CATTLE POINT ROAD REALIGNMENT PROJECT

DRAFT ENVIRONMENTAL IMPACT STATEMENT

August 2010

San Juan County, Washington

Federal Highway Administration
Western Federal Lands
Highway Division

National Park Service
San Juan Island
National Historical Park

Prepared in compliance with the National Environmental Policy Act of 1969, 40 CFR Parts 1500-1508 and 23 CFR 771

FHWA Project WA PLD SAJH 10(1)

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DRAFT ENVIRONMENTAL IMPACT STATEMENT

Submitted Pursuant to
42 U.S.C. 4332 (2)(c) (and where applicable, 49 U.S.C. 303)

By the
U.S. Department of Transportation
Federal Highway Administration
Western Federal Lands Highway Division

And

U.S. Department of Interior
National Park Service
San Juan Island National Historical Park

Cooperating Agencies:

San Juan County, Washington
Washington State Department of Natural Resources

Approved by:

Clara H Conner

Clara H. Conner
Division Engineer
Western Federal Lands Highway Division
Federal Highway Administration

8/16/10

Date

Draft Environmental Impact Statement for Cattle Point Road Realignment Project

Prepared by Federal Highway Administration, U.S. Department of Transportation and National Park Service, U.S. Department of Interior.

This Draft Environmental Impact Statement (DEIS) describes three alternatives for realignment of a portion of the Cattle Point Road located in the San Juan Island National Historical Park and Cattle Point Natural Resources Conservation Area about 8 miles south of Friday Harbor, Washington. The DEIS documents the analysis of potential environmental consequences of maintaining road access to the Cattle Point area considering the threat of coastal erosion to the existing road. The DEIS evaluates the no action alternative (alternative A) and three action alternatives (alternatives B, C, and D). These alternatives are summarized in the following summary section and described in detail in chapter 2 of this document. The environmental consequences of the alternatives are described in chapter 3 for a range of environmental resources including wildlife, cultural and historic resources, visual quality, visitor uses, and socioeconomics.

The DEIS has been distributed to interested agencies, organizations, and individuals for review and comment. The comment period is open for 60 days after the Notice of Availability has been published by the Environmental Protection Agency (EPA) in the Federal Register.

The DEIS can be viewed or downloaded online at www.wfl.fhwa.dot.gov/projects/wa/cattlepoint and http://parkplanning.nps.gov/parkHome.cfm?parkID=340. A print copy of the DEIS is also available for review at the following locations:

San Juan Island Library
1010 Guard Street
Friday Harbor, Washington 98250

National Park Service
650 Mullis Street
Friday Harbor, Washington 98250

San Juan County Public Works
915 Spring Street
Friday Harbor, Washington 98250

Federal Highway Administration
610 East Fifth Street
Vancouver, Washington 98661

Written comments may be submitted through the following websites: www.wfl.fhwa.dot.gov/projects/wa/cattlepoint or http://parkplanning.nps.gov/parkHome.cfm?parkID=340. Comments may also be submitted by mail or in person at the following addresses.

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Summary

Lead Agencies:	Federal Highway Administration - U.S. Department of Transportation
	National Park Service - U.S. Department of the Interior
Cooperating Agencies:	San Juan County, Washington
	Washington State Department of Natural Resources

Approximately 500 feet of the Cattle Point Road (road) located in the San Juan Island National Historical Park (park) is threatened by coastal erosion. Coastal wind and wave action is eroding the base of the bluff that supports the road. At current estimated rates of erosion, the bluff would become a concern for roadway failure in about 16 years; however, a large storm event could cause more rapid erosion. Failure of the road would cut off vehicular access to Cattle Point.

Cattle Point Road provides the only road access to the Cattle Point area, which includes lands within the park as well as state and privately-owned land on the southeast tip of the island. The road allows pedestrians, bicyclists, and visitors traveling by vehicle to enjoy the features of the area. It is also the only road access to private property at the southeast tip of the island, which is home to approximately 270 residents. The road is classified as a rural major collector. The portion of road in the project area is owned and maintained by San Juan County.

Western Federal Lands Highway Division of the Federal Highway Administration (FHWA) and the National Park Service (NPS) are considering realigning a section of the road away from the eroding bluff. The proposed project is located on San Juan Island in San Juan County, Washington.

Purpose

The purpose of this project is to maintain vehicular, bicycle, and pedestrian road access to the Cattle Point area through the San Juan Island National Historical Park. Maintaining this access includes continuing to provide a safe and pleasant roadway experience for residents and visitors without the threat of road failure from coastal erosion.

Need

The proposed project is needed because the only road access to the Cattle Point area of San Juan Island is threatened by coastal bluff erosion. Bluff erosion is predicted to become a concern for roadway failure in about 16 years.

This Draft Environmental Impact Statement (DEIS) documents an analysis of the potential environmental consequences of the proposed project. The following alternatives are evaluated in this document:

Alternative A: No Action

The existing use, maintenance, management, and other activities associated with the road and area would continue without change. This alternative is used as a baseline of current conditions to compare to other alternatives.

Alternative B: Hybrid Mid-Slope Realignment-*Preferred*

This alternative involves mid-slope realignment to the north of the existing road away from the bluff to increase the life expectancy of the road. This alternative has been identified as the preferred alternative.

Alternative C: Long Tunnel on Minor Realignment

This alternative involves a short realignment to the north of the existing road almost entirely within a bored tunnel to reduce the visual impacts of the realignment.

Alternative D: Mid-Slope Alignment with Short Tunnel

This alternative involves mid-slope realignment to the north of the existing road and utilizes a short tunnel to lower the road profile through the top of the ridgeline.

A number of other alternatives were considered but eliminated from further analysis as described at the end of chapter 2.

The FHWA and NPS are co-lead agencies for this project. The FHWA is involved because National Environmental Policy Act (NEPA) documentation and preliminary project planning is being funded through the Public Lands Highway Program of the Highway Trust Fund. The FHWA has stewardship and oversight responsibilities for funds disbursed from the Highway Trust Fund. In addition, the FHWA has expertise in developing transportation projects on federal lands. The park is involved with the project because the road is located within the park boundary, and the NPS is the land management agency for the park. Cattle Point Road is the major route used by visitors to access the park.

The Washington State Department of Natural Resources (DNR) and San Juan County (county) are cooperating agencies. The Cattle Point Natural Resources Conservation Area (NRCA), which is located on the eastern boundary of the park and is included in the project area, is managed by the DNR. The NRCA would be affected by any of the action alternatives. The portion of Cattle Point Road that is located in the project area is owned and maintained by the county, and provides access for county residents and visitors.

All three action alternatives (B, C, and D) address the purpose and need for the project with differing impacts to the natural, cultural, and recreational resources of the park; NRCA; and the island environment. Based on this evaluation of impacts in this document, alternative B is the "preferred alternative" of the FHWA and NPS.

Alternative B conforms to the agency management goals and values as described chapter 1. It minimizes impacts to natural and cultural resources of the park and NRCA while continuing to allow access to park features. It also provides residents with safe transportation between the Cattle Point area and the rest of the island without the threat of coastal erosion, while minimizing socioeconomic impacts and design complexity.

Alternative B has also been identified by the FHWA and NPS as the "environmentally preferred alternative." This is defined as the alternative that best meets the intent of NEPA. Each alternative presented, including the no action alternative, has positive and negative impacts to the human and natural environment. Alternative B provides the best balance of minimizing impacts to the biological and physical environment and meeting the responsibility the project must fulfill as described in NEPA.

The DEIS will be available for public review for 60 days following the date of the Environmental Protection Agency's (EPA) notice of availability (NOA) in the Federal Register.

The FHWA and NPS will respond to all substantive comments and make any necessary revisions to the document.

Following review, the DEIS and revisions will be used to prepare a Final Environmental Impact Statement (FEIS). However, if reviewers identify significant environmental impacts, the DEIS will be revised, and the review process will be repeated. Otherwise, the FEIS will be made available to the public and announced through a NOA in the Federal Register. Following the FEIS availability period, the co-lead agencies will decide to proceed with one of the following options:

1. Implement Alternative A, the No Action Alternative,
2. Implement the Preferred Alternative B, or
3. Implement another alternative with impacts that have been evaluated in this document.

The decision will be documented in a Record of Decision (ROD), which will be announced through a NOA in the Federal Register.

If an action alternative is selected for implementation, additional decisions would also be made regarding project implementation. These decisions would involve finalizing road design details and issues, funding and timing of construction, and identifying further opportunities to mitigate, minimize, or avoid impacts to resources.

Selection of an action alternative could require:

- Compliance with Section 4(f) of the Department of Transportation (DOT) Act of 1966 (chapter 5)
- DNR and county compliance with the State Environmental Policy Act (section 1.4.2)
- Conferencing with the U.S. Fish and Wildlife Service under the Bald and Golden Eagle Protection Act and Section 7 of the Endangered Species Act for effects to federally listed or protected species (chapter 6)
- Consultation with the Washington State Historic Preservation Officer under Section 106 of the National Historic Preservation Act (chapter 6)
- A National Pollutant Discharge Elimination System (NPDES) General Construction Permit from the U.S. Environmental Protection Agency (chapter 6)
- Coastal Zone Management Act consistency review from the Washington State Department of Ecology (WDOE) (chapters 3 and 6)
- Construction and permanent easement/ROWs from the park and DNR for construction and road relocation (chapter 3)
- Further project development and design refinement (chapter 2)
- Further development of mitigation measures and details (chapter 4)
- Development of a revegetation and monitoring plan (chapter 2, 3, and 4)
- Addressing operations and maintenance costs (chapter 2)

These requirements were identified through information gathering during the scoping effort and in development of this document. This effort involved outreach to other agencies, organizations, and the public. In addition to the requirements listed above, comments obtained through the scoping effort were focused on the need to maintain access for Cattle Point residents and on protection of natural, scenic, and recreational resources, including grassland and forest habitats, wildlife, and view-sheds. Specific concerns were raised regarding the park and DNR trail system.

A number of key resources in the Cattle Point area and issues related to the project are described in Section 1.5 of this document. Chapter 4 discusses the impacts related to these issues that have been identified in evaluation of the alternatives. The only major impact identified is the adverse impact to transportation presented by Alternative A, the no action alternative.

None of the alternatives is expected to affect waters of the U.S. Therefore, other than the NPDES compliance requirements, no permits would be required under the Clean Water Act. The area is designated as a Class II attainment area under the Clean Air Act; however, no special provisions apply.

This DEIS has been prepared to satisfy the requirements of the National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190, 42 U.S.C. 4321-4347, as amended), including the Council on Environmental Quality (CEQ) regulations found in 40 Code of Federal Regulations (CFR) 1500 -1508. This DEIS complies with the implementing procedures for NEPA for the FHWA (Environmental Impact and Related Procedures 23 CFR 771) and the NPS (Environmental Impact Analysis and Decision Making Director’s Order #12 NPS 2001). It also addresses the county and DNR issues and needs as identified through their involvement as cooperating agencies.

How to Use This Document

This document is organized as follows:

Chapter 1 contains the introduction, including a description of the project purpose and need, its location, the project team and history, and a summary of the issues associated with the project. .

Chapter 2 describes in detail the alternatives evaluated in this document. This includes a description of major features of each alternative and a brief comparison of the environmental consequences of each alternative. Also included are alternatives that were considered but eliminated from further analysis and the rationale for identifying the preferred alternative.

Chapter 3 describes the existing conditions of resources that may be affected by the project alternatives if they were implemented. The resource conditions described in this chapter represent the baseline information on which the environmental consequences of the alternatives are evaluated in chapter 4.

Chapter 4 describes the potential environmental consequences (effects/impacts) of each alternative on the relevant resources described in chapter 3. Mitigation measures proposed to avoid or minimize adverse environmental impacts are listed at the end of each section and summarized at the end of the chapter.

Chapter 5 explains Section 4(f) and describes the effects of the alternatives on section 4(f) resources.

Chapter 6 includes information regarding consultation and coordination for the project including agency and public involvement, applicable permits and approvals, and project funding.

Chapter 7 presents a list and credentials of the document preparers.

Following chapter 7 are a list of acronyms and abbreviations, a glossary of terms and a bibliography of references used in preparation of this document. The Appendices contain documents supporting the development of information in this DEIS.

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Chapter 1: Purpose and Need for Action

1.1 INTRODUCTION

The San Juan Island National Historical Park (park) of the National Park Service (NPS) and Western Federal Lands Highway Division (WFLHD) of the Federal Highway Administration (FHWA) propose to realign a portion of Cattle Point Road (road) on San Juan Island. Approximately 500 feet of road located near milepost (MP) 8.3 is currently threatened by coastal erosion. Alternatives to safely move the road away from the threatened area would require the construction of approximately 2,800 feet to 4,900 feet of new road.

The proposed project is located in San Juan County, Washington. The NPS is involved in the project because the majority of the proposed road realignment is within the park, which is managed by the NPS. The FHWA is involved because National Environmental Policy Act (NEPA) documentation and preliminary project investigation is being funded through the Public Lands Highway Program of the Highway Trust Fund. The FHWA has stewardship and oversight responsibilities for funds disbursed from the Highway Trust Fund. In addition, the FHWA has expertise in developing transportation projects on federal lands and the NPS requested FHWA assistance. To date, no funds have been appropriated for road construction. If a construction alternative is selected, agencies will seek funding for road construction following the NEPA decision.

Cattle Point Road provides the only road access to the Cattle Point area, which includes lands within the park as well as other public and private property on the southeast tip of San Juan Island. The Cattle Point Natural Resources Conservation Area (NRCA), managed by the Washington State Department of Natural Resources (DNR), is located on the eastern boundary of the park. The road allows pedestrians, bicyclists, and visitors traveling by vehicle to enjoy the features of the area. It also accesses private property at the southeast tip of the island, which is home to approximately 270 residents. The road through the project area is owned and maintained by San Juan County.

Figure 1.1 - View of Cattle Point Road and Project Area Looking East. Problem area is located at the top of the bluff near the end of the point.

Coastal wind and wave action is eroding the base of the bluff that supports the road near MP 8.3 (figure 1.1). At current estimated rates, bluff erosion would likely become a concern for roadway failure in about 16 years; however, a large storm event could advance the erosion. With continued erosion, traffic may be restricted to one lane for a period before complete road closure is required. Failure of the road would cut off vehicular access to Cattle Point, restricting area access to hiking trails, helicopter, seaplane, or boat.

This Draft Environmental Impact Statement (DEIS) documents the analysis of potential environmental consequences of maintaining road access to the Cattle Point area considering the threat of coastal erosion to the existing road. The DEIS evaluates the no action alternative (alternative A) and three action alternatives (alternatives B, C, and D) to reconstruct the road.

The analysis in this document complies with the provisions of NEPA, which requires that federally-funded programs consider the environmental impacts (including social and cultural) of their proposed actions. Based on a preliminary review of the proposed project, the FHWA and NPS have determined that an Environmental Impact Statement (EIS) should be prepared. This EIS complies with the NEPA implementing procedures for the FHWA (Environmental Impact and Related Procedures, 23 Code of Federal Regulations [CFR] 771) and the NPS (Environmental Impact Analysis and Decision Making, Director's Order 12 NPS 2001a). Per the CEQ regulations for implementing NEPA, the intent of this report is to present and describe the environment of the area(s) to be affected or created by the alternatives under consideration (40 CFR 1502.15).

Four agencies comprise the project team. The FHWA and NPS are the lead agencies for the proposed project, and San Juan County (county) and the DNR are cooperating agencies. The lead agencies have the responsibility for developing the project, including NEPA compliance and selecting an alternative, while the cooperating agencies are involved as partners in developing the project and providing input. In addition to meeting the statutory and regulatory needs of the NPS and FHWA, this document also addresses county and DNR issues and needs as identified through their involvement as cooperating agencies.

1.2 THE PROPOSED PROJECT

Through project "scoping," or gathering of information prior to drafting an environmental document, the project team identified the specific problem, addressed why the problem was important, and identified related issues and concerns to be considered in the analysis. Through this effort, the team identified the importance of the access provided to Cattle Point and determined why and how the project would be proposed.

1.2.1 Purpose

The purpose of this project is to maintain vehicular, bicycle, and pedestrian road access to the Cattle Point area through the San Juan Island National Historical Park. Maintaining this access includes continuing to provide a safe and pleasant roadway experience for residents and visitors without the threat of road failure from coastal erosion.

1.2.2 Need

The proposed project is needed because the only road access to the Cattle Point area of San Juan Island is threatened by coastal bluff erosion. Bluff erosion is predicted to become a concern for roadway failure in about 16 years. Failure of the Cattle Point Road would result in loss of road access to the east end of the Cattle Point peninsula.

Cattle Point Road is the primary link between the privately-owned residences in the Cattle Point and Cape San Juan residential areas and the town of Friday Harbor (the main town on the island), as well as to the rest of San Juan Island. San Juan Island is a popular retreat for vacationers, retirees, and those seeking a relaxed lifestyle.

Cattle Point Road is managed by San Juan County and the National Park Service (NPS), depending on land ownership. The portion of the road north of the park boundary is owned and maintained by the county. From the park entrance eastward, the road is maintained by the county on lands owned by the park and DNR. The county retains a right-of-way (ROW) on park land from Pickett's Lane east to the DNR boundary. Within the park, county maintenance is performed through an informal agreement between the county and NPS.

1.3 LOCATION

The proposed project is located on a part of Cattle Point Road at the southern tip of San Juan Island in San Juan County, Washington (figure 1.2). Cattle Point Road begins at the intersection with Mullis Street and Argyle Avenue just south of the town of Friday Harbor and extends southeast through rural county and private land to the park entrance. The road then passes through the park for 3.5 miles to the project area. From here, the road leaves the park and passes through a small portion of the Cattle Point NRCA before ending in the Cape San Juan residential area. The entire road, from the intersection with Mullis Street/Argyle Avenue to Cape San Juan, is 9.5 miles long.

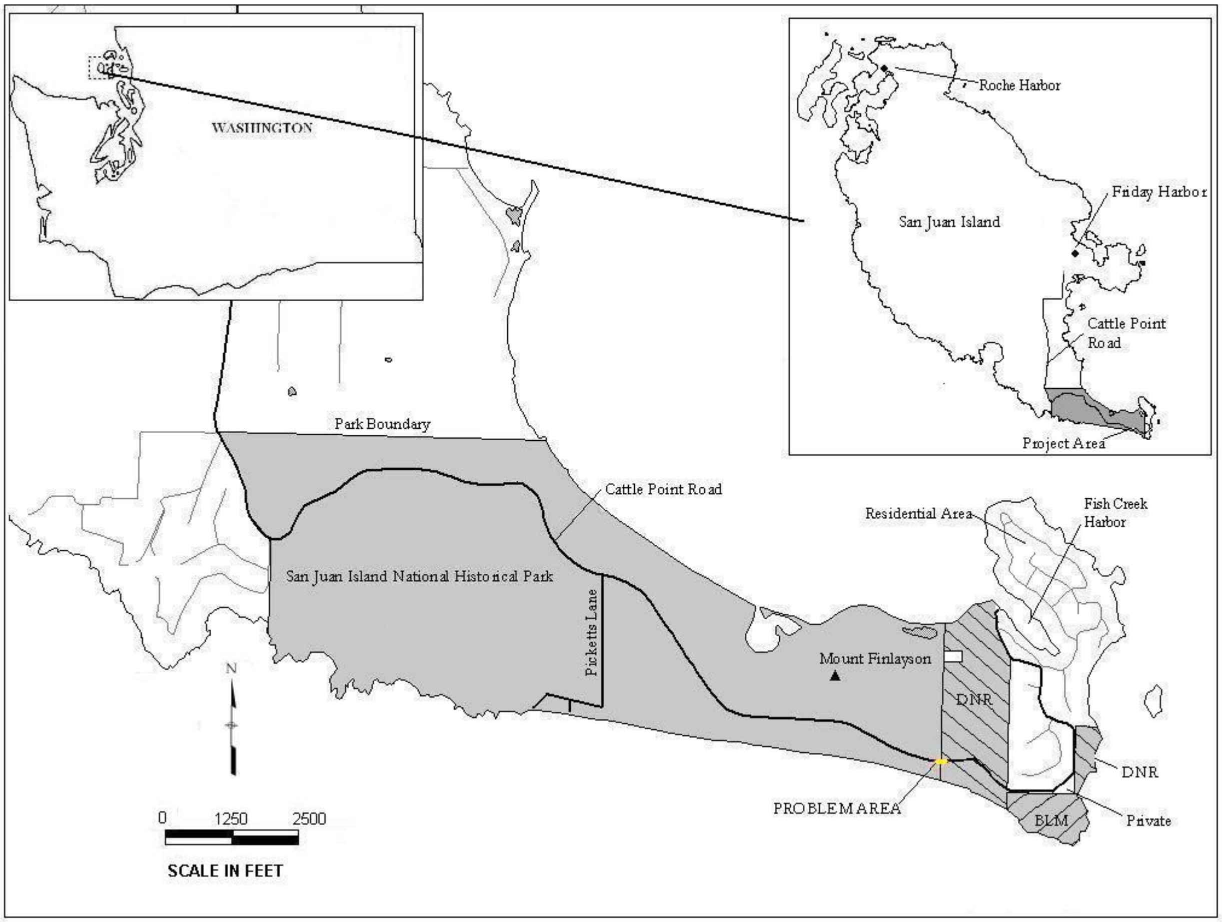


Figure 1.2 - Cattle Point Road Project Location

The 500-foot section of road threatened by bluff erosion is located within the park and extends along a curve in an east-west direction near milepost (MP) 8.3. This section of road is located on the south slope of the Mt. Finlayson ridgeline.

The project area includes the immediate vicinity of the proposed alternatives and the areas that could be directly impacted by construction (figure 1.3). The NRCA is located directly east of the threatened road section and would be affected by all of the action alternatives. The Cattle Point and Cape San Juan residential areas are located east and north of the NRCA. No homes would be directly impacted by construction of proposed alternatives.

Figure 1.3 - Project Area and Land Ownership

Cattle Point is dominated by the ridgeline of Mt. Finlayson. The south side of the ridge contains open grassland, while the north side is primarily mature coniferous forest. The Cattle Point area includes a variety of natural habitats. These include undeveloped rocky shorelines with scenic vistas; rich marine habitat supporting a broad diversity of aquatic plants and animals; grasslands; dunes; old-growth remnants and mature forests of Douglas fir, western red cedar, Sitka spruce, and western hemlock; freshwater wetlands; steep coastal bluffs; and intertidal lagoons. Wildlife is abundant in the area and includes a diverse variety of marine and terrestrial species. In addition to being an important and unique natural area, Cattle Point offers outstanding views of the Olympic and Cascade Mountains and the surrounding islands.

The Cattle Point area contains land owned by the NPS, Bureau of Land Management (BLM), DNR, and private individuals. The American Camp unit of the San Juan Island National Historical Park encompasses most of the Cattle Point peninsula. At 1,223 acres, it includes the historical area, lagoons, Mt. Finlayson, and shoreline.

The park is bordered on the east by the Cattle Point Natural Resource Conservation Area (NRCA), which is managed by the DNR. The 112-acre NRCA consists of two waterfront parcels. The larger parcel is located in the project area. It includes waterfront on the Strait of Juan de Fuca and extends across the Mt. Finlayson ridge to Griffin Bay. The smaller parcel is on the east end of Cattle Point and includes a day use recreation area and interpretive site.

The NRCA contains many of the unique features of Cattle Point, including the undeveloped rocky shorelines, grassland, mature forests, steep coastal bluffs, and a rare high-salinity salt marsh. It provides protection for a variety of state-priority habitats and species, geologic features, and outstanding scenic vistas. Primitive outdoor recreation opportunities such as hiking trails and viewpoints exist throughout the site.

The BLM property is a 27-acre parcel located at the south end of Cattle Point. The property contains a small network of trails, interpretive panels, and a kiosk as well as a working lighthouse owned and operated by the U.S. Coast Guard. A pullout on Cattle Point Road, about 0.5 miles east of the project area, is the head of a popular trail leading to the lighthouse.

The eastern end of Cattle Point consists of the Cattle Point Estates and Cape San Juan residential areas. The housing developments include approximately 150 lots, some of which have not been developed. Currently, these developments are home to approximately 270 permanent and seasonal residents.

Table 1.1 - Cattle Point Area Land Ownership

Owner or Jurisdiction	Acres
National Park Service (San Juan Island NHP-American Camp Unit)	1,223
Washington State DNR (Cattle Pt NRCA)	112
Bureau of Land Management	27
County and Private Lands	220 (est.)

1.4 THE PROJECT TEAM

An interdisciplinary project team (team) was formed to identify the purpose and need for the project, develop possible solutions (alternatives), identify the resources in the area that might be impacted by the project (affected environment), and thoroughly evaluate potential project impacts (environmental consequences).

The FHWA and NPS are co-lead agencies for this project.

The NPS is involved because the road is located within the park boundary, and the NPS is the land managing agency for the park. Cattle Point Road is the major route used by visitors to access the park.

The FHWA is involved because project NEPA and preliminary planning is being funded through the Public Lands Highway Program of the Highway Trust Fund. The FHWA has stewardship and oversight responsibilities for funds disbursed from the Highway Trust Fund. In addition, the FHWA has expertise in developing transportation projects on federal lands.

Under an interagency agreement, the FHWA is responsible for a majority of the road design and construction, while the NPS is responsible for planning and protection of the environment and park values. Through the Cattle Point project agreement, the FHWA has been assigned the responsibility for developing the NEPA document and providing design and engineering services. The FHWA and NPS have worked together in project development and resource studies. Should an action alternative be selected, the FHWA will work with the NPS to obtain permits and will solicit and administer the construction contract.

The DNR and San Juan County are involved as cooperating agencies because state and privately-owned land is accessed by the road. The county owns and maintains the threatened section of road and the DNR owns property at the eastern end of the project area.

1.4.1 Agency Mission and Goals

The mission and goals of the lead and cooperating agencies provide direction for managing their resources and determining their interests with respect to the proposed project. These interests influence how alternatives are identified and evaluated in developing this project because they reflect what is important to each agency involved. This section details the primary management responsibilities and goals of the agencies represented on the project team.

San Juan Island National Historical Park

San Juan Island National Historical Park was established in 1966 to interpret and commemorate the historic events that occurred from 1853 to 1874, culminating in the peaceful arbitration of an international boundary dispute between the United States and Great Britain. The park also protects significant natural resources, many of which played a role in the human history of the area. The park possesses significance extending beyond single properties or buildings, as recognized by its designation as a National Historic Landmark.

As a unit of the National Park System, park management is derived from the National Park Service Organic Act (1916) (16 USC 1). The mission of the NPS is to promote and regulate the use of the national parks and to conserve the scenery, the natural and historic objects, and wildlife for the enjoyment of future generations.

The park uses current management practices, systems, and technologies to accomplish the NPS mission and park goals. The *San Juan Island National Historical Park Final General Management Plan and Environmental Impact Statement* (NPS 2008) details how these goals are transferred to managing resources and activities occurring in the park.

Federal Highway Administration

The mission of the Federal Highway Administration (FHWA) is to improve mobility on the nation’s highways through national leadership, innovation, and program delivery. The Office of Federal Lands Highway is a part of the FHWA. Federal Lands Highways provides program stewardship and transportation engineering services for planning, design, construction, and rehabilitation of the highways and bridges that provide access to and through federally owned lands. The Western Federal Lands Highway Division (WFLHD) operates as part of the Federal Lands Highway Program, serving the needs of Oregon, Washington, Idaho, Montana, Alaska, and Yellowstone and Grand Teton National Parks in Wyoming.

San Juan County

San Juan County government goals include providing public services necessary for the health, safety, and general well-being of the citizens of San Juan County while striving to preserve the heritage of the islands, both environmentally and culturally (www.sanjuanco.com).

Washington State Department of Natural Resources

The Cattle Point NRCA is managed by the Washington State Department of Natural Resources (DNR). The mission of the DNR is to provide professional stewardship of state lands and natural resources as well as provide leadership in creating a sustainable future for the state-trust lands.

Natural Resources Conservation Areas (NRCA) are managed under the Washington Natural Areas Program. The Natural Areas Program was created by the state legislature in 1987 to protect special areas of statewide significance. NRCAs were established for their outstanding scenic and ecological values and to provide opportunities for education and low-impact public use where appropriate (www.dnr.wa.gov).

1.4.2 Agency Jurisdiction

The project team is comprised of federal, state, and county agencies whose planning requirements and regulations must all be considered in project development. Project planning is federally funded and led by the FHWA and NPS. Federal projects are exempt from state and local laws such as state threatened and endangered species regulations and local ordinances that do not have a regulatory connection to a federal law. Since the state owns land that would be affected by the proposed project alternatives and since NPS management policies require the agency to consider state-listed rare, threatened, or endangered species, these issues will be considered in this analysis.

State and local agencies must comply with the Washington State Environmental Policy Act (SEPA), Revised Code of Washington (RCW) 43.21C. SEPA requires state and local agencies to consider the likely environmental consequences of a proposal before approving or denying it. SEPA requirements are similar to NEPA and have been considered in the development of this project and DEIS. Following a decision by the lead agencies and completion of the NEPA process, supplementary compliance would be conducted by the county and DNR. The county would have lead responsibility for SEPA compliance.

Figure 1.4 - Roadway Approaching the Eroding Bluff Area

1.5 KEY ISSUES AND DECISIONS TO BE MADE

1.5.1 Key Issues

An issue is a concern that could have an effect on a physical, biological, social, or economic resource. A number of issues related to the project were identified during project scoping, public involvement, and agency effort. These issues were used to determine the relevant resources to be analyzed in detail in the DEIS. These resources are described in detail in chapter 3. Effects to these resources from proposed alternatives are described in chapter 4.

Recreational Use – Cattle Point Road provides access for bicyclists, pedestrians, and vehicles to enjoy the natural features of the area. Combined with the trail system, the road allows users to enjoy the features of the park, NRCA, and Cattle Point area, including Mt. Finlayson, the shoreline, the grassland, and the forested north side of the ridge. Public comments reflected the importance of maintaining the trail system and natural resources that people travel to the area to enjoy. These issues are discussed in the Visitor Uses, Trail System, and Transportation sections.

Transportation Needs – Cattle Point Road is a key resource for meeting the transportation needs for both visitors and residents of the Cattle Point area. A number of public comments stressed the importance of the road for transportation to residences on Cattle Point. Providing transportation access is also a priority for the county and FHWA as reflected in their agency mission and goals. These issues are discussed in the Transportation and Socioeconomic sections.

Socioeconomics – Wise use of taxpayer money is of concern to the public and government agencies. Ideas and concerns were expressed by the public and agencies related to the cost of project alternatives and the potential benefits to the economy of the island. These issues are discussed under the Socioeconomics section. Costs of the alternatives are discussed in chapter 2.

Access to Essential Services – The road provides access for Cattle Point residents to essential services such as healthcare and emergency services. Some public comments stressed the importance of this access. These issues are discussed in the Public Health and Safety section.

Visual Quality – The view-sheds from the road, park, trail system, residential area, and other natural areas are important features of the Cattle Point environment. Many NPS, DNR, and public comments stressed the importance of the visual quality of the area. These issues are discussed under the Visual Quality and Cultural Landscape sections.

Historic and Cultural Resources – The important historic and cultural resources of the area were the basis for establishment of the national park. Portions of the project area can be viewed from the historic area of the park. American Indian tribes are concerned about the potential effects of the project on traditional properties. These issues are discussed under the Cultural, Historic, and Archaeological Resources section.

Geologic Features – One of the key features of the Cattle Point area is the natural benches formed by the glacial rebound process. NPS and public comments mentioned the importance of this feature. These issues are discussed under the Topography and Geology sections.

Natural Environment – The natural environment of Cattle Point includes rare prairie grassland, mature coniferous forest, freshwater lagoons, coastal shoreline, and near-shore marine waters. These habitats support a number of plant and wildlife species. The natural features of the area and preservation of biological diversity are important values of the NRCA and are of great importance to the mission of the park. Several NPS, DNR, and public comments stressed the importance of the natural elements of the area including the bald eagle, island marble butterfly, and native prairie. These issues are discussed in the Vegetation, Wildlife, and Threatened and Endangered Species sections.

1.5.2 Decisions to be Made

The decisions to be made as the result of this analysis are whether to:

- Implement, Alternative A, the no action alternative,
- Implement the preferred Alternative B, or
- Implement another alternative (C or D) evaluated in this document.

If an action alternative (B, C, or D) is selected, additional decisions would be made regarding final road design and funding of construction; refining mitigation measures; and finalizing a revegetation and restoration plan.

1.6 LAWS, REGULATIONS, AND POLICIES

The following laws, regulations, and policies are applicable to the development and analysis of the alternatives in this DEIS.

1.6.1 National Environmental Policy Act

This DEIS has been prepared in accordance with the National Environmental Policy Act (NEPA), enacted in Title 42 of the United States Code, 4321 et. seq. Regulations implementing NEPA are established by the President’s Council on Environmental Quality (CEQ) (40 CFR Parts 1500 to 1508). CEQ regulations establish the requirements and processes for agencies to fulfill their obligations under the act.

The National Park Service is part of the Department of Interior, whose regulations for implementing NEPA are found in Part 516 of the Department of Interior Departmental Manual. NPS guidelines for implementing NEPA are further described in the NPS Director’s Order 12: *Environmental Impact Analysis and Decision Making*.

Western Federal Lands Highway Division is part of the Federal Highway Administration, whose regulations for implementing NEPA are found in 23 CFR 771, with further guidance in FHWA Technical Advisory T6640.8a.

1.6.2 1970 National Park Service General Authorities Act (amended in 1978 – Redwood amendment)

This act prohibits the National Park Service from allowing any activities that that would detract from the values and purposes for which the parks have been established (except as directly and specifically provided by Congress in the enabling legislation for the parks). The National Park Service has established management policies for all units under its stewardship to clarify its responsibilities under these laws and regulations.

1.6.3 National Park Service Management Policies (2006)

The NPS 2006 Management Policies govern how park managers make decisions on a wide range of issues. It specifies that park roads will be well-constructed, sensitive to natural and cultural resources, reflect the highest principles of park design, and enhance the visitor experience. It also specifies that park roads are generally not intended to provide fast and convenient transportation; rather, they are intended to enhance the quality of a visit while providing for safe and efficient travel, with minimal or no impacts on natural and cultural resources.

Park road designs are subject to NPS Park Road Standards, which are adaptable to each park's unique character and resource limitations. Although some existing roads do not meet current engineering standards, they may be important cultural resources whose values must be preserved.

1.6.4 National Park Service Directors Order 87A: Park Road Standards (NPS 1984)

This guidance states that the quality of the park experience must be the primary concern in providing roads. Consequently, park roads are designed with extreme care and sensitivity with respect to the terrain and environment through which they pass and are laid lightly onto the land.

1.6.5 Regulatory Compliance Requirements

Selection of an action alternative would require:

- Compliance with Section 4(f) of the Department of Transportation Act of 1966
- DNR and county compliance with the State Environmental Policy Act
- Possible consultation with the U.S. Fish and Wildlife Service under the Bald and Golden Eagle Protection Act and Section 7 of the Endangered Species Act for effects to listed species
- Consultation with the Washington State Historic Preservation Officer (SHPO) under Section 106 of the National Historic Preservation Act
- National Pollution Discharge Elimination System (NPDES) General Construction Permit from the U.S. Environmental Protection Agency
- Coastal Zone Management Act consistency review from the Washington State Department of Ecology (WDOE)
- Construction and permanent easement/ROWs from the park and DNR for construction and road realignment
- Development of a revegetation plan

None of the alternatives is expected to involve fill into waters of the U.S.; therefore, a Section 404 permit would not be required. The area is designated as a Class II attainment area under the Clean Air Act; however, no special provisions would apply.

If an action alternative is selected, the requirements and mitigation measures in the EIS will be followed during the project refinement and construction process. This document would be revisited if, at any point, new information is discovered that would affect the decisions made or substantially change the effects described.

Chapter 2: Alternatives

2.1 INTRODUCTION

This chapter presents the alternatives evaluated during the EIS planning process. The following alternatives are described in detail:

- Alternative A: No Action
- Alternative B: Hybrid Mid-Slope Realignment
- Alternative C: Long Tunnel on Minor Realignment
- Alternative D: Mid-Slope Alignment with Short Tunnel

Alternative B is the FHWA and NPS preferred alternative.

This chapter also includes a discussion of how the alternatives were developed and alternatives that were evaluated but eliminated from further consideration. Following the alternative descriptions, a summary table displays the environmental effects of each alternative. Further detail on environment effects is presented in chapter 4.

2.2 ALTERNATIVE DEVELOPMENT

The project alternatives were developed through an interdisciplinary process based on the expertise of planning team members representing the FHWA, the NPS, the DNR, and San Juan County (county) as well as from scoping with interested publics, tribes, and other agencies.

The project team developed alternative methods of meeting the project purpose and need through interdisciplinary discussions and public input. A broad range of possible solutions was considered. During early scoping, the team narrowed the project concepts down to land-based road alternatives, at which time they identified five road corridors for consideration. The corridors consisted of broad areas of land with similar resources and similar environmental effects for analysis. The concept was used to guide the development of numerous potential alternatives within each corridor.

The corridor concept and preliminary alternatives within these corridors were presented at a public scoping meeting on February 18, 2004. It was emphasized that the corridors were broad concepts and that the alternatives were preliminary proposals which the team had developed at that point in the planning process. The corridors included concepts such as alternate road alignments as well as a build-in-place bridge, slope stabilization, and a tunnel option. A total of eight broad alternatives were presented, with possible variations within each alignment. Public attendees were encouraged to devise and submit additional alternatives or comment on the proposals developed by the project team. Based on public comments and interagency discussions, the project team recommended that some of the early proposed alternatives be eliminated from further consideration.

Early in the planning process, a second bluff erosion site located east of the DNR property along Cattle Point Road was also considered for inclusion in this project. Geotechnical analysis determined that the life span of this section of road is at least 50 years; therefore, this section was dropped from consideration for reconstruction under the current project. None of the proposed action alternatives in this DEIS would preclude or influence a future project on this section of the road should it become necessary.

Following public release of the Cattle Point Road EIS Scoping Document in June 2003, the project team began further evaluation of the preliminary alternatives. The team considered the preliminary alternatives and their likely environmental impacts and benefits. The evaluation assessed the features of the no action, the hybrid alignment, the long tunnel, and the short tunnel alternatives (now alternatives A, B, C, and D respectively), then balanced impacts with cost. Through this analysis it was determined that the hybrid alternative provided the best combination of meeting project purpose and need while minimizing impacts to the natural and human environment. As a result, the team identified alternative B as the preferred alternative.

2.3 TERMINOLOGY USED IN ALTERNATIVE DESCRIPTIONS

The alternatives are described and compared using terms that are defined below.

Area of Temporary Disturbance

The area of temporary disturbance refers to the land area that would be affected during construction of an alternative. It includes the roadway itself, cut and fill slopes, and any other disturbance necessary to construct the road. Except for the actual paved road area, this area would be revegetated following construction.

Area of Permanent Disturbance

The area of permanent disturbance refers to the surface area of roadway within the project area that would be paved. For action alternatives, it is assumed that the existing roadway would be obliterated and the new roadway would be rebuilt in a new location. Please note that a tunnel is a subsurface feature, so the road within the tunnel is not included in the area of permanent disturbance. Obliterated roadway would be restored to the natural contours of the surrounding landscape and revegetated; it would also not be included in this area.

Construction Cost (2009 dollars)

Construction cost is a feature that indicates the size and complexity of an alternative, including the construction effort involved and its feasibility. This rough estimate of construction cost includes building the project, obtaining material, and administering the contract. The additional costs of working in the island environment were taken into consideration, but these can be highly variable. This estimate does not include further project design or future maintenance costs.

Earthwork

Earthwork is the amount of earth that needs to be added or removed from the project area to construct an alternative. It is used to estimate the amount of construction effort necessary for an alternative, including offsite impacts related to the project. When a road is built, construction equipment is used to move earth, including soil, gravel, and rock, to create a level road surface. Where earth is removed, it is called a cut. Where earth is added, it is called a fill. The related terms “cut slope” and “fill slope” refer to the uphill or downhill slopes adjacent to the road that result from these cuts and fills.

Some of the earth removed in cuts can be used in fills to reduce the need to transport the material to or from a project. When material can generally be conserved within the project area, the term “balanced” is used for the project.

When excess material is generated from a project, a “waste site” is required. When additional material is needed for construction, a “material source” is required. Transporting material to and from these locations requires large trucks. These trucks, along with waste sites and material sources, produce impacts to the natural and human environment outside of the project area. To illustrate the amount of offsite impacts to other island resources, the alternatives include a rough estimate of the number of truckloads of transported material involved in the construction activities. A truckload is assumed to have a capacity of 10 cubic yards.

Grades

Grades are a feature used to describe the vertical rise and fall rates of the alternatives. Steeper grades create an impediment to large trucks, reduce sight distance for vehicles, and pose safety issues during adverse weather. Steep grades may also create an obstacle for bicyclists.

Grades are subjectively defined as flat, rolling, or steep based on the frequency and height of hills. Maximum grades are given based on rough design alignments. Figure 2.1 illustrates relative grades.

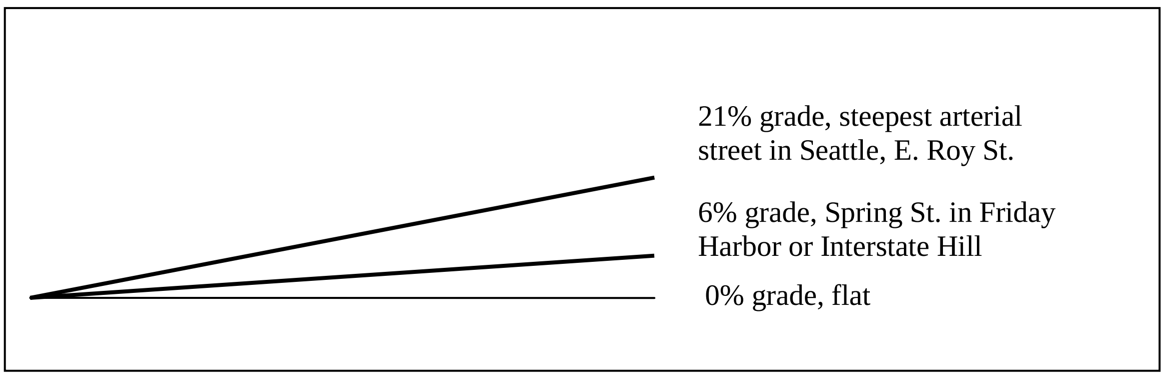


Figure 2.1 - Relative Grades

Implementation Time

Implementation time is the estimated total time needed to design and construct an alternative after full project funding is obtained.

Operating and Maintenance Costs (2009 dollars)

Operating and maintenance costs are the yearly costs to operate and maintain the alternatives. To preserve roadway function, annual maintenance is required on roadway drainage, roadside vegetation, and paved surfaces. Additionally, the tunnels would require substantial operational costs for lighting, as well as fire safety and ventilation systems for the long-tunnel option. There are also maintenance and cleaning costs associated with tunnel systems. The road within the tunnel would require pavement surface maintenance and some cleaning, though vegetation and drainage maintenance costs would not apply.

Predicted Life Span

Predicted life span is a measurement to help determine whether an alternative meets the purpose and need for the project. The measurement is indicated by the estimated number of years (based on the horizontal bluff retreat rate of 1 to 3 feet discussed in chapter 3) it would take for bluff erosion to reach the south edge of the road and create an imminent threat to the stability of the road. Alternatives must meet a life span of at least 50 years in order to meet the purpose and need of the project and to provide an adequate distance from the bluff to effectively remove the threat of erosion. The baseline year for this estimate is 2005. When the lifespan calculation is based on the slow erosion rate and results in an excessively long time span, the number will also include the term "or more" or plus (e.g., 150+ years).

Retaining Walls

Retaining walls are used to hold back earth materials to obtain a level surface for the road. Since they provide a vertical wall, they are beneficial in reducing the need for large cuts and fills that may disturb large areas of land. Like cuts and fills, walls can have aesthetic impacts and create separation between ecosystems. The length and height of walls indicates the level of disturbance an alternative would have.

Retaining walls are described by maximum height and approximate length. Road design and soil information would determine the actual location and size of the walls (figure 2.2).

Figure 2.2 – Examples of Retaining Walls. Left wall is 10 to 15 feet in height, well vegetated. Right wall is 3 to 6 feet in height with less vegetation

Road Cuts/Fills

Road cuts/fills indicate the maximum height of roadside cuts and fills required for each alternative and indicate the degree of disturbance adjacent to the roadway. Large cuts and fills have aesthetic impacts and can create separation between ecosystems.

Figure 2.3 – Example Fill to the Left of the Roadway and Cut to the Right of the Roadway. Both exceed 40 feet in height

Subjective terms are used to describe the maximum height of road cuts and fills.

> Extensive – occurring throughout the road realignment (though likely at much less height); or,
>
> Localized – occurring at few locations on the alignment.

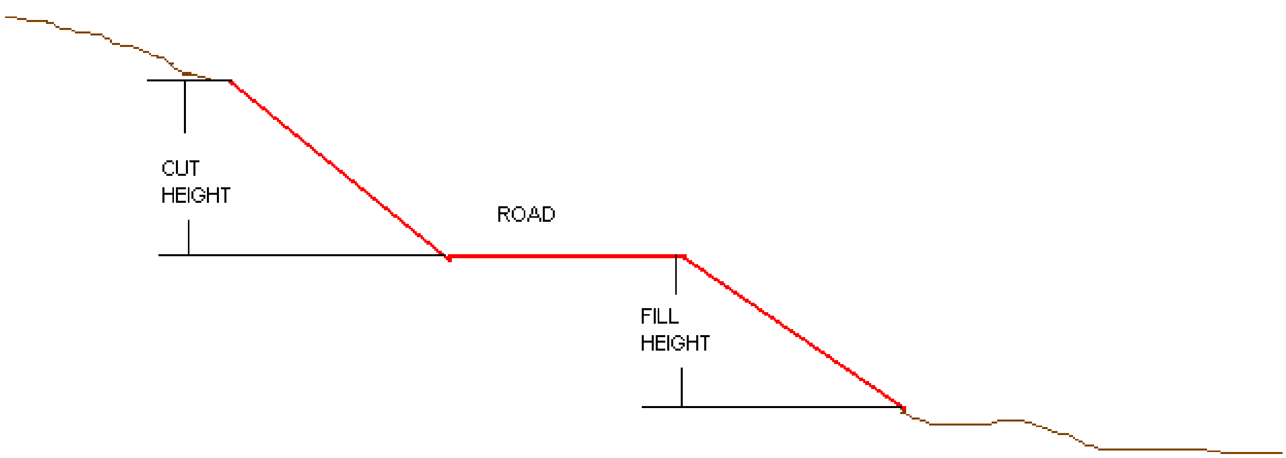


Figure 2.4 - Diagram of Cut and Fill Illustrating Height Measurements

Road Length

There are two measurements of length to consider for the project:

> **The overall road length** is the length of the alternative within the boundaries of the project limits, from the beginning of the project to the end of the project on project plans and maps. This length includes the existing road alignment as well as the new alignment. The existing road alignment is the transition area needed to connect the existing roadway with the new alignment. The roadway within the transition area would be reconstructed in its current location by repaving and raising the grade as needed to make a smooth connection with the new alignment. Raising the road grade would increase the road footprint, resulting in a small amount of new ground disturbance adjacent to the existing roadway.
>
> **The length of new alignment** is the portion of the alternative that does not follow the existing road, and illustrates the extent of new construction and new ground disturbance.

2.4 DESCRIPTION OF ALTERNATIVES

The following table summarizes the alternatives analyzed and their comparative features:

Table 2.1 - Summary of Road Features by Alternative

Feature \ Alternative	A (No Action)	B (Hybrid Mid-Slope Realignment)	C (Minor Realignment with Long Tunnel)	D (Mid-Slope Alignment with Short Tunnel)
Overall Project Length	**5,060 feet**	**6,050 feet**	**3,150 feet**	**5,800 feet**
New Alignment Length	**N/A**	**4,950 feet**	**2,830 feet (includes 1,600 feet in tunnel)**	**4,700 feet (includes 775 feet in tunnel)**
Grades	**Rolling, to 6%**	**Hilly, to 10.5%**	**Rolling, to 7%**	**Rolling, to 8%**
Earthwork	**N/A**	**Likely Balanced**	**4 to 5,000 loads**	**Likely Balanced**
Maximum Road Cut/Fill Height	**20/10 feet Extensive**	**30/30 feet Extensive**	**90/0 feet Localized**	**50/50 feet Extensive**
Retaining Walls - Max. Height/Length	**None**	**Minimal or None**	**20/800 feet**	**20/800 feet**
Total Temporary Disturbance	**N/A**	**17 acres**	**10 acres**	**20 acres**
Total Permanent Disturbance	**3 acres (Existing Pavement)**	**3 acres**	**1 acre**	**3 acres**
Implementation Time (Design and Construction)	**N/A**	**2 to 3 years**	**3.5 to 5 years**	**3.5 to 5 years**
Predicted Life Span	**16 years**	**105+ years**	**115+ years**	**155+ years**
Operating and Maintenance Cost	**$10,000/year**	**$10,000/year**	**$65,000/year**	**$35,000/year**
Construction Cost	**N/A**	**$5 to 8 million**	**$55 to 65 million**	**$30 to 40 million**

The action alternatives (B, C, and D) considered in this document all provide an estimated minimum life span of over 100 years and effectively satisfy the need for the project by removing the threat of coastal bluff erosion for the foreseeable future. To varying extents, they also meet the purpose of the project by maintaining safe and pleasant vehicle, bicycle, and pedestrian access to the Cattle Point area.

With all action alternatives, the abandoned road segment would be restored by removing the road pavement, decompacting the road base, reshaping the roadbed to blend with the surrounding landscape, and planting the obliterated road template with native vegetation. The amount of restoration work would vary by alternative depending on the length of road abandoned. The estimated features and costs shown in table 2.1 include restoration of the abandoned road alignment.

For all the action alternatives (B, C, and D), bluff erosion would eventually remove a portion of the restored abandoned road alignment. However, during the next 25 to 80 years, the eroded area would be small (less than 500 feet) compared to the total area restored (3,800 to 5,100 feet). Erosion of the bluff may continue to remove the restored abandoned road area beyond that time period; however, since the abandoned road alignment curves away from the bluff, very small sections would be lost over a long period of time. It is difficult to predict the extent and rate at which the restored abandoned road segment would be removed by coastal bluff erosion over the long term.

2.4.1 Alternative A: No Action

This alternative would continue present road management activities. Cattle Point Road currently provides an adequate level of service for both existing and predicted future traffic conditions for visitors and residents (Shannon Wilbur, San Juan County, personal communication, email September 26, 2009). Under this alternative, no work would be undertaken to address bluff erosion. Current maintenance activities would continue.

The existing roadway features are (approximately):

Overall Project Length:	5,060 feet (existing)
Length of New Alignment:	Not Applicable (N/A)
Grades:	Rolling to 6% maximum (existing)
Earthwork:	N/A
Road Cuts/Fills:	N/A
Retaining Walls:	N/A
Area of Temporary Disturbance:	N/A
Area of Permanent Disturbance:	3 acres (existing pavement)
Implementation Time:	N/A
Predicted Life Span:	16 years
Operating and Maintenance Costs:	$10,000/year
Construction Cost:	N/A

There would be no construction costs associated with this alternative. Road maintenance activities would continue- including providing adequate drainage, road sweeping and cleaning, mowing, regular light road resurfacing, pavement striping, and repairing road structure failures such as potholes. No major problems currently exist along the road; therefore, maintenance costs for the approximately one-mile stretch of road within the project area would be similar to other county roads at about $10,000 per year (Russ Harvey, San Juan County Public Works, personal communication, email, May 6, 2008).

The existing road provides a pleasant traveling experience for visitors. There are panoramic views of the Strait of Juan de Fuca, the Olympic Mountains, and other islands in the area. The road accesses a widely-used trail system and is popular for bicyclists, pedestrians, and moped users enjoying the features of the park and NRCA.

Current vehicle traffic is relatively light and existing sight distances are adequate, which minimizes the hazard of the narrow road shoulders for mopeds, bicycles, and pedestrians. One crash between a moped and vehicle was reported just west of the project area (MP 6.78) in 2006. However, the cause of the accident was vehicle-driver error. No other accidents have been reported between these road users.

In the future, as bluff erosion encroaches on the roadway, access along this 500-foot section of road may be limited to one-way traffic for an interim period, depending on how rapidly the erosion progresses. Providing continued vehicle access through the impaired or closed road would involve additional road maintenance costs. A catastrophic road failure could pose a considerable safety threat to anyone traveling the road if it occurred before the road could be properly signed or closed.

Bluff erosion would eventually close the road. This would cut off road access to a small portion of the park, the NRCA, the BLM property, and residences in the Cattle Point and Cape San Juan residential areas and would result in a number of long-term impacts. Residents would no longer have vehicular access to the rest of the island, including the ferry terminal at Friday Harbor. Access would continue to be available for pedestrians through the trail network, for boats through private docks, and by air via helicopter or float plane.

Should catastrophic bluff erosion cause the road to be closed, vehicle access would be restored to Cattle Point residents on an emergency basis. Because this type of emergency road repair would not require full environmental clearance, it could result in impacts to the resources in the immediate area. An emergency repair would likely be a temporary solution with potential road safety, access, and stability issues. Although not considered to be within the scope of the no action alternative, any repairs needed to restore safe and secure road access following the road closure would result in a substantial expense of time and money.

2.4.2 Alternative B: Hybrid Mid-Slope Realignment (Preferred Alternative)

Alternative B involves mid-slope realignment of the Cattle Point Road to the north, approximately 300 feet away from the eroding bluff, to increase the life expectancy of the road. The alignment is a compromise between minimizing disturbance to protect resources and providing safe and feasible road access for visitors and residents. The following figures are approximate.

Overall Project Length:	6,050 feet
Length of New Alignment:	4,950 feet
Grades:	Hilly, to approx 10.5%
Earthwork:	Likely balanced
Road Cuts/Fills:	30 feet/30 feet, extensive
Retaining Walls:	Minimal or none
Area of Temporary Disturbance:	17 acres
Area of Permanent Disturbance (New Pavement):	3 acres
Implementation Time:	
Design:	1 year
Construction:	1 to 2 years
Total:	2 to 3 years
Predicted Life Span:	105+ years
Operating and Maintenance Cost:	$10,000/year
Construction Cost:	$5 to 8 million

The preliminary alignment for alternative B is shown on figure 2.5. The project would begin about 0.65 miles east of the Pickett's Lane intersection. At the beginning of the project, the road would be widened and the grade would be raised along the current alignment for about 1,100 linear feet in order to transition with the new road alignment. The new alignment would then leave the current alignment and travel north to follow a natural bench for approximately 1,000 linear feet. From there, the new alignment would climb a moderately steep grade, reaching its high point approximately 300 feet north of the existing bluff erosion site. From there, the new road alignment would descend steeply to connect back to the existing road near where the NRCA trail meets the existing Cattle Point Road. The total length of new road alignment would be approximately 4,950 feet. Realignment of the road upslope from the problem site would protect road access from the threat of coastal bluff erosion for over 100 years. Construction cost for Alternative B would be approximately $5 to 8 million.

Safety concerns would be addressed in the final road design features. Road design would include a wide shoulder, which would provide a minor safety improvement for bicyclists, pedestrians, and special-use vehicles.

Figure 2.5 - Alternative B Preliminary Alignment

Figure 2.6 is a visual simulation illustrating how the alternative B road alignment would appear on the landscape.

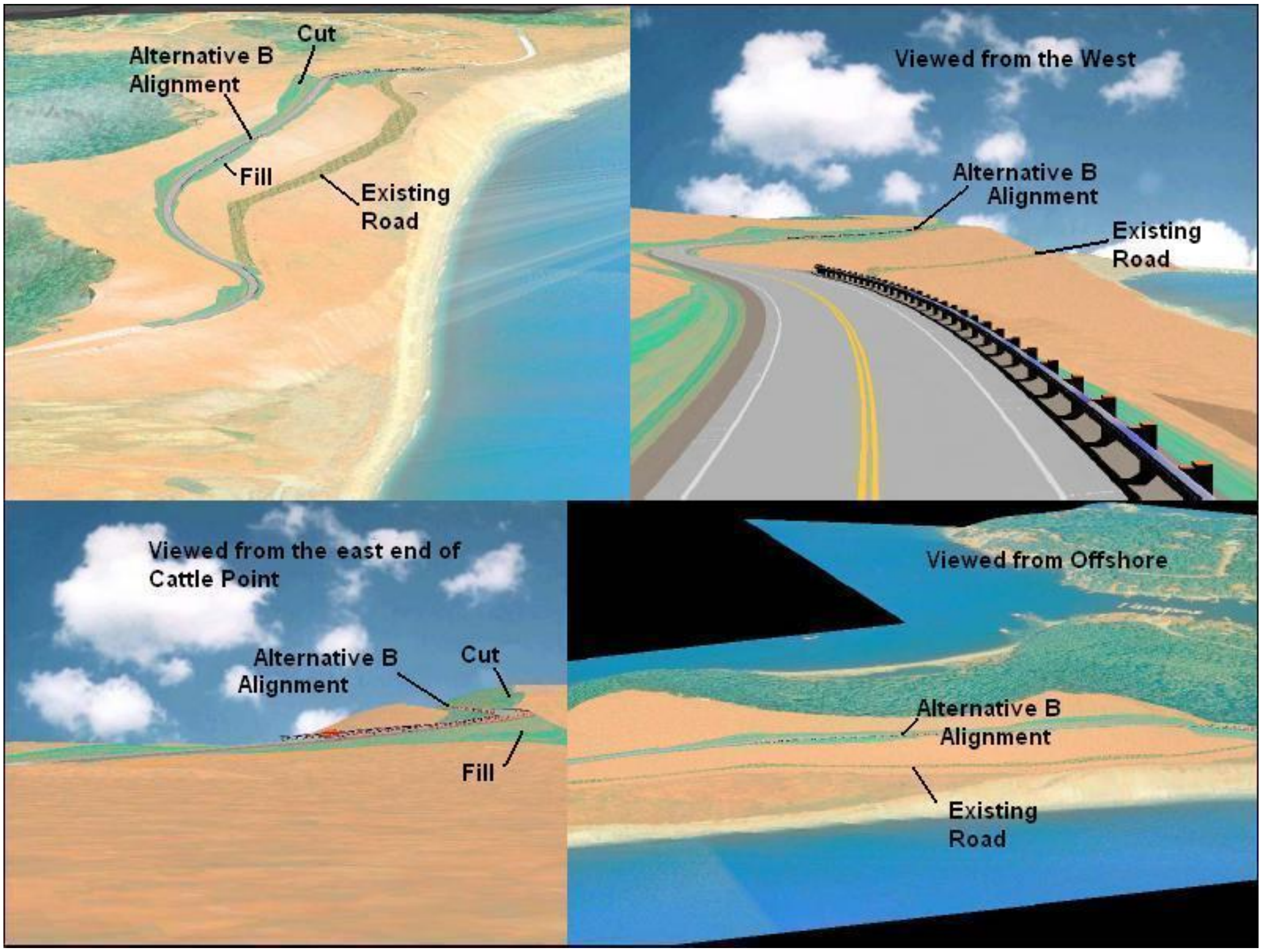


Figure 2.6 - Alternative B Visual Simulation

The east end of the Mt. Finlayson ridgeline presents a road design challenge. The ridgeline descends steeply and is bordered on the north by an informal trail and a forested area. Earlier designs featured gentle road grades, which resulted in high cut slopes that extensively opened up the ridgeline resulting in substantial visual, habitat, and trail impacts. The most recent design features steepen the road grade (up to approximately 10.5 percent) and add curves on the east end, which allows for a large reduction in the size of the cuts and fills and associated impact areas.

The new alignment would be constructed to a total width of 28 feet, consisting of two 10-foot travel lanes with two 4-foot paved shoulders. A typical road cross section is shown on figure 2.7.

Final project development and design of this alternative are not anticipated to be complex, and could be completed within 1 year. Road construction would take 1 to 2 years depending on work timing restrictions.

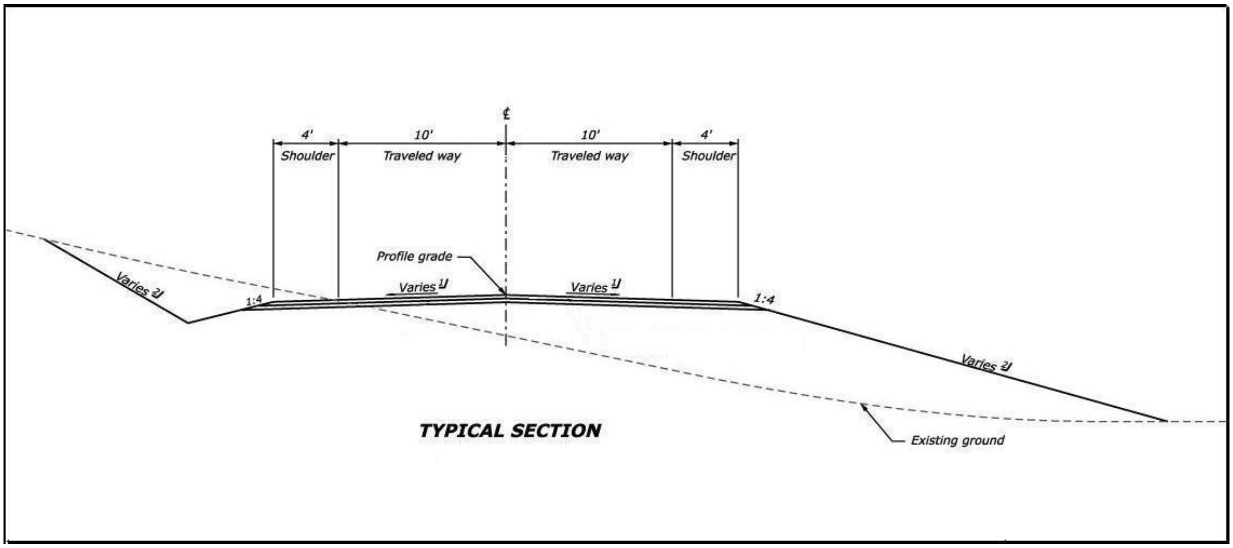


Figure 2.7 - Alternative B Typical Cross Section

Construction of this alternative would initially disturb an area of approximately 17 acres. Disturbance would occur from construction of the new road alignment, new road cuts and fills, construction equipment staging areas, earth stockpiling, and restoration activities along the abandoned road segment. Of the 17 acres of ground disturbance, about 13 acres would be restored and revegetated. Revegetated areas would include road cuts and fills and restoration of the abandoned road segment. The remaining 4 acres would be permanently covered by road pavement.

Cuts and fills along the new alignment would reach maximum heights of approximately 30 feet. Preliminary design does not show the need for retaining walls. The main function of retaining walls is to stabilize hillsides, but in steep terrain they can also be used to reduce the size of roadside cuts and fills. If final design factors determine that retaining walls are necessary, they would be designed to blend as unobtrusively as possible into the natural setting.

During final design, the road alignment would be adjusted to minimize ground disturbance and the need to transport excess earth offsite. This would correspondingly reduce the cost of construction. Though the transport of earth outside of the project area is anticipated to be minimal, there would still be a need to transport construction materials along local roads and perform construction-related activities outside of the project area.

Following construction of the new road alignment, approximately 4,200 feet of the existing Cattle Point Road would be abandoned. The abandoned road segment would be restored by removing the road pavement, decompacting the road base, reshaping the roadbed to blend with the surrounding landscape, and planting the obliterated road template with native species. The area restored along the abandoned road segment would be about 3 acres

Maintenance of the new roadway would include maintaining adequate drainage, roadway sweeping and cleaning, regular light resurfacing, pavement striping, repairing structural failures, and roadside mowing. Initially, maintenance costs for the new roadway would be lower than maintenance of the existing road; however, over time, maintenance of the new road alignment would average approximately the same as the existing road at $10,000 per year. With maintenance and minor resurfacing, the new road structure is expected to last at least 20 years before requiring any substantial rehabilitation efforts. With occasional repairs and resurfacing, the road would remain in place for over 100 years.

2.4.3 Alternative C: Minor Realignment with Long Tunnel

This alternative would be built on a short realignment, almost entirely within a tunnel, with the intention to minimize surface ground disturbance while avoiding the bluff erosion area. Based on preliminary design, the tunnel would be about 1,600 feet long and nearly 100 feet deep at its maximum depth. The following figures are approximate.

Overall Project Length:	3,150 feet
Length of New Alignment:	2,830 feet (1,600 feet in tunnel)
Grades:	Rolling, to 7% max
Earthwork:	4,000 to 5,000 truckloads of excess earth
Road Cuts/Fills:	90 feet, localized
Retaining Walls:	20-foot maximum height, 800 feet long-at portals
Area of Temporary Disturbance:	10 acres
Area of Permanent Disturbance	
(New Pavement):	1 acre (above-ground)
Implementation Time	
Design:	2 years
Construction:	1.5 to 3 years
Total:	3.5 to 5 years
Predicted Life Span:	115+ years
Operating and Maintenance Cost:	$65,000 per year
Construction Cost:	$55 to 65 million

The preliminary alignment for alternative C is shown in figure 2.8. The project would begin about 1.0 mile east of the Pickett's Lane intersection. At the beginning of the project, the road would be widened and the grade would be raised along the current alignment for about 320 linear feet in order to transition with the new road alignment. The new alignment would then leave the current alignment and travel north, entering the tunnel about 675 feet from the beginning of the realignment. The tunnel would be approximately 1,600 feet in length. From its highest point, the tunnel would be approximately 320 feet to the north of the bluff erosion site. The road would exit the tunnel and curve down the ridge, rejoining the existing road alignment near where the NRCA trail meets the existing Cattle Point Road. The cost for construction of this alternative would be approximately $55 to 65 million.

This alternative was proposed to minimize impacts to prairie habitat and other resources on the ground surface. The tunnel would change the road user's experience by restricting views as well as affecting pedestrian and bicycle use. Ground disturbance and associated impacts would be avoided in the tunnel section, though construction of the tunnel portals would still require considerable ground disturbance. Relocation of the road into a tunnel and away from the eroding coastal bluff would remove the threat of erosion to the road for over 100 years.

Figure 2.8 - Alternative C Preliminary Alignment

Figure 2.9 is a visual simulation illustrating how the alternative C road and tunnel alignment would appear on the landscape.

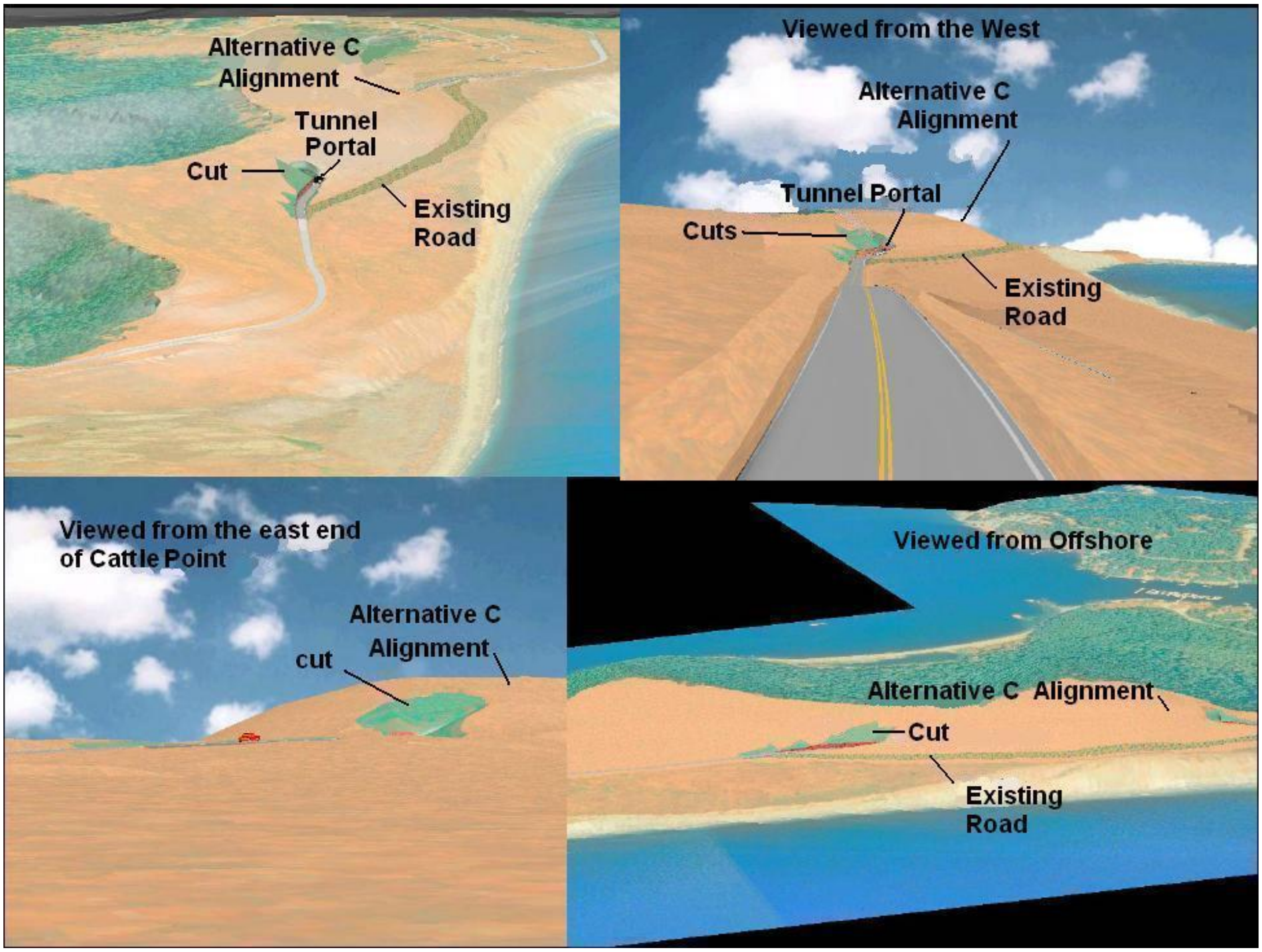


Figure 2.9 - Alternative C Visual Simulation

The new road would be constructed to a total width of 28 feet, consisting of two 10-foot travel lanes and two 4-foot paved shoulders. In addition, the tunnel section would include a 2-foot raised walkway. Typical road cross-sections inside and outside of the tunnel are shown in figure 2.10.

This alternative would require a fairly complex design that would likely take at least 2 years to complete. Construction of this alternative would likely last 1.5 to 3 years. Obtaining funding could be a lengthy process due to the high estimated cost of construction.

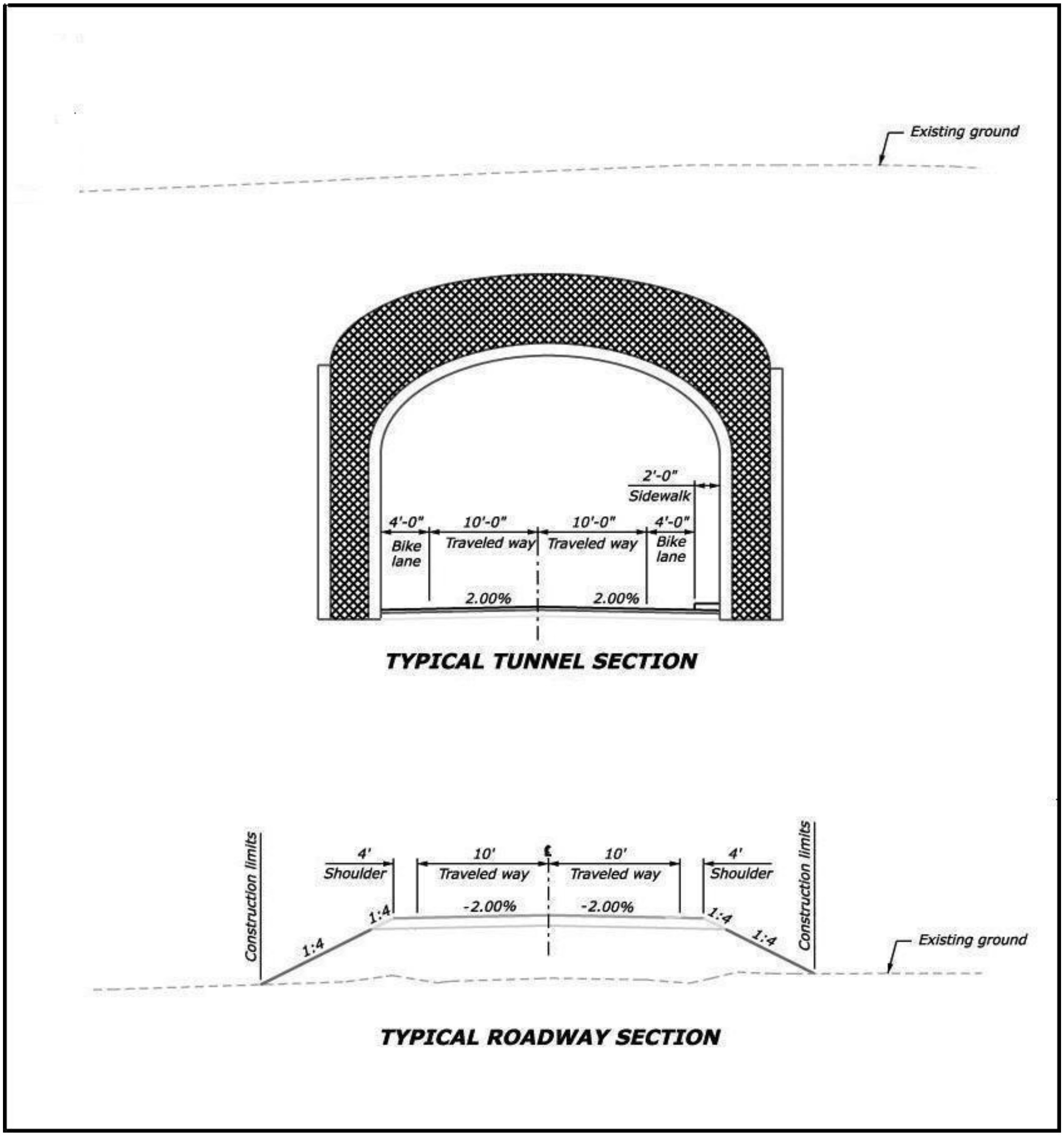


Figure 2.10 - Alternative C Typical Cross Section

Tunnel construction requirements would be more complex than standard road construction because of overhead tunnel excavation and the need to support the soils at the tunnel portals. Grouting would likely be needed to stabilize the soil so that a tunnel could be excavated without the soils collapsing. Temporary shoring and ground reinforcement would be used to support the excavated tunnel until a permanent tunnel structure could be constructed. If large boulders or rock sections were encountered, blasting could be necessary, though based on limited geologic research, this is unlikely to occur. The gravelly soils at the project site and the costs for transporting and operating tunnel boring machinery make it likely that the tunnel would be constructed by conventional earth moving equipment.

Surface ground disturbance associated with this alternative would be approximately 10 acres, since a large portion of the construction would take place underground. Disturbance would occur from construction of the new road alignment, new road cuts and fills, tunnel portal excavation, construction equipment staging areas, earth stockpiling, and restoration activities along the abandoned road segment. The cuts at the tunnel portals would be large (up to 90 feet in height) and would require retaining walls in order to construct the road into the hillside. Of the 10 acres of ground disturbance, about 9acres would be restored and revegetated. Approximately 1 acre of above-ground surface would be permanently covered by pavement (road pavement within the tunnel would cover an additional 1 acre below-ground).

Following construction of a new road alignment, approximately 2,600 feet of the existing Cattle Point Road would be abandoned. The abandoned road segment would be restored by removing the road pavement, decompacting the road base, reshaping the roadbed to blend with the surrounding landscape, and planting the obliterated road template with native species. The area restored along the abandoned road segment would be about 2 acres.

Due to the length of the tunnel, lighting and ventilation would be needed. Power for lighting and ventilation motors would likely be provided by tapping into the existing infrastructure or by construction of a solar generation system. The tunnel systems would also require a back-up power generator.

Fire safety standards in highway tunnels are governed by the National Fire Protection Association 502, *Standards for Road Tunnels, Bridges, and Other Limited Access Highways*. For a tunnel of this length, the standards require the installation of a fire safety system. The system would include fire alarms, fire detection, fire extinguishers, and closed circuit TV (Shannon and Wilson 2004). Fire hose connections would require a water source. Currently there is no readily available water supply to the road, so either a new source would need to be developed or a piping system would need to be constructed to an existing source. The nearest existing water systems are for the residential area at Cattle Point.

To allow for emergency access in case of accidents, an emergency walkway on a raised curb would be included in the tunnel design. Although a shoulder would be provided for bicyclists, pedestrians, and special-use vehicles, the restricted space in the tunnel would offset the safety benefits of the shoulder. With maintenance, the tunnel would be built to a design life of over 100 years.

The large construction effort involved with this alternative would also require a substantial amount of materials and support. Although some excess earth would be used to return the existing road to a natural condition, the tunnel would still produce a large amount of excess excavated soil and cobbles. It is estimated that 4,000 to 5,000 truckloads of excess material would need to be transported and disposed of outside of the construction site.

Following construction, maintenance activities would include routine road and tunnel maintenance including tunnel cleaning and inspection as well as maintenance and operation of the light, ventilation, and fire systems. The estimated cost of maintenance for San Juan County would be about $65,000 per year. Since there are currently no tunnels on the island, the county does not have the equipment or expertise to perform tunnel inspection and maintenance. Start-up costs would be associated with training personnel and obtaining proper equipment. Project funding may absorb some or all of these costs to reduce impacts to the county's budget.

2.4.4 Alternative D: Mid-Slope Alignment with Short Tunnel

This alternative involves mid-slope realignment of the Cattle Point Road to the north, approximately 470 feet away from the eroding bluff area. Based on preliminary design, the tunnel would be about 775 feet long and 65 feet deep at its maximum depth. The following figures are approximate.

Overall Project Length:	5,800 feet
Length of New Alignment:	4,700 feet (775 feet in tunnel)
Grades:	Rolling, to 8% max
Earthwork:	Likely balanced
Road Cuts/Fills:	50 feet/50 feet, extensive
Retaining Walls:	20 feet max height, 800 feet long-at portals
Area of Temporary Disturbance:	20 acres
Area of Permanent Disturbance (New Pavement):	3 acres (above-ground)
Implementation Time:	
Design:	2 years
Construction:	1.5 to 3 years
Total:	3.5 to 5 years
Predicted Life Span:	155+ years
Operating and Maintenance Cost:	$35,000/year
Construction Cost:	$30 to 40 million

The preliminary alignment for alternative D is shown on figure 2.11. The project would begin about 0.65 miles east of the Pickett's Lane intersection. At the beginning of the project, the road would be widened and the grade would be raised along the current alignment for about 1,100 linear feet in order to transition with the new road alignment. The new alignment would then leave the current alignment and travel north to follow a natural bench for approximately 1,000 linear feet. From there, the new alignment would climb a moderately steep grade for approximately 1,500 feet where it would enter a tunnel. The tunnel would be approximately 775 feet in length. From its highest point, the tunnel would be located approximately 470 feet to the north of the coastal bluff erosion site. On exiting the tunnel, the road would curve down the ridge to the southeast where it would connect back to the existing road near where the NRCA trail meets the existing Cattle Point Road. The cost for construction of this alternative would be approximately $30 to 40 million.

The tunnel was proposed to lower the road profile through the top of the ridgeline of Mt. Finlayson and to avoid the steep grade at the east end of the ridge. The tunnel would be built by excavating a large cut, constructing the tunnel structure, and filling in material on top of the structure to restore the natural ground surface. This "cut and cover" method would be the most efficient way to construct a tunnel of this length and depth. Construction would involve removal and stockpiling of a large amount of excavated material outside of the project area, which would require large truck transport along local roads. Tunnel construction would create

Figure 2.11 - Alternative D Preliminary Alignment

a large area of temporary disturbance, but once completed and revegetated, it would reduce the total amount of permanent disturbance.

This alternative would provide more gradual road grades and yield minimal excess soil and cobble material. Relocation of the road away from the problem area would remove the threat of bluff erosion for over 150 years.

The realigned road section of this alternative is similar to the location of alternative B except that it would require slightly more extensive small earth fills. Figure 2.12 is a visual simulation illustrating how the road and tunnel alignment would appear on the landscape.

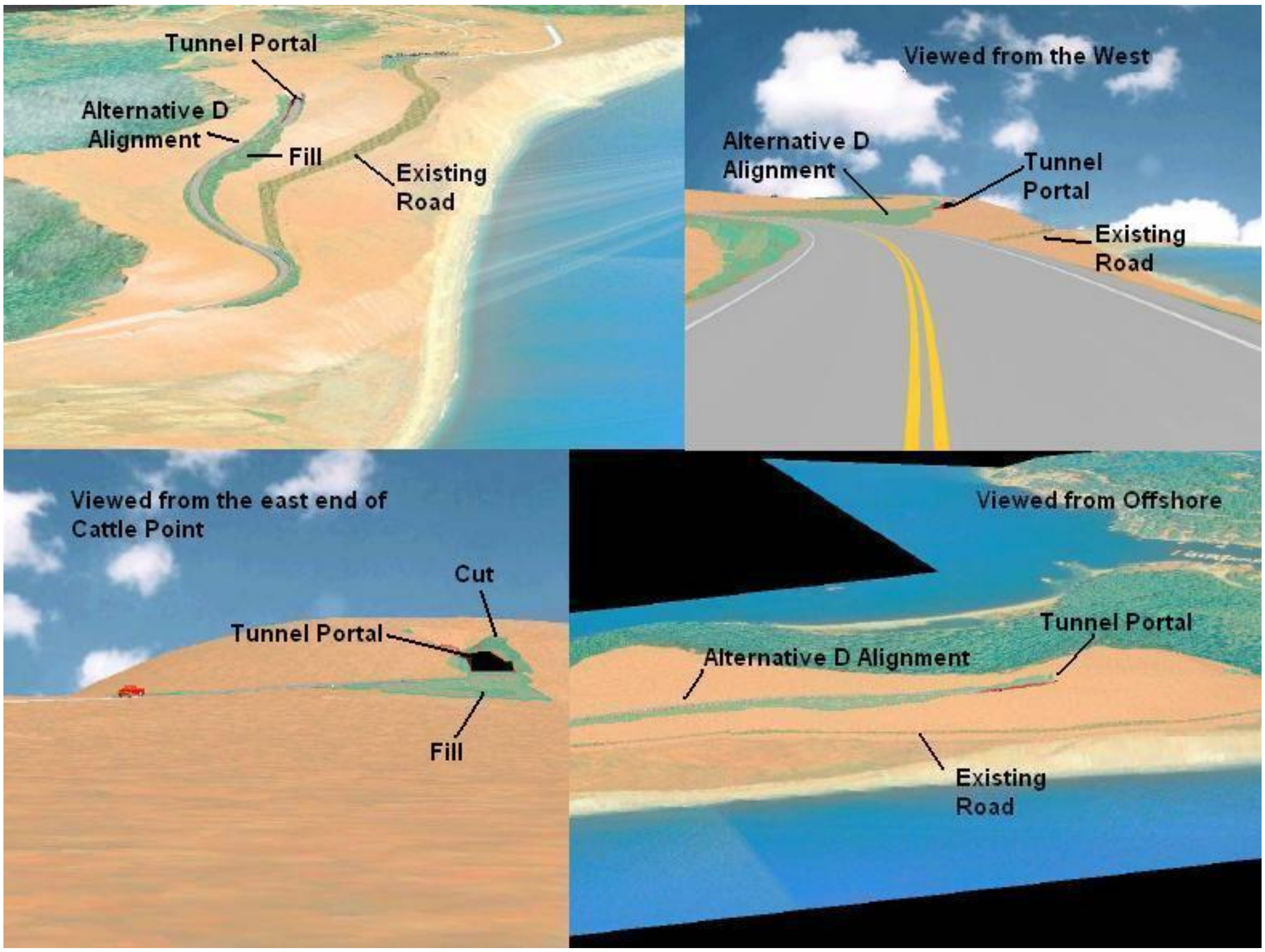


Figure 2.12 - Alternative D Visual Simulations

The new road would be constructed to a total width of 28 feet, consisting of two 10-foot travel lanes and two 4-foot paved shoulders. In addition, the tunnel section would include a 2-foot raised walkway for emergency access. Typical road cross-sections inside and outside of the tunnel would be the same as alternative C (figure 2.9).

Design of this alternative would be fairly complex, likely taking at least 2 years to complete. Construction would likely last 1.5 to 3 years depending on soils encountered and work restrictions. Obtaining funding could be a lengthy process due to the high estimated cost of construction.

Due to the extent of the actions in this alternative, construction impacts would be more intensive than those in alternative B. Construction would disturb approximately 20 acres.

Disturbance would occur from construction of the new road alignment, new road cuts and fills, tunnel construction, construction equipment staging areas, earth stockpiling, and restoration activities along the abandoned road segment. Cuts and fills along the road alignment and at the tunnel portals would be large (up to 50 feet in height) and would require large retaining walls to stabilize the earth around the tunnel portals. Of the 20 acres of ground disturbance, approximately 17 acres would be restored and revegetated. The restored areas would include about 2 acres of ground surface covering the tunnel. About 3 acres of above-ground surface would be permanently covered by pavement (road pavement within the tunnel would cover an additional 0.5 acres below-ground). This alternative involves a wider and slightly longer road than currently exists; however part would be located in a covered tunnel section.

A lighting system would need to be provided in the tunnel section. Due to its shorter length, fire safety and ventilation systems may not be necessary (Shannon and Wilson 2004). Power for lighting would likely be provided by tapping into existing infrastructure or by construction of a solar generation system. The tunnel system would also require a back-up power generator. To allow for emergency access in case of accidents, an emergency walkway on a raised curb would be included in the tunnel design. Although a shoulder would be provided for bicyclists, pedestrians, and special-use vehicles, the restricted space in the tunnel would offset the safety benefits of the shoulder. With maintenance, the tunnel would be built to a design life of over 100 years.

During final design, the road and tunnel alignment would be adjusted to the extent possible to minimize ground disturbance and excess material generated, thus reducing construction costs. Although some excess earth would be used to return the existing road to a natural condition, the tunnel would still generate some excess soil and cobbles that would need to be transported off the construction site. The amount of excess material is anticipated to be far less than alternative C. The large construction effort involved with this alternative would require a substantial amount of offsite materials and support.

Following construction of a new road alignment, approximately 4,350 feet of the existing Cattle Point Road would be abandoned. The abandoned road segment would be restored by removing the road pavement, decompacting the road base, reshaping the roadbed to blend with the surrounding landscape, and planting the obliterated road template with native species. The area restored along the abandoned road segment would be about 3 acres.

Maintenance issues and costs for the road realignment would be similar to those in alternative B. The tunnel section would have similar maintenance, operations, and costs as alternative C. Since the tunnel section in alternative D is shorter, there would be a slight reduction in maintenance effort and costs because the tunnel would not require a ventilation or fire system. Start-up costs associated with training personnel and obtaining proper equipment for tunnel operations and maintenance would be the same as alternative C, although annual costs would be slightly less. Overall, the estimated yearly operations and maintenance cost for this alternative would be approximately $35,000 per year for San Juan County. Project funding may absorb some or all of these costs to reduce impacts to the county’s budget.

2.4.5 Activities Common to All Action Alternatives (B, C, and D)

A number of considerations and activities are common to alternatives B, C, and D. These include utilities and easement/ROWs, proposed road design (e.g., lane width, grades, and shoulder width), general construction, and revegetation.

Construction of a new road alignment would require a new construction easement or right-of-way through the park and NRCA. The buried utility lines along the existing road corridor would need to be moved from the failing road section and placed along the new road alignment. The county would be responsible for maintaining the new road section and its features, including any pullouts and tunnel structures. The utility would be responsible for relocation activities and maintenance of utilities.

Road Design Considerations

The road realignment would be designed to meet both the NPS design standards for Rural Major Collectors as well as appropriate American Association of State Transportation Officials (AASHTO) standards referenced in the NPS standards. The NPS road design standards were developed for use in national parks in order to minimize impacts to park resources while maintaining safe access for park road users.

In all action alternatives, the overall length of the realigned road section would be essentially the same as the existing road that it would replace. The distance to the nearest residences to the east would not change.

Design parameters for the action alternatives were developed by the project team to balance safe, efficient road travel with aesthetic and resource impacts. Balancing resource concerns with road design considerations, the project team selected the following design parameters to ensure that the action alternatives provide an efficient, safe, well-constructed road for transportation while minimizing resource impacts in the park and NRCA:

Design Vehicle: SU-30

A 30-foot-long single unit truck with two or more axles (e.g., a local delivery truck or a recreational vehicle)

Design Speed:	35 miles per hour (mph)
Design Standards:	NPS/AASHTO
Traveled Way Width (2 lanes):	20 feet
Shoulder Width:	4 feet each side
Grades:	12% maximum

If an action alternative is implemented, these parameters would be further refined to determine the most appropriate road standards while minimizing surrounding resource impacts.

Road Shoulder

The project team determined that safety concerns associated with road use by pedestrians, bicycles, and special-use vehicles justified a wide shoulder, even though it would increase the area of ground disturbance. A recent county project northwest of the park added 3-foot shoulders to Cattle Point Road. When other sections of the road in the park require repair, a wider shoulder would likely be considered in these locations in order to improve continuity.

Although the adjoining road sections do not have paved shoulders, the new alignments would have a 4-foot paved shoulder, which would create a discontinuity. The shoulders would continue through the tunnel alternatives. Additionally, the tunnel design would include a 2-foot-wide emergency walkway on a raised curb.

Grade

Steep grades can become impassable for vehicles in snow and icy conditions. The eastern end of the project area contains a steep and narrow ridgeline, bordered on the north by the forest and trail. The action alternatives include a road design that balances the need to minimize impacts to forest, trail, and aesthetic resources with efforts to avoid overly steep road grades. These efforts would continue as the road design is refined.

Design Life

A bluff retreat rate of 1 to 3 feet per year was used to estimate design life for the alternatives. The range in rates results in a corresponding range in design life for the existing road and action alternatives. Since the purpose of the project is to address the threat of road failure due to bluff erosion, the action alternatives were designed to meet a minimum life of 50 years using the highest erosion rate. This time-frame was selected to allow for potential changes in the bluff erosion process over time as well as standard road structure deterioration rates. The minimum life span standard requires that the action alternatives be an adequate distance from the bluff to effectively remove the threat of erosion.

All action alternatives far exceed the 50-year minimum design life with an anticipated life span of over 100 years. The design life of each alternative assumes routine maintenance would continue to maintain the pavement surface and drainage, and to address safety issues.

Construction

Construction of any of the action alternatives would have temporary impacts. The design and specifications for construction of the road would be developed to ensure that a quality project would be constructed and all mitigation measures would be implemented. At the same time, the design would be crafted to allow flexibility and to limit restrictions on construction operations to the extent possible to maximize construction efficiency. Efficient operations minimize cost and time of construction, resulting in lower expenditure of funds and a shorter duration of temporary construction impacts.

In all of the action alternatives, the existing road would be left open during construction to maintain access to the east end of Cattle Point. Some traffic delays would be experienced due to construction traffic and associated construction activities. Traffic delays would probably be limited to 30 minutes or less, except during construction of the connections between the realignment and the existing road. Construction of these short road segments may require full road closure for up to 4 hours at a time during approximately 1 to 2 weeks at both ends of the connection. Road closure and delay schedules would be announced ahead of time through public outreach efforts.

Construction of the action alternatives would require the use of heavy equipment as well as operators and laborers. Construction equipment could include dump trucks, excavators, loaders, bulldozers, scrapers, compactors, paving equipment, support vehicles, water trucks, and other similar equipment. Construction operations would produce localized noise and visual disturbance.

The tunnels proposed in alternatives C and D would likely be excavated using conventional earthmoving equipment because the tunnel lengths would probably not warrant use of a tunnel boring machine. Blasting would be needed if bedrock was encountered during tunnel excavation. Preliminary studies have located no bedrock in the project area. It is also possible, though unlikely, that pile driving would be necessary to install shoring around tunnel portals and retaining walls. Any blasting or pile driving would generate pronounced loud impact noise as opposed to the steadier noise produced by other heavy equipment.

Construction of the action alternatives would require the following additional sites, sources, and services:

- Staging area(s) to store vehicles, materials, and equipment;
- A material source (borrow site) for rock needed to construct the road base;
- A source for the pavement surface material;
- Construction materials from a variety of vendors;
- Water for compaction of earth and dust control;
- A site to permanently store excess soil and rock (waste or spoils storage site);
- Temporary storage site for topsoil;
- Transportation of materials to and from these sites by barging, trucking, and the state ferry system.

Some of these activities would take place within the construction area, which would lessen offsite impacts and minimize transportation costs. No construction staging, borrow, or waste sites would be allowed within the park and NRCA outside of the immediate road construction area.

Some construction activities that could require ground disturbance, occupation, and clearing may take place outside of the construction area. These activities could include material extraction, material wasting, water retrieval, and staging. These activities would take place at either commercial or non-commercial sites. Commercial sites are defined as established sites that have provided material to public and private entities on a regular basis over the last two years, have appropriate state and local permits, and do not require expansion outside of their currently established and permitted area.

An existing commercial pit that could provide material for the project is located on the island about 10 miles from the project area. Local restrictions on barge landings make it likely that sites on San Juan Island would be used or that the existing ferry service would be used for off-island material and equipment transport.

Should a non-commercial site be selected, the contractor would be required to provide the following environmental clearances:

- Cultural Resources - Use of the site would have no more than a *no adverse effect* determination for properties on or eligible for listing to the National Register of Historic Places (NRHP) and a *de minimis* determination if Section 4(f) applies;
- Threatened and Endangered Species - Use of the site would have a determination of no more than *no effect* to species or habitat listed as threatened or endangered under the Endangered Species Act (ESA); and
- Waters of the U.S. - Use of the site would not encroach into waters of the U.S. or wetlands protected under Executive Order 11990.

2.4.6 Comparison of Alternatives

The following table is a comparison matrix showing the effects of each alternative on the physical, biological, cultural, and social resources in the project area. Detailed discussions of the environmental effects of each alternative are presented in chapter 4.

Table 2.2 - Resource Impact Summary

RESOURCE	ALTERNATIVES			
	A (No Action)	**B** (Hybrid Mid-Slope Realignment)	**C** (Minor Realignment with Long Tunnel)	**D** (Mid-Slope Realignment with Short Tunnel)
Topography and Geology	No effect	Moderate adverse effect, short term and long term	Minor adverse effect, short term Minor adverse effect, long term	Minor adverse effect, short term Moderate adverse effect, long term
Soils	No effect	Minor adverse effect, short term Negligible adverse effect, long term	Minor adverse effect, short term Minor beneficial effect, long term	Minor adverse effect, short term Minor beneficial effect, long term
Air Quality	Negligible beneficial effect locally, no effect regionally	Negligible adverse effect locally, short term No effect long term	Negligible adverse effect locally, short term No effect long term	Negligible adverse effect locally, short term No effect long term
Floodplains, Wetlands and Water bodies	No effect	No effect	No effect	No effect
Hydrology	Negligible beneficial effect	Negligible adverse effect, short term and long term	Negligible adverse effect, short term and long term	Negligible adverse effect, short term and long term
Water Quality	Negligible adverse effect	Negligible adverse effect, short term and long term	Negligible adverse effect, short term and long term	Negligible adverse effect, short term and long term
Visual Quality	Negligible adverse effect	Moderate adverse effect, short term and long term	Minor adverse effect, short term Minor beneficial effect, long term	Moderate adverse effect, short term Minor adverse effect, long term
Vegetation	No effect	Minor adverse effect, short term and long term	Minor adverse effect, short term Minor beneficial effect, long term	Minor adverse effect, short term Negligible adverse effect, long term
Wildlife	Minor beneficial effect	Moderate adverse effect, short term Minor adverse effect, long term	Moderate adverse effect, short term Minor beneficial effect, long term	Moderate adverse effect, short term Negligible beneficial effect, long term
Fish	No effect	No effect	No effect	No effect

RESOURCE	ALTERNATIVES			
	A (No Action)	B (Hybrid Mid-Slope Realignment)	C (Minor Realignment with Long Tunnel)	D (Mid-Slope Realignment with Short Tunnel)
Federally-Listed Threatened, Endangered, and Protected Species	Federal TES: No effect Federally Protected: No effect	Federal TES: No effect Federally Protected: Minor adverse effect, short term Negligible adverse effect, long term	Federal TES: No effect Federally Protected: Minor adverse effect, short term No effect, long term	Federal TES: No effect Federally Protected: Minor adverse effect, short term Negligible adverse effect, long term
State-Listed Threatened and Endangered Species	No effect	Minor adverse effect, short term Minor beneficial effect, long term	Minor adverse effect, short term Minor beneficial effect, long term	Minor adverse effect, short term Minor beneficial effect, long term
Other Special Status Species	No effect	Minor adverse effect, short term Negligible adverse effect, long term	Minor adverse effect, short term Negligible adverse effect, long term	Minor adverse effect, short term Negligible adverse effect, long term
Essential Fish Habitat	No effect	No effect	No effect	No effect
Cultural, Historic, and Archaeological Resources	No effect	Negligible adverse effect, short term and long term	Negligible adverse effect, short term and long term	Negligible adverse effect, short term and long term
Land Use	No effect	No effect	No effect	No effect
Local Plans	Does not comply with access guidelines in local land management plans	Follows applicable guidelines and desired conditions of local land management plans	Follows applicable guidelines and desired conditions of local land management plans	Follows applicable guidelines and desired conditions of local land management plans
Visitor Uses	Minor adverse effect locally; negligible effect county-wide.	Moderate adverse effect short term No effect long term	Moderate adverse effect short term No effect long term	Moderate adverse effect short term No effect long term
Trail System	No effect	Moderate adverse effect on Mt. Finlayson Trail, short term. Minor adverse effect on overall trail system, short term. Minor adverse effect on Mt. Finlayson Trail, long term. Negligible adverse effect on trail system, long term.	Moderate adverse effect on Mt. Finlayson Trail, short term. Minor adverse effect on overall trail system, short term. Negligible adverse effect on Mt. Finlayson Trail and overall trail system, long term	Moderate adverse effect on Mt. Finlayson Trail, short term. Minor adverse effect on overall trail system, short term. Minor adverse effect on Mt. Finlayson Trail, long term. Negligible adverse effect on trail system, long term.

RESOURCE	ALTERNATIVES			
	A (No Action)	**B** (Hybrid Mid-Slope Realignment)	**C** (Minor Realignment with Long Tunnel)	**D** (Mid-Slope Realignment with Short Tunnel**)**
Transportation and Road System	Major adverse effect locally; negligible effect county-wide.	Moderate adverse effect, short term No effect, long term	Moderate adverse effect, short term No effect on road system, long term. Moderate adverse effect on county maintenance budget, long term.	Moderate adverse effect, short term No effect on road system, long term. Moderate adverse effect on county maintenance budget, long term.
Special Vehicles, Bicycles, and Pedestrians	Minor adverse effect locally; negligible effect county-wide.	Moderate adverse effect, short term Minor beneficial effect, long term	Moderate adverse effect, short term Minor adverse effect, long term	Moderate adverse effect, short term Minor adverse effect, long term
Road Safety	Minor beneficial effect locally; negligible beneficial effect county-wide.	Negligible adverse effect, short term No effect, long term	Negligible adverse effect, short term No effect, long term	Negligible adverse effect, short term No effect, long term
Population and Demographics	Locally noticeable but minor county-wide adverse effect	No effect, short term and long term	No effect, short term and long term	No effect, short term and long term
Local Industry	Negligible adverse effect	Minor beneficial effect, short term No effect, long term	Minor beneficial effect, short term No effect, long term	Minor beneficial effect, short term No effect, long term
Employment and Income	Minor adverse effect	Minor beneficial effect, short term No effect, long term	Minor beneficial effect, short term No effect, long term	Minor beneficial effect, short term No effect, long term
Environmental Justice	No effect	No effect	No effect	No effect
Relocation	No effect	No effect	No effect	No effect
Public Health and Safety	Major adverse effect locally, no effect county-wide	Negligible adverse effect, short term No effect, long term	Negligible adverse effect, short term No effect, long term	Negligible adverse effect, short term No effect, long term
Utilities	Utilities would eventually need to be relocated as separate project	No effect, short term and long term	No effect, short term and long term	No effect, short term and long term
Hazardous and Solid Waste and Materials	No effect	No effect	No effect	No effect
Energy	Negligible beneficial effect locally; no effect regionally	Minor adverse effect, short term Negligible adverse effect, long term	Minor adverse effect, short term Negligible adverse effect, long term	Minor adverse effect, short term Negligible adverse effect, long term

RESOURCE	ALTERNATIVES			
	A (No Action)	**B** (Hybrid Mid-Slope Realignment)	**C** (Minor Realignment with Long Tunnel)	**D** (Mid-Slope Realignment with Short Tunnel)
Noise	Negligible adverse effect	Moderate adverse effect, short term No effect, long term	Moderate adverse effect, short term No effect, long term	Moderate adverse effect, short term No effect, long term
Light	Negligible beneficial effect	Negligible adverse effect, short term No effect, long term	Negligible adverse effect, short term Minor adverse effect locally, long term. No discernible effect on overall night sky	Negligible adverse effect, short term Minor adverse effect locally, long term. No discernible effect on overall night sky
Prime and Unique Farm Lands	No effect	No effect	No effect	No effect
Coastal Zone	Not applicable	In compliance	In compliance	In compliance
Section 4(f)	No effect	De minimis effect	De minimis effect	De minimis effect

2.5 OTHER ACTIONS AND ALTERNATIVES CONSIDERED

According to the NPS Director's Order 12 Handbook, alternatives may be eliminated from detailed study based on the following reasons (NPS 2001):

- Technical or economic infeasibility;
- Inability to meet project objectives or resolve need for the project;
- Duplication of other less environmentally damaging alternatives;
- In conflict with an up-to-date valid plan, statement of purpose and significance, or other policy; and therefore, would require a major change in that plan or policy to implement;
- Environmental impacts are too great.

2.5.1 Alternatives Eliminated from Further Consideration

The following alternatives were considered in the project planning process but have been eliminated from further analysis. The names of these alternatives are carried over from previous project scoping documents.

Alternative 2RA and 3RA: Mid-Slope Realignments

Alternatives 2RA and 3RA were identified as separate alignments in the scoping document, with 2RA being a shorter realignment around the problem area. This alignment would rise steeply on the west end upslope of the problem area, approach the ridgeline, and drop back steeply on the east end to connect back to the existing road. Alternative 3RA would take a longer realignment, gradually climbing up a natural bench to the west, cresting over the ridgeline, before dropping steeply off the east end.

During the evaluation of the alternatives, participants recognized that there was little benefit to the steeper, shorter west end of 2RA. Although it impacted less area, the extensive cuts required to fit the road into the hillside resulted in more intensive effects in the affected area along with increased visual impacts. The east end of 3RA cut through the top of the ridge and presented a greater impact on trails and view-sheds than 2RA, which would be contoured to the south with smaller cuts or retaining walls. Being closer to the problem erosion area, the 2RA alignment had a slightly shorter but acceptable predicted life.

These issues resulted in a modified (or hybrid) version of alternative 3RA that utilized the west end of 3RA and the east end of 2RA. Since the hybrid alignment would substantially reduce the impacts of the original alternatives, they were subsequently dropped from consideration in favor of alternative B.

Alternative 1SS: Slope Stabilization

Under this alternative, hard bluff and shoreline stabilization techniques such as riprap retaining walls, bulkheads, and revetments would be used to stabilize the top and toe of the bluff and the existing road alignment. In addition, planting vegetation on the upper slopes of the bluff was considered in order to stabilize soils and absorb precipitation and runoff. This "bioengineering" technique would be used in combination with hard stabilization at the toe of the bluff to avoid undercutting of the slope. Stabilization of the bluff would allow the road to remain at or near its existing location with little increase in disturbance area. With this alternative, the life of the road would be dependent on the success of the stabilization methods used and how effectively they would prevent the advance of bluff erosion.

This alternative was eliminated from further consideration for the following reasons:

- Bluff erosion is a natural process formed in a dynamic coastal environment. Hard stabilization along the toe of the bluff and shoreline could adversely interrupt natural shoreline processes and sand movement that could lead to increased erosion adjacent to the structures. In addition, shoreline hardening would impact the sensitive intertidal environment and areas immediately offshore.
- Bluff stabilization would require construction of a structure on the shoreline large enough to change the shoreline erosion process. A large structure would negatively impact the visual quality of the shoreline when viewed from offshore.
- Section 4.8.1.1 (Shorelines and Barrier Islands) of the NPS 2006 Management Policies discourages modification of shoreline processes and requires conformance with state coastal zone management plans (CZMP). The Washington CZMP also discourages modification of shoreline processes.
- The only access to shoreline construction would be by water or by traveling a distance along the shoreline. This would pose construction operational challenges, increase construction costs, and increase impacts to coastal resources.
- Experience in coastal areas of the U.S. has shown that stabilizing an erosion-prone slope provides only short-term relief to coastal erosion. This alternative would not adequately meet the project purpose and need to provide long-term protection of road access.

Alternative 1BR: Bridge

Under this alternative, the threatened section of road would be replaced with a bridge located close to the road's existing alignment and would include the following features:

Bridge/road grades:	Existing
Bridge length:	Over 1,500 feet
Bridge construction material:	Unfinished concrete
Estimated life of the bridge/road:	100+ years

The bridge would be designed to include a pedestrian and bicycle lane or non-motorized traffic would use other trails.

Initially, this alternative would cause little disturbance to areas outside of the existing alignment. However, as bluff erosion continued, the large bridge supports would eventually become exposed.

This alternative was eliminated from further consideration for the following reasons:

- Initial geotechnical investigations found no evidence of bedrock in the area, which would necessitate the use of excessively deep bridge supports (at least 200 feet deep). The need for deep supports would increase the complexity of bridge design and construction, and greatly increase costs.
- As natural bluff erosion continued, the bridge structure and deep bridge supports would be exposed over time. The large structure would negatively impact the natural and historic views of the coastline when viewed from offshore.
- Substantial time would be involved in securing funding for such a large project as well as intricate design factors involving seismic issues and complex construction efforts.
- Following construction, substantial funds would be needed to maintain the structure as bluff erosion continues.

Alternative 4RA: Ridgeline Alignment

This alternative would realign the road along the ridgeline south of Mt. Finlayson. The road alignment would be located near the Mt. Finlayson Trail and would pass through fringe/transitional habitat between the prairie and forest. Road features would include:

- Road grades:	Hills (+8% to -7%)
- Length of realigned road section:	6,800 feet
- Estimated life of the road:	150+ years

This alternative was eliminated from further consideration for the following reasons:

- This road alignment would have required substantial exposed cuts to gain elevation on both the west and east ends of the ridge. While relocating the road to the ridgeline would shield the road from some view-sheds, the view from the historic redoubt at American Camp would be marred by the large excavations.
- A large area of the Mt. Finlayson Trail would be directly impacted by this alternative. The trail would likely be rerouted along the shoulder of the new road alignment, which would negatively impact the solitude of the trail. Public concern was voiced regarding extensive impacts to the Mt. Finlayson Trail.
- The long road realignment would create a new linear barrier which would disturb the established natural resources along the prairie and forest fringes on the ridgeline. The alternative would involve over 10 acres of permanent disturbance.

Alternative 5RA: North Side Alignment

Under this alternative, the road would be realigned to the north side of Mt. Finlayson, well beyond the foreseeable influence of bluff erosion. Road features would include:

- Road grades:	Flat (vary 1% to 4% with an isolated 7%)
- Length of realigned road section:	11,000 feet
- Estimated life of the road:	200+ years

This alignment would provide the greatest life expectancy of any alternate by completely removing the road from the influence of coastal bluff erosion. The location would avoid impacts to the prairie grassland habitat but would impact the adjacent forest habitat. Road user experience and views would differ from the existing road because most of the alignment would be located within a forested area. The new road grade would be relatively flat and require minimal cuts and fills.

This alternative was eliminated from further consideration for the following reasons:

- This alignment would create new forest wildlife habitat fragmentation. Forested areas include habitat for bald eagle and federally-listed marbled murrelet.
- Forest trails would need to be relocated.
- The watershed and subsurface flows into the lagoons located at the base of the forest slopes would be impacted. The Third Lagoon was purchased, in part, with Washington Wildlife and Recreation Program funds. Impacts to this unique resource could involve a lengthy easement petition process.
- Public comments were largely unsupportive of the forest alignment.

A second option on the north side of Mt. Finlayson involved realigning the Cattle Point Road onto the old logging road that is currently being used as a trail. Major road improvements would be needed to make the road usable for vehicular traffic. This alternative was eliminated from further consideration because it would involve extensive impacts to trail users and forest resources.

2.5.2 Design Options Eliminated from Further Consideration

The following are design options, not specific to any alternative, which were considered during early planning but are no longer included in the analysis:

Narrow Shoulders

The benefit of narrow road shoulders would be to reduce overall road width, which would in turn reduce temporary and permanent environmental disturbance. This feature would also reduce construction costs, particularly in tunnel options. Narrow road shoulders would prohibit safe use by bicyclists and pedestrians in the tunnel sections; however, these uses could be accommodated by constructing a multi-use trail bypassing the tunnel. Construction of an additional trail would produce its own environmental impacts, which may offset any gains made from the reduction in road shoulders. Use of existing pedestrian trails as multi-use trails could detract from the hiking experience. Special licensed vehicles would be required to use the road, which could create a safety hazard in the tunnels. Therefore, the design option of narrow road shoulders was removed from consideration in project design.

Use of the Existing Road Alignment as a Trail

Following construction of a new road alignment, the abandoned road could be narrowed and used by non-motorized traffic. This was not an acceptable option due to safety considerations from continued bluff erosion.

Use of State or Local Road Design Standards

The NPS Park Road Standards were selected as the road design standards for the proposed project because of the sensitivity of the natural surroundings and the allowances made in the NPS standards for minimizing environmental impacts while providing safe vehicular access. The state and local design standards were not chosen because they focus on addressing transportation needs over environmental and recreational issues.

2.6 ENVIRONMENTALLY PREFERRED ALTERNATIVE

Council on Environmental Quality (CEQ) regulations for implementing NEPA require that the environmental document specify "the alternative or alternatives which were considered to be environmentally preferable" (40 C.F.R. §1505.2(b)). The environmentally preferred alternative has been interpreted to be the alternative that would promote the national environmental policy as expressed in NEPA. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; and best protects, preserves, and enhances historic, cultural, and natural resources. The environmentally preferred alternative is not necessarily the same as the agency preferred alternative.

The environmentally preferred alternative for this project is alternative B. This alternative provides for continued road access to visitors and residents of Cattle Point while minimizing impacts to the prairie vegetation, visual resources, recreational trails, and historic resources.

For this project, the environmentally preferred alternative is the same as the agency preferred alternative.

Chapter 3: Affected Environment

3.1 INTRODUCTION

This chapter describes the existing physical, biological, cultural, and social environment in the project area and vicinity. It describes the existing conditions of resources that may be affected by the project alternatives if they were implemented. These resource conditions represent the baseline information on which environmental consequences of the alternatives are evaluated in chapter 4.

The chapter is organized by resource categories: physical, biological, cultural, and social. Individual resources within each category are described under these headings. Each resource discussion includes a description of the resource area with background on how the resource is related to the proposed project, a general overview of relevant regulatory requirements pertaining to the resource, where applicable, and a discussion of the conditions of the resource within the project vicinity.

The *project area* (figure 3.1) encompasses the locale between the existing Cattle Point Road alignment (alternative A) and the three action alternative alignments (B, C, and D). The

Figure 3.1 - Project Area and Project Vicinity

western edge of the project begins near MP 7.9 in the San Juan National Historical Park (SJNHP) and proceeds east for approximately 5,200 feet, ending near MP 8.4 in the Cattle Point NRCA, close to the intersection of the NRCA trail and the existing Cattle Point Road. The southern edge of the project area is bounded by the existing road alignment, and the northern edge is located on the ridgeline of Mt. Finlayson, approximately 150 feet up-slope from the existing road. The *project vicinity* includes the entire Cattle Point peninsula, from the north and west boundaries of the American Camp Unit of the SJINHP to the tip of Cape San Juan.

The areas described above comprise the baseline project area and project vicinity. The spatial scope of the resource analysis may be larger, depending on the geographic area of potential impacts for the individual resource of concern. Thus, the area of impact may differ from resource to resource. Any differences in area of impact will be clarified in the resource descriptions and the environmental consequences section.

3.2 PHYSICAL ENVIRONMENT

3.2.1 Topography

Cattle Point is situated on the southeastern tip of San Juan Island. The area is characterized by low rolling hills with the highest point on Mt. Finlayson at 295 feet. The Cattle Point peninsula consists of prairie grassland to the south, with mixed coniferous and deciduous forest located to the north of the Mt. Finlayson ridge. The point is bounded on the south by the ocean waters of the Strait of Juan de Fuca, which separates San Juan Island from the Olympic Peninsula. The southern shoreline consists of long gravel beaches broken by rock outcroppings and protected sandy coves. The northern shoreline of Cattle Point is located on Griffin Bay. This area consists of long gravel beaches as well as three temperate marine lagoons (NPS 2008).

The project area has a southerly aspect, with slopes varying from 0 to 38 degrees and elevations ranging from 140 feet near the existing road to 295 feet at the summit of Mt. Finlayson. The topography in the project area is dominated by two undulating benches and the flat ridgeline of Mt. Finlayson.

3.2.2 Geology and Soils

The geology of the San Juan Islands and Puget Sound has been heavily influenced by glacial processes and plate tectonics. In recent ice ages, the area was covered with ice over one mile in depth. As the glaciers retreated, large quantities of glacial sediments were deposited while the land also rose in the glacial rebound process. At certain times during glacial retreat (theorized to be when glacial rebound matched sea level change), wave-cut benches were created on the slopes of Mt. Finlayson. These benches remain visible in the project area in the form of two to three slope breaks between the ridgeline and the coastal bluff. The open grassland and intact natural topography make the area a prime example of the benches resulting from this process (figure 3.2).

San Juan Island is located in close proximity to the convergence zone of two major tectonic plates, the Juan de Fuca Plate and the North American Plate. Deep-seated, major tectonic events of magnitude 7 or greater are possible along tectonic plate boundaries, and evidence from studies in Japan and on the coasts of Oregon and Washington indicates that a seismic event of this magnitude may have occurred off the Oregon-Washington coast as recently as 300 years ago. Seismic activity also occurs on shallower, near-surface faults in northwestern Washington; however, no active faults are known to be located in the greater project area and no historical earthquakes are known to have occurred in the area of Cattle Point (WFLHD 2005).

Cattle Point is characterized by substantial depths of glacially deposited sand and gravel overlying bedrock. Glacial soils occupy most of the project area. Soils associated with the prairie and slopes of Mt. Finlayson are gravelly to cobbly with occasional boulders and are somewhat excessively drained. Depending on slope, runoff can be low to very low (NPS 2008).

Figure 3.2 - Bench Areas on South Side of Mt. Finlayson

No bedrock outcrops occur within the proposed project area, but an outcrop of bedrock is visible on the beach below and to the east of the project area. If bedrock is present in the project area, it is likely to be similar to bedrock exposed along the shoreline near the eastern tip of the island, which consists of a variety of metamorphosed sedimentary and volcanic rocks (WFLHD 2005).

Three subsurface exploration borings ranging from 70 to 150 feet in depth were performed along the existing road as a part of previous investigations for the project. These borings were located on the existing road near the base of Mt. Finlayson (WFLHD 2005). All three subsurface borings encountered gravelly and silty sand at all depths. Two water well borings have been drilled in the vicinity of the project. One of the water wells encountered bedrock at a depth of 58 feet. Bedrock was not encountered in the other water well boring, drilled to a depth of 282 feet (Milbor-Pita 2001).

<u>Bluff Retreat Rate</u>

The need for the project is driven by the erosion of the shoreline and bluff and the potential impacts the erosion could have on the Cattle Point Road. A section of road approximately 500 feet in length is located less than 70 feet from the edge of the eroding bluff. The area immediately south of this section of roadway slopes variably to a steep bluff edge then drops steeply to the shoreline of the Strait of Juan de Fuca, approximately 150 feet below.

Figure 3.3 - Roadway at the Eroding Bluff

Studies have been conducted to better understand the bluff erosion process. An erosion study commissioned by San Juan County was completed by Landau Associates in 2002. Another study of bluff erosion was conducted independently by Lindsey Baumann in May of 2002. This study was performed as a research project for undergraduate studies at the University of Montana.

Both the Landau and Baumann studies identify coastal wave action as the main cause of erosion at the toe of the slope. Wave cutting processes are generally highest in the winter months particularly when large storm waves and high tides coincide (Landau 2002). Wave action cuts steep scarps at the bluff toe, which leads to translational failure of the soils on the slope above, and ultimately failure of the bluff top (Landau 2002). Wind erosion (particularly under dry conditions) also contributes to slope instability. Due to the high permeability of the soils, little erosion is attributed to surface water because most precipitation infiltrates into the soil. Human foot traffic was also cited as a contributor to slope instability at the top of the bluff (Landau 2002).

Using aerial photographs taken in 1970, 1980, and 2001, Landau Associates measured the rate of retreat at both the toe and top of the bluff in eight locations within the area where the road is located closest to the bluff. During the 31-year period, the bluff toe retreated between 85 and 100 feet and the bluff top retreated 35 to 50 feet. Using these measurements, Landau calculated that the rate of retreat at the toe of the bluff averaged 3.2 feet per year and the rate of retreat at the top of the bluff averaged 1.3 feet per year. Error due to differences in scale and difficulty in clearly identifying the edges of the bluff was estimated to be less than 10 percent. The study measured the closest point of the road to the bluff edge at about 50 feet. However, it was assumed that because of the over-steepened nature of the slope, the amount of bluff retreat that could occur without endangering the road was less than 20 feet. Based on 20 feet of additional allowable bluff retreat and a retreat rate of 3.2 feet per year, the study concluded that the life expectancy of this section of road was approximately 6 years. This prediction has not proven to be entirely accurate.

The Baumann study measured the rate of retreat at the top of the slope from 60 reference points located in the area where the roadway is closest to the bluff. Measurements taken from April 2001 to April 2002 showed that the rate of retreat at these sites ranged from 0 to 40 inches. From this information, the average rate of retreat at the top of the bluff was calculated at 1.3 feet per year, which corresponds with the Landau Associates' findings. Baumann stated that a more comprehensive study of the rate of erosion would need to be conducted over a period of several years in order to draw long-range conclusions regarding bluff erosion rates. Since the conclusion of Bauman's formal study in 2002, the Cattle Point Home Owners Association has continued to monitor and measure the reference points using the original study protocol. Table 3.1 presents the measurements taken in 2001, 2002, 2003, 2004 and 2009, and shows the distance between the road guard rail and the edge of the bluff. The last readings were taken in September 2009. The average erosion rate at each stake for the period between 2001 and 2009 is shown in the far right column.

Table 3.1 – Bluff Erosion from Guard Rail to Edge of Bluff.

	Guard Rail to Edge of Bluff (feet)							
Reference Stake	4/28/2001	1/21/2002	1/3/2003	2/7/2004	12/30/2004	9/15/2009	Total erosion 2001-2009	Annual erosion rate
1	69.6	68.8	67.5	66.8	66.1	66.1	3.5	0.4
2	65.6	63.3	63.2	62.5	62.4	62.4	3.2	0.4
3	61.9	60.4	58.8	58.8	58.5	58.1	3.8	0.5
4	61.0	59.0	57.3	57.0	56.9	56.2	4.8	0.6
5	59.6	57.9	56.1	55.9	55.9	55.3	4.3	0.5
6	57.3	56.7	55.4	55.6	55.5	52.8	4.5	0.6
7	57.8	56.8	56.4	56.2	56.2	54.3	3.5	0.4
8	56.0	55.8	53.2	53.2	53.2	52.7	3.3	0.4
9	55.4	54.0	52.7	52.0	51.5	50.0	5.4	0.7
10	54.9	54.6	52.9	51.9	51.9	51.6	3.3	0.4
11	51.3	50.9	49.2	49.6	49.3	46.3	5.0	0.6
12	48.8	48.8	47.8	47.7	46.8	41.3	7.5	0.9
13	48.0	46.5	45.3	45.2	45.0	38.1	9.9	1.2
14	46.9	45.4	45.8	44.9	44.9	37.8	9.1	1.1
15	43.8	43.0	42.4	42.2	42.2	35.1	8.7	1.1
16	41.4	40.2	40.1	39.5	39.5	32.0	9.4	1.2
17	41.0	40.6	39.4	39.5	39.5	32.0	9.0	1.1
18	39.8	38.1	37.5	37.1	37.1	32.8	7.0	0.9
19	39.3	38.2	38.4	37.5	36.8	33.9	5.4	0.7
20	38.5	37.5	37.6	36.5	36.5	31.4	7.1	0.9
21	41.1	40.3	40.3	39.4	38.9	31.2	9.9	1.2
22	42.5	41.5	40.9	40.9	40.9	33.9	8.6	1.1

Reference Stake	Guard Rail to Edge of Bluff (feet)							
	4/28/2001	1/21/2002	1/3/2003	2/7/2004	12/30/2004	9/15/2009	Total erosion 2001-2009	Annual erosion rate
23	44.5	43.2	43.2	43.2	43.2	35.6	8.9	1.1
24	44.8	44.0	43.8	43.1	43.1	35.6	9.2	1.2
25	44.9	44.1	43.6	42.7	42.1	33.7	11.2	1.4
26	46.2	43.9	42.7	41.0	39.7	32.4	13.8	1.7
27	45.3	44.1	43.3	42.3	41.3	34.8	10.5	1.3
28	44.8	43.4	42.7	40.1	40.1	34.9	9.9	1.2
29	44.2	43.6	42.1	42.1	40.1	35.8	8.4	1.0
30	45.3	43.5	43.5	43.1	41.5	34.3	11.0	1.4
31	44.1	43.2	41.8	42.0	40.3	32.8	11.3	1.4
32	41.7	40.7	39.8	39.8	38.8	33.1	8.6	1.1
33	43.3	41.5	38.4	38.0	38.0	33.2	10.1	1.3
34	48.3	46.2	43.7	43.1	41.8	35.4	12.9	1.6
35	45.4	44.9	44.4	44.3	43.5	37.0	8.4	1.0
36	45.5	45.4	44.8	44.7	44.3	38.3	7.2	0.9
37	45.1	45.1	42.8	42.8	42.8	39.4	5.7	0.7
38	47.2	47.0	45.8	45.5	45.3	38.3	8.9	1.1
39	49.3	48.8	48.8	48.0	47.2	41.9	7.4	0.9
40	49.5	48.6	48.5	48.5	48.5	42.3	7.2	0.9
41	49.3	47.8	47.1	46.8	46.7	43.8	5.5	0.7
42	49.2	46.8	47.3	47.2	47.1	44.9	4.3	0.5
43	52.1	50.5	48.6	48.1	48.1	43.7	8.4	1.0
44	53.4	52.6	51.8	51.0	51.0	46.0	7.4	0.9
45	55.2	54.7	54.1	53.2	51.8	49.7	5.5	0.7
46	56.2	54.5	54.6	54.2	52.8	51.1	5.1	0.6
47	57.3	55.3	55.1	54.2	54.2	51.8	5.5	0.7
48	58.8	57.2	56.6	55.2	54.0	53.2	5.6	0.7
49	60.0	57.9	55.5	55.0	54.3	53.2	6.8	0.8
50	62.5	59.3	57.5	56.4	55.5	55.3	7.2	0.9
51	63.0	61.1	59.5	59.1	59.1	55.7	7.3	0.9
52	63.0	61.5	60.7	60.0	60.0	57.6	5.4	0.7
53	62.4	61.8	59.5	60.1	58.7	54.9	7.5	0.9
54	63.3	62.4	61.0	58.8	58.4	55.6	7.7	1.0
55	65.4	62.0	58.3	58.6	58.0	56.3	9.1	1.1
56	64.9	62.1	62.2	59.2	58.8	57.7	7.2	0.9
57	62.7	62.0	61.6	60.0	59.8	59.1	3.6	0.4
58	63.3	63.3	62.5	61.0	60.3	58.3	5.0	0.6
59	63.2	62.8	62.8	61.2	61.2	55.8	7.4	0.9
60	64.9	64.8	64.4	64.3	62.5	59.8	5.1	0.6

Table 3.2 shows the static compilation of the average erosion for all reference stakes from 2001 to 2009. The lower diagonal shows average yearly erosion rates occurring from survey date to survey date (in feet). The far right column shows average yearly erosion rates from the survey date in the far left column to the latest reading in September 2009.

Table 3.2 – Average Yearly Erosion in Feet from Date (left vertical axis) to Date (top horizontal axis)

Date	1/21/2002	1/3/2003	2/7/2004	12/30/2004	*9/15/2009*
4/28/2001	1.62	1.27	0.98	0.87	*0.86*
1/21/2002		1.00	0.75	0.68	*0.79*
1/3/2003			0.53	0.53	*0.76*
2/7/2004				0.52	*0.80*
12/30/2004					*0.86*

The data show considerably more erosion from 2001 to 2002, then a relative lull in erosion rate in 2004, and a reversion to the previous mean to 2009. The average erosion rate during this period is 0.86 feet per year. Looking at the conditions at each stake and assuming bluff erosion at the average rate of the past eight years, at its closest point (31.2 feet at stake 21) the bluff edge would reach the guard rail in about 36 years.

Recognizing the potential limitations associated with these studies, it is difficult to predict an exact date at which the road will fail. Bluff erosion is now as close as 31 feet from the roadway. During the past eight years, the bluff has retreated at a fairly steady rate; however, larger portions of the bluff have the potential to slide at once during a major storm event. Given the bluff material on which the road is built and its angle of repose of about 32 degrees, erosion would warrant close monitoring when the edge of the bluff comes within 15 feet of the guardrail (Malcolm Ulrich, FHWA geotechnical engineer, personal communication, 2009). At an average erosion rate of 1 foot per year, the roadway would be within 15 feet of the eroding bluff in about 16 years.

The FHWA and NPS have determined that the data from which the erosion rate has been derived is appropriate for use in this document considering the time frame, information, and technology available.

3.2.3 Air Quality

Air quality is regulated by the U.S. Environmental Protection Agency (EPA) and Washington State Department of Ecology (WDOE) through authority of the Clean Air Act of 1970. The EPA has established National Ambient Air Quality Standards (NAAQS) to protect the health and welfare of the public for six criteria pollutants established under the Clean Air Act. These pollutants are carbon monoxide, ozone, nitrogen oxides, sulfur dioxide, lead, and fine particulate matter.

The Clean Air Act requires that land managers protect air quality to meet all federal, state, and local pollution standards. It prohibits federal entities from taking actions in nonattainment or maintenance areas which do not conform to the state implementation plan for the attainment and maintenance of NAAQS. In 1993, the EPA established criteria and procedures for determining if transportation plans, programs, and projects funded under the Federal Transit Act conform to the state implementation plan (SIP).

The EPA Air Data website (www.epa.gov/air/data/index.html) shows that the proposed project is in an attainment area for the six NAAQS criteria pollutants. Because of this, the SIP does not include transportation control measures, and conformity procedures do not apply to this project.

The park area has been designated a Class II area under the Clean Air Act (NPS 2008). Class II areas allow only moderate increases in ambient air pollution over the park.

Air quality in the Pacific Northwest region is good compared with other areas of the United States (Eilers, Rose, and Sullivan 1994 in NPS 2008). Winds regularly deliver clean moist air from the atmosphere over the Pacific Ocean through the Strait of Juan de Fuca, mixing with local air masses and dispersing air pollution (Puget Sound Clean Air Agency 2003). Nearby particulate monitoring stations at Oak Harbor, Anacortes, and Mt. Vernon show no danger of exceeding ambient air quality standards (Franzmann 2003).

3.2.4 Water Resources

3.2.4.1 Floodplains, Wetlands, and Waterbodies

Floodplains are regulated under Executive Order 11988 (*Floodplain Management*), which requires the assessment of impacts and the potential risks involved in placing facilities within floodplains. The order directs that the long and short-term adverse impacts associated with the occupancy and modification of floodplains be avoided wherever there is a practicable alternative.

Wetlands are regulated under the Clean Water Act (33 USC 1344) and Executive Order 11990 (*Protection of Wetlands*). These regulations direct that long and short-term adverse impacts associated with the destruction or modification of wetlands and direct or indirect support of new construction in wetlands be avoided wherever there is a practicable alternative. In addition, the NPS 2006 *Management Policies* require preservation and no net loss of wetlands.

There are no streams or other waterbodies present in the project area. The nearest waterbody is the saltwater shoreline at the base of the eroding bluff. At its closest, the shoreline is approximately 200 feet down-slope from the project area (Biological Report 2006).

Nearby, but outside the project area, there are water resources, including the groundwater-fed water supply well, springs, and seeps. Although many small springs support wetland areas within American Camp, there are no mapped springs and there is no evidence that springs exist within the project area. The closest mapped spring is 0.2 miles southwest of the western end of the project area. A 1998 wetlands survey performed by the NPS found that there are no wetlands or floodplains (as defined in the NPS floodplain management guides) present in the project vicinity (Holmes 1998).

Three temperate marine lagoons, Old Town, Jakle’s, and Third, are located adjacent to the shoreline on the north side of American Camp (figure 3.5). The closest (Third Lagoon) is located about 2,500 feet northwest of the project area. Because they are rare to the Pacific Northwest coast, these lagoons represent valuable ecological resources and are an important natural resource of the park and NRCA (Flora and Sharrow 1992 in NPS 2008). Jakle’s Lagoon, the largest body of surface water in the park, has been designated as an Environmental Study Area by the University of Washington.

Figure 3.5 - Temperate Marine Lagoon Locations and Well Log Locations

3.2.4.2 Hydrology

With the growing population and dependence on glacial-deposit and bedrock aquifers in the San Juan Islands, there is growing concern about the quality and availability of ground water. For residents of Cattle Point, potable water is a critical resource. Residents depend on a well system that is fed by water from aquifers under Mt. Finlayson. Consequently, concerns have been raised over impacts to the aquifer. The groundwater wells pump from shallow unconfined aquifers in glacial deposits or fractured bedrock (NPS 1998). The aquifer is accessed by a well system on the north side of the ridge. The Cape San Juan wells are approximately 800 feet from the nearest proposed road alignment. The remaining wells are over 1,200 feet away (figure 3.6).

Groundwater recharge results from local precipitation infiltration (figure 3.6). A key issue in assessing groundwater availability is to determine the amount of recharge to the aquifers from precipitation. Most recharge occurs between September and April (NPS 1998). Precipitation averages about 22 inches per year at American Camp, and the recharge potential is described as relatively high (NPS 1998). A recent U.S. Geological Survey study on recharge in the San Juan Islands found that average island-wide recharge is most closely related to the amount of area overlain by glacial deposits. Cattle Point is overlain by large glacial deposits, therefore the recharge potential locally is likely to be high (Orr et al. 2002).

The drainage divide at the Mt. Finlayson ridge separates the project area, where water flows toward the Strait of Juan de Fuca, from the north side of the ridge where water flows toward Griffin Bay.

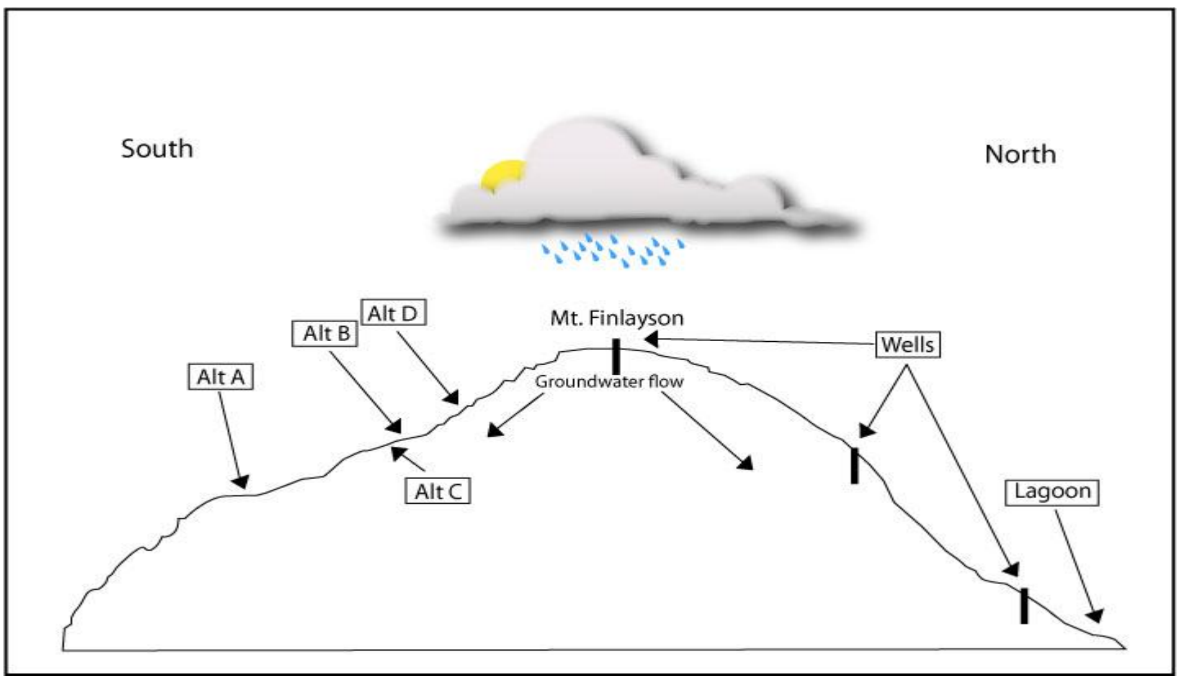


Figure 3.6 - Cross Section of Mt. Finlayson and Water Resources

3.2.4.3 Water Quality

Water quality is regulated by the EPA and U.S. Army Corps of Engineers through authority of the Clean Water Act. The Act uses several regulatory tools to reduce pollutant discharges into waterways and wetlands. The National Pollutant Discharge Elimination System (NPDES) permit applies to construction projects that disturb over 1 acre of land. This permit requires the implementation of a Storm Water Pollution Prevention Plan (SWPPP) to control erosion and the discharge of sediment from construction projects into waterways. The 404 permit is required for discharge of fill material into wetlands and waters of the U.S.

Overall, water quality in the region of San Juan Island Historical Park, including Cattle Point, is relatively high. Marine waters surrounding the islands are rated class AA by the state (Garland 1996 in NPS 2008). Class AA waters have all beneficial uses to a high degree. Beneficial uses include water supply; fish and shellfish spawning, rearing, migration, and harvesting; wildlife habitat; recreation; and navigation. Class AA waters have the highest water quality standards (www.crcwater.org/onalaska/waterquality).

A 2006 NPS report assessed the coastal resources and watersheds in the park. The report lists potential problems with water resources in the Strait of Juan de Fuca near American Camp from toxic compounds (due to potential for fuel/oil spills), water withdrawals, coastal erosion, and marine debris. The report identifies the Cattle Point Road project and recommends making efforts to reduce the impacts of any road-building activities on the near-shore environment.

3.2.5 Visual Quality

The San Juan Islands are well known for their beauty, rural landscape character, and slower pace of life. American Camp has the longest undeveloped stretch of beach on the island (NPS 2008).

The project area is located on the south slope of Mt. Finlayson. The slope consists of an ancient prairie, which lies between the coastal bluffs and the summit. The setting of the road on an open grassland and elevated hillside offers outstanding views to Mount Baker, the Cascade Mountains, the Olympic Mountains, Mt. Rainier, the Strait of Juan de Fuca, Vancouver Island, and other islands. The views become more expansive up the slope to the top of Mt. Finlayson, which is 295 feet in elevation. The scenery changes dramatically on the north slope of Mt. Finlayson. The north slope is covered by a large expanse of dense, mature forest vegetation and offers limited scenic views.

The visual resources of the project area include views from the Cattle Point Road as well as the view of the road itself from areas throughout the park and NRCA. There are a number of other important view-sheds associated with the project area. These include the view from offshore, the beach, the air, the residential areas, and other important locations including those identified in the park's Cultural Landscape Inventory. View-sheds having cultural importance are discussed in Section 3.4.

The existing roadway has vegetated cut and fill slopes that serve to blend somewhat into the surrounding landscape. The road surface and guardrail create a visual impact to which area users have become accustomed. From other areas of Cattle Point including residences and surrounding waters, the road itself creates a minor interruption in the natural landscape, though this is somewhat masked by the vegetated cut and fill slopes. The black pavement and guardrail section is visible from certain eastern parts of the park (especially upslope) and the NRCA, including the trail system.

Figure 3.7 – Cattle Point Road Setting and Views

3.3 BIOLOGICAL ENVIRONMENT

3.3.1 Vegetation

Prairie vegetation is the dominant cover in the project area. It occupies the area from the coastal bluffs up to the south facing slopes of Mt. Finlayson (NPS 2008). Non-native species have invaded the prairie, but remnants of native grasses and wildflowers still exist (NPS 2005b)(figure 3.8).

Native vegetation is dominated by red fescue (*Festuca rubra*), Roemers' fescue (*Festuca idahoensis var. roemeri*), many-flowered wood-rush (*Luzula multiflora*), great camas (*Camassia leichtlinni*), field chickweed (*Cerastium arvense*), and western buttercup (*Ranunculus occidentalis*) (Lambert 2003 in NPS 2008). Much of the grassland has been altered from its pre-settlement condition and is now dominated by non-native vegetation. Non-native species include Canada thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), and Himalayan blackberry (*Rubus discolor*). These species tend to form monocultures, decreasing the biodiversity of the prairie (NPS 2008).

The park's vegetation management goals focus on restoring native vegetation without compromising the historic landscape. Due to the degraded state of the grassland, the park has begun a long term program to restore areas where possible, including those in the project area.

The north slopes of Mt. Finlayson are dominated by Douglas-fir (*Pseudotsuga menziesii*) and western hemlock (*Tsuga heterophylla*) combined with western red cedar (*Thuja plicata*), grand fir (*Abies grandis*), and lodgepole pine (*Pinus contora*). The understory includes evergreen salal (*Gaultheria shallon*) and western sword fern (*Polystichum munitum*) (NPS 2008).

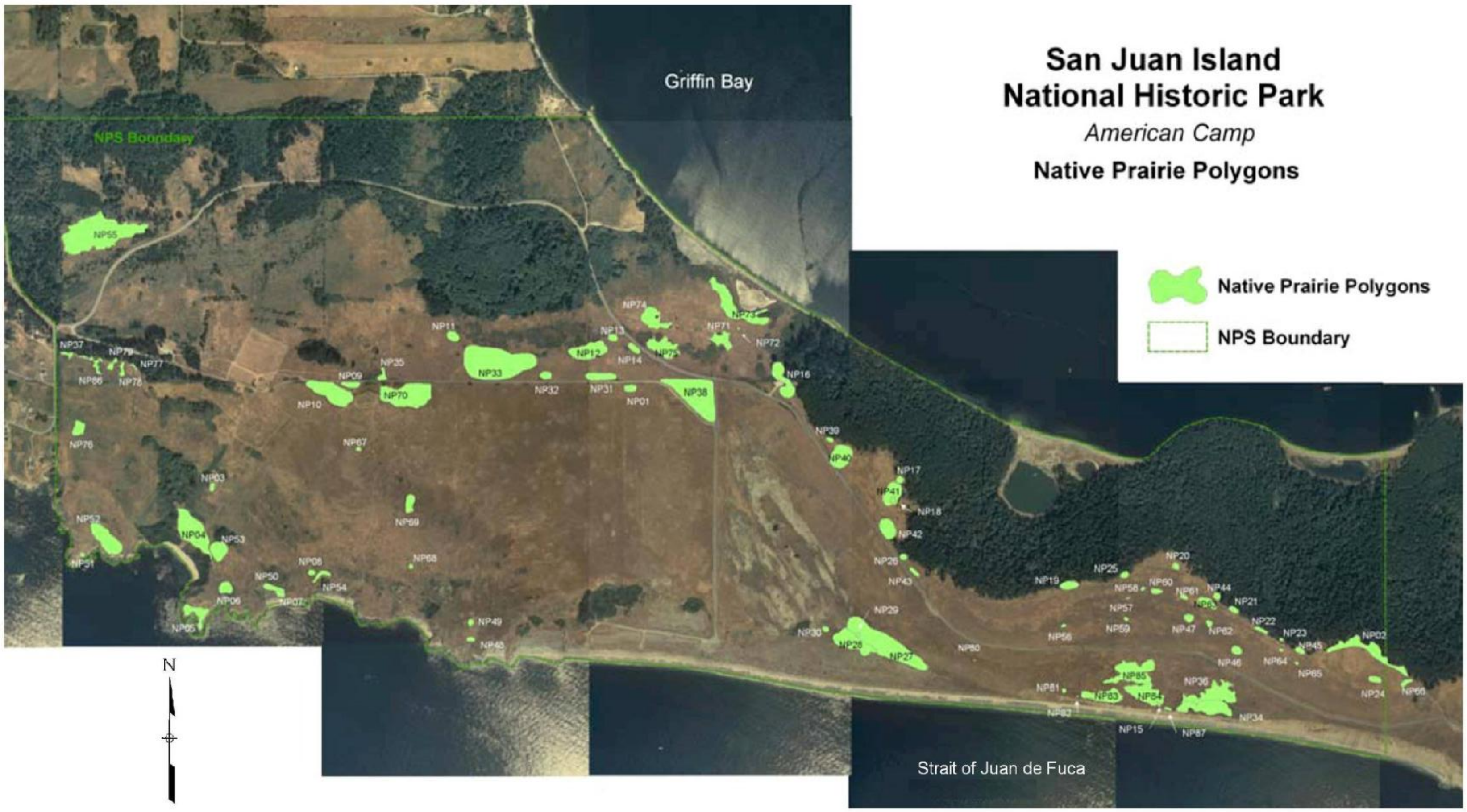


Figure 3.8 – American Camp Native Prairie Polygons

3.3.2 Wildlife and Fish

Cattle Point is divided by the ridgeline of Mt. Finlayson. Exposed open grassland is located on the south slope, while the leeward north slope is forested. This creates two unique habitats with important fringe habitat along the ridgeline where wildlife species transition between forest and grassland.

Forest and grassland habitats in the vicinity of the project area are inhabited by a variety of mammals including the Columbian black-tailed deer (*Odocoileus hemionus*), the European rabbit (*Oryctolagus cuniculus*), and the red fox (*Vulpes vulpes*). The latter two species are non-native, and the rabbits have negatively affected the prairie ecosystem in the project area (NPS 2008). There are also numerous species of small mammals including mice, shrews, voles, and bats.

The presence of 93 species of birds has been confirmed in the park (NPS 2008). These include a variety of songbirds, shorebirds, seabirds, and waterfowl.

Commonly-seen birds in the project area include the savanna sparrow *(Passerculus sandwichensis)*, spotted towhee (*Pipilo maculatus*), chestnut-backed chickadee (*Poecile rufescens)*, western tanager (*Piranga ludoviciana)*, northern flicker (*Colaptes auratus*), great-horned owl (*Bubo virginianus*), Pacific slope flycatcher (*Empidonax difficilis*), violet-green swallow (*Tachycineta thalassina)*, dark-eyed junco (*Junco hyemalis)*, red-breasted nuthatch (*Sitta canadensis)*, brown creeper (*Certhia americana*), bald eagle (*Haliaeetus leucocephalus*), northern harrier *(Circus cyaneus)*, and turkey vulture *(Cathartes aura)*. Also present in the project area are crows and ravens, and a variety of hawk, sparrow, wren, finch, and warbler species. Ducks, loons, gulls, cormorants, oystercatchers, geese, and other birds frequent the project area or use the waters offshore (NPS 2008).

Two amphibian and two reptile species have been documented in the park, and an additional four amphibian and four reptile species are likely to be found in the park (NPS 2008). The Pacific chorus frog (*Pseudacris* regilla), the red-legged frog (*Rana aurora*), the northern alligator lizard *(Elgaria coerulea)*, and the northwestern garter snake (*Thamnophis ordinoides*) have been observed in the park (NPS 2008). Amphibian species are primarily found in wetland and forest habitats of the island. While there are forested areas to the north, there are no wetlands or waterways within the project area.

A variety of butterflies, moths, snails, slugs, and other invertebrate species are also present in the Cattle Point area. Because of the presence of grassland and other habitats favorable to butterflies, species diversity near Cattle Point is high relative to most of western Washington, with more than 30 butterfly and moth species identified in the park (Pyle 2004).

Outside of the project area, the shoreline and offshore environments contain numerous species, ranging from shellfish to orcas, elephant seals, and other marine mammals.

The project area contains no rivers, streams, or other surface waterbodies; therefore no fish or aquatic organisms are found within the project area.

3.3.3 Federally-Listed Threatened, Endangered, and Protected Species

Species of plants and animals that are in serious decline on a national, state, or local level and which may be threatened with extinction are listed by the U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA) Fisheries Service (also known as the National Marine Fisheries Service [NMFS]), or the state of Washington as threatened or endangered.

Section 7 of the Federal Endangered Species Act (ESA) requires that federal agencies review all actions authorized, funded, or carried out by them to ensure that those actions do not jeopardize the continued existence of any federally-listed species or result in the destruction or adverse modification of critical habitat.

Under the ESA, the following designations have been established (www.fws.gov/endangered/ESA/sec3.html):

Endangered: An endangered species is determined to be in danger of extinction throughout all or a significant portion of its range.

Threatened: A threatened species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Information on ESA-listed species within San Juan County was obtained from the USFWS and NOAA websites and last updated on May 8, 2009.

Other applicable federal laws protecting wildlife in the project area include the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and the Marine Mammal Protection Act.

The Migratory Bird Treaty Act (MBTA) of 1918 and later amendments, implements various treaties and conventions between the U.S. and Canada, Japan, Mexico, and Russia for the protection of migratory birds. Under the Act, it is unlawful to take, kill, or possess migratory birds. Migratory birds are those species that generally migrate each fall from breeding grounds to their wintering grounds. In the spring they return to their breeding grounds, where they have young and the cycle repeats. All native birds commonly found in the United States except native resident birds and introduced species are protected under the MBTA. A resident bird is one that does not make seasonal migrations.

The Bald and Golden Eagle Protection Act (BGEPA), enacted in 1940 and amended several times since then, prohibits anyone from taking eagles, including their parts, nests, or eggs. Among other actions, take includes disturbances that agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, 1) injury to an eagle; 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or 3) nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior (www.fws.gov/pacific/eagle).

The Marine Mammal Protection Act (MMPA), enacted in 1972, protects all marine mammals. Marine mammals are mammals that are well adapted for life in the marine environment. They include whales, dolphins, porpoises, seals, sea lions, and walruses. The MMPA prohibits the take of marine mammals in U.S. waters or by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the U.S. Under the MMPA, take is defined as harass, hunt, capture, kill, or collect, or to attempt to harass, hunt, capture, kill, or collect.

To compile the information gathered for use in this document and in the Biological Assessment, both a biological and a plant survey report were completed by the project consultant (Widener 2006a, 2006b). NPS and DNR staff was consulted regarding species and habitat presence in the project area and potential impacts of the proposed project to these species. The information in the 2006 reports was reviewed and updated in October 2008 to incorporate the latest updates to the federal and state threatened, endangered, candidate, and rare species lists.

Using the information obtained from surveys and reports, the proposed project area was evaluated to determine which listed threatened or endangered species might occur within the area of potential impacts. The evaluation was based on the presence of probable habitat types, biological requirements of the species, and known observations.

For terrestrial wildlife species, the area of potential impacts extends beyond the immediate project area to include areas which may be directly or indirectly affected by construction activities. This includes the area within a 0.5-mile radius of the project, which represents the most commonly recognized distance within which disturbance to terrestrial species occurs (WSDOT Feb 2001 as cited in Biological Report), excluding high noise activities such as impact pile driving, blasting, and use of jack hammers. No high noise activities are expected in any of the proposed alternatives.

There are no waterways or wetlands within the project area and there are no surface-flow connections from the project area to aquatic resources to the north or south of the project area; therefore the marine environment adjacent to San Juan Island is not included in the area of potential impacts for marine species.

Federally-listed threatened and endangered species and other federally protected species that may be present in the project are listed in table 3.1. No critical habitat has been formally designated by the USFWS or NOAA Fisheries Service for any listed species in the project area, and no species or critical habitat is proposed for listing. Species having MBTA and MMPA protection in addition to state endangered and rare status are listed in tables 3.2 and 3.3. These tables are not an all inclusive list of birds in the project area protected under the MBTA. The official list of bird species protected under the MBTA can be found at 50 CFR 10.13.

Table 3.1 – Federally-Listed Threatened and Endangered Species and Federally Protected Species Potentially Occurring in the Project Area

Federally-Listed Threatened, Endangered, and Protected Species Potentially Occurring in the Project Area				
Common Name	**Scientific Name**	**Status ***	**Habitat Requirements**	**Occurrence in Project Area**
Birds				
Bald eagle	*Haliaeetus leucocephalus*	BGEPA, MBTA	See detailed information below.	Yes See detailed information below
Marbled murrelet	*Brachyramphus marmoratus*	FT, MBTA	Inhabit calm, shallow, coastal waters and bays, and nest inland, up to 45 miles from shore, in dense, mossy, old-growth conifer stands (www.seattleaudubon.org/birdweb/browse_birds.asp 2008).	No. May feed in waters off Cattle Point but do not nest in project vicinity

Federally-Listed Threatened, Endangered, and Protected Species Potentially Occurring in the Project Area				
Common Name	**Scientific Name**	**Status ***	**Habitat Requirements**	**Occurrence in Project Area**
Fish				
Bull trout	*Salvelinus confluentus*	FT	Require cold water, stable stream channels, clean spawning and rearing gravel, complex and diverse cover, and unblocked migratory corridors (Watson and Pierce 1998).	No. No stream habitat within project area and marine waters are outside area of potential impacts
Chinook salmon	*Oncorhynchus tschawytscha*	FT	Important habitat provided in freshwater streams and estuaries. Eggs laid in deeper water with large gravel. Need cool water and good water flow to survive. Juveniles may spend many months rearing in estuaries before migrating to sea (NOAA 2009).	No. No stream habitat within the project area and marine waters are outside area of potential impacts
Steelhead	*Oncorhynchus mykiss*	FT	Require cool, clean water during all phases of life cycle. Habitat consists of streams with pools having escape cover such as large woody debris, and undercut banks (www.naparcd.org/steelheadtrout.htm 2009).	No. No stream habitat within project area and marine waters are outside area of potential impacts
Marine Mammals				
Humpback whale	*Megaptera novaeangliae*	FE, MMPA	Migrate between California and the Gulf of Alaska during summer and fall. Often range relatively close to shore; however, require deep water for migration. Waters within 0.5 miles of project area are no more than 20 feet deep and most waters are less than 10 feet deep (NPS 2008).	No. Marine waters within 0.5 miles of project area are too shallow
Southern resident killer whale	*Orcinus orca*	FE, MMPA	A small population range from the Queen Charlotte Islands in British Columbia to Monterey, California. They spend much of the summer in protected inshore waters near San Juan Islands in the Strait of Juan de Fuca, Haro Strait, and Georgia Strait, feeding mostly on Chinook salmon.	No. Marine waters adjacent to San Juan Island are outside area of potential impacts

Federally-Listed Threatened, Endangered, and Protected Species Potentially Occurring in the Project Area				
Common Name	**Scientific Name**	**Status ***	**Habitat Requirements**	**Occurrence in Project Area**
Steller sea lion	*Eumetopias jubatus*	FT, MMPA	May occur in Puget Sound and in marine waters adjacent to San Juan Island; although no communal haul-out sites are known to be present in the waters surrounding the project area.	No. No haul-out sites within 0.5 mile of project area
Plants				
Golden paintbrush	*Castilleja levisecta*	FT	Found in open grassland areas and most successful where native prairie species dominate. Commonly associated with Idaho fescue (*Festuca idahoensis*) or red fescue (*Festuca rubra*). Historically present at Cattle Point, but currently thought to be extirpated from project area. Project area contains suitable habitat, but species not found during NPS 2005b field survey. USFWS recovery priority 2. High potential for recovery. Possible for reintroduction in project area.	No. Habitat in project area, but no individuals found during survey
Marsh sandwort	*Arenaria paludicola*	FE	Wetland species. Can grow in saturated acidic bog soils and sandy substrates with high organic content (WNHP 2004; USDA 2004, NPS 2008). No suitable habitat in project area.	No. No suitable habitat in project area

*** Status -**
BGPA*= Protected under Bald and Golden Eagle Protection Act
FE= Federally Listed Endangered
FT= Federally Listed Threatened
MBTA*= Protected under Migratory Bird Treaty Act
MMPA*= Protected under Marine Mammal Protection Act

Bald Eagle

The bald eagle was first listed under the Endangered Species Preservation Act of 1966. Following passage of the Endangered Species Act of 1973, the species was listed as endangered in the lower 48 states, except in Michigan, Minnesota, Oregon, Washington, and Wisconsin, where it was listed as threatened. In 1995, the bald eagle was down-listed to threatened in all lower 48 states. In 2007, the USFWS announced the recovery of the species and removed it from the list of threatened and endangered species; however, the bald eagle is still protected by the Bald and Golden Eagle Protection Act. This Act prohibits the take, possession, sale, or purchase of bald eagles, including their parts, nests, or eggs without a permit. The bald eagle is also classified as sensitive by the state of Washington.

Bald eagles are aquatic ecosystem birds that primarily forage on fish but will occasionally prey on water fowl, seagulls, and prairie species. Carrion is also an important food source. Bald eagles require a good food base as well as suitable perching areas and nesting sites. Their habitat includes estuaries, large lakes, reservoirs, rivers, and some seacoasts (USFWS 2007a).

Bald eagles use large trees or other elevated sites such as cliffs for spotting prey and as night roosts for sheltering. They typically nest in the tops of large trees near water in areas free from disturbances and often return to the same nest every year. In winter, bald eagles typically congregate near open water or in the vicinity of concentrated food resources such as fish spawning areas, waterfowl concentration areas, or sources of mammalian carrion such as ungulate winter ranges. An important component of bald eagle nesting and wintering areas is a consistent source of food. The availability of food resources is critical during brood rearing, when food limits survival of young (Stalmaster in USFWS 2007b).

The bald eagle is identified on the species list as occurring within San Juan County (USFWS 2009). USFWS information indicates that wintering concentrations of bald eagles can be found at nine locations within the county, including southeast San Juan Island, from about October 31 to March 31. Information about winter use by bald eagles in the park is limited. There is a possible roost site to the west of the park (Stofel, personal communication in USFWS 2005) and it is likely that bald eagles are using perching sites within the park for winter foraging (USFWS 2005). The project area is located within the 800-foot shoreline foraging buffer identified by the Washington Department of Fish and Wildlife (WDFW) priority habitat and species data (wdfw.wa.gov/hab/phslist.htm, accessed March 26, 2007).

WDFW data show that the project area is located within two historic bald eagle territories identified as the Mt. Finlayson Bald Eagle Territory and the Cattle Point Bald Eagle Territory, and it is adjacent to a third bald eagle territory known as Old Camp Bald Eagle Territory. Six historic nest sites containing nine nests are located within 0.5 miles of the project area. The upper point on the proposed road realignment is located within the 800-foot buffer of one bald eagle nest located near the peak of Mt. Finlayson (wdfw.wa.gov/wlm/diversity/baldeagles/index.htm). Bald eagle nesting activities occur from January 1 to August 15 (USFWS 2004). Bald eagle territories and nest sites are also located within 1 mile of the project area on Lopez Island and near the American Camp historic areas.

NPS information shows that there are several historic bald eagle nest sites at American Camp but there are currently only two known occupied nest territories within the park boundary (NPS 2009). The bald eagle nest sites near the American Camp historic areas have been monitored by the NPS since the early 1990s. The Mt. Finlayson historic nest sites were monitored in 2009. Of the seven nest locations in the Mt. Finlayson area shown in the WDFW database, only one nest was found, and it was in disrepair and unoccupied (NPS 2009). The nest located closest to the proposed road realignments could not be found by the NPS in 2009.

3.3.4 State-Listed Threatened and Endangered Species

Since the project area includes state lands (NRCA), impacts to state special status species are also considered in this DEIS. Similar to federal ESA designations, the state has listed threatened, endangered, and candidate species that it has determined are at risk on a statewide level and that require special protection. Under Washington Administrative Code (WAC) 232-12-297, these are defined as follows**:**

Endangered: Any wildlife species native to the state of Washington that is seriously threatened with extinction throughout all or a significant portion of its range within the state.

Threatened: Any wildlife species native to the state of Washington that is likely to become endangered throughout a significant portion of its range within the state within the foreseeable future without cooperative management or removal of threats.

In the spring of 2005 a survey was conducted by a NPS botanist to identify native and non-native plants in the project area. Previous field surveys had identified appropriate habitat for nine rare species. The focus of this survey was to verify if these or any other rare plant species were in the project area, to map their locations, and to estimate population numbers of any rare plants, as well as to compile a comprehensive list of all plant species present in the project area. An intensive field survey was conducted in the project area in accordance with the Washington Natural Heritage Program (WNHP) field survey guidelines. Site visits were conducted in April and again in May to increase the likelihood that all species were in fruit or flower during the survey period.

The information from this survey was documented in the NPS Vascular Plant Survey Report (NPS 2005b), which assessed the conditions of plant habitat and confirmed the location of native prairie. The report also identified any unique plant species and plants that provide habitat for key wildlife species. The only rare plant identified within the project vicinity was the state-threatened California buttercup, *Ranunculus californicus*.

Information on state threatened and endangered species was also included in the biological and plant survey reports completed by the project consultant (Widener 2006a, 2006b).

State-listed threatened and endangered species that may be present in the project area are included in table 3.2.

Table 3.2 – State-Listed Threatened and Endangered Species Potentially Occurring in the Project Area

State-Listed Threatened and Endangered Species Potentially Occurring in the Project Area				
Common Name	**Scientific Name**	**Status ***	**Habitat Requirements**	**Occurrence in Project Area**
Birds				
Marbled murrelet	*Brachyramphus marmoratus*	ST, MBTA	See Federal Table 3.1	No
Streaked horned lark	*Eremophila alpestris strigata*	SE, WNHP, MBTA	Nests on the ground in sparsely vegetated sites in short-grass dominated habitats (historically prairies) in lowland areas. Thought to be extirpated from San Juan Islands Reintroduction under consideration	No Extirpated from San Juan Islands
Marine Mammals				
Humpback whale	*Megaptera novaeangliae*	SE, MMPA	See Federal Table 3.1	No

State-Listed Threatened and Endangered Species Potentially Occurring in the Project Area				
Common Name	**Scientific Name**	**Status ***	**Habitat Requirements**	**Occurrence in Project Area**
Northern sea otter	*Enhydra lutris kenyoni*	SE, MMPA	Occupy coastal marine habitats. Generally occur within 1.24 miles (mi) of shore especially shallows with kelp beds and abundant shellfish (USFWS 2004).	No Marine waters adjacent to San Juan Island are outside area of potential impacts
Southern resident killer whale	*Orcinus orca*	SE, MMPA	See Federal Table 3.1	No
Steller sea lion	*Eumetopias jubatus*	ST, MMPA	See Federal Table 3.1	No
Reptiles/Amphibians				
Northwestern pond turtle	*Emys (Clemmys) marmorata marmorata*	SE	Found in ponds and small lakes.	No No suitable habitat in project area
Invertebrates				
Whulge (Taylor's) checkerspot	*Euphydryas editha taylori*	SE	Dependent on native grassland. Although project area likely contains suitable habitat, species not documented in the project area and not observed during 2003 field surveys (Pyle 2003a, 2003b in NPS 2008).	No Habitat in project area, but no individuals found during survey
Plants				
Bear's foot sanicle	*Sanicula arctopoides*	SE	Found in coastal bluffs and grassy sand dunes near salt water.	No No suitable habitat in project area
California buttercup	*Ranunculus californicus*	ST	See detailed information below	Yes See detailed information below
Erect pygmy weed	*Crassula connata*	ST	Preferred habitat is chaparral and wet to moist vernal pools on coastal bluffs.	No No suitable habitat in project area

State-Listed Threatened and Endangered Species Potentially Occurring in the Project Area				
Common Name	**Scientific Name**	**Status ***	**Habitat Requirements**	**Occurrence in Project Area**
Golden paintbrush	*Castilleja levisecta*	SE	See Federal Table 3.1	No Habitat in project area but no individuals found during survey
Sharp fruited peppergrass	*Lepidium oxycarpum*	ST	Occurs in moist areas in salt spray zone and in direct sunlight.	No No suitable habitat in project area

*** Status -**
SE= State of Washington Endangered
ST= State of Washington Threatened
MBTA*= Protected under Migratory Bird Treaty Act
MMPA*= Protected under Marine Mammal Protection Act
WNHP= Washington Natural Heritage Program Priority Species

California Buttercup

The California buttercup is classified by the state of Washington as threatened and critically imperiled (five or fewer known occurrences in the state).

The California buttercup grows at low elevations on bluffs, rocky wooded areas, and in open grasslands along the coast. This species generally prefers relatively dry grassland areas, but can be found in moister ecosystems. The plant typically flowers in May and June (WNHP 2004).

The American Camp population of California buttercup (*Ranunculus californicus)* is complicated by the presence of the western buttercup (*Ranunculus occidentalis)* and the resulting hybrid (Steve Hahn, NPS botanist, personal communication email, May 15, 2004). During the 2005 survey, several morphological features were compared to determine if the plants were *R. californicus, R. occidentalis,* or hybrids. The American Camp population was found to contain approximately 3 percent *R. occidentalis,* 30 percent *R. californicus*, and 67 percent hybrids. However, the hybrids were more closely related to *R. californicus* than *R. occidentalis* (NPS 2005).

During the spring 2005 field survey, the NPS identified 33 groups (consisting of 2 to 260 individuals) of California buttercup within the project area where the total number is estimated at 1,839. However, due to the low, ground-based and multi-branched growth habits of this species, determining individual plant numbers is difficult. Altogether, the plants occupy a total of approximately 0.5 acres within the project area (NPS 2005). California buttercup also occurs outside of the project are on the American Camp prairie; however a comprehensive survey has not been conducted to determine the actual number of groups or individuals (NPS 2005).

3.3.5 Other Special Status Species

Additional special status species include rare species listings from the Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species (last revised June 30, 2008), as well as species in the area that are known to be sensitive or unique though not formally designated. State sensitive species are defined as any wildlife species native to the state of Washington that are vulnerable or declining, and are likely to become endangered or threatened in a significant portion of their range within the state without cooperative management or removal of threats.

Federal and state candidate species are plants and animals for which the regulatory agencies have sufficient information on their biological status and environmental threats to propose them as endangered or threatened under the ESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities. Candidate species receive no statutory protection under the ESA. However, the regulatory agencies encourage the formation of partnerships to conserve these species since they are, by definition, species that may warrant future protection under the ESA.

The USFWS and NOAA also identify species of concern, which are species likely to be in need of conservation action. This may range from a need for periodic monitoring of populations and threats to the species and their habitat, to the necessity for listing them as threatened or endangered. Such species receive no legal protection under the Endangered Species Act and the designation does not necessarily imply that a species will eventually be proposed for listing.

Information on these special status species and ecosystems comes from a wide variety of sources, including the DNR Washington Natural Heritage Program (WNHP) and other state/federal agency botanists, Native Plant Society members, consultants, the University of Washington Rare Care program, and published literature. The WNHP manages site-specific and species/ecosystem-specific information on priority species and ecosystems; those that are rare or have very limited distribution. Park and DNR personnel also provided information on species found in the area.

According to the WNHP database, there are several high quality occurrences of plant communities/ecosystems at Third Lagoon and Jakle's Lagoon, but none are identified within the project area.

The following table lists species with federal and state special status designations. These species are not legally protected under the Endangered Species Act; however, they are of importance in considering the effects of the proposed project.

Table 3.3 – Other Species of Concern Potentially Occurring in the Project Area

Other Special Status Species Potentially Occurring in the Project Area				
Common Name	**Scientific Name**	**Status ***	**Habitat Requirements**	**Occurrence in Project Area**
Birds				
Black oyster catcher	*Haematopus bachmani*	WDFW-P MBTA	Inhabits rocky seacoasts and islands, less commonly sandy beaches	Potentially present in project vicinity Breeding colonies located within 1 mile east of project area
Northern goshawk	*Accipiter gentiles*	SC, MBTA	Inhabits forested areas Prefers coniferous forests but also found in deciduous and mixed forests from sea level to subalpine areas	Potentially present in project vicinity, though most likely found in forested areas
Olive-sided flycatcher	*Contopus cooperi*	FSC, MBTA	Preferred habitat consists of mid- to high-elevation montane and coniferous forests, often associated with forest openings and edges	Potentially present in project vicinity, though most likely found in forested areas
Oregon vesper sparrow	*Pooectetes gramineus affinis*	SC, MBTA	Breeds in sparsely vegetated, grassland habitats with scattered trees or shrubs Structural diversity of habitat important because species use taller perches for singing and open areas for foraging	Potentially present in project area
Osprey	*Pandion haliaetus*	WDFW-P MBTA	Diet consists almost exclusively of fish Nest in any location near a body of water providing an adequate food supply	May potentially forage in project vicinity Nest located about 1 mile northwest of project site
Peregrine falcon	*Falco peregrinus*	FSC, SS, MBTA	Hunt in open areas, especially along the coast and near other bodies of water that provide habitat for prey Nest on cliffs and cliff-like structures	Potentially present in project vicinity
Bats				

Other Special Status Species Potentially Occurring in the Project Area				
Common Name	**Scientific Name**	**Status ***	**Habitat Requirements**	**Occurrence in Project Area**
Long-eared myotis	*Myotis evotis*	FSC	Lives in coniferous forests in mountain areas, roosts in small colonies in caves, buildings, and under tree bark	Potentially present in project vicinity though more likely found in forested areas
Long-legged myotis	*Myotis volans*	FSC	Likes forested mountainous areas, sometimes desert lowlands Roosts in tree hollows and under bark, in crevices and buildings	No
Pacific Townsend's big-eared bat	*Corynorhinus townsendii townsendii*	SC	Snag/log dependent Primarily cavity-dwellers, with most roost sites in Washington located in caves or abandoned mines (Lacki et al. 1994, Sherwin et al. 2000)	Potentially present in project vicinity
Fish				
Bull trout	*Salvelinus confluentus*	SC	See Federal Table 3.1	No
Chinook salmon	*Oncorhynchus tschawytscha*	SC	See Federal Table 3.1	No
Coho salmon	*Oncorhynchus kisutch*	FSC	Rear and feed in streams and small freshwater tributaries Spawning habitat is small streams with stable gravel substrates The remainder of the life cycle is spent foraging in estuarine and marine waters of the Pacific Ocean	No No stream habitat within project area and marine waters are outside area of potential impacts
River lamprey	*Lampetra ayresi*	SC	Require clean gravel substrate in streams for spawning and egg incubation After hatching they burrow in silt and mud in off-channel areas, typically remaining for years	No No suitable habitat in project area
Marine Mammals				

Other Special Status Species Potentially Occurring in the Project Area				
Common Name	**Scientific Name**	**Status ***	**Habitat Requirements**	**Occurrence in Project Area**
Harbor seal	*Phoca vitulina*	WDFW-P	Inhabit shallow areas of estuaries, rivers, and places where sandbars and beaches are uncovered at low tide Haul-out sites identified within 0.5 miles of the project vicinity off the east and north coasts of Cattle Point These marine environments are outside of the area of potential impacts	No No suitable habitat within area of potential impacts
Invertebrates				
Island marble butterfly	*Euchloe ausonides insulana*	FSC, SC	See detailed information below	Yes See detailed information below
Moss' elfin	*Incisalia mossii*	SML	Moss' Elfin lives along canyon slopes, brushy ravines, and steep hills Found in southeastern Vancouver Island	No Potential habitat in project area, though species not found during NPS 2005 survey
Propertius duskywing	*Erynnis propertius*	SML	Found from sea level up onto hillsides, in woodland clearings, trails, and in open meadows, always near oaks	No Larval host plant not found in project area
Valley silverspot	*Speyeria zerene bremnerii*	FSC, SC	Dependent on early blue violet (*Viola adunca*), which is known to grow in grasslands east of redoubt and South Beach However, early blue violet not found in project area during NPS 2005 field survey	Potentially present in project area
Whulge (Taylor's) checkerspot butterfly	*Euphydryas editha taylori*	FC	See State Table 3.2	No Habitat in project area, but no individuals found during survey
Reptiles/Amphibians				

Other Special Status Species Potentially Occurring in the Project Area				
Common Name	**Scientific Name**	**Status ***	**Habitat Requirements**	**Occurrence in Project Area**
Western toad	*Bufo boreas*	SC	Occur in a variety of terrestrial habitats including prairies, forests, canyon grasslands, and ponderosa pine Most common around marshes and small lakes Breeding waters usually permanent wetlands, ponds, lakes, reservoir coves, and the still water off-channel habitats of rivers	Potentially present in project area
Plants				
Annual sandwort	*Minuartia pusilla var. pusilla*	SPC	Found in plains, open pine forest, chaparral slopes, and dry rock cliffs at an elevation of 25 to 7900 feet	No
Nuttall's quillwort	*Isoetes nuttallii*	SS	Terrestrial in wet ground or seepages and in mud near vernal pools Low to middle elevations	No
Slender crazyweed	*Oxytropis campestris var. gracillis*	SS	Occurs in prairies, mountain meadows, open woodlands, and on gravelly flood plains in moist or dry soils	Potential habitat in project area

*** Status * -**

FC= Federal Candidate

FSC= Federal Species of Concern

SC= State of Washington Candidate

SS= State of Washington Sensitive Species

SML=State of Washington Monitor List

SPC= State of Washington Potential Concern

WDFW-P= Washington Department of Fish and Wildlife Priority Habitat and Species Database

Island Marble Butterfly

The island marble butterfly is a federal species of concern and a state candidate species. In November 2006, following a 12-month status review, the USFWS concluded that the island marble butterfly does not warrant listing under the ESA.

The island marble butterfly historically inhabited the open grasslands and Garry oak woodlands on the San Juan Islands and on Gabriola and Vancouver Islands in Canada. It was last seen in 1908 and was believed to be extinct until a small population was found in the San Juan Island National Historical Park in 1998.

Lambert studied the population ecology and life history of the island marble over four flight seasons in 2004 and 2008. Based on this work, it was found that the life cycle of the island marble is closely associated with its host plants. During the vascular plant survey in spring 2005, the NPS documented that the larval host plants, tumble mustard (*Sisymbrium altissimum*) and field mustard (*Brassica campestris*), were present but uncommon in the project area. In addition to its host plants, the island marble butterfly has been observed feeding on approximately 10 different plant species within the park (Pyle 2004). During the 2005 NPS field survey, seven of these plant species were identified within the project area; however, their abundance was classified as uncommon (NPS 2005).

During DNR-USFWS surveys conducted in May and June of 2006, island marble butterflies were observed using tumble mustard near the Cattle Point Road, close to the east boundary of the park. According to the DNR, stands of field mustard on DNR property within the project area hosted the island marble butterfly in 2005 (DNR, personal communication October 2005).

On October 31, 2006, the NPS and the USFWS concluded a conservation agreement entitled *A Conservation Agreement and Strategy for the Island Marble Butterfly (Euchloe ausonides insulanus Guppy & Shepard) Between the San Juan Island National Historical Park, National Park Service and the U.S. Fish and Wildlife Service.* The agreement is aimed at helping ensure the long term continued existence of the island marble butterfly and contributing to its recovery. It lays out general guidelines for a wide array of activities at American Camp, including proposed realignment of the Cattle Point Road. The conservation measures agreed to as part of the Conservation Agreement are included as project mitigation in section 4.4.4

3.3.6 Essential Fish Habitat (EFH)

The Magnuson-Stevens Fishery Conservation and Management Act requires that federal agencies consult with the NOAA Fisheries Service (also known as the National Marine Fisheries Service) on activities that may adversely affect Essential Fish Habitat (EFH). EFH is broadly defined as “those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity” (Magnuson-Stevens Act, 16 U.S.C. 1801 et seq). Freshwater EFH for salmon applies to all streams, lakes, ponds, and wetlands that support Chinook, coho and Puget Sound pink salmon.

The Pacific Fisheries Management Council has designated EFH for several species, including salmon, in the marine waters offshore of the project area (PFMC 2008, NOAA 2006b).

There are no streams, lakes, ponds, or wetlands within the project area, and no waterbodies flowing into marine waters. The marine waters adjacent to San Juan Island are outside of the area of potential effects for the project.

3.4 CULTURAL AND HISTORIC ENVIRONMENT

3.4.1 Cultural Setting

San Juan Island and Cattle Point have been shaped by human activity since ancient times. The oldest archaeological site found on the island is located on the bluff above South Beach at American Camp. Cascade spear points used by native peoples from about 7,000 to 9,000 years ago were discovered at the site in 1948 (NPS 2008).

Sometime between 2,500 and 1,500 years ago the number of people living on the San Juan Islands increased. People from the mainland moved to occupy the islands year-round, where before they had visited only seasonally to fish, dig camas, and collect berries (NPS 2008). By early historic times, the indigenous people from six Central Coast Salish tribes were occupying the San Juan Islands and nearby mainland areas. Three settlements were located in northern San Juan Island.

The first Europeans known to have explored the San Juan Islands were the Spanish. The Nootka Convention of 1790 opened the region between Russian America and Spanish California to joint exploration and occupation between Great Britain and Spain. The Spanish charted Vancouver Island and the Strait of Georgia while the British focused on Puget Sound and the Strait of Georgia. In the early 1790s, Francisco Eliza explored the region and is generally credited with giving the islands the name San Juan (NPS 2008).

A U.S. exploratory expedition was dispatched by the United States in 1841 to chart the Pacific Basin. In 1846, the signing of the Oregon Treaty established the 49th parallel as the principle boundary between British and American possessions in the West; however, it left ambiguous the question of the final boundary between Vancouver Island and the mainland, which threw possession of the San Juan Islands into dispute (NPS 2008).

Euro-American exploitation of the San Juan Islands may have begun as early as 1840 with some timber harvesting operations. Between 1850 and 1851, the Hudson's Bay Company set up its first seasonal fishing station on San Juan Island. By 1853, the governor of the British crown colony of Vancouver Island hoped to further entrench British claims on the islands by establishing a permanent agricultural station on the southern end of San Juan Island. Belle Vue Sheep Farm eventually supported a herd of 4,500 sheep. The farm was comprised of houses, barns, outbuildings, and fenced pastures with more than 100 acres under cultivation (NPS 2008).

By June 1859, about 25 Americans lived on the island. American surveyors staked out speculative claims on Oak Prairie and near the Hudson's Bay Company dock on Griffin Bay. This act attracted a score of failed American miners and others looking for free land (NPS 2008).

The military confrontation known as the Pig War stems from an incident on June 15, 1859, in which an American settler shot a boar foraging in his potato patch. The boar belonged to Belle Vue Sheep Farm, and the subsequent disagreements over compensation as well as exaggerated accounts of the event led to the American settlers on the island petitioning the government for protection. On July 27, 1859, American troops landed at the Hudson's Bay Company dock on

Griffin Bay and established their camp just up from the beach on the Griffin Bay shore. In response to the arrival of American troops, the British government sent three vessels of the Royal Navy to Griffin Bay with orders to evict as trespassers all Americans on the island. An uneasy standoff ensued with reinforcements supplied to both sides and construction of an earthen fortification, thereafter known as the redoubt, by the Americans (NPS 2008). Negotiation of a peaceful stand-down was undertaken by the United States and Great Britain, and by October of 1895 a joint military occupation of San Juan Island was agreed upon, buying time for the boundary dispute to be resolved (NPS 2008).

In March of 1860, British Royal Marines were dispatched to the north end of San Juan Island with supplies and provisions for construction of a British encampment. A permanent American encampment was established near Cattle Point, which offered a commanding view of Griffin Bay, the Strait of Juan de Fuca, and the British settlement of Victoria on the western horizon. A primary physical feature of the camp was the large earthen redoubt (figure 3.9), which formed the easternmost edge of the campsite.

Figure 3.9 - Historic Redoubt. The structure has changed little from the time of the 1859 Pig War.

Barracks, officers housing, a laundry, hospital, guardhouse, kitchen, mess hall, and bake house along with a parade ground, vegetable garden, and extensive fencing were in place at the American camp by the early 1860s. The village of San Juan sprang up around the Hudson's Bay Company wharf on Griffin Bay following the arrival of American forces in 1859. The village consisted of approximately 14 crude structures. Following the withdrawal of the military and the establishment of Friday Harbor as the county seat, the town was slowly abandoned and finally burned to the ground in 1890 (NPS 2008). Figure 3.10 shows the locations of historic resources in the Cattle Point area.

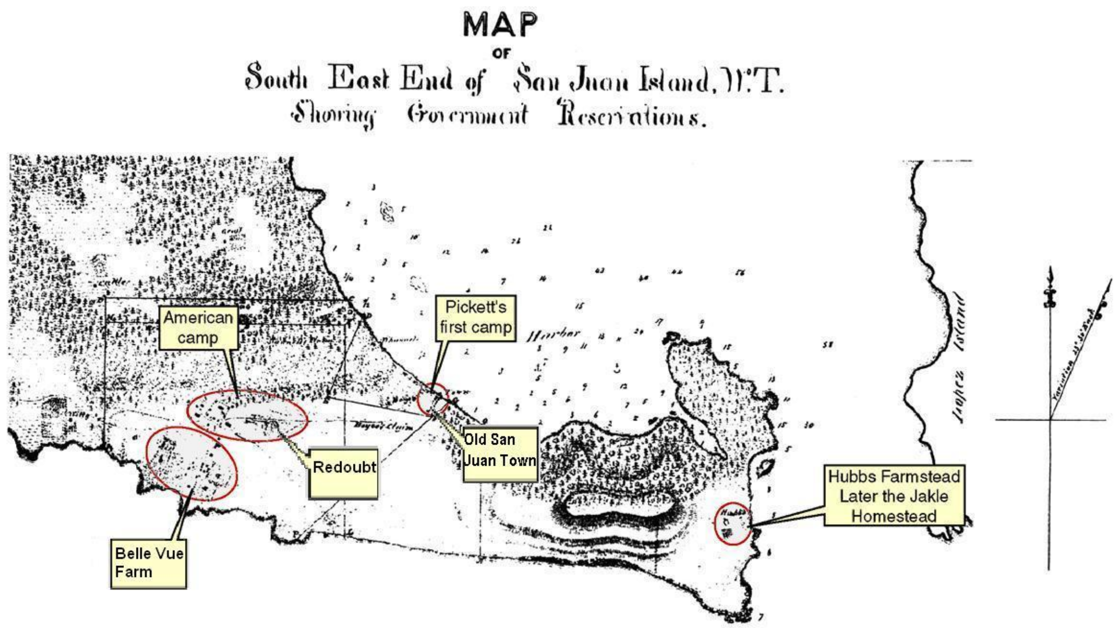


Figure 3.10 – 1860 Map of Cattle Point showing Historic Resources (modified from Thompson 1972)

The joint military occupation of San Juan Island continued for twelve years. In 1872, the San Juan Islands were awarded to the United States following the 1871 Treaty of Washington (NPS 2008).

After the military departed, both camps were sold to private individuals. At American Camp, the land was initially kept as a military reservation, but was later opened to settlement by presidential proclamation. The military buildings were sold at auction, and most were removed from the site. In 1951, the Washington State Parks and Recreation Commission acquired five acres of the historic campsite at American Camp. Commission actions to purchase lands at the American and English camp sites continued until 1963. In 1966, with the creation of the San Juan Island National Historical Park, both the English and American Camp sites were donated by Washington State Parks to the National Park Service (NPS 2008).

3.4.2 Cultural, Historic, and Archaeological Resources

Most of the project area is located within the American Camp unit of San Juan Island National Historical Park (SJINHP). The park was established for the purpose of interpreting and preserving the historic sites and events that occurred on the island in connection with the final settlement of the Oregon Territory boundary dispute and the Pig War of 1859. In addition to the historic resources associated with the park, the area has shown evidence of ancient occupation by indigenous peoples as well as more recent Euro-American settlement (NPS 2008).

Section 106 of the National Historic Preservation Act (NHPA) requires that federal agencies take into account the effects of any federally funded or permitted project on cultural, prehistoric, and historic resources eligible for the National Register for Historic Places (NRHP). Section 106 also requires that all federal agencies consult with Indian Tribes for undertakings which may affect properties of traditional religious and cultural significance. In addition, federal agencies are required to comply with all other federal laws for the protection of cultural and archaeological resources. National Park Service direction relevant to cultural resources includes chapter 5 of NPS 2006 *Management Policies,* and Director's Order (DO) - 28: *Cultural Resource Management*, as well as other related policy directives such as the National Park Service *Museum Handbook*, the National Park Service *Manual for Museums*, and *Interpretation and Education Services Guidelines* (DO-6).

Special conditions associated with Native American Indian presence also apply, including identification of sacred sites (EO 13007) and Indian Trust resources (ECM95–2). Secretarial Order 3175 requires that any anticipated impacts to Native American Indian trust resources from a proposed project or action by Department of Interior agencies be addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable obligation on the part of the United Sates to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

3.4.2.1 Archaeological Resources

Because of the attention paid to the park by archaeologists and historians over the years, a large number of prehistoric and historic archaeological sites outside of the project area have been recorded in the Washington State Archaeological Site Inventory (NPS 2008).

In 2004, field surveys and research were conducted by an archaeological consultant to identify potential archaeological resources within the project area using standard surface and subsurface survey methods. Two isolated finds of pre-contact stone tool-making debris were found near the ridgeline of Mt. Finlayson. Additional subsurface probes in the area did not yield any additional artifacts or features (Northwest Archaeological Associates 2004).

The finds were recorded and evaluated as part of the *Cultural Resources Assessment of the San Juan Island National Historical Park, Cattle Point Road Project San Juan County, Washington* (Northwest Archaeological Associates 2004). The assessment concluded that both finds were isolated basalt flakes and represented very limited stone tool manufacturing, use, or discard. Neither find met the significance or integrity criteria to be recommended as eligible for listing on the NRHP.

No Native American Indian trust resources have been identified within the park and no sacred sites have been identified in the project area. Human remains dating to the period before European settlement have been found in a number of locations west of the project area. Based on these findings, along with coordination with the tribes and the results of the cultural survey, it is possible, though not likely, that Native American remains are present in the project area (Northwest Archaeological Associates).

3.4.2.2 Cultural Resources

The cultural and archaeological resources of the American Camp unit of the park have been surveyed, evaluated, and documented over many years. American Camp is eligible for listing on the NRHP as a historic site and the entire park is designated as a National Historic Landmark. This is the highest historic classification a property can receive.

American Camp contains important historic resources including two of the original military buildings, the reconstructed military fence and flagpole, and numerous archaeological sites

(NPS 2008). American Camp is a cultural landscape incorporating natural features, vegetation, views and vistas, buildings and structures, and archaeological sites that provide a background for interpreting the story of the Pig War and the subsequent joint military occupation (NPS 2004).

The park completed a Cultural Landscapes Inventory (CLI) for American Camp in 2004. Inventoried landscapes are listed on, or eligible for, the National Register of Historic Places (NRHP), or are treated as cultural resources. The cultural landscape boundary for the American Camp unit is shown in figure 3.11. The boundary was chosen by the NPS to include all contributing features retaining historic integrity, including vegetation and clearings that contribute to the historic scene (NPS 2004).

Figure 3.11 – Cultural Landscape Boundary and Historic Sites (modified from NPS 2004)

The setting of American Camp has been altered since the historic period; however, the spatial organization associated with the development of the military encampment retains integrity and contributes to the significance of the site. The primary function of the military operation, establishing a defensible space, was achieved by sighting the camp to take advantage of the natural environment. The location on a ridge and proximate to two bays allowed for good visibility and physical access to the water. The sweeping views, which characterize the landscape of American Camp, also retain integrity and contribute to the significance of the site (NPS 2004).

The following historic view-sheds have been identified within the cultural landscape. They are located to the west of the project area (NPS 2004):

1. Territorial views of the Strait of Juan de Fuca, Griffin Bay, Cattle Point, and surrounding islands from the redoubt (figures 3.12 and 3.13).

Figure 3.12 - View of the Strait of Juan de Fuca from the Redoubt

Figure 3.13 - View of Cattle Point and Mt. Finlayson from the Redoubt

2. Views of the Strait of Juan de Fuca from the cantonment (the military camp) (figure 3.14).

Figure 3.14 – View of the Strait of Juan de Fuca from the Parade Ground (in the military camp).

The project area is not visible in either of these historic view-sheds. However, the project area is remotely visible from a portion of South Beach, which is designated as part of the cultural landscape (figure 3.15). The visible portion of the project area consists of a section of the grassland slope located just west of the bluff erosion problem area. A length of slope is visible from the existing road near the bluff to near the ridgeline. At its closest point, this location is approximately one mile from South Beach.

Figure 3.15 – Magnified View of Existing Road from South Beach

3.5 SOCIAL AND ECONOMIC ENVIRONMENT

3.5.1 Land Use

Approximately 90 percent of the land in the project area is within the San Juan Island National Historical Park (park), which is managed by the National Park Service (NPS). Approximately 10 percent of the project area is in the Cattle Point Natural Resources Conservation Area (NRCA), which is managed by the Washington State Department of Natural Resources (DNR) (figure 3.16).

The park was established by Congress in 1966 for the purpose of interpreting and preserving American and English camps and of commemorating the historic events occurring in connection with the final settlement of the Oregon Territory boundary dispute (NPS 2008). The project area is located within the American Camp unit of the park.

NRCAs were created by the state of Washington in 1987 to protect special areas of statewide significance. They protect outstanding examples of native ecosystems; habitat for endangered, threatened, and sensitive plants and animals; and scenic landscapes. They also provide opportunities for education and low-impact public use (DNR 2008). The Cattle Point NRCA contains trails, informational signing, and a day-use picnic area.

Figure 3.16 - Land Ownership and Use

The Cattle Point Road provides vehicular access to both the park and NRCA.

Four publicly-owned parcels are located on the eastern boundary of the park and NRCA units. One parcel is jointly owned by the San Juan County Land Bank and the DNR, two are owned solely by the DNR, and one is owned by the Bureau of Land Management (BLM). The Cattle Point Water District owns a small property adjacent to the NRCA, where it maintains a desalinization facility for treatment of drinking water for area residences. The BLM property is a 27-acre parcel located at the south end of Cattle Point. It contains a small network of trails, interpretive panels and a kiosk for day use. The U.S. Coast Guard owns and maintains an active marine-navigation lighthouse located on the BLM property. The Coast Guard uses the Cattle Point Road to service and maintain the lighthouse.

The northeast tip of Cattle Point consists of private property in the Cattle Point Estates and Cape San Juan subdivisions. The Cape San Juan subdivision was approved by San Juan County for development in 1963, with subsequent additions approved in 1965, 1966, and 1967. Cattle Point Estates development was approved in 1978 and 1980 (Lee McEnery, San Juan County, personal communication, 2009). The subdivisions contain a total of approximately 150 residential lots, some of which have not yet been developed. Lot sizes vary from 0.5 to nearly 6 acres, with the larger lots located in Cattle Point Estates (NPS 2008). The closest private residence is located approximately 500 feet from the east end of the project area, with multiple residences in low density continuing to the northeast. Approximately seven residences are located within 500 to 1,000 feet of the east end of the construction area. The Cattle Point Road is the only road access for the east end of Cattle Point, including the Cattle Point and Cape San Juan residential areas.

Other private property is located to the west of the park, further from the project area. The Eagle Cove, Eagle Cove Acres, and Eagle Cove Estates subdivisions total 43 single-family lots, averaging approximately 1 acre in size. Over half of the lots have been developed. Eagle Cove subdivision was approved by the county in 1960, Eagle Cove Acres in 1976, Eagle Cove Estates in 1969 and 1980 (Lee McEnery, San Juan County, personal communication, 2009). These residential areas are located over 1.5 miles from the west end of the project area.

Current county zoning designates the private property at the east end of Cattle Point and to the west of the park as rural residential. The park, NRCA, and BLM properties are designated as conservancy (figure 3.17).

The San Juan County Comprehensive Plan (2006) describes rural residential as land consisting of small acreage areas generally with private covenants and restrictions. Conservancy land is described as areas possessing valuable natural features or resources or areas possessing scenic, historical, or recreational qualities of considerable local, regional, state, or national significance.

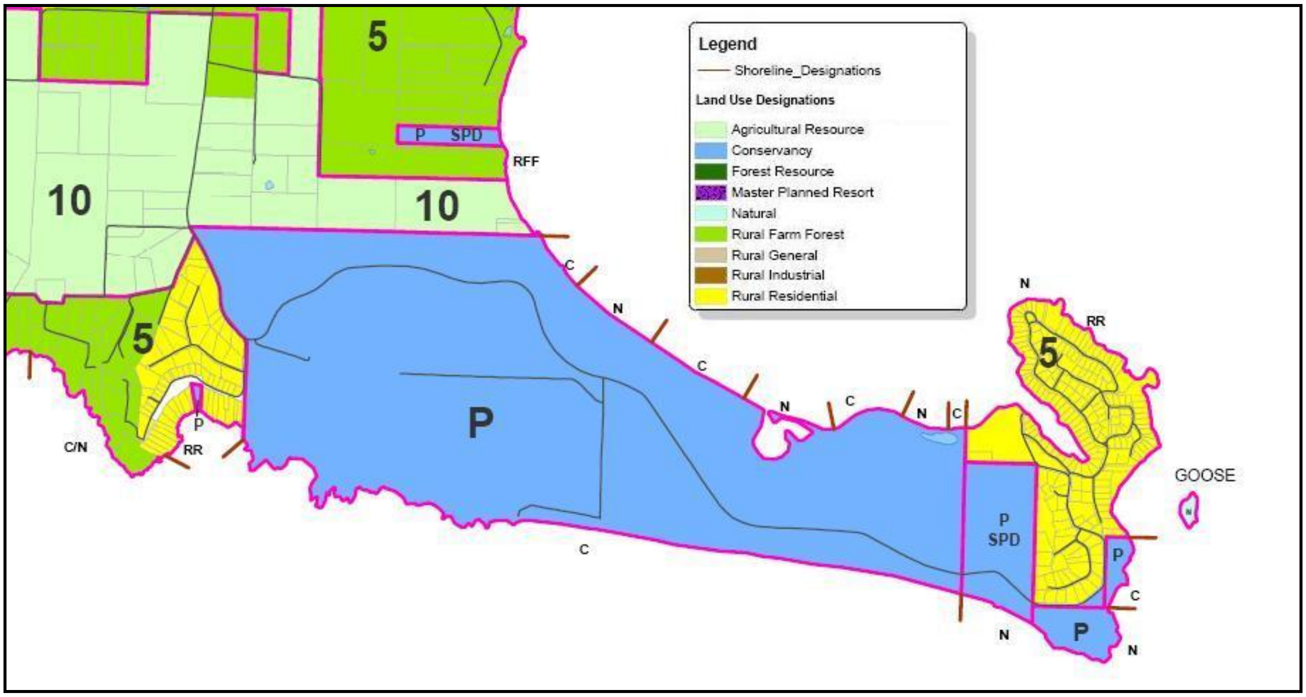


Figure 3.17 – County Land Use Designations (www.co.san-juan.wa.us/planning/officialmaps.aspx)

3.5.2 Local Plans

Three government agency plans apply to Cattle Point Road area.

- *San Juan Island National Historical Park Final General Management Plan and EIS (NPS 2008)*, applicable to national park property
- *Natural Resources Conservation Area State-Wide Management Plan* (DNR 1992), applicable to the Cattle Point NRCA
- *San Juan County Comprehensive Plan* (adopted December 20, 1998, revised July 2006), applicable to county and private property

3.5.2.1 San Juan Island National Historical Park Final General Management Plan (GMP) and EIS 2008

It is the policy of the National Park Service to protect both the abundance and diversity of the naturally-occurring communities and the cultural historical resources for which the park was created. The park manages land in accordance with management goals that consist of three major facets.

- Protect natural and cultural resources
- Provide opportunities for education and for scientific research of resources
- Promote understanding and enjoyment of park resources for visitors

The varied landscapes and settings of San Juan Island National Historical Park provide year-round recreational opportunities and experiences that are compatible with the historic settings and values of the park.

Resources and values in the GMP pertinent to the project area are:

- Opportunities to experience tranquility, natural sounds, and dark night sky
- Opportunities for non-motorized recreation
- Open landscapes providing historic and unobstructed, broad sweeping views
- Intact shoreline areas comprising the longest and most varied expanse of publicly accessible shoreline in the San Juan Islands

Management actions in the GMP that are pertinent to the Cattle Point Road project include:

- Maintenance of vehicular road access for residents at Cape San Juan and Cattle Point Estates and visitors to the Cattle Point Interpretive Area
- Cooperation between the state and county to provide appropriate access to private land adjacent to the park where rights-of-way exist
- Protection of examples of wave-cut marine terraces or other glacial features for educational, interpretive, and scientific purposes
- Protection of scenic resources of the park as required by law and policy
- Construct of new facilities to be compatible with scenic resources
- Restoration of the historic prairie to enhance native species composition, ecological function, and visual quality as it existed during the encampment period

3.5.2.2 Natural Resources Conservation Area Statewide Management Plan

Cattle Point NRCA does not have a site specific management plan; therefore, general management of the area is guided by the 1992 NRCA Statewide Management Plan (Alison Hitchcock, DNR, personal communication, 2009).

The primary goal of the NRCA program is protection, enhancement, and restoration of natural resources. Management guidelines in the NRCA Statewide Management Plan pertinent to the Cattle Point Road project include:

- Activities shall not compromise a site's ecological, geological, scenic, historic, and archaeological integrity.
- Existing roads will remain open to the general public when they meet DNR recreation road standards for safe public access, and where an existing public ROW already exists or the road is determined as essential to access of the site for low-impact use.

- An objective evaluation of allowable uses must be completed and a determination made that the uses will not adversely affect the resource values of the site.

NRCA uses must not adversely affect the quality of the site's natural resources or disrupt long-term ecological processes and must be appropriate to the site's maintenance as a relatively unmodified natural setting. NRCA management gives weight to natural resource conservation and as well as public use, but where conflicts arise, resource conservation prevails (DNR 2004).

3.5.2.3 San Juan County Comprehensive Plan

The San Juan County Comprehensive Plan, together with its supporting documents, is the official policy statement of the county. It provides a long-range framework to guide citizens, county government, private agencies, and service providers in their planning, design, and location decisions about growth, land uses, conservation of natural resources, and major capital facility expenditures.

The Comprehensive Plan designates the private property at the tip of Cattle Point as *rural residential*. The planning goal of rural residential lands is "To protect the predominantly residential character of some rural areas and provide for a variety of residential living opportunities at rural densities." The park, DNR, and BLM properties are is designated as *conservancy*. The planning goal for conservancy lands is "To protect, conserve, and manage existing natural conditions, resources, and valuable historic, scenic, educational, or scientific research areas for the benefit of existing and future generations without precluding compatible human uses."

Planning policies in the Comprehensive Plan that are pertinent to the Cattle Point Road project include:

- Ensure that the location and design of all development within conservancy areas will minimize adverse impacts on the natural features or resources of the site.
- Recognize the needs and desires of residents of each island in making decisions regarding transportation facilities and their operation.
- Bridges and tunnels between islands and from the mainland are inconsistent with the goals of this plan and should not be allowed.
- Maintain a public road system that is as safe and efficient as possible while recognizing the importance of conserving environmental and scenic qualities of island roads.
- Accommodate diverse modes of transportation.
- While safety of county roads is primary, the design, construction, and maintenance of roads should minimize adverse impacts on the scenic character of roadways provided by roadside trees, brush, and terrain, the routes themselves, and vistas from them.
- Establish standards for road improvements that are responsive to the preferences of island residents and that are in accordance with types and intensities of land-uses to be served as well as volumes of traffic to be accommodated.
- A thorough public participation program and interdisciplinary teams advisory to the county engineer should be included in the design phase of major projects. Adjacent property owners and other affected persons should be represented on interdisciplinary teams.

3.5.3 Visitor Uses

Visitors currently experience the natural resources of Cattle Point in a variety of ways. Motorists often stop at pullouts and pedestrians pause along the shoulder of the road to enjoy panoramic views of the San Juan Islands, the Cascade and Olympic mountain ranges, the Strait of Juan de Fuca, the Olympic Peninsula, and Vancouver Island. In Friday Harbor and Roche Harbor, visitors can rent a variety of unconventional motor vehicles including two and three-wheeled mopeds to travel throughout the island. Cattle Point is a popular destination for bicycling because of its views and relatively light vehicle traffic. The trail network is used by visitors and residents to experience the wide variety of natural and cultural resources in the area.

The NPS provides a year-round visitor center and interpretive opportunities including self-guided walks and hikes, as well as ranger-guided walks covering historical and natural themes. The trail system in the project area is often used for these programs.

During the summer, the number of visitors to San Juan Island greatly increases its population. Statistics for 2005 indicate that the island's population increased by about 40 percent during the tourist season (San Juan County 2005). The American Camp area averages from 140,000 to 200,000 visits per year, with the months of June, July, and August receiving the highest visitation (NPS 2008). The park also receives substantial visitation outside of the summer tourist season. During the slower months of November through February, the park typically receives about one-quarter of the monthly visitations of summer (NPS 2005).

In 2000, San Juan County estimated that approximately 253,000 cars traveled the Cattle Point and American Camp roads. About 100,000 cars (40 percent) traveled solely to park locations while the remainder traveled as far as the Cape San Juan residential area. The county estimates that traffic in the Cattle Point area will increase by 7.46 percent annually (San Juan County in NPS 2005a).

Currently, motorists in the Cattle Point project area use the road shoulder and pullouts for parking, standing, and walking to view the scenic vistas, wildlife, and other features that attract them to the area. These facilities are particularly important to visitors with limited mobility or limited time who can only enjoy the area by vehicle. Overlook pullouts are located in the NRCA on the east end of the project area and in the park, about 200 yards west of the project area (figure 3.18).

Formal trailhead parking for the Jakle's Lagoon and Mt. Finlayson trails is located further to the west of the project area. This parking area is popular for trail users year-round and is consistently full during the summer months (Peter Dederich, NPS, personal communication, 2008). Another popular destination on Cattle Point is South Beach, which is located west of the project area and south of Cattle Point Road. Vehicles, bicycles, and mopeds use the short gravel road to access a parking lot near the beach. Visitors stop to sightsee and walk the beach from the parking lot. Informal parking and trail access also occurs at the Jackson overlook (at the west end of the project area in figure 3.18)

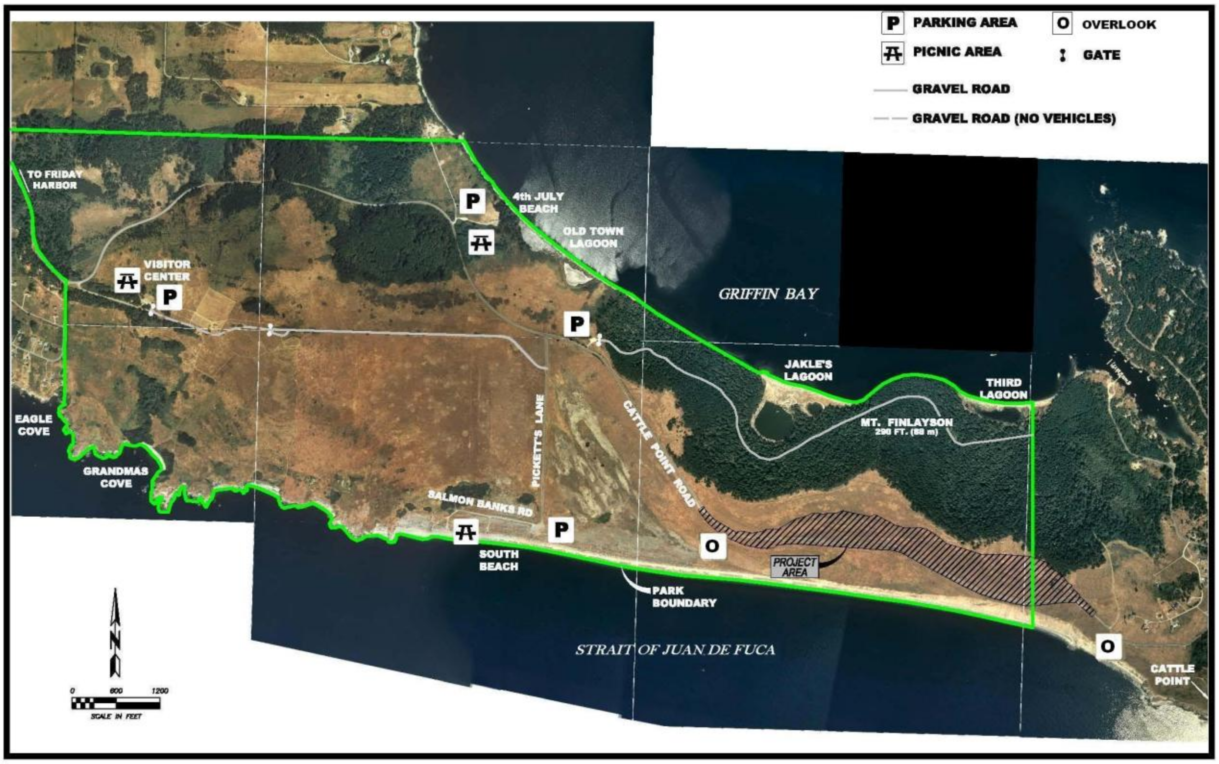


Figure 3.18 - Parking Areas, Overlooks, and Roads in Cattle Point

The Cattle Point Interpretive Area is located on a parcel of the NRCA property located on the east end of Cattle Point. This site includes a day-use recreation area and interpretive site with a parking lot and picnic area, as well as access to the rocky seashore (Alison Hitchcock, DNR, personal communication, 2009). This site is a popular stop for visitors to observe area resources and walk along the shore. A 27-acre parcel of BLM-managed property containing a trail network, interpretive signs and kiosk, as well as a functioning U.S. Coast Guard lighthouse, is located on the southeast tip of Cattle Point (Gregario Teague, BLM, personal communication email, February 5, 2009). These facilities attract interest by the general public as well as lighthouse enthusiasts.

3.5.4 Trail System

Cattle Point area trails are important to both visitors and residents. Trails provide a relaxed means to experience the area’s features up-close. Area trails are both formal and informal, with formal trails designated and maintained by government owner-agencies, and informal trails having no regular maintenance. Some trails cross jurisdictional property boundaries between the park and NRCA. Cattle Point peninsula contains a total of about 9 miles of trails (San Juan Trails Committee 2006).

NPS-designated trails throughout American Camp are mapped, signed, and widely used by visitors and residents. These trails allow access to historic points of interest, vistas, wildlife viewing, and other interesting features in the park. Some of the trailheads include vehicle parking. Adjacent NRCA trails connect to park trails and are also popular with visitors and residents. Trails on the NRCA and BLM property located at the southeast end of Cattle Point are a stopping point for day-use visitors and residents accessing the seashore. Designated park and adjacent NRCA trails are shown in figure 3.19.

Commercial recreation vendors on the island publish maps showing trails and roads. These maps are distributed to island visitors at vehicle rental agencies, hotels, and other commercial establishments. The San Juan Island Trails Committee developed a San Juan Island Trails Plan in September 2006 (www.sanjuanislandtrails.org/TrailsPlan.pdf) and is working with the park to develop connections to park trails. The county developed and adopted the Non-Motorized Transportation Plan in August of 2005.

Although there is no formal data on the number of trail users, based on the amount of trail-related public comments received during project scoping and on observations by agency and county staff, it is clear that the combined formal and informal trail system is widely used by both residents and visitors.

3.5.5 Transportation

San Juan Island is isolated from the mainland road and rail systems. Boats, airplanes, and the car-ferry system provide the only means for travel and transportation of goods between the island and mainland. Cattle Point Road is the only road access between the east end of Cattle Point and the rest of San Juan Island, including Friday Harbor, which is the only major town on San Juan Island. Schools, emergency services, airport, and ferry terminal as well as most businesses and consumer goods are located in Friday Harbor. Cattle Point Road also provides access to a working U.S. Coast Guard navigational-aid lighthouse that is serviced regularly, as well as to private residences and county, park, BLM, and DNR lands and the resources they contain.

Travel to the mainland is important not only for visitors but for residents who conduct business and access goods and services not available on the island. The Washington State Ferries system provides the main means of access to the island at Friday Harbor. This year-round service has multiple daily trips and transports residents, tourists, vehicles, and goods.

The two main water access points for San Juan Island are Friday Harbor and Roche Harbor. There are also a number of small harbors and private docks on the island. On Cattle Point, there is a small protected marina and dock area at Fish Creek that serves a number of residents of Cape San Juan.

One commercial airline (which includes airport and seaplane service) and several charter airlines serve Friday Harbor. The airport accommodates commercial and private planes. Aircraft can also land at a small airstrip at Roche Harbor.

Figure 3.19 – Park and NRCA trails

3.5.5.1 Existing Road System

Cattle Point Road begins at the intersection with Mullis Street and Argyle Avenue, south of the town of Friday Harbor. The road extends southeast through rural county and private land, through the national park and NRCA, back through private property, and ends at Cape San Juan (figure 3.20).

Cattle Point Road is the only road providing access to the east end of Cattle Point. Cattle Point residents depend on the road to access their homes, commute to work and school, and to obtain goods and services. The road provides access from Cattle Point to the airport and ferry system in Friday Harbor for transportation to and from destinations off the island.

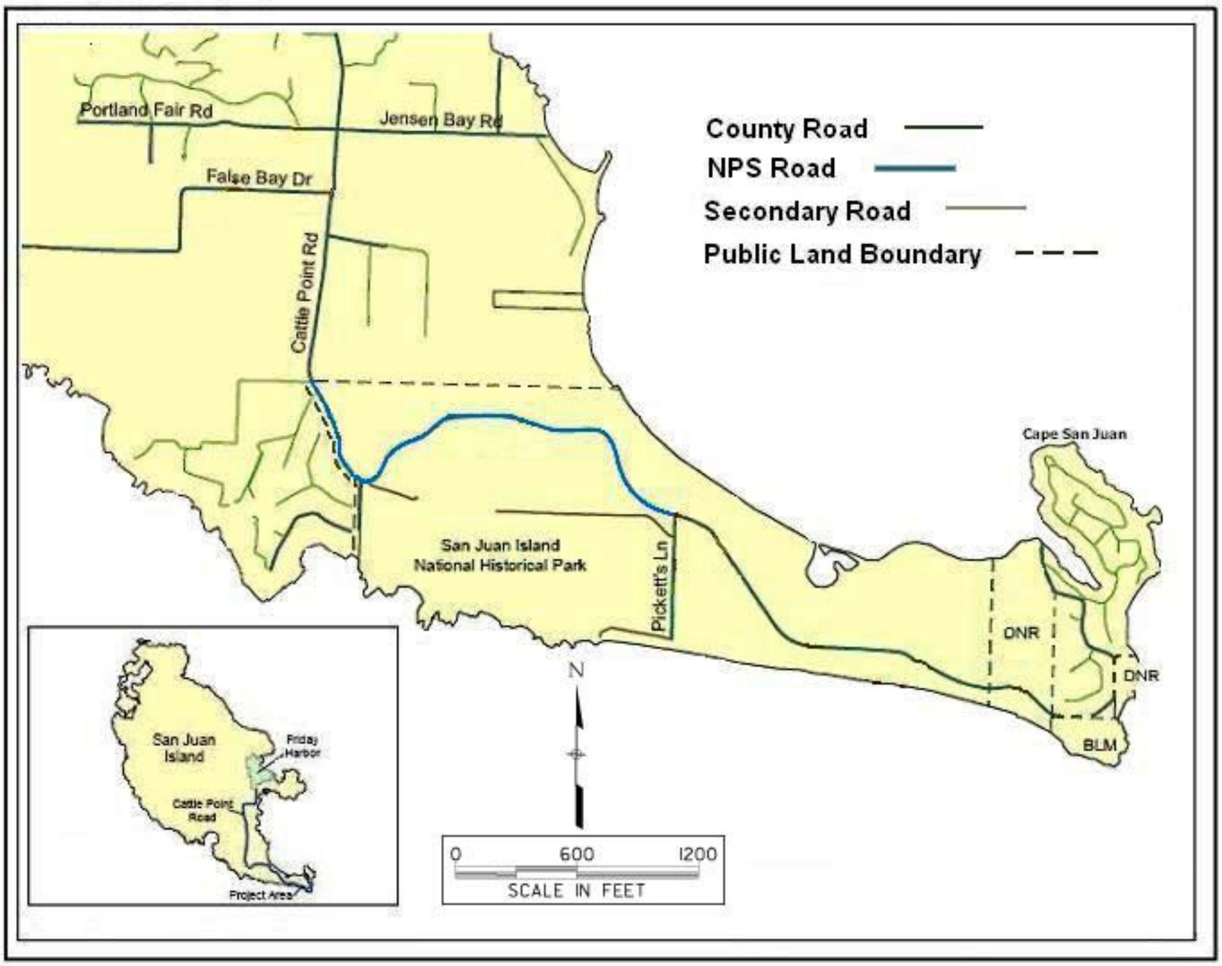


Figure 3.20 – Cattle Point Road System (Russ Harvey, SJC Public Works, personal communication, email, May 6, 2008).

The road is used by pedestrians, bicyclists, and motorists. Residences are accessed primarily by vehicle, while recreational use involves all three modes of transportation. Pedestrians often use the road in conjunction with the trail system to enjoy the views and features of the area. Since bicycle use is restricted on much of the trail system, the road provides the only access for bicyclists to enjoy the area.

Cattle Point Road is designated by the county as a rural major collector route in good overall condition. The following information from San Juan County displays existing use and road conditions (Russ Harvey, San Juan County Public Works, personal communication, email, May

6, 2008). Average daily traffic is a measurement of the number of vehicles which use a highway over a period of a year divided by 365 to obtain the average for a 24-hour period.

Average Daily Traffic (2007):	574 vehicles per day
Projected Average Daily Traffic (2027):	940 vehicles per day (based upon 2.5%/year growth)
Road Classification:	Rural Major Collector
Terrain:	Rolling, grades to 6%
Current Posted Speed:	45 miles per hour
Estimated Travel Speed *:	45 to 55 miles per hour

* Range is based on the 85th Percentile Speed, the range that includes an estimated 85% of user speeds

Cattle Point Road is managed by San Juan County and the National Park Service (NPS), depending on land ownership. The portion of the road north of the park boundary is owned and maintained by the county. From the park entrance eastward, the road is maintained by the county on lands owned by the park and DNR. The county retains a right-of-way on park land from Pickett's Lane east to the DNR boundary. Within the park, county maintenance is performed through an informal agreement between the county and NPS.

San Juan County has designated a section of Cattle Point Road as the Henry M. Jackson Scenic Drive, beginning at Pickett’s Lane and ending at the DNR Interpretive Site. The proposed project is located within the scenic drive area. The scenic drive was designated by a resolution of the San Juan County Board of County Commissioners on June 9, 1987. The resolution documents the designation and directs that two scenic overlooks (referred to as “vistas” in the DEIS) be developed depicting major scenic views commemorating the role of the late Senator Jackson in his conservation leadership. In addition, in 2008 the state designated the Cattle Point Road as part of the San Juan Islands Scenic Byway.

Cattle Point Road is classified by the NPS as a public use park road and intended for the primary use of visitors for access into and within a park. The public use park road classification includes all roads that provide vehicular access for visitors, or access to such representative park areas as points of scenic or historic interest, campgrounds, picnic areas, trailheads, and similar features. In addition, the road provides access for the park’s administrative needs.

3.5.5.2 Special Vehicles, Bicycles, and Pedestrians

Historic features, natural resources, and spectacular vistas in the park and NRCA have created a destination for recreational visitors. Two and three-wheeled mopeds or “scoot cars” (figure 3.21), pedestrians, and bicyclists are all routine users of island roads including the Cattle Point Road. These vehicles travel at considerably slower speeds than standard motor vehicles, particularly when climbing grades. They use road shoulders where available and make frequent stops to enjoy the area resources. These road users can present safety issues and conflicts with other motor vehicle users. Mopeds can be rented at several locations in Friday Harbor and Roche Harbor. One popular travel route for these vehicles is from Friday Harbor along Cattle Point Road to South Beach, just west of the project area.

Figure 3.21 - 3-Wheeled Moped or "Scoot car" (source: susiesmopeds.com)

Bicycling is also very popular on San Juan Island, and Cattle Point is no exception because it provides moderate terrain with limited vehicular traffic and spectacular vistas. Pedestrians often use the road as they explore from their vehicles or make a loop to a hiking trail. Commuting by bike or foot through the project area does not likely take place in large numbers due to the distance to Friday Harbor (approximately 10 miles from Cape San Juan) and other business destinations. Recent fuel cost increases may increase use of non-motorized commuting.

3.5.5.3 Road Safety

Cattle Point Road is made up of long curves and moderate grades (less than 6 percent). Within the project area, the roadway consists of two paved lanes, 11 to 12 feet in width with gravel shoulders or no shoulders. A section of guardrail at the eroding bluff and slopes on either side of the road through the project area prevent vehicle travel off the road surface. Northwest of the project area, the county recently reconstructed the roadway with two 11-foot travel lanes with 4-foot-wide paved shoulders.

Figure 3.22 shows accident locations on the Cattle Point Road near the project area from January 1, 2003 through August, 2009. During this time period, there were six reported vehicle accidents from MP 6.0 to MP 9.0, including one fatality at MP 8.42. Only one of these accidents was within the project area, which is located from approximately MP 7.4 to MP 8.3. There have been no reported accidents in the area since 2007. It is reasonable to assume that there have been a number of minor vehicle-animal collisions that have been unreported (Russ Harvey, JSC Public Works, personal communication, email, May 6, 2008).

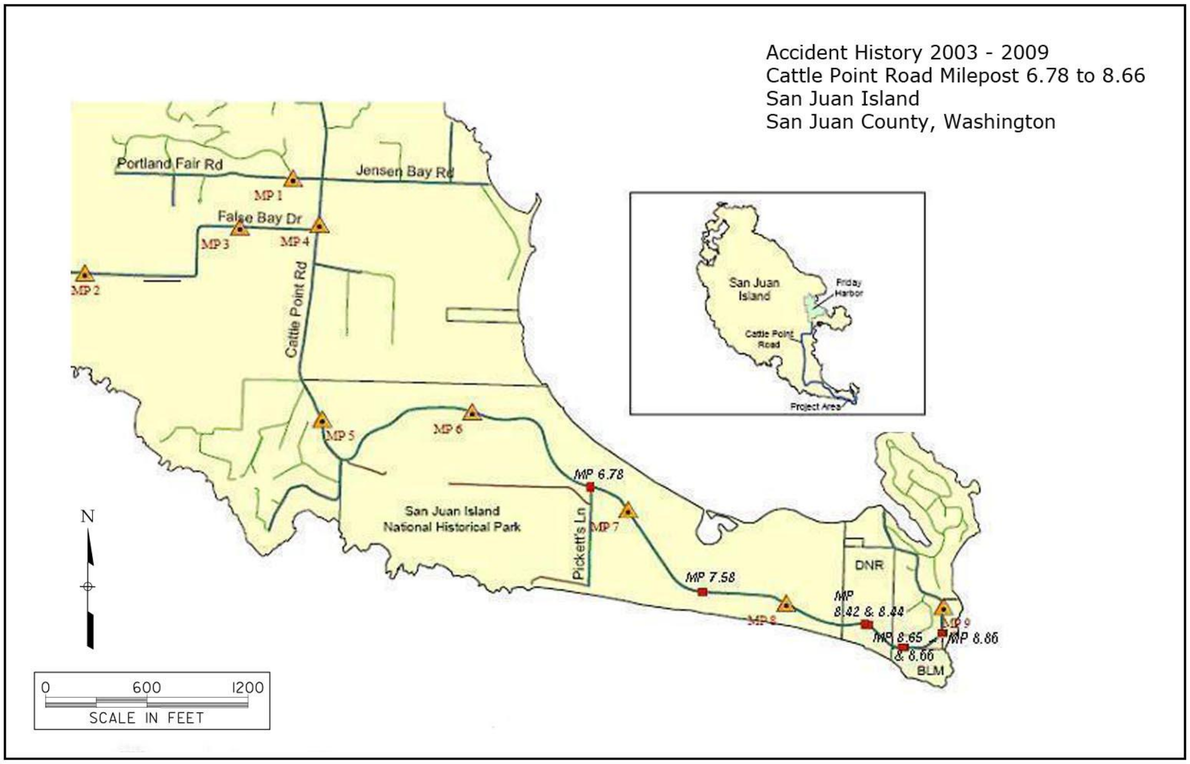


Figure 3.22 - Accident Locations Designated by ■ (Russ Harvey, SJC Public Works, personal communication, email, May 6, 2008)

Using the 2007 Average Daily Traffic rate of 574 for the area from MP 6.0 to 9.0, the accident rate for this portion of the Cattle Point Road is estimated to be about 1.67 per million vehicle miles. The accident rate for San Juan County is 2.84 accidents per million vehicles miles traveled (WSDOT, current traffic data personal communication, email, 2008). These figures indicate that the accident rate for this stretch of Cattle Point Road is lower than the county-wide average.

Of the seven reported accidents near the project area, six were attributed to driver error and one to driving under the influence. The accident at MP 6.78 involved a vehicle passing mopeds then making a right turn in front of them, with the moped striking the vehicle. The accident at MP 8.66 involved a school bus backing into another vehicle. The remaining five accidents involved the driver losing control of the vehicle. Two of these accidents, one involving a fatality, occurred in nearly the same location near a curve at MP 8.42 and 8.44, and were both attributed to speeding. See figure 3.23 for accident details.

Date	Milepost	Non-Injury	Injury	Fatal	Vehicles	Contributing Factor
11/8/03	8.44	x			1 car	Speed too fast for conditions
1/17/04	7.58		1		1 car	Speed too fast for conditions
5/24/05	8.66	x			1 car, 1 bus	Improper backing
8/12/06	6.78	x			1 car, 1 moped	Improper turning
3/5/07	8.42		1	1	1 car	Speed too fast for conditions
6/9/07	8.65	x			1 car	Impaired driving

Figure 3.23 – 2003 through August 2009 Accidents between MP 6.78 and 8.66 (Source San Juan County 2008)

Road design standards indicate that the existing road width and sight distance are sufficient for the types of vehicles using the road (San Juan County 2008). Weather, wildlife, natural obstacles, and the presence of pedestrians, bicycles, and unconventional motorized vehicles represent potential safety hazards on and near the road. The narrow or non-existent road shoulders present a hazard to bicyclists, pedestrians, and mopeds.

3.5.6 Socioeconomics

3.5.6.1 Population and Demographics

San Juan County, the smallest of Washington's 39 counties, has a population of just over 15,000 people (U.S. Census Bureau 2000). San Juan Island itself has about 7,000 residents, including over 2,000 living in the town of Friday Harbor.

San Juan County is one of the fastest growing counties in Washington. During the 20-year period from 1980 to 2000, the population grew by nearly 80 percent (from 7,838 to 14,077). Of the 6,239 residents gained during that time period, only 378 (6 percent) were the result of natural population increases; the remaining 5,872 (94 percent) resulted from net in-migration. Projections for 2000 to 2025 estimate a gain of 8,457 residents. Though the natural population is expected to decrease by 3,477 during that time, these figures will be more than offset by an expected net in-migration of 11,934 people (U.S. Census Bureau 2000; Washington State 2008).

The demographics of population change in San Juan County are unique. The island environment leads to gentrification, where the population is made up of seniors and the wealthy. Most people do not move to the island to work, but to live and, in many cases, to retire. As a result, San Juan County has the highest proportion of elderly people in the state. In 2000, the median age of islanders was 47.4 years, compared to 35.3 years for the state of Washington (U.S. Census Bureau 2000).

This demographic change in age and income is more dramatic in San Juan County than mainland counties experiencing the same phenomenon. Typically, as people in lower income brackets are displaced by the economics of land value and income, they move outward toward rural and less expensive property. Because this is not possible on an island, the economic diversity of the San Juan Island community has diminished.

The racial composition of San Juan County has changed subtly from 1990 to 2000. Whereas the white population comprised nearly 98 percent of the residents in 1990, ten years later the estimated share of the population had decreased to about 95 percent. This change is the result of an increase (135 percent) in the number of non-white residents being offset by an increase in the number (36 percent) of white residents. All racial classes registered positive growth during the decade. The county's largest non-white population, the Hispanic population, grew by about 180 percent, though it still only represents 2.4 percent of the total population.

When compared to statewide statistics, Hispanic, Asian, and African American populations are appreciably underrepresented in the population of San Juan County as well as in visitation to the park. At 0.8 percent, the percentage of Native Americans in the county is less than the state average of 1.6 percent (U.S. Census Bureau 2000).

Information on demographics specific to Cattle Point is not available; however, there is no indication that minority populations in the project area are higher than the rest of the county.

3.5.6.2 Local Industry

Although agriculture was formerly the dominant industry in the county, presently, wholly agricultural lands constitute only 12 percent of the total acreage. Although a number of large farming and grazing tracts remain in the ownership of long-term residents, the goal of these individuals is generally land retention rather than productivity. In addition to agriculture, the early economy of the island was fueled by commercial fishing, timber harvesting, and limestone mining. All of these industries have given way in the post World War II era to tourism and recreational services, which are now by far the largest industries in the county (San Juan County Profile September 1999).

Today, tourism industries, including services and retail sales, account for as much as half of the island's jobs. Other noteworthy employers include government and construction. Manufacturing and resource harvesting industries such as farming and fishing make up a small percentage of employment.

Employers in the project vicinity include the National Park Service as well as a few home businesses located within the residential areas of Cattle Point Estates and Cape San Juan. The immediate project area is park and DNR property, which is undeveloped, with no businesses or other industry present; though tourism-based industries are supported by visitors who travel to Cattle Point.

The park is one of many attractions on the popular tourist destination of San Juan Island. Park visitors spend money on the island, which generates direct personal income for local residents and supports jobs in area tourism businesses. According to NPS Social Science Program modeling, the park's annual economic benefit to the community is over 15 million dollars based on a visitation of about 250,000 for fiscal year 2005. Twenty percent of park visitors surveyed estimated their total expenditures during their visit to be $250 or more. The average visitor group expenditure was $169, or $51 per capita (NPS 2008).

3.5.6.3 Employment and Income

According to the 2000 Census, the San Juan County civilian labor force totaled 6,822 individuals, with an average unemployment rate of 3.2 percent. This is less than the unemployment rate for the state of Washington, which averaged 6.2 percent in 2000.

The poverty rate for families in San Juan County stands at 6 percent, whereas the average rate statewide is 7.3 percent. The poverty rate for individuals in San Juan County is 9.2 percent, compared to 10.6 percent for the state as a whole. For individuals over 65, the poverty rate is 3.1 percent, appreciably lower than the state rate of 7.5 percent and likely a reflection of the relatively affluent retired segment of the county's population.

The Cattle Point area contains waterfront property and luxury homes, indicating property values consistent with or higher than county averages. This is confirmed by a sampling of individual home values from the County Assessor's interactive property value map (Paul Dosset, San Juan County Assessor, personal communications, November 7, 2005). Because of high property values, it is likely that Cattle Point area residents and landowners are retired or have higher incomes. Although there is no census data available specifically for Cattle Point, there are no known disadvantaged or impoverished populations in the Cattle Point community. No survey or interview data exist for the racial makeup of park visitors or the percentage of park visitors who are unemployed or in poverty.

3.5.7 Environmental Justice

Executive Order 12898 (*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*) requires that federal agencies incorporate environmental justice into their missions by identifying and addressing whether their programs or policies have a disproportionately high or adverse human health or environmental effect on minorities and low-income populations or communities.

The closest and most concerned public in the project area are the residents living east of the project in Cattle Point Estates and Cape San Juan subdivision. The Cattle Point Road is the sole road access for these residents to and from their homes. Island visitors also use the Cattle Point Road to access the natural and historic resources of the area. The tourist industry accounts for a substantial portion of the economic base of the area, and any impacts to this industry would affect those employed by it as well.

There are no known statistics specifically for the Cattle Point area regarding minority and low-income populations; however, it is highly unlikely that members of these groups are found in numbers greater than the general population in the project area.

3.5.8 Relocation

All project alternatives are located on undeveloped park and DNR property. There are no residences or public structures in the project area other than the road itself; therefore, no relocation would be required.

3.5.9 Public Health and Safety

Emergency services are provided by the San Juan County Public Health Department, County Sheriff, San Juan County Fire District No. 3, and San Juan Island Emergency Medical Services Hospital District No. 1 (ambulance service provider).

Medical services are available at the Inter Island Medical Center in Friday Harbor. This facility provides daytime medical services and nighttime doctor contact services. Medical services are limited to general practice and do not include specialized care, major surgery, or emergency care.

Major medical services are located off-island, involving personal transport via the ferry, commercial air transport, or by emergency air evacuation from Friday Harbor Airport. Helicopters are also used for major emergencies.

Cattle Point Road is the primary access for all fire, law enforcement, and emergency medical services for residents of the Cattle Point area. Helicopter access is possible in a number of locations. Float planes and small vessels can dock at the marina and shore landing is possible at a few sites.

3.5.10 Utilities

The road provides a corridor for the utilities serving the Cape San Juan and Cattle Point subdivisions. Electrical power, phone, cable television, and internet lines are buried beneath the road shoulders within the road corridor.

These utilities exist within the road corridor under the authority of a utility franchise issued by San Juan County. For purposes of this analysis, it is assumed that utilities would be relocated along with the road, and that a legal easement would be negotiated for that purpose.

3.6 OTHER RESOURCES

3.6.1 Hazardous and Solid Waste and Materials

The EPA administers hazardous waste regulations through both the Resource Conservation and Recovery Act of 1976 and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). The EPA's website (www.epa.gov/superfund/sites/npl/wa.htm) was consulted to determine hazardous waste producers, users, and site information. The list includes sites on the National Priorities List, CERCLA Library Sites, and licensed sites for generation, use, and storage. No waste sites were identified in the project area or on the island. There are 13 hazardous waste users registered on the island, but none is located in the project area. The history of the area is well documented and researched. There have been no commercial, industrial, or other activities that would have produced or disposed of hazardous waste. The county currently transfers solid waste generated by residential and commercial use off of the island for disposal and recycling.

3.6.2 Energy

Fossil fuel is the only natural or depletable energy resource use related to the road. Fossil fuel is used by motor vehicles traveling the road and for periodic roadway maintenance. Fuel and oil are delivered to San Juan Island by trucks. Full fuel trucks are transported to the island by barge and empty fuel trucks return to the mainland on the ferry system. Because of high transport costs, fuel prices on the island are higher than on the mainland.

The residents at Cattle Point use energy for residential electricity and heating, most of which is delivered through the electrical utility line in the existing road corridor. This electricity is transferred from energy sources to the island by Orcas Power and Light Cooperative electrical cable. The electricity comes from a wide variety of energy sources. In general, about two-thirds of the energy in Washington comes from hydroelectricity, followed by coal, natural gas-fired, and nuclear-powered electrical generation. Other renewable electricity sources account for less than two percent of production (State of Washington 2007).

3.6.3 Noise

The National Park Service Organic Act mandates the preservation and/or restoration of natural resources within parks, including the acoustical environment. The acoustical environment can be defined as the actual physical sound resources, regardless of audibility, at a particular location. Natural, cultural, and historic sounds are important components of the many national park units. Natural sounds can include wildlife, water, vegetation, or weather sounds. These sounds are important to the protection of wildlife and their natural setting as well as visitor experience and enjoyment. Intrusive sounds are of concern because they sometimes impede the ability of the NPS to accomplish its mission. NPS Directors Order 47 details the value of the natural soundscape and implements measures to preserve park soundscapes through planning and management activities.

Federal regulations for transportation noise standards (23 CFR 772) classify *Noise Abatement Criteria* for construction noise for different land use types. The project area is categorized as undeveloped, which places it in Activity Category D per 23 CFR 772.19, with no noise limits specified.

Although noise limits are not specified, wildlife, visitors, and residents of the Cattle Point area currently enjoy a soundscape with low levels of human-caused noise. Current traffic noise usually consists of an intermittent passing vehicle. Planes frequently generate noise while flying overhead on their way to and from the Friday Harbor Airport. Sounds from pedestrians and bicyclists generate negligible noise. Offshore, motorboats and ships generate noise, especially during summer months when whale-watching tours and salmon fishing are common.

The area's natural soundscape consists mainly of wind-generated noise, as the exposed land is often buffeted by strong winds. Birds and other animals create low-level noise. Marine mammals can occasionally be heard offshore.

3.6.4 Light

NPS 2006 *Management Policies* identify lightscapes as an important natural resource with a policy to preserve, to the greatest extent possible, the natural lightscapes of parks. Natural lightscapes, including dark night skies, are not only a resource unto themselves, but can be an integral component of the park experience. There is no artificial lighting on or around the project area, other than an occasional passing vehicle and distant residences on Cattle Point. There is some light generated from the city of Victoria, British Columbia, visible in the sky to the west. The natural darkness is a key component to the Cattle Point environment. Nocturnal animals use the darkness for their survival, and views of the night sky are valued by human visitors and residents.

3.6.5 Prime and Unique Farm Lands

Prime and unique farm lands are protected by the Farmland Protection Policy Act. The purpose of the Act is to minimize the impact of federal projects on the irreversible conversion of farmland to nonagricultural uses.

The most recent soil survey by the Natural Resources Conservation Service (NRCS) identifies one small piece of land in the project area that would classify as prime farmland if irrigated (websoilsurvey.nrcs.usda.gov). The area is located on the flat ridgeline of Mt. Finlayson. No agriculture has taken place in the project area during recent decades. No suitable water source exists for potential irrigation, and farming is not compatible with the purposes for which the park and NRCA are managed.

3.6.6 Coastal Zone

Washington's coastal zone is comprised of fifteen counties, including San Juan County. The coastal zone includes all lands in the coastal counties and waters from the coastline seaward for three nautical miles. In addition, the Washington State Shoreline Management Act applies to all *shorelines of the state* including *shorelines of statewide significance*. S*horelines* include all marine waters, and extend 200 feet landward from the edge of marine waters. All waters of the Strait of Juan de Fuca have been identified as *shorelines of statewide significance* (Revised Code of Washington RCW 90.58).

The Coastal Zone Management Act (CZMA) specifically excludes lands held in trust by the federal government (16 USC 1453 Section 304). However, actions excluded from the coastal zone may affect land or water uses or natural resources outside of the excluded area and therefore are subject to provisions of the CZMA.

The Coastal Zone Management Act (CZMA) programs are aimed at the "wise use" of the land and water resources of the coastal zone, while fully considering ecological, cultural, historic, and aesthetic values, as well as the need for compatible economic development. Washington's Coastal Zone Management Program is administered by the WDOE Shorelands and Environmental Assistance Program.

Activities and development affecting Washington's coastal resources which involve federal actions or permits must be evaluated for compliance with the CZMP through a process called *federal consistency* (Section 307). This requires that activities of federal agencies be consistent to the maximum extent practicable with the enforceable policies of CZMA management programs.

The project area is located within Washington's coastal zone.

3.6.7 4(f) Resources

The Department of Transportation (DOT) Act of 1966 includes a special provision, Section 4(f), which stipulates that the FHWA and other DOT agencies cannot approve the use of land from publicly-owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless:

- There is no feasible and prudent avoidance alternative to the use of the property.
- The action includes all possible planning to minimize harm to the property resulting from the use.
- The FHWA determines that use of the property, including any measures to minimize harm, will have a *de minimis* impact on the property.

Section 4(f) was codified under Title 49 United States Code (U.S.C.) Section 1653(f) (Section 4(f) of the USDOT Act of 1966). In 2005, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users Act (SAFTEA-LU) made the first substantive revision to Section 4(f) since 1966. Under Section 6009 of SAFTEA-LU, once the DOT determines that a transportation use of Section 4(f) property results in a *de minimis* impact, analysis of avoidance alternatives is not required. *De minimis* impacts on publicly owned parks, recreation areas, and wildlife and waterfowl refuges are defined as those that do not "adversely affect the activities, features, and attributes" of the Section 4(f) resource. *De minimis* impacts on historic sites are defined as those that will have "no adverse effect" on the historic property.

The national park is considered to be a Section 4(f) resource as a publicly-owned park; however, park roads are exempt from Section 4 (f) requirements under 49 U.S.C 303(c). A park road is defined as a public road that is located within, or provides access to, an area in the National Park System with title and maintenance responsibilities vested in the United States (23 U.S.C. 101(a)(19)). The county retains ROW for a portion of the Cattle Point Road within the park, from Pickett's Lane eastward to the DNR boundary, and the county may be granted ROW and take responsibility for maintenance if a new alignment is chosen. As a result, the exemption cannot be applied at this time.

The entire park is listed on the National Register of Historic Places as a National Historic Landmark, and as such, is also considered to be a Section 4(f) resource as an historic site.

A section of trail connecting the Mt. Finlayson trail with the Cattle Point Road would be obliterated by the proposed road alignment. The Mt. Finlayson trail is located on park and DNR property; however, the section of trail that would be directly affected is located on DNR property and would be considered a Section 4(f) resource as a publicly-owned trail.

Realignment of the Cattle Point Road would use land within the park, historic site, and trail for transportation purposes.

Chapter 4: Environmental Consequences

4.1 INTRODUCTION

This chapter describes the potential environmental consequences (effects/impacts) of each alternative on the relevant resources described in chapter 3. It presents the scientific and analytic basis for comparisons of the alternatives.

This chapter is organized by alternatives, with the impacts of each resource included under the individual alternative heading. Resource topics are listed in the same sequence as presented in chapter 3.

4.1.1 Terms and Definitions

Information collected and interpreted regarding the project alternatives and their effects on the surrounding environment are difficult to measure and affirm with absolute confidence. The following process for impact assessment is based on directives of the NPS DO-12 Handbook. Impacts are assessed on natural, cultural, and social resources as defined by the *context*, *duration*, and *intensity* of the effect.

4.1.1.1 Context

The *context* of a resource impact may range in scale from local to global depending on the resource and the action. For this document, most of the impact analysis is based on the project area or project vicinity as shown in figure 3.1. Impacts to some resources may be analyzed on different scales such as the "area of potential effects" as defined under Section 106 of the National Historic Preservation Act. The context of impacts may also be considered on larger scales, as appropriate, including impacts to the Cattle Point peninsula, San Juan Island, San Juan County, and the northwest Washington/southwest British Columbia region. The analysis area context for each resource is defined under the individual resource descriptions below.

4.1.1.2 Duration

The specific timing or *duration* of environmental impacts indicates the amount of change in the following categories.

- Short-term impacts/effects occur from an activity in the immediate future, typically less than a year from the event.
- Long-term impacts/effects occur from an activity over a longer period, typically more than five years.

4.1.1.3 Intensity

Intensity refers the degree to which the action may affect a resource. Impacts can be adverse or beneficial. Impact intensity in this document is expressed quantitatively or qualitatively (or both), depending on the resource. Quantitative information is expressed as a number; for example, the number of acres of vegetation impacted by an alternative. Qualitative information is expressed as a description of the relative intensity to which a resource could be impacted by a project alternative. Qualitative intensity thresholds are defined as: negligible, minor, moderate, or major.

4.1.1.4 Impact Type

Effects and impacts as used in this document are synonymous. Effects includes ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, and social; whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and adverse effects. Effects include:

- Direct impacts/effects are caused by the action and occur at the same time and place.
- Indirect impacts/effects are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable.
- Cumulative impacts/effects are the summation of impacts on a resource resulting 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. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

4.1.2 Methodology and Assumptions

Where possible, resource impacts are analyzed using quantified data to assess the environmental consequences of each alternative. In most cases, however, analysis is based largely on qualitative conclusions drawn from comparative analyses. The qualitative determination of potential impacts is based on professional judgment and experience with similar actions.

Qualitative intensity thresholds are defined as: negligible, minor, moderate, or major. Intensity thresholds are described differently for each resource. The following sections define the intensity thresholds of environmental impacts for each resource to establish consistent language for comparing the alternatives. It is important to note that the definition of terms used in this document may differ from the definitions used in other legal and guidance documents such as the Endangered Species Act and the National Historic Preservation Act. Any differences in terms will be defined under the appropriate resource impact descriptions.

4.1.2.1 Topography, Geology, and Soils

The analysis area for topography, geology, and soils is the project vicinity including the Cattle Point peninsula. The information used for the analysis is based on available NPS, FHWA, and consultant information and surveys. Potential effects are described quantitatively in acres impacted by project actions as well as qualitatively to describe relative changes under each alternative.

For the purpose of this analysis, the thresholds of change for the intensity of impacts are defined as follows:

Negligible: The effect to geologic features and processes would not be detectable.

Minor: An action could result in a change to a geologic feature or process, but the change would be so small that it would be slightly detectable.

Moderate: An action could result in a change to a geologic feature or process and the change would be measurable and of consequence.

Major: An action could result in a noticeable change to a geologic feature or process; the change would be measurable and the level of disturbance would be severe.

4.1.2.2 Air Quality

The analysis area for air quality is the project area and the San Juan Islands. Potential effects are based on anticipated changes to ambient air visibility in the project area and from base data and the National Ambient Air Quality Standards (NAAQS) as measured at authorized stations at Oak Harbor, Anacortes, and Mt. Vernon.

For the purpose of this analysis, the thresholds of change for the intensity of impacts are defined as follows:

Negligible: An action would have no perceptible visibility effects. The highest three-year maximum for each criteria pollutant (established under the Clean Air Act) would be less than NAAQS standards.

Minor: Visibility effects would be slightly perceptible on fewer than 180 days per year. The highest three-year maximum for each criteria pollutant would be less than NAAQS standards.

Moderate: Visibility effects would be moderately perceptible on fewer than 180 days per year or slightly perceptible on 180 days or more per year. The highest three-year maximum for each criteria pollutant could be greater than NAAQS standards.

Major: Visibility effects would be highly perceptible on 180 days or more per year. The highest three-year maximum for each criteria pollutant would be greater than NAAQS standards.

4.1.2.3 Water Resources

The analysis area for water resources is the drainage basin to the south of the hydrologic divide on Mt. Finlayson including the near-coastal marine environment. The information used for the analysis is based on available NPS, FHWA, and consultant information and surveys.

For the purpose of this analysis, the thresholds of change for the intensity of impacts are defined as follows:

Negligible: Effects on water quality (established by the Clean Water Act) and hydrologic systems would be at or below the level of detection and would occur in a small area. Changes would not be measurable or perceptible.

Minor: Effects on water quality and hydrologic systems would be detectable, but localized, and well below water quality standards.

Moderate: Effects on water quality and hydrologic systems would be readily detectable and have localized consequences, but would be at or below water quality standards and conditions.

Major: Effects on water quality and hydrologic systems would be detectable and would alter the systems from the historic baseline or desired water quality conditions.

4.1.2.4 Vegetation

The analysis area for effects on vegetation is the project area. The information used for the analysis is based on available NPS information and surveys in the Cattle Point area. Potential effects are described quantitatively in acres of vegetation directly impacted by project actions as well as qualitatively to describe relative changes in vegetation under each alternative.

For the purposes of this analysis, the thresholds of change for intensity of impacts are defined as follows:

Negligible: Effects on individual plants or communities would not be measurable. The abundance or distribution of individual plants or communities would not be affected or would be slightly affected. Ecological processes and biological productivity would not be affected.

Minor: An action would not decrease or increase the overall biological productivity. The abundance or distribution of individual plants or communities would be affected in a localized area but the viability of local or regional populations or communities would not be affected.

Moderate: An action would result in a change in overall biological productivity in a small area. A local population would be affected enough to cause a change in abundance or distribution, but the viability of the regional population or communities would not be affected. Changes to ecological processes would be of limited extent.

Major: An action would result in a change in overall biological productivity in a relatively large area. A regional or local population would be affected enough to cause a change in abundance or distribution to the extent that the population or community would not likely return to its former level. Key ecological processes would be altered.

4.1.2.5 Wildlife and Fish

The analysis area for wildlife is the project vicinity including the Cattle Point peninsula and areas within 0.5 miles of the project. Wildlife impacts are closely related to habitat impacts. The analysis considered whether actions would be likely to displace some or all individuals of a species in the project vicinity or would result in loss or creation of habitat conditions needed for the viability of local or regional populations. The information used for this analysis is based on available NPS, WDFW, USFWS, and NOAA Fisheries Service information and surveys.

For the purpose of this analysis, the thresholds of change for the intensity of impacts are defined as follows:

Negligible: Effects would be short-term and at or below the level of detection. Changes to a species' population would not be measurable or perceptible.

Minor: Effects would be detectible but localized and small. Actions would have little impact on species' population. Mitigation measures, if needed to offset adverse impacts, would be simple and would have a high level of confidence for success.

Moderate: Effects would be readily detectable but localized. Actions would affect the population level. Mitigation measures, if needed to offset adverse impacts, would be extensive and would have a high level of confidence for success.

Major: Effects would be obvious and would result in a substantial, permanent change to a species' population at a regional level. Extensive mitigation measures would be needed to offset adverse impacts and the success of mitigation could not be guaranteed.

4.1.2.6 Threatened, Endangered, and Protected Species

The analysis area for this topic is the suitable and known occupied habitat in the Cattle Point peninsula and areas within 0.5 miles of the project area. The information used for the analysis is based on available NPS, WDFW, USFWS, and NOAA Fisheries Service information and surveys.

Under section 7 of the ESA, federal agencies are directed to utilize their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of threatened and endangered species. In addition, federal agencies are required to consult with USFWS or NOAA Fisheries to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of habitat. For section 7 consultation, a "no effect" determination is appropriate when an action would have no affect whatsoever on a listed species or its designated critical habitat. A "may affect, not likely to adversely affect" determination is appropriate when the effects of the action on a listed species or designated critical habitat would be discountable (unlikely to occur), insignificant (not meaningfully detectible, or measurable), or wholly beneficial. A "may affect, likely to adversely affect" determination is appropriate if any adverse effects on a listed species or designated critical habitat may occur as a direct or indirect result of the action or its interrelated actions, and the effect is not discountable, insignificant, or beneficial (NMFS 1996).

For the purpose of this analysis, the thresholds of change for the intensity of impacts are defined as follows:

Negligible: An action would have no measureable effect on a listed or protected species or its critical habitat. The ESA determination would be "no effect." No consultation with the USFWS would be required.

Minor: The effects of an action would be discountable, insignificant, or totally beneficial. Any effect would be small and localized. The ESA determination would be "may affect, not likely to adversely affect." Informal consultation with USFWS or NOAA Fisheries would be required.

Moderate: The effects of an action would result in some change to a population or individuals of a listed or protected species or its designated critical habitat. The change would be measurable and important. The ESA determination would be "may affect, not likely to adversely affect." Informal consultation with USFWS or NOAA Fisheries would be required.

Major: The effects would result in a noticeable change to a population or individuals of a listed or protected species or its designated critical habitat. Any direct or indirect adverse effect would be likely to occur and would be important. Incidental *take* of the protected species could occur. The ESA determination would be "may affect, likely to adversely affect." Formal consultation with the USFWS or NOAA Fisheries would be required.

4.1.2.7 Cultural, Historic, and Archaeological Resources

The discussion of cultural resources includes analysis of potential effects to the cultural landscape, historic landmark, and archaeological resources. The intensity definitions are described together because of the interconnectedness of these resources.

The analysis area for cultural resources is the project area of potential effects (APE) and the cultural landscapes of the American Camp unit of the park. Information used in the assessment was obtained from relevant literature and documentation, maps, and consultation with cultural resource specialists as well as direct sampling at the project area.

The National Historic Preservation Act (NHPA) requires agencies to take into account the effects of their actions on properties listed or eligible for listing in the National Register of Historic Places (NRHP). This process also includes consultation with the State Historic Preservation Office (SHPO) under section 106 of the NHPA. Under section 106 of the NHPA, if an action could change in any way the characteristics that qualify the resource for inclusion in the NRHP, it is considered to have an effect. "No adverse effect" means there could be an effect, but it would not be harmful to the characteristics that qualify the resource for inclusion in the NRHP. "Adverse effect" means the action could diminish the integrity of the characteristics that qualify the resource for the NRHP.

For the purpose of this analysis, the thresholds of change for the intensity of impacts are defined as follows:

Negligible: The effects on cultural resources would be at the lowest levels of detection, barely measurable without any perceptible consequences, either beneficial or adverse. The section 106 determination of effect would be "no adverse effect."

Minor: The effects on cultural resources would be perceptible or measurable, but would be slight and localized within a relatively small area. The action would not affect the character or diminish the features of a NRHP eligible or listed resource, and it would not have a permanent effect on the integrity of the resource. The section 106 determination of effect would be "no adverse effect."

Moderate: The effects would be perceptible and measurable. The action would change one or more character-defining feature of a cultural resource, but would not diminish the integrity of the resource to the extent that its NRHP eligibility would be entirely lost. Under section 106, the resources' eligibility would be threatened and the determination of effect would be "adverse effect."

Major: The effects on cultural resources would be substantial, discernible, measurable, and permanent. For a NHRP eligible or listed resource, the action would change one or more character-defining feature, diminishing the integrity of the resource to the extent that it would no longer be eligible for listing in the NRHP. Under section 106, NRHP eligibility would be lost and the determination of effect would be "adverse effect."

4.1.2.8 Land Use, Local Plans

The analysis area for land use and local plans is the Cattle Point peninsula. The plans that apply to activities within the area are the *San Juan Island National Historical Park Final General Management Plan and EIS* (NPS 2008), the *Natural Resources Conservation Area State-Wide Management Plan* (1992; www.dnr.wa.gov/Publications/amp_nrca_statewide_mgt_plan_9_1992_2.pdf), and the *San Juan County Comprehensive Plan* (adopted December 20, 1998, revised July 2006). The analysis of effects to land use and local plans consists of a qualitative assessment of whether or not the proposed alternatives fulfill the management direction and guidelines of the applicable plans.

4.1.2.9 Visitor Uses, Trails, and Visual Quality

The analysis area for these topics is the Cattle Point peninsula including the American Camp unit of the park, the NRCA, the BLM, and their view-sheds. The information used for this analysis is based on available NPS, DNR, and county information. Potential effects on trails are described quantitatively in length of trail directly impacted by project actions. Effects to visitor uses, trails, and visual quality are also described qualitatively to depict relative changes under each alternative.

For the purpose of this analysis, the thresholds of change for the intensity of impacts are defined as follows:

Negligible: Effects would be barely detectable to the visitor and expected to have no discernible effect related to interpretation and education, recreational opportunities, and scenic resources.

Minor: Effects would be slightly detectable to the visitor, though not expected to have an overall effect on the visitor experience related to interpretation and education, recreational opportunities, and scenic resources.

Moderate: Effects would be clearly detectable to the visitor and could have an appreciable effect on the visitor experience related to interpretation and education, recreational opportunities, and scenic resources.

Major: Effects would be substantial, have a highly noticeable influence on the visitor experience and could permanently alter access to, and availability of, various aspects of the visitor experience related to interpretation and education, recreational opportunities, and scenic resources.

4.1.2.10 Transportation (Roads System, Special Vehicles, Bicycles, Pedestrians, Road Safety)

The analysis area for these topics is the Cattle Point peninsula. The information used for this analysis is based on available NPS, county, and FHWA data.

For the purpose of this analysis, the thresholds of change for the intensity of impacts are defined as follows:

Negligible: Effects would not be detectable and would have no discernible effect on the road condition or traffic flow.

Minor: Effects would be slightly detectable but there would not be an overall effect on road condition or traffic flow.

Moderate: Effects would be clearly detectible and the action could have an appreciable effect on road condition or traffic flow.

Major: Effects would be substantial and highly noticeable; road conditions and traffic flow could be permanently altered.

4.1.2.11 Socioeconomics (Population, Demographics, Local Industry, Employment and Income, Environmental Justice, Relocation, Public Health and Safety, Utilities)

The analysis area for these topics is the Cattle Point peninsula and San Juan County. The information used for the analysis is based on available NPS, county, and U.S. Census data.

For the purpose of this analysis, the thresholds of change for the intensity of impacts are defined as follows:

Negligible: Effects are not detectable.

Minor: Effects are small but detectable, and only affect a small number of businesses and /or a small portion of the population. The impact is slight and not detectable outside the affected area.

Moderate: Effects are readily apparent. Any effects result in changes to socioeconomic conditions on a local scale within the affected area.

Major: Effects are readily apparent. Measurable changes in social or economic conditions at the county or regional level occur. The impact is severely adverse or exceptionally beneficial within the affected area.

4.1.2.12 Hazardous and Solid Waste

The analysis area for these topics is the project area. The information used for the analysis was based on available NPS and EPA information. The thresholds of change for impacts are either *no effect* or *hazardous waste site affected.* A *no effect* determination would be appropriate only when an action would have no affect whatsoever on hazardous and solid waste.

4.1.2.13 Energy

The area of analysis for these topics is the Cattle Point peninsula, San Juan county, and nationwide. The information used for this analysis is subjective, based on the estimated level of energy required to construct each alternative and the long-term use of energy for road maintenance and residential needs.

For the purpose of this analysis, the thresholds of change for the intensity of impacts are defined as follows:

Negligible: Effects would not be detectable and would have no discernible effect on overall energy consumption either locally, county-wide, or nationally.

Minor: Effects would be slightly detectable but there would not be an overall effect on energy consumption either locally, county-wide, or nationally.

Moderate: Effects would be clearly detectible locally but would not have an overall effect on energy consumption county-wide or nationally.

Major: Effects would be substantial and highly noticeable locally and may have an effect on energy consumption county-wide or nationally.

4.1.2.14 Noise

The analysis area for this topic is the Cattle Point peninsula. The information used for the analysis is based on available NPS information. Context, duration, and intensity together determine the level of noise impact for an activity. Noise for a certain period and intensity would be a greater impact in a highly sensitive context. In addition, a given noise intensity would be a greater impact if it occurred more often, or for a longer duration. For example, in low level ambient soundscapes, noises can be much more audible, thereby having greater impact intensities. It is usually necessary to evaluate all three factors together to determine the level of noise impact.

For the purpose of this analysis, the thresholds of change for the intensity of impacts are defined as follows:

Negligible: Impacts would not be detectable and would have no effect on ambient noise levels.

Minor: Impacts would be slightly detectable and in close proximity to the source, but would not be expected to have an appreciable effect on ambient noise levels.

Moderate: Impacts would be clearly detectable and could have an appreciable effect on ambient noise levels; moderate adverse impacts may include introduction of noise associated with an activity or facility into an area with little or no ambient noise.

Major: Impacts would be clearly audible against ambient noise levels, or would have a substantial, highly-noticeable effect on ambient noise levels.

4.1.2.15 Light

The area of analysis for this topic is the Cattle Point peninsula and its view-sheds. The information used for the analysis was based on available NPS information and subjective observations by resource professionals.

For the purpose of this analysis, the thresholds of change for the intensity of impacts are defined as follows:

Negligible: Effects would not be detectable and would have no discernible effect on the night sky.

Minor: Effects would be slightly detectable but there would not be an overall effect on the night sky.

Moderate: Effects would be clearly detectible locally but would not have an overall effect on the night sky of distant view-sheds.

Major: Effects would be substantial and highly noticeable locally and would have an effect on the night sky of distant view-sheds.

4.1.2.16 Prime and Unique Farmland, Coastal Zone, and 4(f)

The analysis area for these topics is the project area. The information used for the analysis of *Prime and Unique Farmland* is based on the Natural Resources Conservation Service (NRCS) Web Soil Survey. Coastal Zone consistency analysis is based on WDOE (easement/ROW) information. Section 4(f) analysis is based on NPS, DNR, and FHWA information.

Prime and unique farm lands are protected by the Farmland Protection Policy Act, enacted to minimize the impact of federal projects on the irreversible conversion of farmland to nonagricultural uses.

Washington’s coastal zone is protected under the Coastal Zone Management Act, aimed at the wise use of the land and water resources within the coastal zone. The coastal zone includes all lands within the coastal counties and waters from the coastline seaward for three nautical miles.

Section 4(f) of the Department of Transportation (DOT) Act of 1966 stipulates that the FHWA (and other DOT agencies) cannot use lands from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless there is no feasible and prudent avoidance alternative; the action includes planning to minimize harm to the property; or the FHWA determines that use of the property, including measures to minimize harm, will have a *de minimis* impact on the property.

The analysis of effects to these topics consists of a qualitative assessment of whether or not the proposed alternatives fulfill the requirements and guidelines of the applicable laws.

4.1.3 Cumulative Impacts

Cumulative impacts/effects are the summation of impacts on a resource resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Cumulative impacts are considered for all impact topics and alternatives. It is assumed that current types of uses in the project area would continue into the future; however, there may also be new or different future uses.

Because of the relative isolation of the island environment and the location of Cattle Point at the southeast tip of the island, the cumulative effects boundary is limited to the Cattle Point peninsula and its adjacent near-shore environment. The cumulative effects time frame generally extends from the establishment of the park in 1966 through the life of the proposed Cattle Point Road improvements, although earlier activities have been described in a general, historic context.

To determine potential cumulative impacts, projects in the area were identified by examining existing plans by local, state, and federal agencies. These projects were considered regardless of the agency, organization, or person who undertakes them. Past actions in the project area are described in section 3.4.1. These past actions along with the following present and potential future actions make up the cumulative impact setting.

4.1.3.1 Present Actions

The San Juan Island National Historical Park completed its General Management Plan (GMP) and EIS in 2008. The plan provides general direction for management of NPS units as well as specific guidelines for the management of park resources and proposed projects. As part of plan implementation, the NPS is currently performing experimental plantings for native prairie restoration, control of exotic vegetation, and wild-fire fuels management.

At the NRCS day-use site, the DNR has recently replaced toilets, graveled the parking lot and walkways, and performed repairs to the block house, including a new roof, painting, and tile floor installation (Alison Hitchcock, DNR, personal communication, email July 28, 2009).

On-going projects include routine county road maintenance as well as maintenance of trails and facilities by the NPS and DNR.

4.1.3.2 Future Actions

Due to NPS and DNR protections, the Cattle Point peninsula is relatively undisturbed. The remaining undeveloped private residential lots in the Cattle Point subdivisions may be developed in limited numbers. There is no opportunity for creating additional lots in the existing subdivisions.

Future projects at American Camp proposed in the preferred alternative of the 2008 GMP include the following:

- Remove the double-wide trailer currently servicing as the visitor’s center and replace with a 5,400 square foot visitor center at the existing site.
- Enlarge the existing parking lot at the visitor’s center to include approximately 30 parking spaces.
- Add restrooms at the existing fire cache (located near the visitor’s center).

- Convert the existing road to a trail from the intersection at Pickett's Lane to the redoubt. Restore the redoubt parking lot to natural conditions. Develop a small parking lot near Pickett's Lane.
- Reconfigure the parking lot at Jakle's Lagoon and Mt. Finlayson to include additional parking spaces and a restroom facility.
- Reconfigure existing parking lots at South Beach and Fourth of July Beach within their existing footprints to accommodate more vehicles.
- Restore the historic prairie to improve native species composition, ecological function, and visual quality to conditions as they existed during the encampment period. Eliminate or control invasive plant species and manage woody vegetation to prevent intrusion into portions of the landscape that were open grassland during the historic period.

Because the GMP is a programmatic level plan, construction of park projects is dependent on securing funding and individual project NEPA compliance.

Future DNR projects include improving beach access near the block house and updating interpretive signs (Alison Hitchcock, DNR, personal communication, email July 28, 2009.).

The NPS and San Juan Island Trails Committee plan trail connections to the park and eventually through Cattle Point. One segment would follow Cattle Point Road south to terminate near False Bay Road. Another segment would continue the trail to the park.

Though not in the county transportation improvement plan, it is the intent of the county and park to add shoulders to the section of Cattle Point Road from the False Bay intersection through the park.

4.1.4 Impairment of Resources

The NPS Management Policies 2006 require an analysis of potential effects to determine whether or not project actions would impair park resources. The fundamental purpose of the national park systems as established by the NPS Organic Act begins with a mandate to conserve park resources and values. NPS managers must seek to avoid or minimize to the greatest degree practicable, adversely impacting park resources and values.

While impacts to park resources and values are allowed in limited circumstances (such as to provide access), impairment of park resources and values are not allowed unless directly and specifically provided for by legislation or by the proclamation establishing the park. Impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values.

Whether or not an impact meets the definition of impairment depends on the particular resource and values that would be affected; the severity, duration, and timing of the impact; the direct and secondary effects of the impact; the cumulative effects of the impact; and other impacts. An impact on any resource or value may constitute impairment. An impact would most likely constitute impairment if 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 park's natural or cultural integrity or to opportunities for enjoyment of the park; or

- Identified as a goal in the park's GMP or other relevant NPS planning documents.

This determination is made by the NPS and only applies to portions of the project within the park.

4.1.5 Offsite Construction Impacts

Project construction may require work outside of the project area in unspecified locations for activities needed to support the project. This includes work related to:

- Obtaining construction materials, including a rock and soil material source,
- Hauling equipment and materials,
- Staging and storing equipment and materials,
- Obtaining water for dust control and use in road construction, and
- Disposing of excess earth and road materials.

Since the exact location of these activities cannot be determined until construction, the effects of the project alternatives on offsite resources are discussed in general terms. The general nature and intensity of these effects are estimated based on the work required for construction of each alternative.

Some of these construction activities may take place in areas outside of the project area or vicinity. Activities at these sites could require ground disturbance, occupation, or clearing which may result in environmental impacts. These activities could take place at either commercial or non-commercial sites. Commercial sites are defined as established sites which have provided material to public and private entities on a regular basis over the last two years, have appropriate state and local permits, and do not require expansion outside their currently established and permitted area.

Should a non-commercial site be selected for project-related activities, the FHWA will require that use of the site:

1. Will have a determination of "no historic properties affected" or no more than a "no adverse effect" on properties on or eligible for listing to the National Register of Historic Places (NRHP) and *de minimis* impact on 4(f) resources;
2. Will have a determination of no more than a "no effect" to species or habitat listed as threatened or endangered under the federal ESA; and
3. Will not encroach into waters of the U.S. or wetlands protected under Executive Order 11990.

Impacts from offsite activities that have the potential to be substantially different from those disclosed in the EIS would require further evaluation under NEPA.

Because of local restrictions on barge landings, it is likely that sites on San Juan Island would be used for offsite construction activities and the existing ferry service would be used for transport of construction materials and equipment obtained from outside of the island. An existing commercial gravel pit located on San Juan Island about 10 miles from the project area could provide aggregate material for the project.

In order to minimize potential impacts from offsite uses, the following mitigation measures are incorporated into all action alternatives (B, C, and D):

- No staging or stockpiling of material would be allowed in the park or NRCA outside of the construction disturbance area.
- Construction activities near residences and sensitive wildlife areas would use timing restrictions to minimize impacts.
- Construction schedule and offsite disturbance areas would be approved by the FHWA in coordination with any affected local resources.

4.1.6 Incomplete or Unavailable Information

CEQ implementing regulations for NEPA (1502.22) specifies how agencies should address incomplete or unavailable information in an EIS. The regulations state that the agency shall always make clear that such information is lacking and use existing credible scientific evidence to evaluate impacts.

Incomplete or unavailable information used in this document include:

- Bluff retreat rate: Assumptions are made based on information available from existing studies (see section 3.2.2).
- Socioeconomic information: The social statistics used in this section are for the entire county or island and are not specific to the Cattle Point area. Information sources used were the most recent and readily available for population and unemployment data characterized by race and gender relevant to this project. The information is on a regional level; data were gathered at a single moment in time and should not be interpreted as annual averages. Assumptions on the population specific to Cattle Point were extrapolated from county and regional information as well as from personal observations and discussions with NPS employees, the County Health Office, the Senior Services Director, the local ambulance service provider (San Juan Island Emergency Medical Services), the County Sheriff, the San Juan Island School District, and two residents of the Cattle Point subdivisions. Obtaining additional data would take a substantial effort and is unlikely to be essential in comparing the impacts of the alternatives and in meeting the project purpose and need.

4.2 IMPACTS COMMON TO ALL ALTERNATIVES

The following resources would be impacted equally by all project alternatives. The resource topics detailed below will not be repeated under each alternative discussion, except as noted. Determinations represent effects in both the short-term and long term except where noted.

4.2.1 Floodplains, Wetlands, and Waterbodies

There are no streams, lakes, ponds, wetlands, or other waterbodies within the project area and no surface hydrologic connection between the project area and any waterbodies (fresh water and marine) or wetlands.

Cumulative Impacts

The nearest waterbody to the project site is the saltwater shoreline at the base of the eroding bluff. Other water resources in the Cattle Point peninsula include groundwater-fed water supply wells, springs, seeps, and temperate marine lagoons. These resources have been impacted by development of water sources for past agricultural, military, and residential needs.

Old Town Lagoon and adjacent coastal resources were impacted by old San Juan Town and its buildings and residential and commercial uses. Coastal resources have been impacted by construction of roads, visitor’s services, parking areas, trails, and residential development in close proximity to the coast. Due to NPS and DNR land management protections, many past activities have reverted to natural conditions, and most of the peninsula is largely undeveloped. Future construction within the federal and state properties focuses mainly on improvements to existing visitor facilities. No new facilities or roads are planned. There are some lots in the Cattle Point Estates and Cape San Juan residential areas that could be developed in the future. Future residential building could affect any springs or seeps in the area. New residences would require a water source for household needs.

There are no streams, lakes, ponds, wetlands, springs, or other waterbodies within the area of the proposed road realignment. The proposed alternatives would have no direct or indirect effect on these resources; therefore, they would not contribute to cumulative impacts.

Conclusion

The proposed project alternatives would have no effect on floodplains, wetlands, and waterbodies. There would be no impairment to these resources as a result of implementation of any of the alternatives.

4.2.2 Fish

There is no fish habitat in the project area as there are no streams, lakes, ponds, or other waterbodies, and no surface hydrologic connection between the project area and any waterbodies (fresh water or marine).

Cumulative Impacts

The nearest fish habitat to the project area is the marine environment, located about 200 feet south of the existing roadway. The Cattle Point peninsula is surrounded on three sides by marine waterbodies. There are no other permanent waterbodies providing fish habitat within the Cattle Point peninsula. Coastal development in the Cattle Point peninsula that may affect marine fish habitat has been very limited in scope. Old Town Lagoon and adjacent coastal resources were impacted by old San Juan Town and its buildings and residential and commercial uses. Commercial and recreational fishing currently takes place in adjacent marine waters. Due to NPS and DNR land management protections, many past land-based activities have reverted to natural conditions, and most of the peninsula is largely undeveloped. Future development that might impact coastal fish habitat in the Cattle Point peninsula is also limited by NPS and DNR land management protections. Future construction within the federal and state properties focuses mainly on improvements to existing visitor facilities; no new facilities are planned. There are some lots in the Cattle Point Estates and Cape San Juan residential areas that could be developed in the future. Most undeveloped residential lots are located inland. Commercial and recreational fishing would continue and would likely increase within regulatory limits.

There is no fish habitat or hydrologic connection to fish habitat within the area of the proposed road realignment. The proposed alternatives would have no direct or indirect effect on these resources; therefore, they would not contribute to cumulative impacts.

Conclusion

Since there is no fish habitat in the project area, the proposed project alternatives would have no effect on fish. There would be no impairment to this resource as a result of implementation of any of the alternatives.

4.2.3 Federally-Listed Threatened, Endangered, and Protected Species

The proposed project area and vicinity were evaluated by the consultant and NPS biologists to determine which federally-listed and protected species may occur based on the presence of habitat types, biological requirements of the species, and known observations. The following federally-listed threatened or endangered species are not known to occur or do not have habitat within the project area or vicinity:

- Bull trout
- Golden paintbrush
- Chinook salmon
- Humpback whale
- Marbled murrelet
- Marsh sandwort
- Southern resident killer whale
- Steelhead
- Steller sea lion

Cumulative Impacts

Marbled murrelet may feed in waters off Cattle Point. Golden paintbrush has habitat in the project vicinity. Humpback whale and southern resident killer whale are found in marine waters adjacent to San Juan Island. Seals and seal lion haul-outs are located on Goose Island off the east shore of the Cattle Point peninsula, as well as on isolated rocks to the north and east. Development of land resources from past agricultural and military activities, construction of roads, visitor's services, parking areas, trails, and residential development has resulted in habitat fragmentation, introduced exotic species, and loss of habitat which has affected terrestrial threatened and endangered species. Human activities in the near-shore environment that have affected marine species include marine vessel traffic, water quality impacts from manufacturing and agriculture, and reduction of food sources from fish harvesting.

While the above federally-listed threatened or endangered species may be found in adjacent areas, these species are not present and do not have suitable habitat in the project area; therefore, the proposed alternatives would not contribute to cumulative impacts to these species.

Conclusion

The proposed alternatives would have no effect on the federally-listed threatened or endangered species listed above because they are not known to occur or do not have habitat within the project area. There would be no impairment to these resources as a result of implementation of any of the alternatives.

Effects to federally-listed and protected species that are present or have suitable habitat in the project area are analyzed under each alternative discussion.

4.2.4 State-Listed Threatened and Endangered Species

The proposed project area and vicinity were evaluated by consultant and NPS biologists to determine which state-listed species may occur based on the presence of habitat types, biological requirements of the species, and known observations. The following state-listed threatened or endangered species are not known to occur or do not have habitat in the project area or vicinity:

Bear's foot sanicle
Erect pygmy weed
Northern sea otter
Northwestern pond turtle
River lamprey
Sharp fruited peppergrass
Streaked horned lark
Whulge (Taylor's) checkerspot

Cumulative Impacts

There is suitable habitat for the Whulge checkerspot in the project vicinity. Northern sea otter are found in marine waters adjacent to San Juan Island. Development of land resources from past agricultural and military activities, construction of roads, visitor's services, parking areas, trails, and residential development has resulted in habitat fragmentation, introduced exotic species, and loss of habitat, which has affected terrestrial threatened and endangered species. Human activities in the near-shore environment that have impacted marine species include marine vessel traffic, water quality impacts from manufacturing and agriculture, and reduction of food sources from fish harvesting.

While the above state-listed threatened or endangered species may be found in adjacent areas, they are not present or do not have suitable habitat in the project area; therefore, the proposed alternatives would not contribute to cumulative impacts to these species.

Conclusion

The proposed alternatives would have no effect on the state-listed threatened or endangered species listed above because they are not known to occur or do not have habitat within the project area. There would be no impairment to these resources as a result of implementation of any of the alternatives.

Effects to state-listed threatened and endangered species that are present or have suitable habitat in the project area are analyzed under each alternative discussion.

4.2.5 Other Special Status Species

The proposed project area and vicinity were evaluated by consultant and NPS biologists to determine which special status and candidate species may occur based on the presence of habitat types, biological requirements of the species, and known observations. The following special status and candidate species are not known to be present or do not have habitat in the project area or vicinity:

Annual sandwort
Coho salmon

Harbor seal
Long-legged myotis
Nuttall's quillwort
Propertius duskywing
River lamprey

Cumulative Impacts

Seals and seal lion haul-outs are located on Goose Island off the east shore of the Cattle Point peninsula, as well as on isolated rocks to the north and east. Development of land resources from past agricultural and military activities, construction of roads, visitor's services, parking areas, trails, and residential development has resulted in habitat fragmentation, introduced exotic species, and loss of habitat which has had an impact on terrestrial threatened and endangered species. Human activities in the near-shore environment that have impacted marine species include marine vessel traffic, water quality impacts from manufacturing and agriculture, and reduction of food sources from fish harvesting.

While the above special status species may be found in adjacent areas, they are not present or do not have suitable habitat in the project area; therefore, the proposed alternatives would not contribute to cumulative impacts to these species.

Conclusion

The proposed alternatives would have no effect on the special status species listed above because they are not known to occur or do not have habitat within the project area. There would be no impairment to these resources as a result of implementation of any of the alternatives.

Effects to special status species that are present or have suitable habitat in the project area are analyzed under each alternative discussion.

4.2.6 Essential Fish Habitat

The Pacific Fisheries Management Council has designated Essential Fish Habitat (EFH) for several species in the marine waters offshore of the project area. There are no streams or other waterbodies within the project area and no surface hydrologic connection between the project area and offshore waters.

Cumulative Impacts

The nearest EFH to the project area is the marine environment, located about 200 feet south of the existing roadway. The Cattle Point peninsula is surrounded on three sides by marine waterbodies. There are no other permanent waterbodies providing fish habitat within the Cattle Point peninsula. Coastal development in the Cattle Point peninsula that may affect marine fish habitat has been very limited in scope. Due to NPS and DNR land management protections, many past activities have reverted to natural conditions, and most of the peninsula is largely undeveloped. Future construction within the federal and state properties focuses mainly on improvements to existing visitor facilities; no new facilities are planned. Commercial and recreational fishing occurs in adjacent marine waters. Most undeveloped residential lots in the Cattle Point peninsula are located inland. Commercial and recreational fishing will continue and will likely increase within regulatory limits.

There is no EFH or hydrologic connection to EFH within the area of the proposed road realignment. The proposed alternatives would have no direct or indirect effect on these resources; therefore, they would not contribute to cumulative impacts.

Conclusion

There is no EFH or hydrologic connection to EFH within the area of the proposed road realignment; therefore, the proposed alternatives would have no effect on this resource. There would be no impairment to this resource as a result of implementation of any of the alternatives.

4.2.7 Environmental Justice

There are no known minorities or low-income populations residing in the project vicinity. Impacts to visitors resulting from the project alternatives would not vary by race or income status. Any action alternative (B, C, or D) chosen may have temporary impacts on residents and tourists visiting the area due to temporary travel disruptions from construction activities. The no action alternative (A) would also impact residents and visitors due to loss of vehicle access to the east end of Cattle Point. These impacts would affect both high and low-income populations equally.

Conclusion

None of the proposed alternatives would have disproportionately high and adverse effects on minorities, low-income populations or communities, or Indian Tribes as defined in the Council on Environmental Quality *Environmental Justice Guidance under the National Environmental Policy Act* (1997). No residences or businesses would be displaced or relocated as a result of the alternative. Negative impacts and benefits of the alternatives would affect all road users equally.

The proposed alternatives would have no direct or cumulative effect on environmental justice.

4.2.8 Relocation

All alternatives are located on federal and state property. There are no residences or businesses in the project area. None of the alternatives would displace developed structures except for the existing road itself. No individuals have been identified outside of the project area whose needs would require relocation because of the project. Assuming that construction would occur prior to failure of the existing road, the construction of any action alternative (B, C, or D) would be staged to allow continued traffic access to the residential areas on Cattle Point.

Conclusion

No residences or businesses would be displaced or relocated as a result of the alternative. Therefore, the proposed project alternatives would have no direct or cumulative effect on relocation.

4.2.9 Prime and Unique Farm Lands

The U.S. Department of Agriculture NRCS Web Survey (websoilsurvey.nrcs.usda.gov) identifies one soil unit in the project area that is classified as prime farmland if irrigated. The unit is located in the grassland area on the flat ridgeline on the south flank of Mt. Finlayson. This unit is located on park and DNR property, and no agriculture has taken place in the area during recent decades. The area would not be suitable for agriculture since irrigation is not readily available in the vicinity, and farming is not compatible with the purposes for which the park and DNR property are managed. The realignment sections of the proposed project alternatives would impact a small amount of the prime farmland unit; however, since the area is not presently used for agriculture and since agriculture is not compatible with current land uses, no productive farmland would be converted to non-agricultural use.

Cumulative Impacts

Most of the grassland prairie located on the south half of the Cattle Point peninsula is considered to be suitable farmland if irrigated. In the project area, the grassland prairie has been converted to other uses due to development of land resources from past military activities, construction of roads, visitor's services, parking areas, trails, and residential development. Some of the prairie grassland was used for grazing and limited production of garden crops beginning in the early 1800s until the park was set aside in 1966. Residential development in the Cattle Point area began in the 1950s and 1960s. Due to NPS and DNR land management protections, many past activities have reverted to natural conditions, and most of the peninsula is largely undeveloped. Future construction within the federal and state properties focuses mainly on improvements to existing visitor facilities; no new facilities are planned. The remainder of the property in the Cattle Point peninsula is subdivided for residential use. There is currently no farming taking place in the Cattle Point peninsula. With current federal, state, and county land management restrictions, no farming would likely take place in the foreseeable future.

The proposed alternatives would not convert functional farmland to other uses. The proposed alternatives would have no direct or indirect effect on this resource; therefore, they would not contribute to cumulative impacts.

Conclusion

The proposed alternatives would not convert functional farmland to non-agricultural uses and would therefore have no effect on prime and unique farm lands.

4.3 IMPACTS OF ALTERNATIVE A: NO ACTION

This alternative would continue present road management in its current location. Under this alternative, no work would be undertaken to deal with bluff erosion and the roadway would eventually fail at this site. Current road maintenance activities would continue on the Cattle Point Road; however, once the road fails, it would not be restored or maintained. All of the impacts described are long term, except as stated. The short-term effects of no action are assumed to be the same as present conditions.

4.3.1 Topography, Geology, and Soils

Coastal bluff erosion would continue to erode the soil and rock of the coastal shoreline and bluff in the project area into the foreseeable future. The bluff would continue to retreat into the coastal topography until it reaches less erosive bedrock. Coastal bluff erosion would warrant close monitoring when it comes within 15 feet of the existing road alignment. The total area potentially affected by coastal erosion is unknown. This is a natural process and would occur regardless of the alternative.

Cumulative Impacts

Coastal bluff erosion impacts the topography and soils along much of the south shoreline of the Cattle Point peninsula. However, most of the coast along the remainder of San Juan Island is rocky and more resistant to erosion, or is protected by shoreline trees and shrubs. Coastal erosion is a natural process and federal actions associated with alternative A would have no influence its progression.

Soils in the Cattle Point peninsula have been impacted by past agriculture and military activities, construction of roads, visitor's services, parking areas, trails, and residential development. These activities cause changes to the soil by adding or changing chemicals, changing parent materials, and changing the rate of erosion. Due to NPS and DNR land management protections, many past activities have reverted to natural conditions, and most of the peninsula is largely undeveloped. Future construction within the federal and state properties focuses mainly on improvements to existing visitor facilities; no new facilities are planned. Expansion of current facilities would have a minimal impact on adjacent soil and thus contribute to cumulative impacts. There are some lots in the Cattle Point Estates and Cape San Juan residential areas that could be developed in the future; however, most residential development at the east end of the Cattle Point peninsula is complete. The extent of future residential development is limited by the number of lots available and county zoning. Future construction of residences would have a small contribution to cumulative effects on soil.

Alternative A involves no new construction that would impact the topography, geology, or soils in the project area. The alternative would have no direct or indirect effect on these resources; therefore, it would not contribute to cumulative impacts.

Conclusion

The no action alternative would have no effect on topography, geology, and soils in the project area. Coastal bluff erosion would continue to impact these resources into the foreseeable future; however, this is a natural process and would occur regardless of the alternative. There would be no impairment to these resources as a result of implementation of alternative A.

4.3.2 Air Quality

Under the no action alternative, the road would eventually fail, cutting off road access between the east end of the Cattle Point peninsula and the remainder of San Juan Island. When the road eventually fails, auto use to the east of the bluff erosion site would likely decrease due to the lack of road access to the remainder of the island. Locally, a reduction in auto use would result in a reduction of air pollutants from auto emissions. However, use of other small vehicles (such as 4-wheelers and motorcycles) by residents to travel within the eastern end of the Cattle Point peninsula could increase. In order to access the rest of San Juan Island and the mainland, Cattle Point residents would increase their use of water transport and floatplanes, resulting in a minor increase in air pollutants from these motor vehicles. Emissions from increased use of boats, floatplanes, and small vehicles could offset any reduction in emissions gained from the loss of auto access. Loss of auto access could also reduce the likelihood for future development of vacant property on the east end of the Cattle Point peninsula. This could reduce the potential to generate air pollutants from new residences such as smoke from wood stoves and fireplaces and emissions from additional vehicles in the area.

Cumulative Impacts

Past and present sources of impacts on air quality in the Cattle Point peninsula are motor vehicles, campfires, prescribed fires, generators, and heating systems. Most air pollution affecting the Cattle Point peninsula comes from outside of the area, notably the Shell Oil Products and Tesoro oil refineries near Anacortes and Bellingham, Washington and the Port Townsend Pulp and Paper Mill in Port Townsend, Washington. As population growth continues in western Washington, additional cars, marine vessels, and infrastructure would increase air pollution emissions, and could result in minor adverse impacts to air quality in the Cattle Point area.

The no action alternative could lead to a reduction in vehicular traffic and a reduction in future population growth potential in the east end of the Cattle Point peninsula. These factors could lead to a reduction in sources of pollutant emissions in the local area. While this could have a negligible beneficial effect on the air quality in the local area, it would not likely result in a cumulative improvement in air quality region-wide.

Conclusion

Overall, this alternative could have a negligible beneficial effect on air quality in the Cattle Point peninsula, but would have no effect on air quality in the region. There would be no impairment to this resource as a result of this alternative.

4.3.3 Hydrology

Bluff erosion could affect the movement of surface and ground water in the affected area; however, this is a natural process and would continue regardless of the alternative. The existing road surface is made up of impermeable pavement that does not allow water to penetrate the ground over the road surface area. Impermeable surfaces accelerate the movement of water, causing higher transport capacities and increasing erosion as well as changing runoff characteristics of a watershed. Because of the low level of residential development and low road density in the project area, the amount of impermeable surface in the project area is low. The no action alternative would lead to obliteration of the existing roadway at the bluff site through natural erosion. This would lead to a slight reduction in impermeable road surface in the project area.

Cumulative Impacts

Hydrologic systems in the Cattle Point peninsula have been affected by past agricultural uses, military activities, construction of roads, parking lots, visitor facilities, and residential development. Due to NPS and DNR land management protections, many past activities have reverted to natural conditions, and most of the peninsula is largely undeveloped. Future construction within the federal and state properties focuses mainly on improvements to existing visitor facilities; no new facilities are planned. There are some lots in the Cattle Point Estates and Cape San Juan residential areas that could be developed in the future; however, most residential development at the east end of the Cattle Point peninsula is complete. Because the area is largely undeveloped and road density is low, these actions have had a minor cumulative effect on hydrologic systems.

Alternative A involves no new construction and would therefore not contribute to cumulative impacts to hydrology.

Conclusion

Overall, implementation of the no action alternative would result in a negligible beneficial effect on the hydrology in the drainage basin and Cattle Point peninsula. There would be no impairment to this resource as a result of this alternative.

4.3.4 Water Quality

Continued bluff erosion could potentially discharge sediment into the Strait of Juan de Fuca. This is a natural process that takes place throughout coastal areas. As the bluff retreats, the road would eventually be destroyed by erosive forces. Road pavement would eventually slough off with the retreating slope and there is the potential that sections of pavement could eventually fall into coastal waters. The leaching of petroleum from the asphalt pavement could affect water quality in the near-coastal area. Testing conducted by the University of New Hampshire to determine the leaching characteristics of reclaimed asphalt pavement show that petroleum contaminants were below the detection level and below applicable state regulatory groundwater concentrations (Eastern Research Group 2001).

Cumulative Impacts

Coastal water quality has been affected by natural geologic processes such as coastal erosion as well as pollution from marine vessels, shoreline development, agriculture, and manufacturing. Surface and ground water has been impacted by human development and agricultural uses. Due to NPS and DNR land management protections, many past activities have reverted to natural conditions, and most of the peninsula is largely undeveloped. Future construction within the federal and state properties focuses mainly on improvements to existing visitor facilities; no new facilities are planned. Visitation in the park is expected to increase into the foreseeable future. Increased human presence along the beaches and adjacent to coastal lagoons could contribute to cumulative impacts on water quality in the Cattle Point area. There are some lots in the Cattle Point Estates and Cape San Juan residential areas that could be developed in the future, which would increase the population of the area and potentially impact water quality along adjacent coastal areas and waterbodies.

Alternative A involves no new construction. The existing road would eventually fail at the bluff erosion site, eliminating road access to the east end of the Cattle Point peninsula. This would reduce future visitor use and potentially reduce the growth of new residential construction on private property. When added to other past, present, and future activities, these actions could have a negligible beneficial effect on water quality locally, but would have no measurable cumulative effect region-wide.

Conclusion

Because of these factors, implementation of alternative A would have a negligible adverse effect on water quality in the project area. There would be no impairment to this resource as a result of this alternative.

4.3.5 Visual Quality

The ability of visitors to access the scenic vistas to the east of the eroding bluff by motor vehicle would be eliminated when the road fails. Pedestrian access to the east of the road failure would continue via existing trails. Access to vistas to the west of the road failure would not be affected. Views of the road, including the portion of the road visible from the historic South Beach area of American Camp, would remain the same over the short-term. The road would eventually fail at the bluff erosion site; however, this is a natural process and would occur regardless of the alternative. The failed road section at the bluff erosion site would appear similar to other naturally eroding bluff sites along the coast. Under the no action alternative, the failed road section would not be restored, and eventually pieces of road pavement would fall onto the bluff below. This would impact the visual quality of the coastal bluff when viewed from South Beach or from offshore; however, over the long term, continued erosion and natural degradation of the asphalt would eventually break the pavement into small pieces that would be difficult to distinguish from the natural surroundings.

Cumulative Impacts

Past and present development that is viewable from within the Cattle Point peninsula and from offshore has impacted the visual quality of the natural setting. The Cattle Point residential areas began development in the early 1960s. These areas have about 150 residential lots with sizes varying from 0.5 acres to 6 acres. Most of these lots have been developed. Residential areas to the west of American Camp also began development in the 1960s. These areas contain a total of 43 single-family lots averaging about 1 acre in size, over half of which have been developed. The residences on the east end of the Cattle Point peninsula cannot be seen from the historic areas of the park; however, some residential development to the west is visible. Although some residences are screened by topography and vegetation, many can be seen to varying degrees from offshore. Other development of land resources including historic military buildings, visitor's services, parking areas, roads, and trails are visible from various locations on the Cattle Point peninsula and from offshore. Due to NPS and DNR land management protections, most of the peninsula is largely undeveloped and retains its natural appearance. Road density in the Cattle Point peninsula is low, except in residential areas. Future construction within the federal and state properties focuses mainly on improvements to existing visitor facilities. No large improvements to existing facilities and no new facilities are planned that would add to cumulative impacts to visual resources.

Alternative A involves no new construction. The existing road would eventually fail at the bluff erosion site and would erode onto the hillside below. Loss of road access could potentially reduce the growth of future residential construction on private property at the east end of the Cattle Point peninsula. However, since most of the residential lots are currently built-out and the remainder of the area is protected from development by NPS and DNR management, this would have a negligible cumulative benefit to visual quality locally and no measurable effect region-wide.

Conclusion

Overall, implementation of alternative A would have a negligible adverse effect on the visual quality of the Cattle Point peninsula from view-points in the park and from offshore.

4.3.6 Vegetation

The existing roadway impacts approximately 3 acres of prairie vegetation within the project area. Natural coastal erosion has also removed an unknown amount of vegetation as the bluffs erode upslope. Bluff erosion is expected to continue at current rates into the foreseeable future, removing areas of vegetation as the bluff recedes upslope until it meets less erosive rock. The area of potential impact from natural erosion is unknown. Prior to road failure, through-traffic would be closed at a safe location to the east and west of the erosion site. Outside of the eroded segment, the Cattle Point Road would likely be left in place.

Cumulative Impacts

In the Cattle Point peninsula, vegetation has been disturbed in localized areas for residential development and within the park, DNR, and BLM property for visitor services, roads, parking areas, and trails. In the past, the vegetation in the Cattle Point peninsula was affected by agriculture, logging, and military operations. Past logging impacted the forested area on the north side of the Cattle Point peninsula. Most of the area is currently second growth or later succession.

Due to NPS and DNR land management protections, many past activities have reverted to natural conditions. Most of the Cattle Point peninsula is largely undeveloped. Future construction within the federal and state properties focuses mainly on improvements to existing visitor facilities; no new facilities are planned. There are some lots in the Cattle Point Estates and Cape San Juan residential areas that could be developed in the future; however, most residential development at the east end of the Cattle Point peninsula is complete. Future construction would have a negligible contribution to cumulative effects to vegetation in the Cattle Point peninsula.

Prairies are an increasingly rare vegetation resource in the San Juan Islands and the greater Pacific Northwest. Prairies in the Northwest have been adversely impacted from conversion to agriculture, introduction of exotic species, and residential development. The NPS has undertaken a limited amount of prairie restoration in the American Camp unit of the park.

Coastal erosion would continue to impact prairie vegetation in the project area as the bluff recedes upslope until it meets less erosive rock. The potential area of impact from natural erosion is unknown. This is a natural process and would continue regardless of the alternative. Alternative A involves no new construction and would not impact natural processes; therefore, it would not contribute to cumulative impacts to vegetation.

Conclusion

Overall, implementation of the no action alternative would have no effect on vegetation other than the area affected by the existing roadway. There would be no impairment to this resource as a result of this alternative.

4.3.7 Wildlife

The existing road impacts wildlife and wildlife habitat by direct loss of the habitat area covered by pavement, fragmentation of continuous habitat patches into smaller sizes, road avoidance due to human activity, noise, and road mortality. Due to the narrow width of the road and low traffic speeds and volumes, these impacts are relatively small.

Eventual failure of the road at the bluff erosion site would result in a large reduction in motor vehicle traffic on the east side of the failure site due to loss of road access to the remainder of the island. This would result in a reduction in vehicle-related human activity and noise as well as a reduction in wildlife road mortality.

Motor vehicle traffic on the west side of the failure site would also be reduced due to elimination of commuter travel by Cattle Point residents. Vehicle speeds would decrease on the section of road leading to the dead-end at the road failure site. The reduction in traffic volume and speed would reduce traffic-related disruptions in wildlife travel across the roadway and reduce direct road mortality. Human activity would continue in the project area, but at a lower level due to the absence of through-traffic. Visitor travel on the west side of the road failure site would continue, and would likely increase at levels expected with normal visitor increases over time. Foot access to the east of the road failure site would continue to be available via the existing trail system. Disruptions to wildlife from this activity would continue on both sides of the road failure site.

Cumulative Impacts

Native wildlife in the Cattle Point peninsula and on San Juan Island has been impacted by past agricultural development, military activities, residential development, road construction, park development, and increased human use and visitation. Impacts include habitat loss and fragmentation, introduction of exotic wildlife species, and introduction of pathogens from domestic livestock.

Continued development on San Juan Island would fragment habitat into smaller areas for the remaining wildlife. Habitat loss causes displacement of individuals and reliance on ever-smaller undisturbed areas of habitat. Introduction of exotic wildlife species has also altered habitat and created competition for food and territory. However, because of federal and state land management protections, most of the land in the Cattle Point peninsula is undeveloped, and future development is extremely limited. While the area is undeveloped, the historic and scenic resources attract a large amount of visitor use. The American Camp area averages 140,000 to 200,000 visits per year, mostly in the summer months. Visitation is expected to increase into the foreseeable future. Increased human use would continue to increase wildlife disturbance in the project area.

The eventual loss of the Cattle Point Road through bluff erosion would eliminate through-traffic to the east end of the Cattle Point peninsula and could contribute to a reduction in vehicular traffic along the Cattle Point Road between Friday Harbor and Cattle Point. While residential traffic would decrease, visitor traffic would continue to increase into the future. Total loss of vehicular traffic at the bluff erosion site and on the east end of the Cattle Point peninsula would reduce habitat fragmentation caused by road use in the localized area. While these factors could lead to a reduction in habitat fragmentation and human disturbance in the local area, it would not likely result in cumulative improvement in wildlife habitat and wildlife use on San Juan Island as a whole.

Conclusion

Overall, implementation of the no action alternative would have a minor beneficial effect on wildlife in the project area. There would be no impairment to this resource as a result of this alternative.

4.3.8 Federally-Listed Threatened, Endangered, and Protected Species

There are currently no federally-listed threatened or endangered species known to be present or having habitat in the project area or vicinity. The following federally protected species is known to be present and have habitat within the project area and vicinity.

Table 4.2 – Federally Protected Species in the Project Vicinity

Common Name	Status	Occurrence in Project Area
Bald eagle	Federally protected under BGEPA	Project vicinity contains two bald eagle territories. Six known nesting sites (9 active nests) within 200 feet to 0.5 mi of project area.

Eventual failure of the road at the bluff erosion site would result in a large reduction in motor vehicle traffic on the east side of the failure site due to loss of road access to the remainder of the island. This would result in a reduction in vehicle-related human activity and noise to the east of the road failure site. Reduction in traffic noise and disturbances would be the greatest for the two historic bald eagle nesting sites located east of the road failure site. One of these sites is located within 800 feet of the project area.

The remaining four bald eagle nesting sites are located to the west of the road failure site. One nest site is located in close proximity to the NPS visitor's center. Motor vehicle traffic on the west side of the failure site would be reduced due to elimination of commuter travel by Cattle Point residents. Visitor travel on the west side of the road failure site would continue, and would likely increase at levels expected with normal visitor increases. Foot access to the east of the road failure would continue to be available over the existing trail system. Use of the Mt. Finlayson trail is expected to increase at levels expected with normal visitor increases. The bald eagle nests located on the ridge of Mt. Finlayson are far enough removed from the Cattle Point Road that it is unlikely that the small amount of traffic noise would affect nesting. The nesting eagles near the visitor's center appear to be acclimated to human activity.

Cumulative Impacts

The development of the Cattle Point peninsula and San Juan Island has resulted in bald eagle habitat fragmentation, introduction of exotic species, habitat loss, and human disturbance. Park operations, visitor uses, and residential development in the Cattle Point peninsula continue to impact the bald eagles that use the area for nesting and foraging. Due to NPS and DNR land management protections, many areas of environmental disruptions caused by past human activities have reverted to natural conditions, and most of the peninsula is largely undeveloped. Future construction within the federal and state properties focuses mainly on improvements to existing visitor facilities; no new facilities are planned. There are some lots in the Cattle Point Estates and Cape San Juan residential areas that could be developed in the future; however, most residential development at the east end of the Cattle Point peninsula is complete.

Bald eagle nesting in the Mt. Finlayson ridge area is somewhat isolated from most human activity other than foot traffic. The nesting eagles near the NPS visitor's center appear to be acclimated to human activity, and have successfully raised chicks over that last several years.

Implementation of alternative A would lead to a reduction in vehicular traffic near the Mt. Finlayson ridge bald eagle nesting sites; however, foot traffic would continue on local trails in close proximity to historic bald eagle nests. Trail use would likely increase at the same rate expected with normal increases in overall park visitation. Implementation of the no action alternative would not alter any trends in visitor use. Although the alternative may have a negligible incremental beneficial effect on bald eagles, when added to other past, present, and future activities it would not result in any cumulative change locally or region-wide.

Conclusion

Because of these factors, implementation of the no action alternative is expected to have no effect on bald eagles or bald eagle nesting the project area and Cattle Point peninsula. There would be no impairment to this resource as a result of this alternative.

4.3.9 State-Listed Threatened and Endangered Species

The following state listed threatened and endangered species is known to be present and have habitat within the project area or project vicinity.

Table 4.3 – State Listed Species in the Project Vicinity

Common Name	Status	Occurrence in Project Area
California buttercup	State threatened	33 groups (consisting of 2 to 260 individual plants) identified within the project area. Total area of occupancy approximately 0.5 acres.

Natural bluff erosion would continue at current rates, removing areas of vegetation as the bluff recedes upslope until it meets less erosive rock. At this time, the closest group of California buttercup is located approximately 285 feet to the north of the bluff erosion site. At current rates, bluff erosion would not affect this site for 97 to 285 years. During that period of time, the range of the plant could increase or recede based on a number of growing and management conditions.

Cumulative Impacts

In the Cattle Point peninsula, vegetation, including the California buttercup, has been disturbed in localized areas by residential development and within the park, DNR, and BLM property by visitor services, roads, parking areas, and trails. In the past, the vegetation in the Cattle Point peninsula was impacted by agriculture, logging, and military operations. Due to NPS and DNR land management protections, many areas of environmental disruptions caused by past human activities have reverted to natural conditions, and most of the peninsula is largely undeveloped. Future construction within the federal and state properties focuses mainly on improvements to existing visitor facilities. No new facilities are planned in the prairie habitat containing California buttercup. There are some lots in the Cattle Point Estates and Cape San Juan residential areas that could be developed in the future; however, most residential development at the east end of the Cattle Point peninsula is complete. Some of these lots are located in prairie grassland vegetation that could contain California buttercup.

Natural bluff erosion would continue to destroy prairie vegetation as the bluff recedes upslope; however, the known California buttercup populations are far removed from the eroding bluff area. This is a natural process and would continue regardless of the alternative. Alternative A involves no new construction and would not contribute to cumulative impacts to California buttercup.

Conclusion

Overall, implementation of the no action alternative would have no effect on any known populations of California buttercup in the project area and Cattle Point peninsula. There would be no impairment to this resource as a result of this alternative.

4.3.10 Other Special Status Species

The following special status species are known to be present or have habitat present in the project vicinity.

Table 4.4 – Special Status Species in the Project Vicinity

Common Name	Status	Occurrence in Project Area
Black oyster catcher	WDFW Priority Habitat and Species Database (WDFW-P)	Breeding colonies located to the east within 1 mile of project area Closest known colony located approximately 0.5 miles from the project area.
Island marble butterfly	Federal species of concern (FSC), State candidate (SC)	Larval host plants present in project area Species observed near Cattle Point Road near east boundary of the park during 2005 survey

Common Name	Status	Occurrence in Project Area
Long-eared myotis	FSC	Potentially present in project vicinity, though more likely found in forested areas on north side of Mt. Finlayson
Moss' elfin	State monitor list (SML)	Potential habitat in project area, though not found during 2005 survey
Northern goshawk	SC	Potentially present in project vicinity, though most likely found in forested areas
Olive-sided flycatcher	FSC	Potentially present in project vicinity, though most likely found in forested areas
Oregon vesper sparrow	SC	Potentially present in project area
Osprey	WDFW-P	Nest located about 1 mile northwest of project area Could potentially forage in project area
Pacific Townsend's big-eared bat	SC	Potentially present in project vicinity
Peregrine falcon	FSC, State sensitive species (SS)	Potentially present in project area
Valley silverspot	FSC, SC	Potentially present in project area
Western toad	SC	Potentially present in project area
Slender crazyweed	SS	Potential habitat in project area

Natural bluff erosion would continue at current rates, removing areas of vegetation as the bluff recedes upslope until it meets less erosive rock. The areas lost to erosion may include special status plants or habitat for special status wildlife species. This is a natural process and would continue regardless of the alternative.

Cumulative Impacts

Habitat for special status species in the Cattle Point peninsula and on San Juan Island has been affected by past agricultural development, military activities, residential development, road construction, park development, and increased human use and visitation. Impacts include habitat loss and fragmentation, introduction of exotic wildlife species, and introduction of pathogens from domestic livestock. In the Cattle Point peninsula, habitat for special status species has been disturbed in localized areas for residential development and within the park, DNR, and BLM properties for visitor services, roads, parking areas, and trails. In the past, habitat in the Cattle Point peninsula was impacted by agriculture, logging, and military operations. Due to NPS and DNR land management protections, many areas of environmental disruptions caused by past human activities have reverted to natural conditions, and most of the peninsula is largely undeveloped Coastal bluff erosion sites could contain special status plant species or habitat for special status plant and wildlife species. Coastal erosion could continue to impact special status species in the project area as the bluff recedes upslope until it meet less erosive rock. This is a natural process and would continue regardless of the alternative.

The eventual loss of the Cattle Point Road through bluff erosion would eliminate through-traffic vehicular access to the east end of the Cattle Point peninsula. This would reduce habitat fragmentation caused by road use in the bluff area and reduce human disturbance of special status wildlife species. Foot traffic would still be present on local trails and in the residential areas, but human presence would be reduced considerably at the bluff erosion site. These factors could have a beneficial effect on special status species in the local area; however, it would not likely result in a cumulative improvement in habitat and use on San Juan Island as a whole when added to other past, present, and future actions.

Conclusion

Because of these factors, implementation of the no action alternative would have no effect on special status species in the project area and Cattle Point peninsula. There would be no impairment to this resource as a result of this alternative.

4.3.11 Cultural, Historic, and Archaeological Resources

No cultural, historic, or archaeological resources have been identified in the area of potential road failure other than the National Historic Landmark. Natural bluff erosion could potentially impact cultural resources that have yet to be discovered. This is a natural process and would occur regardless of the alternative.

Cumulative Impacts

Archaeological resources on San Juan Island have been impacted by past development and construction of roads, trails, visitor’s services, parking areas, residential development, unintentional disturbance, artifact hunting, and vandalism, as well as natural processes such as fire and erosion. Over the years, historic structures have been adversely affected by natural processes and natural wear and tear. Some historic structures were removed from their historic settings and modified prior to establishment of the park. The cultural landscapes in the park have been adversely affected by human development. However, due to NPS and DNR land management protections, most of the peninsula is largely undeveloped and cultural resources are protected.

Cattle Point Road would eventually be destroyed by coastal bluff erosion; however the remainder of the road would likely be left in place. Natural bluff erosion could impact cultural resources that have not been discovered; however, this is a natural process and would continue regardless of the alternative. Alternative A involves no new construction. Implementation of this alternative would not alter current trends and would not contribute to cumulative impacts on cultural, historic, and archaeological resources.

Conclusion

The no action alternative involves no new construction; therefore it would have no effect on cultural, historic, and archaeological resources. There would be no impairment to these resources as a result of this alternative.

4.3.12 Land Use

The project area is located on federal and state property. The no action alternative would not change these land use designations including county land use zoning. Since the Cattle Point Road is the only road access, the eventual failure of the road at the bluff erosion site would result in a complete loss of motor vehicle access to the east end of the Cattle Point peninsula (figure 4.1) including NRCA, BLM, and residential property, as well as the Coast Guard lighthouse located on BLM property. Loss of road access would not change the status of the NRCA, BLM, or lighthouse properties. The U.S. Coast Guard currently uses the Cattle Point Road to service the lighthouse. When the road fails, the lighthouse could be serviced by boat or helicopter; however, this would be more difficult and costly than road access (Lieutenant John Lane, U.S. Coast Guard, personal communication, February 3, 2009). Although the residential areas would loose vehicular access to the remainder of San Juan Island, it would have no effect on use of the land for residential purposes or its county land use zoning.

Cumulative Impacts

Land use in the Cattle Point peninsula and San Juan Island has changed considerably throughout history. Native peoples used the islands to fish and collect camas and berries for thousands of years. The Hudson's Bay Company set up a wharf and established agricultural operations in the Cattle Point peninsula beginning in the 1850s. The American military began a 12-year occupation of American Camp in the early 1860s. A village sprang up on Griffin Bay following the arrival of American forces. After the military departed, the area reverted to agriculture and the village was abandoned. Logging took place in the forested area on the north side of the Cattle Point peninsula. In 1951, the state of Washington began to acquire historic properties at American Camp and English Camp. In 1966, the lands were donated to the federal government to create the San Juan Island National Historical Park. The east end of the Cattle Point peninsula was subdivided and began residential development in the 1960s. The NRCA was created by the state of Washington in 1987. Due to NPS and DNR land management protections, most of the peninsula is largely undeveloped.

Alternative A involves no changes to current land uses. Implementation of this alternative would not alter current trends and would not contribute to cumulative impacts.

Conclusion

Because of these factors, implementation of the no action alternative would have no effect on land use in the project area.

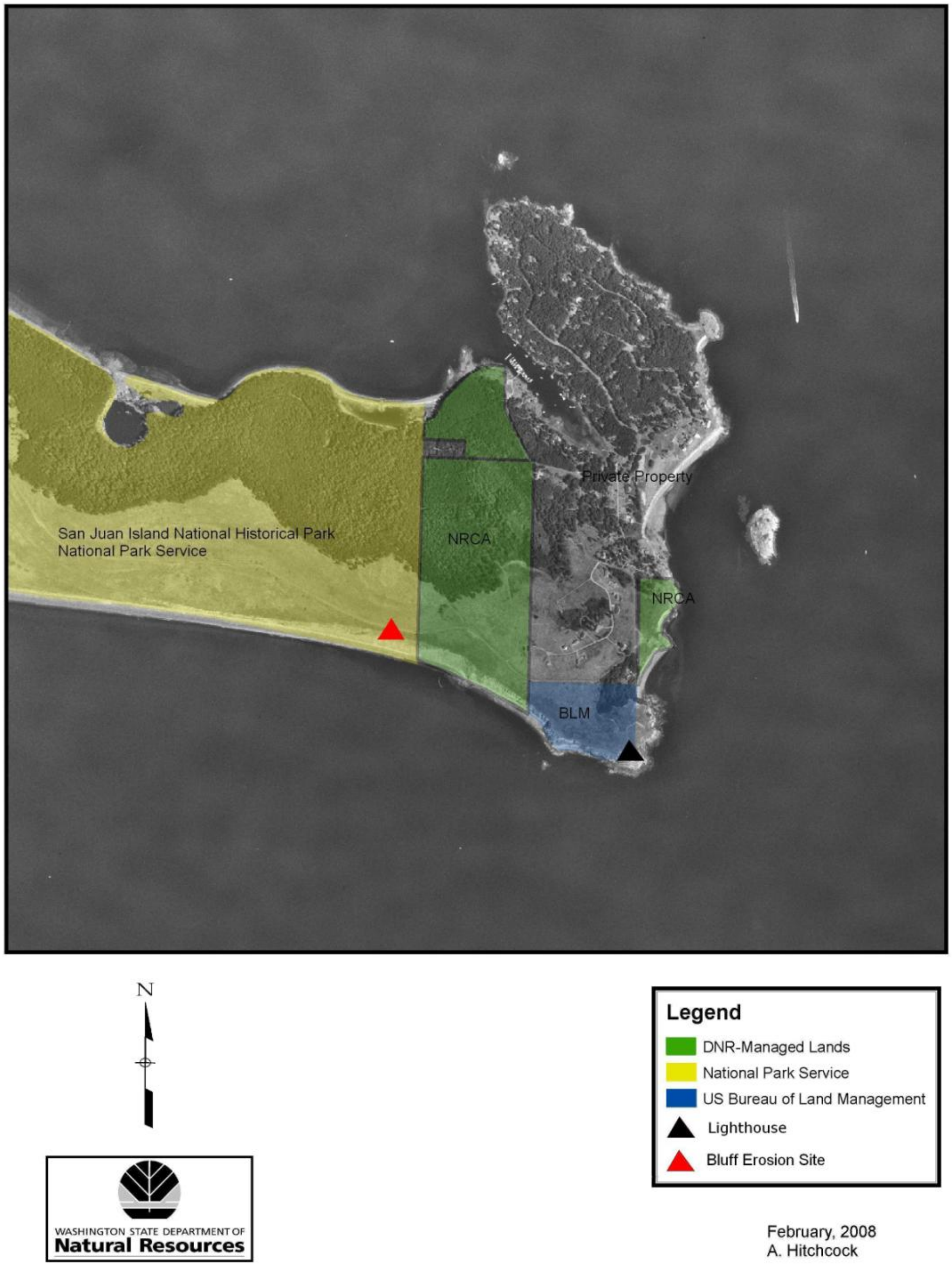


Figure 4.1 – Property at East End of Cattle Point Peninsula

4.3.13 Local Plans

Local plans applicable to management of the project area are the *San Juan Island National Historical Park GMP and EIS* (2008;referred to as the GMP), the *Natural Resources Conservation Area State-Wide Management Plan* (1992), and the *San Juan County Comprehensive Plan* (2006). The no action alternative would lead to the eventual failure of the Cattle Point Road from bluff erosion and the loss of motor vehicle access to the east end of Cattle Point. The loss of vehicular access between Cattle Point and the remainder of the island does not comply with the following management direction and guidelines:

San Juan Island National Historical Park GMP and EIS (2008):

- Maintain vehicular road access for residents at Cape San Juan and Cattle Point Estates and visitors to the Cattle Point Interpretive Area.
- Work cooperatively with the state and county to provide appropriate access to private land adjacent to the park where rights-of-way exist.

Natural Resources Conservation Area State-Wide Management Plan (1992):

- Existing roads will remain open to the general public when they meet DNR recreation road standards for safe public access and where an existing public ROW already exists or the road is determined as essential to access of the site for low-impact use.

San Juan County Comprehensive Plan (2006)

- Recognize the needs and desires of residents of each island in making decisions regarding transportation facilities and their operation.
- Accommodate diverse modes of transportation.
- Establish standards for road improvements that are responsive to preferences of island residents and that are in accordance with types and intensities of land uses to be served as well as volumes of traffic to be accommodated.

4.3.14 Visitor Uses, Special Vehicles, Bicycles, and Pedestrians

The eventual failure of the road at the bluff erosion site would result in a complete loss of motor vehicle and bicycle visitor uses on the east end of the Cattle Point peninsula. However, visitor uses on the west end of Cattle Point, including most of the park, would not be affected.

Based on a traffic estimate by the San Juan County Public Works Department, approximately 253,000 cars traveled the Cattle Point and American Camp roads in the year 2000. About 100,000 of those cars (40 percent) traveled solely to park locations while the remaining 60 percent (about 153,000 cars) traveled as far as the Cape San Juan residential area. It is unknown how many of these motorists were tourists and how many were residents; however, given the small number of year-round residents on the Cattle Point peninsula, it is likely that much of the traffic comes from tourist travel.

Most of the visitor uses in the American Camp area would not be affected by failure of the Cattle Point Road at the bluff erosion site. The NPS visitor's center, historic interpretive opportunities, and most of the trails and overlooks would still be accessible by motor vehicle, bicycles, and pedestrians. Motor vehicle and bicycle access to a small portion of the far eastern edge of the American Camp unit would be lost following road failure. Because only a very small area of the American Camp unit is located to the east of the road failure and because there are no historic resources in this area, the impact to the park would be negligible. Scenic vistas from park property would continue to be available from the area to the west of the road failure site. The native prairie surrounding the project area would continue to be accessed by pedestrians from both the west and east side of the road failure site.

Loss of road access to the east of the road failure site would eliminate access to all of the NRCA and BLM property by visitors who rely on motor vehicles, especially the elderly and disabled. The area could be accessed by pedestrians over the existing trails; however, access to this area by bicycles, mopeds, and other special vehicles would be eliminated following road failure. At this time, bicycle and motorized vehicle use is not permitted on area trails. Visitor use of the day-use facilities, lighthouse, and scenic vistas on DNR and BLM property at the east end of Cattle Point would likely decrease. However pedestrian access to these facilities would continue to be available at the end of an approximately 0.75-mile hike from the road failure site.

Cumulative Impacts

The park and other public lands are a primary source of recreation for both visitors and island residents. These public lands provide public access to a wide variety of recreational opportunities that are important for the enjoyment of the population. As private development continues throughout the San Juan Islands, there is a shrinking land base for public recreation, making the recreational opportunities provided by public lands more important. Continuing growth in San Juan County and increasing numbers of visitors has resulted in congestion along established recreation corridors during peak periods. Local and county efforts are underway to improve bicycle routes by establishing wider road shoulders. Volunteer groups are working to create a network of non-motorized trails connecting destinations throughout San Juan Island.

The eventual loss of road access to the east end of the Cattle Point peninsula would eliminate vehicular and bicycle access to about 140 acres of public lands. This area could still be accessed by boat and on foot over existing trails. The east end of the Cattle Point peninsula makes up a very small portion of the far-east end of American Camp. However, the entire DNR and BLM properties, including the Coast Guard lighthouse, would become inaccessible by motor vehicles and bicycles. These properties make up about 6 percent of the public lands on San Juan Island. These areas would not be available for direct vehicular access; however, they could be accessed by foot over existing trails. While implementation of the no action alternative would contribute a negligible cumulative impact on motor vehicle and bicycle recreational opportunities on San Juan Island, it would not contribute to cumulative impacts to pedestrian recreational uses. When added to other past, present, and future actions overall motorized and bicycle recreational opportunities would not change in a measurable way.

Conclusion

Overall, implementation of alternative A would have a minor adverse effect on visitor uses, special vehicles, bicycles, and pedestrians in the Cattle Point peninsula, but would have a negligible effect on these uses county-wide.

4.3.15 Trail System

Most of the trails in the Cattle Point peninsula are located in the park and to the north of Mt. Finlayson. Trailheads are located in American Camp near the Visitor's Center, South Beach, Fourth of July Beach, and Old Town Lagoon. The DNR and BLM properties on the east end of the Cattle Point peninsula also contain a system of local trails and connectors with the NPS trail system. Trails in the immediate project area include the Mt. Finlayson Trail located in the park along the Mt. Finlayson ridge and DNR trails connecting the east end of the Mt. Finlayson Trail and Cattle Point Road (east of the bluff erosion site) to Third Lagoon.

Natural bluff erosion and eventual failure of the Cattle Point Road would not directly impact trails in the project area. Loss of road access to the east end of the Cattle Point peninsula would not affect access to park trails; however, it would limit motor vehicle access to trail heads located on DNR and BLM properties. However, visitors and residents could continue to access the DNR and BLM trail system by foot or boat.

Cumulative Impacts

The Cattle Point peninsula contains about 9 miles of trails (San Juan Island Trails Committee 2006). Most of the developed trails have been developed since the mid 1960s when the park was established. The park trails provide an infrastructure that connects adjacent DNR and BLM trails in east Cattle Point with roads and trails to the west of American Camp, forming a vital recreational opportunity for visitors and residents. As private development throughout San Juan Island continues, there is an ever shrinking land base for development of public trails. Loss of road access would eliminate direct motor vehicle and bicycle access to about 1 mile of trails on DNR and BLM properties in the east end of the Cattle Point peninsula; however, these areas could still be accessed by foot. Therefore, this alternative would not contribute to cumulative impacts to the trail system locally or on San Juan Island.

Conclusion

Implementation of the no action alternative would have no effect on trails in the project area or Cattle Point peninsula.

4.3.16 Transportation and Road System

In the short-term, bluff erosion in close proximity to the Cattle Point roadway is likely to increase the need for road maintenance at the site until the time that the road fails completely. Over the long term, the no action alternative would lead to erosion of the roadway structure and the eventual loss of road access between the east end of the Cattle Point peninsula and the remainder of San Juan Island. Following road failure, lack of vehicle access would affect the ability of the county to maintain the Cattle Point Road east of the bluff area. As a result, following bluff failure, maintenance costs for the east end of the Cattle Point Road would increase due to its isolation, and the area would likely receive less maintenance than it currently receives.

Cattle Point Road is the only road access between the Cattle Point peninsula and the remainder of San Juan Island, including the island’s major population center in Friday Harbor. Failure of the road at the bluff erosion site would cut off motor vehicle access for Cattle Point residents to schools, emergency services, the airport and ferry terminal, businesses, consumer goods, and employment. The only transportation between the east end of the Cattle Point peninsula and the remainder of the island or off the island would be by boat, helicopter, or floatplane. These methods of transportation may not be available to all Cattle Point residents. Reliable transportation between the Cattle Point peninsula and the remainder of the island would be difficult and impractical for most residents. Development of a commercial or state-run water shuttle service would need to be explored.

Boat access would add considerable travel time between Cattle Point residences and Friday Harbor. Currently, the 9 miles between the Cattle Point residential areas and Friday Harbor takes about 20 minutes to drive. Boat travel from Cattle Point would involve walking or small vehicle transport from residences to a dock, a 10-mile water route to Friday Harbor, followed by a walk from the Friday Harbor dock into town or to a parked vehicle. Travel time would be dependent on the type of boat used, but would likely take over one hour. Floatplane or helicopter would provide faster transportation, but at a much higher cost.

Cumulative Impacts

The county currently maintains about 96 miles of seal-coated, gravel, and asphalt roads on San Juan Island (www.co.san-juan.wa.us/publicworks/pw_index.aspx, 2009). Roads throughout the county are routinely maintained and upgraded as needed to preserve the level of service to residents. The Cattle Point Road is the only through-road in the project area. A small network of residential roads connects the residences of Cattle Point Estates and Cape San Juan with the Cattle Point Road. The existing road system provides adequate access for residents. Future residential expansion is limited by the small number of vacant lots in the existing subdivisions and the large amount of public land that is not available for future residential or commercial development. There are no plans for construction of additional roads in the project area. The area of Cattle Point Road between the bluff erosion site and the end of the road is about 1.4 miles in length. This area makes up about 1 percent of the road system on the island and loss of this area to the overall road transportation system on San Juan Island would be minimal.

Conclusion

Because of these factors, implementation of the no action alternative would have a major adverse effect on the transportation and road system in the east end of the Cattle Point peninsula. However, the effects of this alternative on the county-wide transportation system would be negligible.

4.3.17 Road Safety

In the short term, an unexpected catastrophic road failure at the bluff erosion site could increase the chance of vehicular accidents during a period of low visibility. However, the county would monitor conditions and close the road prior to catastrophic failure. Warnings would slow traffic prior to reaching the end of the road.

Over the long term, the eventual elimination of through-traffic between the Cattle Point residential areas and the remainder of San Juan Island would eliminate local commuter traffic on the road. In the year 2000, approximately 253,000 cars traveled the Cattle Point and American Camp roads (San Juan County 2008). About 100,000 cars (40 percent) traveled solely to park locations while the remainder traveled as far as the Cape San Juan residential area. It is not known how many of these cars were residents and how many were visitors. Given that there are approximately 150 residential lots in the Cattle Point residential areas, most of which are built, it can be assumed that most of the 100,000 cars traveling to the end of Cattle Point Road belong to residents.

Accident data since 2003 indicate that the accident rate between MP 6 and 9 on Cattle Point Road is lower than the county-wide average. There have been no reported accidents on this section of road since 2007.

Elimination of through-traffic from Cattle Point residents would reduce the number of motor vehicles using the east end of the Cattle Point Road. This would reduce the potential for motor vehicle accidents between each other and between bicycles, pedestrians, and special vehicles using the area.

Cumulative Impacts

The Cattle Point Road was built in 1963, and is the only through-road on the east end of the Cattle Point peninsula. There are no plans for construction of additional roads or visitor facilities in the project area that would lead to a change in traffic volume or contribute to an increase in visitor or residential use. Future residential expansion is limited by the small number of vacant lots in the existing subdivisions and the large amount of public land that is not available for future residential or commercial development. Visitation to American Camp has experienced annual fluctuations; however, overall, visitor use has increased by 23 percent between 1993 and 2006 (NPS 2008). The increase in park visitation has resulted in an increase in motor vehicle traffic as well as an increase in use by pedestrians, bicycles, and special vehicles in the project area.

Implementation of Alternative A would nearly eliminate motor vehicle traffic by residents of Cattle Point Estates and Cape San Juan. This would contribute to a minor cumulative reduction in the amount of local traffic traveling the Cattle Point Road from Friday Harbor; however, traffic from park visitors is expected to increase at a steady rate into the foreseeable future. Use of the Cattle Point Road by pedestrians, bicycles, and unconventional vehicles is also expected to increase. Accident figures for the Cattle Point Road since 2007 show that the accident rate in the project area is lower than the county average. Over the same period, the accident rate for all roads in the county has declined by about 12% (www.wsdot.wa.gov/mapsdata/tdo/accidentannual.htm). The minor reduction in motor vehicle traffic attributed to Cattle Point residents is not likely to alter overall trends in traffic volume locally or county-wide, but it may have a minimal contribution to cumulative improvement in overall road safety on the Cattle Point peninsula and county-wide.

Conclusion

Because of these factors, the no action alternative is expected to have a minor beneficial effect on road safety in the local area and a negligible beneficial effect to overall road safety county-wide.

4.3.18 Socioeconomics

A socioeconomic impact assessment examines how the proposed project would change the lives of current and future residents of a community. For the purpose of this analysis, the community is considered to be two tiered. The community primarily affected by project activities is the Cattle Point community, which includes the residents of the Cattle Point Estates and Cape San Juan residential areas. Friday Harbor and the remainder of San Juan Island would be affected to a lesser extent. Impacts to both communities are analyzed as appropriate to the subject.

Cumulative Impacts

The demographics of San Juan County have changed dramatically since World War II as the economy of the area has shifted from agriculture and fishing to tourism. Popularity of the county for retirement and second homes has led to gentrification, where a large portion of the population is comprised of seniors and the wealthy. The current populace of the Cattle Point community generally fits the current county profile. Residential subdivision of farm land on the east end of the Cattle Point peninsula began in the 1960’s. Prior to that, the population in the area was limited to a few homesteads. The existing subdivisions contain about 150 residential lots, some of which have not been developed. All of the private property on the east end of the Cattle Point peninsula is currently subdivided. The remainder of the land is publically-owned by the NPS and DNR, and would not be available for future development. County zoning of the private property as rural residential would limit future development to residential and home-based business. Construction of new residences has slowed recently due to the slowing of the overall economy.

The eventual loss of road access between the east end of the Cattle Point peninsula and the remainder of San Juan Island would result in isolation of the area from the economic center of the island in Friday Harbor. County zoning would limit the local development of businesses on Cattle Point to replace the loss of access to goods and services in Friday Harbor. This isolation combined with the recent declining economy would likely have a major contribution toward a slowing or decline in population in the local area, further gentrification, and a shift toward a younger population more suited to isolated living; however, it would have no cumulative effect on socioeconomics county-wide when added to other past, present, and future actions.

Population and Demographics

Given the high property values in the east Cattle Point residential communities, it is likely that most of the current residents and landowners are retired or have higher incomes. Loss of road access to employment and schools located on the remainder of San Juan Island would have a minor impact on these residents; however, access to medical facilities and business in Friday Harbor would have a major impact. Over the long term, loss of road access to the east end of the Cattle Point peninsula would likely slow or reverse current increases in population in the Cattle Point community. Demographics would shift to a population less dependent on road access tor medical facilities, employment, goods, and services, and more interested in remote living.

Conclusion

Though locally noticeable, these factors would have a minor impact on demographics and population county-wide.

Local Industry

Lack of motor vehicle access to the east end of the Cattle Point peninsula, which makes up a small portion of San Juan Island, would not influence overall tourist visitation to the island. Popular scenic attractions and NPS sites would remain accessible by motor vehicle. The residential population of Cattle Point would become more isolated from the goods and services available in Friday Harbor. As demographics shifted to a population accustomed to remote living, they would likely keep large stocks of necessities on site and reduce their reliance on the readily available goods found in Friday Harbor.

Conclusion

Overall, loss of road access to the east end of the Cattle Point peninsula would have a negligible adverse effect on local industry and the economy of Friday Harbor and the remainder of the county.

Employment and Income

Loss of road access to the east end of the Cattle Point peninsula would increase commuting time and expense for residents who are employed elsewhere on the island, and might result in their relocation outside of the Cattle Point community. Although this would have severe impacts on a small number of people locally, the impact on employment and income on the island as a whole would be negligible. Loss of motor vehicle access to Cattle Point would not likely affect the employment and income of retired residents or part-time residents. The cost of living in the Cattle Point community would increase somewhat due to increased costs of transport outside of the Cattle Point peninsula. This could adversely impact residents on fixed incomes; however, because of the relatively affluent lifestyle of the area, this impact is expected to be minor.

Conclusion

Because of these factors, this alternative is expected to have a minor adverse effect on employment and income county-wide.

4.3.19 Public Health and Safety

With loss of road access, emergency medical assistance to the east end of the Cattle Point peninsula would have to be provided by helicopter. Non-emergency medical services in Friday Harbor would be time consuming and inconvenient to obtain. In the event of non-medical emergencies, such as fire or natural disaster, there would be no quick access for emergency vehicles, and any assistance would need to come by air or water.

Cumulative Impacts

Health care has been provided on San Juan Island since the 1950's. The present medical center was built in Friday Harbor in 1976, providing non-surgical medical services and on-call physicians. Law enforcement, fire, emergency services, and medical transport are also available in Friday Harbor. Major medical services are located off-island with transport by ferry or air. Plans for construction of a hospital on San Juan Island are currently in discussion. The new hospital would likely be located in Friday Harbor. The existing public health and safety infrastructure currently provides an adequate level of services to the population of San Juan County and Cattle Point. Alternative A would not affect or change public health and safety services in San Juan County; however, it would directly affect access to these services by east Cattle Point residents when road access is lost. No other projects or activities are planned in the project area or the county that would affect public health and safety services or access to these services. When added to the already isolated nature of San Juan County and the Cattle Point peninsula, the eventual loss of road access to public health and safety services would add to the isolation of Cattle Point area residents and reduce their sense of security; however, when added to other past, present, and future action it would have no cumulative effect on these resources county-wide.

Conclusion

Because of these factors, the no action alternative would have a major adverse effect on public health and safety in the Cattle Point community; although health and safety services and access to these services would not be affected county-wide.

4.3.20 Utilities

Bluff erosion would eventually reach the utilities that are buried adjacent to the existing roadway, causing major damage to the electrical, telephone, and other telecommunication lines servicing the east end of the Cattle Point peninsula. This is a natural process, and would continue regardless of the alternative chosen. To avoid disruption of service, underground utilities would eventually need to be relocated to an area safe from bluff erosion. The new utility route would be located on park property and would require an easement from the NPS. The exact location would be determined by the utility companies and NPS. If the no action alternative is selected, utility relocation would be performed as a separate project at a later date as determined by the utility companies. NEPA clearance for the project would be performed by the NPS prior to approval of a new utility easement. There are no future projects planned in the area that would affect utility services. All of the private property on the east end of the Cattle Point peninsula is currently subdivided. Future residential expansion is limited by the small number of vacant lots in the existing subdivisions and the large amount of public land that is unavailable for future residential or commercial development. Implementation of alternative A would, in itself, have no direct, indirect, or cumulative effect on utility services.

4.3.21 Hazardous and Solid Waste and Materials

No hazardous wastes or materials have been identified or documented in the project area by the NPS or DNR, and past land uses in the Cattle Point project area are not likely to have produced hazardous materials. There are no future projects planned in the area that would produce hazardous materials. Based on current information, it is unlikely that continued bluff erosion would uncover or otherwise impact hazardous waste. The current residential and visitor uses in the Cattle Point peninsula create solid waste, which is managed by the county. There are no plans for construction of visitor facilities in the project area that would contribute to an increase in solid waste in the future. All of the private property on the east end of the Cattle Point peninsula is currently subdivided. Future residential expansion is limited by the small number of vacant lots in the existing subdivisions and the large amount of public land that is unavailable for future residential or commercial development. Therefore, implementation of alternative A would have no direct, indirect, or cumulative effect on hazardous and solid waste and materials.

4.3.22 Energy

Lack of road access would eliminate traffic between the Cattle Point residential areas and the remainder of the island and would therefore reduce highway vehicle use by Cattle Point residents. However, other types of motorized transportation would increase as boats and floatplanes would be used by residents for transport to the remainder of the island and the mainland. The number of boats and floatplanes would likely be fewer than the number of highway vehicles they replaced. The number of trips taken by residents between the residential area and the remainder of the island would likely decrease as the time and effort needed for the trip increased. This would likely result in an overall reduction of fossil fuel use by Cattle Point residents.

Cumulative Impacts

Growth in energy use is linked to population growth through increases in residential development, transportation, manufacturing, and services. Since San Juan County is one of the fastest growing counties in Washington, it can be assumed that energy use in the county has grown as population has increased. However, the main industries in San Juan County are limited to tourism, services, and retail sales, which account for relatively minor energy use. Being an island, energy used by vehicular travel within the county is limited; however, tourists from off the island expend energy to reach the area by car, ferry, boat, and air. The county estimates that traffic in the project area would increase by 7.46 percent annually, adding to increased energy use. There are no future NPS or DNR projects planned in the area that would affect energy use. The eventual loss of road access the east end of the Cattle Point peninsula would lead to loss of through-traffic and a reduction in energy consumed by the vehicles of east Cattle Point residents; however, due to projected increases in park visitation, this is not likely to alter overall trends in motor vehicle use locally or county-wide. Loss of road access would likely contribute to a trend toward a slowing or decline in population and residential development in east Cattle Point, which would lead to a reduction in the growth of residential energy consumption locally. However, the minor beneficial effects on local energy consumption associated with this alternative; however, when added to other past, present, and future actions it would have no measurable effect on this resource region-wide.

Conclusion

Over the long term, implementation of the no action alternative could have a negligible beneficial effect on energy consumption by east Cattle Point residents; however, it would have no effect county-wide.

4.3.23 Noise and Light

The eventual failure of the road at the bluff erosion site would eliminate through-traffic to the east end of the Cattle Point peninsula. This would greatly restrict visitor use and associated noise from highway vehicle use in the east end of Cattle Point. However, use of boats and floatplanes for access between the east end of the Cattle Point peninsula and the remainder of the island and mainland would increase, resulting in a minor increase in noise off-shore from these uses. Use of small vehicles such as all-terrain vehicles and scooters for travel within the east end of the Cattle Point peninsula may also increase. Motor vehicle use and associated noise in the area immediately west of the road failure site would also be reduced due to lack of through-traffic.

Lack of road access would likely slow the construction of new homes in the east end of the Cattle Point peninsula, which would reduce the trend toward addition of residential lighting and noise locally. Reduced visitor use would also reduce light pollution; however, night visitation to the area is extremely small as there are no overnight facilities.

Cumulative Impacts

Increases in noise and light on Cattle Point and San Juan Island are linked to growth in population and tourism through increases in residential development, transportation, and services. Impacts to the soundscape in the area generally come from over-flights by small and commercial aircraft, boat traffic, highway vehicle traffic, and residential uses. Commercial fishing and whale-watching boats, as well as private boats can often be heard off-shore. Currently there are no plans to expand the airport at Friday Harbor for increased commercial traffic; however, increased development on the island could result in additional use of private floatplanes flying over the area. There are no future projects planned in the east end of the Cattle Point peninsula that would affect noise levels. The eventual loss of road access would eliminate most noise from highway vehicles in the east end of the Cattle Point peninsula. However, it would also lead to increased noise from use of private and commercial boats and sea planes for access to the remainder of the island and the mainland. Loss of road access would likely contribute to a trend toward a slowing or decline in population and residential development in east Cattle Point, which could lead to a reduction in noise locally. Therefore, the local noise impacts associated with this alternative would contribute minimally to the impacts of other current and future projects, and would not contribute to cumulative impacts county-wide.

Impacts to the naturally dark night sky come from the small amount of light generated by Cattle Point residences and vehicles as well as light generated from the town of Friday Harbor to the north and the city of Victoria, British Columbia, visible in the sky to the west. Elimination of night use by highway vehicles and the potential reduction in population growth and construction of new homes on the east end of the Cattle Point peninsula could contribute to a reduction of the appearance of light sources in the local area. However, because of the small population potential of the area, when added to other past, present, and future actions the cumulative change to overall noise and night sky not be measurable.

Conclusion

Overall, implementation of the no action alternative could have a negligible adverse effect on noise locally and regionally over the long term. Conversely, alternative A would have a negligible beneficial effect on the lightscape in the local area; however, the overall effects on the night sky would not be detectible. There would be no impairment to these resources as a result of this alternative.

4.3.24 Coastal Zone

This alternative would entail no federal action; therefore, compliance with coastal zone requirements is not applicable.

4.3.25 Unavoidable Adverse Impacts

Unavoidable adverse impacts are those in which there are no reasonably practicable mitigation measures to eliminate the impact.

The unavoidable adverse impacts associated with the no action alternative would be the permanent loss of road access for the residents of the Cattle Point community and the change in lifestyle, public health and safety, and demographics that would result.

Natural bluff erosion would continue to impact the vegetation, soil, and topography in the adjacent area as the bluff recedes upslope until it meets less erosive rock. This is a natural process and would continue regardless of the alternative.

4.3.26 Relationship of Short-Term Uses and Long-Term Productivity

This alterative would not involve uses or impacts to the productivity of resources in the project area.

4.3.27 Irreversible and Irretrievable Commitment of Resources

Irreversible commitments are those that cannot be regained, such as the extinction of a species or the removal and use of fossil fuels. Irretrievable commitments are those that are lost for a period of time such as the loss of production, harvest, or use of renewable resources.

Under this alternative, limited road construction would be performed to erect barriers at the bluff erosion site and to end the Cattle Point road at safe locations on both the east and west sides of the eventual road failure site. Construction of these facilities would involve a limited commitment of natural, physical, biological, human, and fiscal resources. Fossil fuels, labor, and construction materials, such as aggregate, would be irreversibly expended in road construction. Labor and fossil fuels would be consumed during operation of construction equipment for grading, material movement, and construction activities. In addition, labor and natural resources would be used in the fabrication and preparation of construction materials. Construction would also require an expenditure of funds that could not be used by any other project. Following the eventual failure of the existing road, the residents of the Cattle Point community would need to travel from their residences to obtain goods and services and would continue to expend fossil fuels for transportation by boat and floatplane.

4.4 IMPACTS COMMON TO ALL ACTION ALTERNATIVES (B, C, D)

All of the action alternatives would require new construction on undeveloped sites and restoration of the abandoned road section. The following discussion of impacts is common to all action alternatives regardless of which one is chosen and whether or not a tunnel would be constructed. The resources detailed below will not be repeated under each alternative discussion.

4.4.1 Air Quality

Construction activities common to all of the action alternatives include site preparation, earthmoving, general construction, and road surfacing. Site preparation includes activities such as land clearing and grubbing, including disposal of cleared material. Earthmoving includes cut and fill operations, trenching, soil compaction, grading, and transport of excess soil and rock material offsite. General construction and road surfacing includes the preparation of road base and asphalt roadway surfacing.

Alternatives C and D also involve tunnel construction. Construction of the long tunnel in alternative C would likely involve excavation with conventional earth moving equipment and transport of excess soil and rock material offsite. Construction of the short tunnel in alternative D would likely be accomplished using a cut and cover method which involves excavating a trench, constructing the tunnel structure, and subsequently covering the structure with compacted earthen materials and soils. Alternative D would also involve transport of excess soil and rock material offsite. In the tunnel alternatives, blasting could be necessary if rock or large boulders are encountered. Though based on limited geologic research, this is unlikely to occur.

Air pollutants generated from road construction activities include emissions from heavy equipment and worker commute trips, dust from soil disturbance, aggregate placement, blasting, loading and transport of excess material and aggregate, traffic on unpaved surfaces, and evaporative emissions from asphalt paving. The finished tunnels in alternatives C and D would also enclose pollutants from motor vehicles emissions. Construction activities associated with alternative B are expected to last for 1 to 2 years. Construction for alternatives C and D are expected to last 1.5 to 3 years.

Hot asphalt or chip seal surfacing would likely be used for all of the action alternatives. Asphalt would be provided from a local commercial source. Asphalt plants are required to adhere to local and state air quality requirements. According to research conducted by Eastern Research Group, Inc (2001), on-site hot asphalt application produces minimal evaporative emissions (Volatile Organic Compounds [VOCs] and Hazardous Air Pollutants [HAPs]) and would therefore have a negligible effect on air quality.

Dust nuisance would be the major air pollutant during the construction phase. Impacts from dust would be intermittent over the construction period. Most dust would occur at the road construction and road restoration sites; however, some dust would be generated along haul routes between the construction site and the waste sites and aggregate source, likely located to the west of the project area. Since the construction site is located in a rural undeveloped area, there are a small number of receptors in the project area. Approximately seven residences are located within 500 to 1,000 feet of the east end of the construction area. Residents and visitors traveling through the construction site would also be subjected to airborne dust for a short period of time. Depending on the location of offsite waste and aggregate sites, there would be a number of residences along potential haul routes; however, due to the rural character of the island, numbers are likely to be low.

Over the long term, none of the action alternatives would change the capacity, function, or service of the road. The alternatives would preserve the existing access to the Cattle Point area and would not impact the number of visitors to the area or growth in residential population, nor would it result in a change (either increase or reduction) in traffic in the area beyond that expected with normal growth.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.2.

Implementation of the action alternatives would not change the capacity, function, or service of the road that would lead to an increase in traffic volume. However, traffic volume on the Cattle Point Road is expected to increase in the future at a rate equal to normal increases in visitation. There is the potential for construction of a small number of new residences on vacant lots in the Cattle Point Estates and Cape San Juan residential areas. Population growth on the remainder of San Juan Island and in western Washington is also expected to continue into the future. As population grows, additional cars, marine vessels, and infrastructure would lead to increased air pollutant emissions, and could result in a minor adverse impact on air quality in the Cattle Point area. Implementation of the action alternatives would not alter any trends in vehicle use or population growth and, therefore, would not contribute to cumulative impacts.

Conclusion

With mitigation measures in place, short-term impacts to air quality from construction activities would be negligible and limited in area. Implementation of any of the action alternatives would have no long-term effect on air quality in the project area or San Juan Island. The Class II status of the project area would not be affected. There would be no impairment to this resource as a result of these alternatives.

Mitigation Measures: The following air quality mitigation measures would be implemented as part of alternatives B, C, and D.

> **AQ-1: Burning restrictions.** Burning would not be allowed at the construction site or in the park or NCRA.
>
> **AQ-2: Construction equipment controls.** Construction equipment would be in good operating condition and be used efficiently to minimize emissions
>
> **AQ-3: Dust Control Measures.** A dust palliative or water would be applied to traffic areas and unpaved haul routes to minimize airborne dust from construction operations.
>
> **AQ-4: Tunnel Ventilation.** In accordance with design standards, the tunnels proposed in alternatives C and D would include appropriate ventilation to prevent the build-up of noxious fumes inside of the tunnel.

4.4.2 Hydrology

During construction, grading activities would affect localized drainage patterns within the drainage basin to the south of the hydrologic divide on Mt. Finlayson. Because there are no waterbodies in the project area, storm water runoff would filter into adjacent soils. Construction activities would include implementation of erosion and sediment control measures (Best Management Practices [BMPs]), which would be actively used at the construction site to reduce the erosive effects of concentrated storm water runoff on adjacent properties. These measures would be outlined in a Storm Water Pollution Prevention Plan (SWPPP). Due to the distance between the construction site and the Strait of Juan de Fuca, and the low average rainfall during the construction season, with mitigation measures in place, it is highly unlikely that construction runoff would reach marine waters.

Over the long term, all of the action alternatives would change the topography of the project area, which would affect surface and subsurface drainages. These changes vary slightly by alternative and would change the runoff pattern of localized areas. However, these impacts would not change the overall hydrology of the area and are not likely to have a broad-scale impact to watershed processes in the project area.

Each action alternative would involve small changes in the amount of impermeable surface over the current condition due to construction of new road alignment pavement and removal of existing road alignment pavement in the project area. Alternative B would increase the amount of impermeable surface by approximately 1 acre, alternative C would reduce the amount of impermeable surface by about 1 acre, and alternative D would involve no increase or reduction in the amount of impermeable surface. Restoration of the abandoned road alignment in all alternatives would involve removal of the existing impermeable road pavement and road base, contouring the road prism to blend with adjacent topography, and revegetating the area with native vegetation, which would restore natural drainage patterns in that area. However, actual impacts to hydrology with any of these changes would be negligible because there is no surface water in the project area, and runoff water from impermeable surfaces would infiltrate into adjacent soils.

The action alternatives all are in similar proximity to the well system for Cattle Point residences. The topography and distance make it unlikely that surface waters from the construction project would reach the aquifer for these wells (figure 3.5).

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.3.

The action alternatives would add new impermeable road pavement over the new road alignment; however, restoration of the abandoned road segment would removed existing impermeable road pavement and restore natural conditions under all alternatives. Alternative B would increase the impermeable surface in the project area by 1 acre. Alternative C would reduce the amount of impermeable surface by 1 acre. Alternative D would not change the amount of impermeable surface in the project area. The road density in the project area is currently low and is not expected to increase substantially in the future due to federal and state land management restrictions. Actual cumulative changes in impermeable surface area and resultant effects on hydrology in the project area would be negligible.

Conclusion

Overall, the action alternatives would have a negligible adverse short-term and long-term effect on hydrology in the project area. There would be no impairment to this resource as a result of these alternatives.

<u>Mitigation Measures:</u>

> **H-1: SWPPP.** Prior to construction, the FHWA would develop a Storm Water Pollution Prevention Plan (SWPPP) for implementation during construction. The

SWPPP would include measures (BMPs) for temporary erosion and sediment control devices during construction for control of concentrated storm water runoff.

4.4.3 Water Quality

There are no streams, lakes, ponds, wetlands, or other waterbodies within the project area and no surface hydrologic connection between the project area and any waterbodies or wetlands. The closest water body is the marine shoreline at the base of the eroding bluff. At its closest, the shoreline is approximately 200 feet down slope from the project area. Construction of any of the action alternatives would involve soil disturbance, which could potentially result in erosion and runoff of sediment into adjacent areas. Construction activities also make use of petroleum products and other pollutants that could be released into surrounding areas.

Construction activities that disturb one acre or more are regulated under the National Pollutant Discharge Elimination System (NPDES) storm water program. Regulated construction sites are required to obtain an NPDES permit and implement a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP outlines measures, called Best Management Practices (BMPs), which would be actively used at the construction site to prevent soil erosion and limit the amount of sediment and other pollutants leaving the site due to storm water runoff. As a permanent erosion and sediment control measure, all disturbed sites would be revegetated with native plant species.

Due to the distance between the construction site and the shoreline, and the low average rainfall during the construction season, with mitigation measures in place, it is highly unlikely that construction runoff would reach marine waters.

Following construction, road runoff may be contaminated by heavy metals, inorganic salts, hydrocarbons, or suspended solids that accumulate on the road surface from vehicle operation and road maintenance activities such as salting and sanding. During normal operation, vehicles using the road drop oil, grease, rust, hydrocarbons, rubber particles, and other solid materials on the road surface. These materials may then be washed off the roadway by rain or snow, potentially affecting surface or ground water quality in adjacent areas. Since there are no surface waters in the project area, pollutants would be washed into roadside ditches and dispersed into the adjacent vegetation. Since all action alternatives would be replacing an existing road alignment along the coastal bluff with an alignment that is 100 to 140 feet further upslope, the potential for water pollution from contaminated road runoff into the marine environment would be reduced, because down-slope vegetation would filter most road pollutants before they reached ocean waters. Road design features such as vegetated ditches would be used to the extent possible to reduce runoff pollution potential.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.4.

Implementation of the action alternatives would not alter current trends that would affect water quality. While this alternative may have negligible indirect effect, when added to other past, present, and future actions overall water quality would not change in a measurable way locally and county-wide.

Conclusion

Overall, the action alternatives would have negligible adverse short-term and long-term effects on water quality in the project area. There would be no impairment to this resource as a result of these alternatives.

Mitigation Measures:

WQ-1: SWPPP. Same as H-1. Prior to construction, the FHWA would develop a Storm Water Pollution Prevention Plan (SWPPP) for implementation during construction. The SWPPP would include measures, Best Management Practices (BMPs), for temporary erosion and sediment control devices during construction for control of concentrated storm water runoff.

In addition, the SWPPP would include BMPs for housekeeping measures to address the safe storage, handling, and spill prevention of hazardous construction materials.

WQ-2: Revegetation. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment. See appendix A.

WQ-3: Road Design for Storm Water Runoff Management. To the extent possible, road design would incorporate storm water runoff management features such as vegetated ditches.

4.4.4 Other Special Status Species

Table 4.4 lists the special status species that may be present or have habitat in the project vicinity.

The action alternatives would involve construction in the grassland habitat on the south slopes of Mt. Finlayson. The alignment of alternatives B, C, and D are all located close to the forested fringe at the ridge of Mt. Finlayson. Construction of these alternatives could potentially impact a small amount of forested habitat, but would not likely involve removal of mature trees. The small trees that have grown up in the old quarry site near the Mt. Finlayson ridge would be impacted by all of the action alternatives. None of the alternatives involve impacts to waterbodies or wetland habitat.

The following special status species are most commonly found in forested and wetland habitats.

- Long-eared myotis
- Northern goshawk
- Olive-sided flycatcher
- Pacific Townsend’s big-eared bat
- Western toad

The following special status species are found in grassland habitat or may forage in the project area.

- Oregon vesper sparrow
- Osprey
- Peregrine falcon
- Island marble butterfly
- Moss’ elfin

- Valley silverspot
- Slender crazyweed

Temporary noise impacts would occur during construction within a 0.5-mile radius of the project area. These would consist of general construction noise and would not include blasting, pile driving, or other loud noise activities. As the existing noise environment is fairly quiet, construction activities would noticeably change the existing noise level in terms of loudness, duration, and types of noise, which could impact wildlife. Studies have shown that wildlife is commonly disturbed by noise, particularly noise that is new to an area (Widener & Associates 2005). Noise from the project may cause wildlife to change behavior and move away from the noise source or influence individuals to forage or nest in other areas. Construction of alternative B is expected to last 1 to 2 years, and construction of alternatives C and D are expected to last 1.5 to 3 years. After construction is completed, the increased road grade, particularly at the eastern end of the project corridor, is expected to increase the noise resulting from vehicles accelerating as they go uphill and breaking as they go downhill. Realignment of the road further upslope from its current location would shift traffic noise closer to the forest habitat. Long term traffic noise associated with alternatives C and D would be slightly less than alternative B, since a portion of the roadway would be enclosed in a tunnel.

Road realignment would pass through a section of previously undisturbed grassland prairie. Impacts to grassland habitat could directly impact rare plants and butterflies by direct loss of habitat for foraging and mortality from road traffic.

The slender crazyweed plant could be directly impacted by ground disturbing activities. Although habitat for slender crazyweed is potentially present in the project area, no individual plants were found during plant surveys of the project area. In addition, while habitat for the Moss' elfin and valley silverspot butterflies is potentially present in the project area, neither host plants nor individuals of these species were found during surveys of the project area (NPS 2005 in Widener 2006).

The island marble butterfly inhabits certain open grasslands on San Juan and Lopez islands. The life cycle of the butterfly is closely associated with its host plants. The island marble butterfly has been observed feeding on approximately 10 different plant species within the park (Pyle 2004 in Widener 2006). The 2005 plant survey found that seven of these plants were present, but uncommon, in the project area (NPS 2005 in Widener 2006).

In 2006, the NPS and USFWS developed *A Conservation Agreement and Strategy for the Island Marble Butterfly* to guide management of the island marble butterfly in the park. Measures contained in the agreement would be incorporated into construction plans for all action alternatives. These measures include preconstruction survey and removal or relocation of host plants and larva. Following construction, all disturbed areas would be revegetated using native species. Restoration of the abandoned road segment would include removal of the road pavement, recontouring the road cut to blend with the adjacent topography, and revegetating with native prairie species. Prior to construction, a restoration and revegetation plan would be developed that would outline methods and standards for revegetation of areas disturbed during road construction as well as restoration of the abandoned road segment. The revegetation plan would include planting of island marble butterfly host plants as well as other special status plants and host plants for other special status butterflies. Over the long term, project mitigation could potentially provide the means for improvement of island marble butterfly and other special status species habitat and populations in the project area.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.10.

Implementation of the action alternatives would disturb vegetation along the new alignment routes that would add to the cumulative impacts to special status plant species and habitat for special status plant and wildlife species. Alternative B would temporarily impact about 17 acres, alterative C would temporarily impact about 10 acres, and alternative D would temporarily impact about 20 acres. The roadside cut and fill slopes, tunnel covering, abandoned roadway segment, and equipment staging areas would all be revegetated. New road pavement would permanently impact vegetation, which could affect special status species or their habitat. Alternative B would have a net increase in vegetation impacts of 1 acre, alternative C would have a net reduction in vegetation impacts of 1 acre, and alternative D would have no increase or reduction in vegetation impacts over the present. Both temporary and permanent vegetation disturbance could displace special status species and would have a minor contribution to adverse cumulative impacts to this resource.

Implementation of the action alternatives would not change the capacity, function, or service of the road that would lead to an increase in traffic volume. However, traffic volume on the Cattle Point Road is expected to increase in the future at a rate equal to normal increases in visitation. This could lead to increased disturbances to special status species and their habitat from visitor and residential uses. There is the potential for construction of a small number of new residences on vacant lots in the Cattle Point Estates and Cape San Juan residential areas, which would remove vegetation that may contain special status species or their habitat. When added to other past, present, and future actions, implementation of the action alternatives could result in a minimal incremental impact on special status species locally and region-wide.

Conclusion

Overall, the action alternatives would have a minor adverse short-term effect on special status species and their habitat. With mitigation measures in place, long-term effects of the action alternatives would be negligible. There would be no impairment to this resource as a result of these alternatives.

<u>Mitigation Measures:</u>

> **OSSS-1: Revegetation.** Same as WQ-2. Following active construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment. See appendix A.
>
> In addition, the revegetation plan would include planting of island marble butterfly host plants as well as prairie habitat for other special status wildlife and plants.
>
> **OSSS-2: Conservation Measures for Island Marble Butterfly.** Project activities would comply with the 2006 NPS/USFWS conservation agreement. Prior to construction, affected areas would be surveyed for host plants and larva. Steps would be taken to avoid impacts to these resources prior to and during construction, including removal or relocation of larval host plants and planting of host plants within the restored abandoned road segment.

4.4.5 Cultural, Historic, and Archaeological Resources

There are two areas of potential effects (APEs) to consider for the proposed alternatives. The first APE includes the project footprint where any ground disturbing construction activities would occur. This APE coincides with the project area shown in figure 3.1. The second APE encompasses a wider area and considers any view-shed impacts that the action alternatives might have on historic properties.

The 2004 cultural resources survey found two isolated Native American cultural resources within the project footprint APE. The cultural resources assessment concluded that neither of the resources met the significance or integrity criteria to be recommended as eligible for listing on the National Register of Historic Places (Northwest Archaeological Associates, Inc. 2004). To avoid inadvertent impacts to archaeological resources during construction, the project would be monitored and if archaeological material is found, construction activities would be suspended and the materials would be evaluated by an archaeologist prior to continuation of construction.

Most of the project area is located within the boundaries of the San Juan Island National Historical Park (park), which is listed on the National Register of Historic Places as a National Historic Landmark. The cultural landscape is a primary and broad contributing element to the eligibility of the National Historic Landmark (Schurke 2009). The American Camp cultural landscape boundary is outside of the project footprint APE; therefore, none of the contributing cultural landscape characteristic features would be impacted by ground disturbing activities associated with the action alternatives.

In addition, none of the contributing cultural landscape views and vistas are located within the project view-shed APE. Portions of the alignments would be remotely visible from within the geographic boundaries of the NRHP eligible American Camp cultural landscape. Figure 4.2 shows the areas east of the American Camp cantonment where the alternative road realignments would be visible. The alternative B alignment could be seen in the distance from any point within the yellow area, the alternative C alignment could be seen in the distance from any point within the magenta area, and the alternative D alignment could be seen in the distance from any point within the blue area.

To alleviate impacts to the cultural landscape, disturbed sites would be revegetated with native plants. To the extent possible, the project design would use shallow cut and fill slopes and would not use exposed gabions or geometric forms of embankment materials that would be incompatible with the character of the landscape.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.11.

Implementation of the action alternatives would realign a portion of the Cattle Point Road into a new area on the benches below Mt. Finlayson, a maximum of about 300 to 450 feet to the north of its current location. There are no cultural or archaeological resources located within the project footprint APE; therefore, the project would not contribute to cumulative impacts to these resources. The project footprint APE is located outside of the American Camp cultural landscape boundary and none of the contributing cultural landscape views are located within the project view-shed APE; therefore, the alternatives would not contribute to cumulative impacts to the National Historic Landmark cultural landscape characteristic features. However, portions of the new alignments would be remotely visible from within the geographic

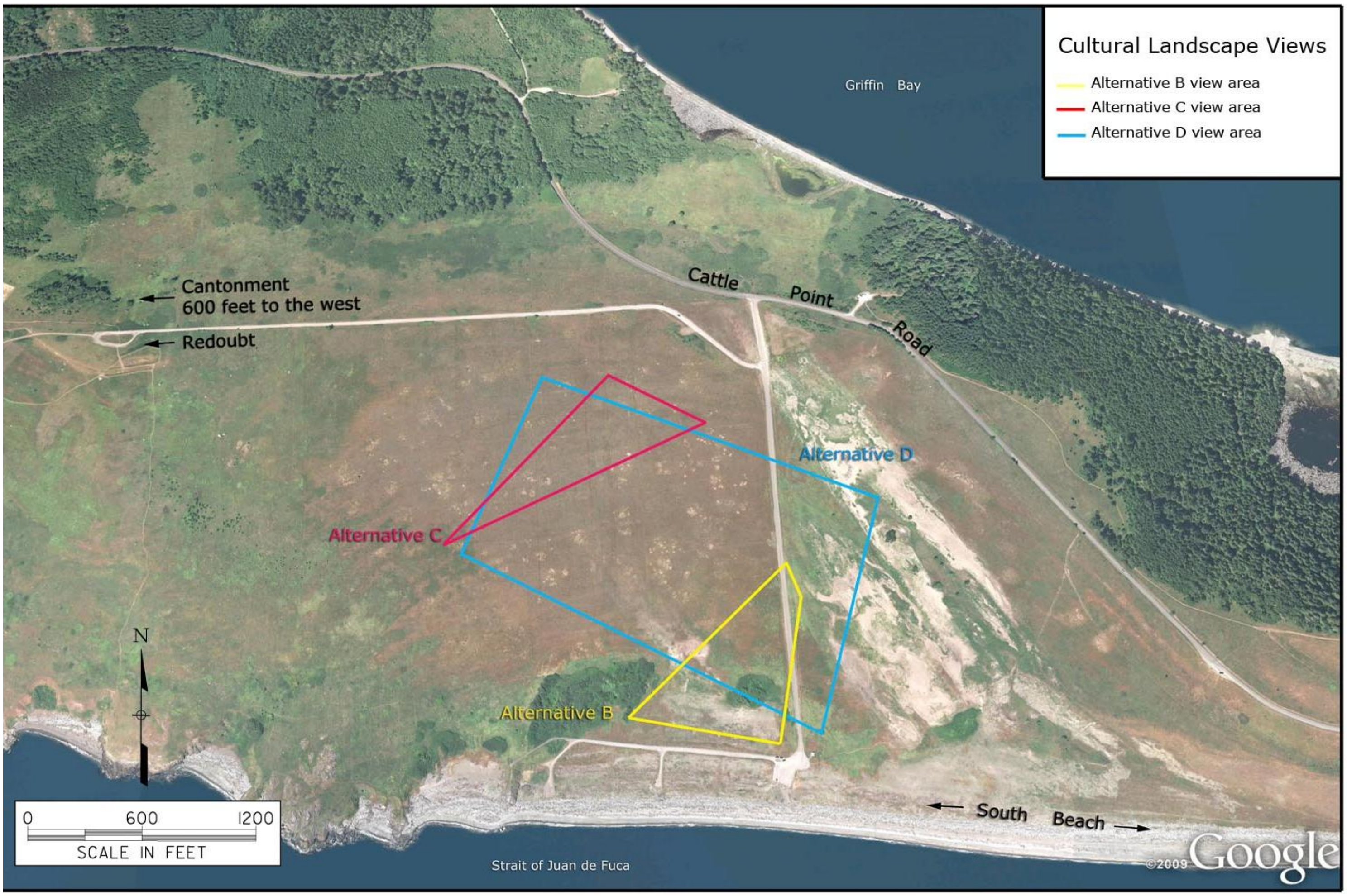


Figure 4.2 – Areas of American Camp Having Views of Alternatives

boundaries of the designated cultural landscape to the east of the American Camp cantonment and portions of South Beach. The existing road alignment is also remotely visible from portions of these areas. The abandoned section of the existing alignment would be restored to natural conditions. There would be no appreciable increase in the amount of road visible from the designated cultural landscape. When added to other past, present, and future actions overall views from the cultural landscape would not change in a measurable way. .

Conclusion

For the purposes of section 106, there are no properties that are listed or eligible for the NRHP within the project footprint APE other than the American and English Camps San Juan Island National Historic Landmark. The project alternatives would have minor viewshed impacts and no ground disturbing impacts to the NRHP eligible cultural landscape within the American and English Camps San Juan Island National Historic Landmark. In May 2009, the FHWA consulted with the SHPO with a recommendation that the proposed project would have *no adverse effect* on historic properties for purposes of section 106. The SHPO concurred with this recommendation in their June 23, 2009, letter.

Overall, the action alternatives would have a negligible adverse short and long-term effect on cultural, historic, and archaeological resources. There would be no impairment to these resources as a result of these alternatives.

Mitigation Measures:

> **CR-1: Previously Undetected Cultural Sites.** The project footprint APE would be monitored during construction. If previously undetected cultural or archaeological resources are encountered during construction, work would stop in that location until the site could be evaluated by a qualified archaeologist.
>
> **CR-2: Revegetation**. Same as WQ-2 and OSSS-1. Following active construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment. The revegetation plan would include planting of island marble butterfly host plants as well as prairie habitat for other special status wildlife and plants. See appendix A.
>
> **CR-3: Road Design**. To the extent possible, the project design would use shallow cut and fill slopes and would not use exposed gabions or geometric forms of embankment materials that are incompatible with the character of the landscape

4.4.6 Land Use

Construction would remove land in the project area from its current intended use over a period of time during the construction period of the action alternatives. Temporary land disturbance from construction activities would be approximately 13 acres for alternative B, 9 acres for alternative C, and 17 acres for alternative D. Construction duration would be 1 to 2 years for alternative B and 1.5 to 3 years for alternatives C and D. Following construction of the new road facilities, disturbed sites would be stabilized with vegetation and returned to their original uses.

All action alternatives would require acquisition of new construction easements or rights-of-way (ROW) through the park and NRCA depending on the alternative route chosen. The rerouted section of road would involve a different use of land, both at the new road location and at the existing road location. Following construction of any action alternative, the existing easement/ROW along the abandoned section would be transferred back to the land management agencies. The abandoned roadway segment would be restored to natural conditions by removing the pavement and road base, contouring the road cut to blend with natural surroundings, and planting with native vegetation. The net impact of new easement/ROW would be offset by restoration of a nearly equivalent area of abandoned roadway. Each action alternative involves approximately 3 acres of new easement/ROW, approximately 90 percent on the park and 10 percent on the NRCA. In addition, reclamation of the abandoned roadway segment would restore approximately 3 acres of native prairie within the park and NRCA; however, some of the restored prairie would eventually be lost due to bluff erosion.

None of the action alternatives would change the capacity, function, or service of the road. The alternatives would preserve vehicular access to the east end of the Cattle Point peninsula and would not result in any permanent changes to land use in the project vicinity. The action alternatives would continue vehicular access for management of park, DNR, and other state and federal properties as well as county road maintenance activities. All action alternatives would maintain vehicular access to the east end of the Cattle Point peninsula during construction.

Conclusion

Construction activities would have a temporary short-term effect on land use in the immediate project area. Over the long term, the action alternatives would have no direct, indirect, or cumulative effect on land use in the Cattle Point peninsula. All alternatives are located on federal and state property. None of the action alternatives would result in a change to the existing federal and state land uses or to the rural residential property in the project vicinity.

Mitigation Measures:

> **LU-1: Restore Abandoned Road Segment.** The abandoned road segment would be restored by removing the road pavement, road base, and buried utility lines and conduits, contouring the road cut with native soil to blend with natural surroundings, and planting with native vegetation. A detailed restoration plan would be developed prior to the beginning of construction
>
> **LU-2: Transfer Abandoned ROW to Land Management Agencies.** Following construction, the existing easement/ROW for the abandoned section would be transferred back to the appropriate land management agency.

4.4.7 Local Plans

Implementation of any of the action alternatives would meet all policies, guidelines, and desired conditions in the local plans applicable to management of the project area. The project alternatives were developed through an interdisciplinary process based on the expertise of planning team members representing the Federal Highway Administration, National Park Service, Washington State Department of Natural Resources; and San Juan County as well as on scoping with tribes; agencies; and interested publics as required by NEPA and local planning. Alternative development has taken into consideration the compatibility of the proposed facility with the surrounding natural and historic resources and with the access needs of residents.

4.4.8 Visitor Uses

Construction activities common to all of the action alternatives include site preparation, earthmoving, general construction, and road surfacing. Alternatives C and D also involve tunnel construction. Construction of the long tunnel in alternative C would likely involve excavation with conventional earth moving equipment and transport of excess soil and rock material offsite. Construction of the short tunnel in alternative D would likely be accomplished using a cut and cover method which involves excavating a trench, constructing the tunnel structure, and subsequently covering the structure with compacted earthen materials and soils. Alternative D would also involve transport of excess soil and rock material offsite. In the tunnel alternatives, blasting could be necessary if rock or large boulders are encountered. Though based on limited geologic research, this is unlikely to occur. Construction activities associated with alternative B are expected to last 1 to 2 years. Construction for alternatives C and D are expected to last 1.5 to 3 years.

Construction activities would affect visitor uses by disrupting traffic, blocking access to scenic vistas, and creating nuisance from construction noise, visual impacts, and dust. Construction activities would not affect visitor uses in most of American Camp due to the location of the construction site to the east of most of the historic features of the area. However, there would be an increase in construction traffic leading to the project site due to offsite hauling and transportation of construction personnel and materials. Visitor access to the DNR and BLM properties located in the east end of the Cattle Point peninsula would be affected by construction traffic and activities.

During construction, the existing road would remain open to maintain access to the east end of the Cattle Point peninsula for visitors and residents. Some traffic delays would be expected due to construction traffic and operations. Though most operations for construction of the road realignment and tunnel would take place outside of the existing roadway, some traffic delays would still take place on the Cattle Point Road adjacent to the construction area. Delays would likely be limited to 30 minutes or less. Construction of the short connectors between the existing roadway and the new alignment may require full road closure for up to 4 hours intermittently during a period of approximately 1 to 2 weeks. Construction activities would have the most impact on hikers and bicyclists using the project area. Due to safety considerations, these users could face some restrictions through the construction site during part or all of the construction period.

Construction machinery working on the benches below Mt. Finlayson would be visible to visitors in the eastern portion of American Camp and the east half of the Mt. Finlayson trail. Dust and noise from construction operations would also impact motorists, pedestrians, bicyclists, and special vehicle users.

Over the long term, none of the action alternatives would change the capacity, function, or service of the road. The alternatives would preserve the existing access to the Cattle Point area and would not impact the number of visitors to the area nor would it result in a change (either increase or decrease) in traffic in the area beyond that expected with normal growth. The tunnel alternatives (C and D) would enclose a portion of the road, affecting the visitor's view of the scenic vistas along this portion of the roadway. However, scenic pullouts would be constructed, as space allows, to provide additional opportunities for visitors to view the scenic resources of the area.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.14.

None of the action alternatives would change the capacity, function, or service of the road that would lead to a change in visitor use. The alternatives would preserve the existing access to the east end of the Cattle Point peninsula. Implementation of the action alternatives would not alter current trends in visitor use and would not contribute to cumulative impacts.

Conclusion

Overall, the construction activities involved with the action alternatives would have a moderate adverse short-term effect on visitor uses in the Cattle Point peninsula. Over the long term, the proposed road realignments would have no effect on visitor uses.

Mitigation Measures:

> **VU-1: Traffic Management.** A traffic control plan would be developed specifying road closure times and a public information program. Delays would be limited to 30 minutes or less. Construction of the short connectors between the existing roadway and the new alignment may require full road closure for up to 4 hours intermittently during a period of approximately 1 to 2 weeks.

4.4.9 Road Safety and Public Health and Safety

During construction, construction traffic on local roads and operation of construction equipment at the construction site would affect road safety in the Cattle Point peninsula. In addition, construction-related traffic disruptions could delay access by emergency vehicles to the east end of the Cattle Point peninsula, affecting public health and safety.

The construction contract would include requirements for temporary traffic control and safety measures at the construction site to prevent safety incidents. Safety measures would include compliance with the *Manual on Uniform Traffic Control Devices* standards and Occupational Safety and Health Administration regulations. During construction, at least one lane of road would be available for emergency access at all times.

Design of the new road alignment and tunnels (in alternatives C and D) would use American Association of State Highway and Transportation Officials (AASHTO) design and safety standards. Widened and improved road shoulders would increase safety for special vehicles, bicycles, and pedestrians using the realigned roadway; however, the remainder of the existing roadway on both ends of the new alignment would continue to have one-foot gravel shoulders.

The alternative B road alignment would have steeper grades and tighter curves compared to the existing road, which may result in a minor increase in accident risk. The tunnel alternatives (C and D) would add a new element to the roadway in the project area. While this would increase traffic confinement, European studies have found that the probability of an accident occurring is lower in tunnels than on open stretches of roads; however, injuries from any accidents that do occur in tunnels tend to be more severe (Nussbaumer 2007). Due to the low traffic volume and low design speed, accident rates are not expected to increase due to this facility.

Over the long term, none of the action alternatives would change the capacity, function, or service of the road. The alternatives would preserve the existing access to the Cattle Point area and would not result in a change (either increase or reduction) in traffic in the area beyond that expected with normal growth. Given current and projected future road use, it is expected that the safety of the road and tunnels in the action alternatives would be similar to the existing condition.

Conclusion

With mitigation measures in place, construction activities would have negligible adverse short-term effects on road safety, and public health and safety in the Cattle Point peninsula. Implementation of the action alternatives would not alter current trends in road safety and public health and safety. Over the long term, the proposed road realignments would have no direct, indirect, or cumulative effect on these resources.

<u>Mitigation Measures:</u>

> **RS/PS-1: Traffic Management.** Same as VU-1. A traffic control plan would be developed specifying road closure times and a public information program. Delays would be limited to 30 minutes or less. Construction of the short connectors between the existing roadway and the new alignment may require full road closure for up to 4 hours intermittently during a period of approximately 1 to 2 weeks.
>
> In addition, during construction, at least one lane of road would be available for emergency access at all times. The construction contract would include requirements for temporary traffic control and safety measures at the construction site to prevent safety incidents. Safety measures would include compliance with the *Manual on*

Uniform Traffic Control Devices standards and Occupational Safety and Health Administration regulations.

4.4.10 Socioeconomics

The road construction project would provide employment opportunities for island residents as well as construction-related spending with island businesses for supplies, equipment, services, and materials. Collectively, these businesses would make a contribution to the local economy on San Juan Island.

Over the long term, none of the action alternatives would change the capacity, function, or service of the road and all would preserve the existing access to the east end of Cattle Point.

Conclusion

As a result, construction of the action alternatives could have a minor beneficial short-term effect on the local economy and income. Implementation of the action alternatives would not alter current trends in socioeconomic factors. Over the long term, the action alternatives would have no direct, indirect, or cumulative effect on population growth or decline, demographics, local industry, employment, and income in the Cattle Point peninsula and San Juan County.

4.4.11 Utilities

All action alternatives involve relocation of utilities to the new roadway alignment in coordination with road construction activities. This would involve underground installation of utilities adjacent to the new road alignment or in a conduit for the tunnel alternatives. All action alternatives would require new easements for the utility vendors. Utility reroutes would take place within the footprint of new road alignment construction activities; therefore, the environmental impacts of utility installation would be the same as the environmental impacts for roadway construction. Following installation of utilities along the new road alignment, the existing utility lines would be removed from the abandoned road segment. Utility removal and relocation would be coordinated with road construction activities.

Construction activities have the potential to disrupt utility service intermittently during ground disturbing activities. Utility locations would be flagged, and care would be required during excavation in the proximity of utilities.

Conclusion

With mitigation measures in place, the action alternatives would have no direct, indirect, or cumulative effects on utility service in the project area.

<u>Mitigation Measures:</u>

> **U-1: Utility Coordination.** The road contractor would coordinate with the utility companies to relocate underground utilities adjacent to the new road alignment and to remove existing utility lines buried along the abandoned road segment prior to construction. If road construction takes place in proximity to utilities, the location would be marked, and care would be taken to avoid disturbance to utilities during construction.

4.4.12 Hazardous and Solid Waste and Materials

No hazardous wastes or materials have been identified or documented in the project area by the NPS or DNR, and past land uses in the Cattle Point project area are not likely to have produced hazardous materials. Based on current information, it is unlikely that construction of any of the action alternatives would encounter or otherwise impact hazardous waste. If hazardous materials were encountered during construction, removal would be handled in accordance with Washington State Department of Ecology (WDOE) and EPA guidelines.

The construction proposed with the action alternatives would involve use of petroleum products and other potentially hazardous materials during construction activities. If any of the action alternatives were implemented, the FHWA would require that the contractor prepare and follow a Spill Prevention, Control, and Countermeasure Plan (SPCC) in accordance with EPA guidelines. Excess petroleum and other potentially hazardous waste generated by construction activities would be disposed of in accordance with EPA guidelines.

Construction activities would also produce non-hazardous solid waste such as paper, wood, asphalt, concrete, and excess soil and rock. Asphalt would likely be recycled in place and used in the new road surface. Alternatives B and D would likely produce little if any excess soil and rock material. Alternative C would produce considerable excess soil and rock from tunnel excavation. Excess material would be disposed of in existing commercial pits on the island. All alternatives would produce excess solid waste from construction activities and employee use. This waste would be transported to a transfer station for removal from the island.

None of the action alternatives would change the capacity, function, or service of the road that would lead to a change in population or visitation that could affect hazardous or solid waste.

Cumulative Impacts

Past agricultural and historic military land uses on the Cattle Point peninsula are not likely to have produced hazardous materials in the project area. Current management of public property for recreation, historic, and natural resource management have not produced hazardous materials; however, visitor and employee uses produce solid waste. Current residential use on private property at the east end of Cattle Point also produces solid waste. Future construction of new homes and the resulting increase in part-time and permanent population would increase the potential for production of solid waste; however, improvements in recycling could reduce individual household waste. Since all of the private property in east Cattle Point has been subdivided and the number of vacant residential lots is limited, the increase in population would be small.

Implementation of the action alternatives would not alter current trends in population or visitation that would contribute cumulatively to hazardous or solid waste disposal. The hazardous and solid waste generated from construction activities and personnel would contribute minimally to the cumulative impacts of other current and reasonably foreseeable projects on San Juan Island.

Conclusion

With mitigation measures in place, hazardous wastes from construction activities would have no short-term or long-term effect on the project area or Cattle Point peninsula. The alternatives would have a negligible short-term effect on solid waste disposal on San Juan Island.

Mitigation Measures:

> **HM-1: Previously Undetected Hazardous Material.** If hazardous materials are encountered during construction, removal would be handled in accordance with WDOE and EPA guidelines.

HM-2: SPCC. The construction contractor would prepare and implement a Spill Prevention Control and Countermeasure Plan in accordance with EPA guidelines. Excess petroleum and other potentially hazardous waste generated by construction activities would be disposed of in accordance with EPA guidelines.

4.4.13 Energy

During construction, petroleum products would be used for operation of road and tunnel construction machinery, manufacture of asphalt for pavement, and commuting for the construction workforce. Construction activities associated with alternative B are expected to last 1 to 2 years. Construction for alternatives C and D is expected to last 1.5 to 3 years.

Over the long term, none of the action alternatives would change the capacity, function, or service of the road. The alternatives would preserve the existing access to the Cattle Point area and would not result in a change (either increase or reduction) in traffic in the area beyond that expected with normal growth. Thus, energy consumed by motor vehicle use on the road would not change over that expected with normal growth.

The activities and energy required for routine road maintenance would vary between the action alternatives. Maintenance activities for the alternative B road alignment would be similar to the existing road. Activities would include maintaining adequate drainage, road cleaning, mowing, regular light road resurfacing, maintaining pavement striping, and repairing road structural failures. Alternative C would involve all of the maintenance activities in alternative B as well as additional activities required for the operation and maintenance of the tunnel facilities. Tunnel operations for alternative C would include tunnel cleaning and inspection as well as maintenance and operation of the light, ventilation, and fire systems. The electricity needed for continual operation of the light and ventilation systems could add up to a substantial increase in energy use over the existing condition. The electricity needed for tunnel operations could be accessed by tapping into the residential grid. However, given the location of the site, electricity for tunnel operations could be generated using alternative methods such as solar or wind power. The short tunnel in alternative D would not require a ventilation or fire system; therefore, the energy required for this alternative would be considerably lower than alternative C. Other maintenance activities would be the same as alternative C.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.22.

Implementation of the action alternatives would not alter current trends in population or visitation that would contribute cumulatively to energy use in the local area or county-wide. Energy used during construction activities would contribute minimally to the impacts of other current and reasonably foreseeable projects.

Conclusion

Because of these factors, the construction activities involved with the action alternatives would have a minor adverse short-term effect on energy use. Long term energy use from implementation of alternative B would be negligible. Long term energy use from implementation of alternatives C and D would be slightly higher, but would still be considered negligible.

<u>Mitigation Measures:</u>

E-1: Alternative Electricity Sources. For alternatives C and D, alternative sources of electricity such as solar or wind generation would be considered for providing power requirements for tunnel operations. Care would be taken to choose a source and location that would not detract from scenic and cultural landscape values.

4.4.14 Noise

The naturally quiet soundscape is an important quality of the Cattle Point project area. Noise producing activities would take place during project construction, which is expected to last 1 to 2 years for alternative B and 1.5 to 3 years for alternatives C and D. Noise producing activities would include use of heavy equipment for site preparation, earthmoving, general construction, abandoned road restoration, hauling, compacting, and road surfacing. Alternatives C and D also involve tunnel construction, which would likely involve excavation with conventional earth moving equipment, soil stockpiling, and transport of excess soil and rock material offsite. Blasting could be necessary if rock or large boulders are encountered during tunnel excavation. However, based on limited geologic research, this is not likely to occur. If blasting becomes necessary, an evaluation would be conducted by the FHWA, and would include involvement with land management agencies and affected publics.

In the naturally quiet ambient conditions of the Cattle Point area, construction noise would be audible to road users traveling through the project area, hikers on the Mt. Finlayson Trail, users of the near-shore area of the Strait of Juan de Fuca, and residences near the east end of the construction site. The closest residence is located about 500 feet to the east of the east end of the project route. Approximately seven residences are located within 500 to 1,000 feet of the east end of the construction area. The construction noise audible in residential areas would be limited because residences are located beyond the east end of the construction site and because the topography of Mt. Finlayson blocks most of the construction site from residences in the northeast end of the Cattle Point peninsula. Since there are no construction material sources located to the east of the construction site, it is expected that there would be no construction hauling through the Cattle Point residential areas. Noise from construction traffic would increase for residents and users along haul routes located to the west of the construction site. This would include the park visitor’s center and the historic section of American Camp. In order to minimize construction-induced noise impacts in the project area, the FHWA would require that construction equipment be equipped with functioning mufflers to limit exhaust noise and that equipment be switched off when not in use. To minimize construction noise audible in the residential areas closest to the construction site, construction activities (having noise levels greater than normal traffic) to the east of the NPS-DNR boundary would not be permitted from 6:00 p.m. to 7:00 a.m.

Over the long term, none of the action alternatives would change the capacity, function, or service of the road. The alternatives would preserve the existing access to the Cattle Point area and would not result in an increase in visitors or a change (either increase or reduction) in traffic in the area beyond that expected with normal growth. Thus, noise produced by motor vehicle and visitor use on the road and adjacent residential areas would not change over that expected with normal growth.

The road alignment in alternative B involves steep grades, which may result in slight increases in engine noise from the additional engine effort necessary to climb the grade and from engine breaking during descent. The tunnel alternatives (C and D) would enclose traffic underground over a portion of the realignment. This would reduce traffic noise in the areas immediately adjacent to the tunnels; however, the overall reduction in noise in the larger project area would be barely noticeable because of the low traffic volume and relatively low speeds.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.23.

Implementation of the action alternatives would not alter current trends in population and visitation that would contribute cumulatively to noise impacts locally or county-wide. Noise produced by construction activities would be short-term, and while it would contribute moderately to the noise generated by other current and reasonably foreseeable projects taking place during the construction period, it would not contribute to long term cumulative impacts.

Conclusion

Overall, noise from construction activities involved with implementation of the action alternatives would have a moderate adverse short-term effect in the immediate project area. Over the long term, use of the new road alignment and tunnels in the action alternatives would have no effect on the noise levels in the project area above those expected with normal growth. There would be no impairment to this resource as a result of these alternatives.

<u>Mitigation Measures:</u>

> **N-1: Equipment Noise Control.** Construction equipment would be equipped with functioning mufflers to limit exhaust noise. Equipment would be switched off when not in use.
>
> **N-2: Construction Timing.** Construction activities (having noise levels greater than normal traffic) to the east of the NPS-DNR boundary would not be permitted from 6:00 p.m. to 7:00 a.m.

4.4.15 Light

The naturally dark sky is an important feature of the Cattle Point peninsula. It is expected that construction activities would create few light producing activities. Some artificial light from construction vehicles may be needed for visibility in the early morning or early evening work hours.

Over the long term, none of the action alternatives would change the capacity, function, or service of the road. The alternatives would preserve the existing access to the Cattle Point area and would not result in an increase in visitors or a change (either increase or reduction) in traffic in the area beyond that expected with normal growth. Thus, light produced by motor vehicle and visitor use on the road and adjacent residential areas would not change over that expected with normal growth.

Alternatives C and D would require a lighting system within the tunnels to provide enough light for motorists, bicycles, and pedestrians to enter, pass through, and exit the enclosure safely. Tunnel lighting would be required during the day when the contrast between outside and inside light is significant, and also at night when contrast is reversed. Stray sight from the tunnel enclosure would be visible at the tunnel portals, especially at night. This would provide two constant points of light along the naturally dark hillside of Mt. Finlayson, where nighttime traffic volume is very low. Light from tunnel portals would be dimly visible in the distance from offshore and adjacent islands. Reflected light from the east portal may be dimly visible to residents close to the east end of Mt. Finlayson; however, because of topographic barriers, light from tunnel portals would not be visible to most residents of the Cattle Point peninsula.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.23.

Implementation of the action alternatives would not alter current trends in population or visitation that would affect light. The light impacts associated with the action alternatives would not contribute to impacts of other current and reasonably foreseeable projects.

Conclusion

Overall, light from construction activities involved with implementation of any of the action alternatives would have a negligible adverse short-term effect in the project area. Over the long term, use of the new road alignment and tunnels in the action alternatives would have no effect on the light levels in the project area above those expected with normal growth. Stray light from tunnel portals in alternatives C and D may have a minor adverse effect in the project area but would have no discernible overall effect on the night sky. There would be no impairment to this resource as a result of these alternatives.

4.4.16 Coastal Zone

All action alternatives would be located in the coastal zone. Under the Washington State program, federal activities that affect any land use, water use, or natural resources of the coastal zone must comply with the enforceable policies within the laws identified in the program document. The applicable laws are:

- Shoreline Management Act (including local government shoreline master programs)
- NEPA (or State Environmental Policy Act (SEPA) in the case of state agencies)
- Clean Air Act
- Clean Water Act
- Energy Facility Site Evaluation Council (not applicable)
- Ocean Resource Management Act (not applicable)

The Washington State Shoreline Management Act (SMA) applies to the shorelines of all marine waters and extends 200 feet landward from the edge of these waters. All waters of the Strait of Juan de Fuca have been identified as shorelines of statewide significance.

The action alternatives involve no activities on the shoreline of the Strait of Juan de Fuca. At its closest (at the bluff erosion site), the existing Cattle Point Road is located approximately 200 feet from the shoreline. The action alternatives would move the road alignment landward from 100 to 140 feet upslope from its existing location. This would place the new road and tunnel alignments between 300 to 440 feet from the shoreline, which is outside of the shoreline management area. The abandoned road segment would be restored to blend with its natural surroundings and revegetated using native species. No new structures would be constructed within the shoreline management area. Therefore the action alternatives would comply with the SMA.

NEPA requires that federal agencies consider environmental factors when making decisions, involve the affected and interested public in the environmental analysis process, and document the environmental analysis process. The analysis in this DEIS complies with the provisions of NEPA.

The Clean Air Act is discussed in section 3.2.3 and the Clean Water Act is discussed in section 3.2.4 of this document. The environmental analysis in section 4.4.1 concludes that short-term impacts to air quality from the action alternatives would be minor and limited in area and that there would be no long-term effect on air quality in the project area or San Juan Island. The Class II status of the project area would not be affected. The environmental analysis in section 4.4.3 concludes that the action alternatives would have a negligible adverse short-term and long-term effect on water quality in the project area. Therefore, the action alternatives would comply with provisions of the Clean Air Act and the Clean Water Act.

The Energy Facility Site Evaluation Council coordinates evaluation and licensing steps for sighting energy facilities such as pipelines, electrical transmission lines, petroleum refineries, and alternative energy electrical generation in Washington. The proposed tunnel alternatives may involve alternative electrical generation; however, since these facilities would be located on federal property, review by the state council would not apply.

The Washington State Ocean Resources Management Act pertains to leases for oil and gas exploration, development, or production, and does not apply to this project.

Analysis in this DEIS indicates that implementation of the action alternatives would have no effect on coastal resources. The action alternatives would comply with the applicable laws and would be consistent with Washington's Coastal Zone Management Program. The FHWA will submit a negative determination and analysis to the Washington State Department of Ecology (WDOE).

4.4.17 Relationship of Short-Term Uses and Long-Term Productivity

NEPA requires a review of the balance or trade-offs between short term uses and long term productivity of resources within the project area. Under NEPA, short term refers to the life of the project facilities and long term refers to the time beyond the lifetime of the facilities.

Conversion of an undeveloped portion of the park and NRCA to a roadway represents a short term use that would have a long term effect on the productivity of the land. A roadway already exists through the project area; however, coastal erosion threatens to destroy a portion of the road in its present location. The project would realign the threatened portion of the road to a location that would not be susceptible to coastal erosion for a long period of time. The abandoned road segment would be restored to its natural grassland habitat productivity. The net loss in land productivity (through new paved surface) between the new road realignment and restoration of the abandoned alignment would be approximately 1 acre in alternative B. Alternative C would result in a net gain in land productivity of 1 acre, as the area of abandoned roadway restored would be greater than the area used in the new road alignment. Alternative D would result in no net gain or net loss in land productivity.

The road facilities proposed in the action alternatives would be designed to preserve the natural character of the road corridor. While it would transform a portion of the park and NRCA to a transportation use, it would not adversely affect the current uses of the land nor would it adversely affect the cultural landscape. Long term benefits of the project would be to continue to provide vehicular access the east end of the Cattle Point peninsula for residents and visitors who make up part of the economy of San Juan Island.

4.4.18 Irreversible and Irretrievable Commitment of Resources

Irreversible commitments are those that cannot be regained, such as the extinction of a species or the removal and use of fossil fuels. Irretrievable commitments are those that are lost for a period of time such as the loss of production, harvest, or use of renewable resources.

Construction of the action alternatives would involve commitment of a range of natural, physical, biological, human, and fiscal resources. Fossil fuels, labor, and construction materials, such as aggregate, would be irreversibly expended in the construction of the action alternatives. Labor and fossil fuels would be consumed during operation of construction equipment for grading, transport of construction materials, and other construction activities. In addition, labor and natural resources would be used in the fabrication and preparation of construction materials. Construction would also require an expenditure of funds that could not be used by any other project.

Highway maintenance would consume fossil fuels and labor through operation of maintenance vehicles and by use of aggregate and asphalt for patching. Visitor and residential vehicles would use predominately fossil fuels for commuting, recreational transportation, and the movement of goods and services. The tunnel alternatives would utilize electricity for lighting and ventilation. Design of the tunnels could make use of sustainable highway operations such as solar power or wind power systems for electric generation. Road construction would use recycled asphalt and alternative asphalt compounds to the extent possible. The abandoned road segment would be restored to its natural grassland habitat. Soils disturbed during construction would be revegetated using native species. The net loss in land productivity (through new paved surface) between the new road realignment and restoration of the abandoned alignment would be approximately 1 acre in alternative B. Alternative C would result in a net gain in land productivity of about 1 acre, as the area of abandoned roadway restored would be greater than the area used in the new road alignment. Alternative D would result in no net gain or loss in land productivity, as the area of new road pavement would be approximately equal to the area of restored abandoned roadway. Land that would be used in the construction of the action alternatives has the potential to be reclaimed when it is no longer needed for transportation purposes.

4.5 IMPACTS OF ALTERNATIVE B - HYBRID MID-SLOPE REALIGNMENT

This alternative involves realignment of the existing road to the north, approximately 300 feet away from the eroding bluff, to increase the life expectancy of the road. The project would begin about 0.65 miles east of the Pickett's Lane intersection. At the beginning of the project, the road would be widened, and the grade would be raised along the current alignment for about 1,100 linear feet in order to transition with the new road alignment. The new alignment would leave the existing road and travel north to follow a natural bench for approximately 1,000 linear feet. From there, the new alignment would climb a moderately steep grade, reaching its high point approximately 300 feet north of the bluff erosion site. From there, the alignment would descend steeply to connect back to the existing road near where the NRCA trail meets the existing Cattle Point Road. The total length of new alignment would be approximately 4,950 feet. Realignment of the road upslope from the bluff erosion site would protect road access from the threat of erosion for over 100 years. The estimated construction cost is approximately $5 to 8 million. Construction would take about 1 to 2 years.

4.5.1 Topography, Geology, and Soils

Alternative B would reroute approximately 1,000 feet of roadway onto the natural bench to the north of the bluff erosion site. Road design features and final location would be planned to minimize the number and height of road cuts and fills. Following natural contours, steepening the road grade (up to approximately 10.5 percent) and adding curves on the east end of the realignment would serve to reduce the size of cuts and fills and the associated impacts. Construction of this alternative would temporarily disturb approximately 17 acres. This disturbance would result from the new road alignment, new road cuts and fills, equipment staging areas, and removal of the existing roadway. Of the 17 acres of temporary soil disturbance, about 13 acres would be restored and revegetated. Cuts and fills along the new alignment could reach a maximum height of about 30 feet.

Under this alternative, about 4 acres of new area would be covered by impermeable road pavement. However, about 3 acres of road pavement would be removed from the abandoned road section, the road bed would be contoured to match the surrounding landscape, and the area would be revegetated with native vegetation. Therefore, the net increase in impermeable pavement surface in the project area would be about 1 acre.

The natural benches through which the new alignment would be routed were formed by glacial rebound and are an important geologic feature of the area. Construction of this alternative would involve cuts and fills along the highest bench on Mt. Finlayson, where it is most visible. Location of the road on these features would make it more difficult for viewers to observe the area's past geologic history. The cut sections at the east end of the project route would also disturb the natural topography of the ridgeline. The road would be rerouted through a previously quarried area on the east end of Mt. Finlayson. The road fill would be designed to restore the quarry area to more closely follow natural contours.

Native soils in the project area consist primarily of gravelly sand, often with the rich organic horizon at the surface typical of prairie soils. These types of soil are highly erosive. Because of this, road cuts would need to be gently sloped to ensure slope stability and promote revegetation. Further geotechnical investigation would be necessary to finalize slope designs prior to construction.

A site may be needed for disposal of excess soil and rock from construction operations, as well as to provide the aggregate needed for the project. If an existing commercial pit would be used for soil disposal and aggregate supply, the impacts to soils and geology in the pit area would be addressed in the existing pit permits and approvals. If a new site is needed for material disposal, there could be impacts to topography and soils at the new site. No new disposal sites would be allowed in the park or NRCA. If a new disposal site (or aggregate source) is required for this alternative, the effects would be analyzed by the FHWA prior to approval of the site for use. For this project, the FHWA requires that new non-commercial disposal and aggregate sources would have no more than a "no adverse effect" on cultural resources, a "no effect" determination on threatened and endangered species, and no encroachment into waters of the U.S. or wetlands.

A NPDES permit would be required for this project. As part of the permit, a Storm Water Pollution Prevention Plan (SWPPP) would be prepared that outlines measures that would be actively taken at the construction site to reduce the amount of soil erosion and sediment leaving the site due to storm water runoff. As a permanent erosion and sediment control measure, all disturbed sites would be revegetated with native species.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.1.

Realignment of the road onto the natural glacial benches below Mt. Finlayson would add a new impact to an area that currently contains no structures. New road cuts and fills would add to cumulative impacts on the topography, geology, and soils. This alternative would add approximately 1 acre of impermeable road pavement to the cumulative impacts on soils in the project area. Because of federal and state land management protections, most of the Cattle Point peninsula is relatively undeveloped and future development is limited. Federal and state projects in the Cattle Point peninsula are planned to improve existing visitor and parking facilities. No new visitor facilities are planned on public land that would impact topography, geology and soils. There is the potential for limited residential construction on the small number of vacant lots on private property in east Cattle Point. This construction would have a minimal impact on soil in east Cattle Point and add a very small amount of impermeable surface in the project vicinity. Current road density in the Cattle Point peninsula is low. No new roads are planned in the future. Alternative B would not increase road density since the existing road alignment would be obliterated and restored to natural conditions. When added to other past, present, and future actions overall cumulative impacts to geology, topography, and soils would be minimal locally and county-wide.

Conclusion

With mitigation measures in place, construction of alternative B would have a minor adverse short-term effect on soils and a moderate adverse short-term effect on topography and geology in the project area. Over the long term, the realignment of the road through the high benches below Mt. Finlayson would have a negligible adverse effect on soils and a moderate adverse effect on the topography and geology of the project area and the Cattle Point peninsula. There would be no impairment to these resources as a result of this alternative.

<u>Mitigation Measures:</u>

TGS-1: Road Design. Same as CR-3. In addition, to the extent possible, road design features and final location would be planned to follow natural contours and to minimize the number and height of road cuts and fills. The abandoned quarry on the east end of Mt. Finlayson would be incorporated into the road profile and would be reclaimed to more closely follow natural surroundings. Cut slopes would be designed to insure slope stability and promote revegetation.

TGS-2: **Geology Wayside Exhibit.** A wayside exhibit would be developed to interpret the area's geology.

TGS-3: SWPPP. Same as H-1 and WQ-1. Prior to construction, the FHWA would develop a Storm Water Pollution Prevention Plan (SWPPP) for implementation during construction. The SWPPP would include measures (BMPs) for temporary erosion and sediment control devices during construction for control of concentrated storm water runoff. The SWPPP would also include BMPs for housekeeping measures to address the safe storage, handling, and spill prevention of hazardous construction materials.

TGS-4: Revegetation. Same as WQ-2. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment. See appendix A.

TGS-5: New Waste Site or Aggregate Source. No disposal sites would be allowed in the park or NRCA. If a non-commercial disposal site or aggregate source is required, the proposal would be analyzed by the FHWA for environmental impacts before approval for use. For this project, new non-commercial disposal and aggregate sources would have no more than a "no adverse effect" on cultural resources, a "no effect" determination on threatened and endangered species, and no encroachment into waters of the U.S. or wetlands.

4.5.2 Visual Quality

Depending on topography and locale, differing views of construction machinery and activities would be visible from adjacent areas of the Cattle Point residential area, the existing road, some beach locations, surrounding offshore areas, and adjacent areas of the park and NRCA, including the Mt. Finlayson Trail.

The new road alignment would be located on the upper bench on the south slope of Mt. Finlayson where it nears the ridgeline, before curving down the east end of the ridge. This location would be more visible than the present road alignment when viewed from offshore and adjacent islands. To the extent possible, the road design and final location would be planned to follow natural contours and minimize the number and height of road cuts and fills. Preliminary design does not anticipate the need for retaining walls in the road design; however, final plans may use short sections of wall in order to reduce the extent of cuts and fills. Walls would present a solid visual disturbance to the natural topography. If needed, walls would be designed with a low profile, using materials with a natural appearance to minimize visual impacts.

For hikers using the Mt. Finlayson Trail, the new road alignment would be closer and more visible than the existing road. This would be most pronounced at the east end of the road alignment. Viewed from the Cattle Point residential area, from offshore to the east, and from Lopez Island, the new through-cut and fill sections would be more visible than the existing road alignment. Viewed from the beach and offshore to the south, the alternative B alignment would be less visible than the existing road because of its higher location. From other points in the park and NRCA, the new road alignment would appear similar to the existing road.

Newly disturbed soils would make the new road alignment more visible over the short term. Following construction, all disturbed areas including cut and fill slopes would be revegetated using native species. Over 2 to 5 years, the growth of planted native vegetation would serve to blend the road into the natural surroundings.

Restoration of the abandoned road segment would include removal of the road pavement, contouring the road cut to blend with the adjacent topography, and revegetating the road footprint with native prairie species. The growth of planted vegetation would serve to blend the restored roadway into the surrounding landscape. Over the long term, there may be some evidence that a road was once present on the site, but the visual intrusion to the natural landscape would be slight when viewed in the distance from viewpoints throughout Cattle Point and from offshore.

For users of the realigned roadway, the new alignment would provide similar views of the surrounding land and sea-scapes as the present road location. Where possible, turnouts would be developed for road users to pull off the road to view the natural features of the area. The higher location of the new alignment would provide vistas to the south along most of the road alignment. Vistas to the north would be blocked by the slope of Mt. Finlayson, which is also the case with the existing road location. A through-cut along a short section of road at the east end of the ridge would block views on both sides of the road, though Lopez Island would still be visible to the east. East of the through-cut, a short fill section would provide views on both sides of the road before connecting with the existing road alignment. Existing pullouts would remain to provide stopping points to enjoy views. New pullouts may be included in the design of the new alignment as location permits.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.5.

Alternative B would realign the road onto the natural glacial benches below Mt. Finlayson, which currently contains no structures. This location would be more visible when viewed from offshore. The abandoned road alignment would be obliterated and restored to natural conditions, which would negate its cumulative visual impact. The new road alignment would not increase the road density in the area. No future projects are planned on public land that would impact visual resources. There is the potential for limited residential construction on the small number of vacant lots on private property in east Cattle Point. This construction would have a minimal visual impact east of the project area. Visual impacts associated with alternative B would contribute moderately to the impacts of other current and reasonably foreseeable projects. Overall, when added to past, present, and future activities cumulative impacts to visual quality would be minimal locally and region-wide.

Conclusion

Overall, ground disturbing activities and construction would have a moderate adverse short-term effect on the visual quality of the project area. Over the long term, the adverse visual impacts of the new road alignment when viewed from the Cattle Point peninsula, offshore, and from neighboring islands would be moderate. There would be no impairment to this resource as a result of this alternative.

<u>Mitigation Measures:</u>

> **VQ-1: Road Design.** Same as CR-3, and TGS-1. To the extent possible, road design features and final location would be planned to follow natural contours and to minimize the number and height of road cuts and fills. The abandoned quarry on the east end of Mt. Finlayson would be incorporated into the road profile and would be reclaimed to more closely follow natural surroundings. Cut slopes would be designed to insure slope stability and promote revegetation. If needed, walls would be designed with a low profile, using materials with a natural appearance. Final wall design would be coordinated with an NPS landscape architect.
>
> **VQ-2: Scenic Turnouts.** Same as VU-2**.** Where possible, scenic turnouts would be constructed along the road alignment for the road user to pull off the road to view the natural features of the area.
>
> **VQ-3: Revegetation.** Same as WQ-2 and TGS-4. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment. See appendix A.

4.5.3 Vegetation

Alternative B would shift the road location upslope, away from the eroding coastal bluff and closer to the forested ridgeline, which would cut through a section of previously undisturbed prairie vegetation (figure 4.3). The fringe of the forest at the east end of the ridgeline would also be affected. It is expected that some small trees would need to be removed for construction of cut slopes and at the old quarry site. There would likely be no removal of large mature trees.

Construction of the new alignment would affect about 4,950 linear feet of grassland at widths varying from 60 to 120 feet (for cuts and fills) for a total of approximately 17 acres of disturbance. Of the 17 acres, about 13 acres would be restored and revegetated. Revegetated areas would include roadside cut and fill slopes, staging areas, and the abandoned road segment. The remaining 4 acres of disturbance would be new pavement area, which would involve permanent impacts to vegetation along the existing and new alignment. Restoration of the abandoned road segment would involve removal of approximately 3 acres of existing pavement and road base material, contouring the road footprint to blend with the surrounding landscape, and planting with native vegetation. The net permanent loss of vegetation in the project area would total approximately 1 acre.

The preliminary alignment shows that seven areas (polygons) of native prairie are located in close proximity to the road alignment and may be impacted by road cuts and fills adjacent to the road realignment (figure 4.3). The road alignment is preliminary, and to the extent possible, final road alignment and design would be adjusted to avoid or minimize impacts to these rare native prairie sites. Existing native vegetation would be retained whenever feasible.

Prior to construction, a detailed restoration and revegetation plan would be developed that would outline methods and standards for revegetation of areas temporarily disturbed during the construction as well as restoration of the abandoned road segment. Revegetation would begin as soon as possible after completion of construction, during the optimum time of year to ensure greatest plant survival. Topsoil removed during construction would be conserved and reapplied to revegetation sites to insure optimum plant establishment. If sufficient conserved topsoil is not available, native topsoil may be imported from elsewhere on the island. Erosion control measures would be applied in order to protect soil and seed prior to establishment of vegetation, following guidelines in the project SWPPP.

All revegetation would use native species. Restoration of the abandoned road segment would provide the opportunity to restore native species and benefit the prairie grassland. All revegetated sites would be monitored for success and failed sites would be replanted as needed.

Road construction activities, soil disturbance, and imported topsoil provide conditions favorable for spread of weeds from adjacent lands as well as from outside of the project area.

Figure 4.3 – Alternative B Alignment Relative to Native Prairie Polygon Locations

BMPs for control of weeds would be implemented during construction. Construction equipment would be cleaned of all mud, dirt, and plant material prior to entering the project area for the first time to minimize the spread of weeds from outside the project area. Aggregate and fill sources as well as imported topsoil would be inspected and certified as weed-free before being approved for use on the project site. If weed-free aggregate and fill sources are not available, the material would be heat-treated to kill weeds and weed seeds prior to transport to the project site. Even with BMPs in place, some weeds may be spread to the project from other areas within or immediately adjacent to the project area. The revegetation plan would include a plan for treatment of weeds on restored sites. Weed treatment would follow NPS and DNR guidelines.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.6.

Alternative B would realign the road into the prairie vegetation below Mt. Finlayson, which would add a new impact to the area that is currently undeveloped. The affected area includes seven polygons of remnant native prairie vegetation that is rare on San Juan Island. Restoration of the abandoned road segment and revegetation of roadside cut and fill slopes would provide the opportunity to benefit the restoration of native prairie vegetation. The project would permanently impact about 1 acre of prairie grassland vegetation. No future projects are planned on public land in the project area that would impact vegetation. Federal and state projects in the Cattle Point peninsula would improve existing visitor and parking facilities. There is the potential for limited residential construction on a small number of vacant lots on private property in east Cattle Point. This construction would impact a small amount of prairie and forest vegetation in the Cattle Point peninsula and add to cumulative effects. When combined with other past, present, and future activities the effects of alternative B would result in a minor cumulative impact on vegetation locally and region-wide.

Conclusion

Because of these factors, construction and other ground disturbing activities would have a minor adverse short-term effect on vegetation in the project area. With mitigation measures in place, the long-term adverse effects on vegetation in the project area would be minor. There would be no impairment to this resource as a result of this alternative.

<u>Mitigation Measures:</u>

> **V-1: Road Design.** Same as CR-3, TGS-1, and VQ-1. To the extent possible, road design features and final location would be planned to follow natural contours and to minimize the number and height of road cuts and fills. The abandoned quarry on the east end of Mt. Finlayson would be incorporated into the road profile and would be reclaimed to more closely follow natural surroundings. Cut slopes would be designed to insure slope stability and promote revegetation. If needed, walls would be designed with a low profile, using materials with a natural appearance. Final wall design would be coordinated with an NPS landscape architect.
>
> In addition, final road alignment and design would be adjusted to avoid or minimize impacts to rare native prairie sites.
>
> **V-2: Revegetation.** Same as WQ-2, TGS-4 and VQ-3. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation

plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment. See appendix A.

In addition, revegetation would begin as soon as possible after completion of construction, during the optimum time of year to ensure greatest plant survival. Topsoil removed during construction would be conserved and reapplied to revegetation sites. If sufficient conserved topsoil is not available, native topsoil may be imported soil from elsewhere on the island.

V-3: Weed Inspection of Aggregate and Fill Sources. Aggregate and fill material sources would be inspected and certified as weed-free by a qualified person prior to approval for use. If weed-free sources are not available, material would be heat-treated to kill weeds and weed seeds.

V-4: BMPs for Weed Control. Construction equipment would be steam-cleaned prior to entering the project area for the first time. All roadsides and disturbed areas would be restored using native conserved topsoil and would be revegetated. Any imported topsoil needed would be certified as weed free. The revegetation plan would include a detailed weed control plan. See appendix A.

V-5: SWPPP. Same as H-1, WQ-1, and. TGS-3. Prior to construction, the FHWA would develop a Storm Water Pollution Prevention Plan (SWPPP) for implementation during construction. The SWPPP would include measures (BMPs) for temporary erosion and sediment control devices during construction for control of concentrated storm water runoff. The SWPPP would also include BMPs for housekeeping measures to address the safe storage, handling, and spill prevention of hazardous construction materials.

4.5.4 Wildlife

Construction activities along the new road alignment as well as continued traffic on the existing road would result in an increase in human presence and noise intermittently during the 1 to 2 year construction period.

In this alternative, the road alignment would be moved upslope and closer to the important fringe habitat along the ridgeline where wildlife species transition between forest and grassland. Over the long term, the road alignment would impact wildlife and wildlife habitat by direct loss of habitat area covered by pavement and reduction in the habitat value of revegetated road cut and fill slopes.

Project activities would directly impact prairie habitat with ground disturbing activities on approximately 17 acres in the project area. Wildlife and bird species using this area would be displaced. Some smaller, less mobile ground-dwelling and nesting species may incur direct mortality. Construction activity and noise would deter animals from using the habitat in the project area for foraging and breeding. Noise and construction activity could also disrupt wildlife use of habitat adjacent to the construction site, possibly causing animals to move to other habitats. There is similar habitat surrounding the project area, including moderately large areas of grassland to the east and west as well as forested areas to the north.

Of the 17 acres of habitat disturbance, approximately 13 acres would be temporarily impacted during construction and 4 acres would be permanently impacted by new road pavement. Of the 13 acres of temporary impact, about 9 acres would consist of roadside cut and fill slopes, about 1 acre would consist of equipment staging areas, and about 3 acres would consist of abandoned roadway restoration. Following construction, these disturbed sites would be revegetated with native species. Road cuts and fills would provide marginal wildlife habitat; however, the restored abandoned road segment would provide higher quality wildlife habitat in a relatively undisturbed setting.

This alternative would not change the capacity, function, or service of the road and would not result in an increase in traffic or visitor use; therefore, long-term effects of the new road alignment on wildlife are not expected to be substantially different than present. Fragmentation of continuous habitat patches into smaller sizes, wildlife road avoidance due to human activity and noise, and road mortality would be similar to the existing road impacts. Due to the narrow width of the road and low traffic speeds and volumes, these impacts would be relatively small.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.7.

Alternative B would move the road alignment closer to the fringe habitat near the ridge of Mt. Finlayson, which is currently undeveloped. This would add cumulatively to habitat fragmentation in the project area. However, restoration of the abandoned road segment would replace habitat lost by the new road alignment. No future projects are planned on public land in the project area. The new road alignment would not increase the road density in the area. There is the potential for limited residential construction on the small number of vacant lots on private property in east Cattle Point. This construction would have a minimal impact on wildlife on the Cattle Point peninsula. When combined with other past, present, and future activities overall wildlife impacts associated with alternative B would be minimal locally and county-wide.

Conclusion

Because of these factors, construction activities associated with this alternative would have a moderate adverse short-term effect on wildlife use patterns and habitat in the project area. Over the long term, the effects of the alternative B road alignment would be minor. There would be no impairment to this resource as a result of this alternative.

<u>Mitigation Measures:</u>

> **W-1: Revegetation.** Same as WQ-2, TGS-4, VQ-3, and V-2. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment.
>
> Revegetation would begin as soon as possible after completion of construction, during the optimum time of year to ensure greatest plant survival. Topsoil removed during construction would be conserved and reapplied to revegetation sites to insure optimum plant establishment. If sufficient conserved topsoil is not available, native topsoil may be imported from elsewhere on the island. The revegetation plan would include stipulations for use of conserved and imported topsoil and control of weeds.

4.5.5 Federally-Listed Threatened, Endangered, and Protected Species

There are no federally-listed threatened or endangered species known to be present or having habitat in the project area or vicinity, however, the federally protected bald eagle is known to be present and have habitat within the project vicinity (table 4.2). WDFW data show that the project area is located within two historic bald eagle territories. Six historic nest sites containing nine nests are located within 0.5 miles of the project area. Bald eagle territories and nest sites are also located within 1 mile of the project area on Lopez Island and near the American Camp historic areas. Bald eagle nesting activities occur from January 1 to August 15 (USFWS 2004). The project area is also located within the 800-foot shoreline foraging buffer identified by the WDFW priority habitat and species data (wdfw.wa.gov/hab/phslist.htm, accessed March 26, 2007). Eagle wintering takes place in the county from October 31 to March 31. There are no known wintering roosts in the project area.

The highest point on the alternative B road realignment would be located within the 800-foot buffer of one historic bald eagle nest near the peak of Mt. Finlayson. All nest sites shown in the WDFW database in the Mt. Finlayson area were monitored by NPS in 2009. Of the seven nest locations, only one nest was found, and it was in disrepair and unoccupied (NPS 2009). The nest located closest to the proposed road realignments could not be found by the NPS in 2009.

Construction noise impacts would affect an area within a 0.5-mile radius of the construction site depending on topographic barriers. Noise producing activities would take place during project construction, which is expected to last 1 to 2 years. Construction activities would take place along the new road alignment, abandoned road segment, haul routes, and staging areas. Regular traffic from residents and visitors would continue along the existing roadway during the construction period. These activities would result in an increase in human presence and noise intermittently during the 1 to 2 year construction period. Site preparation would include activities such as land clearing and grubbing, including disposal of cleared material. Construction activities would include site preparation, earthmoving, general construction, and road surfacing. Earthmoving would include cut and fill operations, trenching, soil compaction, grading, and transport of excess soil and rock material offsite, likely west of the project area. It would involve hauling within the 800-foot buffer of the bald eagle nests in the American Camp historic area. Construction of alternative B would not likely produce loud noises such as blasting or pile-driving; however, if these uses become necessary, a separate assessment would be conducted by the FHWA, and would include an evaluation of the effects to the bald eagle.

The entire road realignment is located on the south slopes of Mt. Finlayson in the prairie grassland habitat. Bald eagle nesting and roosting habitat consists of large trees and elevated sites located in the forested habitat near the peak and on the north side of the Mt. Finlayson ridge. Road realignment is not expected to involve removal of large mature trees suitable for eagle habitat. Cutting of eagle habitat trees would be prohibited. The project area is located within the 800-foot shoreline foraging buffer on the Strait of Juan de Fuca.

Construction activities are expected to take place during part of the bald eagle nesting season and may also take place during part of the winter-foraging season. While construction activities may cause foraging eagles to avoid flying over the construction areas on the south slopes of Mt. Finlayson, foraging areas to the north and east would remain undisturbed. During breeding season, bald eagles are sensitive to a variety of human activities, including noise from construction activities. Not all bald eagle pairs react to human activities in the same way. Some nest successfully within close proximity to human activity while others abandon nest sites in response to activities much farther away (USFWS 2007b). Prior to construction, the bald eagle nest within the 800-foot buffer of the project area would be investigated to determine if it was in active use. If the nest was being used by bald eagle, noise-producing construction activities within the 800-foot buffer would be restricted during the nesting period. If the nest was not in use, no construction restrictions would be necessary. The bald eagles in the American Camp historic area have successfully raised chicks in close proximity to human activities (NPS 2009). Although these individuals have habituated to the routine uses in the area, increased construction traffic may disturb them during nesting. The American Camp nests would be monitored during the nesting period and noise producing construction activities would be avoided to the extent possible.

The new road alignment would permanently relocate road noise and activities closer to the historic bald eagle nesting sites located near the ridge of Mt. Finlayson. The proximity of the new road alignment to the closest nest locations and the associated traffic as well as bicycle and pedestrian use may disturb bald eagles using the area for nesting and foraging. However, traffic levels are relatively light, and eagles have habituated to similar human activity near the American Camp visitor center.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.8.

Alternative B would move the road alignment closer to the historic bald eagle nests located near the ridge of Mt. Finlayson. Along with the pedestrian use on the Mt. Finlayson Trail, the closer road proximity would add cumulatively to potential human disturbance to historic bald eagle nesting in the area. Future projects to improve the American Camp visitor center could also have a small impact on the eagle nest in the vicinity. Visitation to the park and use of the visitor's center and trails in close proximity to eagle's nests is expected to increase into the foreseeable future. Bald eagles nesting in the area near the visitor's center have become acclimated to human presence and vehicle traffic seems to have little effect on bald eagle use patterns (USFWS, personal communication, 2009); however, it is unknown whether there is a limit to the amount of human presence that would be tolerated. When combined with other past, present, and future activities overall impacts to bald eagles associated with alternative B would be minimal locally and region-wide.

Conclusion

Overall, with mitigation measures in place, it is expected that construction activities associated with alternative B would have a minor adverse short-term effect on bald eagle use patterns in the project area. With implementation of the described mitigation measures, the project would be in compliance with USFWS *National Bald Eagle Management Guidelines* (May 2007), and impacts would be below the level of "take" (see glossary). No permits would be required. Over the long term, alternative B would have a negligible adverse effect on bald eagles in the project area and the Cattle Point peninsula. There would be no impairment to this resource as a result of this alternative.

<u>Mitigation Measures:</u>

FTES-1: Construction Timing Restrictions. Noise-producing construction activities within the 800-foot buffer of active bald eagle nests would be restricted during the nesting period (January 1 to August 15).

FTES-2: Prohibit Removal of Bald Eagle Habitat. Removal of bald eagle habitat trees would be prohibited.

FTES-3: **Equipment Noise Control.** Same as N-1**.** Construction equipment would be equipped with functioning mufflers to limit exhaust noise. Equipment would be switched off when not in use.

4.5.6 State-Listed Threatened and Endangered Species

The state-listed California buttercup is known to be present and have habitat within the area of potential impact for alternative B (table 4.3).

Occurrence of this species in the project area roughly coincides with native prairie polygons (figure 4.3). The new road alignment and road cuts and fills could potentially impact three small California buttercup polygons. There are a total of 33 California buttercup polygons in the project area; therefore, the proposed realignment location would impact about 9 percent of the population. To the extent possible, final road alignment and design would be adjusted to avoid or minimize impacts to this species. Priority would be given to avoiding large concentrations of the plant.

Restoration of the abandoned road segment as well as roadway cuts and fills would provide an opportunity for potential planting of California buttercup into new areas of the native prairie grassland. The revegetation plan would outline methods and standards for revegetation of the species in these areas. Road construction activities and soil disturbance provide conditions favorable for spread of weeds from adjacent lands as well as from outside of the project area, which could effect California buttercup. BMPs for control of weeds would be implemented during construction.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.9.

The alternative B realignment would impact about 9 percent of the population of California buttercup in American Camp. Restoration of the abandoned road segment and revegetation of roadside cut and fill slopes would provide the opportunity to benefit the restoration of this species. No future projects are planned on public land in the project area that would impact California buttercup. There is the potential for limited residential construction on a small number of vacant lots on private property in east Cattle Point. This construction could potentially impact a small amount of California buttercup habitat in the Cattle Point peninsula and add to cumulative effects. When combined with other past, present, and future activities the effects of alternative B would result in a minor cumulative impact on California buttercup locally and region-wide.

Conclusion

Overall, construction activities associated with alternative B are likely to result in minor adverse short-term effect on California buttercup. Over the long term, planting of California buttercup during restoration of the abandoned roadway may provide the opportunity to increase the population in the project area, provided that establishment is successful. As a result, the project could have a minor beneficial long-term effect on this species in the project area and in the Cattle Point peninsula. There would be no impairment to this resource as a result of this alternative.

<u>Mitigation Measures:</u>

> **STES-1: Road Design.** Same as CR-3, TGS-1 and V-1. To the extent possible, road design features and final location would be planned to follow natural contours and to minimize the number and height of road cuts and fills. The abandoned quarry on the east end of Mt. Finlayson would be incorporated into the road profile and would be reclaimed to more closely follow natural surroundings. Cut slopes would be designed to

insure slope stability and promote revegetation. Final road alignment and design would be adjusted to avoid or minimize impacts to rare native prairie sites and California buttercup.

STES-2: **Revegetation.** Same as WQ-2, TGS-4, VQ-3, V-2, and W-1. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment.

Revegetation would begin as soon as possible after completion of construction, during the optimum time of year to ensure greatest plant survival. Topsoil removed during construction would be conserved and reapplied to revegetation sites to insure optimum plant establishment. If sufficient conserved topsoil is not available, native topsoil may be imported soil from elsewhere on the island. The revegetation plan would include stipulations for use of conserved and imported topsoil and control of weeds.

In addition, the revegetation plan would outline methods and standards for revegetation of the California buttercup in the abandoned roadway restoration and in roadway cuts and fills.

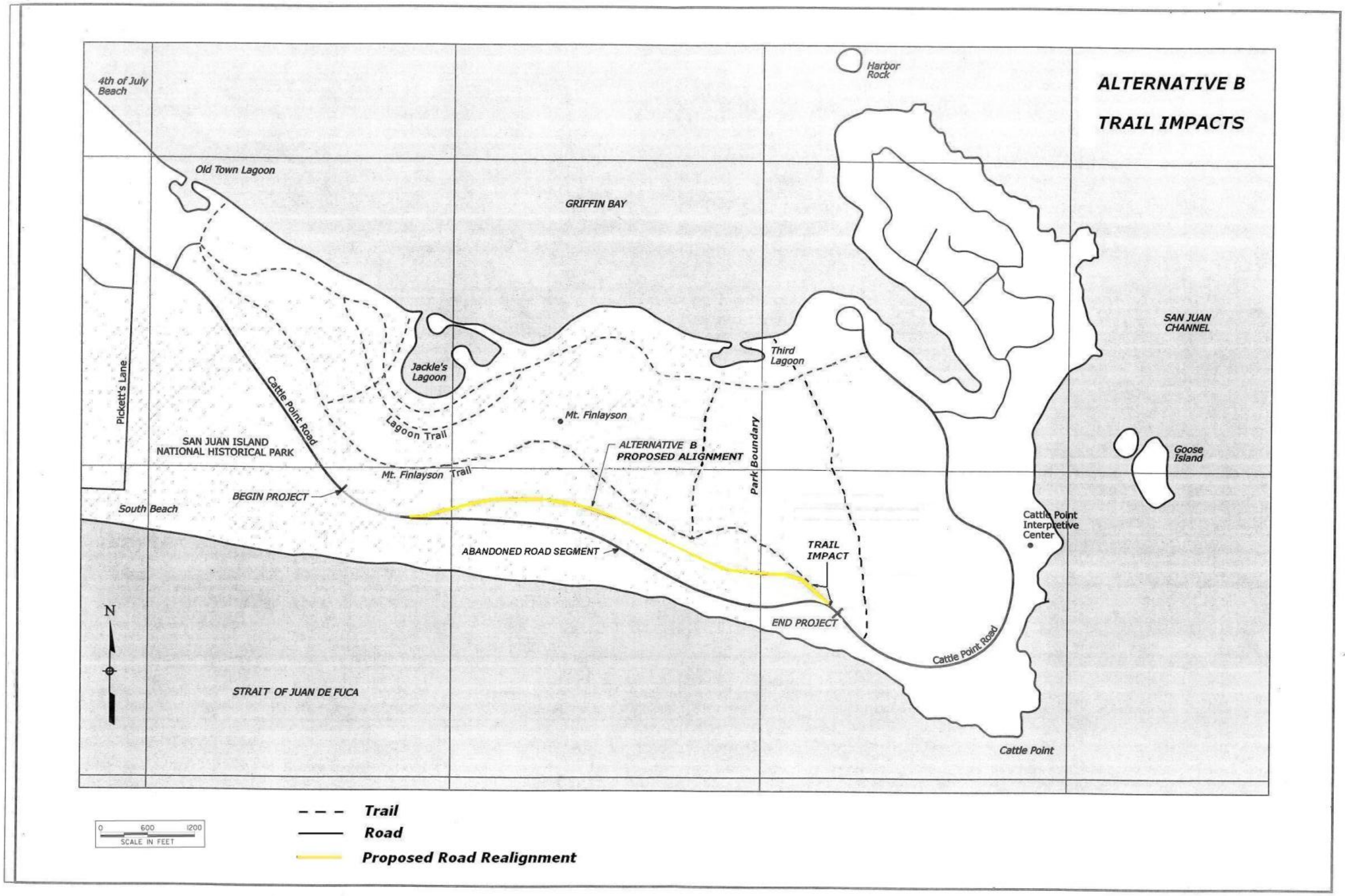
STES-3: **BMPs for Weed Control.** Same as V-4. Construction equipment would be steam-cleaned prior to entering the project area for the first time. All roadsides and disturbed areas would be restored using native conserved topsoil and would be revegetated. Any imported topsoil needed would be certified as weed free. The revegetation plan would include a detailed weed control plan. See appendix A.

4.5.7 Trail System

The alternative B realignment moves the road closer to the existing trail on the ridge of Mt. Finlayson than the existing road location. Along the western portion of the project area, the new road alignment would be located about 400 to 600 feet to the south of the Mt. Finlayson Trail. Along the eastern portion of the project area, the new road alignment would be located 200 to 400 feet south of the trail. At the east end of the project, approximately 200 to 300 feet of trail would be directly impacted by the cut and fill slopes and would need to be relocated. This section of trail would be relocated directly adjacent to the new road fill on the east side of the roadway. To the extent possible, final road design would be adjusted to minimize impacts to the trail. The Mt. Finlayson Trail is the only trail directly impacted by the alternative B realignment (figure 4.4).

Construction noise and views of construction activity would be noticeable to Mt. Finlayson Trail users along the eastern 5,000 feet of the trail route. The east end of the trail on park and DNR properties could be closed occasionally during the 1 to 2-year construction period. Closures would not affect the loop trail from the Mt. Finlayson Trail north to the Lagoon Trails. However, hikers would not be able to travel the entire length of the Mt Finlayson Trail to link back with Cattle Point Road on the east side of the project area. Construction would not affect the other NPS trails in American Camp. Access to the DNR and BLM trails located to the east of the project area may be impacted due to traffic delays.

Figure 4.4 – Alternative B Trail Impact



Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.15.

Alternative B would move the road alignment closer to the Mt. Finlayson Trail, increasing vehicle noise perceptible to trail users and reducing the sense of solitude. As traffic along the road increases in the future with normal increases in park visitation, this impact would become more noticeable to trail users. The realignment would also directly impact 200 to 300 feet at the east end of the Mt. Finlayson Trail. This area represents about 0.6 percent of the 9 miles of trail within the Cattle Point peninsula. The trail would be relocated to the toe of the fill adjacent to the new roadway and would not be completely lost to the trail system. No future projects are planned in the project areas that would adversely impact the trail system. When added to other past, present, and future actions the overall trail system would not change in a measurable way.

Conclusion

Because of these factors, construction of alternative B would have a moderate adverse short-term effect on the Mt. Finlayson Trail. However, the effect of construction on the trail system in the Cattle Point peninsula as a whole would be minor. Over the long term, the alternative B realignment would have a minor adverse effect on the Mt. Finlayson Trail; however, it would have a negligible adverse effect on the trail system on the Cattle Point peninsula as a whole. There would be no impairment to this resource as a result of this alternative.

<u>Mitigation Measures:</u>

> **T-1: Road Design.** Same as CR-3, TGS-1, V-1, and STES-3. To the extent possible, road design features and final location would be planned to follow natural contours and to minimize the number and height of road cuts and fills. The abandoned quarry on the east end of Mt. Finlayson would be incorporated into the road profile and would be reclaimed to more closely follow natural surroundings. Cut slopes would be designed to insure slope stability and promote revegetation. Final road alignment and design would be adjusted to avoid or minimize impacts to rare native prairie sites and California buttercup.
>
> In addition, final road design would be adjusted to minimize impacts to the Mt. Finlayson Trail to the extent possible. Where impacts are unavoidable, the trail would be relocated adjacent to the new road alignment.

4.5.8 Transportation and Road System

Construction activities associated with alternative B are expected to last 1 to 2 years. During construction, the existing Cattle Point Road alignment would be left open to maintain access to the east end of the Cattle Point peninsula. Most construction operations for road realignment would take place outside of the existing Cattle Point Road alignment; however, traffic delays would still be expected on Cattle Point Road adjacent to the construction site. Delays would likely be limited to 30 minutes or less except during construction of the connection between the realigned road section with the existing roadway. Construction of these short road segments may require full road closure for up to 4 hours at a time intermittently for approximately 1 to 2 weeks during construction of both ends of the connection. Road closure and delay schedules would be publicized ahead of time by public announcements through the NPS and local media.

Offsite transport of excess soil and rock from the construction site is expected to be minimal; however, transportation of equipment and construction materials would result in construction traffic and increased congestion on surrounding local roads. There would be some heavy loads related to construction traffic; however, all construction traffic would follow the legal load limits. Therefore no deterioration of the surrounding road system is anticipated above normal wear levels.

Over the long term, alternative B would not change the capacity, function, or service of the Cattle Point Road. The alternative would preserve the existing access to the Cattle Point area and would not result in a change (either increase or reduction) in traffic in the area beyond that expected with normal growth. The abandoned roadway segment would be obliterated and restored to natural conditions following construction of the new alignment. The realigned segment would be approximately equal in the length to the restored abandoned segment; therefore, this alternative would not add to the amount of road in the project area or on the island. Initially, maintenance costs for the new road alignment would be lower than for the existing road; however, over time costs would average approximately the same as for the existing road at about $10,000 annually.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.16.

Alternative B would not change the capacity, function, or service of the Cattle Point Road. The alternative would preserve the existing access to the east Cattle Point area and would not result in a change (either increase or reduction) in traffic in the area beyond that expected with normal growth. There is the potential for limited residential construction on the small number of vacant lots on private property in east Cattle Point. This construction would increase the residential population of the area by a small amount, which in turn would increase use on area roads. No future projects are planned on public land that would affect the transportation and road system. The impacts to the transportation and road system in the project area associated with alternative B would not contribute to the impacts of other current and reasonably foreseeable projects locally or county-wide.

Conclusion

Because of these factors, the construction activities could have a moderate adverse short-term effect on transportation and access in the project area. Over the long term, alternative B would have no effect on the transportation and road system in the project area or on San Juan Island.

<u>Mitigation Measures:</u>

> **TR-1: Traffic Management.** Same as VU-1**.** A traffic control plan would be developed specifying road closure times and a public information program. Delays would be limited to 30 minutes or less. Construction of the short connectors between the existing roadway and the new alignment may require full road closure for up to 4 hours intermittently during a period of approximately 1 to 2 weeks.
>
> **TR-2: Road Damage.** Construction traffic would follow legal load limits to minimize damage to area roads from heavy equipment.

4.5.9 Special Vehicles, Bicycles, and Pedestrians

Construction traffic along local routes leading to the construction site would create a safety concern for special vehicles, bicycles, and pedestrians using the road shoulders. Operation of heavy equipment in the immediate project area would cause a safety issue for use of these modes of transportation through the construction area. Due to safety considerations, these uses could be restricted through the construction area during part or all of the construction period. The FHWA would include requirements in the construction contract to warn equipment operators to use extra caution when operating on area roadways due to high use by special vehicles, bicycles, and pedestrians.

Design of the realigned road segment would include improved shoulders for bicycle and pedestrian traffic. Preliminary design calls for 4-foot paved shoulders along the length of the realignment. While this would improve road function and safety for special vehicles, bicycles, and pedestrians in the realigned segment, the existing roadway leading to the new realignment would continue to have narrow shoulders. The section of Cattle Point Road between the west park boundary and Pickett’s Lane has 1.5-foot gravel/native material shoulders and from Pickett’s Lane to the east park boundary, the road has 1-foot gravel/native material shoulders.

Since the new road alignment would be located higher on the slope of Mt. Finlayson, road grades along portions of the roadway would be steep. At the east end of the new alignment, grades would likely approach 10.5 percent in order to descend the ridge and link back with the existing roadway. These relatively steep grades would slow bicycles and special-use vehicles through the area. However, the wide road shoulders would provide an area for these vehicles to move off the roadway and allow faster vehicle traffic to pass.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.14.

Alternative B would not change the capacity, function, or service of the road that would lead to a change in special vehicle, bicycle, or pedestrian use. The alternative would preserve the existing access to the east end of the Cattle Point peninsula. There is the potential for limited residential construction on the small number of vacant lots on private property in east Cattle Point. This construction would increase the residential population of the area by a small amount, which in turn could result in increased use by special vehicles, bicycles, and pedestrians on area roads. Visitation to the park is expected to increase into the future along with increases in use by special vehicles, bicycles, and pedestrians. No future projects are planned on public land that would affect these uses. When combined with other past, present, and future activities the effects of alternative B would have no measurable cumulative effect locally or region-wide.

Conclusion

Because of these factors, construction activities would have a moderate adverse short-term effect on special vehicle, bicycle, and pedestrian use in the project area and Cattle Point peninsula. Over the long term, the wider road shoulders but steeper road grade along the new road alignment would have a minor beneficial effect on special vehicles, bicycles, and pedestrians in the project area. However, over the Cattle Point peninsula as a whole, beneficial effects would be negligible.

Mitigation Measures:

> **SVBP-1: Construction Traffic Safety.** Construction equipment and vehicle operators would be required to use extra caution when approaching and passing special vehicles, bicycles, and pedestrians.

4.5.10 Unavoidable Adverse Impacts

Alternative B would involve a number of unavoidable short-term adverse impacts. Construction activities would temporarily impact the visual quality of the area with the presence of construction equipment and soil disturbing activities. Construction would impact visitor uses such as hiking at the east end of the Mt. Finlayson trail; special vehicle, bicycle, and pedestrian safety in the project vicinity; and cause disturbances for residents and visitors to the east end of the Cattle Point peninsula from construction noise and sporadic traffic disruptions. Wildlife use patterns and habitat, as well as vegetation and rare prairie plants, would also be adversely impacted by construction activities. All construction-related impacts would be temporary and would end following completion of project construction. Disturbed sites would be revegetated using native species.

Over the long term, this alternative would adversely impact the topography of the area by realigning the roadway onto the previously undeveloped natural glacial bench, high on the slopes of Mt. Finlayson. The roadway and roadside cuts and fills would permanently impact the integrity of the natural glacial bench. The Mt. Finlayson trail would also be adversely impacted by the alternative B alignment. The new road would be 200 to 400 feet closer to the trail along the Mt. Finlayson ridge. The eastern 200 to 300 feet of trail would be directly impacted by road cuts and would need to be relocated. A net loss of about 1 acre of vegetation would be permanently replaced by impermeable road pavement in the project area.

4.6 IMPACTS OF ALTERNATIVE C - LONG TUNNEL ON MINOR REALIGNMENT

Alternative C involves a short realignment of the existing road to the north through a tunnel approximately 320 feet upslope from the eroding bluff. The project would begin about 1 mile east of the Pickett’s Lane intersection. At the beginning of the project, the road would be widened, and the grade would be raised along the current alignment for about 320 linear feet in order to transition with the new road alignment. The new alignment would leave the existing road and travel north, entering the tunnel about 675 feet from the beginning of the realignment. The tunnel would be approximately 1,600 feet in length. From its highest point, the tunnel would be approximately 320 feet to the north of the bluff erosion site. The road would exit the tunnel and curve down the ridge, rejoining the existing road alignment near where the NRCA trail meets the existing Cattle Point Road. The cost for construction of this alternative would be approximately $55 to 65 million. Construction would take 1.5 to 3 years.

4.6.1 Topography, Geology, and Soils

Alternative C would reroute the road onto the slope below the eastern ridge of Mt. Finlayson; however, most of the new road alignment would be the tunnel. The cuts at the tunnel portals would be large (up to 90 feet in height) and would require retaining walls in order to construct the road into the hillside. Road design features and final location would be planned to follow natural topographic contours as much as possible in order to minimize the number and height of road cuts and fills.

Because of gravelly soils, the tunnel would likely be constructed by using conventional earth moving equipment, and soil stabilization methods would be necessary. If rock or large boulders were encountered, blasting could be necessary; however, preliminary geological investigations show this would be unlikely. Since soils and geology would be a key component of the tunnel, portal, and road cuts, an extensive geotechnical investigation would be undertaken to develop final designs.

Tunnel excavation would generate approximately 4,000 to 5,000 truckloads of excess soil and rock material. A site would be needed for disposal of the excess material. A source of aggregate material would also be required for the project. If an existing commercial pit would be used for excess material disposal and aggregate source, the impacts to soils and geology in the pit area would be addressed in the existing pit permits and approvals. If a new site was needed for these activities, there could be impacts to topography and soils at the new site. No new material disposal sites would be allowed in the park and NRCA. There are no aggregate sources in the park or NRCA. If a new disposal site or aggregate source was required for this alternative, the effects would be analyzed by the FHWA prior to approval of the site for use. For this project, the FHWA requires that new non-commercial disposal and aggregate sources would have no more than a "no adverse effect" on cultural resources, a "no effect" determination on threatened and endangered species, and no encroachment into waters of the U.S. or wetlands.

Construction of alternative C would temporarily disturb approximately 10 acres. The disturbance would be from the new road alignment, new road cuts, fills, walls, equipment staging and stockpiles, and removal of the abandoned road alignment. Of the 10 acres of temporary soil disturbance, a total of about 9 acres would be restored and revegetated in road cut and fill slopes, staging areas, and on the abandoned road alignment.

About 1 acre of new ground surface area (outside of the tunnel) would be covered by impermeable road pavement under this alternative. However, approximately 2 acres of road pavement would be removed from the abandoned road segment, the abandoned road cut would be contoured to match the surrounding landscape, and the area would be revegetated using native vegetation. Therefore, the amount of impermeable pavement surface in the project area would be reduced by approximately 1 acre.

The alternative C alignment and tunnel would be routed through the natural bench along the ridge of Mt. Finlayson. The cut at the east tunnel portal would disturb the natural topography of the ridgeline. The road cut would be approximately 90 feet in height in this area. However, most of the road alignment on the ridgeline would be below ground in the tunnel. Only about 800 to 1,000 feet of roadway would be above ground in the natural bench area. As part of the project, the road cuts and fills on the east end would be designed to restore the existing quarry area to more closely follow natural contours.

Native soils in the project area consist primarily of highly-erosive gravelly sand. Because of this, road cuts would need to be gently sloped to ensure slope stability and promote revegetation. Further geotechnical investigation would be necessary to finalize slope designs prior to construction.

A NPDES permit would be required for this alternative. As part of the permit, a SWPPP would be prepared that outlines measures to be used at the construction site to reduce the amount of soil erosion and sediment leaving the site due to storm water runoff. As a permanent erosion and sediment control measure, all disturbed sites would be revegetated with native species.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.1.

Alternative C would realign the road onto the natural glacial benches below Mt. Finlayson, which would add a new impact to an area that currently contains no structures. Most of the realignment in the bench area would be below ground in the tunnel. New road cuts and fills and tunnel portals would add to cumulative impacts on topography, geology, and soils. This alternative would reduce the amount of (above ground) impermeable road pavement in the project area by about 1 acre, which would have a beneficial cumulative impact on soils. Because of federal and state land management protections, most of the Cattle Point peninsula is relatively undeveloped and future development is limited. Federal and state projects in the Cattle Point peninsula are planned to improve existing visitor and parking facilities. No new visitor facilities are planned on public land that would impact topography, geology and soils. There is the potential for limited residential construction on the small number of vacant lots on private property in east Cattle Point. This construction would have a minimal impact on soil in east Cattle Point and reduce the amount of impermeable surface in the project vicinity by a small amount. Current road density in the Cattle Point peninsula is low. No new roads are planned in the future. Alternative C would not increase road density since the existing road alignment would be obliterated and restored to natural conditions. When added to other past, present, and future activities overall impacts to topography, geology, and soils associated with alternative C would be minimal locally and region-wide.

Conclusion

With mitigation measures in place, construction of alternative C would have a minor adverse short-term effect on topography, geology, and soils in the project area. Over the long term, the realignment and tunnel through the natural bench below Mt. Finlayson along with the restoration of the abandoned road section would have a minor beneficial effect on soils and a minor adverse effect on the topography and geology of the project area and the Cattle Point peninsula. There would be no impairment to these resources as a result of this alternative.

<u>Mitigation Measures:</u>

TGS-1: Road Design. Same as CR-3, V-1, and STES-3. To the extent possible, road design features and final location would be planned to follow natural contours and to minimize the number and height of road cuts and fills. The abandoned quarry on the east end of Mt. Finlayson would be incorporated into the road profile and would be reclaimed to more closely follow natural surroundings. Cut slopes would be designed to insure slope stability and promote revegetation. Final road alignment and design would be adjusted to avoid or minimize impacts to rare native prairie sites and California buttercup. Final road design would also be adjusted to minimize impacts to the Mt. Finlayson Trail to the extent possible. Where impacts are unavoidable, the trail would be relocated adjacent to the new road alignment.

TGS-2: **Geology Wayside Exhibit.** A wayside exhibit would be developed to interpret the area's geology.

TGS-3: SWPPP. Same as H-1 and WQ-1. Prior to construction, the FHWA would develop a Storm Water Pollution Prevention Plan (SWPPP) for implementation during construction. The SWPPP would include measures (BMPs) for temporary erosion and sediment control devices during construction for control of concentrated storm water runoff. The SWPPP would also include BMPs for housekeeping measures to address the safe storage, handling, and spill prevention of hazardous construction materials.

TGS-4: Revegetation. Same as WQ-2. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment.

TGS-5: New Waste Site or Aggregate Source. No disposal sites would be allowed in the park or NRCA. If a non-commercial disposal site or aggregate source is required, the proposal would be analyzed by the FHWA for environmental impacts before approval for use. For this project, new non-commercial disposal and aggregate sources would have no more than a "no adverse effect" on cultural resources, a "no effect" determination on threatened and endangered species, and no encroachment into waters of the U.S. or wetlands.

4.6.2 Visual Quality

Alternative C would realign a short segment of the Cattle Point Road higher on the slope at the east end of Mt. Finlayson. Most of the new alignment would be within a 1,600-foot-long tunnel. The cuts at the tunnel portals would be large (up to 90 feet in height) and would require retaining walls in order to construct the road into the hillside.

Depending on topography and locale, differing views of construction activities and machinery would be visible from adjacent areas of the Cattle Point residential area, from the existing road, from some beach locations, from surrounding offshore areas, and from adjacent areas of the park and the NRCA during the 1.5 to 3-year construction period.

Following construction, the road alignment, road cuts and fills, and walls at the tunnel portals would be visible; however, most of the new alignment would be enclosed in the tunnel, especially close to the ridgeline. The east portal would be visible from the residential area, from offshore areas to the east, and from Lopez Island. From the beach and offshore areas to the south, the tunnel would reduce the visual impacts of the alternative, though walls near the portals would be visible. The road alignment located within the tunnel would appear to be part of the natural hillside landscape.

The final road and tunnel location would be planned to follow natural contours and minimize the number and height of road cuts, fills and walls to the extent possible. Wall profiles would be designed as low as possible and use materials with a natural appearance to minimize visual impacts. Following construction, all disturbed areas, including road cut and fill slopes and the abandoned road segment, would be revegetated using native species. The growth of planted native vegetation would serve to blend the road and tunnel portals into the natural surroundings in approximately 2 to 5 years following final construction. The view of the abandoned road segment would be restored to blend with the natural surroundings. Restoration would remove the asphalt, contour the road cut to match the surrounding landscape, and revegetate the area using native vegetation. Vegetation on the restored road segment would reach maturity in 2 to 5 years. Over the long term, there would be some evidence that a road was once present at the site, but the visual intrusion to the natural landscape would be small when viewed in the distance from viewpoints throughout Cattle Point and from offshore.

For users of the new road alignment, the views seen from the roadway outside of the tunnel would be similar to the existing conditions. The tunnel section would create a confined space, with no opportunity to view scenic vistas in this section of road. Scenic pullouts would be included at either end of the tunnel as space permits to mitigate for the loss of viewpoints within the tunnel.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.5.

Alternative C would realign the road onto the natural glacial benches below Mt. Finlayson, which currently contains no structures. However, most of the alignment would be underground in a tunnel. This location would be more visible than the existing road when viewed from offshore. The visible location and high cut, fill, and tunnel portal slopes would add moderately to the cumulative visual impacts of the undeveloped hillside. The abandoned road alignment would be obliterated and restored to natural conditions, which would negate its visual impact. The new road alignment would not increase the road density in the area. No future projects are planned on public land that would impact visual resources. There is the potential for limited residential construction on the small number of vacant lots on private property in east Cattle Point. This construction would have a minimal visual impact east of the project area. When added to other past, present, and future activities overall visual impacts associated with alternative C would be minimal locally and region-wide.

Conclusion

Because of these factors, ground disturbing activities and the presence of construction equipment would have a moderate adverse short-term effect on the visual quality of the project area. Over the long term, alternative C would have a minor beneficial effect on the visual quality of the project area when viewed from the Cattle Point peninsula, offshore, and from neighboring islands. There would be no impairment to this resource as a result of this alternative.

<u>Mitigation Measures:</u>

VQ-1: Road Design. Same as TGS-1 and STES-3. To the extent possible, road design features and final location would be planned to follow natural contours and to minimize the number and height of road cuts and fills. The abandoned quarry on the east end of Mt. Finlayson would be incorporated into the road profile and would be reclaimed to more closely follow natural surroundings. Cut slopes would be designed to insure slope stability and promote revegetation. Final road alignment and design would be adjusted to avoid or minimize impacts to rare native prairie sites and California buttercup. Final road design would also be adjusted to minimize impacts to the Mt. Finlayson Trail to the extent possible. Where impacts are unavoidable, the trail would be relocated adjacent to the new road alignment.

In addition, to the extent possible, walls would be designed with a low-profile and use materials with a natural appearance. Final wall design would be coordinated with an NPS landscape architect.

VQ-2: Scenic Turnouts. Where possible, scenic turnouts would be constructed along the road alignment for the road user to pull off the road to view the natural features of the area.

In addition, as space permits, a scenic turnout would be constructed before entering the west tunnel portal.

VQ-3: Revegetation. Same as WQ-2 and TGS-4. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment. See appendix A.

4.6.3 Vegetation

Alternative C would shift the road alignment upslope, away from the eroding coastal bluff and closer to the forested ridgeline, which would cut through a section of previously undisturbed prairie grassland vegetation. The fringe of the forest at the east end of the ridge line would also be impacted by the large road cut at the east tunnel portal. It is expected that some small trees may need to be removed for construction of cut slopes. Removal of large, mature trees would be avoided to the extent possible.

This alternative would construct about 2,830 feet of new road alignment. Of that area, 1,600 feet would be within a tunnel. Vegetation over the tunnel would not be impacted by road construction. Although there would be a substantial construction effort for tunnel construction, most of the work would take place underground. Construction of the 1,230 feet of road realignment outside of the tunnel would disturb the surrounding grassland at widths from 70 to 150 feet at cuts and fills and tunnel portals. Construction of the new alignment, equipment staging, and reclamation of the abandoned roadway segment would temporarily impact about 10 acres of grassland vegetation. Of the 10 acres of temporary vegetation disturbance, a total of about 9 acres would be restored and revegetated. Revegetated areas would include road cut and fill slopes, staging areas, and the abandoned road segment. The remaining 1 acre (outside of the tunnel) of disturbance would be covered by new pavement, which would involve permanent impacts to vegetation along the existing and new alignment. Restoration of the abandoned road segment would involve removal of about 2 acres of existing road pavement and road base material, contouring the road footprint to blend with the surrounding landscape, and planting the area with native vegetation. As a result, the net permanent gain in vegetation in the project area would total about 1 acre.

The preliminary alignment shows that one area (polygon) of native prairie is located in close proximity to the road alignment and may be impacted by road cuts and fills adjacent to the road realignment (figure 4.5). Native prairie polygons located above the tunnel alignment should not be impacted because tunnel construction activities would occur underground. To the extent possible, final road and tunnel portal design would be adjusted to avoid or minimize impacts to these rare native prairie sites. Prior to construction, a detailed restoration and revegetation plan would be developed that would outline methods and standards for revegetation of areas temporarily disturbed during the construction as well as restoration of the abandoned road segment. Revegetation would begin as soon as possible after completion of construction during the optimum time of year to ensure greatest plant survival. Topsoil removed during construction would be conserved and reapplied to revegetation sites to insure optimum plant establishment. If sufficient conserved topsoil is not available, native topsoil may be imported from elsewhere on the island. Erosion control measures would be applied in order to protect soil and seed prior to establishment of vegetation, following guidelines in the project SWPPP. All revegetation would use native species. Restoration of the abandoned road segment would provide the opportunity to restore native species and benefit the prairie grassland. All revegetated sites would be monitored for success and failed sites would be replanted as needed.

Figure 4.5 – Alternative C Alignment Relative to Native Prairie Polygon Locations

Road construction activities, soil disturbance, and imported topsoil provide conditions favorable for spread of weeds from adjacent lands as well as from outside of the project area. BMPs for control of weeds would be implemented during construction. Construction equipment would be cleaned of all mud, dirt, and plant material prior to entering the project area for the first time to minimize the spread of weeds. Aggregate and fill sources as well as imported topsoil would be inspected and certified as weed free before being approved for use on the project site. If weed-free aggregate and fill sources are not available, the material would be heat-treated to kill weed and weed seeds prior to transport to the project site. Even with BMPs in place, some weeds may be spread to the project from other areas within or immediately adjacent to the project area. The revegetation plan would include a plan for treatment of weeds on restored sites. Weed treatment would follow NPS and DNR guidelines.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.6.

Alternative C would realign the road into the prairie vegetation below Mt. Finlayson, which would add a new impact to an area that currently contains no structures. The impacted area includes one polygon of remnant native prairie vegetation that is rare on San Juan Island. Restoration of the abandoned road segment and revegetation of roadside cut and fill slopes and tunnel portals would provide the opportunity to benefit the restoration of native prairie vegetation in the Cattle Point peninsula. No future projects are planned on public land in the project area that would impact vegetation. Federal and state projects in the Cattle Point peninsula would improve existing visitor and parking facilities. There is the potential for limited residential construction on a small number of vacant lots on private property in east Cattle Point. This construction would impact a small amount of prairie and forest vegetation in the Cattle Point peninsula and add to cumulative effects. When added to other past, present, and future activities overall vegetation impacts associated with alternative C would be minimal locally and region-wide.

Conclusion

Because of these factors, construction and other ground disturbing activities would have a minor adverse short-term effect on vegetation in the project area. With mitigation measures in place, over the long term, alternative C would have a minor beneficial effect on vegetation in the project area. There would be no impairment to this resource as a result of this alternative.

Mitigation Measures:

> **V-1: Road Design.** Same as TGS-1. To the extent possible, road design features and final location would be planned to follow natural contours and to minimize the number and height of road cuts and fills. The abandoned quarry on the east end of Mt. Finlayson would be incorporated into the road profile and would be reclaimed to more closely follow natural surroundings. Cut slopes would be designed to insure slope stability and promote revegetation.
>
> In addition, final road alignment and design would be adjusted to avoid or minimize impacts to rare native prairie sites.
>
> **V-2: Revegetation.** Same as WQ-2, TGS-4 and VQ-3. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment. See appendix A.

In addition, revegetation would begin as soon as possible after completion of construction, during the optimum time of year to ensure greatest plant survival. Topsoil removed during construction would be conserved and reapplied to revegetation sites to insure optimum plant establishment. If sufficient conserved topsoil is not available, native topsoil may be imported from elsewhere on the island. The revegetation plan would include stipulations for use of conserved and imported topsoil and control of weeds.

V-3: Weed Inspection of Aggregate and Fill Sources. Aggregate and fill material sources would be inspected and certified as weed-free by a qualified person prior to approval for use. If weed-free sources are not available, material would be heat-treated to kill weeds and weed seeds.

V-4: BMPs for Weed Control. Construction equipment would be steam-cleaned prior to entering the project area for the first time. All roadsides and disturbed areas would be restored using native conserved topsoil and would be revegetated. Any imported topsoil needed would be certified as weed free. The revegetation plan would include a detailed weed control plan. See appendix A.

V-5: SWPPP. Same as H-1, WQ-1, and TGS-3. Prior to construction, the FHWA would develop a Storm Water Pollution Prevention Plan (SWPPP) for implementation during construction. The SWPPP would include measures (BMPs) for temporary erosion and sediment control devices during construction for control of concentrated storm water runoff. The SWPPP would also include BMPs for housekeeping measures to address the safe storage, handling, and spill prevention of hazardous construction materials.

4.6.4 Wildlife

Construction activities along the new road and tunnel alignment and continued traffic use on the existing road would result in an increase in human presence and noise intermittently during the 1.5 to 3-year construction period.

This alternative would move the road alignment upslope and closer to the important fringe habitat along the ridgeline where wildlife species transition between forest and grassland. The fringe of the forest at the east end of the ridge line would also be affected by the large road cut at the east tunnel portal. It is expected that some trees may need to be removed for construction of cut slopes. Removal of large mature trees would be avoided to the extent possible. However, most of the road alignment in this area would be enclosed in the tunnel. Over the long term, the habitat above the tunnel would be available for use by wildlife. Wildlife could also use the area above the tunnel as a means to safely cross over the roadway. Noise from the tunnel ventilation system could cause wildlife to avoid the area in close proximity to the machinery.

Project activities would directly impact wildlife habitat with ground disturbing activities on approximately 10 acres in the project area. Wildlife and bird species using this area would be displaced. Some smaller, less mobile ground-dwelling and nesting species may incur direct mortality. Construction activity and noise would deter animals from using the habitat in the project area for foraging and breeding. Noise and construction activity could also disrupt wildlife use adjacent to the construction site, possibly causing animals to move to other habitats. There is similar habitat surrounding the project area, including moderately large areas of grassland to the east and west as well as forested areas to the north. Blasting could be necessary if rock or large boulders are encountered during tunnel excavation. However, based on limited geologic research, this is not likely to occur.

Of the 10 acres of habitat disturbance, about 9 acres would be temporarily impacted during construction and about 1 acre would be permanently impacted by new surface road pavement (outside of the tunnel). Of the 9 acres of temporary habitat disturbance, about 2 acres would consist of roadside cuts, fills, and tunnel portals, about 5 acres would consist of equipment staging and stockpiling, and about 2 acres would consist of abandoned roadway restoration. These disturbed sites would be revegetated with native species following construction. Road cut and fill slopes would provide marginal wildlife habitat; however, the restored abandoned road segment would provide higher quality wildlife habitat in a relatively undisturbed setting. Habitat above the tunnel would also be available for use by wildlife. This would result in a net increase in wildlife habitat in the project area of approximately 1 acre over the existing condition.

This alternative would not change the capacity, function, or service of the road and would not result in an increase in traffic or visitor use; therefore, long-term effects of the new road alignment on wildlife are not expected to be substantially different than present. Fragmentation of continuous habitat patches into smaller sizes, wildlife road avoidance due to human activity and noise, and road mortality are expected to be less than existing road impacts due to the availability of wildlife habitat above the tunnel and use of the area above the tunnel for wildlife to safely cross over the roadway.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.7.

This alternative would move the road alignment closer to the fringe habitat near the ridge of Mt. Finlayson, which is currently undeveloped. Most of the realignment would be enclosed in a tunnel. The area above the tunnel would retain grassland habitat and allow wildlife to pass safely over the roadway. Restoration of the abandoned road segment would replace wildlife habitat lost by the new road alignment. The new road alignment would not increase the road density in the area. No future projects are planned on public land that would impact wildlife. The new road alignment would not increase the road density in the area. There is the potential for limited residential construction on the small number of vacant lots on private property in east Cattle Point. Residential construction would have a minimal impact on wildlife on the Cattle Point peninsula. When combined with other past, present, and future actions the effects of alternative C would result in a minor beneficial cumulative impact on wildlife locally and county-wide.

Conclusion

Because of these factors, construction activities associated with this alternative would have a moderate adverse short-term effect on wildlife use patterns and habitat in the project area. Over the long term, this alternative would have a minor beneficial effect on wildlife in the project area. There would be no impairment to this resource as a result of this alternative.

<u>Mitigation Measures:</u>

> **W-1: Revegetation.** Same as WQ-2, TGS-4, VQ-3, and V-2. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment.

In addition, revegetation would begin as soon as possible after completion of construction, during the optimum time of year to ensure greatest plant survival. Topsoil removed during construction would be conserved and reapplied to revegetation sites to insure optimum plant establishment. If sufficient conserved topsoil is not available, native topsoil may be imported soil from elsewhere on the island. The revegetation plan would include stipulations for use of conserved and imported topsoil and control of weeds.

4.6.5 Federally-Listed Threatened, Endangered, and Protected Species

There are no federally-listed threatened or endangered species known to be present or having habitat in the project area or vicinity.

The federally protected bald eagle is known to be present and have habitat within the project vicinity (table 4.2). WDFW data show that the project area is located within two historic bald eagle territories. Six historic nest sites containing nine nests are located within 0.5 miles of the project area. Bald eagle territories and nest sites are also located within 1 mile of the project area on Lopez Island and near the American Camp historic areas. Bald eagle nesting activities occur from January 1 to August 15 (USFWS 2004). The project area is also located within the 800-foot shoreline foraging buffer identified by the WDFW priority habitat and species data (wdfw.wa.gov/hab/phslist.htm, accessed March 26, 2007). Eagle wintering takes place in the county from October 31 to March 31. There are no known wintering roosts in the project area.

Construction noise impacts would affect an area within a 0.5-mile radius of the construction site depending on topographic barriers. Noise producing activities would take place during project construction, which is expected to last 1.5 to 3 years. Construction activities would take place along the new road alignment, abandoned road segment, haul routes, and staging areas. Regular traffic from residents and visitors would continue along the existing roadway during the construction period. These activities would result in an increase in human presence and noise intermittently during the 1.5 to 3-year construction period. Construction activities would include site preparation, earthmoving, general construction, and road surfacing. Site preparation would include activities such as land clearing and grubbing, including disposal of cleared material. Earthmoving would include cut and fill operations, trenching, soil compaction, grading, and transport of excess soil and rock material offsite, likely west of the project area and tunnel construction. It would involve hauling within the 800-foot buffer of the bald eagle nests in the American Camp historic area. Construction of alternative C would not likely produce loud noises such as blasting or pile-driving; however, if these uses become necessary, a separate assessment would be conducted by the FHWA, and would include an evaluation of the effects to the bald eagle.

The highest point on the alternative C road realignment would be located within the 800-foot buffer of one historic bald eagle nest near the peak of Mt. Finlayson. However, most of this portion of the alignment would be enclosed in the tunnel. The east tunnel portal would fall within the 800-foot nest buffer. All nest sites shown in the WDFW database in the Mt. Finlayson area were monitored by NPS in 2009. Of the seven nest locations, only one nest was found, and it was in disrepair and unoccupied (NPS 2009). The nest located closest to the proposed road realignments could not be found by the NPS in 2009.

The entire road realignment is located on the south slopes of Mt. Finlayson in the prairie grassland habitat. Bald eagle nesting and roosting habitat consists of large trees and elevated sites located in the forested habitat near the peak and on the north side of the Mt. Finlayson ridge. Road realignment is not expected to involve removal of large mature trees suitable for eagle habitat. Cutting of eagle habitat trees would be prohibited. The project area is located within the 800-foot shoreline foraging buffer on the Strait of Juan de Fuca.

Construction activities are expected to take place during part of the bald eagle nesting season and may also take place during part of the winter-foraging season. While construction activities may cause foraging eagles to avoid flying over the construction areas on the south slopes of Mt. Finlayson, foraging areas to the north and east would remain undisturbed. During breeding season, bald eagles are sensitive to a variety of human activities, including noise from construction activities. Not all bald eagle pairs react to human activities in the same way. Some nest successfully within close proximity to human activity while others abandon nest sites in response to activities much farther away (USFWS 2007b). Prior to construction, the bald eagle nest within the 800-foot buffer of the project area would be investigated to determine if it was in active use. If the nest is being used by bald eagle, noise-producing construction activities within the 800-foot buffer would be restricted during the nesting period. If the nest is not in use, no construction restrictions would be necessary. The bald eagles in the American Camp historic area have successfully raised chicks in close proximity to human activities (NPS 2009). Although these individuals have habituated to the routine uses in the area, increased construction traffic may disturb them during nesting. The American Camp nests would be monitored during the nesting period and noise-producing construction activities would be avoided to the extent possible.

The new road alignment would permanently relocate road noise and activities closer to the historic bald eagle nesting sites located near the ridge of Mt. Finlayson; however, most of the road alignment in this area would be enclosed in the tunnel, which would greatly reduce traffic noise.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.8.

Alternative C would move the road alignment closer to the historic bald eagle nests located near the ridge of Mt. Finlayson; however, most of the alignment close to the historic bald eagle nests would be confined to a tunnel. Construction traffic would impact an active nest along the haul route. Future projects to improve the American Camp visitor center could have a small impact on the eagle nest in the vicinity. Visitation to the park and use of the visitor's center and trails in close proximity to eagle's nests is expected to increase into the foreseeable future. Bald eagles nesting in the area near the visitor's center have become acclimated to human presence and vehicle traffic seems to have little effect on bald eagle use patterns (USFWS, personal communication, 2009); however, it is unknown whether there is a limit to the amount of human presence that would be tolerated. When added to other past, present, and future activities overall impacts on bald eagles associated with alternative C would be minimal locally and region-wide.

Conclusion

Overall, with mitigation measures in place, it is expected that construction activities associated with alternative C would have a minor adverse short-term effect on bald eagle use patterns in the project area. With implementation of the described mitigation measures, the project would be in compliance with USFWS *National Bald Eagle Management Guidelines* (May 2007), and impacts would be below the level of "take". No permits would be required. Over the long term, alternative C would have no effect on bald eagles in the project area and the Cattle Point peninsula. There would be no impairment to this resource as a result of this alternative.

Mitigation Measures:

FTES-1: Construction Timing Restrictions. Noise-producing construction activities within the 800-foot buffer of active bald eagle nests would be restricted during the nesting period (January 1 to August 15).

FTES-2: Prohibit Removal of Bald Eagle Habitat. Removal of large mature eagle habitat trees would be prohibited.

FTES-3: **Equipment Noise Control.** Same as N-1**.** Construction equipment would be equipped with functioning mufflers to limit exhaust noise. Equipment would be switched off when not in use.

4.6.6 State-Listed Threatened and Endangered Species

The state listed California buttercup is known to be present and have habitat within the area of potential impact for alternative C (table 4.3).

Occurrence of this species in the project area roughly coincides with the native prairie polygons (figure 4.5). The preliminary road alignment, road cuts and fills, and tunnel portals could potentially impact two small California buttercup polygons. Polygons along the tunnel alignment should not be affected because construction activities would take place underground. There are a total of 33 California buttercup polygons in the project area; therefore, the proposed realignment would impact about 6 percent of the population in the project area. To the extent possible, final road alignment and design would be adjusted to avoid or minimize impacts to this species. Priority would be given to avoiding large concentrations.

Restoration of the abandoned road segment as well as roadway cuts and fills would provide an opportunity for potential planting of California buttercup into new areas of the native prairie grassland. The revegetation plan would outline methods and standards for revegetation of the species in these areas. Road construction activities and soil disturbance provide the opportunity for spread of weeds from adjacent lands as well as from outside of the project area, which could impact California buttercup. BMPs for control of weeds would be implemented during construction.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.9.

The alternative C realignment would impact about 6 percent of the population of California buttercup in American Camp. Restoration of the abandoned road segment and revegetation of roadside cut and fill slopes would provide the opportunity to benefit the restoration of the species. No future projects are planned in the project area that would impact California buttercup. When added to other past, present, and future activities overall impacts to California buttercup associated with alternative C would be minimal locally and region-wide.

Conclusion

Because of these factors, construction activities associated with this alternative are likely to have a minor adverse short-term effect on the California buttercup in the project area. Over the long term, planting of California buttercup during restoration of the abandoned roadway may provide the opportunity to increase the population in the project area, provided that establishment is successful. As a result, the project could have a minor beneficial long-term effect on this species in the project area and in the Cattle Point peninsula. There would be no impairment to this resource as a result of this alternative.

Mitigation Measures:

> **STES-1: Road Design.** Same as TGS-1 and V-1. To the extent possible, road design features and final location would be planned to follow natural contours and to minimize the number and height of road cuts and fills. The abandoned quarry on the east end of Mt. Finlayson would be incorporated into the road profile and would be reclaimed to more closely follow natural surroundings. Cut slopes would be designed to insure slope stability and promote revegetation. Final road alignment and design would be adjusted to avoid or minimize impacts to rare native prairie sites and California buttercup.
>
> **STES-2**: **Revegetation.** Same as WQ-2, TGS-4, VQ-3, V-2, and W-1. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment. See appendix A.
>
> Revegetation would begin as soon as possible after completion of construction, during the optimum time of year to ensure greatest plant survival. Topsoil removed during construction would be conserved and reapplied to revegetation sites to insure optimum plant establishment. If sufficient conserved topsoil is not available, native topsoil may be imported soil from elsewhere on the island. The revegetation plan would include stipulations for use of conserved and imported topsoil and control of weeds.
>
> In addition, the revegetation plan would outline methods and standards for revegetation of the California buttercup in the abandoned roadway restoration and in roadway cuts and fills.
>
> **STES-3**: **BMPs for Weed Control.** Same as V-4. Construction equipment would be steam-cleaned prior to entering the project area for the first time. All roadsides and disturbed areas would be restored using native conserved topsoil and would be revegetated. Any imported topsoil needed would be certified as weed free. The revegetation plan would include a detailed weed control plan. See appendix A.

4.6.7 Trail System

The alternative C realignment moves the road closer to the existing trail on the ridge of Mt. Finlayson. However, most of the new road alignment would be enclosed in the tunnel, which would reduce the visible traffic and noise noticeable to trail users. At the east tunnel portal, the new road alignment would be located 200 to 400 feet south of the trail. At the east end of the project, approximately 100 to 150 feet of trail would be directly impacted by the cut slopes of the new alignment and would need to be relocated. This section of trail would be relocated directly adjacent to the new road fill on the east side of the roadway. To the extent possible, final road design would be adjusted to minimize impacts to the trail. The Mt. Finlayson Trail is the only trail directly impacted by this alternative (figure 4.6).

Construction noise and machinery would be noticeable to Mt. Finlayson Trail users along the eastern 4,000 feet of the trail route. The east end of the trail would probably be closed occasionally during the 1.5 to 3- year construction period. Closures should not affect the loop trail from the Mt. Finlayson Trail north to the Lagoon trails. However, hikers could not travel

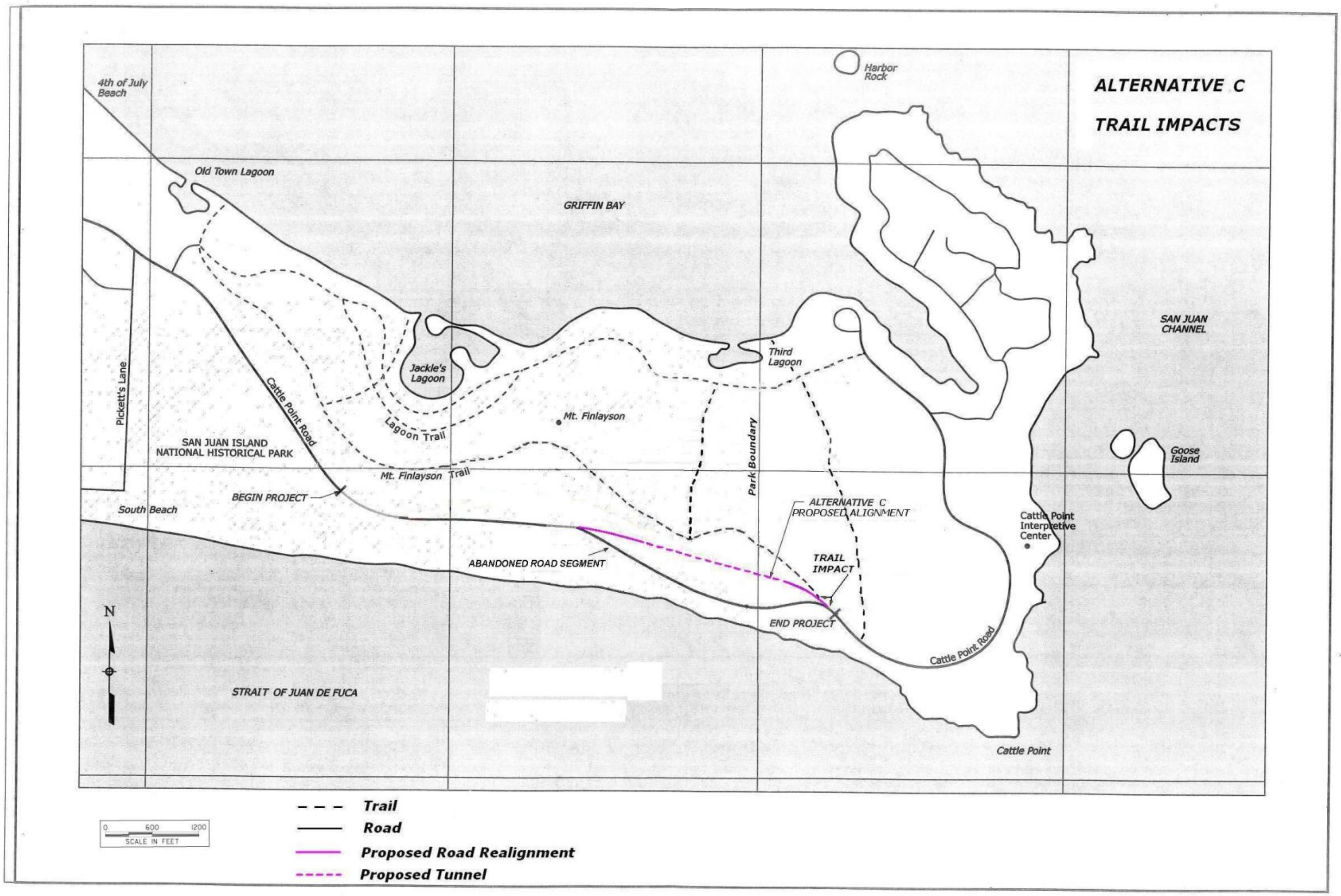


Figure 4.6- Alternative C Trail Impacts

the entire length of the Mt Finlayson Trail to link with Cattle Point Road on the east side of the project area. Construction would not affect the other NPS trails in American Camp.

Access to the DNR and BLM trails located to the east of the project area may be affected by traffic delays.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.15.

Alternative C would move the road alignment closer to the Mt. Finlayson Trail; however most of the road would be enclosed in the tunnel. The closer road proximity could increase the vehicle noise perceptible to trail users and reduce the sense of solitude. As traffic along the road increases in the future with normal increases in park visitation, this impact would become more noticeable to trail users. The realignment would also directly impact 100 to 150 feet at the east end of the Mt. Finlayson Trail. This area represents about 0.3 percent of the 9 miles of trail within the Cattle Point peninsula. The trail would be relocated to the toe of the fill adjacent to the new roadway and would not be completely lost to the trail system. No future projects are planned in the project areas that would adversely impact the trail system. When added to other past, present, and future actions the overall trail system would not change in a measurable way.

Conclusion

Because of these factors, construction of alternative C would have a moderate adverse short-term effect on the Mt. Finlayson Trail. However, the effect of construction on the trail system in the Cattle Point peninsula as a whole would be minor. Over the long term, this alternative would have a negligible adverse effect on the Mt. Finlayson Trail and the trail system on the Cattle Point peninsula as a whole. There would be no impairment to this resource as a result of this alternative.

<u>Mitigation Measures:</u>

> **T-1: Road Design.** Same as TGS-1, V-1, STES-3, and VQ-1. To the extent possible, road design features and final location would be planned to follow natural contours and to minimize the number and height of road cuts and fills. The abandoned quarry on the east end of Mt. Finlayson would be incorporated into the road profile and would be reclaimed to more closely follow natural surroundings. Cut slopes would be designed to insure slope stability and promote revegetation. Final road alignment and design would be adjusted to avoid or minimize impacts to rare native prairie sites and California buttercup. To the extent possible, walls would be designed with a low profile and use of materials with a natural appearance. Final wall design would be coordinated with an NPS landscape architect.
>
> In addition, final road design would be adjusted to minimize impacts to the Mt. Finlayson Trail to the extent possible. Where impacts are unavoidable, the trail would be relocated adjacent to the new road alignment.

4.6.8 Transportation and Road System

Construction activities are expected to last 1.5 to 3 years. During construction, the existing Cattle Point Road alignment would be left open to maintain access to the east end of the Cattle

Point peninsula. Most construction operations for road realignment would take place outside of the existing Cattle Point Road alignment; however, traffic delays would still be expected on Cattle Point Road adjacent to the construction site. Delays would likely be limited to 30 minutes or less except during construction of the connection between the realigned road section with the existing roadway. Construction of these short road sections may require full road closure for up to 4 hours at a time for approximately 1 to 2 weeks during construction of both ends of the connection. Road closure and delay schedules would be publicized ahead of time with public announcements through the NPS and local media.

Tunnel excavation would generate approximately 4,000 to 5,000 truckloads of excess soil and rock material. Disposal of excess material, as well as transport of aggregate material required to build the project, would result in heavy construction traffic and increased congestion and possible delays on surrounding local roads. There would be heavy loads related to construction traffic; however, all construction traffic would follow the legal load limits. Therefore little deterioration of the surrounding road system is anticipated above normal wear levels.

Over the long term, this alternative would not change the capacity, function, or service of the Cattle Point Road. The existing access to the Cattle Point area would be preserved and there would be no change (either increase or reduction) in traffic in the area beyond that expected with normal growth. The abandoned road segment would be obliterated and restored to natural conditions following construction of the new alignment.

The realigned segment would be shorter than the existing alignment; however, the tunnel would greatly add to the cost and effort of maintenance of the new road. Since there are no tunnels currently located in San Juan County, the road department does not have the equipment or expertise needed to perform tunnel inspection and maintenance. Start-up costs would be associated with training personnel and obtaining proper equipment. Some project funds could be used to offset initial start-up costs for training and equipment necessary for tunnel maintenance. It is estimated that maintenance costs for the new road alignment and tunnel would average about $65,000 annually.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.16.

Alternative C would not change the capacity, function, or service of the Cattle Point Road. The alternative would preserve the existing access to the east Cattle Point area and would not result in a change (either increase or reduction) in traffic in the area beyond that expected with normal growth. There is the potential for limited residential construction on the small number of vacant lots on private property in east Cattle Point. This construction would increase the residential population of the area by a small amount, which in turn would increase use on area roads. No future projects are planned on public land that would affect the transportation and road system. The impacts to the transportation and road system associated with alternative C would not alter current trends and would not contribute to cumulative impacts locally and county-wide.

Conclusion

Because of these factors, construction activities would have a moderate adverse short-term effect on transportation and access in the project area and the Cattle Point peninsula. Over the long term, this alternative would have no effect on the transportation system in the project area or on San Juan Island; however, it would have a moderate adverse effect on county maintenance costs.

Mitigation Measures:

> **TR-1: Traffic Management.** Same as VU-1**.** A traffic control plan would be developed specifying road closure times and a public information program. Delays would be limited to 30 minutes or less. Construction of the short connectors between the existing roadway and the new alignment may require full road closure for up to 4 hours intermittently during approximately 1 to 2 weeks.
>
> **TR-2: Road Damage.** Construction traffic would follow legal load limits to minimize damage to area roads from heavy equipment.
>
> **TR-3: County Maintenance Costs.** Project funds may be provided to the county to offset initial start-up costs for training and equipment necessary for tunnel maintenance.

4.6.9 Special Vehicles, Bicycles, and Pedestrians

Construction traffic and hauling of large amounts of excavated tunnel material along local routes leading to the construction site would create a safety concern for small vehicles, bicycles, and pedestrians using the road shoulders. Operation of heavy equipment in the immediate project area would cause a safety issue for use of these modes of transportation through the construction area. Due to safety considerations, these uses could be restricted through the construction site during part or all of the construction period. The FHWA would include requirements in the construction contract warning construction equipment operators to use extra caution due to heavy use of area roads by special vehicles, bicycles, and pedestrians.

Design of the realigned road segment would include improved shoulders for bicycle and pedestrian traffic. Preliminary design calls for 4-foot paved shoulders along the length of the realignment. While this would improve road function and safety for special vehicles, bicycles, and pedestrians in the realigned segment, the existing roadway leading to the new realignment would continue to have narrow shoulders. The section of Cattle Point Road between the west park boundary and Pickett's Lane has 1.5-foot gravel/native material shoulders and from Pickett's Lane to the east park boundary, the road has 1-foot gravel/native material shoulders.

Preliminary tunnel design includes a 4-foot bike lane adjacent to both travel ways and a 2-foot-wide raised sidewalk for pedestrians. The bike lane would provide special vehicles and bicycles sufficient room to travel safely through the tunnel. The long enclosed tunnel would give the perception of an increased safety risk for special vehicles or bicycles using the tunnel. A 2001 California study concluded that bicycle collisions were no more frequent in tunnels than on the approaches to the tunnels (Statewide Safety Study of Bicycles and Pedestrians on Freeways, Expressways, Toll Bridges, and Tunnels MTI Report 01-01, 2001). Slow moving vehicles such as mopeds and scoot-cars that cannot use the confined shoulder area may pose a hazard. Signs with flashing beacons activated by the special vehicle operator, bicyclist, or pedestrian would be installed at tunnel portals warning motorists of "Bicyclist or Slow-moving Vehicle in Tunnel When Flashing."

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.14.

Alternative C would not change the capacity, function, or service of the road that would lead to a change in special vehicle, bicycle, or pedestrian use. The alternative would preserve the existing access to the east end of the Cattle Point peninsula. There is the potential for limited residential construction on the small number of vacant lots on private property in east Cattle Point. This construction would increase the residential population of the area by a small amount, which in turn could result in increased use by special vehicles, bicycles, and pedestrians on area roads. Visitation to the park is expected to increase into the future along with increases in use by special vehicles, bicycles, and pedestrians. No future projects are planned on public land that would affect these uses. Impacts to special vehicle, bicycle, and pedestrian use associated with alternative B would not alter current trends and would not contribute to cumulative impacts locally and county-wide.

Conclusion

Because of these factors, construction activities would have a moderate adverse short-term effect on special vehicle, bicycle, and pedestrian use in the project area and Cattle Point peninsula. Over the long term, the new road alignment and tunnel would have a minor adverse effect on special vehicle, bicycle, and pedestrian use in the Cattle Point peninsula.

Mitigation Measures:

> **SVBP-1: Construction Traffic Safety.** Construction equipment and vehicle operators would be required to use extra caution when approaching and passing special vehicles, bicycles, and pedestrians.
>
> **SVBP-2: Warning Signs.** Signs with flashing beacons activated by the special vehicle operator, bicyclist, or pedestrian would be installed at tunnel portals warning motorists of "Bicyclist or Slow-moving Vehicle in Tunnel When Flashing"

4.6.10 Unavoidable Adverse Impacts

Alternative C would involve a number of unavoidable short-term adverse affects. Construction activities would temporarily impact the visual quality of the area with the presence of construction equipment and soil disturbing activities. Construction would impact visitor uses such as hiking at the east end of the Mt. Finlayson trail; special vehicle, bicycle, and pedestrian safety in the project vicinity; and cause disturbances for residents and visitors to the east end of the Cattle Point peninsula from construction noise and sporadic traffic disruptions. Wildlife use patterns and habitat, as well as vegetation and rare prairie plants would also be adversely affected by construction activities. All construction-related impacts would be temporary and would end following completion of project construction. Disturbed sites would be revegetated using native species.

Over the long term, this alternative would adversely impact the topography of the area by realigning the roadway onto the previously undeveloped natural glacial bench on the slopes of Mt. Finlayson. The roadway and roadside cuts and fills would permanently impact the integrity of the glacial bench; however, most of the alignment would be enclosed in a tunnel, which would have a minor beneficial effect on the visual quality of the project area when viewed from the Cattle Point peninsula, offshore, and from neighboring islands. The tunnel would also reduce wildlife habitat fragmentation and improve wildlife passage over the roadway. The Mt. Finlayson trail would be adversely impacted by the alternative C alignment. The eastern 100 to 150 feet of trail would be directly impacted by road cuts and would need to be relocated.

4.7 IMPACTS OF ALTERNATIVE D - MID-SLOPE ALIGNMENT WITH SHORT TUNNEL

This alternative involves realignment of the road to the north of the existing road, approximately 470 feet away from the eroding bluff area through a short tunnel. The project would begin about 0.65 miles east of the Pickett's Lane intersection. At the beginning of the project, the road would be widened, and the grade would be raised along the current alignment for about 1,100 linear feet in order to transition with the new road alignment. The new alignment would then leave the existing roadway and travel north, following a natural bench for approximately 1,000 linear feet. From there, the roadway would climb a moderately steep grade for about 1,500 feet where it would enter a tunnel along the ridgeline of Mt. Finlayson. The tunnel would be approximately 775 feet in length. On exiting the tunnel, the road would curve down the ridge to the southeast where it would connect back to the existing road near where the NRCA trail meets the existing Cattle Point Road. At its maximum, the tunnel would be located about 470 feet to the north of the bluff erosion site. It is estimated that this alignment would protect the road from the threat of bluff erosion for over 150 years. The estimated cost for construction of this alternative is approximately $30 to 40 million. Construction would take 1.5 to 3 years.

4.7.1 Topography, Geology, and Soils

Alternative D would reroute the roadway onto the natural bench to the north of the bluff erosion site. The realignment would climb a moderately steep grade, where it would enter a short tunnel along the ridgeline of Mt. Finlayson. Cuts and fills along the road alignment and at the tunnel portals would be large, up to 50 feet in height, and would require large retaining walls to stabilize the earth around the tunnel portals. Road design features and final location would be planned to follow natural topographic contours as much as possible in order to minimize the number and height of road cuts and fills.

The tunnel would be built by excavating a large cut, constructing the tunnel structure, and filling in material on top of the structure to restore the natural ground surface. If rock or large boulders were encountered, blasting could be necessary; although, preliminary geological investigations show this to be unlikely. The tunnel would be designed to generate a minimal amount of excess earth.

Construction of this alternative would temporarily disturb approximately 20 acres, consisting of new road alignment, road cuts and fills, tunnel construction, equipment staging and stockpiling, and reclamation of the abandoned road segment. Of the 20 acres of temporary soil disturbance, about 17 acres would be restored and revegetated using native vegetation. The restored areas would include about 2 acres of ground surface covering the tunnel. This alternative involves a wider and slightly longer road alignment than currently exists; however, part of the road would be located in a covered tunnel. About 3 acres of new ground surface area (outside of the tunnel) would be covered by impermeable road pavement. However, about 3 acres of road pavement would be removed from the abandoned road segment, the road cut would be contoured to match the surrounding landscape, and the area would be revegetated using native vegetation. Therefore, there would be no net increase or reduction in impermeable pavement surface under this alternative.

The natural benches through which the new alignment would be routed were formed by glacial rebound and are an important geologic feature of the area. This alternative would require cuts and fills along the highest bench of Mt. Finlayson where it is most visible. However, the original surface contour of the most visible part of the bench would be restored as the tunnel section is filled. Near the east end of the project route, the road would enter a short tunnel that would serve to lower the road profile through the top of the ridgeline area and avoid the steep grade at its east end. About 2,000 feet of new road alignment would be above ground in the natural bench area. Another 775 feet of the road below the east ridge of Mt. Finlayson would be within the tunnel. As part of the project, the road cuts and fills on the east end would be designed to restore the quarry area to more closely follow natural contours.

Native soils in the project area consist primarily of highly erosive gravelly sand. Because of this, road cuts would need to be gently sloped to ensure slope stability and promote revegetation. Further geotechnical investigation would be necessary to finalize slope designs prior to construction.

An NPDES permit would be required for this alternative. As part of the permit, a SWPPP would be prepared that outlines measures used at the construction site to reduce the amount of soil erosion and sediment leaving the site due to storm water runoff. As a permanent erosion and sediment control measure, all disturbed sites would be revegetated using native species.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.1.

Alternative D would realign the road onto the natural glacial benches below Mt. Finlayson, which would add a new impact to an area that currently contains no structures. Part of the realignment in the bench area would be below ground in the tunnel. New road cuts and fills and tunnel portals would add to cumulative impacts on topography, geology, and soils. Under this alternative there would be no increase in impermeable road pavement to the cumulative impact on soils in the project area. Because of federal and state land management protections, most of the Cattle Point peninsula is relatively undeveloped and future development is limited. Federal and state projects in the Cattle Point peninsula are planned to improve existing visitor and parking facilities. No new visitor facilities are planned on public land that would impact topography, geology and soils. There is the potential for limited residential construction on the small number of vacant lots on private property in east Cattle Point. This construction would have a minimal impact on soil in east Cattle Point and reduce the amount of impermeable surface in the project vicinity by a small amount. Current road density in the Cattle Point peninsula is low. No new roads are planned in the future. Alternative D would not increase road density since the existing road alignment would be obliterated and restored to natural conditions. Overall, impacts from alternative D when added to past, present, and future actions would result in minimal impacts to topography, geology, and soils locally and county-wide.

Conclusion

With mitigation measures in place, construction of alternative D would have a minor adverse short-term effect on topography, geology, and soils in the project area. Over the long term, the realignment and tunnel through the natural bench below Mt. Finlayson along with the restoration of the abandoned road section would have a minor beneficial effect on soils and a moderate adverse effect on the topography and geology of the project area and the Cattle Point peninsula. There would be no impairment to this resource as a result of this alternative.

<u>Mitigation Measures</u>: All are the same as alternative B, section 4.5.1

> **TGS-1: Road Design.** Same as V-1, and STES-3. To the extent possible, road design features and final location would be planned to follow natural contours and to minimize

the number and height of road cuts and fills. The abandoned quarry on the east end of Mt. Finlayson would be incorporated into the road profile and would be reclaimed to more closely follow natural surroundings. Cut slopes would be designed to insure slope stability and promote revegetation. Final road alignment and design would be adjusted to avoid or minimize impacts to rare native prairie sites and California buttercup. Final road design would also be adjusted to minimize impacts to the Mt. Finlayson Trail to the extent possible. Where impacts are unavoidable, the trail would be relocated adjacent to the new road alignment.

TGS-2: **Geology Wayside Exhibit.** A wayside exhibit would be developed to interpret the area's geology.

TGS-3: SWPPP. Same as H-1 and WQ-1. Prior to construction, the FHWA would develop a Storm Water Pollution Prevention Plan (SWPPP) for implementation during construction. The SWPPP would include measures (BMPs) for temporary erosion and sediment control devices during construction for control of concentrated storm water runoff. The SWPPP would also include BMPs for housekeeping measures to address the safe storage, handling, and spill prevention of hazardous construction materials.

TGS-4: Revegetation. Same as WQ-2. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment. See appendix A.

TGS-5: New Waste Site or Aggregate Source. No disposal sites would be allowed in the park or NRCA. If a non-commercial disposal site or aggregate source is required, the proposal would be analyzed by the FHWA for environmental impacts before approval for use. For this project, new non-commercial disposal and aggregate sources would have no more than a "no adverse effect" on cultural resources, a "no effect" determination on threatened and endangered species, and no encroachment into waters of the U.S. or wetlands.

4.7.2 Visual Quality

This alternative would realign the road higher on the south slopes of Mt. Finlayson. Approximately 775 feet of the new alignment would be within a tunnel, near the east ridgeline of Mt. Finlayson. The cuts at the tunnel portals would be large (up to 50 feet in height) and may require retaining walls in order to construct the road into the hillside. Walls would present a solid visual disturbance to the natural topography. The final road design and location would follow natural contours and minimize the number and height of road cuts, fills, and walls to the extent possible. Wall profiles would be designed as low as possible and use materials with a natural appearance to minimize visual impacts.

Depending on topography and locale, differing views of construction activities and machinery would be visible from adjacent areas of the Cattle Point residential area, the existing road, some beach locations, surrounding offshore areas, and adjacent areas of the park and the NRCA during the 1.5 to 3 year construction period.

The "cut and cover" method of tunnel construction would involve excavating a trench from the surface, building the tunnel structure in the trench, and then backfilling and restoring the ground above the tunnel. Large amounts of soil from the trench would be temporary stockpiled during the construction period. Stockpiles would likely be wind-rowed adjacent to the new and existing road alignments. The excavated trench and stockpiled soil would create a short term visual impact. Following construction, the road alignment, road cuts and fills, and walls at the tunnel portals would be visible; however 775 feet of the new alignment near the east end of Mt. Finlayson would be enclosed in the tunnel. The east tunnel portal would be visible from the residential area, from offshore areas to the east, and from Lopez Island. From the beach and offshore areas to the south, the tunnel would somewhat reduce the visual impacts of the alternative, though walls near the tunnel portals would be visible. The road alignment located within the tunnel would appear to be part of the natural hillside landscape.

The final road and tunnel location would be planned to follow natural landscape contours and minimize the number and height of road cuts, fills, and walls to the extent possible. Wall profiles would be designed as low as possible and use materials with a natural appearance to minimize visual impacts. Following construction, all disturbed areas including cut and fill slopes, the area above the tunnel, and the abandoned road segment would be revegetated using native species. Over 2 to 5 years, the growth of planted native vegetation would serve to blend the roadside, the area above the tunnel, and the tunnel portals into the natural surroundings. Reclamation of the abandoned road segment would remove the asphalt pavement, contour the road cut to match the surrounding landscape, and revegetate the area using native species. Over the long term, there would be some evidence that a road was once present at the site, but the visual intrusion to the natural landscape would be small when viewed in the distance from viewpoints throughout Cattle Point and from offshore.

For road users, the views seen from the roadway outside of the tunnel would be similar to the existing conditions. The tunnel section would create a confined space and there would be no opportunity to view scenic vistas in this section of road. Scenic pullouts would be included at either end of the tunnel as space permits to mitigate for the loss of viewpoints within the tunnel.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.5.

Alternative D would realign the road onto the natural benches below Mt. Finlayson, which currently contains no structures. However, some of the alignment would be underground in a tunnel. This location would be more visible than the existing road when viewed from offshore. The visible location and high cut, fill, and tunnel portal slopes would add moderately to the cumulative visual impacts of the natural hillside. The abandoned road alignment would be obliterated and restored to natural conditions, which would negate its visual impact. The new road alignment would not increase the road density in the area. No future projects are planned on public land that would impact visual resources. There is the potential for limited residential construction on the small number of vacant lots on private property in east Cattle Point. This construction would have a minimal visual impact east of the project area. Overall, impacts from alternative D when added to past, present, and future actions would result in minimal impacts to visual quality locally and region-wide.

Conclusion

Overall, ground disturbing activities and construction would have a moderate adverse short-term impact on the visual quality of the project area. Over the long term, the adverse visual impacts of the new road alignment when viewed from the Cattle Point peninsula, offshore, and from neighboring islands would be minor. There would be no impairment to this resource as a result of this alternative.

Mitigation Measures:

VQ-1: Road Design. Same as TGS-1 and STES-3. To the extent possible, road design features and final location would be planned to follow natural contours and to minimize the number and height of road cuts and fills. The abandoned quarry on the east end of Mt. Finlayson would be incorporated into the road profile and would be reclaimed to more closely follow natural surroundings. Cut slopes would be designed to insure slope stability and promote revegetation. Final road alignment and design would be adjusted to avoid or minimize impacts to rare native prairie sites and California buttercup. Final road design would also be adjusted to minimize impacts to the Mt. Finlayson Trail to the extent possible. Where impacts are unavoidable, the trail would be relocated adjacent to the new road alignment.

In addition, to the extent possible, walls would be designed with a low-profile and use materials with a natural appearance. Final wall design would be coordinated with an NPS landscape architect.

VQ-2: Scenic Turnouts. Where possible, scenic turnouts would be constructed along the road alignment for the road user to pull off the road to view the natural features of the area.

In addition, as space permits, a scenic turnout would be constructed before entering the west tunnel portal

VQ-3: Revegetation. Same as WQ-2 and TGS-4. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment. See appendix A.

4.7.3 Vegetation

This alternative would shift the road location upslope, away from the eroding coastal bluff and closer to the forested ridgeline, which would cut through a section of previously undisturbed prairie vegetation. The fringe of the forest at the east end of the ridgeline would also be affected. It is expected that some trees may need to be removed for construction of cut slopes. Removal of mature trees would be avoided to the extent possible.

Construction of alternative D would affect about 4,700 linear feet of grassland at widths varying from 60 to 120 feet for cuts, fills, and tunnel construction. Construction of the new alignment, tunnel construction, equipment staging, soil stockpiling, and restoration of the abandoned road segment would impact about 20 acres of vegetation. The tunnel would be built by excavating a large cut, constructing the tunnel structure, and filling in material on top of the structure to restore the natural ground surface. Of the 20 acres of disturbance, about 17 acres would be restored and revegetated. Revegetated areas include roadside cut and fill slopes, the area above the tunnel, and restoration of the abandoned road segment. This alternative involves a wider and slightly longer road than currently exists; however, a portion would be located in the covered tunnel section. About 3 acres of disturbed area (outside of the tunnel) would be covered by new pavement, which would involve permanent impacts to vegetation along the existing and new road alignment. Restoration of the abandoned road segment would involve removal of approximately 3 acres of existing pavement and road base, contouring the road footprint to blend with the surrounding landscape, and planting the area with native vegetation. There would be no permanent net loss of vegetation in the project area as the result of this alternative.

The preliminary road alignment shows that eight areas (polygons) of native prairie could be impacted by road construction (figure 4.7). To the extent possible, final road alignment and design would be adjusted to avoid or minimize impacts to these rare native prairie sites. The cut and cover method of tunnel construction would impact two areas of native prairie. The area above the tunnel would be revegetated using native species, providing an opportunity to increase the amount of native prairie in the project area. Existing native vegetation would be retained whenever feasible.

Prior to construction, a detailed restoration and revegetation plan would be developed that would outline methods and standards for revegetation of areas temporarily disturbed during the construction as well as restoration of the abandoned road segment. Revegetation would begin as soon as possible after completion of construction, during the optimum time of year to ensure greatest plant survival. Topsoil removed during construction would be conserved and reapplied to revegetation sites to insure optimum plant establishment. If sufficient conserved topsoil is not available, native topsoil may be imported from elsewhere on the island. Erosion control measures would be applied in order to protect soil and seed prior to establishment of vegetation, following guidelines in the project SWPPP. All revegetation would use native species. Restoration of the abandoned road segment would provide the opportunity to restore native species and benefit the prairie grassland. All revegetated sites would be monitored for success and failed sites would be replanted as needed.

Road construction activities, soil disturbance, and imported topsoil provide conditions favorable for spread of weeds from adjacent lands as well as from outside of the project area. BMPs for control of weeds would be implemented during construction. Construction equipment would be cleaned of all mud, dirt, and plant material prior to entering the project area for the first time to minimize the spread of weeds from outside the project area. Aggregate and fill sources as well as imported topsoil would be inspected and certified as weed-free before being approved for use on the project site. If weed-free aggregate and fill sources are not available, the material would be heat-treated to kill weed and weed seeds prior to transport to the project site. Even with BMPs in place, some weeds may be spread to the project from other areas within or immediately adjacent to the project area. The revegetation plan would include a plan for treatment of weeds on restored sites. Weed treatment would follow NPS and DNR guidelines.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.6.

Alternative D would realign the road into the prairie vegetation below Mt. Finlayson, which would add a new impact to an area that currently contains no structures. The impacted area includes eight polygons of remnant native prairie vegetation that is rare on San Juan Island. Restoration of the abandoned road segment and revegetation of roadside cut and fill slopes and tunnel portals would provide the opportunity to benefit the restoration of native prairie vegetation in the Cattle Point peninsula. No future projects are planned on public land in the project area that would impact vegetation. Federal and state projects in the Cattle Point peninsula would improve existing visitor and parking facilities. There is the potential for limited residential construction on a small number of vacant lots on private property in east Cattle Point. This construction would impact a small amount of prairie and forest vegetation in the Cattle Point peninsula and add to cumulative effects. Overall, impacts from alternative D

Figure 4.7 – Alternative D Alignment Relative to Native Prairie Polygon Locations

when added to past, present, and future actions would result in minimal impacts to vegetation locally and region-wide.

Conclusion

Because of these factors, construction and other ground disturbing activities would have a minor adverse short-term effect on vegetation in the project area. With mitigation measures in place, the long-term effects to vegetation in the project area would be negligible. There would be no impairment to this resource as a result of this alternative.

Mitigation Measures:

V-1: Road Design. Same as TGS-1. To the extent possible, road design features and final location would be planned to follow natural contours and to minimize the number and height of road cuts and fills. The abandoned quarry on the east end of Mt. Finlayson would be incorporated into the road profile and would be reclaimed to more closely follow natural surroundings. Cut slopes would be designed to insure slope stability and promote revegetation.

In addition, final road alignment and design would be adjusted to avoid or minimize impacts to rare native prairie sites.

V-2: Revegetation. Same as WQ-2, TGS-4 and VQ-3. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment. See appendix A.

In addition, revegetation would begin as soon as possible after completion of construction, during the optimum time of year to ensure greatest plant survival. Topsoil removed during construction would be conserved and reapplied to revegetation sites to insure optimum plant establishment. If sufficient conserved topsoil is not available, native topsoil may be imported from elsewhere on the island. The revegetation plan would include stipulations for use of conserved and imported topsoil and control of weeds.

V-3: Weed Inspection of Aggregate and Fill Sources. Aggregate and fill material sources would be inspected and certified as weed-free by a qualified person prior to approval for use. If weed-free sources are not available, material would be heat-treated to kill weeds and weed seeds.

V-4: BMPs for Weed Control. Construction equipment would be steam-cleaned prior to entering the project area for the first time. All roadsides and disturbed areas would be restored using native conserved topsoil and would be revegetated. Any imported topsoil needed would be certified as weed free. The revegetation plan would include a detailed weed control plan. See appendix A.

V-5: SWPPP. Same as H-1, WQ-1, and TGS-3. Prior to construction, the FHWA would develop a Storm Water Pollution Prevention Plan (SWPPP) for implementation during construction. The SWPPP would include measures (BMPs) for temporary erosion and sediment control devices during construction for control of concentrated storm water runoff. The SWPPP would also include BMPs for housekeeping measures to address the safe storage, handling, and spill prevention of hazardous construction materials.

4.7.4 Wildlife

Construction activities along the new road and tunnel alignment and continued traffic use on the existing road would result in an increase in human presence and noise intermittently during the 1.5 to 3-year construction period.

The new road alignment would move upslope and closer to the important fringe habitat along the ridgeline where wildlife species transition between forest and grassland. However, about 775 feet of the road closest to the ridgeline would be enclosed in a tunnel. The fringe of the forest at the east end of the ridge line would also be affected by the large road cut at the east tunnel portal. It is expected that some trees may need to be removed for construction of cut slopes. Removal of mature trees would be avoided to the extent possible. Over the long term, the habitat above the tunnel would be restored and available for use by wildlife. Wildlife would also use the area above the tunnel as a means to safely cross over the roadway.

Project activities would directly impact wildlife habitat with ground disturbing activities on approximately 20 acres in the project area. Wildlife and bird species using the area would be displaced. Some smaller, less mobile ground-dwelling and nesting species may incur direct mortality. Construction activity and noise would deter animals from using the habitat for foraging, migration, and breeding. Noise and construction activity could also disrupt wildlife use adjacent to the construction site, possibly causing animals to move to other habitats. There is similar habitat surrounding the project area, including moderately large areas of grassland to the east and west as well as forested areas to the north. Blasting could be necessary if rock or large boulders are encountered during tunnel excavation. However, based on limited geologic research, this is not likely to occur.

Of the 20 acres of habitat disturbance, approximately 17 acres would be temporarily impacted during construction and 3 acres would be permanently impacted by new road pavement (above ground). Of the 17 acres of temporary habitat disturbance, about 9 acres would consist of roadside cuts, fills, and tunnel construction, about 5 acres would consist of equipment staging and soil stockpiling, and about 3 acres would consist of abandoned roadway restoration. These disturbed sites would be revegetated with native plants following construction. Road cut and fill slopes would provide marginal wildlife habitat; however, the restored abandoned road segment would provide higher quality prairie habitat in a relatively undisturbed setting. Habitat above the tunnel would also be available for use by wildlife.

About 3 acres of new surface area (outside of the tunnel) would be covered by pavement under this alternative; however, about 3 acres of pavement would be removed from the abandoned road segment. The abandoned roadway would be contoured to match the surrounding landscape and the area would be revegetated using native prairie vegetation. Therefore, there would be no net loss in prairie habitat as a result of this alternative.

This alternative would not change the capacity, function, or service of the road and would not result in an increase in traffic or visitor use; therefore, long-term effects of the new road alignment on wildlife are not expected to be substantially different than present. Fragmentation of continuous habitat patches into smaller sizes, wildlife road avoidance due to human activity and noise, and road mortality are expected to be somewhat less than existing road impacts due to the availability of wildlife habitat above the tunnel and use of the area above the tunnel for wildlife to safely cross over the roadway.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.7.

This alternative would move the road alignment closer to the fringe habitat near the ridge of Mt. Finlayson, which is currently undeveloped. Some of the realignment would be enclosed in a tunnel. Following revegetation, the area above the tunnel would retain grassland habitat and allow wildlife to pass safely over the roadway. Restoration of the abandoned road segment would replace wildlife habitat lost by the new road alignment. The new road alignment would not increase the road density in the area. No future projects are planned on public land that would affect wildlife. There is the potential for limited residential construction on the small number of vacant lots on private property in east Cattle Point. Residential construction would have a minimal impact on wildlife on the Cattle Point peninsula. When combined with other past, present, and future actions the effects of alternative D would result in a negligible beneficial cumulative impact on wildlife locally and county-wide.

Conclusion

Because of these factors, construction activities associated with this alternative would have a moderate adverse short-term effect on wildlife use patterns and habitat in the project area. Over the long term, this alternative would have a negligible beneficial effect on wildlife in the project area. There would be no impairment to this resource as a result of this alternative.

<u>Mitigation Measures:</u>

> **W-1: Revegetation.** Same as WQ-2, TGS-4, VQ-3, and V-2. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment. See appendix A.
>
> In addition, revegetation would begin as soon as possible after completion of construction, during the optimum time of year to ensure greatest plant survival. Topsoil removed during construction would be conserved and reapplied to revegetation sites to insure optimum plant establishment. If sufficient conserved topsoil is not available, native topsoil may be imported from elsewhere on the island. The revegetation plan would include stipulations for use of conserved and imported topsoil and control of weeds.

4.7.5 Federally-Listed Threatened, Endangered, and Protected Species

There are no federally-listed threatened or endangered species known to be present or having habitat in the project area or vicinity.

The federally protected bald eagle is known to be present and have habitat within the area of potential impact for alternative D (table 4.2). WDFW data show that the project area is located within two historic bald eagle territories. Six historic nest sites containing nine nests are located within 0.5 miles of the project area. Bald eagle territories and nest sites are also located within 1 mile of the project area on Lopez Island and near the American Camp historic areas. Bald eagle nesting activities occur from January 1 to August 15 (USFWS 2004). The project area is also located within the 800-foot shoreline foraging buffer identified by the WDFW priority habitat and species data (wdfw.wa.gov/hab/phslist.htm, accessed March 26, 2007).

Eagle wintering takes place in the county from October 31 to March 31. There are no known wintering roosts in the project area.

Construction noise impacts would affect an area within a 0.5-mile radius of the construction site depending on topographic barriers. Noise producing activities would take place during project construction, which is expected to last 1.5 to 3 years. Construction activities would take place along the new road alignment, abandoned road segment, haul routes, and staging areas. Regular traffic from residents and visitors would continue along the existing roadway during the construction period. These activities would result in an increase in human presence and noise intermittently during the 1.5 to 3-year construction period. Construction activities would include site preparation, earthmoving, tunnel construction, general construction, and road surfacing. Site preparation would include activities such as land clearing and grubbing, including disposal of cleared material. Earthmoving would include cut and fill operations, tunnel trenching, soil stockpiling, soil compaction, grading, and transport of excess soil and rock material offsite, likely west of the project area. It would involve hauling within the 800-foot buffer of the bald eagle nests in the American Camp historic area. Construction of alternative C would not likely produce loud noises such as blasting or pile-driving; however, if these uses become necessary, a separate assessment would be conducted by the FHWA, and would include an evaluation of the effects to the bald eagle.

The highest point on the alternative C road realignment would be located within the 800-foot buffer of one historic bald eagle nest near the peak of Mt. Finlayson. About 775 feet of the alignment would be enclosed in the tunnel. The east tunnel portal would fall within the 800-foot nest buffer. All nest sites shown in the WDFW database in the Mt. Finlayson area were monitored by NPS in 2009. Of the seven nest locations, only one nest was found, and it was in disrepair and unoccupied (NPS 2009). The nest located closest to the proposed road realignments could not be found by the NPS in 2009.

The entire road realignment is located on the south slopes of Mt. Finlayson, in the prairie grassland habitat. Bald eagle nesting and roosting habitat consists of large trees and elevated sites located in the forested habitat near the peak and on the north side of the Mt. Finlayson ridge. Road realignment is not expected to involve removal of large mature trees suitable for eagle habitat. Cutting of eagle habitat trees would be prohibited. The project area is located within the 800-foot shoreline foraging buffer on the Strait of Juan de Fuca.

Construction activities are expected to take place during part of the bald eagle nesting season and may also take place during part of the winter-foraging season. While construction activities may cause foraging eagles to avoid flying over the construction areas on the south slopes of Mt. Finlayson, foraging areas to the north and east would remain undisturbed. During breeding season, bald eagles are sensitive to a variety of human activities, including noise from construction activities. Not all bald eagle pairs react to human activities in the same way. Some nest successfully within close proximity to human activity while others abandon nest sites in response to activities much farther away (USFWS 2007b). Prior to construction, the bald eagle nest within the 800-foot buffer of the project area would be investigated to determine if it was in active use. If the nest is being used by bald eagle, noise-producing construction activities within the 800-foot buffer would be restricted during the nesting period. If the nest is not in use, no construction restrictions would be necessary. The bald eagles in the American Camp historic area have successfully raised chicks in close proximity to human activities (NPS 2009). Although these individuals have habituated to the routine uses in the area, increased construction traffic may disturb them during nesting. The American Camp nests would be monitored during the nesting period and noise producing construction activities would be avoided to the extent possible.

The new road alignment would permanently relocate road noise and activities closer to the historic bald eagle nesting sites located near the ridge of Mt. Finlayson; however, some of the road alignment in this area would be enclosed in the tunnel, which would reduce traffic noise.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.8.

Alternative D would move the road alignment closer to the historic bald eagle nests located near the ridge of Mt. Finlayson; however, some of the alignment would be confined to a tunnel. Construction traffic would impact an active nest along the haul route. Future projects to improve the American Camp visitor center could have a small impact on the eagle nest in the vicinity. Visitation to the park and use of the visitor's center and trails in close proximity to eagle's nests is expected to increase into the foreseeable future. Bald eagles nesting in the area near the visitor's center have become acclimated to human presence and vehicle traffic seems to have little effect on bald eagle use patterns (USFWS, personal communication, 2009); however, it is unknown whether there is a limit to the amount of human presence that would be tolerated. When added to other past, present, and future activities cumulative impacts to bald eagle associated with alternative D would be minimal locally and region-wide.

Conclusion

Because of these factors, with mitigation measures in place, it is expected that construction activities would have a minor adverse short-term effect on bald eagle use patterns in the project area. With implementation of the described mitigation measures, the project would be in compliance with USFWS *National Bald Eagle Management Guidelines* (May 2007), and impacts would be below the level of "take". No permits would be required. Over the long term, this alternative would have a negligible adverse effect on bald eagles in the project area and the Cattle Point peninsula.

<u>Mitigation Measures</u>:

> **FTES-1: Construction Timing Restrictions.** Noise-producing construction activities within the 800-foot buffer of active bald eagle nests would be restricted during the nesting period (January 1 to August 15).
>
> **FTES-2: Prohibit Removal of Bald Eagle Habitat.** Removal of large mature eagle habitat trees would be prohibited.
>
> **FTES-3**: **Equipment Noise Control.** Same as N-1**.** Construction equipment would be equipped with functioning mufflers to limit exhaust noise. Equipment would be switched off when not in use.

4.7.6 State-Listed Threatened and Endangered Species

The state-listed California buttercup is known to be present and have habitat within the area of potential impact for alternative D (table 4.3).

Occurrence of this species in the project area roughly coincides with the native prairie polygons (figure 4.7). The preliminary alignment shows that four known California buttercup polygons could potentially be impacted by road and tunnel construction activities. There are a total of 33 California buttercup polygons in the project area; therefore, the project alternative would impact about 12 percent of the population in the project area. To the extent possible, final road and tunnel alignment and design would be adjusted to avoid or minimize impacts to this species. Priority would be given to avoiding large concentrations.

Restoration of the abandoned road segment as well as roadway cuts and fills and the area above the tunnel would provide an opportunity for potential reintroduction of California buttercup into new areas of the native prairie grassland. The revegetation plan would outline methods and standards for revegetation of the species in these areas. Road construction activities and soil disturbance provide the opportunity for spread of weeds from adjacent lands as well as from outside of the project area, which could impact California buttercup. BMPs for control of weeds would be implemented during construction.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.9.

The alternative D realignment would impact about 12 percent of the population of California buttercup in American Camp. Restoration of the abandoned road segment and revegetation of the roadside cut and fill slopes would provide the opportunity to benefit the restoration of this species. No future projects are planned in the project area that would impact California buttercup. When added to other past, present, and future activities cumulative impacts to California buttercup associated with alternative D would be minimal locally and region-wide.

Conclusion

Because of these factors, construction activities associated with this alternative are likely to have a minor adverse short-term impact on California buttercup in the project area. Over the long term, planting of California buttercup during restoration of the abandoned roadway may provide the opportunity to increase the population in the project area, provided that establishment was successful. As a result, the project could have a minor beneficial long-term effect on this species in the project area and in the Cattle Point peninsula. There would be no impairment to this resource as a result of this alternative.

<u>Mitigation Measures</u>:

STES-1: Road Design. Same as TGS-1 and V-1. To the extent possible, road design features and final location would be planned to follow natural contours and to minimize the number and height of road cuts and fills. The abandoned quarry on the east end of Mt. Finlayson would be incorporated into the road profile and would be reclaimed to more closely follow natural surroundings. Cut slopes would be designed to insure slope stability and promote revegetation. Final road alignment and design would be adjusted to avoid or minimize impacts to rare native prairie sites and California buttercup.

STES-2: **Revegetation.** Same as WQ-2, TGS-4, VQ-3, V-2, and W-1. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment. See appendix A.

Revegetation would begin as soon as possible after completion of construction, during the optimum time of year to ensure greatest plant survival. Topsoil removed during construction would be conserved and reapplied to revegetation sites to insure optimum plant establishment. If sufficient conserved topsoil is not available, native topsoil may be imported from elsewhere on the island. The revegetation plan would include stipulations for use of conserved and imported topsoil and control of weeds.

In addition, the revegetation plan would outline methods and standards for revegetation of the California buttercup in the abandoned roadway restoration and in roadway cuts and fills.

STES-3: **BMPs for Weed Control.** Same as V-4. Construction equipment would be steam-cleaned prior to entering the project area for the first time. All roadsides and disturbed areas would be restored using native conserved topsoil and would be revegetated. Any imported topsoil needed would be certified as weed free. The revegetation plan would include a detailed weed control plan. See appendix A.

4.7.7 Trail System

This alternative realignment moves the road closer to the existing trail on the ridge of Mt. Finlayson. About 775 feet of the road alignment in this area would be enclosed in the tunnel, which would reduce the visible traffic and noise noticeable to trail users. On the west end of the project area, the new road alignment would be located about 400 to 600 feet to the south of the Mt. Finlayson Trail. On the east end of the project area, the new road alignment would be located 200 feet south of the trail. At the east end of the project, approximately 500 to 600 feet of trail would be directly impacted by the cut slopes of the new alignment and would need to be relocated. This section of trail would be relocated directly adjacent to the new road fill on the east side of the roadway. To the extent possible, final road design would be adjusted to minimize impacts to the trail. The Mt. Finlayson Trail is the only trail directly impacted by this alternative (figure 4.8).

Construction noise and machinery would be noticeable to Mt. Finlayson Trail users along the eastern 4,000 feet of the trail route. The east end of the trail would probably be closed occasionally during the estimated 1.5 to 3-year construction period. Closures should not affect the loop trail from the Mt. Finlayson Trail north to the Lagoon trails. However, hikers would not be able to travel the entire length of the Mt Finlayson Trail to link back with Cattle Point Road on the east side of the project area. Construction would not affect the other NPS trails in American Camp. Access to the DNR and BLM trails located to the east of the project area may be impacted by traffic delays.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.15.

Alternative D would move the road alignment closer to the Mt. Finlayson Trail; however, some of the road would be enclosed in the tunnel. The closer road proximity would increase the vehicle noise perceptible to trail users and reduce the sense of solitude. As traffic along the road increases in the future with normal increases in park visitation, this impact would become more noticeable to trail users. The realignment would also directly impact about 500 to 600 feet at the east end of the Mt. Finlayson Trail. This area represents about 1 percent of the 9 miles of trail within the Cattle Point peninsula. The trail would be relocated to the toe of the fill adjacent to the new roadway and would not be completely lost to the trail system. No future projects are planned in the project areas that would impact the trail system. When added to other past, present, and future actions the overall trail system would not change in a measurable way.

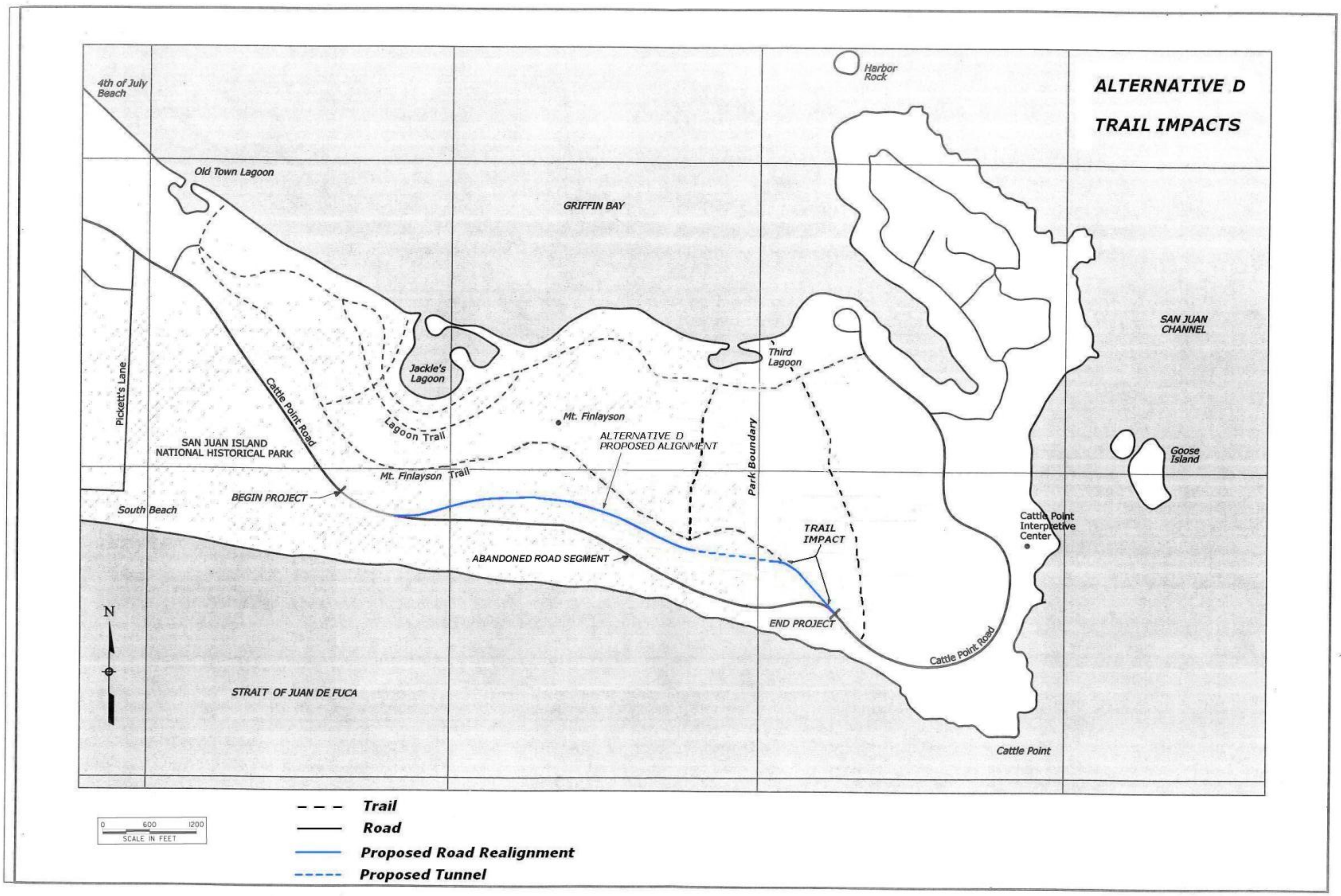


Figure 4.8 – Alternative D Trail Impacts

Conclusion

Because of these factors, construction of alternative D would have a moderate adverse short-term effect on the Mt. Finlayson Trail. However, the effect of construction on the trail system in the Cattle Point peninsula as a whole would be minor. Over the long term, the alternative D realignment would have a minor adverse effect on the Mt. Finlayson Trail; however, it would have a negligible adverse effect on the trail system on the Cattle Point peninsula as a whole. There would be no impairment to this resource as a result of this alternative.

<u>Mitigation Measures:</u>

> **T-1: Road Design.** Same as TGS-1, V-1, STES-3, and VQ-1. To the extent possible, road design features and final location would be planned to follow natural contours and to minimize the number and height of road cuts and fills. The abandoned quarry on the east end of Mt. Finlayson would be incorporated into the road profile and would be reclaimed to more closely follow natural surroundings. Cut slopes would be designed to insure slope stability and promote revegetation. Final road alignment and design would be adjusted to avoid or minimize impacts to rare native prairie sites and California buttercup. To the extent possible, walls would be designed with a low-profile and use materials with a natural appearance. Final wall design would be coordinated with an NPS landscape architect.
>
> In addition, final road design would be adjusted to minimize impacts to the Mt. Finlayson Trail to the extent possible. Where impacts are unavoidable, the trail would be relocated adjacent to the new road alignment.

4.7.8 Transportation and Road System

Construction activities are expected to last 1.5 to 3 years. During construction, the existing Cattle Point Road would be left open to maintain access to the east end of Cattle Point. Most activities for road realignment and tunnel construction would take place outside of the existing Cattle Point Road alignment; however, traffic delays would still be expected on Cattle Point Road adjacent to the construction site. Delays would likely be limited to 30 minutes or less except during construction of the connection between the realigned road section with the existing roadway. Construction of these short road sections may require full road closure for up to 4 hours at a time for approximately 1 to 2 weeks during construction of both ends of the connection. Road closure and delay schedules would be publicized ahead of time with public announcements through the NPS and local media.

There would be some heavy loads related to construction traffic; however, all construction traffic would follow the legal load limits. Therefore no deterioration of the surrounding road system is anticipated above normal levels.

Over the long term, this alternative would not change the capacity, function, or service of the Cattle Point Road. The existing access to the Cattle Point area would be preserved, and there would be no change (either increase or decrease) in traffic in the area beyond that expected with normal growth. The abandoned road segment would be obliterated and restored to natural conditions following construction of the new alignment.

The realigned road would be approximately equal in length to the existing alignment; however the tunnel would greatly add to the cost and effort of maintenance along the new road. Since there are no tunnels currently located in the county, it does not have the equipment or expertise needed to perform tunnel inspection and maintenance. Start-up costs would be associated with training personnel and obtaining proper equipment. Some project funds could be used to offset initial start-up costs for training and equipment necessary for tunnel maintenance. It is estimated that maintenance costs for the new road alignment and tunnel would average about $35,000 annually.

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.16.

Alternative D would not change the capacity, function, or service of the Cattle Point Road. The alternative would preserve the existing access to the east Cattle Point area and would not result in a change, either increase or decrease, in traffic in the area beyond that expected with normal growth. There is the potential for limited residential construction on the small number of vacant lots on private property in east Cattle Point. This construction would increase the residential population of the area by a small amount, which in turn would increase use on area roads. No future projects are planned on public land that would affect the transportation and road system. The impacts to the transportation and road system associated with alternative D would not alter current trends and would not contribute to cumulative impacts locally or county-wide.

Conclusion

Because of these factors, construction activities would have a moderate adverse short-term effect on transportation and access in the project area and the Cattle Point peninsula. Over the long term, this alternative would have no effect on the transportation system in the project area or on San Juan Island; however, it would have a moderate adverse effect on county maintenance costs.

<u>Mitigation Measures:</u> Both are the same as alternative B, section 4.5.7

> **TR-1: Traffic Management.** Same as VU-1**.** A traffic control plan would be developed specifying road closure times and a public information program. Delays would be limited to 30 minutes or less. Construction of the short connectors between the existing roadway and the new alignment may require full road closure for up to 4 hours intermittently during approximately 1 to 2 weeks.
>
> **TR-2: Road Damage.** Construction traffic would follow legal load limits to minimize damage to area roads from heavy equipment.
>
> **TR-3: County Maintenance Costs.** Project funds may be provided to the county to offset initial start-up costs for training and equipment necessary for tunnel maintenance

4.7.9 Special Vehicles, Bicycles, and Pedestrians

Construction traffic along local routes leading to the constriction site would create a safety concern for small vehicles and bicycles using the road shoulders. Operation of heavy equipment in the immediate project area would cause a major safety issue for use of these modes of transportation through the construction area. Due to safety considerations, these uses could be restricted through the construction site during part or all of the construction period. The FHWA would include requirements in the construction contract warning construction equipment operators to use extra caution due to heavy use of area roads by special vehicles, bicycles, and pedestrians.

Design of the realigned road would include improved shoulders for bicycle and pedestrian use. Preliminary design calls for 4-foot paved shoulders along the length of the realignment. While this would improve road function and safety for special vehicles, bicycles, and pedestrians in the realigned section, the existing roadway leading to the new alignment would continue to have narrow shoulders. The section of Cattle Point Road between the west park boundary and Pickett's Land has 1.5-foot gravel/native material shoulders and from Pickett's Land to the east park boundary, the road has 1-foot gravel/native material shoulders.

Preliminary tunnel design includes a 4-foot bike lane adjacent to both travel ways and a 2-foot wide raised sidewalk for pedestrians. The bike lane would provide special vehicles and bicycles sufficient room to travel safely through the tunnel. The enclosed tunnel would give the perception of an increased safety risk for special vehicles or bicycles using the tunnel. A 2001 California study concluded that bicycle collisions were no more frequent in tunnels than on the approaches to the tunnels (Statewide Safety Study of Bicycles and Pedestrians on Freeways, Expressways, Toll Bridges, and Tunnels MTI Report 01-01, 2001). Slow moving vehicles such as mopeds and scoot-cars that cannot use the confined shoulder area may pose a hazard. Signs with flashing beacons activated by the special vehicle operator, bicyclist, or pedestrian would be installed at tunnel portals warning motorists of "Bicyclist or Slow-moving Vehicle in Tunnel When Flashing."

Cumulative Impacts

The past, present, and reasonable foreseeable future activities considered in this analysis are described under cumulative impacts in section 4.3.14.

Alternative D would not change the capacity, function, or service of the road that would lead to a change in special vehicle, bicycle, or pedestrian use. The alternative would preserve the existing access to the east end of the Cattle Point peninsula. There is the potential for limited residential construction on the small number of vacant lots on private property in east Cattle Point. This construction would increase the residential population of the area by a small amount, which in turn could result in increased use by special vehicles, bicycles, and pedestrians on area roads. Visitation to the park is expected to increase into the future along with increases in use by special vehicles, bicycles, and pedestrians. No future projects are planned on public land that would affect these uses. Impacts to special vehicle, bicycle, and pedestrian use associated with alternative B would not alter current trends and would not contribute to cumulative impacts locally or county-wide.

Conclusion

Because of these factors, construction activities would have a moderate adverse short-term effect on special vehicle, bicycle, and pedestrian use in the project area and Cattle Point peninsula. Over the long term, the new road alignment and tunnel would have a minor adverse effect on special vehicle, bicycle, and pedestrian use in the Cattle Point peninsula.

Mitigation Measures:

> **SVBP-1: Construction Traffic Safety.** Construction equipment and vehicle operators would be required to use extra caution when approaching and passing special vehicles, bicycles, and pedestrians.
>
> **SVBP-2: Warning Signs.** Signs with flashing beacons activated by the special vehicle operator, bicyclist, or pedestrian would be installed at tunnel portals warning motorists of "Bicyclist or Slow-moving Vehicle in Tunnel When Flashing"

4.7.10 Unavoidable Adverse Impacts

Alternative D would involve a number of unavoidable short-term adverse impacts. Construction activities would temporarily impact the visual quality of the area with the presence of construction equipment and soil disturbing activities. Construction would also impact visitor uses such as hiking at the east end of the Mt. Finlayson trail; special vehicle, bicycle, and pedestrian safety in the project vicinity; and cause disturbances for residents and visitors to the east end of the Cattle Point peninsula from construction noise and sporadic traffic delays. Wildlife use patterns and habitat, as well as vegetation and rare prairie plants would be adversely impacted by construction activities. All construction-related impacts would be temporary and would end following completion of project construction. Disturbed sites would be revegetated using native species.

Over the long term, this alternative would adversely impact the topography of the area by realigning the roadway onto the previously undeveloped natural glacial bench on the slopes of Mt. Finlayson. The roadway and roadside cuts and fills would permanently impact the integrity of the natural feature; however some of the alignment near the ridge top would be enclosed in a tunnel. The tunnel would also reduce wildlife habitat fragmentation and improve wildlife passage over the roadway. The Mt. Finlayson trail would also be adversely impacted by the alternative D alignment. The eastern 500 to 600 feet of trail would be directly impacted by road cuts and would need to be relocated. A net loss of about 0.1 acre of vegetation would be permanently replaced by impermeable road pavement in the project area.

4.8 MITIGATION

The Council on Environmental Quality (CEQ) NEPA implementation regulations define mitigation as:

- Avoiding the impact altogether by not taking a certain action or parts of an action
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action
- Compensating for the impact by replacing or providing substitute resources or environments

Many elements of mitigation have been incorporated in the development of the alternatives. This includes designing the roadway to balance a safe, efficient, long-term transportation solution with minimal impacts to the natural environment. Specific mitigation for each alternative is also discussed under the impacts for each alternative.

The following mitigation measures would be implemented with each alternative if chosen:

Table 4.4 – Mitigation Measures by Alternative

MITIGATION MEASURES BY ALTERNATIVE
ALTERNATIVE A – No Action
No Mitigation Measures
ALTERNATIVE B – Hybrid Mid-Slope Realignment
BMPs for Weed Control: V-4, STES-3. Construction equipment would be steam-cleaned prior to entering the project area for the first time. All roadsides and disturbed areas would be restored using native conserved topsoil and would be revegetated. Any imported topsoil needed would be certified as weed free. The revegetation plan would include a detailed weed control plan.
Burning Restrictions: AQ-1. Burning would not be allowed at the construction site or in the park or NCRA.
Conservation Measures for Island Marble Butterfly: OSSS-2. Project activities would comply with the 2006 NPS/USFWS conservation agreement. Prior to construction, affected areas would be surveyed for host plants and larva. Steps would be taken to avoid impacts to these resources prior to and during construction, including removal or relocation of larval host plants and planting of host plants within the restored abandoned road segment.
Construction Equipment Controls: AQ-2. Construction equipment would be in good operating condition and be used efficiently to minimize emissions.
Construction Timing Restrictions: FTES-1. Noise producing construction activities within the 800-foot buffer of active bald eagle nests would be restricted during the nesting period (January 1 to August 15). N-2. Construction activities (having noise levels greater than normal traffic) to the east of the NPS-DNR boundary would not be permitted from 6:00 p.m. to 7:00 a.m.
Construction Traffic Safety: SVBP-1. Construction equipment and vehicle operators would be required to use extra caution when approaching and passing special vehicles, bicycles, and pedestrians.
Dust Control Measures: AQ-3. A dust palliative or water would be applied to traffic areas and unpaved haul routes to minimize airborne dust from construction operations.
Equipment Noise Control: N-1, FTES-3. Construction equipment would be equipped with functioning mufflers to limit exhaust noise. Equipment would be switched off when not in use.
Geology Wayside Exhibit: TGS-1. A wayside exhibit would be developed to interpret the area's geology.
New Waste Site or Aggregate Source: TGS-5. No disposal sites would be allowed in the park or NRCA. If a non-commercial disposal site or aggregate source is required, the proposal would be analyzed by the FHWA for environmental impacts before approval for use. For this project, new non-commercial disposal and aggregate sources would have no more than a "no adverse effect" on cultural resources, a "no effect" determination on threatened and endangered species, and no encroachment into waters of the U.S. or wetlands.
Previously Undetected Cultural Sites: CR-1. The project footprint APE would be monitored during construction. If previously undetected cultural or archaeological resources are encountered during construction, work would stop in that location until the site could be evaluated by a qualified archaeologist.
Previously Undetected Hazardous Material: HM-1. If hazardous materials are encountered during construction, removal would be handled in accordance with WDOE and EPA guidelines.

MITIGATION MEASURES BY ALTERNATIVE

Prohibit Removal of Bald Eagle Habitat Trees: FTES-2. Removal of bald eagle habitat trees would be prohibited.

Restore Abandoned Road Segment: LU-1. The abandoned road segment would be restored by removing the road pavement, road base, and buried utility lines and conduits, contouring the road cut to blend with natural surroundings, and planting with native vegetation. A detailed reclamation plan would be developed prior to the beginning of construction.

Revegetation: WQ-2, TGS-4, VQ-3, V-2, W-1, STES-2, OSSS-1, CR-2. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment. See appendix A.

Revegetation would begin as soon as possible after completion of construction, during the optimum planting time to ensure plant survival. Topsoil removed during construction would be conserved and reapplied to revegetation sites. If sufficient conserved topsoil is not available, native topsoil may be imported from elsewhere on the island.

Revegetation plans would outline methods and standards for revegetation of California buttercup, rare native prairie species, and island marble butterfly host plants.

Road Damage: TR-2. Construction traffic would follow legal load limits to minimize damage to area road from heavy equipment.

Road Design: CR-3, TGS-1, VQ-1, V-1, STES-1, T-1. To the extent possible, road design features and final location would be planned to follow natural contours and to minimize the number and height of road cuts and fills. The abandoned quarry on the east end of Mt. Finlayson would be incorporated into the road profile and would be reclaimed to more closely follow natural surroundings.

Cut slopes would be designed to use shallow cut and fills to the extent possible and would not used exposed gabions or geometric forms of embankment materials that are incompatible with the character of the landscape. Cut and fill slopes would be designed to insure slope stability and promote revegetation. If needed, walls would be designed with a low profile, using materials with a natural appearance. Wall design would be coordinated with an NPS landscape architect.

Road alignment and design would be adjusted to avoid or minimize impacts to rare native prairie sites, California buttercup, and to minimize impacts to the Mt. Finlayson Trail to the extent possible. Where trail impacts are unavoidable, the trail would be relocated adjacent to the new road alignment.

Road Design for Storm Water Runoff Management: WQ-3. To the extent possible, road design would incorporate storm water runoff management features such as vegetated ditches.

Scenic Turnouts: VQ-2. Where possible, scenic turnouts would be constructed along the road alignment for the road user to pull off the road to view the natural features of the area.

SPCC: HM-2. The construction contractor would prepare and implement a Spill Prevention Control and Countermeasure Plan in accordance with EPA guidelines. Excess petroleum and other potentially hazardous waste generated by construction activities would be disposed of in accordance with EPA guidelines.

SWPPP: TGS-3, H-1, WQ-1, V-5. Prior to construction, the FHWA would develop a Storm Water Pollution Prevention Plan (SWPPP) for implementation during construction. The SWPPP would include measures (Best Management Practices-BMPs) for temporary erosion and sediment control devices during construction for control of concentrated storm water runoff. The SWPPP would also include BMPs for housekeeping measures to address the safe storage, handling, and spill prevention of hazardous construction materials.

Traffic Management: VU-1, TR-1. A traffic control plan would be developed specifying road closure times and a public information program. Delays would be limited to 30 minutes or less. Construction of the short connectors between the existing roadway and the new alignment may require full road closure for up to 4 hours intermittently during approximately 1 to 2 weeks.

MITIGATION MEASURES BY ALTERNATIVE
Transfer Abandoned ROW to Land Management Agencies: LU-2. Following construction, the existing easement/ROW for the abandoned section would be transferred back to the appropriate land management agency.
Utility Coordination: U-1. The road contractor would coordinate with the utility companies to relocate utilities prior to construction. If road construction takes place in proximity to utilities, the location would be marked and care would be taken to avoid disturbance to utilities during construction.
Weed Inspection of Aggregate and Fill Sources: V-3. Aggregate and fill material sources would be inspected and certified as weed free by a qualified person prior to approval for use. If weed free sources are not available, material would be heat-treated to kill weed and weed seeds.
ALTERNATIVE C – Long Tunnel on Minor Realignment
Alternative Electricity Sources: E-1. Alternative sources of electricity such as solar or wind generation would be considered for providing power requirements for tunnel operations. Care would be taken to choose a source and location that would not detract from scenic and cultural landscape values.
BMPs for Weed Control: V-4, STES-3. Construction equipment would be steam-cleaned prior to entering the project area for the first time. All roadsides and disturbed areas would be restored using native conserved topsoil and would be revegetated. Any imported topsoil needed would be certified as weed free. The revegetation plan would include a detailed weed control plan.
Burning Restrictions: AQ-1. Burning would not be allowed at the construction site or in the park or NCRA.
Conservation Measures for Island Marble Butterfly: OSSS-2. Project activities would comply with the 2006 NPS/USFWS conservation agreement. Prior to construction, affected areas would be surveyed for host plants and larva. Steps would be taken to avoid impacts to these resources prior to and during construction, including removal or relocation of larval host plants and planting of host plants within the restored abandoned road segment.
Construction Equipment Controls: AQ-2. Construction equipment would be in good operating condition and be used efficiently to minimize emissions.
Construction Timing Restrictions: FTES-1. Noise producing construction activities within the 800-foot buffer of active bald eagle nests would be restricted during the nesting period (January 1 to August 15). N-2. Construction activities (having noise levels greater than normal traffic) to the east of the NPS-DNR boundary would not be permitted from 6:00 p.m. to 7:00 a.m.
Construction Traffic Safety: SVBP-1. Construction equipment and vehicle operators would be required to use extra caution when approaching and passing special vehicles, bicycles, and pedestrians.
Dust Control Measures: AQ-3. A dust palliative or water would be applied to traffic areas and unpaved haul routes to minimize airborne dust from construction operations.
Equipment Noise Control: N-1, FTES-3. Construction equipment would be equipped with functioning mufflers to limit exhaust noise. Equipment would be switched off when not in use.
Geology Wayside Exhibit: TGS-1. A wayside exhibit would be developed to interpret the area's geology.
New Waste Site or Aggregate Source: TGS-5. No disposal sites would be allowed in the park or NRCA. If a non-commercial disposal site or aggregate source is required, the proposal would be analyzed by the FHWA for environmental impacts before approval for use. For this project, new non-commercial disposal and aggregate sources would have no more than a "no adverse effect" on cultural resources, a "no effect" determination on threatened and endangered species, and no encroachment into waters of the U.S. or wetlands.
Previously Undetected Cultural Sites: CR-1. The project footprint APE would be monitored during construction. If previously undetected cultural or archaeological resources are encountered during construction, work would stop in that location until the site could be evaluated by a qualified archaeologist.

MITIGATION MEASURES BY ALTERNATIVE
Previously Undetected Hazardous Material: HM-1. If hazardous materials are encountered during construction, removal would be handled in accordance with WDOE and EPA guidelines.
Prohibit Removal of Bald Eagle Nest Trees: FTES-2. Removal of bald eagle habitat trees would be prohibited.
Restore Abandoned Road Segment: The abandoned road segment would be restored by removing the road pavement, road base, and buried utility lines and conduits, contouring the road cut to blend with natural surroundings and planting with native vegetation. A detailed reclamation plan would be developed prior to the beginning of construction.
Revegetation: WQ-2, TGS-4, VQ-3, V-2, W-1, STES-2, OSSS-1, CR-2. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment. See appendix A. Revegetation would begin as soon as possible after completion of construction, during the optimum planting time to ensure plant survival. Topsoil removed during construction would be conserved and reapplied to revegetation sites. If sufficient conserved topsoil is not available, native topsoil may be imported from elsewhere on the island. Revegetation plans would outline methods and standards for revegetation of California buttercup, rare native prairie species, and island marble butterfly host plants.
Road Damage: TR-2. Construction traffic would follow legal load limits to minimize damage to area road from heavy equipment.
Road Design: CR-3, TGS-1, VQ-1, V-1, STES-1, T-1. To the extent possible, road design features and final location would be planned to follow natural contours and to minimize the number and height of road cuts and fills. The abandoned quarry on the east end of Mt. Finlayson would be incorporated into the road profile and would be reclaimed to more closely follow natural surroundings. Cut slopes would be designed to use shallow cut and fills to the extent possible and would not used exposed gabions or geometric forms of embankment materials that are incompatible with the character of the landscape. Cut and fill slopes would be designed to insure slope stability and promote revegetation. If needed, walls would be designed with a low profile, using materials with a natural appearance. Wall design would be coordinated with an NPS landscape architect. Road alignment and design would be adjusted to avoid or minimize impacts to rare native prairie sites, California buttercup, and to minimize impacts to the Mt. Finlayson Trail to the extent possible. Where trail impacts are unavoidable, the trail would be relocated adjacent to the new road alignment.
Road Design for Storm Water Runoff Management: WQ-3. To the extent possible, road design would incorporate storm water runoff management features such as vegetated ditches.
Scenic Turnouts: VQ-2. Where possible, scenic turnouts would be constructed along the road alignment for the road user to pull off the road to view the natural features of the area. In addition, as space permits, a scenic turnout would be constructed at the west end of the tunnel entrance.
SPCC: HM-2. The construction contractor would prepare and implement a Spill Prevention Control and Countermeasure Plan in accordance with EPA guidelines. Excess petroleum and other potentially hazardous waste generated by construction activities would be disposed of in accordance with EPA guidelines.
SWPPP: TGS-3, H-1, WQ-1, V-5. Prior to construction, the FHWA would develop a Storm Water Pollution Prevention Plan (SWPPP) for implementation during construction. The SWPPP would include measures (BMPs) for temporary erosion and sediment control devices during construction for control of concentrated storm water runoff. The SWPPP would also include BMPs for housekeeping measures to address the safe storage, handling, and spill prevention of hazardous construction materials.

MITIGATION MEASURES BY ALTERNATIVE
Traffic Management: VU-1, TR-1. A traffic control plan would be developed specifying road closure times and a public information program. Delays would be limited to 30 minutes or less. Construction of the short connectors between the existing roadway and the new alignment may require full road closure for up to 4 hours intermittently during approximately 1 to 2 weeks.
Transfer Abandoned ROW to Land Management Agencies: LU-2. Following construction, the existing easement/ROW for the abandoned section would be transferred back to the appropriate land management agency.
Tunnel Ventilation: AQ-4. In accordance with design standards, the tunnels would include appropriate ventilation to prevent the build up of noxious fumes inside of the tunnel.
Utility Coordination: U-1. The road contractor would coordinate with the utility companies to relocate utilities prior to construction. If road construction takes place in proximity to utilities, the location would be marked and care would be taken to avoid disturbance to utilities during construction.
Weed Inspection of Aggregate and Fill Sources: V-3. Aggregate and fill material sources would be inspected and certified as weed-free by a qualified person prior to approval for use. If weed free sources are not available, material would be heat treated to kill weed and weed seeds.
Warning Signs: SVBP-2. Signs with flashing beacons activated by the user would be installed at tunnel portals warning motorists of “Bicyclist or Slow-moving Vehicle in Tunnel When Flashing.”
ALTERNATIVE D – Mid-Slope Alignment with Short Tunnel
Alternative Electricity Sources: E-1. Alternative sources of electricity such as solar or wind generation would be considered for providing power requirements for tunnel operations. Care would be taken to choose a source and location that would not detract from scenic and cultural landscape values.
BMPs for Weed Control: V-4, STES-3. Construction equipment would be steam-cleaned prior to entering the project area for the first time. All roadsides and disturbed areas would be restored using native conserved topsoil and would be revegetated. Any imported topsoil needed would be certified as weed free. The revegetation plan would include a detailed weed control plan.
Burning restrictions: AQ-1. Burning would not be allowed at the construction site or in the park or NCRA.
Conservation Measures for Island Marble Butterfly: OSSS-2. Project activities would comply with the 2006 NPS/USFWS conservation agreement. Prior to construction, affected areas would be surveyed for host plants and larva. Steps would be taken to avoid impacts to these resources prior to and during construction, including removal or relocation of larval host plants and planting of host plants within the restored abandoned road segment.
Construction Equipment Controls: AQ-2. Construction equipment would be in good operating condition and be used efficiently to minimize emissions.
Construction Timing Restrictions: FTES-1. Noise producing construction activities within the 800-foot buffer of active bald eagle nests would be restricted during the nesting period (January 1 to August 15). N-4. Construction activities (having noise levels greater than normal traffic) to the east of the NPS-DNR boundary would not be permitted from 6:00 p.m. to 7:00 a.m.
Construction Traffic Safety: SVBP-1. Construction equipment and vehicle operators would be required to use extra caution when approaching and passing special vehicles, bicycles, and pedestrians.
Dust Control Measures: AQ-3. A dust palliative or water would be applied to traffic areas and unpaved haul routes to minimize airborne dust from construction operations.
Equipment Noise Control: N-1, FTES-3. Construction equipment would be equipped with functioning mufflers to limit exhaust noise. Equipment would be switched off when not in use.

MITIGATION MEASURES BY ALTERNATIVE
Geology Wayside Exhibit: TGS-1. A wayside exhibit would be developed to interpret the area's geology.
New Waste Site or Aggregate Source: TGS-5. No disposal sites would be allowed in the park or NRCA. If a non-commercial disposal site or aggregate source is required, the proposal would be analyzed by the FHWA for environmental impacts before approval for use. For this project, new non-commercial disposal and aggregate sources would have no more than a "no adverse effect" on cultural resources, a "no effect" determination on threatened and endangered species, and no encroachment into waters of the U.S. or wetlands.
Previously Undetected Cultural Sites: CR-1. The project footprint APE would be monitored during construction. If previously undetected cultural or archaeological resources were encountered during construction, work would stop in that location until the site could be evaluated by a qualified archaeologist.
Previously Undetected Hazardous Material: HM-1. If hazardous materials were encountered during construction, removal would be handled in accordance with WDOE and EPA guidelines.
Prohibit Removal of Bald Eagle Habitat Trees: FTES-2. Removal of bald eagle habitat trees would be prohibited.
Restore Abandoned Road Segment: LU-1. The abandoned road segment would be restored by removing the road pavement, road base, and buried utility lines and conduits, contouring the road cut to blend with natural surroundings, and planting with native vegetation. A detailed reclamation plan would be developed prior to the beginning of construction.
Revegetation: WQ-2, TGS-4, VQ-3, V-2, W-1, STES-2, OSSS-1, CR-2. Following construction, all disturbed sites would be revegetated using native plant species. A detailed revegetation plan would be developed and implemented on all sites disturbed by construction activities as well as reclamation of the abandoned road segment. See appendix A. Revegetation would begin as soon as possible after completion of construction, during the optimum planting time to ensure plant survival. Topsoil removed during construction would be conserved and reapplied to revegetation sites. If sufficient conserved topsoil is not available, native topsoil may be imported from elsewhere on the island. Revegetation plans would outline methods and standards for revegetation of California buttercup, rare native prairie species, and island marble butterfly host plants.
Road Damage: TR-2. Construction traffic would follow legal load limits to minimize damage to area road from heavy equipment.
Road Design: CR-3, TGS-1, VQ-1, V-1, STES-1, T-1. To the extent possible, road design features and final location would be planned to follow natural contours and to minimize the number and height of road cuts and fills. The abandoned quarry on the east end of Mt. Finlayson would be incorporated into the road profile and would be reclaimed to more closely follow natural surroundings. Cut slopes would be designed to use shallow cut and fills to the extent possible and would not used exposed gabions or geometric forms of embankment materials that are incompatible with the character of the landscape. Cut and fill slopes would be designed to insure slope stability and promote revegetation. If needed, walls would be designed with a low profile, using materials with a natural appearance. Wall design would be coordinated with an NPS landscape architect. Road alignment and design would be adjusted to avoid or minimize impacts to rare native prairie sites, California buttercup, and to minimize impacts to the Mt. Finlayson Trail to the extent possible. Where trail impacts are unavoidable, the trail would be relocated adjacent to the new road alignment.
Road Design for Storm Water Runoff Management: WQ-3. To the extent possible, road design would incorporate storm water runoff management features such as vegetated ditches.
Scenic Turnouts: VQ-2. Where possible, scenic turnouts would be constructed along the road alignment for the road user to pull off the road to view the natural features of the area. In addition, as space permits, a scenic turnout would be constructed at the west end of the tunnel entrance.

MITIGATION MEASURES BY ALTERNATIVE
SPCC: HM-2. The construction contractor would prepare and implement a Spill Prevention Control and Countermeasure Plan in accordance with EPA guidelines. Excess petroleum and other potentially hazardous waste generated by construction activities would be disposed of in accordance with EPA guidelines.
SWPPP: TGS-3, H-1, WQ-1, V-5. Prior to construction, the FHWA would develop a Storm Water Pollution Prevention Plan (SWPPP) for implementation during construction. The SWPPP would include measures (BMPs) for temporary erosion and sediment control devices during construction for control of concentrated storm water runoff. The SWPPP would also include BMPs for housekeeping measures to address the safe storage, handling, and spill prevention of hazardous construction materials.
Traffic Management: VU-1, TR-1. A traffic control plan would be developed specifying road closure times and a public information program. Delays would be limited to 30 minutes or less. Construction of the short connectors between the existing roadway and the new alignment may require full road closure for up to 4 hours intermittently during approximately 1 to 2 weeks.
Transfer Abandoned ROW to Land Management Agencies: LU-2. Following construction, the existing easement/ROW for the abandoned section would be transferred back to the appropriate land management agency.
Tunnel Ventilation: AQ-4. In accordance with design standards, the tunnels would include appropriate ventilation to prevent the build up of noxious fumes inside the tunnel.
Utility Coordination: U-1. The road contractor would coordinate with the utility companies to relocate utilities prior to construction. If road construction took place in proximity to utilities, the location would be marked and care would be taken to avoid disturbance to utilities during construction.
Weed Inspection of Aggregate and Fill Sources: V-3. Aggregate and fill material sources would be inspected and certified as weed-free by a qualified person prior to approval for use. If weed-free sources are not available, material would be heat-treated to kill weed and weed seeds.
Warning Signs: SVBP-2. Signs with flashing beacons activated by the user would be installed at tunnel portals warning motorists of “Bicyclist or Slow-moving Vehicle in Tunnel When Flashing.”

Chapter 5: Section 4(f) De Minimis Impacts

5.1 INTRODUCTION

This chapter identifies Section 4(f) resources that would be affected by the project alternatives. It also discusses coordination with agencies having jurisdiction over the resources and efforts to avoid and minimize harm to these resources.

5.2 SECTION 4(F)

Section 4(f) was enacted as part of the U.S. Department of Transportation Act of 1966 codified in federal law 49 USC 303. Section 4(f) protects significant publicly-owned parks, recreation areas, and wildlife and waterfowl refuges, as well as publicly and privately-owned historic sites. In general, the FHWA may not approve the use of land from a Section 4(f) property for transportation purposes unless a determination is made that: 1) there is no feasible and prudent alternative to the use of land from the property, and 2) the action includes all possible planning to minimize harm to the property resulting from such use.

Under Section 4(f), a *use* can be any of the following: 1) a direct use where Section 4(f) property is permanently incorporated into a transportation project, 2) a temporary use where Section 4(f) property is temporarily occupied in a way that adversely affects the property's purpose, or 3) a constructive use where the project does not incorporate land from a Section 4(f) property, but the project's proximity impacts are so severe that the protected activities, features, or attributes are substantially impaired.

Section 6009 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) provides for a simplified approval of projects that have a *de minimis* impact on Section 4(f) resources. FHWA has issued guidance for making findings of *de minimis* impacts and amended its Section 4(f) regulations to provide for these findings (24 CFR 774.3(b), 774.5(b), 774.17).

An impact to a park, recreation area, or wildlife and waterfowl refuge may be determined to be *de minimis* if:

- The transportation use of the Section 4(f) resource, together with any impact avoidance, minimization, and mitigation or enhancement measures incorporated into the project does not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f);
- The official with jurisdiction over the Section 4(f) property is informed of the FHWA's intent to make a *de minimis* finding based on their written concurrence that the project will not adversely affect the activities, features, and attributes that qualify the property for protection under Section 4(f); and
- The public has been afforded an opportunity to review and comment on the effects of the project on the protected activities, features, and attributes of the Section 4(f) resource.

An impact to a historic property may be determined to be *de minimis* if:

- The Section 106 analysis and review process results in a determination of "no adverse effect" or "no historic properties affected" with the concurrence of the SHPO or Tribal

Historic Preservation Officer (THPO), and the Advisory Council on Historic Preservation (ACHP) if participating in the Section 106 consultation;

- The SHPO/THPO and ACHP (if participating) is informed of the FHWA's intent to make a *de minimis* impact finding based on their written concurrence in the Section 106 determination, and
- The FHWA has considered the views of any consulting parties participating in the Section 106 consultation.

5.3 SECTION 4(F) RESOURCES

The proposed project alternatives would affect three Section 4(f) resources.

The San Juan Island National Historical Park (park) is considered to be a Section 4(f) resource as a publicly-owned park. However, park roads are exempt from Section 4 (f) requirements under 49 U.S.C 303(c). A park road is defined as a public road that is located within, or provides access to, an area in the National Park System with title and maintenance responsibilities vested in the United States (23 U.S.C. 101(a)(19)). The county retains ROW for a portion of the Cattle Point Road within the park, from Pickett's Lane eastward to the DNR boundary, and the county may be granted ROW and take responsibility for maintenance if a new alignment is chosen. As a result, the exemption cannot be applied at this time.

The entire park is listed on the National Register of Historic Places as a National Historic Landmark, and as such, is also considered to be a Section 4(f) resource as an historic site.

A section of trail connecting the Mt. Finlayson trail with the Cattle Point Road would be obliterated by the proposed road alignment. The Mt. Finlayson trail is located on park and DNR property; however, the section of trail that would be directly affected is located on DNR property and would be considered a Section 4(f) resource as a publicly-owned trail.

Realignment of the Cattle Point Road would use land within the park, historic site, and trail for transportation purposes.

5.3.1 Publicly-Owned Park Impacts

The park consists of two distinct units, American Camp and English Camp, totaling 1,752 acres (NPS 2008). The American Camp unit of the park is located in the east portion of the Cattle Point peninsula. The American Camp unit totals 1,223 acres and encompasses the historical area, lagoons, Mt. Finlayson, and shoreline. The park became part of the National Park System in 1966 and is managed by the National Park Service (NPS).

The proposed project is located in the east end of the American Camp unit to the south of the Mt. Finlayson ridge. The topography in the project area is dominated by two undulating glacial benches and the flat ridgeline of Mt. Finlayson. Prairie grassland, a rare vegetative type in the Pacific Northwest, is the dominant vegetative cover in the project area. It occupies the area from the coastal bluffs to the south facing slopes of Mt. Finlayson. The forest and grassland habitats in the vicinity are inhabited by a variety of mammals including Columbian black-tailed deer, European rabbit, and red fox. There are also numerous species of small mammals, including mice, shrews, voles, and bats as well as a variety of songbirds, shorebirds, seabirds, and waterfowl. A variety of butterflies, moths, snails, slugs, and other invertebrate species are also found in the Cattle Point area. Because of the grassland habitat, the species diversity of butterflies in the area is relatively high. The rare California buttercup and habitat for the rare

Island marble butterfly is found in the project area. Recreational uses in the area include beachcombing, picnicking, bird watching, viewing and photographing wildlife, hiking, bicycling, and general sightseeing (NPS 2008). The setting of the project area in an open grassland and elevated hillside offers outstanding views to Mount Baker, the Cascade Mountains, the Olympic Mountains, Mt. Rainier, the Strait of Juan de Fuca, Vancouver Island, and other islands.

The action alternatives would realign a portion of the Cattle Point Road onto an undeveloped glacial bench a maximum of 300 to 500 feet north and upslope of its existing location. This would convert an undeveloped portion of grassland prairie into a transportation use. Construction of a new alignment in this area would impact wildlife habitat, rare plant and prairie habitat, and scenic qualities.

A segment of the existing road would be bypassed by the new alignment and would no longer be needed for transportation purposes. Following construction, this segment of road would be obliterated and restored to natural conditions, converting an existing transportation use back to park uses. Road restoration would involve removing the existing pavement and road base, contouring the road cut and fill to blend with natural surroundings and planting with native vegetation. The restored road alignment would be used for wildlife habitat, rare plant and prairie restoration, and scenic values.

Approximately 90 percent of the proposed project is located on park property.

Alternative B would disturb about 15 acres of park property along about 4,455 feet of new road alignment. Of the 15 acres of disturbance, about 12 acres would be revegetated. Alternative B would result in construction of new road cuts and fills and pavement of about 3.6 acres through relatively undisturbed grassland prairie just below the Mt. Finlayson ridge. However, this alternative would also remove about 2.7 acres of existing pavement and restore natural topographic and habitat conditions along about 3,780 feet of abandoned roadway. Overall, alternative B would involve a net increase of about 0.9 acres of road pavement in the park.

Alternative C would disturb about 9 acres of park property along about 2,550 feet of new road alignment. Of the 9 acres of disturbance, about 8 acres would be revegetated. Alternative C would result in construction of new road cuts and fills as well as a bored tunnel through relatively undisturbed grassland prairie just below the Mt. Finlayson ridge. This alternative would construct about 0.9 acres of new pavement above ground. However, it would also remove about 1.8 acres of existing pavement and restore natural topographic and habitat conditions along about 2,340 feet of abandoned roadway. Overall, alternative C would involve a net reduction of about 0.9 acres of road pavement (above ground) in the park.

Alternative D would disturb about 18 acres of park property along about 4, 230 feet of new road alignment. Of the 18 acres of disturbance, about 15 acres would be revegetated. Alternative D would result in construction of new road cuts and fills as well as a cut and cover tunnel through relatively undisturbed grassland prairie just below the Mt. Finlayson ridge. This alternative would construct about 2.7 acres of new pavement above ground. However, it would also remove about 2.7 acres of existing pavement and restore natural topographic and habitat conditions along about 3,900 feet of abandoned roadway. Overall, alternative D would involve 0 net increase/reduction of road pavement (above ground) in the park.

Implementation of the action alternatives would provide for continued vehicular and bicycle access for visitors to enjoy the scenic resources at the east end of American Camp. The action alternatives would have no direct impact on visitor’s facilities, trailheads, or trails within the park.

5.3.2 Historic Site Impacts

The entire park is listed on the National Register of Historic Places (NRHP) as a National Historic Landmark. The American Camp unit of the park is a cultural landscape incorporating natural features, vegetation, views and vistas, buildings and structures, and archaeological sites that provide a background for interpreting the story of the Pig War and the subsequent joint military occupation (NPS 2004). American Camp contains important historic resources including two of the original military buildings, the reconstructed military fence and flagpole, and numerous archaeological sites (NPS 2008).

The cultural landscape is a primary and broad contributing element to the eligibility of the National Historic Landmark (Schurke 2009). The American Camp cultural landscape boundary is outside of the project footprint area of potential effects (APE); therefore, none of the contributing cultural landscape characteristic features would be impacted by the alternatives.

In addition, none of the contributing cultural landscape views and vistas are located within the project view-shed APE; however, portions of the alignments would be remotely visible from within the geographic boundaries of the designated cultural landscape to the east of the American Camp cantonment and portions of South Beach. The existing Cattle Point Road alignment is also remotely visible from portions of these areas.

In May 2009, the FHWA consulted with the State Historic Preservation Office (SHPO) regarding potential impacts of the proposed project on historic properties and the National Historic Landmark. FHWA concluded that there would be minor viewshed impacts and no ground disturbing impacts to the cultural landscape within the National Historic Landmark. Therefore, FHWA recommended that the proposed project would have *no adverse effect* on historic properties for purposes of section 106. The FHWA also informed the SHPO that it intended to make a *de minimis* Section 4(f) impact determination based on SHPO concurrence with the FHWA recommendation of *no adverse effect*.

The SHPO concurred with the FHWA recommendation of *no adverse effect* in a letter dated June 23, 2009.

5.3.3 Publicly-Owned Trail Impacts

The Mt. Finlayson Trail is about 1.5 miles in length. It begins at the Jakle's Lagoon parking area and traverses the prairie grassland on the south slopes of the Mt. Finlayson ridge with sweeping views of Mt. Baker to the east, Mt. Rainier to the southeast, the Olympic Mountains to the south, and Vancouver Island to the west. Near the summit of Mt. Finlayson, the Lagoon Trail takes off to the north, looping through the forest and past Third Lagoon and Jakle's Lagoon before ending at the Jakle's Lagoon parking area. The Mt. Finlayson trail proceeds east along the ridgeline before descending to the Cattle Point Road near the east end of the project area at about MP 8.3. About 1.3 miles of the Mt. Finlayson Trail is located on park property and 0.2 miles is located on DNR property.

The proposed alternatives would move the road upslope100 to 140 feet closer to the Mt. Finlayson Trail. Traffic noise from the new road alignment would be more noticeable to users of the trail in this area. A portion of the east end of the trail on DNR property would be directly impacted by construction of the new road realignment. Alternative B would directly impact about 200 to 300 feet of trail, alternative C would impact about 100 to 150 feet of trail, and alternative D would impact about 500 to 600 feet of trail. To replace the obliterated trail, a new trail would be constructed at the toe of the road fill slope adjacent to the new roadway.

During construction, hiking on the east end of the Mt. Finlayson Trail would likely be restricted from the summit of Mt. Finlayson through the connection to the Cattle Point Road. This portion of the trail would be reopened following completion of road and trail construction. The remainder of the Mt. Finlayson Trail would be open for use during road construction.

5.4 PUBLIC AND AGENCY COORDINATION

The public has been given the opportunity to review and comment on the proposed project, including impacts to park, historic site, and trail resources, through public meetings and newsletters. Through the release of the DEIS, the public will have the opportunity to review and comment on the effects of the proposed project on the protected activities, features, and attributes of the Section 4(f) resources.

The NPS is a co-lead, along with the FHWA, in development of the proposed project and alternatives. The NPS is the agency responsible for management of the park and historic site. The DNR is a cooperating agency in the development of the proposed project. The DNR is the agency responsible for the portion of the Mt. Finlayson Trail that would be directly impacted by the proposed project.

In May 2009, the FHWA consulted with the State Historic Preservation Office (SHPO) regarding potential impacts of the proposed project on historic properties and the National Historic Landmark. The FHWA also informed the SHPO that it intended to make a *de minimis* Section 4(f) impact determination based on SHPO concurrence with the FHWA recommendation of *no adverse effect*. The SHPO concurred with the FHWA recommendation of *no adverse effect* in their June 23, 2009, letter.

The NPS has consulted with tribes that may have religious or cultural concerns and the tribes have been informed of the intent of the FHWA to make a *de minimis* 4(f) finding.

Coordination between the agencies has been ongoing throughout the project planning process. Measures to minimize and mitigate impacts to Section 4(f) resources have been incorporated into the project alternatives by the agencies. Since the park encompasses the entire width of the Cattle Point peninsula, there are no possible alternatives that would avoid the use of park and historic site property. The east end of the road realignment has been designed to minimize direct impacts to the Mt. Finlayson Trail; however, since the existing trail intersects the road, there was no alternative to avoid use of a small portion of the trail.

5.5 DE MINIMIS FINDING

5.5.1 Publicly-Owned Park

The FHWA has determined that the transportation use of the park, together with minimization, mitigation, and enhancement measures incorporated into the project does not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f). Because of these factors, the FHWA believes that the project alternatives qualify as *de minimis* impacts.

The environmental analysis shows that while the proposed alternatives would realign the road into an area of the park that is currently undeveloped, it would also restore a nearly equal area from an existing transportation use back to natural conditions. Both the new alignments and the restored area provide equal quality wildlife habitat, rare plant and prairie habitat, and scenic qualities. The area of park incorporated into a transportation use would be minimal. Overall, alternative B would involve a net increase of about 0.9 acres of road pavement, alternative C would involve a net reduction of about 0.9 acres of road pavement (above ground), and alternative D would involve 0 net increase/reduction of road pavement (above ground) in the park.

The NPS was informed of the intent of FHWA to make a *de minimis* finding by email on October 7, 2009. The NPS concurred with the FHWA determination that the project would have a *de minimis* impact on the park in a letter dated December 7, 2009.

During the public comment period for the DEIS, the public will be afforded an opportunity to review and comment on the effects of the project on the protected activities, features, and attributes of the park. The FHWA will make its final determination following review of public comments.

5.5.2 Historic Site

The FHWA has determined that the project alternatives would have a *de minimis* impact upon the historic site. The transportation use of the Section 4(f) resource, together with minimization and mitigation measures incorporated into the project would not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f).

The Section 106 analysis and review process has determined that the proposed project would have *no adverse effect* on historic properties, including the historic site. In a letter dated May 28, 2009, the FHWA consulted with SHPO on its *no adverse effect* determination and notified SHPO of its intent to make a *de minimis* finding on effects to the National Historic Landmark. A SHPO letter of June 23, 2009 concurred with the FHWA determination of effects and acknowledged its intended *de minimis* finding. The NPS has consulted with tribes that may have religious or cultural concerns and the tribes have been informed of the intent of the FHWA to make a *de minimis* 4(f) finding.

On October 7, 2009, the FHWA requested concurrence from NPS that a *de minimis* Section 4(f) finding is appropriate for the National Historic Landmark resource under its management. In a letter dated December 7, 2009, the NPS concurred with the FHWA determination that the proposed project would have a *de minimis* impact on the National Historic Landmark.

5.5.3 Publicly-Owned Trail

The FHWA has determined that the transportation use of the trail, together with minimization, mitigation, and enhancement measures incorporated into the project does not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f). Because of these factors, the FHWA believes that the project alternatives qualify as *de minimis* impacts.

The environmental analysis shows that while the proposed alternative realignments would directly impact a portion of the east end of the Mt. Finlayson trail, it would also reconstruct the trail adjacent to the new road alignment. The new trail would be about 100 to 500 feet from its current location. The impacted portion of the existing trail and the reconstructed trail would have the same vistas and would provide a similar recreational experience. The area of trail incorporated into a transportation use would be minimal and the trail would be replaced in kind.

The DNR was informed of the intent of FHWA to make a *de minimis* finding by email on October 7, 2009. The DNR concurred with the FHWA determination that the project would have a *de minimis* impact on the trail in a letter received October 27, 2009.

During the public comment period for the DEIS, the public will be afforded an opportunity to review and comment on the effects of the project on the protected activities, features, and attributes of the trail. The FHWA will make its final determination following review of public comments.

Chapter 6: Consultation and Coordination

6.1 INTRODUCTION

This chapter presents the public and government agency consultation and coordination that have occurred in development of the proposed project alternatives and preparation of the DEIS.

6.2 AGENCY COORDINATION

The co-lead agencies responsible for preparation of the DEIS – the Federal Highway Administration/Western Federal Lands Highway Division (FHWA) and the National Park Service (NPS) – invited federal, state, and local agencies with the appropriate expertise and jurisdiction to participate in the project planning and NEPA process. The cooperating agencies are:

- San Juan County (county)
- Washington State Department of Natural Resources (DNR)

During project development, the NPS and FHWA have worked closely to ensure consistency with agency policies and NEPA. As co-lead agencies, they are responsible for allocating resources for alternative design and development of the environmental document. They are also the decision-making agencies in determining which proposed alternative best meets the project purpose and need and agency mandates. The NPS provided guidance and resource specialists for development of the DEIS. The FHWA provided engineering design and technical expertise as well as NEPA expertise and project management. The resource investigations were performed by environmental and cultural resource consultants as well as by NPS resource specialists.

As cooperating agencies, the county and DNR worked as part of the project team in identifying issues and providing assistance in the analysis and decision-making process. As part of the project team, they were involved in the internal and public scoping process, were present at project and public meetings, provided review of documents, and were involved in correspondence and discussion of relevant issues. The DNR provided information regarding the resources present in the NRCA and project area. The county provided information from its previous public scoping effort and bluff retreat studies. The county owns and maintains the section of road through the project area; therefore, it would be the lead in seeking federal and state funding for the final design and construction phase if an action alternative is selected.

Internal scoping of co-lead and regulatory agencies was also included in the scoping process. This involved the project interdisciplinary team and other government agencies having regulatory jurisdiction or resource expertise in the area. These agencies include the U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (USACE), U.S. Environmental Protection Agency (EPA), Washington Department of Fish and Wildlife (WDFW), Washington State Historic Preservation Office (SHPO), Advisory Council on Historic Preservation (ACHP), and the Washington State Department of Ecology (WDOE). Coordination with the project team and appropriate agencies will continue though the remainder of the project development and NEPA process.

If an action alternative is chosen, the project team would continue to work together in the final design, construction, and monitoring phases of the project. This includes continuing compliance with all applicable laws, policies, and regulations, as well as continued examination of methods to minimize environmental impacts in developing and implementing the chosen alternative.

6.3 OTHER AGENCY AND TRIBAL CONSULTATION AND COORDINATION

6.3.1 U.S. Fish and Wildlife Service

Section 7(a)(2) of the Endangered Species Act (ESA) requires that federal agencies insure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat.

The USFWS was initially contacted by letter on March 19, 2004, as part of the scoping effort. The letter included information on the proposed project and an invitation to participate as a cooperating agency due to the presence of bald eagle in the project area, which at the time was listed as endangered. The bald eagle was removed from the endangered species list in 2007; however, it continues to be federally protected under the Bald and Golden Eagle Protection Act (BGEPA). Due to limited resources the agency declined to join as a cooperator, but it did offer its expertise for future consultation needs.

The environmental analysis concludes that the project alternatives would have no effect on any federally-listed threatened or endangered species; however, the action alternatives would affect bald eagle in the project area. The BGEPA prohibits *take* in the form of disturbance to bald eagles. At this time, the USFWS has not developed a take permit for the BGEPA. The FHWA will continue to coordinate with USFWS regarding its responsibilities for bald eagle protection and mitigation of potential project effects.

6.3.2 State Historic Preservation Office

Section 106 of the National Historic Preservation Act requires that federal agencies consider the effects of their actions on archeological and historic properties. The law requires that federal agencies consult with the State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO) and give the Advisory Council on Historic Preservation an opportunity to comment before projects are implemented.

The FHWA first contacted the SHPO on March 19, 2004, through the Washington State Office of Archaeology and Historic Preservation (OAHP). Because of the historical significance of the park, the SHPO was asked to participate as a cooperating agency. The OAHP requested information, when available, to assist in their review of the project.

Cultural resource surveys and analysis concludes that there are no properties that are listed or eligible for the National Register of Historic Places (NRHP) within the project Area of Potential Effects (APE) other than the American and English Camps, San Juan Island National Historic Landmark. The FHWA has determined that the proposed project would have *no adverse effect* on historic properties. The FHWA consulted with SHPO for concurrence its determination on May 28, 2009. In addition, the FHWA informed the SHPO of its intent to make a *de minimis* impact determination based on SHPO concurrence of *no adverse effect* on historic properties. The SHPO concurred with the FHWA determination in its letter dated June 23, 2009.

6.3.3 Native American Tribes

Four federally recognized tribes have traditional ties to the project area. They are the Lummi, Samish, Swinomish, and Klallam (or S'Klallam). These tribes have been consulted by the NPS through personal communication and e-mail during various stages of project development, and their comments have been considered in development of this document. The NPS and FHWA will continue to coordinate with the tribes and consult with them on the results of the cultural survey and determination of effects. The tribes will receive a copy of the DEIS and will continue to be consulted in further project planning and implementation if an action alternative is chosen.

6.3.4 Other Agencies

Numerous resources were used in the development of this project including other government agencies and informational resources. The Cultural Resources Assessment utilized a number of resources to develop information on the history of the area. Plant and biological studies were developed from information from a multitude of resources. In compiling this document, the FHWA and NPS consulted with other resource professionals, as well as text and online resources to obtain the best information available for the project. Other agencies that provided information for this EIS include:

- Washington State Department of Ecology for Coastal Zone Management Act compliance
- U.S. Army Corps of Engineers regarding bluff erosion and coastal processes
- Washington Department of Fish and Wildlife regarding state-listed species
- National Oceanic and Atmospheric Administration-Fisheries regarding marine species

The City of Friday Harbor is the only municipality in the project vicinity. It is located approximately 8 miles north of the project area. The city has been included on the mailing list and has provided information regarding the project.

6.4 PUBLIC INVOLVEMENT

An integral part of the NEPA process is to engage the public in the decision-making process. The goal of the public involvement process for this project is to develop public awareness and understanding of the project, gain public input from all potentially affected interests, and appropriately consider public issues in developing and evaluating the alternatives. This proactive public involvement process maximizes the chances for a successful project by establishing early understanding and ownership of the effort by key stakeholders.

For this proposal, public stakeholders consist primarily of local property owners, residents, community leaders, park visitors, and environmental and conservation groups. A wide range of public and agency perspectives have been considered in developing and evaluating alternative solutions.

6.4.1 Scoping

Public scoping allows stakeholders, and interested parties to identify or suggest resources to be evaluated, issues that may require environmental review, reasonable alternatives to consider, and potential mitigation if adverse effects are identified. Scoping also provides decision makers with insight on the analyses that agencies, stakeholders, and interested publics believe should be considered as part of the environmental review process.

The initial scoping effort for this project was undertaken by San Juan County in 2001, and a scoping document was published in February 2002. This document proposed 11 alternatives and identified environmental analysis needs, including an assessment of the existing conditions. A geotechnical investigation that included two borings and a bluff retreat report were completed as a part of the county effort and are referenced in this document.

Information relevant to the project was sent to federal, state, local, and tribal agencies and the general public. Pre-scoping interviews were conducted and information packets were mailed to over 175 people. A public scoping meeting was held in August of 2001 in Friday Harbor on San Juan Island with over 70 people in attendance. Comments were received throughout the process. These comments were considered in the development of this DEIS. Copies of the full comments and the scoping document are available for review at the San Juan County Public Works Department.

In September of 2003, federal funding became available for project planning. These funds came through the Public Lands Highway Program of the Highway Trust Fund. The FHWA has stewardship and oversight responsibilities for funds disbursed from the Highway Trust Fund. The NPS is responsible for project programming and planning of Parks Road Program projects. The use of federal funding brought about the need for a change in agency responsibilities. The project lead was shifted from the San Juan County to the FHWA and NPS. Federal funding also brought requirements for adherence to different regulations, policies, and management values. Therefore, it was determined that a review and revision of the determinations made during the scoping process undertaken in 2002 was warranted. This effort is detailed in the June 3, 2004, Scoping Report.

Subsequent scoping involved an invitation to all federal, state, and local agencies, and tribes as well as any interested publics that might be affected by the proposed action. A Notice of Intent to prepare an EIS was published in the Federal Register by the FHWA in February 2004. The project team was formed and met to outline time frames, roles, and responsibilities. Potential alternatives were developed and the information from the previous scoping effort was revisited. Preliminary design details and information on the affected environment were developed and researched. As alternatives were discussed, the need for additional information was recognized. A Conceptual Tunnel Study (Shannon and Wilson 2004) and Cultural Resource Assessment (Earley and Kopperl 2004) were developed.

Public scoping was initiated through a newsletter to introduce the issue and announce a public meeting. The first public meeting, held in February 2004 in Friday Harbor on San Juan Island, focused on project introduction and scoping. The meeting was announced through the local media and the NPS website. An afternoon and evening session were held, with displays and information available. Project team members were on hand to discuss issues and gather feedback and ideas on alternatives and environmental issues. Public comments were received before, during, and after the meeting. Using comments from the meeting and agency recommendations, the project team decided on alternatives to be carried forward and further information to be gathered.

6.4.2 Public Comments

The public comments received on this project raised a number of issues. Comments generally supported the purpose and need for the project. No comments were received that were in favor of the no action alternative.

Public comments were received during the initial county scoping effort in 2001. The FHWA and NPS reviewed these comments during implementation of their scoping efforts in 2004. Additional public comments were received in connection with the public open house meeting held in Friday Harbor on February 6, 2004.

Public Comment Synopsis and Agency Response:

Public comments touched on a variety of issues and concerns. Some comments focused on protection of natural, scenic, and recreational resources such as grassland habitat, wildlife habitat, hiking trails, and view-sheds. These comments, along with other considerations, led the project team to recommend that preliminary road alignments located on the Mt. Finlayson ridge (identified as corridor 4 in early planning and scoping documents) and in the forested area on the north side of Mt Finlayson (identified as corridor 5 in early planning and scoping documents) be eliminated from further consideration due to their relatively high level of impacts to biological and recreational resources.

Other public comments centered on the need to maintain access for east Cattle Point residents. These comments emphasized the need to build a long-lasting road and a contingency plan in case of road failure. These issues were among the “key issues” (section 1.5.1) considered by the project team in the development and evaluation of the action alternatives. The public comments highlighted the need for the design life of the alternatives to be carefully balanced with impacts.

A few public comments concerned possible stabilization of the toe of the eroding slope and shoreline. One comment specifically addressed a disagreement with the calculations used to anticipate the rate of erosion of the cliff. The FHWA response detailed how attempts to manipulate the shoreline erosion and deposition process would not adequately protect park resources. The USACE concurred with the FHWA geotechnical study regarding the validity of the erosion studies. It is the agencies’ conclusion that due to the complexity and regional scale of the causes of shoreline erosion and the unpredictable nature of storm-induced erosion, that further studies to better estimate the erosion rate would require a substantial undertaking and might yield only marginally improved results.

Some public comments addressed the need to retain facilities for visitors of all kinds including pedestrians, bicyclists, and motorists. This would include features such as pedestrian paths, bicycle trails, and road pullouts. In response, the project team emphasized the importance of safety for non-motorized travel and the need to address trail use and views in the development of the alternatives and mitigation measures.

One public comment requested a detailed archaeological analysis for each alternative. Assessment of project impacts on cultural and archaeological resources has been included in the DEIS. The NPS has coordinated with appropriate Native American Tribes. The FHWA has consulted with the SHPO and received their concurrence with project effects on cultural resources.

6.5 PUBLIC REVIEW OF DRAFT EIS

The Notice of Availability has been published in the Federal Register. The DEIS is available for a 60-day public review and public comment period. During the public review period, the FHWA and NPS will host an open house to share information from the DEIS and receive public comments. The public open house date and location will be announced in the local and regional news media.

The DEIS have been mailed to agency representatives and interested public who have requested a copy of the document. In addition, letters have been sent to those on the mailing list to notify them of the availability of the DEIS and how to request a copy of the document. The DEIS is posted on the web at www.wfl.fhwa.dot.gov/projects/wa/cattlepoint/ and http://parkplanning.nps.gov/parkHome.cfm?parkID=340. Copies have also been distributed to the public library, NPS office, and San Juan County Public Works office in Friday Harbor, and FHWA office in Vancouver, Washington.

Following the public comment period, the FHWA and NPS will review and consider all comments. Agency responses to substantive comments will be included in the final EIS (FEIS). A Record of Decision (ROD) will be published following release of the FEIS. The ROD will present the project decision and explain the basis for the decision.

6.6 PERMITS AND APPROVALS

If an action alternative is selected, all applicable federal permits would be obtained prior to construction. Applicable federal permits include the following:

6.6.1 NPDES

A National Pollutant Discharge Elimination System (NPDES) permit is require for all construction activities that disturb 1 acre or more. Implementation of any of the action alternatives would require an NPDES Construction General Permit (CGP). NPDES permitting for federal projects is administered by the EPA. The CGP requires preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) during construction. The SWPPP addresses water pollution control during construction and outlines erosion and sediment control BMPs to be installed on the construction site.

6.6.2 Coastal Zone Consistency

The proposed project is located within a coastal zone. Any federal action that is likely to affect a land or water use or natural resource of the coastal zone is required to be consistent to the maximum extent practical with the enforceable policies of state management programs. The environmental analysis has determined that implementation of any of the action alternatives would not affect the coastal zone and would comply with the applicable laws. A negative determination has been submitted to the Washington State Department of Ecology (WDOE).

6.6.3 Clean Water Act

The environmental analysis indicates that the action alternatives would have no impacts on wetlands or waters of the U.S. Therefore, the project would comply with the Clean Water Act and Executive Order 11990, and a Section 404 permit would not be required.

6.6.4 Other State Requirements

The DNR and county operate under state laws requiring compliance with the State Environmental Policy Act (SEPA). The SEPA process allows adoption of existing NEPA documents for compliance. If the agencies are in agreement with the findings in the FEIS, and the document meets their SEPA compliance requirements, the findings of the NEPA process would be adopted to satisfy SEPA requirements. The county would take the lead on SEPA compliance.

6.7 FUNDING

The project is currently funded by the Public Lands Highway Program for preliminary engineering and environmental studies only. If an action alternative is selected, additional funding would be needed for final road design and project construction as well as development, implementation, and monitoring of mitigation plans, and emergency contingency plans. Additional funding would be requested through the appropriate federal and state sources, with San Juan County taking the lead.

Chapter 7: List of Preparers

Name	Professional Discipline	Education and Experience	Responsibilities in EIS
FHWA			
Michael Boynton	Environmental Protection Specialist – Archaeologist (retired)	B.A. Anthropology, M.A. Anthropology 35 years experience	Cultural Resources
Jack Doucey	Design Engineer	B.S. Forestry Management 34 years experience	Alternative Designs, Graphics, and Estimates
Reuben Johnson	Design Engineer		Alternative Designs
Al Kilian	Senior Geotechnical Engineer (retired)	B.S Civil Engineering 35 years experience	Bluff Erosion, Geology and Soils
Sven Leon	Hydrologist and Hydraulics Engineer	B.S. Geology; B.S. Civil Engineering 20 years experience	Water Resources
Andrew Rasmussen	Environmental Protection Specialist - Engineer	B.S. Civil Engineering 10 years experience	Environmental Project Manager Lead Preparer (draft DEIS)
Ann Richmond	Technical Writer/Editor Consultant – Brooks and Associates	B.A Journalism; M.S. Fishery and Wildlife Biology 9 years experience	Document Editor
Makayah Royal	Environmental Protection Specialist	B.S. Biology; M.S. City and Regional Planning 6 years experience	Document Preparation and Review (first draft)
Michael Schurke	Cultural Specialist	B.A. Anthropology; pursuing M.A. Anthropology 7 years experience	Cultural Resources SHPO Consultation
Diane Spencer	Senior Environmental Protection Specialist	B.S. Natural Resources Management 31 years of experience	Environmental Project Manager Lead Preparer (DEIS)

NPS			
Peter Dederich	Superintendent, San Juan Island National Historical Park (SJINHP)		NPS, Park Policy
Bill Gleason	(Formerly) Chief of Resource Management, SJINHP		NPS Compliance
Rose Rumball-Petre	Environmental Protection Specialist, Pacific West Region		NPS Compliance
Cheryl Teague	Landscape Architect, Pacific West Region		NPS Compliance
San Juan County			
Louis J. Haff	Consultant Engineer		Alternative Designs and County Resources
Russ Harvey	Operations Manager		Road Use Information
Washington State Department of Natural Resources (DNR)			
Christ Thomsen	Public Use Manager		DNR Issues
Kathy Gunther	Natural Areas Steward		NRCA Issues
Consultants			
Vaughn Anderson	Consultant Project Manager, Engineer DJ&A PC		Alternative Design Engineering and Graphics
Mary Hamilton	Consultant, Environmental Specialist (Formerly) Widener and Associates	Masters of Applied Sciences	Vegetation and Wildlife Resources
Ross Widener	Consultant Project Manager Widener and Associates		Scoping Document, Resource Reports, Public Involvement

REVIEWERS:

FHWA/WFLHD

Victoria Brinkly, Highway Safety Engineer

Betty Chon, Project Manager

Jennifer Corwin, Environmental Specialist

Dave Lofgren, Geotechnical Engineer

Jody Marshall, Environmental Senior Technical Specialist

Rayann Speakman, Legal Counsel

NPS

Chris Davis, Resource Management Specialist, San Juan National Historical Park

Keith Dunbar, Team Leader for Planning and Partnerships, Pacific West Region

Dave Kruse, Former Transportation Program Manager, Pacific West Region

Alan Schmierer, Regional Environmental Coordinator, Pacific West Region

DNR

Alison Hitchcock, NW Region Natural Areas Manager

Deborah Nemens, Natural Areas Assistant Ecologist - Westside

Curt Pavola, Natural Areas Program Manager

Pene Speaks, Assistant Division Manager

David Wilderman, Natural Areas Ecologist - Westside

San Juan County

Jon Shannon, Public Works Director

John Van Lund, County Engineer

Shannon Wilbur, Transportation Planning Engineer

List of Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effects
BA	Biological Assessment (under Section 7 of the Endangered Species Act an assessment of the adverse impacts of a proposed action on a species listed by the USFWS)
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMP	Best Management Practice
BO	Biological Opinion (a determination, under Section 7 of the Endangered Species Act) of the effects of a proposed action on a species listed by the USFWS)
CAA	Clean Air Act
CFR	Code of Federal Regulations
CEQ	Council on Environmental Quality
CWA	Clean Water Act
CZMA	Coastal Zone Management Area
CZMP	Coastal Zone Management Programs
CLI	Cultural Landscapes Inventory
DBA	A-weighted decibels
DEIS	Draft Environmental Impact Statement
DNR	Washington State Department of Natural Resources
DO	Director’s Order
DOT	Department of Transportation
ECM	Environmental Compliance Memorandum
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order

EPA	(United States) Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionary Significant Unit
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
FLH	Federal Lands Highway
GMP	General Management Plan
HAP	Hazardous Air Pollutant
MBTA	Migratory Bird Treaty Act
MMPA	Marine Mammal Protection Act
MP	Milepost
MPH	Miles Per Hour
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHP	National Historical Park
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NPS	National Park Service
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NRCA	Natural Resources Conservation Area
NRCS	Natural Resources Conservation Service
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
OAHP	Office of Archaeology and Historic Preservation
RCRA	Resource Conservation and Recovery Act of 1976
RCW	Revised Code of Washington

RPP	Recreation and Public Purpose
SEA	Shorelands and Environmental Assistance Program
SAFETEA-LU	The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SEPA	State Environmental Policy Act
SHPO	State Historic Preservation Office or Officer
SJNHP	San Juan National Historical Park
SPCC	Spill Prevention, Control, and Countermeasure
SMA	Washington State Shoreline Management Act
SWPPP	Storm Water Pollution Prevention Plan
THPO	Tribal Historic Preservation Office
USACE	United States Army Corps of Engineers
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WA	Washington
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDOE	Washington State Department of Ecology
WFLHD	Western Federal Lands Highway Division
WNHP	Washington Natural Heritage Program
WSDOT	Washington State Department of Transportation

Glossary
Technical Terms Used in This Document

Affected environment: The existing physical, biological, cultural, and social environment in the project area and vicinity. It describes the existing conditions of resources that may be affected by the project alternatives if they were implemented.

Alternatives: Sets of management elements that represent a range of options for how or whether to proceed with a proposed action. An environmental document analyzes the potential environmental impacts of the range of alternatives, as required under the National Environmental Policy Act (NEPA).

Anadromous: Fish that are born in fresh water, spend a portion of their lives in the ocean, then return to fresh water to spawn.

Area of permanent disturbance: The area permanently covered by pavement.

Area of potential effect: The geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties.

Area of temporary disturbance: The area of ground impacted by construction activities that would be restored to preconstruction conditions following completion of the project.

Best Management Practices (BMPs): Effective, practical, structural and nonstructural methods which prevent or reduce soil erosion or the movement of sediment.

CEQ Regulations: Congress established the Council on Environmental Quality (CEQ) as part of the National Environmental Policy Act of 1969 (NEPA) to oversee federal agency implementation of the environmental impact assessment process. CEQ regulations provide guidance for federal agency compliance with NEPA.

Cooperating agency: An agency working collaboratively with the lead agency in completion of the NEPA process for the project.

County: Referring to San Juan County.

Cumulative impact: 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.

Cultural landscape: Defined by the World Heritage Committee as a distinct geographical area or properties uniquely "representing the combined work of nature and of man." A historically significant landscape within the National Park System

Cut: Excavation required to lower the natural ground line to the desired road profile.

Cut slope: The upslope face of an excavated bank sloping up from the road bed.

Decibel: A unit of measure for sound intensity.

Direct effects or impacts: Effects caused by an action and occurring at the same time and place.

Earthwork: The earth which must be moved from one place to another during road construction for activities such as cuts, fills, and tunnel construction.

Environmental Impact Statement (EIS): A document required of federal agencies by the National Environmental Policy Act for major projects significantly affecting the environment. A tool used for decision making, describing the positive and negative effects of the undertaking and alternative actions.

Environmentally preferable alternative: The alternative that will promote the national environmental policy in Section 101 of NEPA. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources.

Estimated construction cost: Estimated total cost for all aspects of project construction.

Fill: A section of roadway where earth must be imported and placed in construction.

Fill slope: The face of a down slope bank of a roadway.

Floodplain: Land area subject to periodic flooding from a contiguous body of water. Floodplains are delineated by the expected frequency of flooding.

Grade:. The slope of the roadway surface. Grade is expressed as the change in elevation per 100 feet of horizontal distance.

Guardrail: A safety feature consisting of a rail and post system that is intended to reduce the chances of cars traveling off the road.

Historic property: Under NHPA and NEPA/CEQ a district, site, building, structure, or object that is included in or eligible for listing in the National Register of Historic Places, and includes resources to which American Indians attach cultural and religious significance.

Impairment: An impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including opportunities that would otherwise be present for the enjoyment of those resources or values.

Invasive species: A non-native species of plant or wildlife that employs habits that allow it to take over the habitat to displace native species.

Irretrievable Commitments of Resources: Actions that result in the loss of resources that, once gone, cannot be replaced.

Irreversible Commitments of Resources: Actions that result in the loss of resources that cannot be reversed or restored to their original condition.

Lead agency: The agency preparing or having taken primary responsibility in completion of the NEPA process for a project.

Mitigation: Mitigation is the attempt to offset potential adverse effects of human activity on the environment by actions used to avoid, minimize, rectify, eliminate, or compensate.

National Environmental Policy Act: The National Environmental Policy Act (NEPA) requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. NEPA requires that federal agencies follow procedural steps when making decisions that may have an effect on the human environment.

No action alternative: The alternative that proposed to continue current management actions and direction. "No Action" means the proposed activity would not take place.

Non-native or exotic species: Organisms that are not indigenous to the ecosystem to which they were introduced and which are capable of surviving and reproducing without human intervention.

Organic Act (NPS) 1916: The National Park Service Organic Act established the National Park Service to "promote and regulate the use of the parks . . ." and defined their purpose "to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

Park: Referring to the San Juan Island National Historical Park.

Predicted life span: The length of time a structure is expected to last based on average conditions and durability of material components.

Preferred alternative: The alternative which the cooperating agencies believe would fulfill their mission and responsibilities, including the purpose and need for the project and other factors.

Project team or team: The interdisciplinary team consisting of specialists from several fields combining skills and resources to conduct the NEPA analysis for the project.

Public comment process: The role of the public in the NEPA process, particularly during scoping, in providing input on what issues should be addressed in the environmental document and in commenting on the findings in an agency's NEPA documents.

After issuance of a draft EIS, a Notice of Availability is published in the Federal Register to begin the public comment period of at least 45 days, during which time the public may comment on the NEPA document content and project development process.

Pullout: A widened section of roadway that allows vehicles to pull off the road for viewing, access to terrain or emergencies. Pullouts may be formal (paved or graveled) or user-designated (created by visitor use over time). Also called a turn out.

Purpose and need: The underlying purpose and need to which the agency is responding in proposing the alternatives. The purpose and need states the problems of the transportation facility and the goal for the facility.

Retaining wall: A wall built to stabilize hillsides, control erosion or reduce the grade of a road or the length or height of the cut or fill slope.

Road: In reference to the Cattle Point Road.

Scoping: Initial project research effort that includes coordination efforts with government agencies, identification of interested parties, initializing contacts, identifying potential concerns, preliminary assessment of area resources, and investigation of potential solutions.

Secondary (or indirect) effects: Effects caused by an action but which are removed by greater time or distance from the original action, although still reasonably foreseeable.

Section 7 consultation: Section 7 of the Endangered Species Act requires federal agencies, when proposing a federal action, to obtain a species list for the project area from, and to consult with, the U.S. Fish and Wildlife Service (USFWS) regarding potential impacts from the proposed action.

Short-term use vs. Long-term productivity: A review of the balance or trade-offs between short-term uses and long-term productivity of resources within the project area.

Sight distance: The length of roadway ahead continuously visible to the driver. The three types of sight distance common in roadway design are intersection sight distance, stopping sight distance, and passing sight distance.

Special vehicles: Two and three-wheeled mopeds or "scoot cars" that frequently utilize island roadways.

Take: To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect.

Threatened or endangered species: Species protected under the Endangered Species Act of 1973 (ESA) or by Washington Administrative Code (WAC). A threatened species is a native species that is at risk of becoming endangered in the near future. A threatened species may have a declining population or be exceptionally rare. An endangered species is a native species that faces a significant risk of extinction in the near future throughout all or a significant portion of its range.

Unavoidable adverse impacts: Moderate to major impacts that cannot be fully mitigated or avoided

U.S. Fish and Wildlife Service (USFWS): The federal agency responsible for conserving, protecting, and enhancing fish, wildlife, and plants and their habitats; includes regulatory authority for the Endangered Species Act.

Visitor experience: The perceptions, feelings, reactions, and activities of park visitors in relationship to the surrounding environment

Visitor use: The types of recreation activities engaged in by visitors, including the type of activity, visitor behavior, timing, and distribution of use.

Wetland: An area inundated or saturated with surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

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Appendix A

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Preliminary Revegetation Plan
Cattle Point Improvement Project
January 2010

The purpose of this report is to present viable revegetation strategies and measures that would be used to revegetate disturbed sites associated with the Cattle Point Road Improvement Project if an action alternative is selected. This is a *preliminary* revegetation plan which means that it will be modified as the road plans evolve, depending on which alternative is chosen following completion of the NEPA process. Since the current road plans are in a very preliminary stage, many design elements will change during planning. A *final* revegetation plan will be completed when road plans are at the 70% design. The preliminary revegetation plan will be used to begin the process of obtaining seeds and seedlings from appropriate genetic sources for plant material production.

The report is structured as follows:

Objectives

Road Objectives

The objectives of the Cattle Point Road Improvement Project are to "maintain vehicular, bicycle, and pedestrian road access to the Cattle Point area through the San Juan Island National Historical Park" and "provide safe and pleasant roadway experiences for residents and visitors". The preferred alternative (Alternative B) in the Draft Environmental Impact Statement developed by the Federal Highway Administration and the National Park Service (2010) proposes to realign 4,950 feet of the Cattle Point Road to the north of the existing road and to restore the portion of the existing Cattle Point Road, that would be abandoned in the process, so that it blends into the surrounding topography. The road construction would create about 10 acres of new cuts and fills and about 3 acres of reclaimed abandoned road, which would be revegetated. In addition, the staging area, which would occupy approximately 1 acre, would likely need to be revegetated.

This plan outlines preliminary revegetation strategies based on the preferred alternative (Alternative B). If a different alternative is chosen, the revegetation strategies would be the same; however, the details of the plan would be altered to reflect the chosen alternative and final road design details.

Revegetation Objectives and DFCs

The revegetation objectives are the foundation for which strategies for reestablishing vegetation are based. The desired future conditions (DFCs) are created from revegetation objectives and become the monitoring criteria used for measuring the success of the revegetation project. The following are the main revegetation objectives and DFCs identified for the Cattle Point Improvement Project.

<u>1) Stabilize disturbed soils</u>. NPDES (National Pollution Discharge Elimination System) permit requires that disturbed soils associated with construction be stabilized to reduce the potential of surface erosion (including wind and storm runoff) and sloughing of cuts and fills. It also requires establishment of a uniform vegetative cover with a density of 70% of the background plant cover.

DFC: *Less than 20% of soil will be exposed 12 months after road construction and at the end of three years, basal cover*[1] *of vegetation (native and non-native species) will cover 70% of the soil surface*. The "Soil Cover" protocol outlined in the Roadside Revegetation technical guide (Steinfeld and others 2007) will be used to monitor this parameter.

<u>2) Reestablish native vegetation</u>. Disturbed areas associated with this project offer a unique opportunity to create an extensive native plant community that currently exists only in small, isolated remnants throughout the prairie/grassland habitat of the American Camp unit. By establishing native plants in the reclaimed road section, a long corridor of native plants will transect a portion of the Park, serving as an anchoring point for the reestablishment of desirable species into the surrounding area. This would achieve a San Juan Island National Historical Park vegetation management goal of restoring native vegetation to the historic landscape and at a broader level, the National Park System's fundamental goal of restoring and enhancing park lands to preexisting natural conditions. The proposed action also offers the opportunity to test revegetation treatment methods that could be used for future restoration efforts in the park.

DFC: *By end of third year, native plants will occur on 70% of the project area.* The "Species Presence" protocol, using a 0.1 square meter quadrat frame, will be used for monitoring the presence of native plants. This protocol is described in the Roadside Revegetation technical guide (Steinfeld and others 2007).

<u>3) Control aggressive non-natives</u>. Reducing the presence of aggressive non-native species is a management goal for San Juan Island National Historical Park. Bare soils resulting from road construction activities will open up sites to invasion by noxious weeds. This plan will propose an Integrated Pest Management approach to reducing the presence of these species.

DFC: *Less than 1% of the quadrats will have bull thistle, Canada thistle, tansy ragwort, Fuller's teasel, spotted knapweed, California poppy, common mullein, cutleaf and Himalayan blackberry, oneseed hawthorn, quackgrass, orchard grass, ripgut brome (Bromus rigidus), or tall fescue (Lolium arundinaceum) and less than 5% of the quadrats will have Queen Anne's lace, common St. Johnswort, common velvetgrass, or hairy catsear.* The "Species Presence" protocol using a 1.0 square meter quadrat frame will be used to monitoring the presence of noxious weeds.

<u>4) Establish host plants for the Island Marble Butterfly</u>. The DEIS requires the establishment of host species for the Island Marble Butterfly (*Euchloe ausonides insulanus*) as a mitigating measure for the enhancement of this species. According to Pyle (2004), this butterfly "represents one of the most dra-

[1]Basal cover refers to the area that the base of plants occupy at ground line and involves clipping grasses and forbs at one inch above the ground surface during monitoring.

matic examples in the North America fauna of a narrowly endemic taxon...and its entire future seems to depend upon management within the Park". Its host plants are tall tumblemustard (*Sisymbrium altissimum*), field mustard (*Brassica campestris; renamed Brassica rapa*) and Menzies' pepperweed (*Lepidium virginicum var menziesii*).

The first two mustards are introduced species and the pepperweed is native. Since National Parks are prohibited from intentionally propagating non-native species, only the Menzies' pepperweed can be considered for propagation in this plan however, the other two species will not be eradicated if they reestablish on their own. Several other native plant species will be investigated as potential host plants for the Island Marble Butterfly. These include Eschscholtz's hairy rockcress (*Arabis eschscholtziana*) and tower rock cress (*Arabis glabra*) which are found on San Juan Island but not in the park. Common pepperweed (*Lepidium densiflorum var. densiflorum*) is a native host plant for the Large Marble butterfly (*Euchloe ausonides*), a conspecific of the Island Marble Butterfly, that inhabits the mainland. Small trials to evaluate butterfly preferences of known and potential host plant species will be conducted by park resource management staff in 2010/11, but propagating plant species other than the pepperweed, will be deferred until more information is obtained about these plant-butterfly relationships.

DFC: *Until more is known, 10 patches per acre of native host plants, containing at least 20 plants per patch, will be established on disturbed sites three years after construction*. Monitoring this DFC will be accomplished by mapping these populations.

5) Maintain and enhance the presence of California buttercup. The California buttercup (*Ranunculus californicus*) is classified by the state of Washington as threatened and critically imperiled because there are less than six known occurrences in the state. During the spring 2005 field survey, the National Park Service (NPS) identified 33 groups (consisting of 2 to 260 individuals) of California buttercup within the project area, occupying a total area of approximately 0.5 acres. The new road construction will seek to minimize ground disturbance to avoid as many California buttercup groups as possible. Nevertheless this action could potentially impact approximately 4 to 5 known groups. Plants in these areas will be salvaged prior to ground disturbance and relocated. Restoration of the abandoned road segment, as well as roadway cuts and fills, will provide an opportunity for increasing California buttercup populations.

DFC: *The California buttercup will increase by 15 population groups by the third year after construction*.

Site Inventory

The Cattle Point project area is unique in its environment and aside from possibly portions of nearby islands (Long Island and Charles Island), it appears to stand alone in terms of soils, climate, and vegetation.

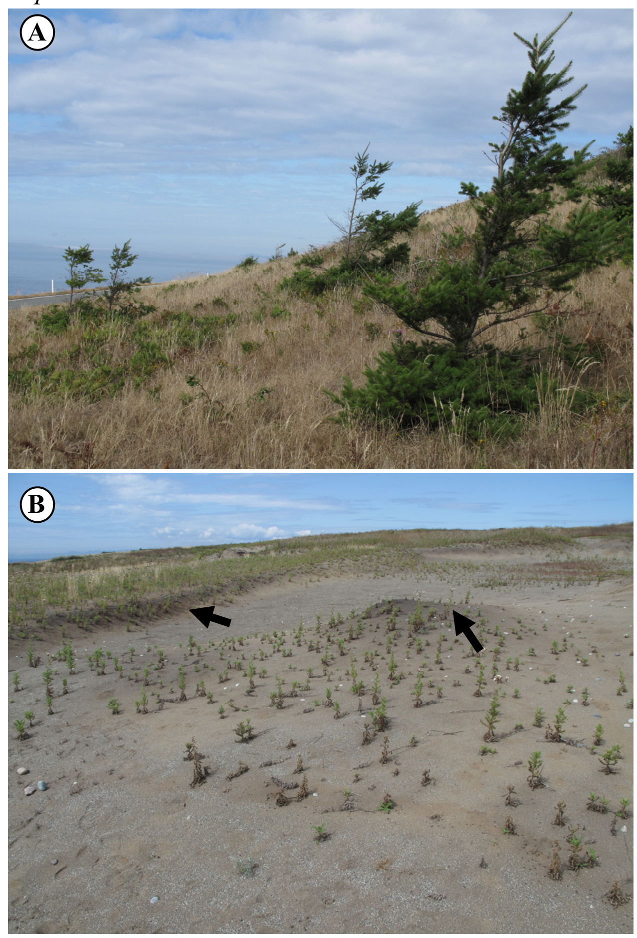
Climate[2]

Wind. High winds have strongly influenced the development of soils, geomorphology, and subsequently the vegetative patterns and plant growth observed in the project area. Slopes have a southern exposure that receives the direct effects of storms blowing across the Strait of Juan de Fuca. These winds have scoured a half mile portion of the park between Pickett's Lane and Cattle Point Road, as it

[2]The data sets presented in the climate section were derived using the PRISM climate mapping system, USDA's official climate data. PRISM uses data from weather stations, a digital elevation model, and expert knowledge of complex climatic extremes, including rain shadows, coastal effects, and temperature inversions to estimate monthly temperatures and precipitation for any set of coordinates. The decimal degrees location used for this analysis was 48.4524 and -122.9724. The analysis evaluated data from 1970 to 2008.

funnels around the Mt Finlayson ridge, creating sand dunes and an eroded landscape (see Figure 1B). Winds are also responsible for the two-foot deposit of fine loess sands that blanket an extremely gravelly subsoil.

Figure 1. Wind Effects. *The few trees present in the project area have been deformed by strong winds (A). Winds have also scoured a portion of the park landscape, removing the topsoil and depositing in dunes. Arrows in the bottom picture (B) show areas of remnant topsoil.*



The degree that an area is protected from high winds will strongly influence the development of the plant community. The most obvious example of this is the dramatic change from grasslands to forests at the Mt Finlayson ridgeline. While some young trees have become established on the windward side of the ridge, the impacts from winds have reduced tree and shrub growth substantially (see Figure 1A).

High winds will affect revegetation efforts by stressing newly planted seedlings or seed as they are germinating. These effects will be greatest during the summer months but should diminish as daily temperatures decline in the fall. Desiccating winds occurring during the early establishment of vegetation will be one of the main limiting factors for successful revegetation, therefore some degree of wind protection during the first several years of establishment should be considered when implementing this plan.

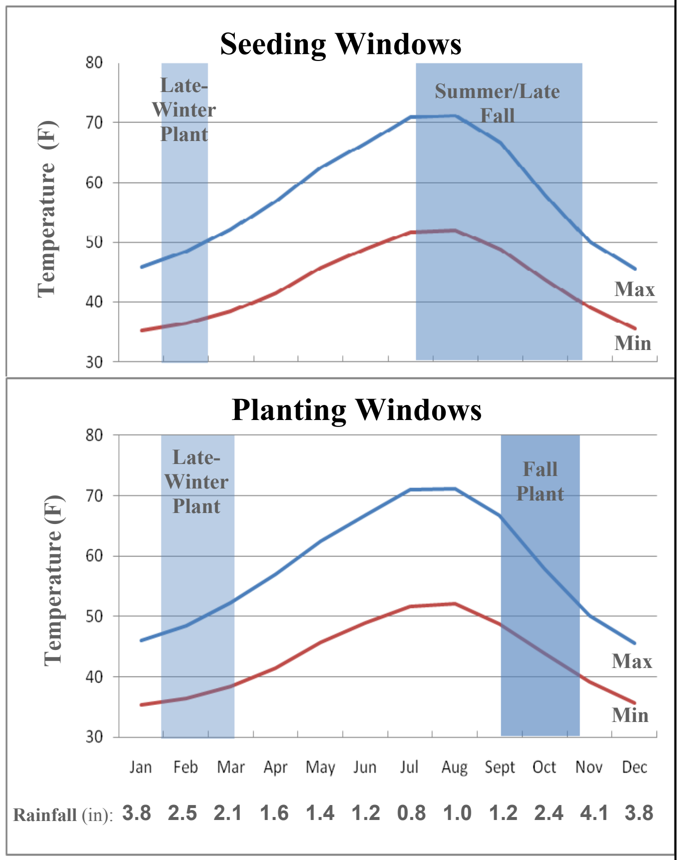
Precipitation. Cattle Point receives an annual rainfall of approximately 26 inches with more than half occurring from November through February. Precipitation from late spring through the end of summer is sparse, averaging approximately an inch of rainfall a month (see Figure 2). This is not enough rainfall to wet a dry topsoil and therefore the lack of precipitation in the summer is considered one of the main limitations to plant establishment on this project. The arrival of the first rainstorms in late September to October determines the earliest that seedlings can be planted in the fall.

Temperatures. Temperatures are quite favorable for plant growth during much of the year as long as soil moisture is available. Optimum temperatures for plant growth occur from June through September, but this is also the period when precipitation is at its lowest. Fall temperatures are mild with a warming trend over the last thirty years. October and November are favorable months for plant establishment because the mild soil temperatures are ideal for new root growth. This is also a period of the year when many seeded species, including weed seeds, germinate before winter arrives.

Winter temperatures are cool but don't frequently fall below 32 degrees, reducing the risk of freeze thaw effects on planted seedlings and germinating seeds. While some root growth takes place during December and January, most plant growth is limited during this period because of low solar radiation. Warming of soils and increased day length in February initiates new roots on most plants and by early March, most established plants have begun to develop new shoots. Seeds of species requiring stratification that were sown in the fall also begin to germinate by late February.

Planting Windows. Planting windows are dictated by temperature, precipitation, and soil conditions (Figure 2). The optimum time to plant at Cattle Point is from mid-September to early November when topsoils are at field capacity (typically this occurs after one or two substantial rainstorms). The earlier that containerized seedlings are planted in the fall (soil moisture permitting), the longer they will be exposed to warm soil conditions and the greater the chances of establishment. Warm soils increase the likelihood that roots will quickly grow out from the plugs and occupy the topsoil before non-native species begin to germinate. New root growth decreases in the late fall and winter months with declining temperatures but picks up again in February. By early spring, when non-native germinants are just beginning to put down roots, the planted native species will be well on their way to occupying most of the below and above ground environments.

Figure 2. Seeding and Planting Windows. *The best time to seed and plant is in the fall because soil moisture is high, soil temperatures are mild, and soil conditions favorable for ground-based equipment. Planting and seeding during this time leads to seedlings that are established by early spring.*



Seedlings can be planted after mid-October, but the likelihood of more frequent and substantial rainfall events increase. For hand-planted seedlings this is not a problem (hand-planting can be done from November through March), but for ground-based planting equipment, wet soils will limit equipment operations and potentially cause soil puddling and compaction.

The late-winter planting window is less favorable than the fall planting window because there is less time for roots to grow out from the plug before precipitation becomes limiting in late May. Sites that are planted in late winter have the added problem of competing with seeds of non-native species that have germinated in the fall and are now beginning to grow, in which case there is a greater chance that non-native species will outcompete the planted seedlings for the site. While rainfall is less in February than the preceding months, there still will be many days when soils will be too wet to operate equipment.

Seeding Windows. The optimum time to seed at Cattle Point is from mid-July through early November. Depending on the species and seed covering method, most seeds sown during this period will germinate by late fall. Seeds applied through hydroseeding equipment should be applied later in the seeding window (October) to avoid excessive exposure of seed to the elements. Seeds being covered with soil or mulch can be sown earlier in the seeding window. The reason for applying seeds in the summer months when construction slopes are ready is to reduce the potential that non-native seeds will “get there first”.

For example, leaving a site unseeded until October increases the likelihood that non-native seeds will blow onto the bare soils and compete with the germinating native seeds. Mulching over the native seeds further reduces the potential that non-native seeds will germinate prior to native seedling establishment.

Soils

The soils of the project area have been mapped as San Juan Sandy Loam series with three phases based on slope gradient: 2 to 8 Percent Slopes, 15 to 35 Percent Slopes, and 30 to 60 Percent Slopes (Natural Resources Conservation Service and National Park Service 2005). The soil profile is made up of very distinct horizons (see Figure 3). The base horizon, or parent material, is composed of gravels and cobbles and holds very little water and nutrients for plant growth. By itself, the parent material is not suitable for growing plants. Overlaying the parent material is a thick windblown layer composed of a topsoil and subsoil. The topsoil is rich in organic matter and nutrients. Sandwiched between the topsoil and parent material is the subsoil which is approximately 8 inches deep and considered less productive than the topsoil but far more productive than the parent material.

The soils of the project area are productive and support a predominantly non-native grass/forb plant

Figure 3. Soil Profile. *The San Juan Sandy Loam soil series is the predominant soil in the project area.*

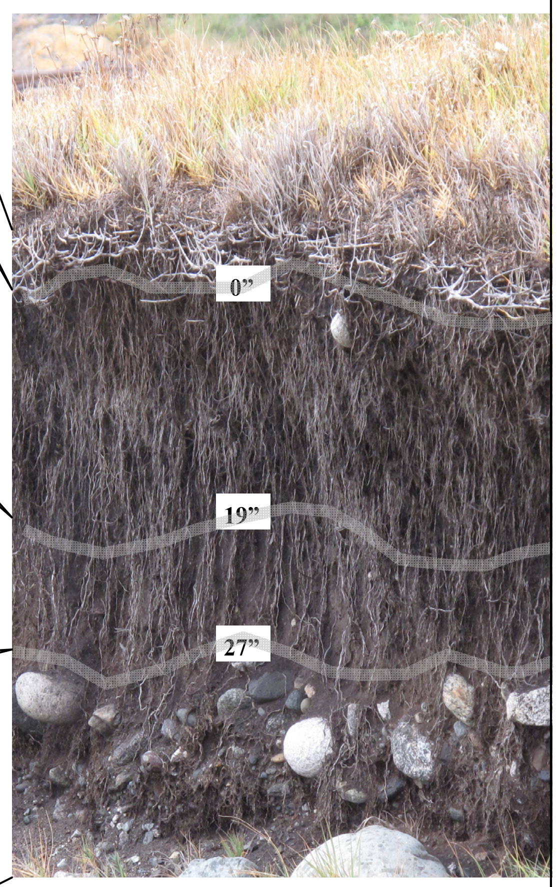
San Juan Sandy Loam Soil Profile

Organic Layer is composed of grass and forb plants, thatch, and leaf litter. Thickness varies by vegetation but can be several inches thick.

Topsoil is a dark, friable sandy loam, high in fine roots. It has a moderate water holding capacity of 1.1 to 1.6 inches per foot of soil. Organic matter is very high in the top 12 inches of soil (6 to 12%) but declines with depth (3 to 6% at 12 to 19 inches). Permeability is rapid, ranging from 2 to 20 inches per hour. pH ranges from acid (5.1) at the surface to neutral (6.5) near the bottom of the horizon.

Subsoil is a brown gravelly loamy coarse sand (30% gravels). It has a very low water holding capacity of 0.1 to 0.7 inches per foot. Organic matter varies from 1 to 4 %. Permeability is rapid, ranging from 6 to 20 inches per hour. pH is near neutral (6.1 to 6.5).

Parent Material is a dense, extremely gravelly coarse sand with 80% gravels and cobbles. It holds a fraction of water (0.1 to 0.5 inches per foot water holding capacity). Organic matter is scant (<1%) and nutrients are very low. Permeability is very rapid ranging from 6 to over 100 inches per hour. pH is neutral (6.6 to 7.3). This a very deep layer.



community. This project offers an opportunity to create a functioning native plant community through the application of appropriate restoration methods, practices, and strategies on sites that have been disturbed through road construction activities. Key to the success of such project will be: 1) salvaging, 2) storing, and 3) reapplying of topsoil. The challenge when building the new road section will be to excavate as much topsoil as possible, while mixing only minor amounts of subsoil and no parent material into the salvaged material. If parent material is inadvertently removed with the topsoil, then the result will be salvaged topsoil high in gravels and cobbles, and the quality of the material as a growing medium, will be reduced. Further confounding the operation will be the removal and disposal of the top several inches of topsoil prior to salvage to keep from introducing unwanted non-native seeds and plants. Topsoil storage conditions will also have to have a high degree of oversight to assure that soil quality is maintained. Finally, the attention to how topsoil is reapplied to sites is very important to assure that soils are not overly compacted during compaction. These three phases of topsoil transfer will be discussed in more detail in this plan (pages 10-12)

In addition to the undisturbed soils described above, this project also has soils that have been highly disturbed when the road was first built, yet recovered in recent years. They include the fill slopes of the Cattle Point Road. While these soils have not been investigated, it is suspected that they are high in gravels and cobbles because when they were placed, the horizons, including the parent material, where undoubtedly mixed. Material from the fill slopes should be investigated during road construction to assess where they can be used in the project.

The main limiting factor for revegetation that is associated with soils on this project will be the topsoil depth. While there are no disturbed reference sites to evaluate, it appears that 12 inches of topsoil over an uncompacted subsoil containing less than 35% gravels should be sufficient for reestablishing native vegetation. Where this is not possible, composts or other organic amendments will be applied to the soil to increase its productivity. Another limiting factor to native plant revegetation will be soil disturbance caused by rabbits when they create their warrens. Large areas of soils are exposed by this type of disturbance and become sites where non-native species become established.

Figure 4. Plant Communities. *The Cattle Point project area includes several remnant native polygons (green polygons) which are composed of four dominant native vegetation communities. Surrounding these polygons is non-native prairie composed primarily of the Holcus lanatus vegetative community (Bivin 2009).*

Vegetation

The American Camp prairie falls within the Xeric Grassland with Shrub Islands vegetation type described by Peterson (2002). The prairie is roughly 704 acres in area and contains an astonishing variety of native species. In a recent plant survey of the American Camp prairie, Bivin (2009) found that of the 109 species identified in this vegetative type, 60 were native species and 49 exotic. In this survey, areas that were dominated by native plants were located and mapped (Figure 4). These areas, or polygons, range from less than 0.01 acres to 4.5 acres and make up approximately 12 percent of the prairie. Islands of native diversity will provide the ecological information and plant materials necessary for developing successful revegetation strategies for this project. Restoration efforts that expand into these communities will provide greater ecological connectivity and habitats within the prairie.

Bivin also identified 12 vegetation communities making up the prairie, five of which were surveyed in, or adjacent to, the project area (Figure 4). Of these vegetation communities, four were dominated by native species. These native vegetation communities, which are named after the dominant species, are: *Festuca roemeri*, *Bromus sitchensis*, *Leymus mollis*, and *Lupinus littoralis*. Figure 5 shows the most common species occurring in these communities. The composition of species in each of these vegetation communities will be used as a guide in the selection of species for revegetating this project. It is important to note that while these plant communities are dominated by native species, they also have a component of non-native species, some of which are aggressive or undesirable.

The remaining 85 percent of the project area is composed of non-native vegetation, with *Holcus lanatus* being the primary vegetation community. While the *Holcus lanatus* plant community is dominated by *Holcus lanatus* (41% cover), over 25 percent of the plant cover is composed of native species which include *Carex inops*, *Elymus glaucus*, and *Pteridium aquilinum* (Figure 6). Understanding the *Holcus lanatus* vegetation community will provide ecological insights into the selection and use of the species for this revegetation project.

Figure 6. Non-native Plant Community. *Most of the project area is of the Holcus lanatus vegetation community which is composed of the percentage of species shown in this table. Green cells are native and salmon cells are undesirable species.*

Holcus lanatus	Holcus lanatus	41
	Poa pratensis	15
	Carex inops	11
	Elymus glaucus	10
	Pteridium aqualinum	7
	Bromus hordeaceus	4
	Hypochaeris radicata	5
	Cirsium arvensis	4
	Rumex acetosella	4
	Vicia sativa	4

Figure 5. Native Plant Communities. *Four native plant communities (Festuca roemeri, Leymus mollis, Bromus sitchensis, and Lupinus littorallis) are found within or adjacent to the project area. These communities are dominated by native species (species in green-shaded cells) however, within these communities are species that have been identified as aggressive and undesirable (salmon-shaded cells).*

Festuca roemeri	Festuca roemeri	57
	Holcus lanatus	14
	Carex inops	8
	Vicia sativa	6
	Pteridium aquilinum	5
	Rumex acetosella	5
	Poa pratensis	4
	Aira caryophyllea	2
	Camassia quamash	3
	Danthonia californica	3
	Hypochaeris radicata	3
	Rubus ursinus	0.5
	Luzula multiflora	2

Leymus mollis	Leymus mollis	33
	Rubus ursinus	12
	Pteridium aquailinum	11
	Bromus sitchensis	10
	Festuca rubra	9
	Cirsium arvense	5
	Aira caryophyllea	5
	Poa pratensis	4
	Vicia hirsuta	2
	Vicia sativa	1

Bromus sitchensis	Bromus sitchensis	27
	Bromus hordeaceus	27
	Poa pratensis	25
	Vicia sativa	10
	Bromus rigidus	10
	Holcus lanatus	6
	Pteridium aquilinum	6
	Cirsium arvense	4
	Hypochaeris radicata	3
	Geranium molle	3

Lupinus littoralis	Lupinus littoralis	35
	Bromus rigidus	22
	Pteridium aquilinum	6
	Rumex acetosella	6
	Bromus sterilis	6
	Leymus mollis	5
	Cirsium avense	4
	Hypochaeris radicata	4
	Festuca roemeri	3
	Abronia latifolia	3

The numbers in the columns to the left of the species name is the percent cover.

Revegetation Units

The project area is broken into four revegetation units: 1) gentle cuts and fills, 2) steep cuts and fills, 3) reclaimed road, and 4) staging areas. Each unit has its own revegetation strategies and set of treatments.

Unit 1. Gentle Cuts and Fills

The middle portion of the proposed road is located on gentle terrace slopes with gradients ranging from 5 to 30 percent and encompassing less than 3 acres. The cuts and fill slopes that are created in this area will be minimal in size and offer a greater variety of revegetation treatments because of the gentle slopes. Specifically, gentle slopes can be planted with seedlings using ground-based equipment, which opens the opportunity of establishing many forb species. This area is important because it is the part of the project where topsoil will be salvaged and reapplied on the cuts, fills and on the old road section. Because of the potential lack of topsoil on this project, it is important that as much "clean"[3] topsoil is obtained from this area as possible.

Figure 7. Unit 1. *General vicinity of gentle cuts and fills.*

The following are the main revegetation strategies that will be followed:

- Salvaging and storing topsoil (page 10)
- Applying topsoil to gentle slope gradients (page 11)
- Planting methods—Seedlings (page 19)

Unit 2. Steep Cuts and Fills

Steep cut and fill slopes will be created at the beginning and the end of the proposed new road alignment. These slopes will range from 30 to over 50 percent and create approximately 5 to 7 acres to revegetate. The long, steep slopes will eliminate the use of ground-based mechanical restoration methods. Salvaging topsoil on steeper slopes will be more difficult than on gentler slopes nevertheless, since topsoil is at a premium, care must be taken to obtain as much clean topsoil as possible. Placing salvaged topsoils on steep cuts and fill slopes will have to be done during construction using an excavator or stone slinger. While some hand-planting of grass and forb seedlings can be done on these slopes, most of the revegetation will have to be accomplished using seed.

Figure 8. Unit 2. *Steep cuts and fills at north end of project.*

[3] "Clean" refers to topsoil free of gravels and cobbles from the parent material and non-native plant reproductive propagules (seeds, plants, roots) from the surface horizon.

The following are the main revegetation strategies that will be followed:

- Salvaging and storing topsoil (page 10)
- Applying topsoil to steep slopes (page 12)
- Seeding methods (page 16)
- Applying mulch (page 12)
- Applying compost (page 13)

Unit 3. Reclaimed Abandoned Road

Figure 9. Unit 3. *Section of Cattle Point Road that will be obliterated after new road is constructed.*

When the new section of road has been constructed, the existing road will be obliterated. The road asphalt and road base will be removed and the road fill pulled into the road prism and recontoured to blend in with the surrounding landscape. Salvaged topsoil, obtained during the construction of the new road, will be placed over the reclaimed abandoned road section. Approximately 2.4 acres will be restored to native vegetation.

Revegetation methods will depend on the steepness of the reclaimed surfaces. There will be more opportunities to plant forb and grass seedlings with ground-based equipment on gentler slope gradients; whereas the steeper sections of reclaimed road will have to be seeded with native grass species. The following are the main revegetation strategies that will be followed:

- Applying topsoil to gentle and steep slopes (page 11-12)
- Seeding methods (page 16)
- Planting methods (page 19)
- Applying mulch (page 12)

Unit 4. Staging Areas

The staging areas have not yet been identified.

Revegetation Strategies

Salvaging and Storing Topsoil

Topsoil is critical for reestablishing native vegetation on cuts, fills, and the reclaimed road. It is an achievable goal to obtain all topsoil from the 12.4 acre footprint of the new road so that topsoil does not have to be brought in from outside sources. It is also important that topsoil be free of non-native plant propagules (seeds, roots, and plants) that might reestablish and outcompete native plant reestablishment on this project. For these reasons, detailed attention needs to be given to how topsoil is salvaged.

When topsoil is removed from the new section of road, some or all of the following measures can be used to prevent contamination of topsoil with non-native plant propagules.

1. Remove organic layer and 3 to 6 inches of surface topsoil without mixing this material into lower topsoil horizons (Figure 3). The material from this layer is full of seeds, roots, and litter from non-native

species and must be stored in separate piles. This layer will be referred to as the "organic topsoil" to differentiate it from the material below it which will be referred to as "clean topsoil".
2. Monitoring the removal of the organic topsoil during salvage is important to insure that the proper depth of this layer is removed and not mixed into the lower topsoil layers. Removal of this layer should be done without disturbing the lower horizons. Equipment such as a tilt bucket attached to an excavator is preferred for exact removal of soil horizons.
3. The organic topsoil material excavated from this operation will produce between 5,000 to 10,000 cubic yards of material. This material must be kept separate from the clean topsoil pile. A location for storing the organic topsoil will need to be identified.
4. Since the organic topsoil will be high in organic matter, it will compost to some extent in the piles. If the piles reach high enough temperatures (greater than 180°F), then most seeds and plant parts will be killed and the resulting composted organic topsoil could be used on the project as a lower horizon. Adding high organic matter, such as chipped woody debris and yard waste, to these piles will increase the composting process.
5. After the organic topsoil layer has been removed, a 12 to 24 inch deep section of clean topsoil will be excavated. This should be done when soils are relatively dry. A soil scientist or other trained personnel should be on site when this work is done to assure that soil horizons are being removed correctly. Some subsoil will be excavated with the clean topsoil, but no more than 15% gravels will be allowed in the total volume of clean topsoil removed.
6. The clean topsoil that will be used on the gentle cut and fill slopes can be stored in windrows above cuts or below the fill slopes. The clean topsoil must be placed on plastic to prevent non-native propagules present on the undisturbed soil surface from contaminating the salvaged soil. When enough soil to cover the cuts and fills to a depth of 12 to 18 inches has been placed in windrows, then the clean topsoil must be covered with plastic to prevent erosion, reduce the potential for non-native seeds to blow onto the soil, and keep the soils relatively dry.
7. The clean topsoil that will be applied to the reclaimed abandoned road will be stored offsite on the road from Pickett's Lane to the Redoubt. Clean topsoil will be placed in long windrows on one side of the road, leaving enough room for one-lane vehicular access. Topsoil will be stored in piles no higher than 15 feet high and in a manner that does not overly compact or damage the soil. Soil will not be driven on by heavy equipment.
8. The clean topsoil will be covered with plastic to prevent erosion, to reduce the potential for weed seeds to blow onto the piles and to keep the piles relatively dry. Soils should not remain uncovered for any length of time during the seed dispersal window (summer through early fall) to prevent contamination of windblown seed.
9. Construction equipment will be steam-cleaned prior to excavating clean topsoil. When construction equipment is used in areas high in weeds, it will be steam-cleaned prior to working in clean topsoil areas.

Applying Topsoil to Gentle Slope Gradients

Applying salvaged topsoil to low gradient slopes is much easier than on steeper slopes. The wider range of equipment that can be used on these slopes, results in lower costs and often better results.

1. The placement of clean topsoil must be done during or just before the optimum seeding or planting windows (Figure 2).
2. Clean topsoil must be placed on non-compacted slopes. If sites are compacted prior to topsoil placement, they must be loosened to a depth of 18 to 24 inches. This is preferably done with an excavator bucket or the teeth of an excavator bucket. Clean topsoil placed over non-compacted soils increases rooting depth and increase the potential for successful revegetation.
3. Clean topsoil will be applied with equipment that does not compact or mix the soil during or after

placement. Such equipment includes excavators, manure spreaders, or stone slingers, but not ground-based equipment because of the potential risk of compaction and mixing clean topsoil with lower soil layers.
4. Placement of topsoil will be monitored by a soil scientist or trained personnel to assure that it is applied at a minimum depth of 12 inches and not mixed in with the surfaces below. Compaction will be measured with a soil penetrometer.
5. Since the high quantities of organic topsoil are unsuitable as salvaged topsoil, this material could be applied as a base, then covered with 6 to 12 inches of clean topsoil. This will depend on the condition of the organic topsoil, such as how much composting has taken place, and other factors which a soil scientist will determine at that time. Using the organic topsoil will increase the amount of topsoil for the project as well as dispose of the material.
6. The final slope shape will be left somewhat uneven to create different niches for plant establishment. Sculpted or uneven surfaces produce microsites that are protected from the wind which should result in better establishment of vegetation.
7. The soil surface will be left in a roughen condition after application. This can be accomplished during application through instructions to the operator or by using equipment designed for surface imprinting. After topsoil application, soils will not be driven on with high ground pressure equipment. If equipment must be used for revegetation efforts, then only equipment with ground pressures of less than 5 psi will be used.
8. Seeding, mulching, or planting seedlings will be done as soon after placement of clean topsoil as possible to get a jump on non-native plant reestablishment. This will be especially important if topsoil placement is done during the optimum period of weed seed dispersal.

Applying Topsoil to Steep Slope Gradients

Application of topsoil to steep slopes is more difficult and the application methods more limited.

1. The ground surface must be sculpted or have an irregular surface prior to application of clean topsoil. This will minimize the risk of topsoil sloughing after placement.
2. Clean topsoil will be applied with equipment such as an excavator or a stone slinger in a manner that will not mix the clean topsoil with the lower materials.
3. The placement of clean topsoil must be done during or just before the optimum seeding or planting windows (Figure 2).
4. Placement of topsoil will be monitored by trained personnel to assure that it is applied to a minimum depth of 12 inches, not mixed in with the surfaces below, and not overly compacted.
5. The soil surface will be left in a roughen condition after application. This can be accomplished during application through instructions to the operator or by using equipment designed for surface imprinting.
6. The final slope shape will be left somewhat uneven to create different niches for plant establishment. Sculpted or uneven surfaces produce microsites that are protected from the wind which should result in better establishment of vegetation.
7. Seeding, mulching, or planting seedlings should be done as soon after placement of clean topsoil as possible to get a jump on non-native plant reestablishment. This will be especially important if topsoil placement is done during the optimum period of seed dispersal.

Applying Mulch

Applying a mulch over soils that have been seeded should be considered especially if: 1) the slope gradients are steep, 2) the soil surface is prone to wind or water erosion, or 3) if a mulch is needed to reduce the establishment of unwanted species.

1. Use clean, high quality mulch, free of seeds. Source will be certified “weed-free”.
2. Use only sources of mulch originating on San Juan Island. This would involve working with local businesses that specialize in compost and mulch production, such as the San Juan Sanitation Co., several years prior to project implementation to assure that appropriate material and quantities are available.
3. Perform weed surveys of material before accepting. Material should be certified weed-free by a botanist.
4. Use long-fiber mulch, not wood chips.
5. Place over seeded areas at a depth of 0.8 inches for large seeded species (most grass and some forb species) and at a depth of 0.25 inches over small seeded species (most forb and some grasses such as Roemer’s fescue).
6. Investigate using a tackifier over mulch to prevent movement of the mulch by high winds.

Applying Compost

Where clean topsoil is not available, an option is to cover the soil surface with an imported compost that is free of seeds. The thick layer of compost will bury weed seeds present in the soil surface and prevent them from germinating. Obtaining compost on the island however, will be very expensive, so this option should only be used as a last resort.

1. Use high quality compost, free of seeds, and meeting US Composting Council standards (for example of standards see Steinfeld and others 2007 page 225). The compost must be fertile, fine textured, and demonstrate that it is capable of growing vegetation. Source will be certified “weed-free”.
2. Use only composts originating on San Juan Island. This would involve working with local business, such as the San Juan Sanitation Co., several years prior to the project to insure that appropriate material and quantities are available.
3. Perform weed surveys of compost material before accepting. Material should be certified weed free by a botanist.
4. Place compost at a minimum of a 2 inch depth, but deeper depending on the amount and type of non-native species that are present in the topsoil.
5. Use a tackifier in the compost.
6. Schedule the placement of compost right before seeding or planting to reduce the risk that non-native seeds will blow in from surrounding areas.
7. Place compost with a stone slinger or mulch blower, instead of tractors or excavators, to assure a uniform application.
8. Be certain that equipment is free of seeds and vegetative parts by steam cleaning or other methods.

Species and Genetic Source

The isolation of San Juan Island created conditions where plant species evolved independently of their counterparts on the mainland and adapted to the unique characteristics of the soils and climate of the prairie ecosystem. It is important that these unique traits are conserved in the park. For this reason, only locally collected native plant materials will be used for propagation in this revegetation project.

The species that could potentially be propagated for this project are shown in Figure 10. The selection of these species was based on their presence in the four native plant communities (Figure 5), propagation experience, and project objectives. Of these, only a portion will be used in large amounts. These are referred as workhorse species and they will form the backbone of the native plant communities that will be reestablished. The list in Figure 10 will change as more experience is gained in the next few years from propagating these species by the San Juan Island National Historical Park personnel and by others.

The makeup of the native plants found in the four native plant communities shown in Figure 5 will be used as a guide in developing several seed and seedling mixes. The appropriate composition of species in a mix will be developed in the next few years. One approach is to develop four seed and seedling mixes that correspond to the makeup of each of the four native plant communities shown in Figure 5. If four mixes are developed, then it will be important to understand where they will be applied. Another approach is to develop seed and seedling mixes that are composed of a hybrid of these native plant communities. A third approach is to have a seed and seedling mix that is predominately composed of one or two native grass species. This approach has been tested in several fields at American Camp. A field below the Redoubt was planted several years ago with Roemer's fescue at a 1-foot spacing with very good results (Figure 11). Another field, near the American Camp Visitor Center, was planted with two species, blue wild rye and Sitka brome with good results.

Information Needs. Whichever seed and seedling mixes are developed, testing how each performs will be important to know prior to implementing the revegetation project.

Propagation and Installation of Plant Materials

There are many ways to reestablish the plant species shown in Figure 10. The most common, and typically least expensive propagation and installation method, is direct seeding. Yet for many forb and shrub species, direct seeding is not the best method for achieving plant establishment. Other methods can be more successful and they include propagating from nursery-grown seedlings, bulbs, wildlings, and in some cases, sprigs. Each of these propagation methods has advantages and disadvantages as discussed in the following section.

Seeds

Seeding is the most common method of reestablishing native grasses on restoration projects because it is relatively inexpensive compared to other propagation methods. Most grass species do well when seeded and it can be assumed that this will be the case for the grass species selected for this project. There is less experience with seeding forb species and for this reason the primary method of propagating forbs should be from planting containerized seedlings. Nevertheless, seeding trials using forb species should be initiated to understand how well they might reestablish using this propagation method.

Seed Production. This project will require larger quantities of seeds than can be efficiently obtained through hand collection. Obtaining large quantities of seeds is typically done through seed-increase contracts. Under these contracts, hand-picked seeds that have been cleaned at a seed extractory are sent to farmers who specialize in growing native grass and forb seeds. The farmer receives the "starter" seeds in the late summer, sows them in the fall, and harvests new seeds from the established beds the following summer. Beds can remain in production for several years or more producing large quantities of seeds. To obtain enough seed for this project, seed beds need to be established two to three years prior to direct seeding. The seeds harvested from these beds must be cleaned, packaged, and held under controlled storage conditions until needed for the project. This will necessitate that "starter" seeds from species listed in Table 10 are available for seed-increase contract. The Park has already collected many of these species and has these in seed storage. Some of these species are being propagated for seeds through the Natural Resources Conservation Service (NRCS) Plant Materials Center in Corvallis, Oregon. Larger seed increases can be made through the U.S. Forest Service which contracts its seed pro-

Figure 10. Species Propagation. The following table identifies those species that will be considered for propagation. The species highlighted in green are considered workhorse species which means that they will be the backbone of the species mix. The blue highlighted cells are "specialty" species, which are those species that meet specific project objectives. The "propagation" column indicates if a species has been successfully propagated by either the San Juan National Historic Park or by others. Information for this table was obtained from a review of each species on the Native Plants Network (www.nativeplants.for.uidaho.edu) and the Plants Database (www.plants.usda.gov).

			Stocktype				
Grasses		**Propagation**	**Containers**	**Bulbs**	**Seeds**	**Sprigs**	**Wildlings**
Sitka brome	Bromus sitchensis var. sitchensis	1,2	y		y		
Jepson's blue wildrye	Elymus glaucus ssp. jepsonii	1,2	y		y		
Roemer's fescue	Festuca roemeri	1,2	y		y		
California oatgrass	Danthonia californica	1,2	y		y		
slender wheatgrass	Elymus trachycaulus ssp. trachycaulus	1	y		y		
Alaska oniongrass	Melica subulata var. subulata	1	y		y	y	
American dunegrass	Leymus mollis ssp. mollis		y			y	
long-stolon sedge	Carex inops ssp. inops		y			y	
Lemmon's needlegrass	Achnatherum lemonii	1,2	y		y		
red fescue	Festuca rubra ssp. rubra	1	y		y		
Forbs							
barestem biscuitroot	Lomatium nudicaule	1	y				
common camas	Camassia quamash	1	y	y		y	y
checker lily	Fritillaria affinis var. affinis		y	y			y
meadow deathcamas	Zigadenus venenosus var. venenosus	1	y	y			y
western yarrow	Achillea millefolium var. occidentalis	1	y		y	y	
western pearly everlasting	Anaphalis margaritacea	1	y		y		
Canadian goldenrod	Solidago canadensis var. salebrosa	1	y		y	y	
Sierra pea	Lathyrus nevadensis var. pilosellus		y				
miniature lupine	Lupinus bicolor ssp. bicolor	1	y		y		
American vetch, purple vetch	Vicia americana ssp. americana		y		y		
tapertip onion, taper-tip onior	Allium acuminatum	1	y	y			y
fireweed	Chamerion angustifolium	1	y				
bracken fern	Pteridium aquilinum var. pubescens	1	y			y	
Henderson's shooting star	Dodecatheon hendersonii		y				
California buttercup	Ranunculus californicus	1	y				y
wild strawberry	Fragaria virginiana	1	y			y	y
Nootka rose	Rosa nutkana var. nutkana	1	y				
hookedspur violet	Viola adunca var. adunca	1	y				
seashore lupine	Lupinus littoralis		y		y		
common woodrush	Luzula multiflora var. multiflora		y				
hyacinth brodiaea	Triteleia hyacinthina	1	y	y			
Eschscholtz's hair rockcress	Arabis eschscholtizana		y				
Menzies' pepperweed	Lepidium virginicum var. menziesii		y				
Common pepperweed	Lepidium densiflorum var. desiflorum		y				
Shrubs							
common snowberry	Symphoricarpos albus var. laevigatus		y				
trailing blackberry	Rubus ursinus ssp. macropetalus		y			y	y

Propagation: 1 - propagated by others, 2 - propagated by the SJHNP

duction through farmers in the Columbia Basin. Bulk seeds need dry, cool, and rodent-free conditions for storage. Bulk seed storage facilities can be either located on the island or at the U.S. Forest Service Bend Pine Seed Extractory in Bend Oregon.

Seeding Methods. There are a variety of seeding methods which will be used depending on the species being sown and site conditions. Hydroseeding is a method where seeds are hydraulically delivered to the surface of the soil through a slurry composed of wood fibers and a tackifier. The advantage of this system is that seeds can be applied in a very short period of time without the need for ground-based equipment. For many small-seeded forb species that require light to germinate, hydroseeding has an advantage over other seeding methods, because forb seeds in this method are barely covered with wood fiber, directly exposing them to sunlight. Unlike broadcast seeding, where seeds can move off the site through wind and surface erosion, hydroseed mixes contain a tackifier that keep small forb seeds in place until germination. While hydroseeding can be advantageous for small-seeded species, large-seeded species, such as grasses and some forbs (e.g., lupines), need to be covered either by soil or mulch for good germination. This fact does not preclude using hydroseeding to place the seed but it will require that once seeds are placed, they are covered by mulch or soil.

Other seeding practices include hand-seeding, drilling, and harrowing. Hand-seeding has an advantage over other seeding methods where the placement of a single species or a specialized seed mix on the project is critical. Hand-seeding assures that seeds are placed in the exact locations and at the appropriate seeding rates. The disadvantage of hand-seeding is that the surface-applied seeds are exposed to wind or water erosion which could move the seeds before or while they are germinating. To compensate for this, hand-applied seeds must be immediately covered with either soil or mulch to keep them in place and to create a favorable environment for germination.

Seed drilling requires specialized equipment that is pulled behind ground-based equipment. The advantage of using the seed drill is that seeds can be placed at the appropriate depth in the soil surface to correspond to the seed size and germination requirements (e.g., grasses will have a deeper setting than most forb species). Some seed drills have several hoppers that can hold more than one seed mix, and each hopper can be calibrated to the specific requirements of the seed mix. The disadvantage of seed drilling is that it is limited by the slope gradients that the ground-based equipment can effectively and safely operate without disturbing the soil. Specialized low ground pressure tractors, including track tractors, can work on slopes up to 30% and often steeper slopes, and should be considered for this type of operation.

Seed harrowing is a seed application system where seed is broadcasted on the soil surface and then immediately mixed in the soil by a "toothed" chain dragging behind the seeder. This system has less accuracy than seed drilling because the seed is mixed throughout the top layer of soil and not placed at a specific depth. Like seed drilling, harrowing is also limited by slope gradients. Nevertheless, it has advantages because it can be used under conditions not favorable to seed drills (e.g., rough surface conditions and narrow strips).

A less typical way of seeding is to mix seeds with compost (page 13). In this operation, seeds are injected into the compost as it is blown onto the surface of the soil. The disadvantage of this method is that compost is expensive and must come from offsite producers.

Mulching is a method to cover seeds once they are sown (page 12). The advantages of mulching are that seed covering depths can be accurately controlled and mulch creates an optimum environment for seed germination. As with compost, the disadvantage of using mulch is that it must be created at the project site or delivered from offsite producers in large quantities (typically 100 to 135 yards per acre).

A seeding strategy will be developed in the final revegetation plan that uses some or all of the above seeding methods in combination or separately. Seed mixes and seeding rates will be developed for the different seeding methods and revegetation objectives. High seeding rates will be used for areas where seed germination is predicted to be low or the threat of weed infestation high.

Some considerations when seeding are:

1. Seed during optimum seeding windows (Figure 2).
2. Seed immediately after topsoil placement.
3. Use high seeding rates to "flood the system" with native species and reduce the potential that non-native seeds, if present, can establish on the site.
4. If seeds are sown in late winter or early spring, pre-germinate seeds prior to sowing.
5. Do not apply fertilizer with seed since nutrient levels should be high in clean topsoil (reassess need for fertilizers once plants have become established).
6. Apply mycorrhizae in case populations have been reduced during topsoil storage. This can be applied with the seed.
7. Seed applied by hand must be immediately followed with a surface application of long-fibered mulch (page 12).
8. Seed applied with a seed drill must be pulled by low ground pressure equipment and placed at a depth of 0.25 to 1.0 inch below soil surface depending on the size of the seed.
9. Seed applied with a seeder/chain harrow must be pulled by low ground pressure equipment. Higher seeding rates should be used with this equipment since some seeds will not be covered and some will be buried too deeply.
10. Unless covered with mulch, seed application using hydroseeding equipment, should be scheduled later in the fall when there is a greater chance that the surface soil will stay moist for longer periods.
11. To insure plant establishment in critical areas, supplemental irrigation using hydroseeding equipment should be scheduled.
12. If forb seeds are used, develop seed mixes that are low in grass seed to reduce the competition from grasses.

Information Needs: Direct seeding over bare soil has not been investigated in the Park so there is little actual knowledge how well this treatment would do under project site conditions. The concern with seeding is that the non-native seed bank, if present, will outcompete any native seeds applied to the site. A trial could be established that would evaluate which methods would work best for controlling non-native vegetation while succeeding in establishing native species. This trial could evaluate 1) how well workhorse species establish from seed, 2) how well native species grow when competing with non-native species, and 3) which method of seed cover is most effective – mulch covering or soil cover.

Seedlings

The advantage of establishing vegetation from nursery-grown seedlings is that the germination and early growth phase (the most critical period in plant development) takes place under a controlled nursery environment. This not only results in less seed being used (because most seeds develop into plants) but more importantly, the larger seedlings, when planted in the field, have a 3 to 4 month growing advantage over non-native species starting from seed. Planting seedlings at close spacing (e.g. one foot apart) easily develops into a desirable stand of native species within a year (Figure 11). The disadvantage of using containerized seedlings is the high costs of seedling production, transportation, and planting. Using seedlings requires a higher degree of coordination since plants can not be stored for long periods like seeds. A higher degree of scheduling orders, growing contracts, seedling delivery, short-term storage, and planting is important for successful plant establishment.

The National Park Service has had very good success in establishing native grasses from nursery-grown seedlings. In the last several years, they have established blue wildrye (*Elymus glaucus*) and Sitka brome (*Bromus sitchensis*) in small fields near the American Camp Visitor Center and Roemer's fescue (*Festuca roemeri*) near the Officer's Quarters at the Redoubt from small containerized plants instead of from seed (Figure 11). These fields have demonstrated that planting containerized plants is a viable method of reestablishing native grasses at a production scale.

Figure 11. Seedling Establishment. *As NPS has demonstrated in a field below the Redoubt, planting Roemer's fescue grass plugs at 1 foot spacing can lead to quick native plant cover, low in non-native species.*

Seedling Production. Grass and forb seedlings can be grown outside or in greenhouses. The advantage of growing seedlings outside is the lower production costs and the greater opportunities to grow seedlings closer to the project site. As the NPS has demonstrated, temporary seedling growing areas can be set up to produce large quantities of seedlings relatively inexpensively (Figure 12). If the NPS decides to take on the role of growing some or all of the containerized seedlings on site, then it will be important that there are trained personnel dedicated to overseeing the crop seven days a week during the growing season. It is also very important that outdoor production facilities have a good irrigation system, one that evenly distributes water to all containers. Uneven irrigation will create an inconsistent crop.

While most grass species can be grown outside, forb species might need to be started in a greenhouse environment and then moved outdoors. Nursery grass and forb production from offsite facilities will require the development of a contract for growing containers, or a contract for growing and planting containers. The NPS is learning how to grow a variety of forb species and what is being learned will help in establishing how large quantities of forb seedlings will be produced.

Some considerations for seedling production are:

1. Schedule nursery sowing so that grass plugs have not outgrown the containers by the time they are needed for planting. For most grass species that are sown in 6 cubic inch or smaller containers, sow seed 6 to 10 weeks prior to outplanting.
2. Most forb species take longer to grow in containers than grasses. Scheduling of forbs will be on a species specific basis.
3. Use a 5 to 6 cubic inch volume container for most grass species. Larger container sizes will increase costs.
4. Use potting media without perlite.
5. Unless fertilizers can be injected into the irrigation system during watering, apply slow-release fertilizer to plugs prior to sowing to assure that nutrients are available during production.
6. Apply mycorrhizae to plugs in nursery or in outplanting to assure mycorrhizae are present on the roots.

Figure 12. Seedling Propagation. *Propagating native grasses in containers can be done simply as the NPS has shown at American Camp.*

Planting Methods. Seedlings can be planted manually or mechanically. The NPS contracted the planting of containerized seedlings in the fields near the Redoubt and American Camp Visitor Center. These seedlings were planted with a 4-gang transplanter pulled by a tractor. Planting rates can be very high with this type of system, however this system will not work on steep slopes. On steeper areas, hand planting will be the preferred method. Hand planting can also be used where small clumps of a single forb species are desired (Figure 13). Hand planting can be done with shovels, augers, and dibbles.

Some considerations when planting seedlings are:

1. Plant seedlings during planting windows (Figure 2) and after soils have reached field capacity (i.e., after several major rainstorms). Planting can be done later in the season with hand crews, but ground-based planting equipment will be limited by wet soil conditions from mid-November through February.
2. Do not plant during hot spells or dry winds. Plant when weather outlook for 7 to 10 days after planting is favorable for plant establishment.
3. Protect plants from wind by planting on the upwind side of micro-relief features (this assumes the site is hand planted, not machine planted).
4. Pull seedling transplanters with low ground pressure equipment.
5. Thoroughly wet up plugs right before transplanting.
6. For grass species, plant at one-foot spacing.
7. Spacing for forb plants will be based on species characteristics. Design the location for forb plugs to minimize the competition with grass species. Many forb species grow in large populations or clumps and plantings should reflect the natural distributions.
8. Assure the top of the plug is not exposed to drying by covering the surface of the plug with 0.5 to 1.0 inches of soil.
9. Do not apply fertilizer to site after planting. Assess need for fertilizers only after plants have become established. Soils with salvaged topsoil should have enough nutrients without fertilizer application.
10. To assure plant establishment in critical areas (i.e., establishment of important species, steep cut slopes etc), supplemental irrigation using hydroseeding equipment in the late summer following planting could be used.

Information Needs**.** Grass seedlings are relatively easy to grow, but propagating many of the native forb species in containers will require some literature review and testing to develop an understanding on how well they grow and how long they will take to propagate. The NPS is growing some of these species on site and at the Plant Materials Center in Corvallis Oregon, but more work needs to be done in the next couple of years. Outplanting forb species in test plots will help establish the optimum planting densities for each species.

While planting seedlings is a very effective way of establishing desirable vegetation, it can also be expensive. A cost effective method of growing and planting seedlings needs to be investigated for gentle slopes and steep slopes. Each site condition will require different planting equipment.

Bulbs

Several forb species in Figure 10 can be grown from bulbs. The advantages of establishing plants from bulbs are that they have wider planting windows than seedlings, they are easy to plant, and they can be stored for long periods of time. The disadvantage of bulb propagation is that to produce bulbs large enough in size for transplanting can take 2 to 4 years, which increases production costs substantially.

Bulb Production. Bulbs are typically started from seed either sown in containers or bareroot nursery beds. The plants that develop are grown for several years until the bulbs are harvested. Bulb production works well at bareroot nurseries because these facilities have the equipment and experience to lift roots from the ground. Bulb production is similar to growing bareroot seedlings, except there are no tops on the plants at the time of harvest. Harvesting bulbs is done in the winter and requires bareroot lifting equipment that loosens the soil and brings the bulbs to the surface where the are hand-picked. In contrast, when bulbs are grown in containers the bulbs must be removed from the container and then extracted from the media. Harvested bulbs are stored in coolers until they are needed, however the duration that the bulbs of species shown in Table 10 can remain in cold storage and still be viable is uncertain and should be investigated if long-term bulb storage is anticipated.

One of the unique advantages of growing bulbs is that there are multiple stocktypes that can be derived from a single crop. Bulb-producing species, grown in containers, can produce seeds, bulbs, or seedlings. When grown in bareroot beds for several years, these plants will produce a seed, as well as a bulb crop. In addition, multiple bulb harvests can be made from a single bareroot bed if, during bulb lifting, only large bulbs are harvested and smaller bulbs left to continue to grow and produce a crop the following year.

Planting Methods. Bulbs can be planted with some of the same methods and equipment used to plant seedlings (e.g., shovels, dibbles, and transplanters), however other methods should be considered. One method is to apply bulbs to the topsoil during placement which would eliminate the need to plant bulbs in a separate operation. This method of restoration is not common, so some investigation in terms of potential damage to the bulb and the depth that bulbs should be placed would have to be conducted.

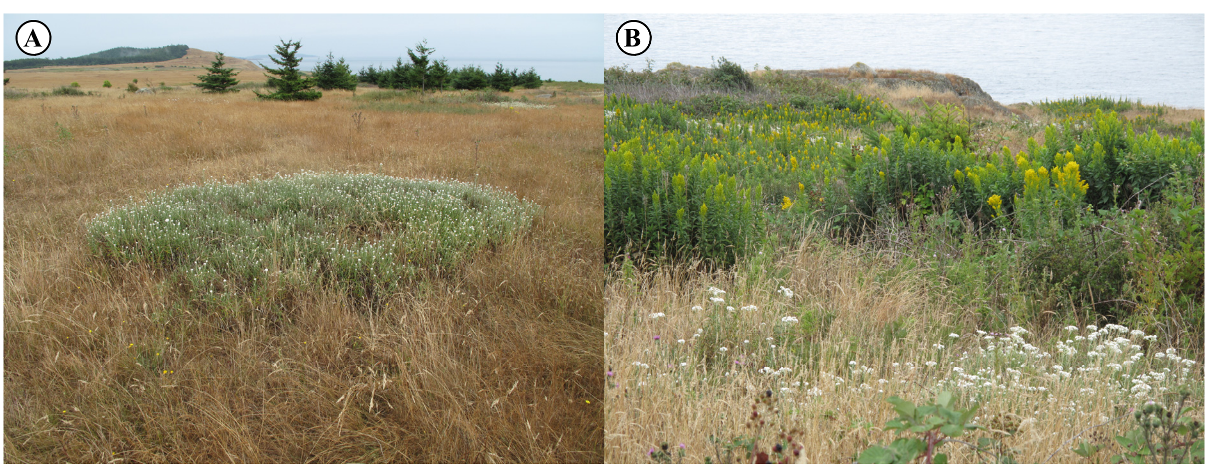
Information Needs. Culturing and planting practices for bulb installation should be investigated if bulbs are going to be used. Locating bareroot nurseries that would want to grow bulb crops should also be investigated.

Sprigs

Sprigging is a method of establishing rhizomatous grasses from small stems or rhizome segments (called "sprigs"). In this process, sprigs which contain three or more nodes are broadcasted over the site and covered with soil. When soil moisture and temperature conditions are right, the sprigs grow roots and leaves. Propagating grasses from sprigs is a method used in the turf grass industry, especially in the establishment of golf greens, however sprigging has seldom been used in restoration projects.

Sprig Production. At least six species have been identified in Table 10 as having the potential to be grown from sprigs. While there is no experience in propagating these species from sprigs, some trials

Figure 13. *Many forb species, such as western pearly everlasting (A) and Canadian goldenrod (B) grow in dense populations or clumps.*



could be established to investigate the feasibility of propagating and installing sprigs. One production method could use bareroot nurseries or seed production facilities to grow these grasses in beds and then during dormancy (summer, fall, or winter) the plants would be lifted from the soil and cut into sprigs. The advantage of using bareroot nurseries is that these facilities have equipment specialized for lifting plants. In addition, a sprig bed could also produce a seed crop if the bareroot nursery is equipped for harvesting seeds. The golf industry has developed equipment to lift and separate sprigs for planting.

Planting Sprigs. There are several possible ways of planting sprigs. Sprigs could be hand or mechanically broadcasted over the soil, then lightly disked or crimped into the surface. Sprigs could also be placed in with the clean topsoil while it is being applied. This method would eliminate the need for a separate spreading operation.

Information Needs. There is little written in the restoration literature on sprigging, so there would need to be some investigation into this methods of propagation and planting if it were to be used on any scale. A place to begin would be to review the work that has been done by the golf industry.

Wildlings

Plants obtained from digging individuals from the wild are called wildlings. Using wildlings in restoration projects has the advantage over the previously discussed methods in that the plant material does not need to be propagated, it is just excavated and moved to a new location. The construction of the new road will offer a large source of wildlings for this or other local projects. For projects where species are hard to establish or where just a few plants of one species are needed, salvaging wildlings can be a very good method. The disadvantages of salvaging wildlings are 1) the high costs of excavation, transportation, and installation of the plants and 2) the risk of excavating and replanting weed species that might be growing in or near the plants to be salvaged.

Most of the species in Table 10 can be reestablished by salvaging wildlings however, for only those species where other propagation methods are not practical or economical, should this method be considered. The populations of California buttercup within the road construction footprint should be considered for movement to new locations because of importance of maintaining and enhancing this species (see Specialty Species section).

Salvaging wildlings is a three phase operation of excavating, transporting, and planting. Complications arise when the sites where the wildlings are being moved are not ready for planting. This will most likely be the case for this project and will require that wildlings be moved to a temporary growing area while sites are being prepared. Keeping the wildlings alive during this period will require constant monitoring and irrigation during the growing season. The planting window for wildlings and care during and after planting are similar to those for container seedlings.

Specialty Species

California buttercup (*Ranunculus californicus*). Propagation of the California buttercup can be done from either wildlings obtained prior to road construction or from seedlings. Salvaging plants from the 4 to 5 potentially impacted populations will begin before construction (within the framework of National Environmental Policy Act (NEPA) and NPS policies) to assure that plants will be available by the time the sites are ready for planting. Prior to salvaging plants, a survey will be conducted to locate all populations that will be disturbed. Salvaging plants from these populations will involve digging a portion of the plants and moving them to a temporary growing area (this could be on the Park premises). While being grown in this area, individual plants will be transplanted into large containers (0.5 to 1.0 gallon size containers) and grown for at least a year.

Starting the buttercup from seeds will involve first obtaining seeds from local sources. Collecting seeds should begin as soon as possible. Seed should be sown in small containers first to conserve space and once germinated, moved to larger containers, such as 0.5 to 1.0 gallon size to assure high success in plant establishment. Washington State Department of Natural Resources (DNR) has recently propagated California buttercup in containers from seeds and planted them on state lands at Cattle Point. Based on work with similar species, they expect that it should be easy to establish this species from seedlings. To produce a seedling large enough in size for outplanting should take 1 to 2 years.

Once the site is ready, plants can be hand-planted in clumps, mimicking the size and shape of the natural populations. Mulching the surface of the soils around each plant will reduce the potential of other species competing with the California buttercup.

Host species for the Island Marble Butterfly. Menzies' pepperweed (*Lepidium virginicum var. menziesii*) is a known host plant and Eschscholtz's hairy rockcress (*Arabis eschscholtizana*), tower rock cress (*Arabis glabra*), and common pepperweed (*Lepidium densiflorum var. desiflorum*) are potential host plants for the Island Marble Butterfly. Seeds from these four species will be collected as soon as possible and the NPS will begin evaluating propagation methods using both direct seeding and seedling production. The NPS will also be conducting trials to determine if the Island Marble will utilize the three potential host plants and if larvae will survive and thrive on them. Pending the results of these trials, only known and documented native host plants will be propagated for the project.

Integrated Pest Management

Overview

There are 49 exotic species found in the American Camp prairie (Bivin 2009) and of these, 18 species are considered aggressive or undesirable by the NPS (Figure 14). These species are undesirable for many reasons: how well they repopulate disturbed soils, how aggressively they move into areas already established with native plants, their longevity on a site, and the difficulty of eradicating them.

The NPS will use an integrated pest management (IPM) approach to weed control. IPM consists of a series of pest management evaluations, decisions, and controls that will be developed for each of the 18 species of concern (EPA 2009). This approach uses information on the life cycles of each weed and their interaction with the environment to control them economically, and with the least possible hazard to people, property, and the environment. Within the framework of IPM, the NPS emphasizes the judicious use of pesticides. IPM is a four-step process: 1) prevention, 2) set action thresholds, 3) monitor, and 4) control.

Prevention

The basic strategy for weed prevention is:

1. Start with weed-free soil by salvaging and applying "clean" topsoil (pages 10-12).
2. When possible, schedule the application of topsoil after the optimum weed dispersal window.
3. Apply native seeds or plants at high densities immediately after topsoil placement (pages 14-22).
4. Where appropriate, apply "clean" mulch immediately over native seeds or plants (page 12).
5. Steam-clean all equipment used on the project with special attention given to equipment used in topsoil salvage and placement, revegetation equipment, and hydroseeding tanks.

Other prevention methods include controlling wind-borne seeds originating downslope from the new road and the abandoned road. This can be done by mowing the meadows in a 100 foot swath parallel to each road before weed seeds become mature.

Action Thresholds

The action threshold is the point at which pest populations or environmental conditions indicate that pest control action must be taken. The action threshold for each weed species is shown in Figure 14. They are based on the stated desired future conditions stated in Objective 3 on page 2

Monitoring

Monitoring will be conducted before, during, and after construction. Prior to construction, an inventory of the weeds identified in Figure 14 will be conducted on cut and fill slopes of the existing road and in the footprint of the proposed road. The "Species Presence" protocol using a 1.0 square meter quadrat frame will be used for monitoring the presence of weed species of concern (Steinfeld and others 1997).

Sites under construction will be visually monitored for presence of weeds and on a monthly basis, top-soil piles will be monitored visually for the presence of weeds. After revegetation has taken place, the project will be monitored periodically, beginning in the late winter after construction. The monitoring schedule will be developed according to the weed species and severity of invasion.

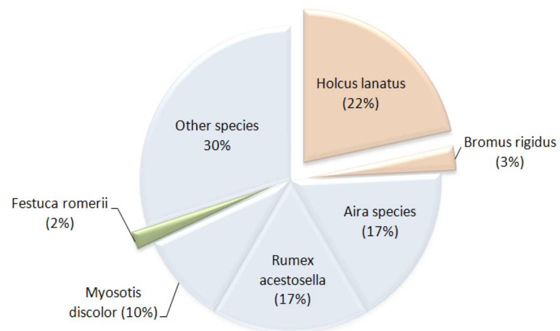
Figure 14. Weed Species of Concern. *Of the non-native plants identified in the project area, the 18 weeds shown in this table are considered aggressive or undesirable. Most of the species are perennial or biennial (Duration column: P = perennial, B = biennial, A = Annual). Some species are on the Washington Noxious Weed list (Weed Class column). The action threshold column is the percent of plots having a species of concern at which an action will be taken.*

Species	Common Name	Duration	Weed Class	Action Threshold (% Presence)
Bromus rigidus	ripgut brome	AP		1
Centaurea stoebe	spotted knapweed	BP	B	1
Cirsium arvense	Canada thistle	P	C	1
Cirsium vulgare	bull thistle	B	C	1
Crataegus monogyna	oneseed hawthorn	P		1
Dactylis glomerata	orchard grass	P		1
Daucus carota	Queen Anne's lace	B	B	5
Dipsacus fullonum	Fuller's teasel	B		1
Elymus repens	quackgrass	P		1
Eschscholzia californica	California poppy	AP		1
Holcus lanatus	common velvetgrass	P		5
Hypericum perforatum	common St. Johnswort	P	C	5
Hypochaeris radicata	hairy cat's ear	P	B	5
Lolium arundinaceum	tall fescue	P		1
Rubus armeniacus	Himalayan blackberry	P		1
Rubus laciniatus	cutleaf blackberry	P		1
Senecio jacobaea	tansy ragwort	P	B	1
Verbascum thapsus	common mullein	B		1

Control

Once monitoring has indicated the action thresholds of any of the weed species of concern have been exceeded, then an array of control measures will be considered, a decision made, and action taken. Weed control measures include hand weeding, flaming, steaming, covering, spot herbicide spraying, and broadcast herbicide spraying. Each of these treatments has some degree of effectiveness that varies with the type of species shown in Figure 14.

Figure ***15. Weed Seed Bank.*** *Germination tests of the seedbank samples taken in the prairie showed that 70% of the germinants were from the six species shown in this chart. Only Festuca romerii was native at 2%, while two undesirable species, Holcus lanatus and Bromus rigidus, were present on 25% of the plots.(Bivin 2009).*



IPM Plan

It is not in the scope of this revegetation plan to identify the effectiveness of each control measure for each species shown in Figure 14. This should be addressed in an IPM plan developed specifically for the implementation of this project. The development of the plan will require a thorough review of the effectiveness of weed control measures for each species in Figure 14. It would outline measures that will be taken if monitoring indicates a threshold for any species has been exceeded.

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