existing utilities appear to be eligible for permitting under the MDEP's permit-by-rule program. The PBR procedure requires that a notice be filed with the DEP identifying the action to be taken and requires that applicable construction and erosion control standards are followed while conducting the activity.

In an onsite meeting with a representative of MDEP's division of enforcement for erosion and sedimentation control, the NPS received guidance on compliance with applicable construction and erosion control standards associated with the proposed project. Specifically, routine maintenance of existing structures, including removing debris from water supply pipes, would not require a permit (Beyer pers comm. 2002). MDEP also suggested ways of dealing with flooding on Duck Brook Road, and noted that these would generally be considered routine maintenance as well. For information on specific construction and erosion control measures to be implemented, please refer to Chapter 3.

Chapter 335 of NRPA applies to any activity that takes place in, on, or over a Significant Wildlife Habitat contained within a freshwater wetland and requiring permit approval through the MDEP. An activity is subject to permit approval if it occurs within 100 feet, measured horizontally, of the edge of a Significant Wildlife Habitat contained within a freshwater wetland, or if it occurs within the boundaries of a significant wildlife habitat contained within a freshwater wetland. A search of the MDIFW website (http://www.state.me.us/ifw/wildlife/endangered/SFList.htm) and additional consultation (Schaeffer pers comm. 2002) confirmed that no state listed threatened or endangered species exist within the boundaries of the site. There are, however, two state species of concern (four-toed salamanders and marsh hawks) and one Significant Wildlife Habitat (waterfowl/wading bird habitat) in close proximity to Duck Brook Road. Work would occur within 100 feet of the Significant Wildlife Habitat and would require a permit. The MDIFW noted that construction should be timed to minimize impacts to surrounding wildlife. For specific mitigation measures planned during construction, please refer to Chapter 3.

Maine Mandatory Shoreline Zoning Act

The Mandatory Shoreline Zoning Act, which is administered by at the local level, was enacted in the early 1970's in order to prevent water pollution and damage shorelines and riparian habitat. The ordinance applies to all areas within 250 feet of lakes, ponds, rivers, tidal areas (coastal wetlands) and freshwater wetlands, and at least 75 feet from certain streams, including Duck Brook (Keene pers comm. 2002). Coordination with the Town of Bar Harbor is ongoing to ensure compliance with this ordinance.

Other Local Regulations

While Duck Brook Road is a part of lands deeded to the NPS, the Town of Bar Harbor Department of Public Works owns and operates the pump station and water pipes that traverse the project area. Any activities specifically related to the water supply and facilities are regulated by the Town, and the NPS will request that planning documents be reviewed by town officials to obtain specific comments on the project.

4.5 List of Recipients

This environmental assessment in on formal public review for 30 days and has been distributed to a variety of interested individuals, agencies and organizations, including those listed under "Consultation & Coordination." This EA is available on the Internet at http://www.nps.gov/acad/ management.htm and has been placed in local libraries during the review and comment period.

Federal Agencies
Jay Clement, U.S. Army Corps of Engineers
Gordon Russell, U.S. Fish & Wildlife Service

State and Local Agencies
James Beyer, Maine Department of Environmental Protection
Todd Burrowes, Maine Coastal Program
Ted Koffman, Maine House of Representatives
Maine Floodplain Management Program
Maine Department of Inland Fish and Wildlife
Dana Reed, Town of Bar Harbor
Chip Reeves, Town of Bar Harbor

Community Organizations, Consulting Partners, and Individuals
Acadia Bike
Associated Press
Bangor Daily News
Bar Harbor Bicycle Shop
Bar Harbor Times
Bucksport Enterprise
Hon. Susan Collins
Tom Crikelair
Ellsworth American
David Legere, Aquaterra Adventures
Dr. Steve Katona, ANP Advisory Commission
Ann Kozak, Mount Desert Islander
Mount Desert Islander
Paul Murphy, Downeast Transportation
Ken Olson, Friends of Acadia
Hon. Olympia Stowe
Claire Wood, Bar Harbor Chamber of Commerce

Federally Recognized Tribes in Maine
Brenda Commander, Houlton Band of Maliseet Indians
Barry Dana, Penobscot Nation
Richard Doyle, Passamaquoddy Tribe
Richard Hamilton, Penobscot Nation
Bernard Jerome, Aroostook Band of Micmacs
William Phillips, Aroostook Band of Micmacs
Donald Soctomah, Passamaquoddy Tribe
Richard Stevens, Passamaquoddy Tribe
Sharri Venno, Houlton Band of Maliseet Indians

Libraries
Bangor City Library
Ellsworth Public Library
Jesup Memorial Library
Northeast Harbor Library
Seal Harbor Library
Somesville Public Library
Southwest Harbor Public Library
Thorndike Library

References

Acronyms

AASHTO – American Association of State Highway and Transportation Officials

CEQ – Council on Environmental Quality
COE – U.S. Army Corps of Engineers
CWA – Clean Water Act
CZMA – Coastal Zone Management Act of 1972

EA – Environmental Assessment
ESA – Endangered Species Act

FHWA – Federal Highway Administration

GMP – General Management Plan

MDEP – Maine Department of Environmental Protection
MDIFW – Maine Department of Inland Fish and Wildlife
MSPO – Maine State Planning Office

NEPA – National Environmental Policy Act
NHPA – National Historic Preservation Act of 1966, as amended
NPS – National Park Service
NRPA – Natural Resources Protection Act

PBR – Permit-by-Rule

SHPO – State Historic Preservation Office

USFWS – U.S. Fish & Wildlife Service

List of Preparers

This document was prepared by Vanasse Hangen Brustlin, Inc. and Acadia National Park with design and technical assistance from Goody Clancy and Associates, Inc.

Vanasse Hangen Brustlin, Inc.

Jill Cohen, MS	Planner	10 years experience	Document preparation.
Doug Kelleher, BS	Cultural Resource Specialist	10 years experience	Document preparation.
Lisa Standley, Ph.D.	Chief Environmental Scientist	25 years experience	Project management and document preparation.
Nancy Barker, PWS	Environmental Services Manager	18 years experience	Guidance of the NEPA process and project management.
Margaret Beavers, MS	Environmental Scientist	7 years experience	Graphics and GIS analysis.
Kevin McMaster, MS	GIS Specialist	4 years experience	Graphics and GIS analysis.
Emily Newman, MS	Environmental Planner	4 years experience	Document preparation.
Christina Shumate, MEM	Environmental Planner	2 years experience	Document preparation.
Tricia Wingard, BS	Environmental Scientist	3 years experience	Guidance of the NEPA process.

Goody Clancy and Associates, Inc.

Jeanne Pelletier	Program Manager

Acadia National Park

Paul Haertel	Superintendent
Bruce Connery	Wildlife Program Manager
Judy Hazen Connery	Biologist
Linda Gregory	Botanist
David Manski	Chief of Resource Management
Lee Terzis	Cultural Resource Program Manager
James Vekasi	Chief of Maintenance

National Park Service Boston Support Office

David Clark	Senior Environmental Compliance Specialist

National Park Service Denver Service Center

George Tait	Project Manager
Greg Cody	Cultural Resources Planning Group Leader
John Freeman	Landscape Architect

Table A-1: Regulation Matrix (Cont'd.)

Federal Mandates	Reference	Purpose
Federal Advisory Committee Act	5 USC (Appendix)	Creates a formal process for federal agencies to seek advice and assistance from citizens. Any council, panel, conference, task force, or similar group used by federal officials to obtain consensus advice or recommendations on issues or policies falls under the purview of this Act.
Federal Water Pollution Control Act of 1972, as amended	33 U.S.C. 1251-1376, et seq.	Establishes criteria and performance standards for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters through prevention, reduction and elimination of pollution.
Fish and Wildlife Coordination Act of 1934, as amended	16 U.S.C. 661-666	Requires early coordination with the U.S. Fish & Wildlife Service whenever water resources are involved.
National Park System General Authorities Act of 1970	16 U.S.C. 1	Affirmed that all national park areas, including historic sites, while acknowledged to be "distinct in character," were "united through their interrelated purposes and resources into one national park system, as cumulative expressions of a single national heritage.
Historic Sites, Buildings and Antiquities Act of 1935, as amended	16 U.S.C. 461-467	Declares a national policy to preserve historic sites and objects of national significance for public use. Establishes an Advisory Board.
National Environmental Policy Act of 1969	42 U.S.C. 4321-4347	Requires all federal agencies to analyze alternatives and to document impacts resulting from proposed actions that could potentially affect the natural and human environment.
National Historic Preservation Act of 1966, as amended; Sec. 106 and 110	16 U.S.C. 470 36 CFR 800	To protect and preserve districts, sites and structures and architectural, archaeological and cultural resources. Sec. 106 requires consultation with the State Historic Preservation Office. Sec. 110 requires that NPS identify and nominate all eligible resources under its jurisdiction to the National Register of Historic Places.
National Park Service Organic Act of 1916	16 U.S.C. 1-4, et seq.	To promote and regulate the use of national parks, monuments and reservations by such means and measures as to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the land in such manner as will leave them unimpaired for the enjoyment of future generations.
National Parks and Recreation Act of 1978	P.L. 95-625	Requires the identification of and implementation commitments for visitor carrying capacity for all areas of national park units; measures for the preservation of an area's resources; indication of types and general intensities of development (including visitor circulation and transportation patterns, systems and modes) associated with public enjoyment and use of the area, including general locations, timing of implementation, and anticipated costs; and indications of potential modifications to the external boundaries of the unit, and the reasons therefore.
Native American Graves Protection and Repatriation Act of 1990	P.L. 101-601; 104 Stat. 3049	Assigns ownership of control of American Indian human remains, funerary and sacred objects and objects of cultural patrimony that are discovered on federal lands or tribal lands to lineal descendants of affiliated Indian tribes or Native Hawaiian organizations; establishes criminal penalties for trafficking in human remains or cultural objects; and requires federal agencies and museums that receive federal funding to inventory American Indian human remains and related funerary objects in their control and identify their cultural and geographic affiliations within five years and prepare summaries of information about other American Indian cultural resources.

Table A-1: Regulation Matrix (Cont'd.)

Federal Mandates	Reference	Purpose
National Park Omnibus Management Act of 1998	16 U.S.C. 5901 et seq.	States that the Secretary of the Interior shall take such measures as are necessary to assure the full and proper utilization of the results of scientific study for park management decisions.
Occupational Safety and Health Act of 1970	PL 91-596, 84 Stat 1590, 5 USC 5108	Establishes national safety and health standards for worker environments and establishes the Occupational Safety and Health Administration (OSHA)
Rivers and Harbors Act of 1899		Establishes Army Corps of Engineers' regulatory authority over U.S. navigable waters. Establishes permit requirements for construction of bridges, causeways, dams, or dikes within or over navigable waters of the U.S. Bridge and causeway construction is regulated by the Transportation Secretary, while dam and dike permits are reviewed by the Corps. Sec. 10 requires a Corps permit for construction of any "obstruction of navigable waters" of the U.S., and for any excavation, fill, or other modification to various types of navigable waters. Sec. 13 requires a Corps permit for discharge of refuse of any kind (except liquid from sewers or urban runoff) from land or vessel, into the navigable waters of the U.S. or into their tributaries. Similarly, discharge of refuse is prohibited upon the banks of navigable waters of their tributaries where the refuse could be washed into the water.
Water Resources Planning Act of 1965 and Water Resource Council's Principles and Standards		States a national policy "to encourage the conservation, development, and utilization of water and related land resources on a comprehensive and coordinated basis by the federal government, states, localities, and private enterprises with the cooperation of all affected federal agencies, states, local governments, individuals, corporations, business enterprises, and others concerned". Establishes the Water Resources Council with responsibility for assessing the adequacy of water supplies, studying the administration of water resources, and developing principles, standards, and procedures for federal participants in the preparation of comprehensive regional or river basin plans. Establishes the framework for state and federal cooperation through a series of river basin commissions.
U.S. Department of Transportation Act of 1966, Sec. 4(f)	49 U.S.C. 303, Subtitle I	Preserves publicly owned parkland, waterfowl and wildlife refuges and significant historic sites. Requires the Secretary of Transportation to consider all prudent and feasible alternatives to impacting such lands.

Federal Executive Orders	Reference	Purpose
Analysis of Impacts on Prime and Unique Agricultural Lands in Implementing NEPA	45 CFR 59189	Requires federal agencies to analyze the impacts of federal actions on agricultural lands in accordance with NEPA.
Federal Compliance with Pollution Control Standards	Executive Order 12088	Establishes procedures and responsibilities to ensure that all necessary actions are taken to prevent, control, and abate environmental pollution with respect to federal facilities.
Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations	Executive Order 12898	Directs federal agencies to avoid federal actions that cause disproportionately high and adverse impacts on minority and low-income populations with respect to human health and environment.

Table A-1: Regulation Matrix (Cont'd.)

Federal Executive Orders	Reference	Purpose
Indian Sacred Sites	Executive Order 13007	Directs federal agencies to avoid potential impacts to Native American sacred sites and to avoid potential land use conflicts with local or state interests or interests of Native American tribes. Also must avoid impacts to Indian Trust Resources.
Intergovernmental Review of Federal Programs	Executive Order 12372	Establishes clearinghouse coordination required with state and local agencies concerning impacts of federal projects.
Invasive Species	Executive Order 13112	Directs federal agencies to prevent the introduction of invasive species and provide for their control and establishes the Invasive Species Council
Protection and Enhancement of Cultural Environment	Executive Order 11593	Directs federal agencies to protect and enhance the cultural environment.
Protection and Enhancement of Environmental Quality	Executive Order 11514, as amended by E.O. 11991	Provides federal government leadership in protecting and enhancing the quality of the nation's environment to sustain and enrich human life.
Protection of Wetlands	Executive Order 11990	Requires federal agencies to consider all practicable alternatives to impacting wetlands.
NPS Director's Orders	**Reference**	**Purpose**
Cultural Resource Management Guidelines	Director's Order 28	Describes NPS policy in regard to the preservation and treatment of archaeological, cultural and historic properties and ethnographic resources within a park.
Interpreting the National Park Service Organic Act	Director's Order 55	Interprets NPS policy regarding the National Park Service Organic Act and the National Park Service General Authorities Act as stating the laws prohibit the impairment of park resources and values.
National Environmental Policy Act Guidelines	Director's Order 12	Provides bureau guidance on NEPA compliance consistent with CEQ regulations and on approaches to environmental documentation.
Natural Resources Management Guidelines	Director's Order 77	Provides bureau guidance on addressing and managing natural resources within park boundaries.
Park Planning	Director's Order 2	Directs the decision making processes that result in the goals and actions specific to each unit of the national park system and those units of the national trails system administered by NPS.
Wetland Protection	Director's Order 77-1	Directs NPS to avoid adverse impacts to wetlands if undertaking new development or land use activities and provides guidelines to meet requirements of Executive Order 11990, Protection of Wetlands.

Table A-1: Regulation Matrix (Cont'd.)

Maine Statutes	Reference	Purpose
Erosion and Sedimentation Control Law	Maine State Legislature, Office of the Revisor of Satutes, 38 MRSA .§ 420-C	This law requires basic controls and site stabilization when a project involves filling, displacing, or exposing earthen material. No permit is required. The law sets a minimum across-the-board standard that helps prevent harm to surface waters.
Mandatory Shoreline Zoning Act	Title 38, Chapter 3, §§ 435-449	This law is primarily administered through municipalities, and involves the regulation of activities in the shoreland zone.
Natural Resources Protection Act	Title 38, Chapter 3, §§ 480-A to 480-Z.	This law regulates activities in, on, over or adjacent to natural resources such as lakes, wetlands, streams/rivers, fragile mountain areas, and sand dune systems. The program uses permit by rule (PBR) for certain classes of activity. Standards to be met focus on the possible impacts to the resources and to existing uses.
Maine Stormwater Management Law	PL 1997, ch. 603, section 8	This law regulates activities creating impervious or disturbed areas (of certain size/location) because of their potential impacts to water quality. In effect, this law extended stormwater standards to smaller-than Site Law-sized projects. It requires quantity standards for stormwater to be met in some areas, and both quantity and quality standards to be met in others.

Appendix B

Correspondence

Transportation
Land Development
Environmental
Services

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April 25, 2002

Vanasse Hangen Brustlin, Inc.

Ref: 07529.04

Ms. Kathleen Leyden, Director
Coastal Program
Maine State Planning Office
187 State Street
Augusta, ME 04333

Re: Duck Brook Road Rehabilitation
Interagency Consultation

Dear Ms. Leyden;

Vanasse Hangen Brustlin, Inc. has been retained by the National Park Service to assist the Acadia National Park staff in completing an *Environmental Assessment* for the proposed rehabilitation of Duck Brook Road in Acadia National Park, Maine. The site location is depicted on the attached figure and includes improving the physical condition of the road while retaining the character of the site and the natural and cultural resources; and improving parking at the Duck Brook Bridge access area.

The NPS is preparing an *Environmental Assessment* to comply with the requirements of the National Environmental Policy Act, specifically Section 102, and the Council on Environmental Quality Regulations. The purpose of this letter is to provide the Maine Coastal Program the opportunity to comment on the project or provide any consultation regarding coastal resources you feel is appropriate at this time.

We anticipate release of the Environmental Assessment on **July 15, 2002** and will provide you with a copy when they become available. In the meantime, we welcome any comments you may have. If you have any questions regarding this project, please feel free to call me at (617) 924-1770 ext. 1818.

Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

Jill Cohen

Jill Cohen
Planner

Cc: Todd Burrows, Maine Coastal Program

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April 25, 2002

Vanasse Hangen Brustlin, Inc.

Ref: 07529.04

Mr. James Beyer
Maine DEP
106 Hogan Road
Bangor, ME 04401

Re: Duck Brook Road Rehabilitation
Interagency Consultation

Dear Mr. Beyer;

Vanasse Hangen Brustlin, Inc. has been retained by the National Park Service to assist the Acadia National Park staff in completing an *Environmental Assessment* for the proposed rehabilitation of Duck Brook Road in Acadia National Park, Maine. The site location is depicted on the attached figure. The work being considered at this time includes rehabilitation of the road to improve the physical condition and drainage, while retaining the character of the site and the natural and cultural resources; and improving parking at the Duck Brook Bridge access area.

The purposes of this letter is to request any additional comments or consultation you may feel is appropriate at this time.

The NPS is preparing an *Environmental Assessment* to comply with the requirements of the National Environmental Policy Act, specifically Section 102, the Council on Environmental Quality Regulations. The NPS will provide the DEP with a copy of this EA as soon as it is released for public review and will accept written comments for 30 days following this release.

If you have any questions regarding this project, please feel free to call me at (617) 924-1770 ext. 1818.

Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

Jill Cohen

Jill Cohen

Planner

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April 25, 2002

Vanasse Hangen Brustlin, Inc.

Ref: 07529.04

Mr. Tom Schaeffer
Maine Department of Inland Fisheries and Wildlife
Wildlife Division
P.O. Box 220
Jonesboro, ME 04648

Re: Duck Brook Road Rehabilitation
Interagency Consultation

Dear Mr. Schaeffer;

Vanasse Hangen Brustlin, Inc. has been retained by the National Park Service to assist the Acadia National Park staff in completing an *Environmental Assessment* for the proposed rehabilitation of Duck Brook Road in Acadia National Park, Maine. The site location is depicted on the attached figure. The work being considered at this time includes rehabilitation of the road to improve the physical condition while retaining the character of the site and the natural and cultural resources; and improving parking at the Duck Brook Bridge access area.

The purpose of this letter is to request identification of essential habitat in the vicinity of the site and invite any additional comments or consultation that the Department finds appropriate at this time.

The NPS is preparing an *Environmental Assessment* to comply with the requirements of the National Environmental Policy Act, specifically Section 102, the Council on Environmental Quality Regulations. The NPS will provide the DIFW with a copy of this EA as soon as it is released for public review on July 15, 2002, and will accept written comments for 30 days following this release.

If you have any questions regarding this project, please feel free to call me at (617) 924-1770 ext. 1818.

Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

Jill Cohen

Jill Cohen
Planner

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Angus S. King, Jr.
Governor

Lee E. Perry
Commissioner

DEPARTMENT OF INLAND FISHERIES AND WILDLIFE

April 29, 2002

James Hall
Wildlife Division - Region C
P.O. 220
Jonesboro, ME 04648
Phone: (207) 434 - 5921
Fax: (207) 434 – 5923

Jill Cohen
Vanasse Hangen Brustlin, Inc.
101 Walnut St.
PO Box 9151
Watertown, Mass. 02471-9151

Dear Jill,

Enclosed is a Wildlife Habitat Map of your project area around Duck Brood Road. There are no Essential Wildlife Habitats in that immediate area. There is a Significant Wildlife Habitat, a Waterfowl Wading Bird Habitat and a Plant Habitat in close proximity to the road. Depending on the amount of restorative work needed, and any need to go outside of the current ROW, probably timing of the work will be one of the most important considerations.

Feel free to contact me if you have any further questions.

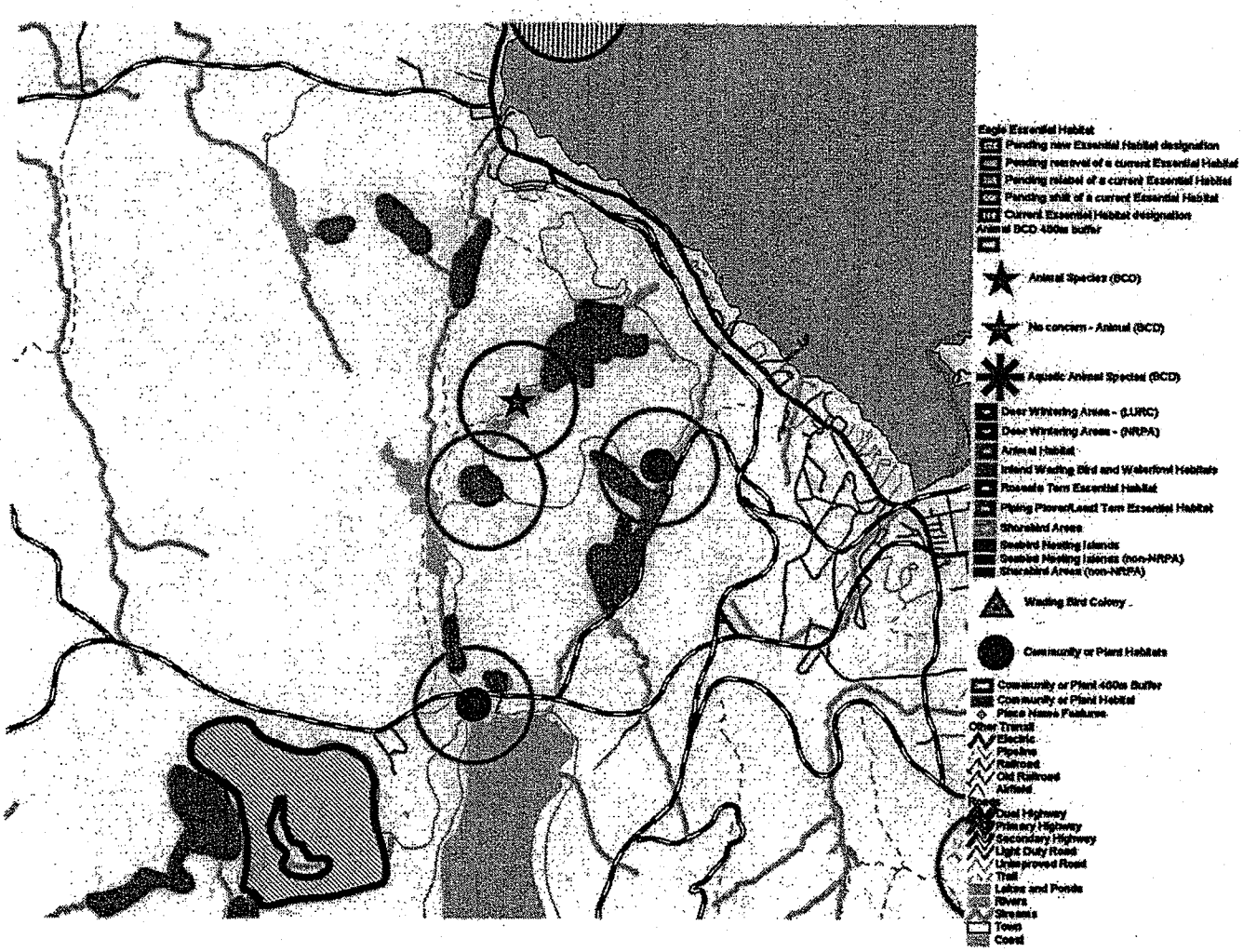
Sincerely,

James Hall

James Hall, Wildlife Biologist

04/29/2002

IF&W Report
Request for Information



Department of Inland Fisheries and Wildlife
Region C, (207) 434-5927

N
W E
S

1 0 1 Miles

Biologist Notes

Duck Brood Road

Transportation
Land Development
Environmental
Services

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April 25, 2002

Vanasse Hangen Brustlin, Inc.

Ref: 07529.04

Ms. Kim Keene, Code Enforcement Officer
Town of Bar Harbor
93 Cottage Street
Bar Harbor, ME 04609

Re: Duck Brook Road Rehabilitation
Interagency Consultation

Dear Ms. Keene;

Vanasse Hangen Brustlin, Inc. has been retained by the National Park Service to assist the Acadia National Park staff in completing an *Environmental Assessment* for the proposed rehabilitation of Duck Brook Road in Acadia National Park, Maine. The site location is depicted on the attached figure. The work being considered at this time includes rehabilitation of the road to improve the physical condition while retaining the character of the site and the natural and cultural resources; and improving parking at the Duck Brook Bridge access area.

The purpose of this letter is to offer the Town of Bar Harbor the opportunity to provide addition comments or consultation.

The NPS is preparing an *Environmental Assessment* to comply with the requirements of the National Environmental Policy Act, specifically Section 102, the Council on Environmental Quality Regulations. The NPS will provide the Town of Bar Harbor with a copy of this EA as soon as it is released for public review on July 15, 2002, and will accept written comments for 30 days following this release.

If you have any questions regarding this project, please feel free to call me at (617) 924-1770 ext. 1818.

Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

Jill Cohen

Jill Cohen
Planner

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April 25, 2002

Vanasse Hangen Brustlin, Inc.

Ref: 0572904

Mr. Gordon Russell

U.S. Deptartment of the Interior
Fish and Wildlife Service
1033 South Main Street
Old Town, Maine 04468

Re: Duck Brook Road Rehabilitation
Interagency Consultation

Dear Mr. Russell;

Vanasse Hangen Brustlin, Inc. has been retained by the National Park Service to assist the Acadia National Park staff in completing an Environmental Assessment for the proposed rehabilitation of Duck Brook Road in Acadia National Park, Maine. The site location is depicted on the attached figure.

The work being considered at this time includes:

1. Rehabilitation to improve the physical condition of the road while retaining the character of the site and the natural and cultural resources; and
2. Improving parking at the Duck Brook Bridge access area.

The National Park Service is examining the potential environmental impacts of these actions to fulfill its responsibilities under the National Environmental Policy Act. We would appreciate any consultation or comments your office may have in regard to threatened, endangered or special concern species. If you have any questions regarding this project, please feel free to call me at (617) 924-1770 ext. 1818.

Very truly yours,

VANASSE HANGEN BRUSTLIN, INC.

Jill Cohen

Jill Cohen
Planner

Cc: Acadia National Park

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Appendix C

Flood Photos













Appendix D

Viewshed Photos



Photograph No. 1: View of the carriage road from Duck Brook Road.



Photograph No. 2: Duck Brook Road, area where parallel parking would be constructed in Alternative B.



Photograph No. 3: View of parking at the Duck Brook Bridge entrance.



Photograph No. 4: Duck Brook Road, area where parallel parking would be constructed in Alternative B.



Photograph No. 5: Parking at the bridge entrance.



Photograph No. 6: Looking south from the Duck Brook Bridge entrance to the Bar Harbor Department of Public Works pump house.



Photograph No. 7: View of Duck Brook Road from the carriage road.



Photograph No. 8: View of Duck Brook Road from the carriage road.



Photograph No. 9: View of Duck Brook Road from the carriage road.

Appendix E

Draft Statement of Findings for Wetlands

U.S. Department of the Interior
National Park Service

Draft Statement of Findings for Wetlands
Duck Brook Road Rehabilitation

Acadia National Park
Bar Harbor, Maine
July 2002

Recommended:_____

Superintendent, Acadia National Park Date

Concurred:_____

Water Resources Division Date

Approved:_____

Northeast Regional Director Date

Introduction

Acadia National Park has prepared and made available for public review an Environmental Assessment (EA) for the proposed rehabilitation of Duck Brook Road in Bar Harbor, Maine. Because the road rehabilitation is expected to affect wetlands, the resource must be analyzed in an environmental document and a federal permit must be acquired for placement of fill in the wetlands.

Executive Order 11990 (Protection of Wetlands) requires the NPS and other federal agencies to evaluate the likely impacts of actions in wetlands. NPS Director's Order #77-1: Wetland Protection and Procedural Manual #77-1 provide NPS policies and procedures for complying with E.O. 11990. This Statement of Findings (SOF) documents compliance with these NPS wetland protection procedures.

The NPS has chosen a preferred alternative for this EA. Both of the build alternatives involve impact to wetlands. The purpose of this Statement of Findings is to provide a rationale for locating the proposed actions in the wetland and to document the expected effects on wetland functions and values.

The NPS has described agency policies for compliance with Executive Order 11990 in Director's Order 77-1: Wetland Protection and Procedural Manual #77-1: Wetland Protection. These policies and procedures stress exploring all practicable alternatives to building on or working in wetlands. The NPS must follow the steps below during development of proposed actions that have the potential to have adverse impacts on wetlands: avoid adverse impacts to the extent practicable; minimize impacts that could not be avoided; and compensate for remaining unavoidable adverse wetland impacts via the restoration of degraded wetlands. This sequencing process ensures that the project also meets the requirements of Section 404 of the Clean Water Act. A project must meet these requirements before the U.S. Army Corps of Engineers can issue a Section 404 wetland fill permit. NPS guidelines require a "Statement of Findings" to be written justifying any unavoidable impacts to wetlands. In addition, NPS policy requires wetland impact compensation if the adverse impacts from the entire project total 0.1 acre or more. Compensation in the form of restoration of degraded or former wetland habitat is preferred.

Proposed Action

The Duck Brook Road Rehabilitation Project has two principal components: rehabilitating Duck Brook Road from its intersection with Route 233 to the West Street Extension and improving parking at the approach to Duck Brook Bridge. Rehabilitating the road would correct drainage problems and improve the surface of the roadway. Improving the parking would eliminate haphazard parking at the bridge approach, allowing the distinctive character of the carriage road bridge and surroundings to be seen.

Alternative B (Figure 5) would include rehabilitating Duck Brook Road from Route 233 to West Street Extension. The paved surface of the road over this approximately two-mile section would be kept at its current width of 16 feet. Rehabilitation would include replacing drainage culverts under Duck Brook Road, constructing new drainage ditches along the east side of the road to capture water and divert it under the road, reconstructing the road base, and repaving. Rehabilitating the road and its drainage system would include raising the road profile no more than 12 inches to accommodate 8 inches of reclaimed aggregate, a 4-inch aggregate base, and 4 inches of asphalt paving. Two, one-foot gravel shoulders would provide structural

support for the edges of the paved travel lanes. Side slopes from the edge of the shoulders to the toe of slope would be minimized, with a 2:1 (horizontal to vertical) ratio. Alternative B would have an average construction zone width of approximately 24 feet, wider in areas where drainage ditches or steep slopes occur. These improvements would minimize future maintenance requirements for the roadway. New directional signs would be installed as needed, but would not impact wetland areas.

Flooding and erosion problems where Duck Brook currently overflows its banks would also be improved. The ditch along the west side of Duck Brook Road at this location would be lined with stone, and the small culvert that conveys water under the berm containing the pipes would be enlarged. Alternative B would also require that the existing overhead power line and poles along the east side of the road in the southern section be relocated outside of the roadway construction limits. These poles provide electrical and telephone service to the Bar Harbor Department of Public Works facilities. Relocation would be completed by the Bangor Hydroelectic Company, owner of the power lines. All poles are currently located in upland habitat and would be relocated to uplands to avoid impacts to wetlands.

The coping stones along the northern section of the road, between Duck Brook Bridge and the Paradise Hill Road Bridge, would be reset with wider spacing (approximately 2 feet) to conform to the similar placements along the carriage road system, and newer, incongruous stones would be removed. This activity would not impact wetlands.

Alternative B would also include a component for formalizing the parking that occurs around Duck Brook Bridge. The existing informal gravel parking area at the bridge would be narrowed and landscaped with native species such as balsam fir (*Abies balsamea*), sheep laurel (*Kalmia angustifolia*), and lowbush blueberry (*Vaccinium angustifolium*) to restore vegetative cover and develop a more natural setting around the bridge. Stones would line the narrowed area to deter vehicles from parking close to the bridge, which obstructs access to and views from the bridge. Parallel parking spaces would be provided for about 10 passenger vehicles on the east side of Duck Brook Road. The spaces would begin approximately 25 feet north of Duck Brook Bridge and continue south for 200 feet, ending just north of the water tank access road. The parallel parking spaces would extend 8 feet from the shoulder of the road into Great Hill. This alternative would accommodate existing parking levels but remove these cars from parking directly adjacent to the historic bridge and obstructing access to and views of the bridge. This parking area would be constructed on the east side of Duck Brook Road and would not impact wetlands.

Corridor Description

Duck Brook parallels Duck Brook Road from State Route 233 north for approximately 1 mile, and eventually discharges north into Frenchman Bay. Wetlands and streams located in close proximity to Duck Brook Road provide wildlife habitat and contribute to the visual and scenic features of the road.

The National Wetlands Inventory (NWI) has recently updated its wetland mapping in the Acadia National Park region (Figure E). The NWI classifies wetlands for the purposes of regulation, habitat evaluation, inventory and management. Wetlands in Acadia National Park are diverse, and include marine aquatic beds, intertidal shellfish flats, salt marshes, freshwater marshes, forested wetlands, and peatlands. For the purposes of this EA, wetlands are also classified according to the system described in Calhoun et al. 1994 and Cowardin et al. 1979. Wetlands comprise over 10 percent of the Acadia National Park holdings and cover

approximately 13,135 acres of the park and surrounding towns, not including the linear wetlands of marine or riverine systems. The predominant freshwater wetland system for Acadia National Park is palustrine, which

covers 2,618 acres of the park. Palustrine wetlands are characterized by persistent vegetation such as sedge meadows, cattail marshes, or wooded swamps. A large diversity of plant communities and overall species abundance occurs in palustrine wetlands owing to the wide range of settings within which these wetlands form. In Acadia, palustrine wetlands are dominated by scrub-shrub (dominated by high or low shrubs) and forested communities (dominated by evergreens, hardwoods, or a mixed community) and the majority are under 1 acre in size. The New Mill Meadow wetland (108 acres) is one of the largest wetlands within the park, and is immediately west of Duck Brook Road (Calhoun et al. 1994).

Figure E depicts wetlands associated with Duck Brook (Table 1), which flows northward out of Eagle Lake parallel to and west of Duck Brook Road. Duck Brook is bordered by palustrine forested wetlands (PFO) of the evergreen forested wetland subtype dominated by balsam fir (*Abies balsamea*), spruce (*Picea* sp.), red maple (*Acer rubrum*), and northern white cedar (*Thuja occidentalis*), which extend in some locations to the base of the slope of the existing road. Shrub swamps dominated by winterberry (*Ilex verticillata*), meadowsweet (*Spiraea* sp.), and alder (*Alnus* sp.) occur along the edges of the brook and New Mill Meadow, and there are also shrub-dominated peatland wetlands on the west side of the New Mill Meadow wetlands. Palustrine emergent marshes (PEM) of the nontidal fresh marsh subtype dominated by emergent plant species (cattails (*Typha angustifolia*), sedges, and grasses) occur in some locations along Duck Brook and border an unnamed tributary to Duck Brook, east of the road. These more open wetlands are greater than 50 feet from the road, and are not easily visible due to the dense vegetation between the road and the wetland. All wetlands within the project area are considered jurisdictional wetlands by the U.S. Army Corps of Engineers.

Wetlands occur along both sides of the southern section of the road. The wetlands to the east are generally small palustrine forested wetlands dominated by spruce and fir, with some northern white cedar in the overstory and sphagnum moss and sedges in the herbaceous layer. Close to the road, poor drainage has resulted in the impoundment of small pools dominated by sheep laurel (*Kalmia angustifolia*). These correspond to the scrub-shrub fen subtype. In 2002, one of these pools supported spotted salamander (*Ambystoma maculatum*) egg masses and functions as a vernal pool. Other similar impoundments may also provide vernal pool habitat. Several small culverts convey intermittent (seasonal) flows under the road, from east to west. Small, well-defined palustrine forested wetlands occur west of the road in excavated areas between the road and the water line berm. The southernmost of these is an isolated pool that contains vegetation indicative of permanent water, including water lilies (*Nuphar* sp.) and bur reed (*Sparganium* sp.). Several egg masses of spotted salamander were observed in this wetland in April 2002, demonstrating that it functions as a vernal pool.

In the central segment of the project, Duck Brook flows through the New Mill Meadow wetlands. There are a series of outstanding open views of these wetlands from the road. The upper wetland is a large beaver impoundment confined by an inactive curving beaver dam, containing palustrine emergent wetlands and open water. The open water and emergent vegetation provide high quality habitat for waterfowl and wildlife. A heath-like open shrub wetland (classified as a scrub-shrub fen) extends further to the west. Below the beaver dam, Duck Brook flows in a more well-defined channel through a shrub (alder) swamp, classified as a palustrine scrub-shrub wetland (PSS) to the lower wetland. The lower wetland is also a large expanse of open water and emergent wetlands, with a large active beaver lodge on the east side. The lower wetland is confined by an old mill dam just below the pump station. These wetlands provide high quality wildlife habitat and aquatic habitat due to their large size, connectivity with other wetlands, and interspersion of open water and vegetated wetlands.

North of New Mill Meadow, Duck Brook flows into a deep ravine well away from the road. Wetlands also occur on both sides of the road north of the Paradise Hill Road Bridge. Wetlands on the east side are confined to a drainage ditch. The wetlands on the west side contain seasonal standing water pools, with dense shrub borders (palustrine scrub-shrub wetlands, PSS) and provides vernal pool habitat (NPS 2002). A stream flows north along the west side of the road then diverges away from the road in a man-made channel.

Table 1 Wetland Types Along Duck Brook Road

Cowardin et al. (1979) Wetland Type	Description
Palustrine Forested Wetland (PFO)	Forested wetland (balsam fir, spruce, red maple, and northern white cedar)
Palustrine Emergent Marsh (PEM)	Emergent plant species (cattails, sedges, and grasses)
Palustrine Scrub-shrub Wetland (PSS)	Shrub (alder) swamp

Wetland Functional Values Assessment

A functional values assessment was performed for the wetlands within the Duck Brook Road corridor. The purpose of the assessment was to determine the ability of each wetland to protect the environment. The methodology used was developed by the U.S. Army Corps of Engineers (New England District) as described in *The Highway Methodology Workbook Supplement, Wetland Functions and Values - a Descriptive Approach* (1995). This assessment technique is a simple way to determine whether a wetland provides a particular function or value, and which of these are the principal or most important functions or values of that wetland.

This assessessment was performed for the four principal wetlands along the corridor: the Duck Brook wetlands (Wetland 1), wetlands bordering the major tributary to Duck Brook (Wetland 2); New Mill Meadow (Wetland 5), and the wetland north of Paradise Hill Road (Wetland 6). Two smaller isolated wetlands were also assessed as representatives of the several other small wetlands adjacent to the road. Wetlands assessed were designated as:

1. Duck Brook and its bordering wetlands, between Route 233 and New Mill Meadow
2. An intermittent stream and its bordering wetlands, tributary to Duck Brook Road and east of the road
3. An isolated wetland west of Duck Brook Road, between the road and the water line berm
4. An isolated wetland west of Duck Brook Road, between the road and the water line berm
5. New Mill Meadow
6. A wetland system, bordering an intermittent stream, north of the Paradise Hill Road Bridge.

Table 1 Wetland Functions and Values						
	Wetland					
Function/Value	**1**	**2**	**3**	**4**	**5**	**6**
Groundwater recharge/discharge	+	+	-	-	+	+
Floodflow alteration	+	P	+	+	P	+
Fish and shellfish habitat	P	+	-	-	P	-
Sediment/toxicant/pathogen retention	+	P	-	-	P	P
Nutrient removal/retention/transformation	+	P	-	-	P	+
Production export	+	+	-	-	P	+
Sediment/shoreline stabilization	P	+	-	-	+	+
Wildlife habitat	P	P	P	+	P	P
Recreation	+	+	-	-	+	-
Education/scientific value	+	+	+	-	+	+
Uniqueness/heritage	+	+	-	-	+	-
Visual quality/aesthetics	+	P	+	-	P	-
Endangered species habitat	P	P	-	-	P	-

+ = Function/value occurs in the wetland

- = Function/value does not occur in the wetland

P = principal function/value of the wetland

Duck Brook, its associated wetlands, and the wetlands bordering a tributary intermittent stream provide all of the typical wetland functions and values, because these contain an intermittent or perennial waterbody, a well-developed wetland plant community, are visible from a traveled road, provide wildlife and fish habitat, and occur in an undeveloped forested landscape. The wetlands associated with Duck Brook provide fish habitat, shoreline stabilization, wildlife habitat, and endangered species habitat (four-toed salamanders) as the principal or most important functions.

The wetlands associated with the tributary stream, which have a constricted outlet, also provide floodflow alteration, sediment retention, and nutrient retention, and provide aesthetic values due to the views of the open marsh that are available from Duck Brook Road.

The small isolated wetlands between the road and the water line berm, and along the edge of the road in other locations, provide relatively few functions because they lack connection with a waterbody and are only seasonally flooded. The southernmost and larger of these wetlands provides vernal pool habitat and therefore has a principal function as wildlife habitat.

The New Mill Meadow wetland, a large and diverse wetland system with a constricted outlet and permanent open water, is visible from Duck Brook Road and provides numerous important or principal functions (floodflow alteration, sediment retention, nutrient retention, production export, wildlife habitat, visual quality, and endangered species habitat).

The small wetland north of the Paradise Hill Road Bridge occurs on both sides of Duck Brook Road, and receives and conveys runoff from the road system in an intermittent stream. A portion of this wetland contains

a dense shrub swamp and provides vernal pool habitat. This wetland therefore provides sediment/toxicant retention and wildlife habitat as its principal values.

Justification for Use of the Wetlands

Rehabilitating Duck Brook Road would result in unavoidable minor losses of wetlands. Wetland impacts are not avoidable because Duck Brook Road parallels Duck Brook and is directly adjacent to wetlands, on both sides of the road, for much of its length. Alternative B would result in minor impacts to wetlands and water resources. Rehabilitating the road and drainage system would require work in proximity to wetlands and would require placing fill in small portions of the wetlands immediately adjacent to the road. These impacts have been minimized to the greatest extent feasible through design modifications. The road elevation would be raised the minimum height required to rehabilitate the pavement surface. Raising the road elevation 12 inches would require placing fill approximately 2 feet from the existing toe of slope, and would fill small portions of the forested wetlands that border the road.

A total of approximately 0.43 acres of wetland, in 22 locations, would be affected. Impacted areas (Figure E) would be narrow strips along the edge of the existing road, and would not affect the functions and values of the wetlands. This estimate is high, and is expected to be reduced once wetlands boundaries have been precisely delineated and located with survey, and final roadway design has been advanced. There would be no fill placed in the principal corridor wetlands, with no loss of wetland area or functions in the Duck Brook wetland (Wetland 1) or the New Mill Meadow wetland (Wetland 5). The majority of wetland impacts would be small and would affect wetlands that provide few functions and values. Placing fill in wetlands, and their temporary alteration for drainage improvements, would result in minor losses of wildlife habitat, in areas directly adjacent to the existing road. The affected wetlands would still provide floodflow alteration, as there would be no loss of flood storage. The wetlands adjacent to Duck Brook Road would continue to contribute to the visual and aesthetic values of the park. Impact sites are located in Wetland 6 (impact sites 20, 21, and 22), Wetland 2 (impact sites 11 and 12), or in small, isolated wetlands (impact sites 1-10 and 13-18). Impacts in these small, isolated wetlands would have the same functions and values as Wetlands 3 and 4.

Drainage improvements, including constructing new drainage ditches and replacing culverts, could result in temporary minor impacts to wetlands adjacent to the road but would not affect the ability of these wetlands to provide important functions and values. Although there is a possibility that replacing culverts could adversely alter the hydrology of the small wetlands on the east side of the road, these impacts would be minimized by replacing culverts in-kind (at the same size) and at the same elevation as the existing culverts. There would be no change in surface or ground water elevations. The areas adjacent to the road, excavated to improve drainage, would be allowed to recover and would be likely to function as temporary pools providing seasonally important habitat, similar to their current function. The impacted area in Wetland 6 would be restored to its current condition and function as a vegetated ditch parallel to the road and would continue to provide sediment retention, shoreline stabilization, and wildlife habitat functions.

Table 3 Wetland Impacts by Type

Cowardin et al. (1979) Wetland Type	Area Impacted (acres)
Palustrine Forested Wetland (PFO)	0.425
Palustrine Emergent Marsh/Palustrine Scrub-shrub Wetland (PEM/PSS)	0.004

Use of sediment and erosion controls, regular inspection, and maintenance of erosion controls would prevent sedimentation into Duck Brook and adjacent wetlands.

Alternative B would result in a minor increase of approximately 1,800 square feet in impervious area in the vicinity of the Duck Brook Bridge entrance. This increase would not be anticipated to result in increased rates or volumes of stormwater runoff to Duck Brook. No additional parking would be created; therefore, this alternative would not result in an increase in stormwater contaminants from vehicles or runoff.

Investigation of Alternatives

Alternative A (No Action)
This alternative would retain the roadway, drainage, utilities, and parking essentially in their existing conditions. No substantive changes would be made to improve the road, the drainage systems, or parking. The road would continue to deteriorate with loss of surface material, increased potholes, and further flooding. The existing informal parking near the approach to Duck Brook Bridge would persist as well. Under this alternative, the roadway and drainage would be repaired incrementally if, and when, funds became available. Current NPS maintenance practices would continue.

Alternative C (Major road rehabilitation with head-in parking area)
Alternative C calls for upgrading and widening Duck Brook Road to meet NPS and Federal Highway Administration standards for width, slope, and curve radius. Duck Brook Road would be widened to 18 feet wide with two, one-foot gravel shoulders, and all trees and obstructions, such as ledge outcrops, trees, and utility poles, would be removed within 7 to 10 feet of the road edge for safety. Other geometric improvements, including excavating to lower the grade of the road and changing the curvature of the road to improve vertical and horizontal sight distances at some locations, would be required. Other measures to reduce traffic speeds would be used in areas of concern (the curve north of Duck Brook Bridge). These measures would include signage or rumble strips. Rehabilitation would include replacing drainage culverts under Duck Brook Road, constructing new drainage ditches along the east side of the road to capture water and divert it under the road, reconstructing the road base, and repaving. Blasting would likely be required for ledge removal and modifications to the vertical profile of the road. Side slopes adjacent to the road would be graded to a ratio of 4:1 (horizontal to vertical. Alternative C would have an average construction zone width of 44 feet.

Due to the presence of sensitive wetlands, particularly the New Mill Meadow wetland system along the west side of the road, all widening would be done on the east side. Widening would include filling for road construction, culvert extension, and ditch construction. Widening Duck Brook Road, particularly in the central section immediately north of Duck Brook Bridge, where Duck Brook Road and the carriage road run parallel along the two rims of the Duck Brook ravine, would require a substantial cut into the hillside east of the road and removal of vegetation on this slope.

Flooding and erosion problems where Duck Brook currently overflows its banks would also be improved. The ditch along the west side of Duck Brook Road at this location would be lined with stone, and the small culvert that conveys water under the berm containing the pipes would be enlarged. Alternative C would also require that the existing overhead power line and poles along the east side of the road in the southern section be relocated outside of the roadway construction limits. These poles provide electrical and telephone service to

the Bar Harbor Department of Public Works facilities. Relocation would be done by the Bangor Hydroelectric Company, owner of the power lines.

Alternative C includes a component for formalizing the parking that occurs around Duck Brook Bridge. The existing informal gravel parking area at the bridge would be narrowed and landscaped with native species such as balsam fir, sheep laurel, and lowbush blueberry, to restore the vegetative cover and develop a more natural setting around the bridge. Stones would line the narrowed area to deter vehicles from parking close to the bridge, which obstructs access to and views from the bridge. This alternative would provide head-in parking for about 10 passenger vehicles on the east side of Duck Brook Road. These spaces would begin south of the bridge and extend to approximately 100 feet. This formalized gravel parking area would extend approximately 30 feet into the side of Great Hill and would require the use of rustic, granite blocks as a retaining wall on the east side of the parking area.

Alternative C would result in moderate impacts to wetlands. The widening of the road to 18 feet would impact wetlands due to filling for road construction, culvert extension, and ditch construction. One small vernal pool adjacent to the road, which provides breeding habitat for amphibians, would be lost. A total of approximately 0.66 acres of wetlands, in 24 locations, would be affected. Alternative C would require placing fill in the principal wetlands along the corridor, and would result in a loss of wetland area in the Duck Brook wetland and New Mill Meadow.

Mitigative Actions

Avoidance and minimization measures were applied throughout the project design to reduce impacts to sensitive wetland resources. Avoiding wetland impacts is not practicable, because wetlands are directly adjacent to the existing road on both sides. Impacts have been minimized to the extent practicable by using minimum road rehabilitation standards and 2:1 side slopes, and will be further minimized in the final design process. Culverts will be replaced with culverts of the same size and elevation, which will minimize hydrologic impacts to upstream wetlands. Ditches will be allowed to revegetate with native species, and habitat functions of these small wetlands upgradient of Duck Brook Road (primarily these provide temporary seasonal habitat for migrating amphibians) are expected to recover. General mitigative measures would also include sustainable design of the roadway, culverts, and ditches and use of durable building materials; and application of best management practices. The contractor will implement a Stormwater Pollution Prevention Plan using standard erosion and sediment control measures (siltation fencing and straw bales) throughout the construction process to mitigate the discharge of sediment to adjacent wetlands, and will utilize best management practices to protect water quality in Duck Brook and other wetlands during construction. The project will improve water quality in Duck Brook by reducing the sediment load caused by erosion of the existing road shoulder. Roadway reconstruction, as a result of soil disturbance and the need to import topsoil to stabilize and revegetate the disturbed slopes along the road, could result in the introduction of non-native species and invasive species. Mitigation measures incorporated into the design of the road (park inspection and approval of topsoil sources as free of invasive species; use of the park-developed native seed mixture) would reduce the potential for the introduction of undesirable species that are not currently part of the vegetation community of these wetlands.

All drainage ditches and side slopes would be loamed and seeded with a native seed mixture developed by the park. Some ditches could eventually provide wildlife habitat, sediment/toxicant/pathogen retention, nutrient retention/transformation, and floodflow alteration functions. The remaining impacted wetlands, primarily small wetlands which provide few functions or values, would be permanently lost.

Specific mitigative measures would be applied to reduce the impact of losing this area and would include removing sediment from Duck Brook and its associated wetlands that has accumulated as a result of runoff and poor drainage along Duck Brook Road, as well as from deterioration of the road itself. Two areas have been identified where siltation is a particular problem (Figure E). Duck Brook near the intersection of Route 233 and Duck Brook Road has been adversely affected by the deposition of sand from de-icing Route 233. Approximately 7,500 square feet of stream and wetland would be cleaned at this location. At the confluence of Duck Brook and an intermittent tributary, sand and gravel from the eroding roadbed have been deposited in the channel. This deposition affects channel depth and flow characteristics, and may affect the ability of the brook to support native trout. As part of the road rehabilitation project, silt would be removed from the streambed, along a linear distance of approximately 300 linear feet in Duck Brook and 250 linear feet in the intermittent tributary, and nearby wetlands at these locations to restore natural flow and hydrologic conditions. Palustrine open water would be restored to provide all of its functions of floodflow alteration (by increasing channel depth), shoreline stabilization, aquatic habitat (fish and stream invertebrate habitat), and visual/scenic values. In addition, three mountain streams flow from the uplands east of Duck Brook Road and have undercut the hillside. Each of these areas would be stabilized with emergent and shrub plantings to prevent further erosion of the slope, which contributes silt to the wetlands west of the road via culverts. Silt would be removed from wetlands in the area of the culvert outfalls. In each of these instances, palustrine scrub-shrub wetlands would be restored along with stabilizing the the streambanks. To fully meet the NPS 1:1 compensation requirement, additional areas will be identified throughout the park where wetlands would benefit from restoration. These areas will be detailed in the final Statement of Findings.

Stream restoration would be funded and scheduled as part of the Duck Brook Road rehabilitation project. Park biologists would investigate the streams and delineate the areas and depths of sediment to be removed. All work would be done under the supervision of a biologist or wetland scientist. Removal of sediments would be done under summer low flow conditions to minimize downstream siltation, and temporary siltation controls would be installed across the channel during excavation work. Vehicles would access the stream using "swamp mats" to avoid damage to the vegetation or substrate, and would use access routes identified and marked by park biologists. The impacted stream segments are close to Duck Brook Road, and can easily be accessed from paved areas. Some removal of small trees or shrubs may be required for vehicular access, but would result in temporary impacts since shrubs would be cut at the base and would resprout. Work would be completed using a combination of equipment (bob cat or long-arm track hoe). In sensitive areas, sediment would be removed manually depending on the actual amount of sediment to be removed.

Compliance

Coastal Zone Management Act of 1972

The Coastal Zone Management Act of 1972 requires that federal activities which affect land, water, or natural resources of Maine's designated coastal resources management area be consistent with the enforceable policies of the Maine Coastal Program. The NPS has determined that the project would be consistent to the

maximum extent practicable with these policies, and concurrence on this determination would be sought from the Maine Coastal Program (Maine State Planning Office).

Corps of Engineers (Section 404 of the Clean Water Act)
The Proposed Action would qualify for permitting under the COE's Programmatic General Permit for Maine, and no mitigation would be required.

State of Maine (Natural Resources Protection Act)
The Maine Department of Environmental Protection has indicated that Alternative B, as a maintenance and rehabilitation activity, would be exempt from regulation under the Natural Resources Protection Act. There is no requirement for compensatory wetland mitigation

Alternative C would require a wetland permit under the NRPA. There is no set requirement for wetland replacement - an analysis of functions and values would be required because the alteration is more than 20,000 square feet. If the functions and values analysis showed degradation of functional values, compensation would be required.

National Environmental Policy Act
The Environmental Assessment, Section 106 Compliance Review, this Statement of Findings for Executive Order 11990, and the Finding of No Significant Impact would complete the requirements of the National Environmental Policy Act for this project.

Conclusion

The National Park Service has identified Alternative B as the proposed action for rehabilitating Duck Brook Road in Acadia National Park. Wetland impacts have been minimized to the practicable extent allowed by sound engineering of the road improvements. NPS policies for impacts to wetlands allow up to 0.1 acre of disturbance for road rehabilitation, as proposed in Alternative B; however, because the total impacts of this project exceed that, Acadia National Park must describe and compensate for wetland losses. By restoring vegetated wetland habitat along Duck Brook Road and removing sediment that has accumulated in Duck Brook and adjacent wetlands, the project would adequately compensate for wetland loss caused by the proposed road improvements. Mitigation sites have been identified in this draft Statement of Findings; however, additional sites will be identified throughout the park to bring the total compensation ration to 1:1. This project, therefore, is consistent with Executive Order 11990 and Director's Order 77-1: Wetland Protection, including the NPS no-net-loss of wetlands policy.

Duck Brook Carriage Road Bridge

Bar Harbor Department of Public Works

New Mill Meadow

Paradise Hill Road

Paradise Hill Road Bridge

Duck Brook Road

West Street Extension

Duck Brook

Park Loop Road

Eagle Lake Road

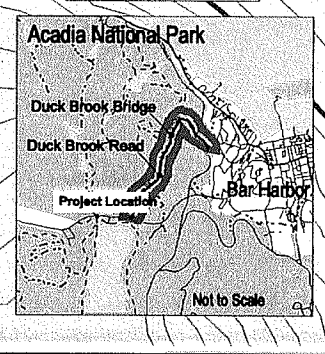
W1 W2 W3 W4 W5 W6

280 300 220 420 520 320 240 233

N

Scale - 1:6,000

0 500 Feet



Project Location
Roads
Carriage Road
Topography (CI = 20 ft.)
Park Land

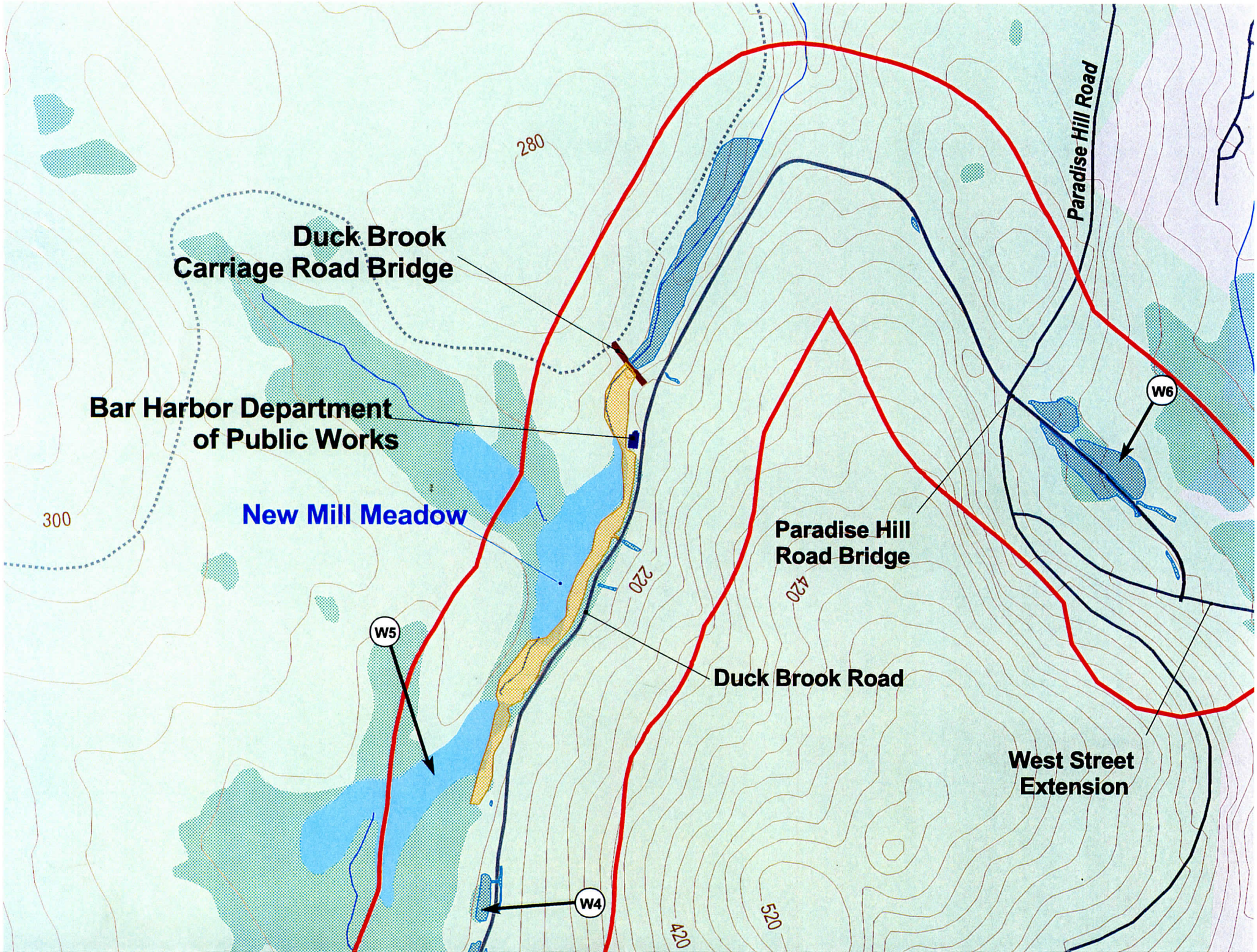
Field Mapped Wetlands
Palustrine Emergent / Palustrine Scrub-Shrub Wetlands (PEM/PSS)
Palustrine Forested Wetlands (PFO)

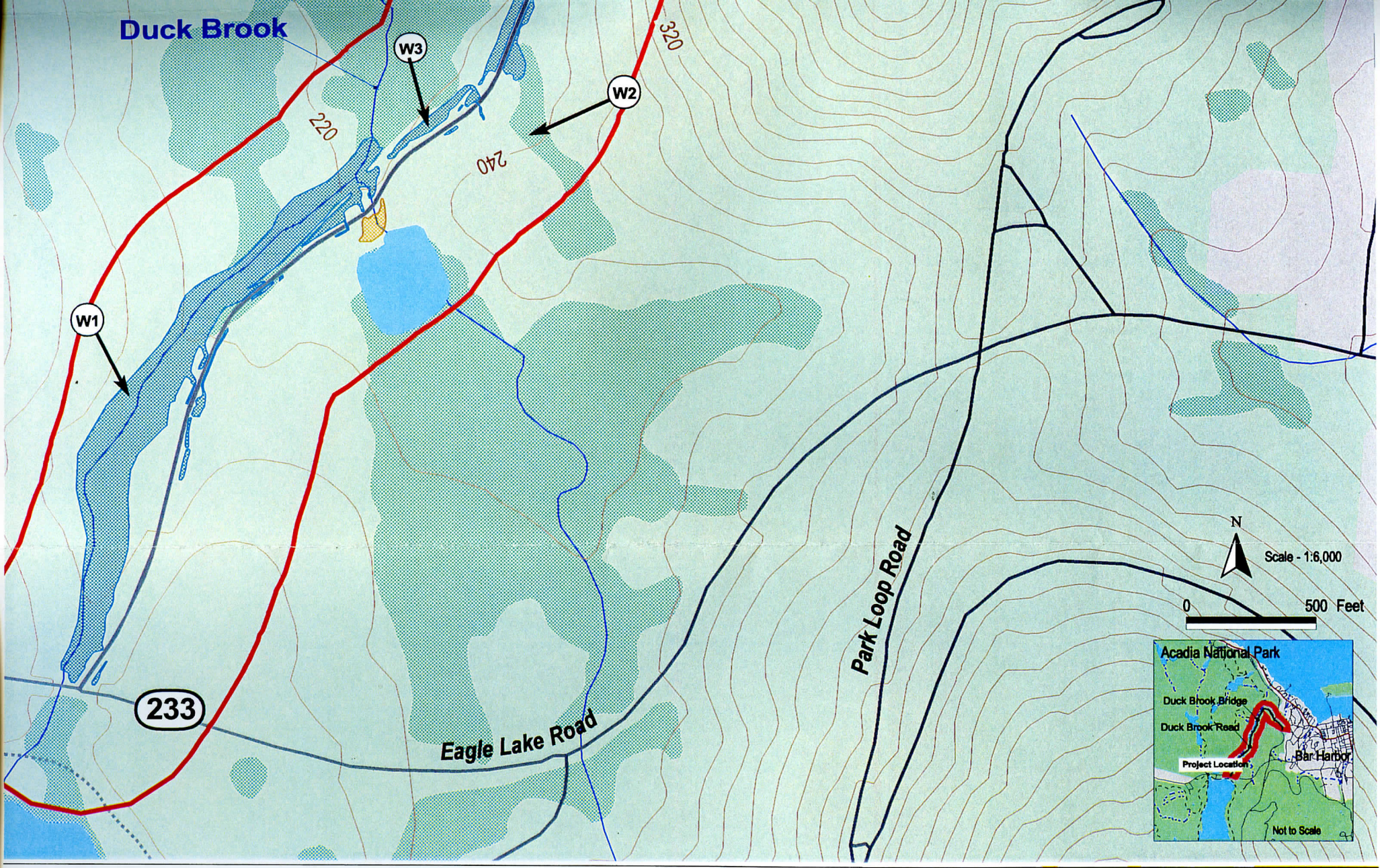
National Wetlands Inventory Mapping

W6 Wetland Functional Assessment Locations

NATIONAL PARK SERVICE
Acadia National Park
Duck Brook Road

Wetlands Mapping
Figure 8


Duck Brook
Carriage Road Bridge
Bar Harbor Department
of Public Works
New Mill Meadow
Paradise Hill
Road Bridge
Duck Brook Road
West Street
Extension
Paradise Hill Road
W4
W5
W6
280
300
220
420
420
520



Project Location
Roads
Carriage Road
Topography (CI = 20 ft.)
Park Land

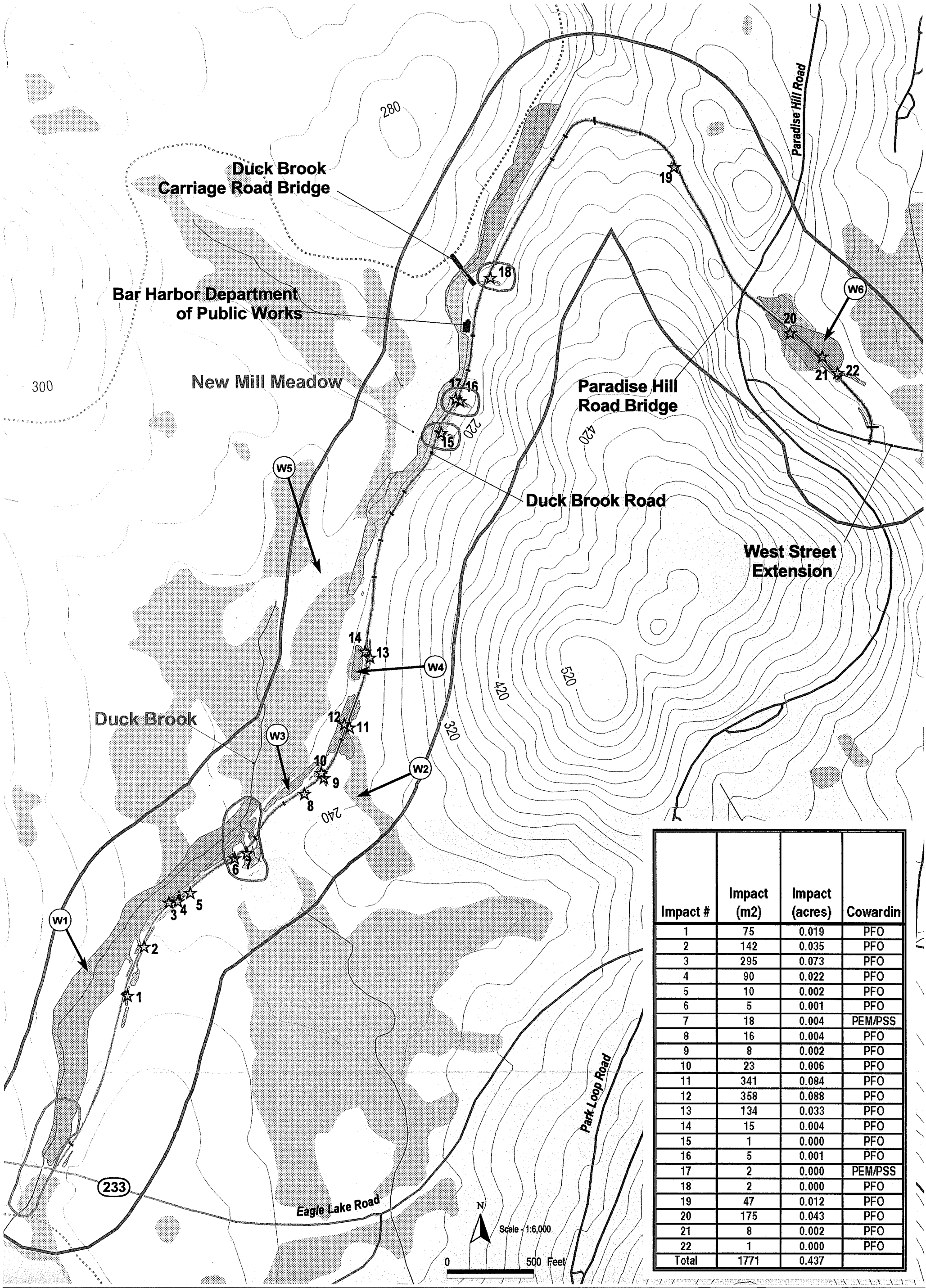
Field Mapped Wetlands
Palustrine Emergent / Palustrine Scrub-Shrub Wetlands (PEM/PSS)
Palustrine Forested Wetlands (PFO)

National Wetlands Inventory Mapping

W6 Wetland Functional Assessment Locations

NATIONAL PARK SERVICE
Acadia National Park
Duck Brook Road

Wetlands Mapping
Figure 8



Impact #	Impact (m2)	Impact (acres)	Cowardin
1	75	0.019	PFO
2	142	0.035	PFO
3	295	0.073	PFO
4	90	0.022	PFO
5	10	0.002	PFO
6	5	0.001	PFO
7	18	0.004	PEM/PSS
8	16	0.004	PFO
9	8	0.002	PFO
10	23	0.006	PFO
11	341	0.084	PFO
12	358	0.088	PFO
13	134	0.033	PFO
14	15	0.004	PFO
15	1	0.000	PFO
16	5	0.001	PFO
17	2	0.000	PEM/PSS
18	2	0.000	PFO
19	47	0.012	PFO
20	175	0.043	PFO
21	8	0.002	PFO
22	1	0.000	PFO
Total	1771	0.437	

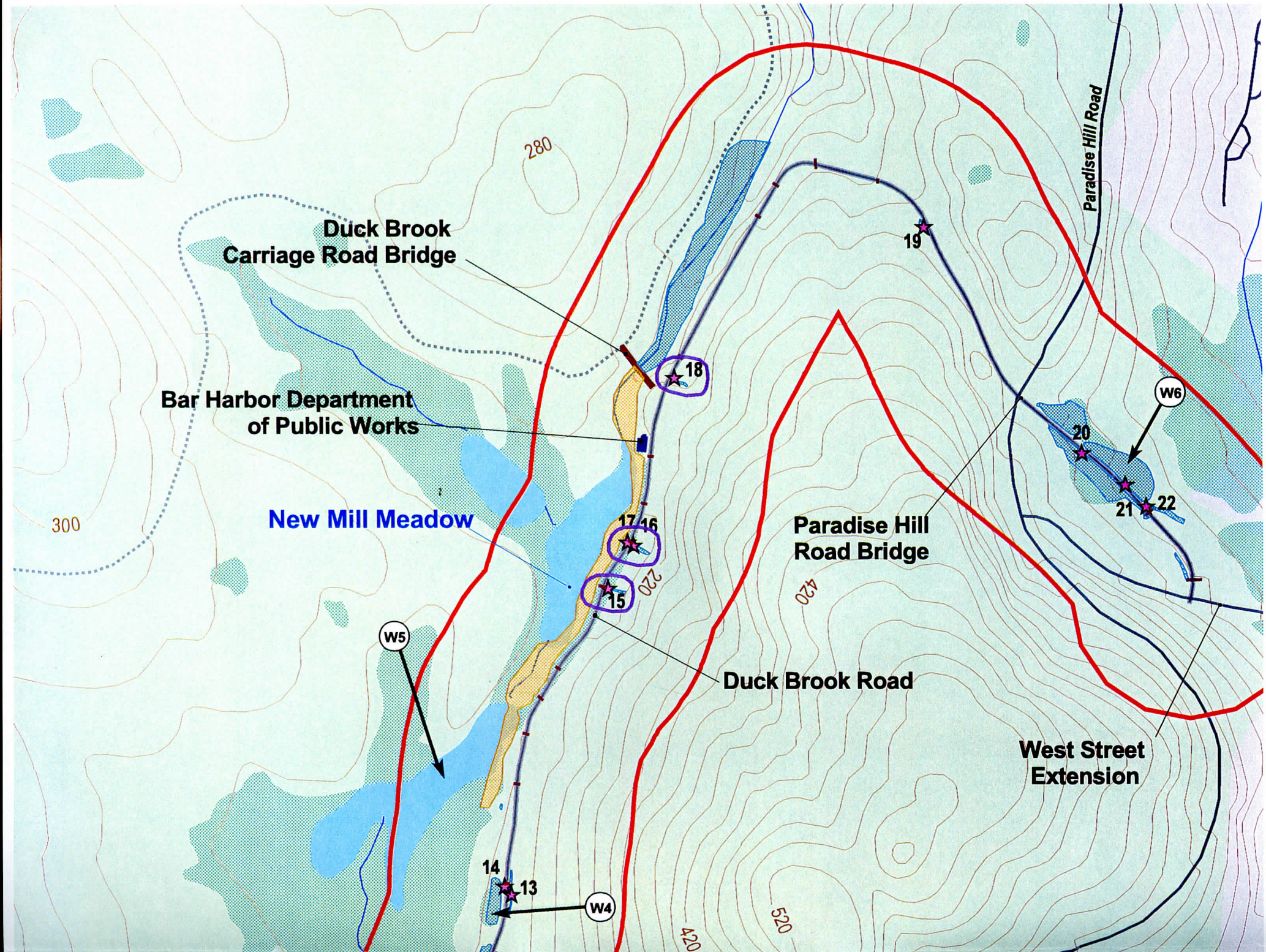
Project Location
Roads
Carriage Road
Topography (CI = 20 ft.)
Park Land
Culverts

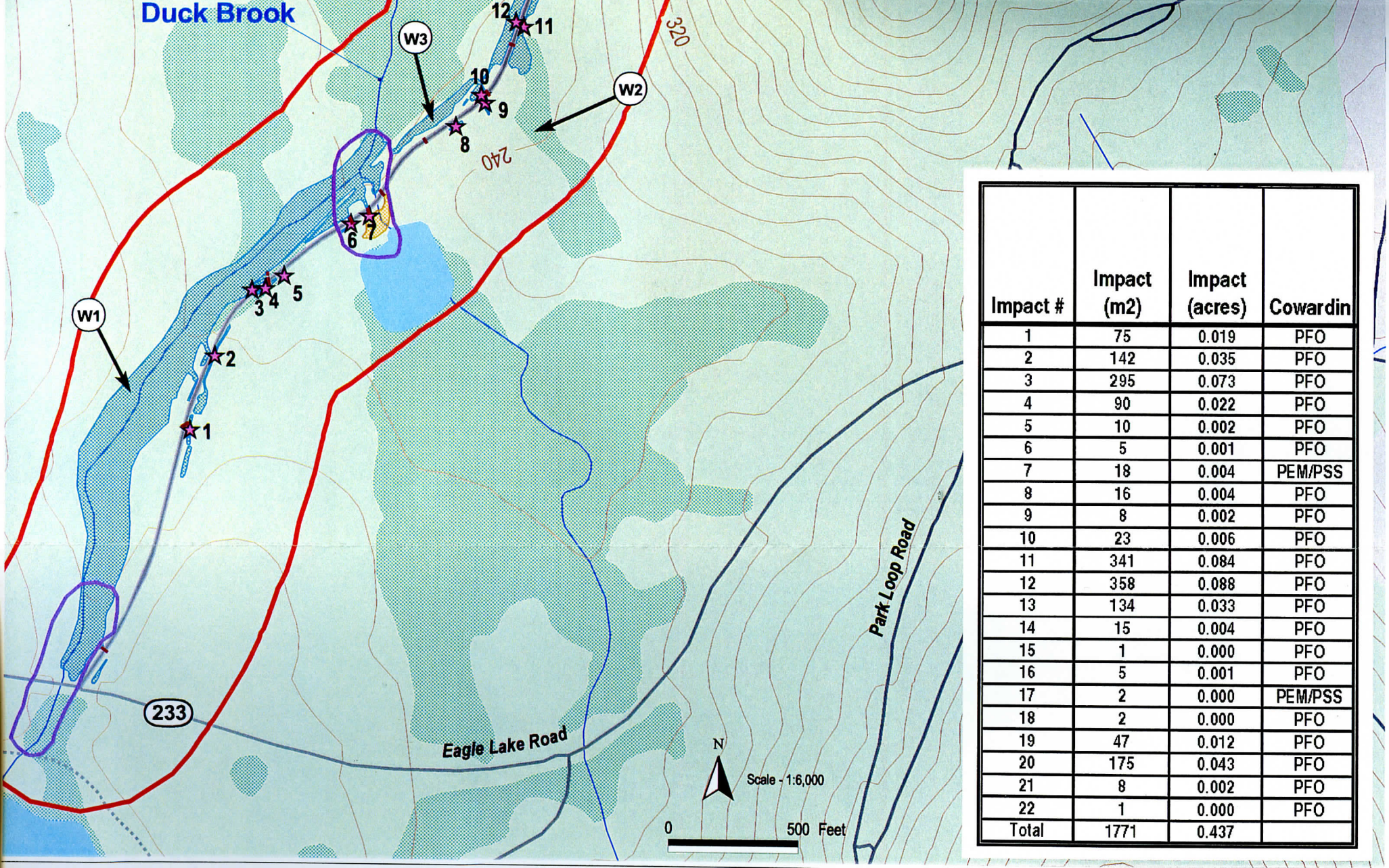
Field Mapped Wetlands
Palustrine Emergent / Palustrine Scrub-Shrub Wetlands (PEM/PSS)
Palustrine Forested Wetlands (PFO)
National Wetlands Inventory Mapping

Location of Wetland Impacts
W6 Wetland Functional Assessment Locations
Potential Wetland Restoration Site

NATIONAL PARK SERVICE
Acadia National Park
Duck Brook Road

Wetland Impacts, Functional Assessment & Potential Restoration Site Locations


Duck Brook
Carriage Road Bridge
Bar Harbor Department
of Public Works
New Mill Meadow
Paradise Hill
Road Bridge
Duck Brook Road
West Street
Extension
Paradise Hill Road
280
300
220
420
520
420
18
19
20
21
22
17
16
15
14
13
W4
W5
W6



Impact #	Impact (m2)	Impact (acres)	Cowardin
1	75	0.019	PFO
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19	47	0.012	PFO
20	175	0.043	PFO
21	8	0.002	PFO
22	1	0.000	PFO
Total	1771	0.437	

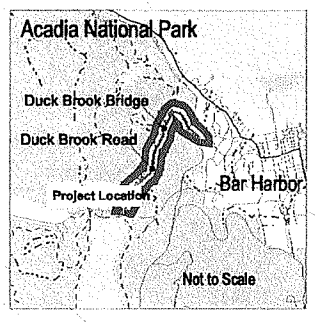
Project Location
Roads
Carriage Road
Topography (CI = 20 ft.)
Park Land
Culverts

Field Mapped Wetlands
Palustrine Emergent / Palustrine Scrub-Shrub Wetlands (PEM/PSS)
Palustrine Forested Wetlands (PFO)
National Wetlands Inventory Mapping

Location of Wetland Impacts
W6 Wetland Functional Assessment Locations
Potential Wetland Restoration Site

NATIONAL PARK SERVICE
Acadia National Park
Duck Brook Road

Wetland Impacts, Functional Assessment
& Potential Restoration Site Locations



Duck Brook Carriage Road Bridge

Paradise Hill Road Bridge

Paradise Hill Road

Bar Harbor Department of Public Works

West Street Extension

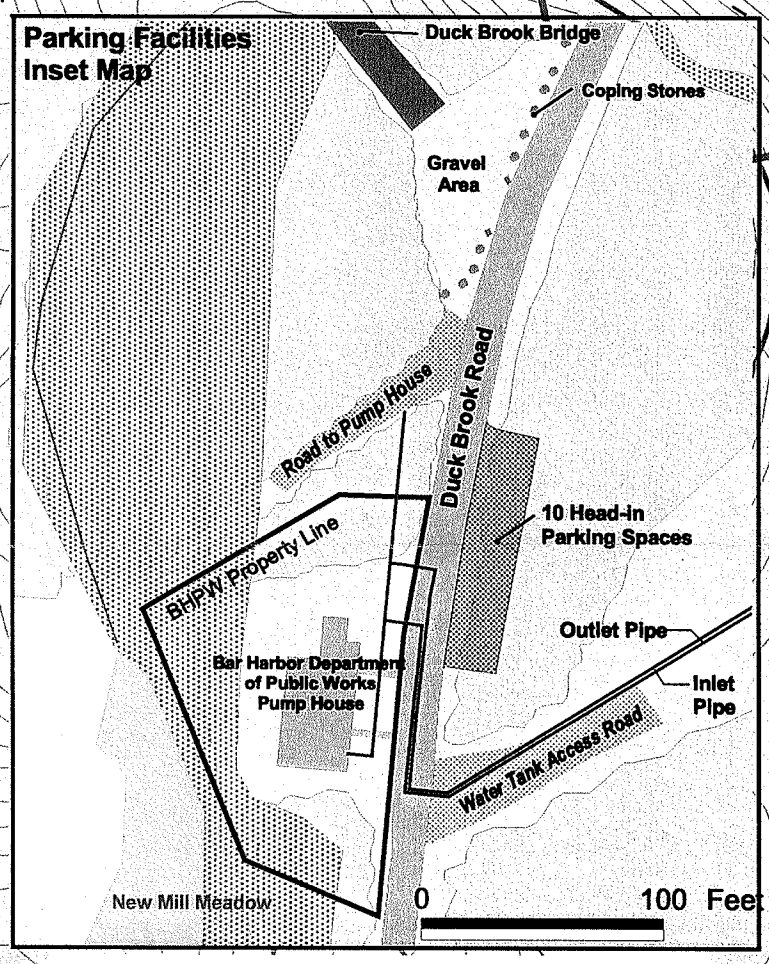
500,000 Gal. Water Storage Tank

New Mill Meadow

Duck Brook Road

Duck Brook

280 180 300 220 420 320 420



Alternative C

Roadway

- Pavement reconstruction
- Increase width to 18 feet with 1-foot gravel shoulders; widening to occur only on east side to avoid wetlands
- Side slopes to be 4:1 (horizontal to vertical ratio)
- Construction zone is 44 feet wide on average

Utility Poles

- East side of road - move existing utility poles out of construction limits

Coping Stones

Between Duck Brook Bridge & Paradise Hill Road

- reset stones to 2 feet apart
- replace with rustic looking stones
- set coping stones at existing gravel area at bridge to deter parking (2 feet apart)

Parking Areas

- Ten head-in spaces east of Duck Brook Road begins south of bridge and extends to north of water tank access road
- Parking area to be 30-feet deep with granite blocks retaining wall on east side of parking area

Culverts

- Culverts to be replaced
- Drainage ditches to be installed on the east side of Duck Brook Road

233

Eagle Lake Road

N

Scale - 1:6,000

0 500 Feet

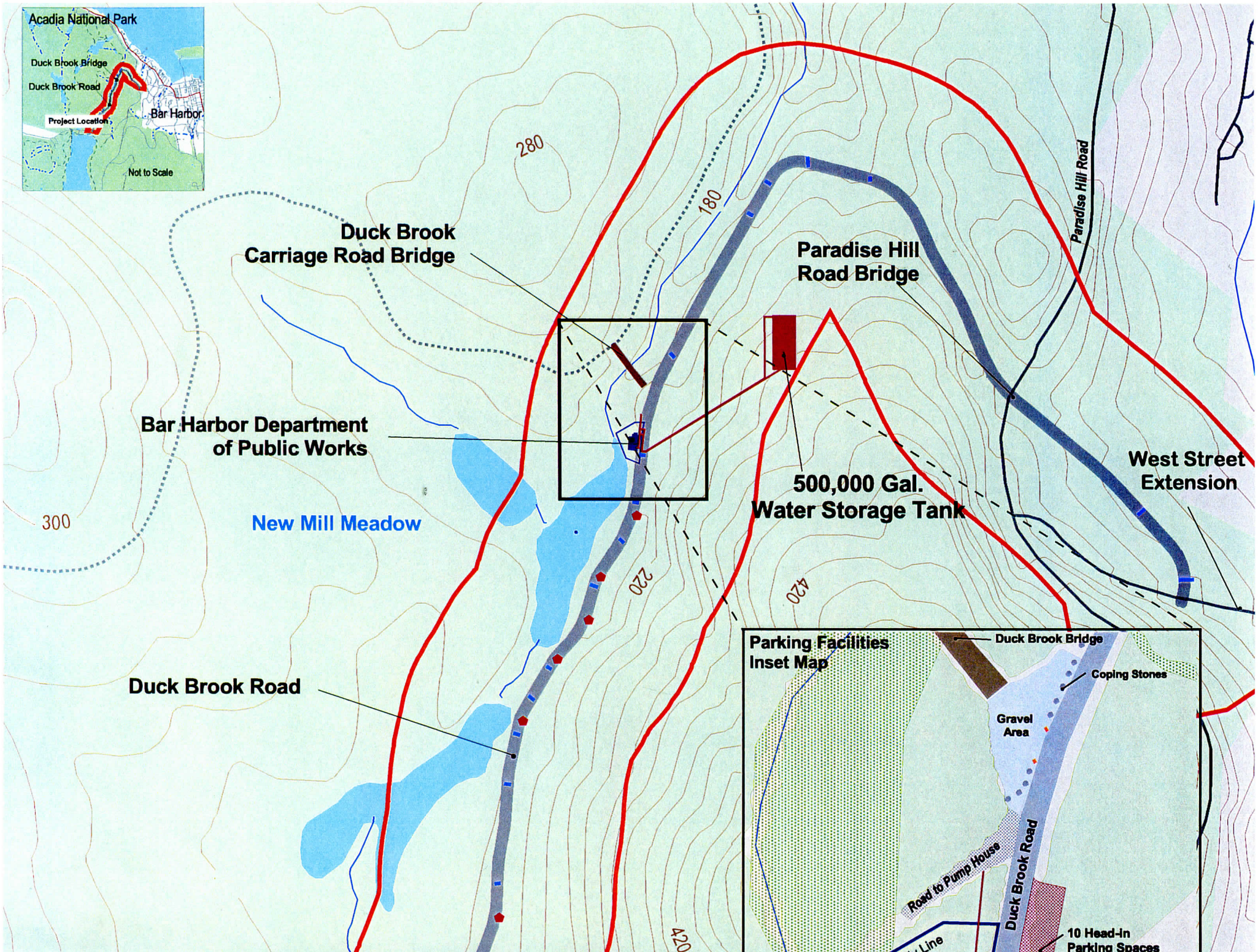
Project Location
Roads
Carriage Road
Topography (CI = 20 ft.)
Park Land
Utility Pole
Culverts

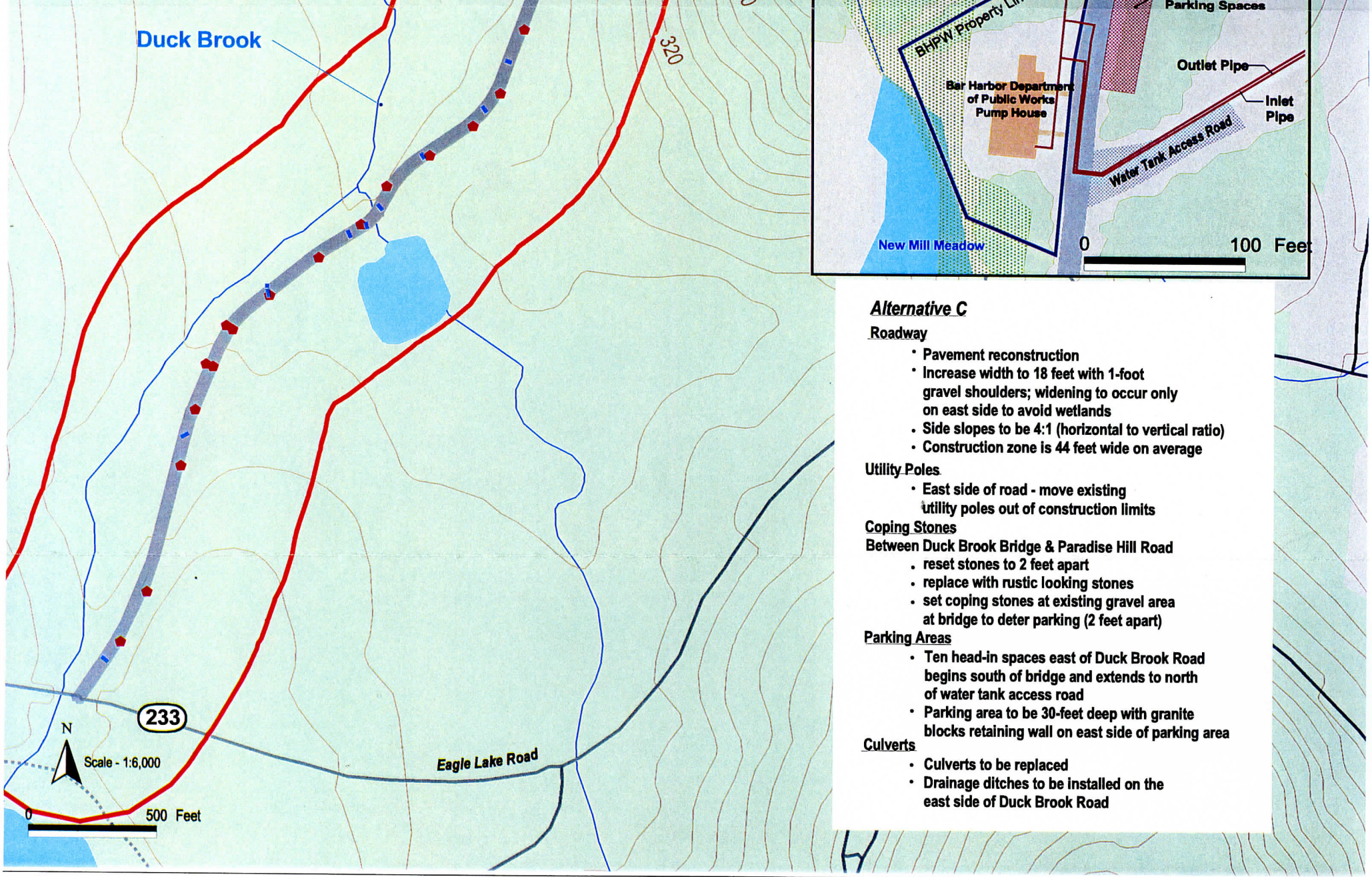
Inset Map Legend

Field Mapped Wetlands
Coping Stones
Duck Brook Bridge
Gate Post
Water Storage Tank & Associated Inlet/Outlet Pipes
Proposed Head-in Parking Area
Pump Station
Unpaved Road
Bar Harbor Department of Public Works Property Line

NATIONAL PARK SERVICE
Acadia National Park
Duck Brook Road

Alternative C
Figure 6


Acadia National Park
Duck Brook Bridge
Duck Brook Road
Project Location
Bar Harbor
Not to Scale
Duck Brook
Carriage Road Bridge
Paradise Hill
Road Bridge
Paradise Hill Road
Bar Harbor Department
of Public Works
West Street
Extension
500,000 Gal.
Water Storage Tank
New Mill Meadow
Duck Brook Road
280
180
300
220
420
420
Parking Facilities
Inset Map
Duck Brook Bridge
Coping Stones
Gravel
Area
Road to Pump House
Duck Brook Road
10 Head-in
Parking Spaces



Alternative C

Roadway

- Pavement reconstruction
- Increase width to 18 feet with 1-foot gravel shoulders; widening to occur only on east side to avoid wetlands
- Side slopes to be 4:1 (horizontal to vertical ratio)
- Construction zone is 44 feet wide on average

Utility Poles

- East side of road - move existing utility poles out of construction limits

Coping Stones

Between Duck Brook Bridge & Paradise Hill Road

- reset stones to 2 feet apart
- replace with rustic looking stones
- set coping stones at existing gravel area at bridge to deter parking (2 feet apart)

Parking Areas

- Ten head-in spaces east of Duck Brook Road begins south of bridge and extends to north of water tank access road
- Parking area to be 30-feet deep with granite blocks retaining wall on east side of parking area

Culverts

- Culverts to be replaced
- Drainage ditches to be installed on the east side of Duck Brook Road

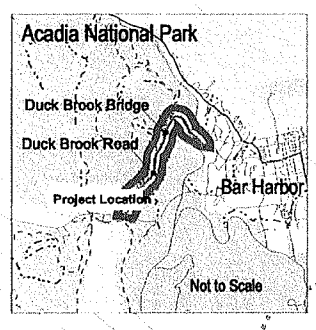
Project Location
Roads
Carriage Road
Topography (CI = 20 ft.)
Park Land
Utility Pole
Culverts

Inset Map Legend

Field Mapped Wetlands
Coping Stones
Duck Brook Bridge
Gate Post
Water Storage Tank & Associated Inlet/Outlet Pipes
Proposed Head-in Parking Area
Pump Station
Unpaved Road
Bar Harbor Department of Public Works Property Line

NATIONAL PARK SERVICE
Acadia National Park
Duck Brook Road

Alternative C
Figure 6



Duck Brook Carriage Road Bridge

Bar Harbor Department of Public Works

Paradise Hill Road Bridge

Paradise Hill Road

West Street Extension

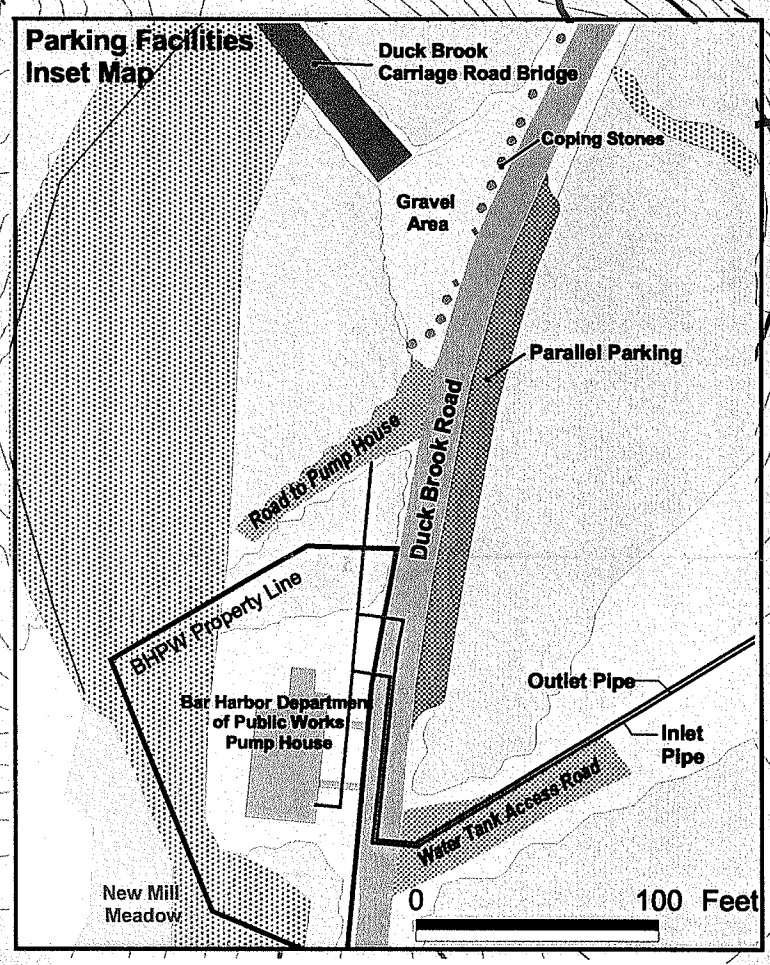
500,000 Gal. Water Storage Tank

Mill Meadow Pond

Duck Brook Road

Duck Brook

280 180 300 220 420 320 240



Alternative B - Preferred

Roadway

- Pavement reconstruction
- Maintain 16 foot width
- 1-foot gravel shoulders on each side
- Profile of road raised 12 inches side slopes from edge of shoulders to toe of slope to be 2:1(horizontal to vertical ratio)
- Construction Zone - 24 feet wide

Utility Poles

- East side of road - move existing utility poles out of construction limits

Coping Stones

Between Duck Brook Bridge & Paradise Hill Road

- reset stones to 2 feet apart
- replace with rustic looking stones
- set coping stones at existing gravel area at bridge to deter parking (2 feet apart)

Parking Areas

- Ten parallel spaces on east side of Duck Brook Road starting 25 feet north of bridge and continuing for 200 feet to the south (ends just north of water tank access road)

Culverts

- Culverts to be replaced
- Drainage ditches to be installed on the east side of Duck Brook Road

233

Eagle Lake Road

N

Scale - 1:6,000

0 500 Feet

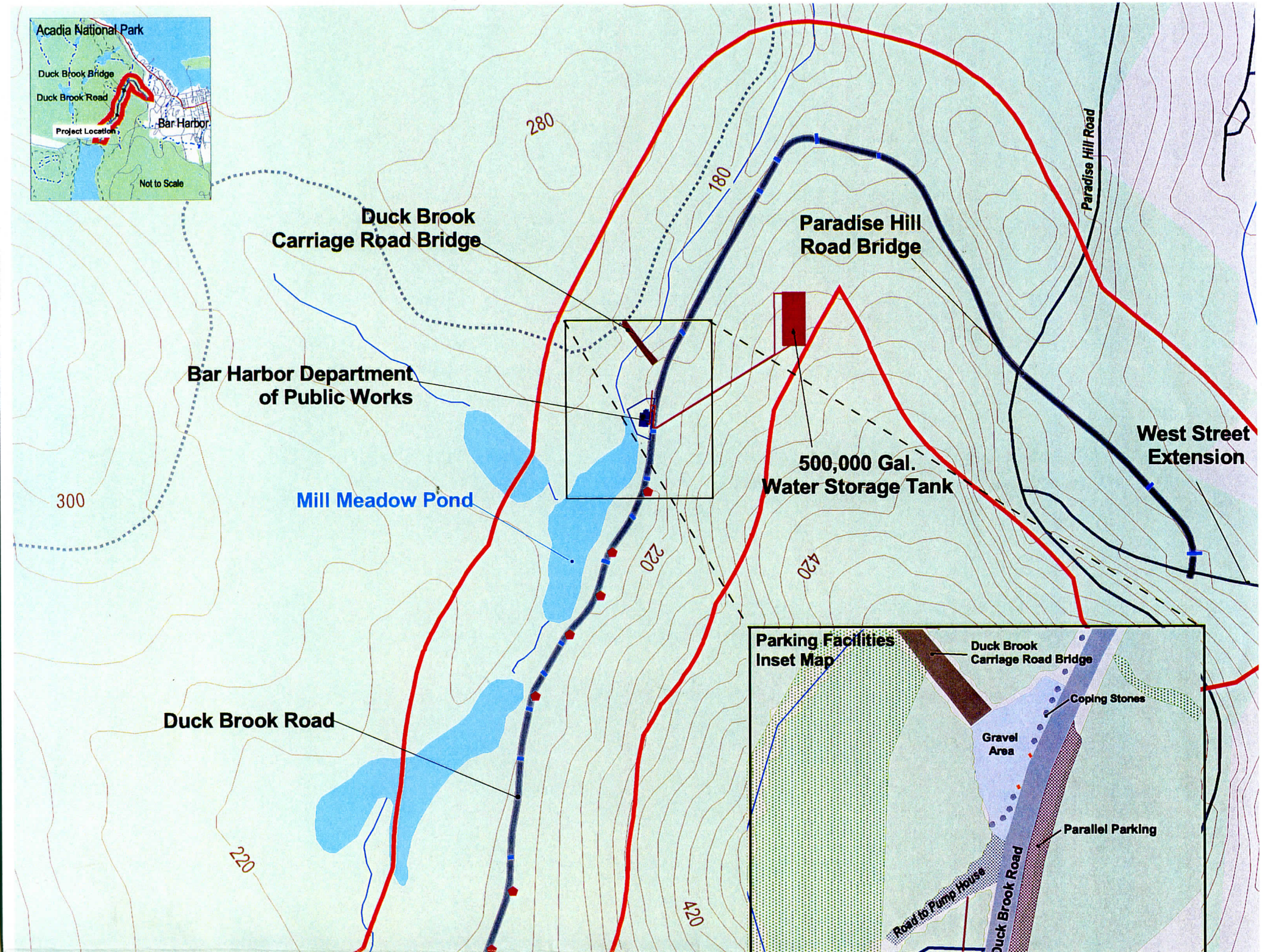
Project Location
Roads
Carriage Road
Topography (CI = 20 ft.)
Park Land
Utility Pole
Culverts

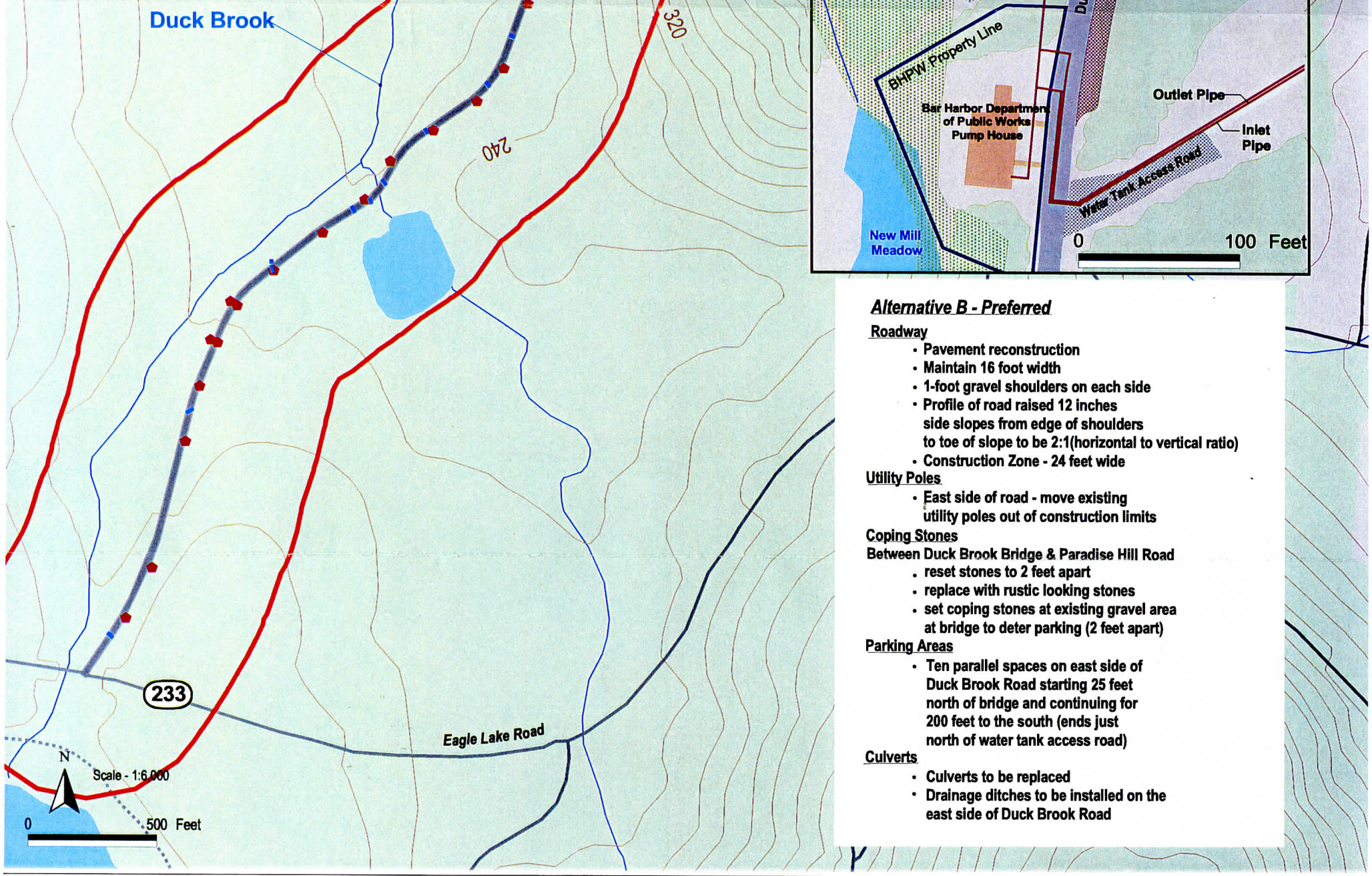
Inset Map Legend

Field Mapped Wetlands
Coping Stones
Duck Brook Bridge
Gate Post
Water Storage Tank & Associated Inlet/Outlet Pipes
Proposed Parallel Parking Area
Pump Station
Unpaved Road
Bar Harbor Department of Public Works Property Line

NATIONAL PARK SERVICE
Acadia National Park
Duck Brook Road

Alternative B
Figure 5


Acadia National Park
Duck Brook Bridge
Duck Brook Road
Bar Harbor
Project Location
Not to Scale
Duck Brook
Carriage Road Bridge
Paradise Hill
Road Bridge
Paradise Hill Road
West Street
Extension
Bar Harbor Department
of Public Works
500,000 Gal.
Water Storage Tank
Mill Meadow Pond
Duck Brook Road
280
180
300
220
420
220
420
Parking Facilities
Inset Map
Duck Brook
Carriage Road Bridge
Coping Stones
Gravel
Area
Parallel Parking
Road to Pump House
Duck Brook Road



Alternative B - Preferred

Roadway

- Pavement reconstruction
- Maintain 16 foot width
- 1-foot gravel shoulders on each side
- Profile of road raised 12 inches side slopes from edge of shoulders to toe of slope to be 2:1(horizontal to vertical ratio)
- Construction Zone - 24 feet wide

Utility Poles

- East side of road - move existing utility poles out of construction limits

Coping Stones

Between Duck Brook Bridge & Paradise Hill Road

- reset stones to 2 feet apart
- replace with rustic looking stones
- set coping stones at existing gravel area at bridge to deter parking (2 feet apart)

Parking Areas

- Ten parallel spaces on east side of Duck Brook Road starting 25 feet north of bridge and continuing for 200 feet to the south (ends just north of water tank access road)

Culverts

- Culverts to be replaced
- Drainage ditches to be installed on the east side of Duck Brook Road

Project Location
Roads
Carriage Road
Topography (CI = 20 ft.)
Park Land
Utility Pole
Culverts

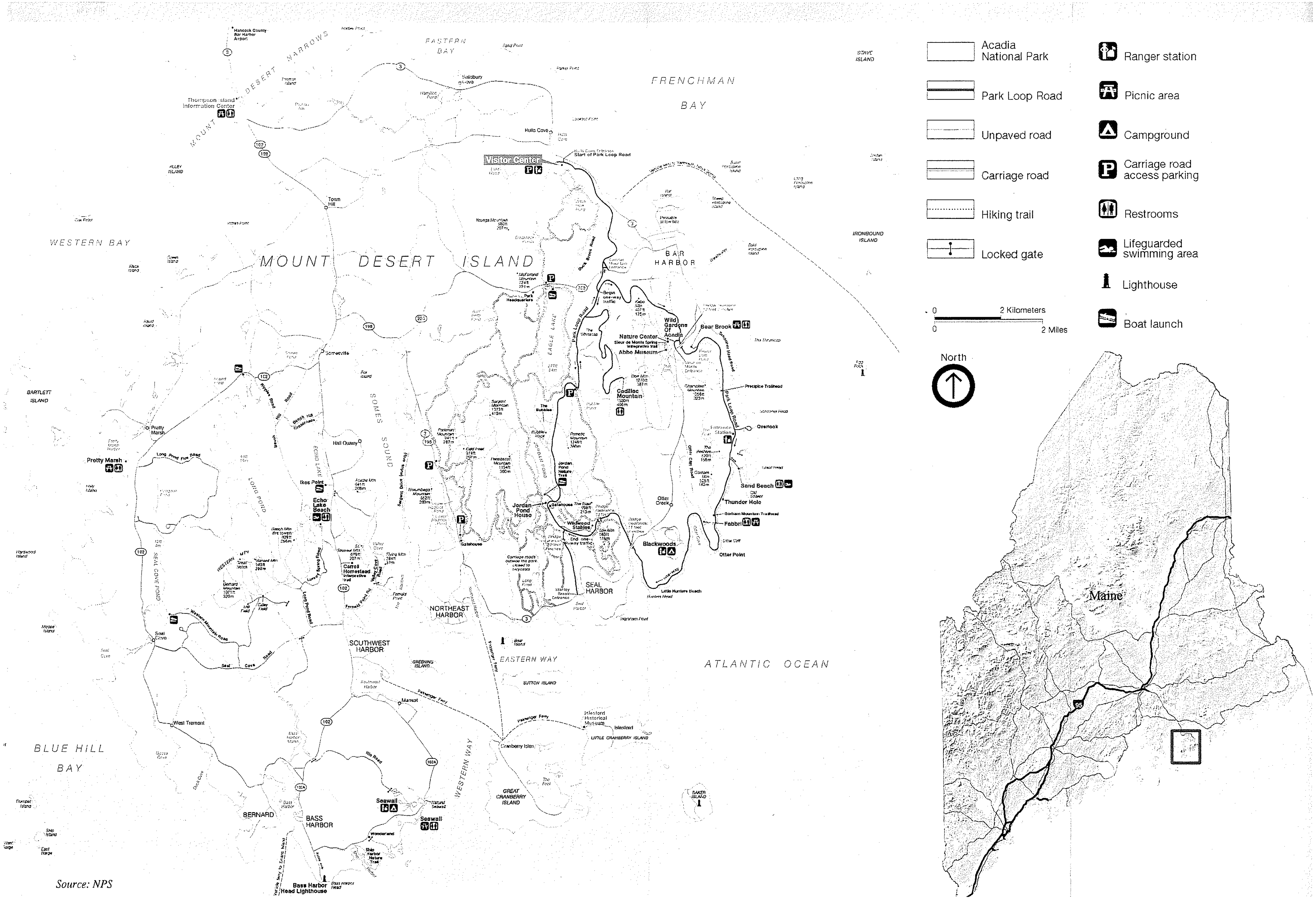
Inset Map Legend

Field Mapped Wetlands
Coping Stones
Duck Brook Bridge
Gate Post
Water Storage Tank & Associated Inlet/Outlet Pipes
Proposed Parallel Parking Area
Pump Station
Unpaved Road
Bar Harbor Department of Public Works Property Line

NATIONAL PARK SERVICE
Acadia National Park
Duck Brook Road

Alternative B
Figure 5

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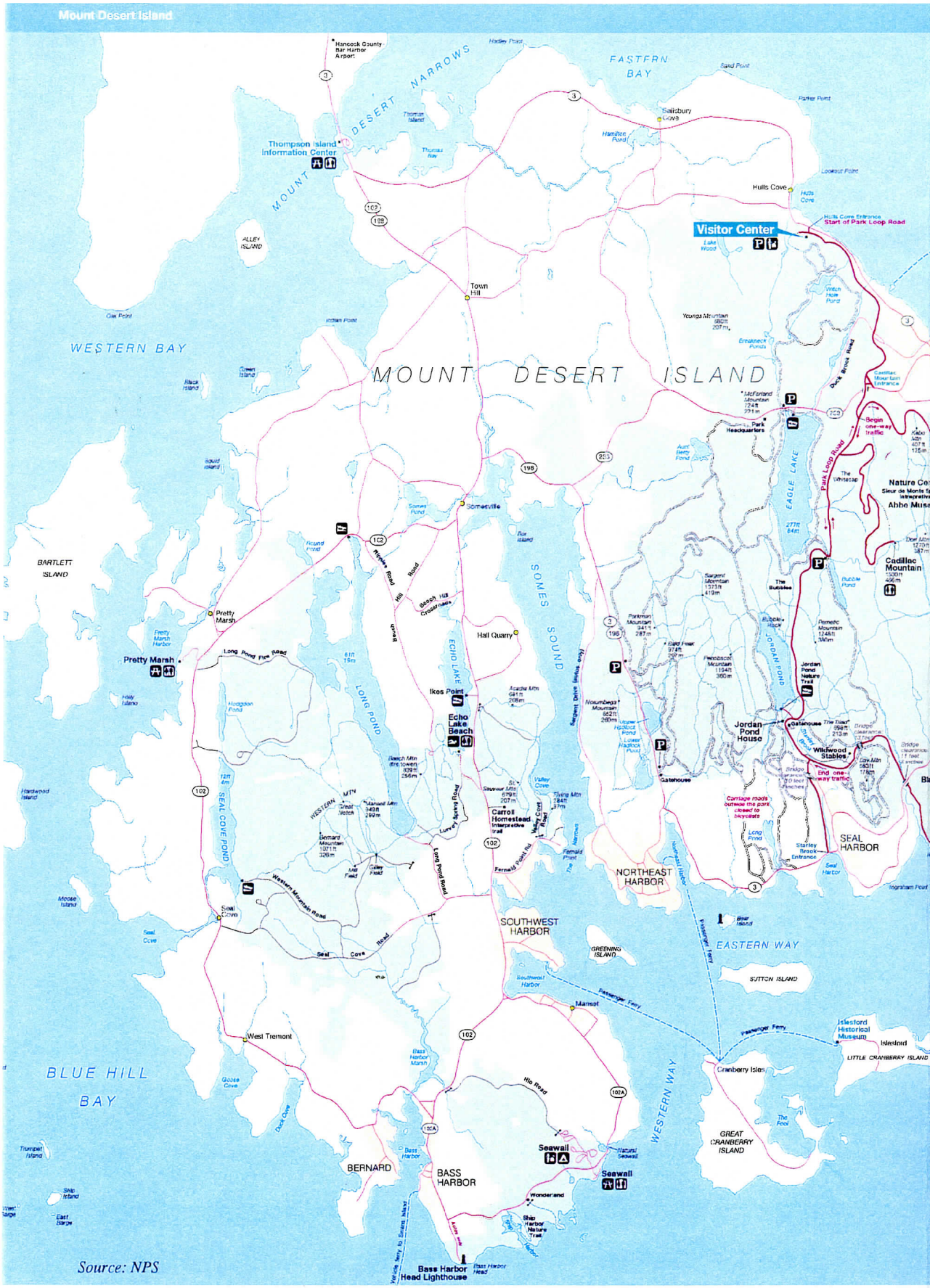
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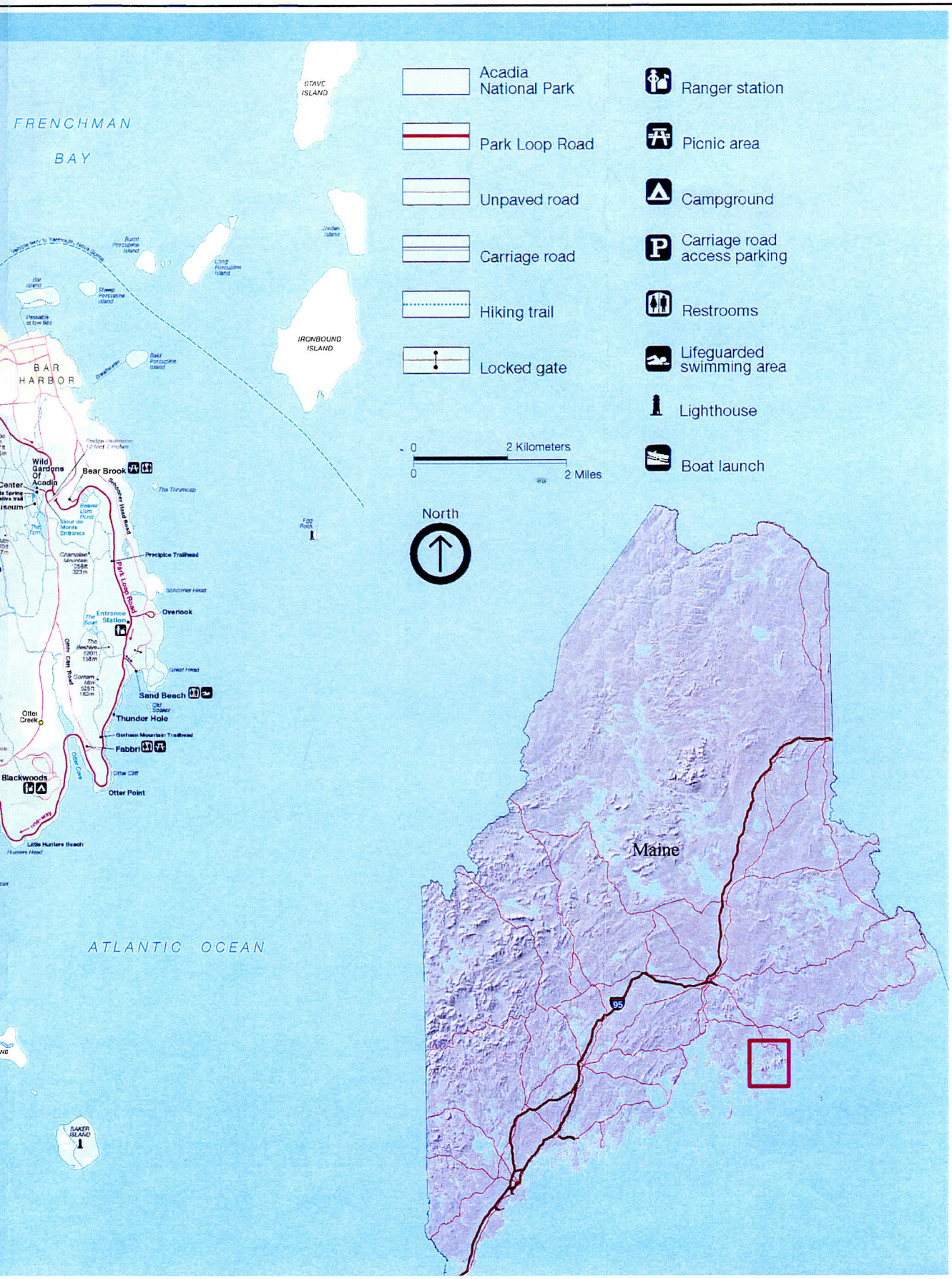
NATIONAL PARK SERVICE

Acadia National Park

Regional Context
Figure 1

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NATIONAL PARK SERVICE

Acadia National Park

Regional Context
Figure 1