Chapter 6: Environmental Consequences

This chapter describes the environmental consequences or impacts of implementing each of the three management alternatives previously described. Each management action that could affect resources or resource uses has been analyzed, and the conclusions of those analyses are described by alternative below. Since the alternatives are broad and conceptual in nature, the following environmental analysis is general as well. Many of the action items presented in the document would require additional analysis during the implementation planning phase prior to implementation. Many items would also require additional compliance with federal, biological, and cultural resources laws and regulations.

The National Environmental Policy Act (NEPA) requires that environmental documents discuss the environmental impacts of a proposed federal action, feasible alternatives to that action, and any adverse environmental effects that cannot be avoided if a proposed action is implemented. In addition, the effects on historic properties are considered in accordance with the National Historic Preservation Act (NHPA). In this case, the proposed federal action would be the adoption of a general management plan for San Juan Island National Historical Park.

The alternatives in this general management plan provide broad management direction. Thus, this environmental impact statement should be considered a programmatic document. If and when specific developments or actions are proposed subsequent to this general management plan, appropriate detailed environmental and cultural compliance documentation will be prepared in accord with NEPA and NHPA requirements.

This chapter begins with a discussion of terms and definitions, followed by policy related to cumulative impacts and the projects that make up the cumulative impact scenario, followed by a discussion on impairment. The second part of this chapter describes the methods and assumptions used for each impact topic and the effects or impacts of the alternatives on the impact topic. The impacts of the alternatives are analyzed by resource topic in the order they appeared in the "Alternatives" chapter. Each impact topic includes a description of the impact of the alternative, a discussion of cumulative effects, and a conclusion. Where data are limited, professional judgment has been used to project environmental impacts. Professional judgment was based, in part, on observation, analysis of conditions, and responses in similar areas.

At the end of the impacts of each alternative, there is a brief discussion of unavoidable adverse impacts, irreversible and irretrievable commitments of resources, and the relationship of short-term uses of the environment and the maintenance and enhancement of long-term productivity.

The impacts of each alternative are also summarized in the "Summary of Impacts" chart at the end of the "Alternatives" chapter.

Terms and Definitions

The following section defines the terms used for determining the environmental consequences of the actions in the alternatives. The environmental consequences to each impact topic are defined based on impact type, intensity, and duration, and whether the impact would be direct or indirect. Cumulative effects are also identified.

Impact Type

The effects that an alternative would have on an impact topic may be either adverse or beneficial. Adverse impacts involve a change that moves the resource away from a desired condition or detracts from its appearance or condition. Beneficial effects are those that involve a positive change in the condition or appearance of a resource or a change that moves the resource toward a desired condition. In some cases, the action could result in both adverse and beneficial effects for the same impact topic.

Intensity

Defining the intensity or magnitude of an impact is taken directly from Director's Order 12: Conservation Planning, Environmental Impact Analysis and Decision-making (National Park Service, 2001).

Impact intensity is the magnitude or degree to which a resource would be beneficially or adversely affected. Each impact was identified as negligible, minor, moderate, or major in conformance with specific definitions included at the beginning of each impact topic. Due to the broad nature of actions called for in this GMP, most intensity findings are expressed qualitatively.

Duration

Duration refers to how long an impact would last. The planning horizon for the GMP is approximately 15 years. Unless otherwise stated, impacts that would occur within five years or less were classified as short-term effects and long-term effects would last for more than five years.

Direct versus Indirect Impacts

Direct effects would be caused by an action and would occur at the same time and place as the action. Indirect effects would be caused by the action and would be reasonably foreseeable but would occur later in time, at another place, or to another resource.

Cumulative Impacts

Cumulative impacts result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other 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. The National Park Service assumes the types of use that are occurring now will continue, but there may be new or different future uses. These actions are evaluated in conjunction with the impacts of each alternative to determine if they have any cumulative effects on a particular resource. For most of the impact topics, the geographic area defined for the analysis was the broader San Juan Islands. In some cases, the area of consideration was the Pacific Northwest.

To determine potential cumulative impacts, projects in the area surrounding the park were identified. Projects included in this analysis were identified by examining other existing plans and by calls to local governments and to state and federal land managers. These projects were considered regardless of what agency, organization, or person undertakes them. Projects included in the cumulative impact analysis do not affect all resources equally.

The following plans and actions make up the cumulative impact scenario:

Cattle Point Road EIS – A portion of Cattle Point Road located in the park is threatened by erosion. Coastal wind and wave action is eroding the base of the bluff that supports the road. At current estimated rates, the road will fail in 5 to15 years; however a large storm event could cause immediate failure. Failure of the road would terminate vehicular access and severely impact non-motorized access to Cattle Point.

Cattle Point Road provides the only road access to the Cattle Point area. The Cattle Point area includes lands within the park as well as state and privately owned land on the Southeast tip of the island. The road allows visitors traveling by vehicles, bicycles and as pedestrians to enjoy the features of the area, including the park, and is the only road between the privately owned residences and the rest of the island. As a result, the Federal Highway Administration (FHWA) and National Park Service (NPS) are considering relocation of a section of the road to avoid the threatened area.

Olympic Games in Vancouver, British Columbia in 2010 – The next Winter Olympic Games are scheduled to be held in Vancouver, British Columbia in 2010. The games will attract additional visitors to the Pacific Northwest, and likely have a short-term impact on visitation to San Juan Island and the park.

Snohomish County Public Utility District (PUD) Tidal Energy Permits - In Puget Sound there are currently 10 proposed projects located at 8 different sites by 4 different proponents. Tacoma Power is proposing to develop tidal energy at the Tacoma Narrows and Washington Tidal Energy Company is proposing development at Deception Pass. Public Utility District Number 1 of Snohomish County (SnoPUD) has proposed a competing project proposal for Deception Pass as well as Admiralty Inlet, Agate Pass, Guemes Channel, Rich Pass, San Juan Channel and Spieden Channel. The City of Port Townsend has also proposed a competing project for Admiralty Inlet.

Tacoma Power has a three year study permit issued by the Federal Energy Regulatory Commission (FERC). SnoPUD also has study permits issued for five of their projects: Agate Passage, Guemes

Channel, Rich Passage, San Juan Channel, and Spieden Channel. All the other proposed projects have study permit requests pending with the FERC. The scope of activities to be covered under this request for a preliminary permit (P-12692-000) include site selection; equipment selection; design, performance and cost estimates of both a demonstration test installation and a commercial scale plant; environmental effects; and permitting issues (www.pstidalenergy.org, 2007).

As described in the permit applications, each site in the San Juans would host an array of about 130 turbines, or so-called "tidal in-stream energy conversion devices," which combined could meet the demands of about five percent of Snohomish County, Washington's 600,000 residents. Though submerged, the turbines would generate electricity in much the same fashion as windmills, with rotating blades up to 66 feet in diameter and approximately 100 feet tall (Rasmussen, "Green Light for Tidal Study," 2007: p.4A).

Tidal energy has the benefits of being a renewable energy source that is predictable in time, duration, and production levels for the foreseeable future with a high level of accuracy. It could also displace the need for other non-renewable energy sources that contribute to global warming.

However, there are also a lot of unknowns about the effects of tidal energy development on marine resources. Studies have not been conducted to identify the effects of these energy projects on marine life, marine habitat, and tidal flows. As projects are planned and developed in the United States and in Canada, studies will need to be conducted to analyze the potential effects (www.pstidalenergy.org, 2007). Washington state, San Juan County, and Friends of the San Juans all "intervened" in the federal regulatory process in response to the PUD applications, entitling each entity to receive relevant information in both the preliminary phase and be a participant if the utility pursues a federal license (Rasmussen, "Green Light for Tidal Study," 2007: p4A).

Rosario Resort Master Plan Final Environmental Impact Statement – The proposed action is the adoption by the San Juan County Council of the Rosario Resort Master Plan. Rosario Resort is an established destination resort located on the shoreline and uplands adjacent to Cascade Bay on Orcas Island in San Juan County, Washington. Adoption of the master plan is a non-project action under the Washington State Environmental Policy Act (SEPA) and the EIS is the first phase of a phased environmental review under SEPA of planned future development at Rosario Resort. Under the County's Master Planned Resort regulations (SJCC 18.80.060.A.2), existing resorts that were designated as Master Planned Resorts are required to prepare a resort master plan for review and approval by San Juan County before any substantial additional resort development is allowed. The Rosario Resort Master Plan has been submitted by the applicant for adoption by the County to fulfill the requirement of San Juan County Code.

The applicants' preferred alternative would result in a family oriented destination resort comprised of a mixture of resort accommodations and vacation residential units located on different parts of the site, supplemented by new food and beverage venues, an expanded marina (from 34 to 165 slips), complementary retail opportunities, a renovated Moran Mansion, an expanded spa and fitness center, and a variety of indoor and outdoor recreational activities for adults, teens, and children. Implementation of this plan could increase visitation to the San Juan Islands in general, whether from day trips from the resort or additional visitors seeking vacation opportunities in the area (Rosario Resort Master Plan, 2006).

Impairment of Resources

In addition to determining the environmental consequences of the alternatives, NPS policies require that potential effects be analyzed to determine whether or not proposed actions would impair park resources or values. An evaluation of impairment is not required for topics related to visitor use and experience, operations or the socioeconomic environment.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must seek ways to avoid or minimize adverse impacts on the resources and values to the greatest degree practicable. However, laws do give the NPS management discretion to allow impacts on the resources and values when necessary and appropriate to fulfill the purposes of a unit, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the NPS this management discretion, it is limited by the statutory requirement that the NPS must leave the

resources and values unimpaired unless a particular law directly and specifically provides otherwise.

Impairment is an impact that in the professional judgment of the responsible NPS manager would harm the integrity of the resources and values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. 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 natural or cultural integrity of the unit or to opportunities for enjoyment of the unit; or
- identified as a goal in the general management plan or other relevant NPS planning documents.

Impairment might result from NPS activities in managing a unit, visitor activities, or activities undertaken by concessionaire, contractors, and others operating in the park. Actions that occur outside park boundaries could cause impairment, but this would not be a violation of the Organic Act unless the National Park Service was in some way responsible for the action. A determination on impairment is made in this chapter in the conclusion section for each required impact topic related to the park's resources and values. When it is determined that an action(s) would have a major or significant adverse effect, a justification of non-impairment is made. Impacts of negligible, minor, or moderate intensity would by definition not result in impairment.

Effects on Cultural Resources

Methodology and Assumptions

Cultural Resources Listed, or Eligible to be Listed, in the National Register of Historic Places

The following discussion of cultural resources includes analyses of potential impacts to the cultural landscape, historic buildings and structures, and archaeological resources. These physical components of the cultural resources at San Juan Island National Historical Park were described separately in the "Affected Environment" chapter. However, the intensity definitions are discussed together here, because of the interconnectedness of these resources. For example, the historic structures, vistas, and historic vegetation obviously contribute to the cultural landscape, and yet the full extent of the archaeological resources, many of which also contribute to the cultural landscape, are not known. The park's cultural resources are composed of all these elements, which also contribute to the cultural landscape as a whole. In addition, many of the management actions proposed in the alternatives affect a combination of two and sometimes all three of these resources. Thus, the effects of each alternative on all three types of cultural resources are discussed below.

Information used in this assessment was obtained from relevant literature and documentation, maps, and consultation with cultural landscape preservation experts, as well as from interdisciplinary team meetings, field trips, and site visits. The National Historic Preservation Act requires agencies to take into account the effects of their actions on properties listed in or eligible for listing in the National Register of Historic Places (NRHP). The process begins with identification and evaluation of cultural resources for NRHP eligibility, followed by an assessment of effects on eligible resources. In Washington, this process includes consultation with the state historic preservation officer (SHPO). If an action could change in any way the characteristics that qualify the resource for inclusion in the National Register, it is considered to have an effect. No adverse effect means there could be an effect, but the effect would not be harmful to the characteristics that qualify the resource for inclusion in the National Register. Adverse effect means the action could diminish the integrity of the characteristics that qualify the resource for the National Register. For the purposes of this analysis under the National Environmental Policy Act and Section 106 of the National Historic Preservation Act, the intensity of impacts on cultural resources was 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 to cultural landscape resources, historic buildings or structures, or archaeological resources. For the purposes of Section 106 and the National Historic Preservation Act, the 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 cultural landscape, historic structure, or archaeological site, and it would not have a permanent effect on the integrity of any such resource. For the purposes of Section 106 and the National Historic Preservation Act, the 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 features of a cultural resource, but would not diminish the integrity of the resource to the extent that its NRHP eligibility would be entirely lost. For the purposes of Section 106 and the National Historic Preservation Act, the cultural resources' NRHP 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 NRHP eligible or listed cultural landscapes, historic structures, or archaeological sites, the action would change one or more character-defining features, diminishing the integrity of the resource to the extent that it would no longer be eligible for listing in the National Register. For purposes of Section 106, National Register eligibility would be lost and the determination of effect would be adverse effect.

The relationships between definitions of effects, including beneficial effects, and treatments of cultural resources, are analyzed in the impact analysis for each of the alternatives. Levels of beneficial effect are not directly linked to specific types of treatments; rather they depend on the particular treatment of given cultural resources. All treatments proposed under all of the alternatives would be in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. All treatments proposed under all of the alternatives would have no adverse effect on known cultural resources.

Museum Collections

Museum collections (prehistoric and historic objects, artifacts, works of art, archival documents, and natural history specimens), are generally ineligible for listing in the National Register, and are not subject to Section 106 of the National Historic Preservation Act. The intensity of impacts on museum collections is defined as follows:

Negligible: Impact is at the lowest levels of detection — barely measurable with no perceptible consequences, either adverse or beneficial, to museum collections.

Minor: Adverse impact — would affect the integrity of few items in the museum collection but would not degrade the usefulness of the collection for future research and interpretation.

Beneficial impact — would stabilize the current condition of the collection or its constituent components to minimize degradation.

Moderate: Adverse impact — would affect the integrity of many items in the museum collection and diminish the usefulness of the collection for future research and interpretation.

Beneficial impact — would improve the condition of the collection or protect its constituent parts from the threat of degradation.

Major: Adverse impact — would affect the integrity of most items in the museum collection and destroy the usefulness of the collection for future research and interpretation.

Beneficial impact — would secure the condition of the collection as a whole or its constituent components from the threat of further degradation.

Impacts from Alternative A

Cultural Landscape

The historic landscape report would be updated under this alternative and a resource stewardship strategy that provides direction for cultural as well as natural resources would be completed. This document would provide additional guidance about natural resources that possess cultural significance, resulting in more integrated management of cultural and natural resources that are important to maintaining the cultural landscape. Current stabilization measures and preservation maintenance would continue on the cultural landscapes within the park. The removal of non-historic exotic species and the continued use of prescribed fire as a tool to maintain the cultural landscape would enhance the resource. This continued program of cultural resource management in the park, including stabilization and preservation activities and the integration of natural and cultural resource management, would have minor to moderate beneficial impacts on the cultural landscape. All treatments proposed would be in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

Pursuing island-wide trail connections and extending the ADA trail at English Camp from the Crook house to the parade ground would have negligible impacts on the cultural landscape. The addition of Mitchell Hill would incorporate remnants of the historic military road at English Camp, providing protection for this cultural landscape feature, a long-term moderate beneficial effect.

Cumulative Impacts

Over the years, the cultural landscapes in the park have been adversely affected by natural processes and wear and tear associated with visitor access, park administrative use, and deferred maintenance. In a few instances, placements of trails and parking lots have had some adverse effects on cultural landscapes. In addition, many of the buildings and structures that were part of the cultural landscape during the historic period were removed prior to NPS presence on the island. Other historic buildings that were part of the post-encampment period have been altered or are in a state of decline, creating moderate adverse effects. In the future, management direction would continue to place emphasis on preservation of existing historic structures. Resource management activities would continue to consider the natural resource values of cultural landscapes as well as their culturally important character-defining features and patterns.

Overall, the cumulative effects would be long-term, minor, adverse and beneficial. This alternative would provide some beneficial effects to cultural landscapes and would not contribute to adverse cumulative effects.

Conclusion

The implementation of the No Action Alternative would have no adverse effect on the cultural landscapes of the park. The continued program of cultural resource management in the park, including stabilization and preservation activities and integration of natural and cultural resource management, would have minor to moderate beneficial impacts on the cultural landscape. This alternative would provide some beneficial impacts to cumulative effects of cultural landscapes and would not contribute to the adverse cumulative effects. There would be no impairment of this resource or value as a result of implementing this alternative.

Historic Buildings and Structures

The emphasis in this alternative is on preservation of existing historic structures, and no historic buildings from the encampment period would be repatriated. All preservation maintenance on historic buildings and structures would be consistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, and be a minor impact on those properties. The barracks at American Camp would continue to be used as a primary visitor contact station and the blockhouse would continue to be open to the public. Other buildings, including the commissary, laundress' quarters, officers' quarters, and Crook house would continue to be interpreted as outdoor exhibits. The non-historic addition to the Crook house would be removed and efforts to remove bats from the house would continue. Subsequent hazardous material remediation could allow for additional adaptive reuse of the house in the future. These actions could have moderate benefits to the Crook house.

Cumulative Impacts

Over the years, historic structures have been adversely affected by natural processes and natural wear and tear from both visitor and administrative use. Some historic structures were removed from their historic settings and modified prior to the establishment of the park.

Maintenance on buildings outside the park has likely not been consistent with the Secretary of the Interior's Standards, resulting in moderate adverse effects. Implementing this alternative could be a minor, long-term beneficial contribution to cumulative impacts by preserving historic structures remaining in the park.

Conclusion

The implementation of the No Action Alternative would have no adverse effect on historic buildings and structures in the park. The emphasis on preservation of existing historic structures, and actions to remove the non-historic addition and bats from the Crook house would have minor to moderate benefits. All preservation maintenance on historic buildings and structures would be consistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. This alternative has a minor, long-term beneficial contribution to cumulative effects by preserving historic structures. There would be no impairment of this resource or value as a result of implementing this alternative.

Archaeological Resources

Most of the park has been surveyed and an updated archaeological overview and research design study would be prepared. Developing an archaeological base map as part of this project would provide the park additional location data and would enhance protection of archaeological resources. Archaeological resources close to or easily accessible from major use areas and trails would continue to be vulnerable to disturbance or inadvertent damage. Known archaeological resources would continue to be avoided to the greatest extent possible, and as appropriate.

The park would also conduct archaeological surveys or monitoring to the greatest extent possible to protect these resources prior to any ground disturbing activities, such as trail construction, road maintenance, and parking improvements. If National Register-eligible or listed archaeological resources could not be avoided, the park would develop appropriate mitigation through consultation with both interested tribes and the SHPO and would complete documentation of resources prior to proceeding with projects.

Cumulative Impacts

Past actions and processes that have likely had adverse impacts to archaeological resources include natural processes such as fire, climate change, and shoreline erosion; past development or construction; maintenance of trails and roads; visitor use; unintentional disturbance; artifact hunting, and vandalism. Development of residential areas outside the park may have had adverse impacts to archaeological resources on San Juan Island. Implementing the No Action Alternative would not contribute to adverse cumulative impacts and may have minor benefits to archaeological resources.

Conclusion

Implementation of the No Action Alternative would result in no adverse effects to archaeological resources. The overall cumulative impacts would be adverse; however, implementing this alternative would not contribute to adverse cumulative effects. There would be no impairment on this resource or value as a result of implementing this alternative.

Museum Collections

The park's collections would continue to be maintained at off-site locations including North Cascades National Park Service Complex, the Burke Museum in Seattle, and at Fort Vancouver National Historic Site. A few dozen objects would be available for showing in display cases at American Camp. These facilities meet NPS museum standards and provide adequate curatorial facilities. However, curatorial staffing is limited to approximately three pay periods per year from a shared curatorial position at North Cascades National Park Service Complex, resulting in ability to meet the basic requirements of annual reporting, housekeeping, minimum custodial care and correspondence. The additional park needs of processing loans, research permits, artifact conservation, condition documentation, interaction with the Burke Museum, and outreach can not be fulfilled, resulting in a minor adverse impact on museum collections.

Cumulative Impacts

As the park collections have grown, adequate space to ensure their proper curation was needed. That space has not been available at the park and has resulted in collections being stored in multiple locations. The Pacific West Region recently completed a collections facility strategy which called for the park's collections

to be stored and administered outside the park, with the prehistoric material and biological specimens at North Cascades National Park Service Complex and the Burke Museum, and the historic material at North Cascades and Fort Vancouver National Historic Site. This strategy provides for long-term storage and curation of current and future collections, a long-term benefit to these resources.

Conclusion

The overall effect of implementing Alternative A and maintaining the museum collections at facilities off-site would result in minor benefits, limited by current curatorial staffing. The planned cumulative activities would result in moderate long-term benefits. There would be no impairment of this resource or value as a result of implementing this alternative.

Impacts from Alternative B

Cultural Landscape

Implementation of Alternative B would include a variety of techniques to enhance the cultural landscapes after adequate research was completed and by restoring the native prairie at American Camp. At English Camp, actions taken to partially restore the Crook family orchard and the Sandwith orchard respectively would help depict historically accurate orchards. Visitors would have opportunities to better understand the historic significance of these orchards, and researchers would have opportunities for further study. These activities would have moderate benefits to the cultural landscapes by adding or improving features that enhance the integrity of the cultural landscapes.

Construction of the new visitor center at American Camp would introduce a relatively large, non-historic feature in close proximity to the historic scene and within the cultural landscape, which allows the visitor easy access. Although proposed to be situated behind a grove of trees, this new building could be perceived as visually intruding on the historic scene. While the current visitor is also within the cultural landscape, it is in an area that already has non-contributing features to the cultural landscape. Short-term impacts from construction activities would be minor and adverse while long-term impacts could be minor to moderate and adverse.

Alternative B expands the scale at which the cultural landscape is emphasized, contributing minor to moderate long-term benefits.

Cumulative Impacts

Cumulative impacts are the same as Alternative A. Implementation of Alternative B would have an overall greater long-term benefit toward cumulative impacts with expanded techniques to enhance the cultural landscape, rehabilitation and restoration of the orchards, and prairie restoration. This alternative could contribute a minor to moderate adverse impact toward the cultural landscape by placing a new visitor center closer to the historic core of the cultural landscape. The contribution of impacts from construction related activities in the short-term would be minor.

Conclusion

Implementation of Alternative B would have overall long-term moderate benefits to the cultural landscape through expanded techniques to enhance the cultural landscape, rehabilitation and restoration of the orchards, and the prairie restoration. This alternative could contribute a minor to moderate adverse impact toward the cultural landscape by placing a new visitor center closer to the historic core of the cultural landscape. The contribution of impacts from construction related activities in the short-term would be minor. This alternative would also provide some additional long-term benefits to cumulative impacts on the cultural landscape. There would be no impairment of this resource or value as a result of implementing this alternative.

Historic Buildings and Structures

The impacts on historic structures are the same as Alternative A, with the exception of the Crook house and the barracks at English Camp. Alternative B proposes to rehabilitate the Crook house once the bats are relocated and bat guano is removed. This alternative proposes to use the ground floor as a visitor contact facility and to convert the second floor for administrative use. The process of bringing the house up to current health and safety standards for staff and visitors involves cleaning up after the bats are removed. It would require modification of the interior as well as some exterior additions. The non-historic addition that is removed would need to be replaced with another non-historic addition that would accommodate a staircase meeting current building

codes because the main house does not have adequate space to provide a code-compliant staircase. Impacts to the Crook house would occur from the addition of this non-historic element, however this adaptive reuse would ultimately have long-term benefits to the historic building.

Alternative B also calls for using a portion of the barracks at English Camp for a display with period furnishings. This action would have no negative impacts and could have some long-term benefits to historic building preservation through interpretation and keeping the buildings in service. As in Alternative A, all preservation maintenance on historic buildings and structures would be consistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

Cumulative Impacts

Cumulative impacts are the same as Alternative A. Implementation of Alternative B would have a greater long-term benefit to cumulative impacts on historic structures by providing for adaptive reuse of the Crook house as well as additional use of the barracks.

Conclusion

Implementation of Alternative B would have similar impacts as Alternative A; however proposals for adaptive reuse of the Crook house and added interpretation at the barracks at English Camp would have greater long-term benefits to historic structures. All preservation maintenance on historic buildings and structures would be consistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

There would be no impairment of this resource or value as a result of implementing this alternative.

Archaeological Resources

In addition to the impacts from Alternative A, Alternative B calls for a number of actions, which could impact archaeological resources. Archaeological surveys would precede all ground-disturbing activity in all proposed project locations, consistent with park-wide mitigation measures. If archaeological resources were identified during surveys, appropriate mitigation strategies would be developed in consultation with the SHPO and associated American Indian Tribes, as appropriate, to minimize impacts to underground resources.

Alternative B proposes a new visitor center and parking lot at American Camp, which would increase the likelihood of disturbing unknown archaeological resources. Archaeological surveys would precede ground disturbance associated with these activities; however, the area has not been surveyed to date. Given the location, there is a greater chance of discovering prehistoric as well as historic sites. If these resources could not be avoided, minor to moderate adverse impacts to those resources could occur.

Development proposed at English Camp includes a loop road connecting the existing parking lot with the administrative road, formalizing two parking areas, and developing a kayak or canoe landing on Westcott Bay connecting to the existing trail system. Archaeological surveys would precede ground disturbance associated with these activities as well; however if sites could not be avoided, they would be documented and some additional minor to moderate adverse impacts could occur.

Cumulative Impacts

Cumulative impacts would be similar to Alternative A. The construction activities with Alternative B could be a minor, long-term contribution to adverse impacts to archaeological resources.

Conclusion

Overall, implementation of Alternative B could result in minor to moderate adverse impacts to archaeological resources from the development of the visitor center near the redoubt at American Camp and the construction of the loop road, parking, and kayak/canoe landing at English Camp. Cumulative impacts would be similar to Alternative A, with construction activities contributing minor long-term adverse impacts to archaeological resources. There would be no impairment to this resource or value as a result of implementing this alternative.

Museum Collections

Implementation of Alternative B calls for a portion of the collections to be moved to the park. This would be located in a collections study room in a new 5,400 square foot permanent visitor center at American Camp. Natural resources and cultural resources including prehistory and military era collections would be represented. This collections room would meet NPS collections management standards and would require oversight by staff trained in museum

collections management. Housing the portion of the collections on-site and the addition of a journeyman level curator position to the staff would have moderate benefits, by enabling the staff to interpret and display these collections in the context of their original location. Having these collections on-site, and being able to readily rotate them through displays at the visitor center, could build additional knowledge, support, and understanding with the visiting public, a moderate to major benefit for collections and other cultural resources. Having a small portion of collections nearby would also facilitate access by serious researchers and enhance interpretation and educational programs.

In addition, adding a full-time equivalent of a journeyman curator would expand the ability of the park to manage collections beyond the basic requirements. Additional staff would enhance opportunities for processing research requests, artifact conservation, loans, and additional coordination and interaction with other operations managing collections and result in a minor to moderate long-term benefit to collections.

Cumulative Impacts

The cumulative impacts under Alternative B would be similar to those described under Alternative A.

Conclusion

Collectively, the actions proposed in Alternative B would result in moderate long-term benefits by providing adequate space for collections and the ability to interpret them within their historic context as well as additional staff to provide for care of collections beyond the basis requirements. Contributions of this alternative to cumulative impacts are similar to those in Alternative A. There would be no impairment of this resource or value as a result of implementing this alternative.

Impacts from Alternative C

Cultural Landscape

Impacts to the cultural landscape would be the same as Alternative B, plus added benefits from the repatriation of two historic buildings and structures to the park when appropriate. These additional structures could help enhance the cultural landscape by restoring features that add to the integrity of the camps. Although the treatment of the Sandwith orchard calls for a partial restoration, the difference in impacts to this resource from a partial versus more complete restoration would be negligible to minor.

Cumulative Impacts

Cumulative Impacts would be the same as Alternative B. Repatriation of historic structures would contribute added long-term benefits to the cultural landscape.

Conclusion

Implementation of Alternative C would result in impacts to the cultural landscape the same as Alternative B, plus added benefits from the repatriation of historic buildings and structures on the island back to the camps. There would be no impairment of this resource or value as a result of implementing this alternative.

Historic Buildings and Structures

The effects on historic structures would be similar to those in Alternative B and all preservation maintenance on historic buildings and structures would be consistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Under Alternative C, after the bats are relocated, the Crook house would be rehabilitated for use as an exterior exhibit only, with interpretive signs and displays about the Crook family era. This rehabilitation would require fewer modifications to the building but would still have some benefits to the building. The barracks and other buildings at English Camp would be treated the same as Alternative A, and impacts would be the same as Alternative A.

Under Alternative C, the officers' quarters at American Camp and hospital at English Camp would be opened to the public. If exhibits and interpretive material were proposed to include furnishings for the hospital, significant research would be required before historically accurate displays could be provided. While there would be no physical adverse impacts to the buildings, there would be research problems to solve. Other interpretation techniques could be used with less detailed information.

For the officer's quarters, half would be rehabilitated for use as an interpretive exhibit that shows a typical officers' quarters and the other half would be available for research and academic study. Any exhibits would need to be designed and constructed to resist interior changes in climate given the challenges of bringing heating and electricity to the building. The exterior walls are single plank depth, leaving no interior wall

space to run electrical wires or plumbing. Opening both these structures at American Camp to the public could have long-term moderate benefits to historic structures by increasing additional public interest and opportunities for research.

Alternative C also calls for the repatriation of historic structures once located at American and English camps to the park. Additional research would be required to verify what the structures are, determine their integrity and potential contribution to the cultural landscape, and evaluate their condition. Repatriation efforts would have moderate long-term benefits to historic structures by returning them to their historical context which contributes to their integrity.

Cumulative Impacts

Cumulative impacts would be the same as Alternative B, plus the potential repatriation of historic structures to the park would contribute added long-term benefits to the cumulative effects on these resources.

Conclusion

Implementation of Alternative C would have some additional long-term benefits to the preservation of historic structures through the opening to the public of additional buildings at American Camp and repatriating historic buildings to the park if possible. All preservation maintenance on historic buildings and structures would be consistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. This alternative would also have some additional benefits to cumulative impacts through these same actions. There would be no impairment of this resource or value as a result of implementing this alternative.

Archaeological Resources

Implementation of Alternative C would have fewer adverse impacts on archaeological resources than Alternative B. Although Alternative C also calls for a new replacement visitor center at American Camp, the proposed location in this alternative is on a previously disturbed site that has been surveyed for archaeological resources. This proposed area is further away from documented archaeological sites than areas proposed near the redoubt. Any archaeological resources inadvertently discovered during construction would likely be disturbed ephemera of the camp thereby reducing the data potential of archaeological objects. Compared to the proposed redoubt site in Alternative B, this location would likely have minor adverse impacts.

Potential impacts to archaeological resources at English Camp are also less than those from Alternative B. The scale of development at English Camp is less than that proposed in Alternative B, with no loop road and no kayak/canoe landing proposed. Impacts from proposed development in Alternative C with the expanded education camp along the administrative road are less likely to have significant impacts on archaeological resources given the distance from known sites and the water. Impacts to archaeological resources at English Camp would likely be minor.

Alternative C also calls for the repatriation of two historic buildings to the camps. Repatriation would entail moving buildings to their historical location. Mitigation measures for archaeological surveys and site specific mitigation would precede these actions as with all potentially ground disturbing activities to minimize impacts to archaeological resources.

Cumulative Impacts

Cumulative impacts are similar to those in Alternative A; however, implementation of Alternative C would have a negligible contribution to long-term cumulative impacts on archaeological resources.

Conclusion

Implementation of Alternative C could have minor, long-term, adverse impacts to archaeological resources, given the location of the proposed visitor center on a previously disturbed site further from documented significant archaeological sites at American Camp and the smaller scale development at English Camp. Implementation of Alternative C would have a negligible contribution to long-term adverse impacts on these resources. There would be no impairment of this resource or value as a result of implementing this alternative.

Museum Collections

Alternative C proposes maintaining a collections study room for natural and cultural resources located at either park headquarters or in the 5,400 square foot permanent visitor center. The collection would contain a portion of the military-era collections, including some non-military items. The effects on museum collections would be similar to Alternative B, providing long-term moderate benefits to these resources.

Cumulative Impacts

Contributions to cumulative impacts to museum collections are the same as Alternative B.

Conclusion

Implementation of Alternative C would have similar moderate long-term benefits to museum collections as Alternative B by providing a collections study room in the new visitor center or at park headquarters and additional curatorial capacity. There would be no impairment of this resource or value as a result of implementing this alternative.

Effects on Natural Resources

Methodology and Assumptions

Vegetation

The area of consideration for vegetation is park-wide. All available information on vegetation in the park was compiled. Defining potential impacts from management actions is based on professional judgment and experience with similar actions and impacts were assessed qualitatively. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: The impact on vegetation (individuals or communities) would not be measurable. The abundance or distribution of individuals or communities would not be affected or would be slightly affected. Ecological processes and biological productivity would not be affected.

Minor: The action would not necessarily decrease or increase an area's overall biological productivity. An action would affect the abundance or distribution of individuals or communities in a localized area but would not affect the viability of local or regional populations or communities.

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

Major: The action would result in a change in overall biological productivity in a relatively large area. An action would affect a regional or local population of a species sufficiently to cause a change in abundance or in distribution to the extent that the population or communities would not be likely to return to its formal level (adverse), or would return to a sustainable level (beneficial). Key ecological processes would be altered.

Wildlife

The area of consideration for wildlife is the San Juan Islands. Impacts on wildlife are closely related to the impacts on habitat. The evaluation considered whether actions would be likely to displace some or all individuals of a species in the park or would result in loss or creation of habitat conditions needed for the viability of local or regional populations. All available information on wildlife populations was compiled. Predictions about short and long-term impacts were based on previous studies or impacts to natural resources and recent monitoring data from the park. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Effects on wildlife would be at or below the level of detection, would be short-term, and the changes would be so slight that they would not be of any measurable or perceptible consequence to the species' population.

Minor: Effects on wildlife would be detectable, but localized, small, and of little consequence to the species' population. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

Moderate: Effects on wildlife would be readily detectable but localized, with consequences at the population level. Mitigating measures, if needed to offset adverse effects, would be extensive and likely successful.

Major: Effects on wildlife would be obvious and would result in substantial consequences to the wildlife populations at a regional level. The change would result in a severely adverse or major beneficial impact,

and possible permanent consequence on the species. Extensive mitigating measures would be needed to offset any adverse effects and their success would not be guaranteed.

Special Status Species

The area of consideration for special status species is the suitable and known occupied habitat on the San Juan Islands. Information on threatened, endangered, candidate species, and special species of concern was gathered from responsible agencies, research, and specialists. Known locations of habitat associated with threatened, endangered, candidate species, and species of special concern were compared with locations of development and facilities, and modifications of existing facilities. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: The action would have no measurable effect to a listed species, suitable, potential, or critical habitat, resulting in a no effect determination.

Minor: The effects of the action would be discountable (extremely unlikely to occur), insignificant (not able to be meaningfully measured, detected, or evaluated), or completely beneficial. Any change would be small and localized and of little consequence, and result in a may affect, not likely to adversely affect determination and require informal consultation with the U.S. Fish and Wildlife Service.

Moderate: An action that would result in some change to a population or individuals of a species or designated critical habitat. The change would be measurable and of consequence but would most likely result in a may effect, not likely to adversely affect determination and require informal consultation with the U.S. Fish and Wildlife Service.

Major: An action that would result in a noticeable change to a population or individuals of a species or designated critical habitat. Any adverse affect to the species that may occur as a direct or indirect result of the alternative and the effect is not discountable, insignificant, or completely beneficial. Incidental take is anticipated to occur as a result of the action. The change would result in a may effect, likely to adversely affect determination and require formal consultation with the U.S. Fish and Wildlife Service.

Soils and Geologic Resources

The area of consideration for soils and geologic resources is park-wide. Available information on geological resources and geologic processes in the park was compiled. Potential impacts from management actions are based on professional judgment and experience with similar actions. The thresholds of change for the intensity of and impact are defined as follows:

Negligible: An action that could result in a change to a geologic feature or process, but the change would be so small that it would not be of any measurable or perceptible consequence.

Minor: An impact that could result in a change to a geologic feature or process, but the change would be so small that it would not be of any measurable or perceptible consequence.

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

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

Coastal Water Resources and Hydrologic Systems

The area of consideration for water resources is park-wide. Available information on coastal water resources, hydrologic systems and ecological links to these resources was compiled. Potential impacts from management actions are based on professional judgment and experience with similar actions as well as studying effects from previous actions. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Effects on coastal water resources and hydrologic systems would be at or below the level of detection, would occur in a small area, and the changes

would be so small that they would not be of any measurable or perceptible consequence.

Minor: Effects on coastal water resources and hydrologic systems would be detectable, but localized, small, and of little consequence.

Moderate: Effects on coastal water resources and hydrologic systems would be readily detectable and have localized consequences to the health and functioning of an intertidal area or a measurable change to a hydrologic system.

Major: Effects would be obvious and would have widespread, substantial consequences on coastal water resources and hydrologic systems that would result in either a severely adverse or major beneficial impact with regional consequences.

Air Quality

The area of consideration for this topic is the San Juan Islands. Impacts on the park's air quality would be based on anticipated changes from base data and national standards as measured at authorized stations. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: There would be no perceptible visibility impacts. The first highest three-year maximum for each pollutant would be less than the national ambient air quality standards (NAAQS).

Minor: There would be slightly perceptible visibility impacts on less than 180 days per year. The first highest three-year maximum for each pollutant would be less than the national standards.

Moderate: There would be moderately perceptible visibility impacts on less than 180 days per year or slightly perceptible visibility impacts on 180 days or more per year. The first highest three-year maximum for each pollutant could be greater than national standards.

Major: There would be highly perceptible visibility impacts on 180 or more days per year. The first highest three-year maximum for each pollutant would be greater than national standards.

Soundscapes

The area of consideration for soundscapes is parkwide. Context, time, and intensity together determine the level of impact for an action or activity. Noise for a certain period and intensity would be a greater impact in a highly sensitive context, and a given intensity would be a greater impact if it occurred more often, or for 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.

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

Minor: Impacts would be slightly detectable and in close proximity to the source, but are not 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.

Impacts from Alternative A

Vegetation

Implementing Alternative A would provide some long-term benefits to vegetation. The park would develop a vegetation management plan to guide overall vegetation management as well as restoration of prairies and forests. This plan would benefit vegetation by providing management direction that recognizes the cultural significance of these resources as well as their natural resource values. Expanded interpretive programs would increase public understanding of the park's historic natural resources, such as camas beds and prairies, encouraging awareness and stewardship of these resources and the broader natural environment. The park would also continue to implement management actions and programs, such as fire management and exotic species removal, that restore, maintain, and promote these resources.

Specifically, maintaining the Garry oak woodland through thinning and prescribed fire would have a moderate to major benefit on this resource because Garry oak is a regionally declining resource.

Implementing Alternative A would also result in some disturbance to vegetation from regular park operations, such as road maintenance and establishing trail connections. As visitation continues, trampling in localized areas, mostly around developed areas and along trails, can adversely affect vegetation.

Cumulative Impacts

Inside the park, vegetation has been disturbed in localized areas for facilities and infrastructure associated with necessary visitor services and park operations. Vegetation has been impacted in the past from construction of a visitor center and parking areas. Currently, the park maintains vegetation along roads and trails, and occasionally removes hazardous trees for public safety.

Prairies are an increasingly rare vegetation resource in the San Juan Islands and greater Pacific Northwest. Prairies in the Northwest have been adversely impacted from conversion to agriculture and the introduction and continued presence of exotic species, including rabbits which overgraze prairie grasses and dig warrens, creating likely areas for the establishment of invasive plant species. Increasing development has also impacted prairies. The current and future prairie restoration at the park, though it would occur over a long period of time, would have a long-term beneficial effect on northwest prairies.

Past logging had an impact on the forests at the park, both during the historical period and after. Most forests in the park are second growth or later succession. These actions have had adverse impacts on native vegetation in the park. Along the Pacific Northwest coast, forests have also likely been adversely impacted by global climate change. Increased temperatures, changed precipitation patterns, and increased severity of storms caused by climate change could have moderate to major impacts on vegetation communities in the region, including forests and prairies.

The overall effect of the cumulative actions would be minor to moderate and adverse. The contribution from implementing Alternative A would include minor long-term adverse impacts. This alternative, when considered with other actions, would have a small contribution to the overall cumulative impacts on vegetation.

Conclusion

Implementing Alternative A would result in long-term, moderate benefits to vegetation through ongoing resource management actions, expanded interpretation, and implementation of a vegetation management plan. Maintaining the Garry oak woodland through thinning and prescribed fire has a moderate to major benefit on this resource. Continuing park operations and sustained or increasing visitation would have some negligible to minor adverse impacts to vegetation. The overall effect of the cumulative actions would be minor to moderate and adverse; however the contribution from this alternative would be small. There would be no impairment to vegetation or its values as a result of implementing this alternative.

Wildlife

Implementing Alternative A would result in some actions that could change the condition of wildlife populations. Implementing a program to control or eliminate exotic and invasive species would result in moderate benefits to ensure the long-term survival of the native ecosystem and the integrity of the cultural landscape. There would be beneficial effects to small mammals, raptors, and other species of wildlife from the habitat provided by the park and additional public land protection.

Impacts to the exotic population would be moderate and adverse. Additional ongoing park operations are likely to have localized, short-term, negligible to minor impacts on wildlife.

The park would continue to construct and install bat houses in an effort to relocate the colony of bats from the Crook house. This action would have some short-term minor impacts to bats from the disturbance associated with relocation, but would have long-term benefits by providing a more sustainable location for the bats.

Cumulative Impacts

There has been past disruption to wildlife in the park from the historic development of San Juan Island, including habitat loss and fragmentation, introduction of exotic species, and introduction of pathogens from domestic livestock. It is highly likely that most wildlife remaining in the park is accustomed

to human presence, including visitation, associated infrastructure and park operations. Ongoing park operations are likely to have localized, short-term, minor impacts on wildlife.

Continued development outside the park on San Juan Island results in additional habitat fragmentation for the remaining wildlife. Impacts from habitat loss which can cause displacement of individuals would be moderate and adverse. Introduction of exotic species has also had moderate adverse impacts to wildlife. Exotic species can alter the habitat for native species and impact the population dynamics through competition.

The overall cumulative impacts to wildlife populations would be minor to moderate and adverse. The contribution from implementing this alternative to cumulative impacts would be small.

Conclusion

Implementation of Alternative A would have overall long-term, moderate benefits to wildlife by promoting a plan to remove exotics to ensure the long-term survival of the native ecosystem and its associated wildlife. Providing alternative bat houses to relocate the colony of bats would have short-term, minor, adverse impacts but long-term benefits by providing a more sustainable location. There would be minor to moderate adverse cumulative impacts to wildlife mostly resulting from ongoing development, continued presence of exotic species, and habitat fragmentation; however the contribution from implementing this alternative would be small. There would be no impairment to this resource as a result of implementing this alternative.

Special Status Species

Implementing Alternative A would result in minor to moderate short-term impacts to bald eagles. The bald eagle is no longer a federally threatened species, but is still protected under the U.S. Bald and Golden Eagle Protection Act. The management and potential removal of exotic species, such as European rabbits, may have temporary minor adverse impacts to raptor predation habits. However, the native grasslands that would result from prairie restoration would result in a natural, long-term population of small native rodents and other species, providing a different prey base for these and other raptors.

While the marbled murrelet is generally known to use the waters of the San Juan Islands, results of recent surveys at the park indicate that although murrelets may be feeding in waters off the islands, they do not nest in the park. The most suitable potential nesting habitat within the park was identified at the eastern boundary of the park, within American Camp and adjacent to DNR land (Hall, 1999). Implementation of Alternative A could have a negligible to minor impact on murrelets from continued visitation in the area. Because recreation on trails in this area is limited to non-motorized uses, impacts would likely be no more than minor.

Beneficial impacts from the continued protection of sensitive species, including bald eagles and marbled murrelets, and their habitat within the park, would continue under this alternative. Potential reintroduction of the golden paintbrush and streaked horned lark would have additional benefits by providing habitat for additional sensitive status species.

Continuation of vegetation management programs and prairie restoration efforts under Alternative A would result in minor adverse impacts to the island marble butterfly resulting in some level of mortality to individual butterflies. However, continuing with these programs at the current scale and following the principles outlined in the Conservation Agreement and Strategy for the Island Marble Butterfly would have minor to moderate long-term benefits for the island marble from habitat restoration.

Cumulative Impacts

The development of San Juan Island has resulted in habitat fragmentation, introduction of exotic species, and overall loss of habitat which has had past adverse impacts to sensitive species. Park operations would continue to have localized, short-term, negligible impacts to bald eagles. These impacts would likely result primarily from noise associated with roads and the areas of the park where visitation is concentrated and mechanized equipment may be used. Mitigation associated with timing activities during critical periods for these species would reduce the level of impacts to negligible. Overall, cumulative impacts to sensitive species are long-term minor to moderate and adverse. The contribution of this impact would be very small.

Conclusion

Implementation of Alternative A could contribute minor, short-term, adverse impacts to bald eagles from the reduction or removal of exotic species and

potential minor impacts to marbled murrelets, if they are nesting on the island. Protection of both the species and habitats would continue to provide long-term benefits to bald eagles and marbled murrelets. Cumulative impacts would be minor to moderate from past habitat fragmentation and habitat loss. Impacts from prairie restoration would also have short-term minor adverse effects coupled with overall long-term, minor to moderate benefits to the island marble butterfly by improving habitat. There would be no impairment to this resource as a result of implementing this alternative.

Soils and Geologic Resources

Implementing Alternative A would not result in any additional impacts on geologic features or processes. Adverse impacts now occurring from natural erosion, existing development, and wave action would continue.

Continuing park operations and sustained visitation would result in negligible to minor, long-term impacts to soils from trampling, grading, or small scale removal. Continued use of the well-developed warrens and new burrowing by rabbits would result in excessive churning and compaction of soil. This activity impacts the soil-water relationship because infiltration is reduced and runoff increases with soil compaction. Burrowing also disrupts the texture of the surface soil by bringing subsurface soil and gravel to the surface, creating a soil environment that is conducive to establishment by exotic plant species as opposed to native prairie grasses (Biggam, 2003) and perpetuating adverse impacts to the entire prairie ecosystem. This alteration of the soil environment would result in moderate, long-term, adverse impacts to soils.

Cumulative Impacts

The preferred road alternative proposed in the current version of the unpublished Cattle Point Road Draft Environment Impact Statement involves realignment of the roadway away from the bluff to increase the life expectancy of the road. The total length of the realignment is approximately 5,100 feet and would involve cuts and fills using heavy equipment to fit the road onto sloping ground. Retaining walls may be needed to reduce the size of cuts and fills. The cuts and fills would result in moderate, long-term, adverse impacts to the natural benches formed by glacial rebound processes. The cut sections would also disturb the mounded ridge, creating moderate, adverse long-term impacts to the natural topography. Soils would also be disturbed from construction of the Cattle Point Road realignment. Soil disturbance from cuts and fills could also create potential erosion issues, most severe in the short-term during the actual construction period. Best management practices would be used, including soil stabilization and a silt fence, and other means to control runoff to minimize impacts to soils. The alternative is also designed to require minimal need for imported rock and soil, and a restoration plan would be designed to encourage establishment of native plants and reduce the potential for long-term soil erosion. In the long-term impacts to soils would be minor and adverse. Implementation of Alternative A would have a negligible contribution to cumulative impacts (Federal Highway Administration and National Park Service, 2007).

Conclusion

Implementing Alternative A would not result in any additional impact on geologic features or processes. Long-term, minor to moderate adverse impacts to soils would continue from ongoing park operations and burrowing activity from rabbits. Cumulative impacts to geologic landforms from the Cattle Point Road proposed realignment would be moderate, long-term and adverse while impacts to soils from this project would be minor, long-term and adverse. Implementation of Alternative A would have a negligible contribution to cumulative impacts. There would be no impairment to soils or geology or their value as a result of implementing this alternative.

Coastal Water Resources and Hydrologic Systems

Implementing Alternative A would not result in any direct change to coastal water resources, including intertidal areas (the strip of beach between high and low tides), or hydrologic systems, including wetlands and floodplains. Existing conditions and impacts from current development and human activities, such as trampling and harvesting of organisms, would continue. The condition of water resources in Westcott and Garrison bays would continue to be influenced by relatively low rates of flushing, seasonally high use by recreational boaters, and by land use practices, including agriculture and discharge from residential septic systems in the watershed. These activities combined could cause major impacts to water quality in the vicinity of English Camp (Klinger et al, 2006: p.110).

The south-facing shore of American Camp is exposed to the eastern Strait of Juan de Fuca, resulting in a higher flushing than the interior bays at English Camp. While used by recreational boaters for fishing and wildlife viewing, it is not used for overnight anchoring. Residential development along the south-facing shore is also relatively sparse, limited primarily to Eagle Cove and Cattle Point Estates. These activities combined have minor impacts and water quality at American Camp remains relatively high (Klinger et al, 2006: p.113-114).

No development would occur along any shoreline, and wetlands and saltwater marshes would be preserved, which would be a benefit to water resources and hydrologic systems. The park would continue to maintain passive management of intertidal areas, which could contribute to further decline of eelgrass beds in Westcott and Garrison bays or other loss of habitat associated with intertidal resources. This alternative does not provide for further protection for the intertidal areas and could result in long-term moderate adverse impacts to the intertidal community.

Continued restoration of the native plant communities on San Juan Island would have moderate benefits to hydrologic systems. Native plant species are more drought resistant and will retain surface soil better, resulting in less erosion into hydrologic systems. Restoration of native plants will also increase infiltration and decrease runoff, resulting in fewer pollutants entering the hydrologic system and marine ecosystem.

Cumulative Impacts

The rapid dispersal of non-indigenous or exotic species has been identified as one of the most severe environmental threats facing the Pacific Northwest. The spread of these species could lead to drastic changes in the ecology of marine estuarine and freshwater systems, and produce significant economic impacts on water dependent industries, such as aquaculture and hydro power. One such species of concern to the park is the European green crab (Carcinus maenas). From 2000 to 2002, park staff monitored the intertidal zone of Griffin Bay and Garrison Bay with no detections of this species. However, green crabs are present in Willipa Bay and Grays Harbor on the coast of Washington and are found on Vancouver Island, British Columbia. Native to Europe, the green crab most likely arrived in ship ballast or in seaweed used as packing material for bait. This species is an aggressive predator that feeds on a variety of organisms including bivalve mollusks, polychaetes, and small crustaceans. It disrupts and negatively impacts the native ecosystem by out competing the Dungeness crab and other native crab species, and by heavily feeding on clams and oysters. Additionally, it is host to a parasitic worm that may affect the health of local shore birds (Washington Department of Fish and Wildlife, 2007).

Coastal water resources and hydrologic systems on the Pacific Coast have also been and are being affected by natural geologic processes, fragmentation of habitats, by pollution and disturbance in watersheds and human activities. These resources are also impacted by global climate change which causes changes in coastal erosion, salinity, precipitation, the range of environmental variation, and species diversity (Flora, 2007: p.7). In many areas along the Pacific Coast, ocean resources are impaired, declining, and rapidly approaching critical levels beyond which recovery may not be possible.

In the San Juan Islands, impacts from Snohomish Public Utility District potential use of tidal energy are currently unknown, but could range from minor to major. The underwater turbines could have impacts on marine life and habitat, shorelines, and tidal flows. Impacts will be better assessed following the studies proposed by the public utility district.

Hydrologic systems and wetlands have been affected by past construction of roads, parking lots, culvert placement, and other facilities within and outside the park. Of particular note is a county road that bisects English Camp. This county road is contributing negligible impacts to the hydrologic resources at English Camp. Overall, these actions would result in minor cumulative impacts to hydrologic systems.

Conclusion

Implementing Alternative A would have no direct, adverse impact on coastal water resources or hydrologic systems, including wetlands. Water resources in Westcott and Garrison bays would continue to be influenced by relatively low rates of flushing, recreational boaters, and by land use practices, which combined could cause major impacts to water quality in the vicinity of English Camp. Water quality at American Camp would remain relatively good, with minor impacts from recreation activities. Continued restoration of the native plant communities would have moderate benefits to hydrologic systems. Cumulative impacts would be moderate and adverse and could be major and adverse based on potential tidal energy development programs and invasion of

the European green crab. The contributions to these effects from this alternative would be very small. There would be no impairment to these resources as a result of this alternative.

Air Quality

Under Alternative A, there would be no notable changes to future air quality trends due to park management or park operations. The park would continue to have no site-specific monitoring for additional air quality data.

Cumulative Impacts

Past and present sources of impacts on air quality in the park are motor vehicles and equipment, campfires, prescribed fires, and generators and heating systems. Most air pollution affecting the park comes from outside the park, 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, particularly in western Washington, additional cars, marine vessels, and infrastructure will increase air pollutant emissions, and could result in minor to moderate adverse impacts to park air quality. Implementing Alternative A would not alter any trends in population growth or air quality and therefore would not contribute to cumulative impacts.

Conclusion

Implementing Alternative A would not result in any adverse impacts to air quality. Cumulative impacts associated with population growth and increased pollution primarily from motor vehicle emissions would contribute minor to moderate adverse impacts to park air quality. Implementing Alternative A would not alter any trends that impact air quality and therefore would not contribute to cumulative impacts. There would be no impairment to this resource or value as a result of this alternative.

Soundscape

Implementation of Alternative A would include development of an overflight management plan and establishing a noise baseline for planes flying over the park, generally to and from the airport in Friday Harbor. Establishing this baseline and implementing a plan for overflights would have long-term benefits to the park soundscape.

Impacts to soundscape from ongoing park operations such as road maintenance would be negligible.

Cumulative Impacts

Impacts to park soundscape generally come from overflights and boat traffic. Planes flying over the island impact the soundscape at both American and English camps. 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 residents with private planes flying over the park.

At American Camp, commercial fishing and whale watching boats can often be heard, in addition to private boats. At English Camp, most boat traffic is from private boats. As development expands on Garrison Bay, there is potential for additional larger boats or yachts on the water, which could result in moderate adverse impacts to soundscape. Noise associated with larger boats would not be considered compatible with the historic scene and relatively pastoral setting. Alternative A would have a minor contribution to cumulative impacts.

Conclusion

Implementation of Alternative A would have long-term benefits to soundscape though development of an overflight management plan and establishment of a noise baseline for planes flying over the park. Cumulative impacts are largely from overflights and boat traffic and could be moderate and adverse in the long-term as development on Garrison Bay expands. Alternative A would have a minor contribution to cumulative impacts. There would be no impairment to this resource or value as a result of this alternative.

Impacts from Alternative B

Vegetation

Implementing Alternative B would provide some similar long-term, moderate benefits to vegetation, including the Garry oak woodland and prairie, as in Alternative A from the continuation of park resource management actions and programs. Under Alternative B, the park would expand efforts to restore the prairie at American Camp, providing restoration of a rare resource, enhancing critical habitat for the island marble butterfly as well as the historic scene. These efforts would have a moderate to major, long-term benefit to the prairie, restoring this rare resource in

the Pacific Northwest. The park would also expand partnerships in Alternative B, which could provide additional volunteers and funding to increase the number of projects the park is able to accomplish for vegetation management each year.

However, implementing Alternative B would also result in localized moderate adverse impacts to vegetation at American Camp from the construction of a permanent visitor center in a previously undeveloped location. This construction would result in vegetation removal for the new facility, parking lot, and access road; however, no sensitive vegetation species or large diameter trees would be affected. There would also be short-term impacts to vegetation from the staging of construction equipment required. The long-term increase in vehicular and pedestrian traffic would also adversely impact vegetation by increasing possibilities of trampling and introduction of exotic species.

The relocation of the road and parking lot at English Camp would also result in moderate adverse impacts to vegetation. Construction would result in long-term impacts from vegetation removal, consisting mostly of underbrush and small trees; however, no large diameter trees would be removed. Short-term impacts could also result from staging equipment.

Cumulative Impacts

Cumulative impacts are similar to Alternative A. Implementation of Alternative B would have a greater contribution to long-term benefits from prairie restoration efforts at American Camp, but would also have a greater contribution to the adverse cumulative impacts in the short and long-term from the staging for construction and permanent removal of some vegetation from actual construction at both camps.

Conclusion

Implementation of Alternative B would have similar moderate long-term benefits as Alternative A from the continuation of park resource management actions and programs. Alternative B provides some additional benefits from the expansion of partnerships; however Alternative B would also result in localized moderate adverse impacts to vegetation from the construction of a new permanent visitor center and associated infrastructure on a previously undeveloped site at American Camp and relocation of the road and parking lot at English Camp. Cumulative impacts are similar to Alternative A; however Alternative B has a greater contribution to long-term, adverse cumulative impacts. There would be no impairment to this resource or value as a result of this alternative.

Wildlife

Implementation of Alternative B would have similar impacts as Alternative A from managing exotic species and relocating the bat colony from the Crook house. In addition, Alternative B would result in moderate adverse impacts to wildlife from the construction of a new visitor center and associated infrastructure on a previously undeveloped site at American Camp and relocation of the road and parking lot at English Camp. Construction activities would cause short-term disruptions to wildlife species and could cause long-term habitat fragmentation. Although habitat would be fragmented, it is likely that wildlife would adapt to the new permanent visitor center, new road development, and other infrastructure over time. The increased visitor facilities and infrastructure would likely attract new visitors. The increase in visitation could also result in minor long-term impacts to wildlife from unintentional visitor or vehicle conflicts.

Prairie restoration under Alternative B would have long-term benefits to some species of wildlife by restoring a large area of habitat for native species. Small rodents populations would likely increase, providing a prey source for raptor populations.

Cumulative Impacts

Cumulative impacts are similar to Alternative A; however Alternative B has a greater contribution to long-term adverse cumulative impacts associated with habitat fragmentation.

Conclusion

Implementation of Alternative B would have similar impacts on wildlife as Alternative A from the continuation of park resource management actions and programs, with some additional long-term benefits from prairie restoration. Alternative B would also result in moderate adverse impacts to wildlife from the construction activities, including a new visitor center and associated infrastructure on a previously undeveloped site at American Camp and relocation of the road and parking lot at English Camp. Cumulative impacts are similar to Alternative A; however Alternative B has a greater contribution to long-term adverse cumulative impacts. There would be no impairment to this resource or value as a result of this alternative.

Special Status Species

Implementing Alternative B would result in similar impacts to bald eagles and marbled murrelets as Alternative A, with some additional short-term minor to moderate impacts, most likely resulting from noise associated with construction projects. Noise and construction activities may also disrupt behavior. Beneficial impacts from the continued protection of sensitive species and their habitat within the park would continue under this alternative.

Expanded prairie restoration efforts would have long-term benefits to bald eagles and the island marble butterfly. Larger scale prairie restoration would increase native grasslands which would serve as habitat for small rodents, a prey source for bald eagles. Native grasslands restored through this action also include a mustard plant which commonly serves as host to island marble larvae. The increase in native prairie habitat should result in stronger island marble populations (National Park Service and U.S. Fish and Wildlife Service, 2006) and long-term moderate benefits to the species.

Cumulative Impacts

Cumulative impacts are similar to Alternative A. The contribution of this alternative to cumulative impacts on special status species from noise disturbance would be greater than Alternative A; however, these impacts would not exceed moderate adverse impacts. In addition, this alternative contributes moderate long-term benefits to cumulative impacts from the increase in habitat from prairie restoration.

Conclusion

Beneficial impacts from the continued protection of sensitive species and their habitat within the park would continue under this alternative. Implementing Alternative B would result in some additional short-term minor to moderate impacts, most likely resulting from noise associated with construction projects. Expanded prairie restoration efforts would have a long-term moderate benefits to bald eagles and long-term moderate to major benefits to the island marble butterfly. The contribution of this alternative to cumulative impacts from noise disturbance would be greater than Alternative A; however, this alternative contributes beneficial effects from increasing prairie habitat through restoration efforts. There would be no impairment to this resource or value as a result of this alternative.

Soils and Geologic Resources

Implementing Alternative B could potentially result in some minor impacts to geologic resources from construction activities related to improving parking areas at Young Hill and Jakle's Lagoon. However, prominent geologic features would be avoided during construction at both camps and most construction would not impact geologic processes in the long-term.

Prairie restoration efforts, including the control or elimination of invasive species, could have long-term moderate benefits to soils. Reducing or eliminating the burrowing activity from rabbits would improve soil infiltration. Similarly, restoring native grasses to the prairie would improve the soil environment, creating long-term benefits to soils at American Camp.

Soils would be adversely impacted from construction activities from all construction, including the new permanent visitor facility at American Camp and the road re-route at English Camp. Short-term impacts associated with increased erosion potential due to the removal of plants, rocks and soils would be moderate. Mitigation measures following construction would reduce any long-term impacts to soils from erosion or runoff.

Cumulative Impacts

Cumulative impacts are similar to Alternative A regarding the Cattle Point Road Draft EIS unpublished alternatives. Alternative B would have a greater contribution to adverse impacts to soils than Alternative A, but the effects would not exceed moderate impacts and be short-term. Alternative B would also contribute moderate long-term benefits to cumulative impacts by restoring the prairie ecosystem.

Conclusion

Overall, implementation of Alternative B would result in some minor short-term adverse impacts from construction activities, with no long-term impacts to prominent geologic features and processes. Soils would also be moderately affected from construction in the short-term; however, there would be long-term benefits to soils from prairie restoration efforts. Cumulative impacts are similar to Alternative A regarding the Cattle Point Road Draft EIS alternatives. Alternative B would contribute short-term moderate adverse impacts for cumulative impacts from construction as well as long-term benefits from prairie

restoration. There would be no impairment to this resource or value as a result of this alternative.

Coastal Water Resources and Hydrologic Systems

Under Alternative B, the park would utilize partnerships with the DNR and others to aid the management of the intertidal zone. Taking on a more active management role in intertidal areas would have long-term moderate benefits by focusing more attention on management of this resource. Expanded interpretation of about the value of bays and coastal water resources would have long-term benefits by increasing public awareness and stewardship of the importance this resource.

Alternative B proposes development at American Camp with a new permanent visitor center and access road closer to the redoubt. The area in which the new access road traverses and some of the location of the visitor center and parking is characterized as wet. Development on this site could have minor to moderate adverse impacts to hydrology in this localized area.

Alternative B proposes a loop road at English Camp that could have varying degrees of impacts depending on the alignment chosen. The wetness classification of the area at English Camp ranges from dry to very wet; however, it is impossible to connect to the parking lot without traversing some very wet terrain. When constructing in wet and very wet areas, it is necessary to have adequate drainage to maintain total hydrologic continuity, of both surface and subsurface water, across the road. This can be accomplished by use of bridges, or adequately compacted fill, with what may appear to be a surfeit of cross-draining structures (Kennard, 2006).

Site specific analysis would follow selection of an actual alignment. Impacts would range from minor if a route just north of the existing parking lot was chosen where the terrain transitions from dry to moist, to moderate to major impacts if the loop road provided vehicle access directly to the Crook house and crossed wet to very wet land (Kennard, 2006). Maintenance of a road across wet or very wet areas would have long-term impacts due to the greater intensity of these activities.

Cumulative Impacts

Cumulative impacts would be similar to those in Alternative A. The construction of the visitor center at American Camp and the loop road at English Camp both would be located in some wet areas, contributing additional minor to moderate impacts to hydrologic systems from construction in the short-term and in the long-term due to the potential disruptions to surface and subsurface water flow and maintenance activities required to support them.

Conclusion

Implementation of Alternative B would result in long-term benefits to coastal water resources by having the park staff engage more actively in management of the intertidal zone. This alternative would also contribute minor to moderate adverse impacts to hydrologic systems in the short and long-term from construction at both American and English camps. Cumulative impacts would be similar to Alternative A, with additional minor contributions. There would be no impairment to hydrologic systems or coastal water resources or their values as a result of this alternative.

Air Quality

Implementation of Alternative B would result in some short-term minor to moderate adverse impacts to air quality from construction of facilities and roads at American and English camps. Construction would result in additional exhaust from construction equipment as well as dust and increased particulates from construction activities. These impacts would be moderate and short-term with no long-term impacts.

Cumulative Impacts

Cumulative impacts are similar to Alternative A. Alternative B would have a greater contribution to cumulative impacts in the short-term, but long-term contributions to impacts as a result of implementing this alternative would be negligible to minor.

Conclusion

Implementation of Alternative B would result in some short-term minor to moderate adverse impacts to air quality from construction of facilities and roads at American and English camps. Alternative B would have a greater contribution to cumulative impacts in the short-term, but long-term contributions to impacts as a result of implementing this alternative would be very small. There would be no impairment to this resource or value as a result of this alternative.

Soundscape

Implementation of Alternative B would have the same actions and impacts as Alternative A, plus additional long-term benefits from conducting baseline acoustic monitoring through the NPS soundscapes program. Data from this monitoring would provide park management with important information about natural sounds and ambient noise levels that could guide future decisions.

Alternative B would also result in additional moderate short-term impacts to soundscapes as a result of the additional construction activities at both camps. There could be some additional minor long-term impacts from increased traffic through English Camp due to the road continuing through the unit, potentially in hearing range from the parade ground. The expanded capacity at American Camp from the new visitor center and enlarged parking could also result in noise from the increased number of vehicles in the area.

Cumulative Impacts

Cumulative impacts would be the same as Alternative A. Alternative B would have a greater contribution to cumulative impacts than Alternative A. However, the contribution would still be very small.

Conclusion

Implementation of Alternative B would result in similar impacts as Alternative A, plus additional long-term benefits from conducting baseline acoustic monitoring. Additional moderate short-term adverse impacts would also occur from construction activities at both camps. Cumulative impacts are the same as Alternative A, but this alternative would have a slightly greater contribution to cumulative impacts. There would be no impairment to this resource or value as a result of this alternative.

Impacts from Alternative C

Vegetation

Implementation of Alternative C would have similar benefits as Alternative B from resource management programs, prairie restoration efforts, and expanded partnerships which would assist in vegetation management. Alternative C also includes the park playing a more active role in partnerships related to coastal resource management and implementing the recommendations of the coastal watershed assessment, which would provide additional long-term benefits to vegetation through improvements in the broader ecosystem.

Alternative C calls for less development than Alternative B, with the visitor center construction at American Camp occurring on the existing site and limiting road improvements at English Camp to the existing entrance road. This development would result in fewer impacts to vegetation, and adverse impacts could be moderate in the short-term, but minor in the long-term.

Cumulative Impacts

Cumulative impacts are the same as Alternative B; however, implementation of Alternative C would contribute fewer adverse impacts to vegetation.

Conclusion

Implementation of Alternative C would have similar benefits as Alternative B from resource management programs, prairie restoration and expanded partnerships, with additional long-term benefits from the park's more active role related to coastal resource management. Adverse impacts from smaller scale construction would be less than Alternative B, and would be minor to moderate in the short-term and minor in the long-term. Cumulative impacts are the same as Alternative B, with this alternative contributing fewer adverse impacts to cumulative effects. There would be no impairment to this resource or value as a result of this alternative.

Wildlife

Implementation of Alternative C would have similar benefits to wildlife as Alternative B, notably from prairie restoration efforts and other resource management programs; however, adverse impacts under this alternative would be less than Alternative B. The construction of the visitor center at American Camp would be confined to the already developed area and there would be no loop road at English Camp, reducing the amount of habitat disturbed by construction.

Cumulative Impacts

Cumulative impacts are the same as Alternative B; however, implementation of Alternative C would contribute fewer adverse impacts to cumulative effects than Alternative B.

Conclusion

Implementation of Alternative C would have similar long-term benefits to wildlife from prairie restoration efforts and other expanded resource management programs. Adverse impacts are less than Alternative B due to less construction of facilities and roads, and would be minor to moderate in the short-term, and would likely not exceed minor in the long-term. Cumulative impacts are the same as Alternative B, although Alternative C would contribute fewer adverse impacts to cumulative effects. There would be no impairment to this resource or value as a result of this alternative.

Special Status Species

Bald eagles nest near the visitor center site in Alternative C, but also regularly utilize habitat near the visitor center site in Alternative B. Eagles near the existing visitor center appear to be habituated to a certain level of human activity, so the two alternatives are likely to have similar impacts on special status species from visitor center construction. Elimination of the loop road at English Camp in Alternative C would result in fewer additional disturbances to habitat for special status species.

Cumulative Impacts

Cumulative impacts are the same as Alternative B.

Conclusion

Implementation of Alternative C would have similar impacts to special status species as Alternative B; however, the more limited construction activities in this alternative would reduce adverse impacts related to noise. Cumulative impacts are the same as Alternative B. There would be no impairment to this resource or value as a result of this alternative.

Soils and Geologic Resources

The effects on geologic resources and processes would be the same as Alternative B.

Implementation of Alternative C would contribute fewer impacts to soil resources as a result of less development at both American and English camps. Soil impacts and intensity would be the same as Alternative B; however the amount of area adversely impacted would be less than Alternative B.

Cumulative Impacts

Cumulative effects are the same as Alternative B, with Alternative C contributing fewer adverse jmpacts to the cumulative effects on soils due to the smaller scale of development.

Conclusion

Impacts on geologic resources and processes would be the same as Alternative B. Impacts to soils would be the same as Alternative B in terms of intensity and duration, but a smaller amount of soil area would be impacted. Cumulative effects are the same as Alternative B; however, Alternative C does not contribute as much long-term adverse impacts to soil resources. There would be no impairment to this resource or value as a result of this alternative.

Coastal Water Resources and Hydrologic Systems

Implementation of Alternative C calls for additional actions that would benefit coastal water resources and hydrologic systems. Implementation of the Ocean Stewardship Strategy, recommendations of the Assessment of Coastal Water Resources and Watershed Conditions, in addition to engaging in additional partnerships with the University of Washington Friday Harbor Labs and agencies for both education and management of coastal resources would have moderate to major long-term benefits.

In addition, the construction of the visitor center at American Camp would be in an area that where soils are not as wet, creating less of an impact to hydrologic systems. Elimination of the loop road at English Camp would also reduce hydrologic impacts in that area.

Cumulative Impacts

Cumulative impacts are the same as Alternative B; however, Alternative C contributes fewer adverse impacts and additional long-term benefits to coastal water resources and hydrologic systems than the other two alternatives.

Conclusion

Implementation of Alternative C would result in additional moderate to major long-term benefits to coastal water resources through additional management actions and partnership opportunities. Adverse impacts to hydrologic systems would be less than Alternative B due to the location of the

visitor center at American Camp on the existing site. Cumulative impacts are the same as Alternative B, with Alternative C having fewer contributions to adverse effects and greater contributions to long-term benefits. There would be no impairment to this resource or value as a result of this alternative.

Air Quality

Implementation of Alternative C would result in some short-term minor to moderate adverse impacts to air quality from construction of facilities and roads at American and English camps. However, impacts would be somewhat less than Alternative B due to the more limited development at English Camp, notably from the omission of constructing a new loop road. Construction for Alternative C would also result in additional exhaust from construction equipment as well as dust and increased particulates from construction activities. These impacts would be moderate and short-term with no long-term impacts.

Cumulative Impacts

Cumulative impacts are the same as Alternative B. Omission of the loop road at English Camp could result in a negligible to minor change in the contribution of this alternative to adverse impacts on air quality.

Conclusion

Implementation of Alternative C would have similar impacts to air quality as Alternative B. The more limited development, especially the elimination of the loop road alternative at English Camp, would contribute fewer direct and cumulative adverse impacts to air resources. Adverse impacts would be moderate and short-term, with no long-term impacts. There would be no impairment to this resource or value as a result of this alternative.

Soundscape

Alternative C would have similar impacts as Alternative B; however, there would be fewer noise intrusions due to the smaller scale of construction, resulting in less adverse impacts to park soundscapes.

Cumulative Impacts

Cumulative impacts are the same as Alternative B.

Conclusion

Implementation of Alternative C would have similar impacts as Alternative B, with fewer adverse short-term impacts due to the smaller scale of construction. There would be no impairment to this resource or value as a result of this alternative.

Effects on Visitor Experience

The following discussions of effects on the visitor experience cover the effects on interpretation (which includes the elements of visitor information and orientation), education, recreational opportunities, soundscapes and scenic resources.

Methodology and Assumptions

The area of consideration for visitor experience is the San Juan Islands. To evaluate the potential impacts on the visitor experience, impact intensities for visitor experiences related to interpretation and education, recreation opportunities, and scenic resources were defined as follows:

Negligible:	Impacts would be barely detectable to the visitor and expected to have no discernible effect related to interpretation and education, recreation opportunities, and scenic resources.
Minor:	Impacts would be slightly detectable to the visitor, though not expected to have an overall effect on the visitor experience related to interpretation and education, recreation opportunities, and scenic resources.
Moderate:	Impacts would be clearly detectable to the visitor and could have an appreciable effect on the visitor experience related to interpretation and education, recreation opportunities, and scenic resources.
Major:	Impacts 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, recreation opportunities, and scenic resources.

Impacts from Alternative A

Interpretation, Education, and Outreach

Under Alternative A, the primary interpretive facilities would continue to be the existing visitor center at American Camp and the barracks building would continue to serve as a visitor contact station at English Camp. These facilities would not be expanded in the short-term, and visitors would find the area crowded during peak periods. Some visitors may be unable or unwilling to use the visitor center due to crowds. A limited number of park programs would continue to be provided to park visitors at American Camp and English Camp. The Volunteers in Parks program would continue to focus primarily on supporting interpretation, helping with summer reenactments, demonstrations, and staffing information counters. Some visitors and visiting school groups may not be able to participate in park programs due to limited staffing and the subsequent timing of programs not fitting into all schedules.

Interpretive media would continue to focus primarily on historical themes, with some additional displays and programs on the significance of the park's natural resources. Updated and improved exhibits in the ferry terminal, on the ferries, and in Friday Harbor, created and maintained through partnerships, would have a moderate to major benefit by providing interpretive and orientation information prior to arrival at the park. These exhibits would reach visitors who may be vacationing on San Juan Island but may not be aware of the park and opportunities the park provides.

Limited staffing and funding would prevent the further expansion of interpretive programs and media and limit visitor contact with park interpretive rangers, a long-term moderate adverse impact to interpretive opportunities.

Cumulative Impacts

Current and past park activities have maintained a coherent interpretive message about the historic events on San Juan Island, including the Pig War crisis. There are limited opportunities to obtain detailed, specific information outside the park. Journalists and students contact park staff for information on the Pig War crisis for media stories and school projects. As the current generation's interests change, the story of lasting peace is often overshadowed by the story of the Pig War crisis, making it imperative that interpretation is precise and focused in all of its products and programs.

These activities result in moderate long-term beneficial cumulative impacts on interpretation and educational opportunities for visitors.

Conclusion

The effects of proposed actions under Alternative A would have moderate long-term benefits on interpretation and education. There would also be moderate, long-term adverse impacts to visitor understanding and park resources. Although visitors would enjoy the park, they would experience crowding and limited access to key interpretive opportunities as a result of overcrowded facilities during peak periods. Limited staffing and funding would prevent further expansion of interpretive programs and limit visitor contact with park interpretive rangers. As a result, visitors may not understand the sensitivity of park resources and the complexity of the interconnections of the park's natural and cultural resources. Park programs, facilities, and staff would continue to contribute moderate long-term benefits to cumulative impacts on interpretation and education about park resources and values, but could be hampered by overcrowding, limited staffing, few interpretive programs, and static funding.

Recreational Resources

There would be several enhancements to recreation under the No Action Alternative. Closing the non-historic redoubt road (approximately 2800 linear feet) at American Camp to motorized vehicles and converting it to a trail would provide an additional recreation opportunity in the park and be beneficial to the cultural landscape. People would be more likely to use this route as a trail if there is no potential for conflicting uses with motorized vehicles. In addition, establishing the former military road at English Camp as a trail would offer another new recreation opportunity to park visitors. However, closing the redoubt road does create a longer trip by foot for those visitors with limited ability which is a potential minor to moderate adverse impact for those user groups.

The park would continue limited involvement with local efforts to establish island-wide trail connections and would continue to work with the county to improve bicycle routes along roads, and improving public safety. The park's trails provide the infrastructure to which other trails on the island strive

to connect. Many of these trails provide visitors the experience of walking along historic corridors used by the military and subsequent settlers after the joint occupation, a moderate to major benefit to recreation. Recreation opportunities for equestrian use would not change under Alternative A. Equestrian use would continue to be allowed in defined areas.

The park's shoreline areas would continue to provide the longest and most varied expanse of publicly accessible shoreline in the San Juan Islands. Continuing to provide public access to these areas would benefit recreation, providing opportunities for water-based activities such as walking, beachcombing, swimming, and fishing. However, continuing the current style of management of the tidelands may have some minor to moderate adverse impacts to these areas, as park staff will have limited authority and jurisdiction, and the DNR has minimal presence on the island.

Cumulative Impacts

Continuing growth in San Juan County and increasing numbers of visitors are resulting in congestion along established recreation corridors during peak periods. Consequently, local and county efforts are underway to improve bicycle access by establishing wider road shoulders and developing partnerships to create an island-wide trail network. These efforts have had, and are expected to continue to have, a moderate benefit to recreation opportunities.

The park continues to be a primary source of recreation for both park visitors and island residents. In a rapidly growing and developing region, the park provides public access to a wide variety of recreational opportunities that are vital to the health and enjoyment of the population. As private development throughout the San Juan Islands continues, there is an ever shrinking land base for public recreation, making the recreational opportunities provided by the park's public lands even more important. Implementation of Alternative A contributes moderate to major benefits to the cumulative impacts on recreation opportunities.

Conclusion

The effects of proposed actions under Alternative A would have moderate long-term benefits to recreational opportunities. Continuing limited involvement with local efforts to establish island-wide trail connections and working with the county to improve bicycle routes along roads would have moderate benefits to recreation and contribute to improving public safety. Maintaining publicly accessible shorelines would have moderate benefits to recreation, limited by the passive management of the intertidal areas. Implementation of Alternative A contributes moderate to major benefits to the cumulative impacts on recreation opportunities.

Scenic Resources

Historic views contribute to the significance of the landscape at San Juan Island National Historical Park. Continuing to protect scenic resources in accordance with law and policy and continuing to educate the public through programs on dark night sky would benefit these resources. Cooperating with adjacent landowners to implement scenic protection measures such as design guidelines through the use of vegetative screening and other techniques would also benefit scenic resources.

Cumulative Impacts

Continued development outside the park but viewable from within the park and historic viewpoints would continue to have an adverse impact on scenic resources. Potential additional development of homes and docks at Garrison Bay adjacent to English Camp and additional homes developed at Eagle Cove adjacent to American Camp could have long-term adverse impacts to scenic resources by altering the rural context of the areas outside the park. Construction of a new Cattle Point Road at American Camp would have short-term adverse impacts to scenic resources from the construction activities, but impacts would be minor to moderate over the long-term. Development of tidal energy turbines by Snohomish Public Utility District could also have long-term adverse impacts to scenic resources if they are within sight of the park. Implementation of Alternative A would contribute moderate benefits to scenic resources.

Conclusion

The effects of proposed actions under Alternative A would have moderate long-term benefits to scenic resources. These benefits would occur through management of scenic resources within the park and working with adjacent landowners and others to minimize impacts to scenic resources from cumulative actions outside the park but within the historic viewshed. Implementation of Alternative A would not result in an impairment of park resources or values.

Impacts from Alternative B

Interpretation, Education, and Outreach

Under Alternative B, the park would construct a new visitor center at American Camp north of the redoubt closer to the historic scene. This new visitor center would have a major benefit to interpretation by providing the park with the additional space needed for visitors to access interpretive media throughout the year, including during peak visitation periods. The new visitor center would also offer the park opportunities to update all the displays, and expand the interpretive messages. By locating the visitor center closer to the historic scene, it would improve access to many of the historic sites for visitors with limited abilities and mobility.

Alternative B also calls for the rehabilitation of the Crook house as a visitor contact station once the bats are removed. Reuse of the Crook house would provide an additional venue for interpretive information at English Camp, and it would improve visitor understanding of the distinction between the encampment era and the subsequent Crook family era at the site. In addition, the park could use the upstairs for offices for employees or volunteers.

Expanded partnerships would also enhance the park's ability to communicate interpretive themes to the public. However, these partnerships require sufficient guidance and oversight from NPS staff to ensure a consistent message is being shared. Reaching a broader audience through partnerships would have a moderate to major beneficial impact to interpretation.

Cumulative Impacts

Cumulative impacts are similar to those described in Alternative A. The addition of an enlarged visitor center at American Camp and adaptive reuse of the Crook house for a visitor contact station at English Camp, as well as the expansion of educational programs through enhanced partnerships will contribute moderate to major benefits to cumulative impacts.

Conclusion

Development of a new, enlarged visitor center closer to the historic scene at American Camp and adaptive reuse of the Crook house at English Camp would have moderate to major long-term benefits to interpretation. Expanded partnerships would also contribute moderate to major long-term benefits by reaching a larger audience. This alternative also contributes moderate to major long-term benefits to cumulative impacts on visitor understanding of park resources.

Recreational Resources

Under Alternative B, the park would seek more active involvement with the county to establish new long-distance trail connections on San Juan Island. The park's trails provide the main infrastructure to which many other trails on the island strive to connect. Active involvement to establish additional trails on park lands that connect with existing and future long-distance trails would have major benefits to recreation by expanding this trail network. Similar to Alternative A, many of these trails provide visitors the experience of walking along historic corridors used by the military and subsequent settlers after the joint occupation, a moderate to major benefit to recreation.

Under Alternative B, the park would also actively partner with the county to improve bicycle use along existing roads. If the Mitchell Hill property is acquired, bicycle use along those existing multi-use trails would be permitted. The park would also partner with other groups to establish and maintain bicycle trails. This partnership would also involve enforcement of proper use of trails, which would minimize potential conflicts between bicycles and other prohibitive use. These partnerships would build a larger coalition of support for bicycle use and provide moderate to major benefits to recreation.

Under this alternative, the Mitchell Hill property, if acquired, would permit equestrian use. This expanded use would have additional benefits to recreation.

Implementation of Alternative B would result in major-long-term benefits to recreation related to the public shoreline areas. Seeking more active management of the intertidal areas would provide major benefits to shoreline management and ensure long-term protection of these areas. Expanded or re-delineated parking lots in close proximity to trails leading to the shorelines would also improve visitor access to these locations.

Cumulative Impacts

Cumulative impacts are the same as Alternative A. Implementation of Alternative B would have a greater contribution to major long-term benefits to recreation than Alternative A through more active partnerships

for long-distance trail connections and seeking more active management of the intertidal areas.

Conclusion

Implementation of Alternative B would result in major long-term benefits to recreation. These benefits are realized through more active participation in the expansion of island-wide trail connection and partnerships to improve bicycle use and access. The park's active management of the intertidal zone would result in the long-term preservation of the shoreline areas which are a critical recreation resource. The addition of Mitchell Hill and other properties would also expand recreational opportunities.

Scenic Resources

The effects on scenic resources from ongoing park activities and education programs would be the same as Alternative A. In addition, the implementation of photovoltaic systems on any new facilities would minimize light pollution because solar-powered lights produce a dimmer light and have a beneficial impact to an important scenic resource, the dark night sky. Designing and directing outdoor lighting to minimize light pollution, including the use of lights with low lumens and motion sensors, will provide addition beneficial impacts to scenic resources sky by reducing the amount of artificial light that compromises dark night sky.

At American Camp, restoration of the prairie would provide an added scenic benefit in addition to a resource benefit. In addition, removal of the non-historic redoubt road would improve the scenic aspects and benefit the cultural landscape of American Camp by removing cars from the scene as well as dust generated by cars driving along the road. The parking areas at the relocated redoubt parking lot, South Beach and Jakle's Lagoon would all be reconfigured, and the Jakle's Lagoon parking would potentially be expanded, resulting in short-term impacts from some limited construction, and minor to moderate long-term impacts.

Construction of a new visitor center at American Camp would have moderate adverse impacts in the short-term on scenic resources; however, long-term impacts would be minor due to trees surrounding the site and the overall design, color and low profile of the building. It is not anticipated that the visitor center would be seen from key vistas such as the top of Mount Finlayson.

At English Camp, construction activities associated with developing a one-way loop road would create moderate, short-term adverse impacts to scenic resources; however, long-term impacts would be negligible as the road would not be visible from the historic scene or other popular overlooks such as the top of Young Hill.

Cumulative Impacts

Cumulative impacts in Alternative B are the same as those in Alternative A. Implementation of Alternative B would contribute some greater short-term adverse impacts to scenic resources by relocating the visitor center at American Camp and reconfiguring the parking areas. However, the long-term contributions of the cumulative actions to scenic resources would be minor.

Conclusion

Implementation of Alternative B would result in some additional short-term moderate adverse impacts to scenic resources from construction of a new visitor center and enlarged parking at American Camp and construction of a one-way loop road at English Camp. Removing the non-historic redoubt road at American Camp and converting it to a bicycle and pedestrian trail would have long-term benefits to scenic resources and the cultural landscape. Alternative B would also result in some long-term benefits from the use of new photovoltaic systems and lighting techniques that would enhance dark night skies.

Impacts from Alternative C

Interpretation, Education, and Outreach

Under Alternative C, the park would construct a permanent visitor center at American Camp. However, in contrast to Alternative B, the permanent visitor center under this alternative would be located in the same location as the existing temporary visitor center. Similar to the effects of Alternative B, this permanent visitor center would have a major benefit to interpretation by providing the park with the additional space needed for visitors to access interpretive media throughout the year, including during peak visitation periods. The permanent visitor center would also offer the park opportunities to update all the displays, and expand the interpretive messages.

Alternative C calls for the stabilization and preservation of the Crook house for use as an exterior exhibit, with signs and displays interpreting the Crook Family era. Interpreting the role of the Crook family in caring for the site would give visitors information on the post encampment period. This use of the Crook house would improve visitor understanding of the distinction between the encampment period and subsequent Crook family occupation and use of the site; however, the options for interpretive media would be more restricted with an exterior exhibit only. In addition, visitors would have less contact with interpretive rangers than Alternative B given that the Crook house would not be a staffed visitor contact station. Use of the Crook house in Alternative B would contribute moderate long-term benefits to interpretation and education.

Expanded partnerships would also enhance the park's ability to communicate interpretive themes to the public and result in the same benefits to interpretation as Alternative B.

Cumulative Impacts

The cumulative impacts are the same as Alternative B. Implementation of Alternative C would contribute the same moderate to major benefits to cumulative impacts as Alternative B.

Conclusion

The addition of a new, expanded visitor center at the existing site of the current visitor center would have a major long-term benefit to interpretation. Reuse of the Crook house as an exterior exhibit would improve visitor understanding of the distinction between the encampment era and the subsequent Crook family era at the site and contribute additional moderate benefits to interpretation. Expanded partnerships would also enhance the park staff's ability to communicate interpretive themes to the public. Implementation of Alternative C would also contribute the same moderate to major benefits to cumulative impacts.

Recreational Resources

Under Alternative C, the effects on recreational resources would be the same as in Alternative B. In addition, actively supporting efforts to implement the concept of a historic military road trail as part of a partnership with the county to establish new long distance trail connections would be an added benefit to recreation opportunities. This trail would connect the two camps along an historic alignment, providing an additional recreation opportunity within the historic context of the park.

Cumulative Impacts

Cumulative impacts are the same as Alternative B. Implementation of Alternative C would also have a contribution to major long-term benefits to recreation.

Conclusion

Implementation of Alternative C would result in major long-term benefits to recreation. These benefits are similar to Alternative B, with the added effort to implement the concept of a historic military road trail connecting the two camps.

Scenic Resources

Under Alternative C, the short-term adverse impacts on scenic resources would be less than those in Alternative B. Although a new visitor center is proposed at American Camp, it is smaller in scale and on a previously disturbed location further from the core historic scene than the one proposed in Alternative B. Construction of a new redoubt parking lot for approximately four to five vehicles would be screened by a berm and would have a minor effect. Similarly, the development proposed at English Camp is smaller in scale than Alternative B, with no loop road through the site, creating fewer short-term adverse impacts.

Benefits from implementing photovoltaic lighting on new facilities, prairie restoration, and converting the non-historic redoubt road to a non-motorized multi-use trail are the same as Alternative B. Benefits from working with adjacent landowners and continuing education programs on scenic resources are the same as Alternatives A and B.

Cumulative Impacts

Cumulative impacts are the same as Alternative A. Implementing Alternative B would contribute less to adverse cumulative impacts than Alternative B and provide greater long-term benefits by keeping the scale of development smaller than Alternative B.

Conclusion

Implementation of Alternative C would result in fewer short and long-term impacts to scenic resources due the smaller scale of proposed development of the visitor center and parking lot at American Camp and

eliminating construction of a loop road at English Camp. Alternative C would have similar long-term benefits to scenic resources as Alternative B by removing the non-historic redoubt road at American Camp and converting it to a bicycle and pedestrian trail. There would also be long-term benefits to scenic resources by implementing new systems and techniques for outdoor lighting that would reduce light pollution and enhance dark night skies.

Effects on Visitor Access and Transportation

Methodology and Assumptions

The area of consideration for visitor access is San Juan Island. The impact analysis evaluates how each alternative would change access and visitation and the capacity of park roads and facilities to handle that change.

Negligible:	The effects would not be detectable and would have no discernible effect on the condition of roads and trails and/or traffic flow.
Minor:	The effect would be slightly detectable, but there would not be an overall effect on the condition of roads and trails and/or traffic flow.
Moderate:	Impacts would be clearly detectible, and the action could have an appreciable effect on the condition of roads and trails and/or traffic flow.
Major:	Impacts would be substantial, with a highly noticeable influence, and the condition of roads and trails and/or traffic flow could be permanently altered.

Impacts from Alternative A

Under Alternative A, the park would continue to maintain the existing road systems and parking areas at both American and English camps. The roads at both camps provide visitors with adequate access to historic sites and recreational opportunities. At American Camp, the park would continue to work cooperatively with the state and county to provide access to private land southeast of the park, a benefit to residents and visitors. At English Camp, the two-way park entrance road would continue to be somewhat crowded when tour buses are present, and the road would seasonally continue to occasionally have a washboard surface, making traction challenging for some vehicles.

Parking at English Camp would not be improved and would continue to be crowded during peak seasons and difficult for large buses to turn around when the parking lot is near capacity. Informal shoulder parking at the Young Hill trailhead would continue, making access to the trail challenging at times, and a potential safety hazard.

Linking trails at American Camp and English Camp to the island-wide trail system would have long-term moderate benefits by providing additional access to the park sites by different modes, including hiking. Extending the ADA trail at English Camp from the Crook house to the parade ground would also have long-term moderate access benefits by providing a better connection between key visitation sites for visitors with limited mobility.

Cumulative Impacts

Washington State Ferries predicts all routes in the San Juan Islands corridor are projected to experience a 70 percent system-wide increase by 2030 with walk-on ridership growing at a faster rate than vehicles (Washington State Ferries, 2006: p.1). A number of efforts are underway that would have long-term cumulative benefits to visitor access and transportation on the island. San Juan County Public Works Department prepared a Nonmotorized Transportation Plan in December 2004 that identified policies, goals and projects for a 20 year period to enable members of the public who travel on foot or by bicycle to reach their destinations safely and efficiently (San Juan County Nonmotorized Transportation Plan, 2004: p.1). Implementation of this plan would improve facilities and infrastructure for non-motorized transportation on the island, provide increased access to island destinations which are currently difficult to access without a motor vehicle, and provide holistic transportation planning on the island.

The San Juan Island Trails Committee also developed a San Juan Island Trails Plan in September 2006 that provides a framework and proposed projects for creating a network of non-motorized trails that connect key resources and destinations on the island (San Juan Island Trails Committee, 2006: p.6). Implementation of this plan, which includes proposed trails that link American Camp and English Camp with other island destinations, would create a network of trails suitable for walkers, bicyclists, and equestrians, or a combination of users, and improve island-wide

circulation and transportation by providing additional infrastructure to access key island destinations.

In anticipation of the increased vehicles, and in response to current congestion in Friday Harbor from vehicles arriving by ferry, the state has prepared a Draft Final Master Plan for the Friday Harbor Ferry Terminal. The plan identifies short, intermediate, and long-term improvements to reduce dwell times (the time the ferry stays in the ferry terminal), eliminate pedestrian and vehicle conflicts during off-loading and improve vehicle off-loading and egress from the holding area and through the local street system.

Implementation of these plans and projects would have major long-term cumulative benefits to visitor access and transportation on the island, by expanding infrastructure and improving access for non-motorized travelers as well as improving the access from the ferry for vehicles.

Alternative A, with the maintenance of the existing road infrastructure at both camps and pursuing development of an island-wide trail system if other public or private entities lead the initiative would contribute minor benefits to cumulative impacts.

Conclusion

Implementation of Alternative A would have minor long-term benefits to visitor access and transportation due to the limited improvements to parking and maintenance of existing road systems at American and English camps. Alternative A would contribute some moderate long-term benefits from linking with the island-wide trail system and extending the ADA trail at English Camp. There would be major long-term benefits from cumulative impacts including the implementation of the county's Non-Motorized Transportation Plan, San Juan Island Trails Plan and Master Plan for the Friday Harbor Ferry Terminal.

Impacts from Alternative B

The effects on visitor access and transportation from implementing Alternative B would be of greater long-term benefit than Alternative A. Construction of the new permanent visitor center closer to the redoubt, the addition of a small parking area for about four to five vehicles at Pickett's Lane following the removal of the redoubt road for motorized vehicles, and parking improvements proposed at other locations at American Camp would improve long-term access to key areas for visitors. There would be some short-term adverse impacts to access from construction; however, these impacts could be negligible to minor if timed for off-peak visitor use.

Improvements at English Camp would also provide long-term benefits to visitor access and transportation. Creating several formalized parallel parking spaces at Young Hill would provide easier, safer access to the trailhead. Reconfiguring the road system as a one-way loop road would improve traffic through English Camp and eliminate the conflicts of wide vehicles passing each other. The additional of a new parking area north of the Crook house with ADA parking spaces adjacent to the house would improve access to the site, and reduce the distance visitors with disabilities would need to cross in order to access the historic building. Restoration of the existing parking lot to more natural conditions would reduce the overall impact of the new parking area.

Cumulative Impacts

Cumulative impacts are the same as Alternative A. The expanded tour routes and need for parking generated by the visitor contact station at English Camp would have a negligible effect on cumulative impacts. The proposed changes to the road system at English Camp and placement of the new visitor center at American Camp in closer proximity to the historic scene, and parking improvements at both camps, would contribute minor to moderate long-term benefits to cumulative impacts.

Conclusion

Implementation of Alternative B involves a number of improvements that would contribute minor to moderate to major, long-term benefits to visitor access and transportation at both American and English camps. Construction of a new permanent visitor center closer to the historic scene and enhancements to parking areas at American Camp, coupled with the improved parking at Young Hill and the one-way loop road at English Camp provide moderate to major benefits. These actions would contribute a moderate long-term benefit to cumulative impacts island-wide.

Impacts from Alternative C

The effects on visitor access and transportation would be similar to Alternative B, but with two main differences. At American Camp, the permanent visitor center would be developed on the existing site, further from the historic scene. Visitors would have to park

farther away from the historic scene and access would be primarily by foot or bicycle. With the removal of vehicles from the redoubt road and conversion to non-motorized transportation, adverse impacts could be moderate for some visitors with limited mobility. Those visitors who prefer alternative opportunities for exclusive non-motorized options may perceive these impacts as benefits. Long-term benefits from improvements to other parking areas at American Camp would be the same as Alternative B.
In Alternative C, at English Camp, the existing entrance road would be maintained and improved for two-way traffic by providing two to three informal turnouts for passing cars. Certain sections of road would be chip-sealed or paved to improve traction for vehicles exiting the park. Improvements would be made to the visitor parking lot at English Camp to increase drainage during rainfall and to minimize the general seasonal wetness of the area. This alternative would preserve the historical alignment of access to English Camp, providing visitors with a more authentic historic entry and exit from the site. The administrative road would be used for park operations and educational camp use only, concentrating traffic on the main entry road. These improvements would provide moderate long-term benefits to access, transportation and circulation. Long-term benefits from improving parking to the Young Hill trailhead would be the same as Alternative B.

Cumulative Impacts

The cumulative impacts will be similar to Alternative B, with the expanded tour routes and need for parking generated by a new visitor center on the existing location at American Camp contributing a negligible effect on cumulative impacts. The proposed changes to the roads and parking at both American Camp and English Camp would contribute moderate long-term benefits to cumulative impacts.

Conclusion

Implementation of Alternative C would involve improvements that would contribute moderate long-term benefits to visitor access and transportation at both American and English camps. Construction of a permanent visitor center on the existing site and enhancements to parking areas at American Camp, coupled with the improved parking at Young Hill and improvements to the existing entrance road at English Camp would have moderate benefits. These actions would contribute a moderate long-term benefit to cumulative impacts island-wide.

Effects on Socioeconomics

This section identifies the potential impacts on the social and economic impacts that might result from implementing each alternative.

Methodology and Assumptions

Socioeconomic impacts were determined based on applied logic, professional expertise, and professional judgment. The factors considered to identify and discuss potential impacts were economic data, historic visitor use data, projected visitor use, and future developments within the park. A mostly qualitative analysis is sufficient to compare the effects of alternatives for decision-making purposes. For the purposes of socioeconomic analysis, short-term impacts would last less than three years and long-term impacts would last more than three years and may be permanent.

The following thresholds were defined for analyzing impacts to socioeconomic conditions:

Negligible:	No effects occur or the effects on socioeconomic conditions are not detectable.
Minor:	The effects on socioeconomic conditions 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:	The effects on socioeconomic conditions are readily apparent. Any effects result in changes to socioeconomic conditions on a local scale (e.g. a gateway community) within the affected area.
Major:	The effects on socioeconomic conditions 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.

Impacts from Alternative A

The visitor industry is one of the economic anchors of San Juan County, with tourism generating about 20 percent of all county employment and tax receipts (Barney and Worth, p.17). Revenue generated through tourism offsets the costs of providing services county-

wide and provides income for residents from all parts of the islands. In addition, San Juan County ranks second among Washington counties in terms of the percentage of overall employment earnings that are generated through travel and tourism, with 15.7 percent of county-wide earnings travel-generated. In 2005, travelers spent approximately $118.8 million in San Juan County, supporting more than 1,800 jobs (Barney & Worth Inc., 2007: p.17).

As demonstrated through the NPS Money Generation Model, San Juan Island National Historical Park has a major socioeconomic benefit to the local region, defined as a 50 mile radius around the park (Stynes, 2006: p.2). In fiscal year 2005, the park received 248,831 recreation visits, with visitor spending contributing more than $15.8 million to the economy and supporting approximately 319 jobs (Stynes, 2006: p.23). These visits have a direct benefit to the local area through visitor spending on lodging, food and beverages, amusements, and retail shopping. The local area also directly benefits from NPS employees spending their salaries and wages in the local area. Part-time and full-time non-NPS jobs are also supported by both visitors and NPS employees' spending money in the local areas around the park. Special events at the park, such as the annual encampment event, also provide benefits to the local community by creating social events for which the community members as well as the visiting public engage. These events can be significant social events for the local community and maintain awareness of the importance of the park in the community's history. Park staff also participate in other civic events and organizations, including the local theatre company, which contribute to the sense of small community on the island.

The No Action Alternative calls for some improvements in facilities and trails and the continuation of popular interpretation and education programs. The contributions of the park by continuing to bring visitors to the island result in major long-term benefits to the local economy around the park.

Cumulative Impacts

The Olympic Games are being held in Vancouver, British Columbia in 2010. This event will very likely attract additional visitors to the San Juan Islands and to the park. These visitors will have a major short- term benefit on socioeconomics by bringing even more tourism and tourism-related income and jobs to the local economy.

The proposed additional development at Rosario Resort on Orcas Island could also attract additional visitors to San Juan Island who are interested in exploring other islands nearby during their stay, or in addition to their stay. Income from this additional tourism would also have a long-term benefit to the local economy.

The cost of housing on San Juan Island has been increasing at an accelerated rate, making it increasingly difficult for people to afford to live and work on island. The median cost of a home in San Juan County was $290,000 in 2000. By June 2006, the median home price had climbed to $640,000, and the average price of a home was over $750,000, the highest in Washington State (Walker, 2006: p.1A). While these prices are affordable for those with independent income sources seeking retirement on the island, affordability for families earning an income on the island has become increasingly difficult. By 2006, the "affordability index" of San Juan County, which measures the ability of a middle-income family to handle a mortgage on a median-priced home, ranked last among the 39 counties in Washington State (Rasmussen, "Affordable housing returns to center stage," 2007: p.3A). The continuation of the gap between wage increases and cost of homes would make it difficult to attract and maintain employees for both park staff and positions in the local community. Potential negative impacts to the local community could result if those supporting the tourism industry, and the park staff themselves, can not afford the cost of housing on the island. It may become difficult for businesses to hire enough employees to support the local tourist industry if staff must commute long distances via ferry from Anacortes.

Conclusion

Implementation of Alternative A would continue to have a major long-term benefit to the local economy through a sustained stream of tourism dollars and jobs supported by park-based recreation. The continuation of park facilities, infrastructure and programs would also contribute major long-term benefits to the local community and area economy. Potential adverse cumulative impacts could result from rising home prices and the gap between wage earnings and the median cost of a home. Other cumulative impacts include economic benefits from the 2010 Olympic Games and on-going development at Rosario Resort on Orcas Island. Implementation of Alternative A would contribute moderate long-term benefits to cumulative impacts.

Impacts from Alternative B

Alternative B calls for a new permanent visitor center, expanded trail connections, and other recreational improvements which would likely attract additional visitors to the island. In addition, visitors may be encouraged to extend their stay on the island given the additional recreational and educational opportunities provided by the park. These visitors would have an additional benefit to the local economy by bringing additional income to the tourism-based economy. Alternative B also calls for more extensive interpretive programs and additional partnerships to enhance interpretation and education. These programs and partnerships would provide additional opportunities for island residents to engage in park activities and would help foster the sense of community on the island.

Implementation of Alternative B would also result in major, long-term benefits to the area.

Cumulative Impacts

Cumulative impacts are the same as Alternative A. The addition of the new visitor center and improvements to recreation would have a moderate contribution to the major long-term cumulative benefits to socioeconomics.

Conclusion

Implementation of Alternative B would also continue to have a major long-term benefit to the socioeconomic environment through a sustained stream of tourism dollars and jobs supported by park-based recreation. The addition of a new permanent visitor center, improved facilities, and expanded recreation and education opportunities could result in additional tourists as well as community-based opportunities and a greater long-term benefit than Alternative A.

Impacts from Alternative C

Impacts to socioeconomics from Alternative C would be similar to those major long-term benefits of Alternative B. Although the scale of the permanent visitor center and parking area at American Camp would be smaller in scale, it would not likely affect the projected additional visitation. The expanded recreational opportunities, most notably additional trails, would still attract additional visitation and benefit socioeconomics.

Cumulative Impacts

Cumulative impacts from Alternative C are the same as Alternative B.

Conclusion

Implementation of Alternative C would result in similar major long-term benefits to socioeconomics to Alternative B from expanded recreation and education opportunities, as well as new and expanded facilities that could attract additional visitors and bring increased tourism revenues to the local economy.

Effects on Park Operations

This section identifies the potential impacts on park operations that might result from implementing each alternative.

Methodology and Assumptions

Park management and operations refers to the current management structure of the park to provide policy direction for the protection, public use, and appreciation of the park, and the ability of park staff to adequately protect and preserve vital resources and provide for an effective visitor experience. The discussion of impacts to park management, operations and staffing focuses on the type of management structure, the amount of staff available to ensure visitor and resident safety, and the ability of staff to protect and preserve resources given current funding and staffing levels. Staffs knowledgeable about the management and operations of the park were consulted to evaluate the impacts of implementing each alternative. Definitions of impact levels are as follows:

Negligible:	Park operations would not be affected or the effect would be at low levels of detection.
Minor:	The effect would be detectable, but would be of a magnitude that it would not have an appreciable adverse or beneficial effect on park operations.
Moderate:	Impacts would be readily apparent and would result in a substantial adverse or beneficial change in park operations in a manner noticeable to staff and the public.
Major:	Impacts would be readily apparent and would result in a substantial adverse or beneficial change in park operations

in a manner noticeable to staff and the public and would be markedly different from existing operations.

Impacts from Alternative A

Under Alternative A, there would be no immediate change to park infrastructure and development. The 1979 double-wide trailer serving as a temporary visitor center at American Camp would continue to require periodic and extensive maintenance due to its age and that it was intended to be a temporary structure. Funding for staffing levels would be inadequate to meet the needs of resource management, interpretation, visitor protection and safety, and administrative needs of the park, resulting in long-term moderate adverse impacts to park operations.

Cumulative Effects

Past and ongoing projects, including road and facility maintenance and repairs, have had long-term moderate beneficial impacts on park operations by maintaining the inventory of park structures. Aging facilities and utilities would continue to be replaced or modified as needed when funds are available. Eventually, more sustainable and efficient facilities and utility systems would replace existing, less sustainable systems, resulting in moderate, beneficial impacts over the long-term.

Conclusion

Alternative A would result in no immediate change to park infrastructure and would continue a level of inadequate funding and staffing, resulting in long-term minor adverse impacts to park operations. As projects are completed to replace or maintain aging facilities or replace them with more sustainable infrastructure, the ongoing maintenance needs will decrease. Completing these projects would result in cumulative moderate long-term benefits. Overall, there would be short-term minor to moderate adverse impacts and long-term cumulative moderate benefits to park operations.

Impacts from Alternative B

Alternative B calls for a number of infrastructure improvements, most notably a 5,400 square foot new permanent visitor center north of the redoubt to replace the double-wide trailer serving as a temporary visitor center at American Camp. Replacement of this visitor center would benefit operations by providing a structure that can more appropriately accommodate the function of serving visitors. The permanent visitor center would be designed with increased display space and allow visitors more personal contact with park staff. While a more significant capital investment would be required, long-term cyclic maintenance costs would be more sustainable. Construction of the visitor center on a previously undeveloped site would minimize short-term disruptions to park operations because the current visitor center could remain open and operational during the construction period. Alternative B also calls for additional facilities including a maintenance storage area, formalized fire camp and enlarged VIP sites at English Camp. These enhancements would provide the park with needed facilities to meet current operational needs, a benefit to park operations.

Alternative B also calls for additional staff that would benefit park operations by providing an adequate number of personnel to provide visitor services, resource management, and maintain park administrative functions. Staff and budget levels proposed in this alternative would bring the park more in line with comparable parks based on acreage and levels of visitation.

Cumulative Effects

Cumulative impacts are the same as Alternative A.

Conclusion

Implementation of Alternative B would have long-term benefits to operations by improving infrastructure and providing a new permanent visitor center that appropriately meets the needed function of the park. Construction of this facility at a different location than the existing visitor center would minimize short-term disruptions to the visitors because the existing building could remain operational while the new facility was being constructed. Additional staff and budget proposals would have long-term benefits by providing adequate staff to meet park needs. Cumulative impacts are the same as Alternative A.

Impacts from Alternative C

Implementation of Alternative C would have similar long-term benefits from infrastructure improvements and would replace the temporary visitor center with a 5,400 square foot permanent visitor center that meets current and future needs. Construction on the existing site would have more short-term disruptions to park operations, as staging and construction for the

permanent visitor center would occur on the same site as the existing visitor center.

Alternative C calls for similar additional facilities as Alternative B, providing similar benefits to park operations.

Additional staff and budget proposed would have similar benefits as Alternative B.

Cumulative Effects

Cumulative impacts are the same as Alternative A.

Conclusion

Implementation of Alternative C would have similar long-term benefits by improving the visitor center and other park infrastructure. This alternative would have greater short-term impacts to park operations from construction occurring in the same location as the primary visitor contact function at American Camp. Additional staff and budget would have similar benefits as Alternative B. Cumulative impacts are the same as Alternative A.

Unavoidable Adverse Impacts

Unavoidable adverse impacts are defined as moderate to major impacts that cannot be fully mitigated or avoided

Unavoidable Adverse Impacts under Alternative A

Unavoidable adverse impacts are defined as moderate to major impacts that cannot be fully mitigated or avoided.

There would be little potential for unavoidable adverse impacts because there would be no major new development in Alternative A. Roads and facilities within the park would remain in their existing locations and alignments.

This alternative would have little potential for unavoidable adverse impacts on cultural resources because historic structures would be adaptively used throughout the park. Historic structures would be protected by means of stabilization measures, preservation maintenance, restoration, and rehabilitation.

Unavoidable Adverse Impacts under Alternative B

There would be little potential for unavoidable adverse impacts under Alternative B. While this alternative would have some adverse impacts from construction activities, these impacts would be site specific and short-term. None of the impacts of this alternative would adversely affect resources or values to a degree that would prevent the NPS from fulfilling the purpose of the park or threaten the park's natural and cultural resources to the degree that the integrity of these resources are compromised.

Unavoidable Adverse Impacts under Alternative C

Similar to Alternative B, there would be little potential for unavoidable adverse impacts to natural and cultural resources.

Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are actions that result in the loss of resources that cannot be reversed. Irretrievable commitments are actions that result in the loss of resources but only for a limited time.

Irreversible or Irretrievable Resource Commitments under Alternative A

No actions taken as a result of this alternative would result in more than a negligible consumption of nonrenewable natural resources or in the use of renewable resources that would preclude other uses. Thus, there would be no irreversible or retrievable commitments of resources in the park by the National Park Service.

No actions would be taken that would result in irreversible or irretrievable effects on historic structures. The park would continue to conduct appropriate cultural resource management in accordance with the Secretary's Standards and NPS policies.

Irreversible or Irretrievable Resource Commitments under Alternative B

Same as Alternative A.

Irreversible or Irretrievable Resource Commitments under Alternative C

Same as Alternative A.

Short-term Use vs. Long-term Productivity

Under all of the alternatives the park's cultural and natural resources would be protected and would continue to be used by the public. The National Park Service would continue to manage the park under all the alternatives to preserve the cultural resources associated with the historic setting, maintain ecological processes and native and biological communities, and to provide for appropriate recreational activities consistent with the preservation of natural and cultural resources. Previously disturbed areas would be restored where possible to return these areas to productivity. Any actions the National Park Service takes in the park would be taken with consideration to ensure that uses do not adversely affect the productivity of biotic communities.

Short-term Use vs. Long-term Productivity under Alternative A

Under Alternative A, there would be no appreciable loss of ecological productivity because there would be little new development. Existing developed areas would remain.

Short-term Use vs. Long-term Productivity under Alternative B

Under Alternative B, there would be greatest potential risk to long-term productivity because it allows the greatest amount of development. There would be some short-term impacts to ecological productivity from development of a new permanent visitor center on a previously undeveloped site at American Camp, and changes to the road system at English Camp. However, the restoration of the existing visitor center site and prairie restoration program would have a positive effect on long-term productivity of ecological system. This alternative would yield the greatest long-term benefits to visitor use and experience.

Short-term Use vs. Long-term Productivity under Alternative C

Under Alternative C, the Preferred Alternative, the smaller scale of development for the visitor center at the existing location, would result in some minor short-term changes, but there would be no long-term adverse changes in ecological productivity because the scale of new development would not affect long-term productivity. Prairie restoration and more active participation in the management of coastal water resources could yield the greatest benefits to long-term ecological productivity.