



CHAPTER 5: THE AFFECTED ENVIRONMENT

The purpose of this chapter is to describe the physical, biological, cultural, and social environments of San Juan Island National Historical Park, including human uses that could be affected from implementing any of the alternatives described in the preceding chapter. This chapter contains topics that were identified as important issues by the public and the agencies during scoping. It also contains additional background data relevant to both readers and park managers.

THE CULTURAL ENVIRONMENT

Prehistory and History

San Juan Island National Historical Park is the site of one of the last dramatic chapters of American continental expansion. San Juan Island, one of 172 named islands and islets of the San Juan archipelago, is strategically located at the confluence of the Strait of Juan de Fuca and the Strait of Georgia, midway between mainland Washington State, and Vancouver Island, British Columbia, Canada. In the mid-19th century, there remained a lingering dispute over which channel between Vancouver Island and the mainland had been designated by the Oregon Treaty of 1846 as the boundary between British holdings to the north and American holdings to the south. If the treaty negotiators had intended the boundary to follow the Rosario Strait, the islands would be British possessions; if they intended the Haro Strait to the west, then the islands belonged to the U.S. Territory of Washington.

Competing claims between the British and American settlers and officials ultimately led to a brief confrontation between British and American forces in 1859 known today as the “Pig War.” (It was known then as the San Juan Imbroglio.) The crisis was followed by 12 years of joint British-American military occupation of the island while the international dispute was addressed and slowly resolved through mediation by the Emperor of Germany. American Camp at the southeastern end of the island and English Camp in the northwest corner on Garrison Bay, provide the backdrop for interpreting the story of the boundary dispute and its peaceful arbitration. (See Figure 13: English Camp, Historic Conditions—1872 and Figure 14: American Camp, Historic Conditions—1872.)

Occupation of the San Juan Islands by Native Peoples

The prehistory and early history of native peoples of the islands has been derived from the evidence obtained through archaeological investigations. Additional information has been gathered through documents on initial Euro-American contact with indigenous populations and more than a century of ethnographic research by anthropologists who have worked with members of United States tribes and Canadian First Nations (Boxberger 1989, 1994, Suttles 1951, 1990, 2003).

The landmass we know as San Juan Island began to emerge from the glacial ice approximately 16,000 years ago (Riedel 2003). At this time, the Vashon glacier, the last glacier known to have affected the San Juan archipelago, began its retreat back to the Fraser River valley. At the height of glaciation, the islands and all of Puget Sound were covered with a river of ice almost a mile thick. The ice extended south from the Fraser River valley to the Nisqually delta just north of Tacoma. When the glacier began retreating, it exposed bare ground compressed from the constant weight of the ice upon it. Over thousands of years after the glacier receded, the ground would “rebound” as it was freed from the tremendous weight. Evidence of the rebound on San Juan can be seen on the south slope of Mount Finlayson, where beach erosion lines, called benches, can be seen. These benches were formed by marine waters cutting into the land as it emerged after the glacier had retreated. The Cattle Point Road, where it crosses the side of Mount Finlayson, was built on one of these benches.

Slowly the glacier melted and retreated northward. At San Juan, American Camp’s South Beach was the first to appear, and then finally, after hundreds of years, the entire island emerged from the ice. Native people already present on the North American continent began moving northward, following the retreating glaciers and hunting woolly mammoths, mastodons,

English Camp: Historic Conditions - 1872

San Juan Island National Historical Park GMP/EIS



Figure 13

Produced by: National Park Service
 FWRO-Seattle GIS Group
 Date Created: February 28, 2007
 Data Sources: Adapted from "Historic Landscape Report:
 American Camp & British Camp, 1987"

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American Camp: Historic Conditions - 1872

San Juan Island National Historical Park GMP/EIS

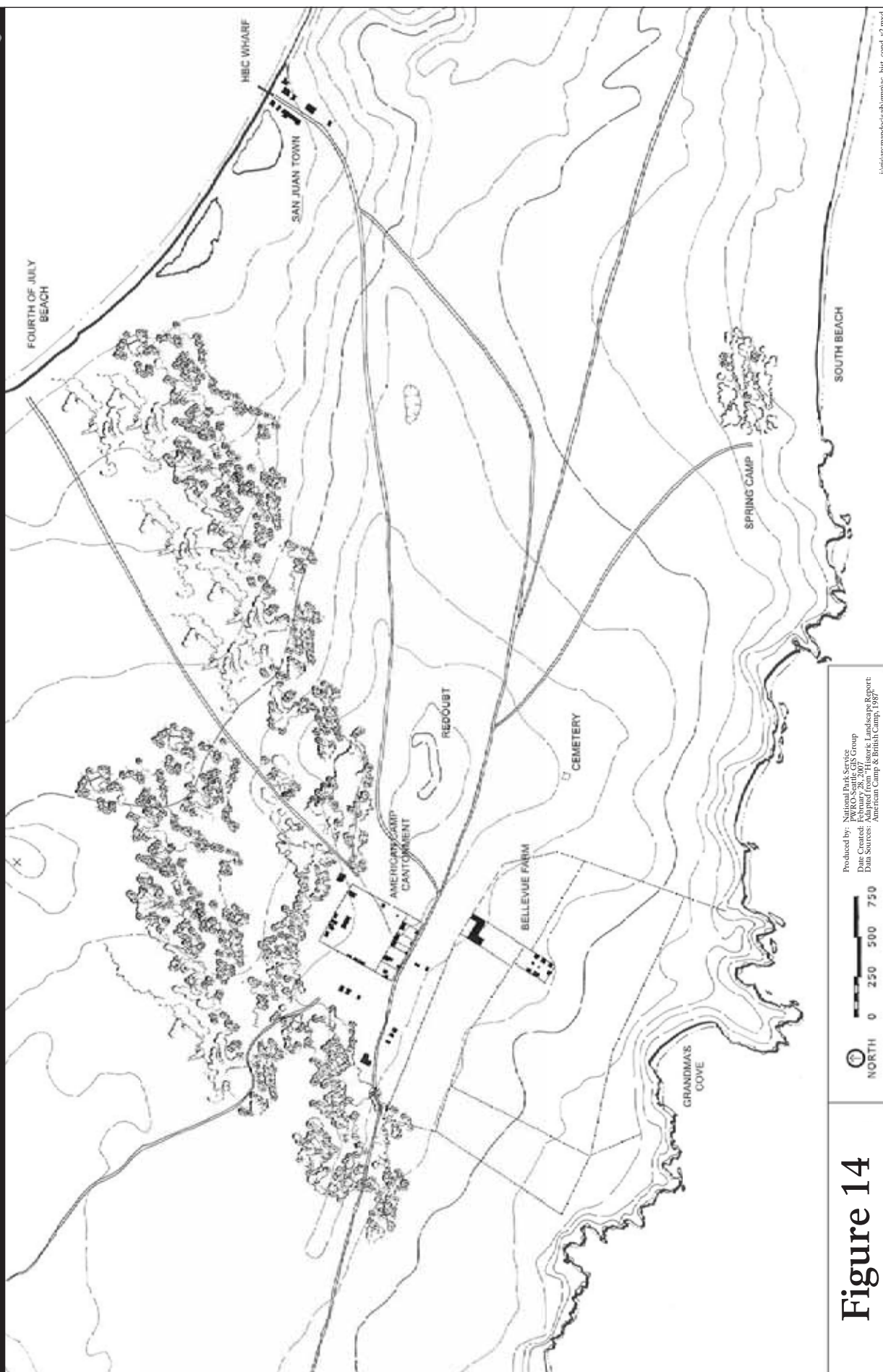


Figure 14

and other large animals that grazed on the grassy slopes watered by the melting ice.

These people are referred to by archaeologists as the Paleo-Indians. They hunted in the post-glacial period until about 9,500 years ago when most of the prey was no longer available. To date, no Paleo-Indian archaeological sites containing Clovis spear points have been found on San Juan Island. Sites containing the Clovis points have been found at the Manis Mastodon site near Sequim, Washington, across the straits from San Juan Island. One of the points was also found in a garden above the town of Coupeville, on neighboring Whidbey Island. Many archaeologists feel it is only a matter of time before a Clovis site is found on San Juan Island. Perhaps a site exists on one of the earliest formed benches below Mount Finlayson where the earliest visitors to San Juan might have camped.

Although no Clovis sites have been found on San Juan Island, sites that were left by the successors of the Paleo-Indians have been found within the park.

The oldest archaeological site found within the park is on the bluff above South Beach at American Camp. There, spear points called Cascade points were found by Dr. Arden King (Tulane University) in 1948. These points were used by native peoples from about 9,000 to 7,000 years ago, and were used to hunt the animals that are now commonly found in western Washington.

As no shelters that can be associated with the Cascade people have been discovered in the Northwest, archaeologists have surmised that these people were still concentrating their search for food of terrestrial animals and rarely stopped to erect more than temporary shelters.

About 4,500 years ago, the western red cedar began to appear in the islands offering an excellent wood for the production of tools and shelter. Sometime after 2,500 years ago, salmon began running from the Pacific down the straits, turning near South Beach to either head north up to the Fraser River or south to the rivers on the Olympic Peninsula and those draining into Puget Sound.

Archaeologists suggest that between 4,500 and 2,500 years ago, moderating climate and changes in plant and animal communities were associated with a flowering of native arts and technology and an increase in human organizational structure. Tool making and other craft industries made it easier to

procure resources. These technologies, together with a developing societal structure, offered a more stable environment for family and community life. The native people began to build more permanent shelters and moved from a hunting and gathering lifestyle to more permanent living arrangements. Besides hunting the terrestrial animals, they began exploiting more resources such as shellfish, birds, fish, berries and harvesting edible plants like camas, bracken fern and nettle.

Sometime between 2,500 and 1500 years ago, the number of the people living on the islands increased. People from the mainland moved to occupy the islands year-round, where before they had visited only seasonally to fish, dig camas and collect berries. Archaeologists have determined the population boom by the carbon 14 dating of shell middens and other sites discovered on the islands.

These people produced the art, tools and carvings that we now associate with the Northwest Native American culture. They also began to design and construct long houses—the traditional homes of the northwest people and those first seen by Europeans in the early 16th century.

By early historic times, the indigenous people of the San Juan Islands and nearby mainland areas were primarily members of six Central Coast Salish tribes who spoke the Northern Straits language. Another Central Coast Salish tribe that entered the Northern Straits country spoke the closely related Klallam (or Clallam) language. In addition to sharing closely related languages, the Central Coast Salish tribes shared a culture and way of life through which they used a wide range of marine, riverine, and terrestrial resources. They followed patterns of seasonal movement between islands and the mainland and from large winter villages to smaller resource collection camps occupied in the other seasons. A distinctive feature of the subsistence strategy was the use of underwater reef nets to catch migrating salmon.

Throughout the southern Gulf and San Juan Islands generally, Northern Straits speaking tribal groups known as the Lummi, Saanich, Samish and Songhees had winter villages in the mid-eighteenth century. However, Suttles notes that by

...the mid-nineteenth century, because of the great loss of life from the early epidemics and from northern raiders, village sites in the islands were abandoned as winter villages.

Their inhabitants had either died out or moved to villages on Vancouver Island or on the mainland, from which they returned to the islands seasonally for fishing, hunting, or harvesting vegetable foods and shellfish (Suttles, 2003: Chapter 10, p.1).

The numerous localized family and tribal groups of the Central Coast Salish continued to be highly mobile within the region in the mid-nineteenth century and there is a great deal of ethnographic information about intermarriages among them. The native population responded to the initial presence of British and American armed forces, as well as increasing non-native settlement, by changing patterns of seasonal travel, residential occupation and resource procurement. Treaties with two governments then directly led to the relocation of most indigenous people from the islands to reserves in Canada and reservations in the United States.

Three settlements or village sites were located in northern San Juan Island in a cove just to the west of Lonesome Cove, at Mitchell Bay, and within the English Camp unit of San Juan Island National Historical Park at Garrison Bay. West of San Juan Island, there may have been a fourth village located at Open Bay on nearby Henry Island. Central Coast Salish tribes believed to be residents of these sites included a group known as the Klalakamish (variously claimed as ancestors by Songhees, Lummi and Saanich) the Lummi, the Saanich and the Songhees. In addition to larger settlements or villages, four smaller camps were noted on an 1853-54 U.S. Coast Survey map that were probably associated with one or more of the ten reef net locations along the western shore of the island (Suttles 1998: p.21-25).

At the south end of San Juan Island, east of American Camp, there was “a single small house on or near Fish Creek just north of Cattle Point . . . that belonged to a Clallam man, his Samish wife and their son Captain George” (Suttles 1998: p.26). According to Suttles, Captain George had worked for the American garrison and often hosted Samish relatives who trolled and fished for halibut in the area south of the island around 1850. The family reportedly moved to a Samish village on Guemes Island around 1875 (Suttles 1998: p.26).

In addition to those who occupied San Juan Island villages and used certain reef net locations, other tribes made use of resources on the island or in the immediate vicinity. While the Klallam traditionally occupied the northern slope of the Olympic Peninsula

on the south side of the Strait of Juan de Fuca, some of them established winter villages in former Sooke territory on the Vancouver side of the strait after Fort Victoria was built in 1843 (Suttles 2003: Chapter 10, 1). Intermarriage among Lummi, Samish and other native groups was probably an old practice that persisted in the late nineteenth-century and continued subsequently (Suttles, personal communication). Like the Samish, the Klallam and the Swinomish also used the popular fishery south of Cattle Point.

Treaty relationships with native people of the San Juan Islands were shaped by the on-going competition between Britain and the United States over control of the region. Between 1850 and 1852, Governor James Douglas negotiated a series of British treaties wherein the Saanich and Songhees peoples accepted reserves on the Saanich Peninsula and elsewhere on southeastern Vancouver Island and ceded other lands. In 1855, Governor Isaac Stevens of Washington Territory held a series of treaty councils with Indians of the territory. Representatives of the Lummi, the Swinomish and, it is claimed by present day Samishes, the Samish, signed an early draft of the Point Elliott Treaty of 1855 (Ruby and Brown 1986: p.179). These treaties obligated native peoples to leave the San Juan Islands and take up residence on the reserves and reservations. However, a small number of individuals and extended families remained in the islands during the early reservation period and their descendents continue to be part of the island communities of the present.

European and American Exploration and Settlement of the San Juan Islands, 1790-1859

The first Europeans known to have explored the San Juan Islands were the Spanish. In 1790, Manuel Quimper explored both shores of the Strait of Juan de Fuca and may have reached as far as the southwestern corner of the islands. The following year, Francisco Eliza sailed into this region and is generally credited with giving these islands the name “San Juan.” Eliza explored many of the islands and recorded brief descriptions of what were probably Saanich and Semiahmoo peoples operating reef nets near Point Roberts on the mainland to the north.

The Nootka Convention of 1790 opened the region between Russian America and Spanish California to joint exploration and occupation between Great Britain and Spain. Capts. George Vancouver and Juan Francisco de la Bodega y Quadra met in Nootka Sound in 1792 to work out the details of the Nootka

Convention. The Spanish charted Vancouver Island and the Strait of Georgia while British focused on Puget Sound (named for Lt. Peter Puget) and the Strait of Georgia. The Spanish chart makers, Capts. Dionisio Alcalá Galiano and Cayetano Valdés aboard *Mexicana* and *Sutil*, started their surveys of the inland waterways east of Vancouver Island in June 1792. It was here they met the Vancouver expedition off Point Roberts and exchanged notes. The San Juan Islands were partially charted by Vancouver and the Spanish explorers between 1792 and 1794. The Spanish sketched only the outer rim of the island group, while Vancouver identified the interior channels and roughed in the major islands served today by Washington State Ferries. Vancouver also emphasized with a solid line the route he chose in circumnavigating Vancouver Island and its contiguous islands and islets: the Rosario Strait, which runs between the San Juan Archipelago and the mainland. The British would cite this route to support their claim of Rosario Strait as the boundary from 1846 to 1872.

U.S. Navy Lt. Charles Wilkes arrived in the San Juan Island in 1841 as part of the U.S. Exploring Expedition, which had been dispatched by the United States to chart the Pacific Basin. Wilkes also produced charts of the San Juans based largely upon the surveys of Vancouver, Quimper, Galiano and Eliza. However, the American surveyor held that Haro Strait, being deeper, wider and more amenable to sailing craft was the logical boundary between U.S. and British possessions. He underscored his opinion by arbitrarily re-naming all of the island and features, some of which remain today. Vancouver and Wilkes wrote little about native peoples living in the archipelago. Vancouver was focused on chart making while Wilkes had to cut his survey short and rush south on learning that one of the expedition ships had wrecked crossing the Columbia River bar.

The signing of the Oregon Treaty of 1846, establishing the 49th North Parallel as the principle boundary between British and American possessions in the West, had left ambiguous the question of the final boundary line between Vancouver Island and the mainland, which ultimately threw possession of the San Juan Islands into dispute

Euro-American exploitation of the islands may have begun as early as 1840 with some timber harvesting operations. Between 1850 and 1851, the Hudson's Bay Company, operating out of their post at Fort Victoria on Vancouver Island, set up their first seasonal fishing station on San Juan Island. By August 1853,

James Douglas, operating as governor of the British crown colony of Vancouver Island in addition to being chief factor of the Company, was enforcing British jurisdiction over timber resources in the islands. In December 1853, Douglas hoped to further entrench British claims to the San Juan group, and San Juan Island in particular, by establishing a permanent agricultural station on the southern end of San Juan Island within the current boundaries of American Camp. Belle Vue Sheep Farm was a substantial operation, eventually supporting a herd of 4500 sheep. In addition to houses, barns, and outbuildings, there were fenced pastures and more than 100 acres in cultivation. The foundations and other features of the Belle Vue Sheep Farm operation comprise an archeological site on the slope below the redoubt at American Camp.

By the mid-1850s, the non-native population of the San Juan Islands was limited to a few European Belle Vue Sheep Farm employees and the temporary residence of three successive deputy U.S. Customs inspectors. By June 1859, about 25 Americans lived on the island along with the sheep farm staff. Two American surveyors that year staked out speculative preemption claims (in anticipation of the dispute being resolved at some near date) on Oak Prairie (today's San Juan Valley) and near the company dock on Griffin Bay. The act of staking claims attracted a score of failed American miners and others looking for free land, which heightened the paranoia company officials held over potential American incursions upon their real estate. The proximity of these claims, which included some subsistence garden patches, to the Company operations set the stage for confrontation.

The designation of the military confrontation as the Pig War stems from an incident on June 15, 1859, in which an American settler shot a black boar foraging in his potato patch. The boar belonged to Belle Vue Sheep Farm and the subsequent disagreements over compensation as well as exaggerated accounts of the event, led to the American settlers on the island petitioning the government for protection. While the petition sought protection only against northern Indian raids, the department of Oregon commander, Brig. Gen. William S. Harney must have been impressed by the settlers' verbal complaints about the Hudson's Bay Company. On July 18, Harney issued Special Orders #72 to Capt. George E. Pickett, commander of Fort Bellingham. Pickett was to abandon his post on Bellingham Bay and proceed to San Juan Island, where he was to establish a new post to protect U.S. citizens from Indian raids. In a closing

paragraph—almost an afterthought—Pickett also was directed to discourage British officials from assuming jurisdiction over U.S. citizens.

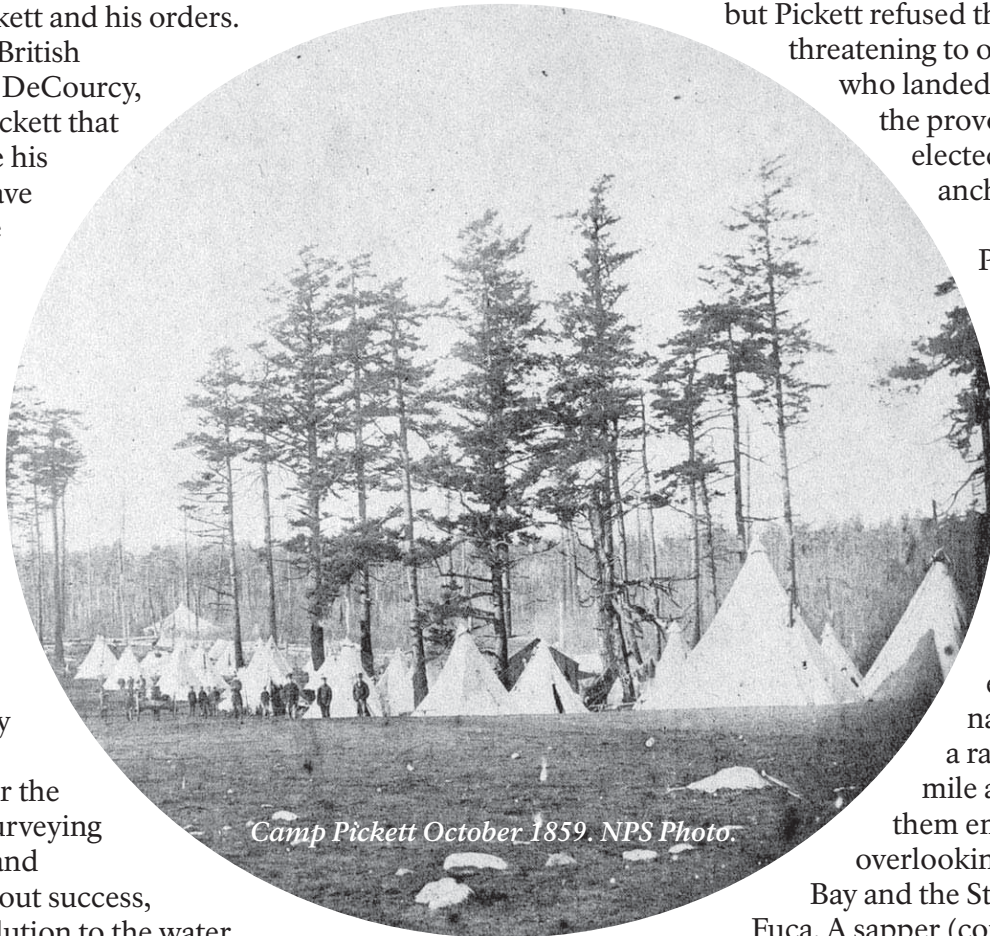
A company of U.S. troops (64 officers and Prevost thereafter enlisted men) arrived on July 27, 1859, landing at the HBC dock on Griffin Bay and establishing their camp just up from the beach on the Griffin Bay shore, about 50 yards from the dock on the other side of what we call today Old Town Lagoon. HMS *Satellite*, a 21-gun steam corvette with a British magistrate aboard, arrived on the bay shortly after Pickett. The magistrate was there to arrest Lyman Cutlar and evict as trespassers all Americans on the island, which placed him in immediate conflict with Pickett and his orders.

Undaunted, the British magistrate, John DeCourcy, announced to Pickett that if he did not take his company and leave that he would be placed under arrest.

Watching all this from his berth on the U.S. Lighthouse Tender *Shubrick* was Archibald Campbell, the U.S. Boundary Survey commissioner. Campbell had for the past year been surveying the 49th parallel and attempting, without success, to negotiate a solution to the water boundary with his British counterpart, Capt. James Prevost, who was also captain of the *Satellite* and in company with DeCourcy in Pickett's camp. Campbell had been notified of Pickett's landing before the fact by Harney's adjutant, Capt. Alfred Pleasonton, but had been away on a hunting expedition in the San Juan's, which is why he was on the bay aboard the *Shubrick*. Prevost thereafter believed that Campbell was engaged in duplicity and had nothing to do with him, which stymied any solutions concerning the San Juans for years to come, never mind George Pickett's provocative behavior.

Pickett escalated the crisis by posting a sign on Old Town Lagoon that proclaimed the islands U.S. territory and himself the sole arbiter of justice. It was in response to this that Douglas dispatched HMS *Tribune*, a 31-gun steam frigate under the command of Capt. Geoffrey Phipps Hornby, son of a Royal Navy fleet admiral, to take Pickett in hand. His orders—to evict Pickett, by force if necessary—were quickly countermanded by the senior British naval officer in Victoria, Capt. Michael DeCourcy (no relation to John). The Royal Navy's British Station policies were clear about not firing until being fired upon. Captain DeCourcy's suggested alternative was to land a number of Royal Marines on Griffin Bay

equal to Pickett's company. Douglas assented, but Pickett refused the proposal, threatening to open fire on any who landed. Hornby ignored the provocation and elected to remain at anchor in the bay.



Pickett meanwhile asked Harney for reinforcements, which arrived 10 days later with Lt. Col. Silas Casey, deputy commander of the Ninth Infantry Regiment. Casey brought along eight 32-pounder naval guns (with a range of up to a mile and half) and had them emplaced on a hill overlooking both Griffin Bay and the Strait of Juan de Fuca. A sapper (combat engineers) team led by 2nd Lt. Henry M. Robert

planned and supervised excavation of the earthen fortification, which thereafter became known as the redoubt. (Robert would go on to write *Robert's Rules of Order*.) Hornby watched these proceedings from his quarterdeck with growing alarm. For his original orders had been to take whatever steps necessary to prevent the U.S. from reinforcing Pickett and erecting fortifications; acts that would affirm U.S. intentions to formally occupy the island. By the act of dispatching Casey, 400 soldiers and 8 naval guns and 14 field pieces, Harney was stating that he was ready to fight.

Hornby sent a messenger to his superior, the recently arrived Rear Adm. R. Lambert Baynes, asking if he should land the marines, storm the heights and spike the guns. The admiral rejected this course at once, ordering in strong terms that Hornby remain on station and only fire if fired upon. Baynes knew that his nation, already stressed by war with Russia and two colonial conflicts in the 1850s, could not afford a major conflagration with the United States, a rapidly expanding industrial power. The Royal Navy's mission was to protect British commercial interests around the world. Britain had a huge capital investment in U.S. businesses and a lucrative trade agreement with the United States worth millions more pounds. Where the San Juan Island issue was concerned, Baynes also was aware that British interests were not served by risking war over a 54 square-mile island.

The importance of maintaining peace between the two nations also is underscored by the fact that, with the blessing of the British government, an aged and infirm Lt. Gen. Winfield Scott, was sent on the difficult journey from New York City to Washington Territory, which required transit of the Isthmus of Panama by rail. Scott was considered indispensable as the only leader, military or civilian, in the United States with the moral authority to negotiate a peaceful stand-down with British officials. On that score, Scott and Baynes were a perfect match, both adept in the arts of international diplomacy, even though they were warriors by profession. Heretofore an aggressive businessman and absolutist civil authority, Douglas had to have been both impressed and intimidated by these two men because he quickly toned down his rhetoric and expressed a willingness to arrive at accommodation with the Americans.

In less than a week, the three leaders agreed to remove all reinforcements from the island and surrounding waters, save for a single company of U.S. infantry. The soldiers would remain to protect U.S. citizens and British subjects alike from Indian raids, which had been the primary focus of the petition the Americans had submitted to Harney that June.

Douglas, however, asked Scott to remove Pickett from the island. The governor, still rankled by Pickett's truculence and his proclamation, wanted no part of the Virginian. He was certain that Scott would concur to a command that would "ensure a continuation of perfect harmony and tranquility, until the unfortunate question of title may be forever set at rest." Scott assured the governor on November 9 that no official from Washington territory would be

permitted to interfere with any British subject. British subjects violating the law would be referred to the proper British authorities. Pickett would return to Fort Bellingham, and Captain Lewis Cass Hunt and Company C, Fourth Infantry would remain. Hunt was directed to break up "...that part of the camp near and within sight of the Hudson's Bay Company's buildings... The little clearing in the wood and behind the hill has had comfortable shelter erected upon it where one company will be stationed."

Scott and Douglas agreed to remove all artillery from the island as part of the stand down agreement; an act that also became a key proviso of the formal joint military occupation agreement drafted almost simultaneously a continent away by officials from both nations. The conventional wisdom was that big guns represented the potential for big trouble. Once work on the redoubt was stopped, the guns, ammunition, and other equipment were hauled from the edifice and lugged back down the prairie slope to South Beach.

In October of 1859, Great Britain and the United States agreed to joint military occupation of San Juan Island, buying time for the boundary dispute to be submitted for arbitration to the court of Wilhelm I, Kaiser of Germany.

British-American Military Occupation of San Juan Island, 1859-1874

In March of 1860, British Royal Marines were dispatched to the north end of the island with supplies and provisions for construction of a British encampment. The U.S. camp was relocated three times within the first three weeks of Pickett's landing. The permanent camp, which technically was not on the prairie but in the forest fringe, was established at its present site to guard against naval bombardment should the Royal Navy decide to bring bomb (or mortar) ships into the harbor. From Officers' Row, the U.S. commander had commanding views of Griffin Bay, the Strait of Juan de Fuca, and the British settlement of Victoria on the western horizon.

The joint military occupation of San Juan Island continued for twelve years. Troops stationed at American Camp operated under the command of the Department of Oregon, U.S. Army, headquartered in Vancouver, Washington (now part of Vancouver National Historical Reserve). The Royal Marines were attached to the Royal Navy's Pacific Station command, headquartered at Esquimalt on Vancouver Island. Both military outposts evolved into substantial structural complexes with officers' quarters and

barracks, parade grounds, hospitals and service buildings, fortifications, gardens, cemeteries, and circulation systems. Access by boat and wagon road was established by the two camps and over time, a cordial communication system existed between the military personnel. The American Civil War prevented a speedy resolution of the boundary issue until 1872, when the San Juan Islands were finally awarded to the United States through arbitration. (See Figure 15: English Camp, Cultural Resources.)

American Camp – Physical Evolution, 1859-1872

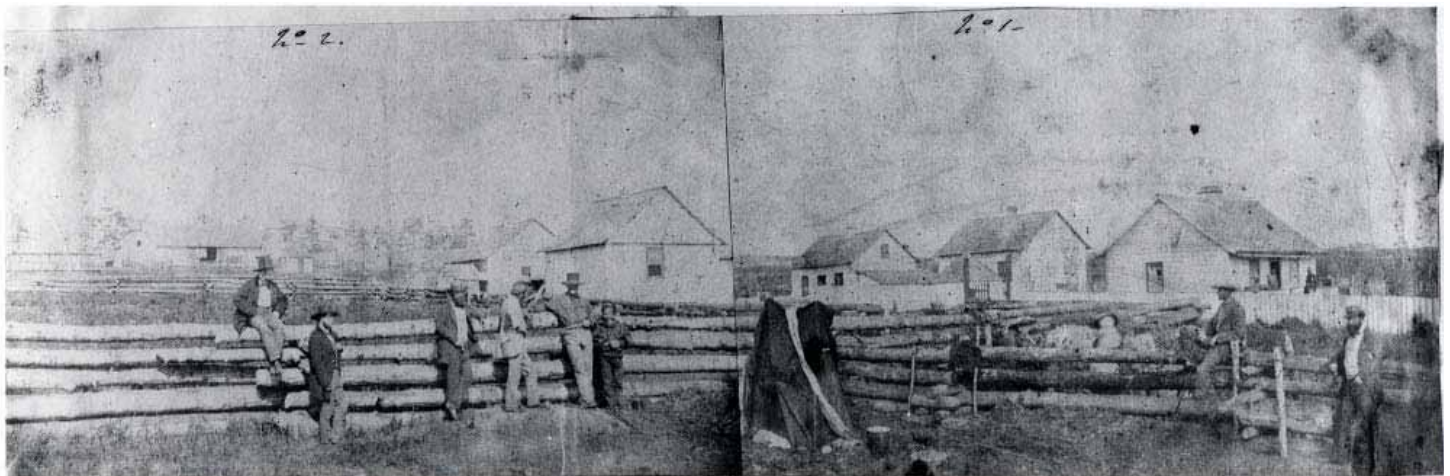
Structural development at American Camp under the military occupation can be divided into two major periods: the years between 1859 and 1865 when the primary framework of the site evolved; and a second period between 1866 and 1872 when improvements and additions established the camp as a major island settlement. A primary physical feature of the camp was the large earthen redoubt, approximately 350 feet in length, which formed the easternmost edge of the overall campsite. Rudimentary barracks, officers' housing, laundress' quarters, a hospital, guardhouse, kitchen, mess hall, and bake house, along with a parade ground, vegetable garden, and extensive fencing were in place by the early 1860s, when the advent of the Civil War halted all construction at the camp. Repairs and construction accelerated dramatically between 1866 and 1868 when the war drew to a close. Seven of the original buildings were repaired and converted to new uses, two received major additions, and the remaining buildings received various types of repairs. In addition, over a dozen new buildings were constructed, along with more fencing and improvements to the roads and trails linking the camp with other island residents. (See Figure 16: American Camp, Cultural Resources.)

English Camp – Physical Evolution, 1859-1872

Captain James Prevost of the Royal Navy selected a suitable location for the British encampment at a cove located on the inland waters of Garrison Bay. Long used by native peoples, the cove offered well-sheltered prairie land for use as the parade ground and a good supply of grass and water. On March 21, 1860, Captain George Bazalgette landed 86 Royal Marines at the site along with construction materials and supplies.

Physically and symbolically, the structural complex at English Camp was divided into a series of “levels” according to rank and function. Officers' quarters were sited on the highest ground surrounding the camp, while troops were housed in barracks located on the broad level grounds around the shore. Service buildings were clustered around the barracks and shoreline enclosing the parade ground. Most of these structures were oriented toward Garrison Bay, which was the primary focus for the entire camp. From the highest points in the camp, signal fires on Vancouver Island could be spotted.

Actual construction took place in two primary phases: an initial phase of development from 1860 to 1866; and a second period between 1867 and 1872, when several new buildings were added. By the mid-1860s, the post included officers' quarters built on stone-walled terraces on the lower slopes of Young Hill, two barracks, a blockhouse-style guardhouse, wharf, storehouses, a barn, cookhouse, mess room, and sutler's (trader or merchant) store. Later developments included a home for the commanding officer, a subaltern's house, hospital, and several service-related buildings.



Belle Vue Sheep Farm, September 1859. NPS Photo.

English Camp: Cultural Resources

San Juan Island National Historical Park GMP/EIS



- Park Boundary
- Primary Road
- Secondary Road

0 500 1,000
Feet



Figure 15

Produced by: National Park Service
PWRO-Seattle GIS Group

Date Created: February 28, 2007

Data Sources: NPS - cultural resources,
DOQ's (1997),
park boundary, roads,
shoreline
USGS - shaded relief

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American Camp: Cultural Resources

San Juan Island National Historical Park GMP/EIS



Produced by: National Park Service, PWRO-Seattle GIS Group
 Date Created: February 28, 2007
 Data Sources: NPS - cultural resources, lakes, park boundary, roads, shoreline
 USGS - shaded relief
 i:\gis\arcmapdoc\sjnh\gmp\ac_cult_resources_v5.mxd

Figure 16

San Juan Town, 1859-1890

Despite the efforts of the military commanders who were placed in charge of civil affairs on the island, the presence of the two camps and the lack of direct civil authority attracted a number of outlaws, scoundrels, and others interested in profiting from the sale of liquor and other items to both the military personnel and local Indians. The village of San Juan sprang up around the Hudson's Bay Company wharf following the arrival of American forces in 1859. Located within the present day boundaries of American Camp, the village consisted of approximately 14 crude structures. Following the withdrawal of the military and the establishment of Friday Harbor as the county seat, the town was slowly abandoned and finally burned to the ground in 1890.

Late Settlement and Agricultural Activity on San Juan Island, 1873-present

In 1880, six years after the conclusion of the military occupation in 1874, the U.S. Census Report listed an island population of 536 individuals, 302 men and 234 women. They were farmers, fishermen, or laborers. Among the Euro-Americans, a high percentage were European born. By 1900, Friday Harbor was a thriving village with a population of 300-400, a salmon cannery, wharves and warehouses, and a telephone system. At Roche Harbor, north of English Camp, a lime manufacturing plant was operating. Steamers connected the islands to the mainland.

Indian use of San Juan Island also continued. The Indian population was primarily composed of reef net fishermen who traveled to the island from various locations, as well as a full-time residential population of mixed blood from unions between Native American women and Euro-American men. Several families formed the core of this resident "metis" community and came to be known as two separate groups: the San Juan Tribe of Indians and the Mitchell Bay Band. Those who remained on the island also engaged in farming and early commercial fishing.

After the military departed, both camps were sold to private individuals. At American Camp, land was thrown open to settlement by presidential proclamation. The military buildings were sold at auction and most were removed from the site. Homesteaders made use of the site for farming and grazing, gradually altering the historic landscape of the camp. In 1951, the Washington State Parks and Recreation Commission acquired the core five acres

of the historic campsite thus preserving it from further alteration.

At English Camp, the land and many of the structures were acquired by the William Crook family in 1875. For the next 92 years, the Crook family worked and shaped the landscape around the cove at Garrison Bay. Though some of the original camp structures had been sold at auction and removed in 1875, Crook retained and made practical use of many of them. The family also erected new structures, including a substantial barn and house. An orchard was planted on the old parade ground. In 1963, the Crook family transferred ownership of 100 acres of the farm, including the historic campsite, to the Washington State Parks and Recreation Commission. In 1966, with the creation of the San Juan Island National Historical Park, both the English and American Camp sites were transferred from Washington State Parks to the National Park Service.

Historic Properties Eligible for or Listed in the National Register of Historic Places

The cultural resources of San Juan Island National Historical Park have been surveyed, evaluated, and documented over the years through a series of studies prepared primarily by historians, anthropologists, archaeologists, cultural landscape architects, and historical architects working for the National Park Service as staff or contractors. Originally, the Secretary of the Interior identified the two camps as nationally significant historic landmarks in 1961 through the National Survey of Historic Sites and Buildings program, authorized by the Historic Sites Act of 1935. No documentation for the camps was prepared. It was in 1966—just prior to establishment of the Park—that the camps were administratively entered into the newly created National Register of Historic Places with the passage of the National Historic Preservation Act. The National Register listing for the NHL originally encompassed an area of more than 12,000 acres, though no boundaries were described and no nomination form existed for the properties. This informality was not unusual for this period of time. The lack of specificity has led many to treat the NHL and the park as the same, while in actuality, the NHL preceded the park and (theoretically) was much larger. In 1973, the NPS prepared a National Register of Historic Places nomination for American Camp. No companion nomination for English Camp was prepared. The National Register listing did not specifically mention many of the cultural resources

now recognized as important in the park. In an attempt to consolidate all of the historical research and studies previously completed for the park, the NPS prepared a draft multiple property document (MPD) entitled “Cultural Resources of San Juan Island National Historical Park, Prehistory through 1945.” It was prepared under contract with NPS by historian Florence Lentz and forwarded to the State Historic Preservation Officer in 1999. While the SHPO approved the draft, the MPD was never finalized and officially entered into the National Register due to additional documentation required by the NPS Washington Office. Regardless of which alternative is chosen for this GMP, the National Register listing needs to be updated to finalize the documentation for the park and to be in compliance with Section 110 of the National Historic Preservation Act. A new nomination is needed for the prehistoric archaeological sites, as they were not included in the 1999 MPD.

This multiple property listing documentation of 1999 summarized the findings of the following key studies, beginning in 1961, as follows:

- *National Survey of Historic Sites and Buildings: American and English Camps (Pig War Site), San Juan Island, Washington* (Charles Snell, NPS, 1961)
- National Historic Landmark File Correspondence (Pacific West Region, Cultural Resources NHL files)
- *English Camp, San Juan Island National Historical Park: Historic Structures Report – Part One* (Lewis Koue and Erwin Thompson, NPS, 1969)
- *Historic Resource Study, San Juan Island National Historical Park, Washington* (Erwin Thompson, NPS, 1972)
- *Historic Structures Report, Officers’ Quarters, Laundress’ Quarters, English Camp Hospital, San Juan Island National Historical Park* (Harold LaFleur, NPS, 1978)
- *San Juan Archeology, Volume I and II* (Roderick Sprague, University of Idaho, 1983)
- *Historic Structures Report, Crook House, San Juan Island National Historical Park* (Pat Erigero and Barry Schnoll, NPS, 1984)
- *Historic Landscape Report: American Camp and English Camp, San Juan Island National Historical Park* (Cathy Gilbert, NPS, 1987)
- *Archaeological Overview and Basemap of American and English Camps, San Juan Island National Historical Park* (Gary C. Wessen, NPS, 1988)

- *An Ethnographic Overview of the Native Peoples of the San Juan Islands Region* (Gary C. Wessen, NPS, 1988)
- *Deciphering a Shell Midden* (Julie K. Stein, Academic Press, 1992)
- *San Juan Island Cultural Affiliation Study* (Daniel L Boxberger, Western Washington University, 1994)

The multiple property documentation identifies four major historic contexts associated with the American Camp and English Camp sites and lists historic property types, as well as specific resources, associated with each context. These resources have been evaluated for eligibility for the National Register of Historic Places.

Historic Context I: Occupation of the San Juan Islands by Native Peoples, to 1855

Habitation sites associated with the native peoples of the San Juan Islands are thought to have been of two types: cedar plank longhouses and mat-covered lodges. Split cedar plank longhouses were often large structures, as much as 60 feet wide and twice that in length. They had either gable or shed roofs, made of overlapping cedar planks supported by rafter support posts. Walls consisted of cedar planks tied horizontally between pairs of support posts. Inside, the entire house consisted of a single room with a low cedar plank bench running along the inner wall. Space was divided into a series of individual nuclear family areas along the bench and walls sharing a common household area in the center of the floor. Each nuclear family area had its own fire hearth near the bench. Mat lodges were 15-20 feet long, pole structures covered with mats made of cattail rushes or cedar bark. Some lodges had split cedar roofing.

Within English Camp, the remains of a longhouse platform at Garrison Bay have been located, confirming ethnographic reports of a winter village being located at the cove. The site features include evidence of the physical dimensions of the structure, as well as hearths, pits, and post holes. It is eligible for the National Register under Criteria D (resources with the potential to provide significant information). No examples of mat lodge dwelling types have been identified within the park’s boundaries.

Sites related to resource procurement have been identified at both American and English camps.

Sites related to the religious beliefs of the native people of the San Juan Islands include tangible artifacts such as rock cairns and burial sites, as well as significant landscape features. Rock cairns and burial sites have been identified within the boundaries of the park.

Historic Context II: European and American Exploration and Settlement of the San Juan Islands, 1790-1859

Belle Vue Sheep Farm, the sheep station established by the British Hudson's Bay Company is within the boundaries of American Camp. The remains of the 1850s sheep station include foundations and other archaeological features associated with the main structures and related outbuildings. The site is eligible for the National Register of Historic Places under Criteria A (associated with broad patterns of history) and Criteria D.

Lyman Cutlar's farmstead, where the infamous pig was shot, may have been located just outside the present boundaries of American Camp to the northwest, though this has long been subject to conjecture. The site of the subsistence farm of Lyman Cutlar would represent the earliest farmsteads established by American squatters prior to the Pig War. If conclusively identified, it would have the potential to provide valuable information on subsistence farming in the 1850s on the island. Additional historical and archaeological research would be required to solve this 150-year old puzzle.

The archaeological remains of the San Juan Town site have been identified within the boundaries of American Camp. Features include foundations and building materials associated with the fourteen

structures of this small settlement that included a store, hotel, and numerous saloons. The site is eligible for the National Register under Criteria D, offering the potential for providing additional knowledge about the physical fabric of San Juan Town, its spatial relationships, and its inhabitants.

Historic Context III: British-American Military Occupation of San Juan Island, 1859-1874.

Both American Camp and English Camp are cultural landscapes incorporating complex layers of structural, landscape and archaeological features that provide a strong interpretive background for relating the military story of the Pig War and the subsequent joint occupation. The great majority of original aboveground features whose existence is documented in early photographs and maps have long since been removed. Two buildings out of an original 28 now stand at American Camp, four out of an original 30 at English Camp. The locations of some former buildings are marked by foundations, chimney rubble, or depressions in the earth; others have been identified by archaeological survey and/or excavation. Elements of landscape patterns that relate to the historic setting are distinguishable at both sites. These include the earthen redoubt at American Camp; rock-walled terraces, shoreline features, and a fenced cemetery at English Camp; and parade grounds and portions of original paths and road systems at both camps. At English Camp, remains of the post sutler's farm and orchard are also in evidence.

These resources represent the primary features contributing to the eligibility of the two sites as National Historic Landmarks and are eligible under Criteria A, B, and D for their associations with the



Bay view of English Camp, post-1867. NPS Photo.

story of the Pig War and the diplomacy associated with the resolution of the boundary dispute.

Historic Context IV: Late Settlement and Agricultural Activity on San Juan Island, 1873-1945

Although both camps were subsequently occupied by farmsteads, the primary resource associated with the post military settlement of the two camps is the Crook house and related archaeological and landscape resources associated with the Crook Farm era.

The Crook family was the caretaker of English Camp for many years. William Crook took possession of the 161-acre property as a homestead in 1876. Ownership was transferred to Washington State in 1963 and the park received it in 1966. The Crook house was determined eligible for the National Register of Historic Places in 1984.

History of Archaeology at San Juan Island National Historical Park

Two prehistoric sites preserved within the boundaries of the park are “Cattle Point” (45SJ1) at South Beach in American Camp, and at English Camp (45SJ24).

Cattle Point

The older of the two sites within the park is Cattle Point. It was excavated twice, first in 1946-1947, under the direction of Dr. Arden King, who was teaching a field school for the University of Washington as a faculty member at Tulane University in New Orleans. Dr. Carroll Burroughs (an archaeologist working for the National Park Service at Mesa Verde who came to teach the field school for the University of Washington) directed the second excavation in 1948. King, who published his results in *American Antiquity* (Memoir 7, 1950) found two different occupations at the site above South Beach. The first and deeper site contained Cascade points and preserved animal bone and charcoal. King did not retain any of the bone or charcoal, so carbon 14 dating of the occupation level was not possible. From the artifact association, the site’s estimated date is somewhere between 9,000 to 4,500 years ago. In addition, the data King recovered at the first occupation depth reveals that the grassy prairie now seen at American Camp has persisted for thousands of years.

Luckily, King did save shell from the second and higher occupation level, and the carbon 14 analysis from the shell produced dates between 2,550 and

2,300 years ago. In this level, King and Burroughs also found interesting rock lined trenches and several circular bowl shaped features. It is unclear what function these features served.

English Camp

The English Camp (45SJ24) was excavated three times. In 1950, Dr. Adam E. Treganza (San Francisco State University) taught a field school there for the University of Washington. The field school consisted of testing the shell midden just west of the parade ground. No formal report was submitted.

In 1970-1972, Dr. Roderick Sprague (University of Idaho) specializing in the historic period, directed a large archaeology excavation within the park. Sprague excavated several of the historic British building foundations at English Camp. His data was used to assist the NPS in reconstructing the historic structures and in the interpretation of the British occupation on Garrison Bay. Sprague’s report, a two-volume document entitled *San Juan Archaeology* was published by the NPS in 1983. The report also includes historical archaeological investigations at American Camp, old San Juan Town and the Hudson’s Bay Company’s Belle Vue Sheep Farm.

An appendix to the *San Juan Archaeology* publication was a small report by Stephen Kenady, a University of Washington student connected with Sprague’s field school. Kenady conducted limited testing of the prehistoric shell midden at English Camp. Most of Kenady’s data, in the form of field notes, were lost for 20 years, and were rediscovered in the mid-1990s. Park and Regional Office funds were provided to allow Kenady to revisit his data and write a report. The final draft report has recently been received and will be published when funds become available.

The third major excavation conducted from 1983-1991, was led by Dr. Julie K. Stein, Curator of Archaeology at the Burke Museum, University of Washington. Stein investigated the shell midden lining the eastern shore of Garrison Bay, underlying the grassy parade ground and continuing partially into the wooded region to the north. The middens were an accumulation of used shell and other food waste and trash that was deposited throughout the prehistoric occupation period.

The largest excavations were at the parade ground, Operation (Op) A, and in the wooded area to the north, Op D. Carbon-14 dates from Op D indicate that people lived there for only a short time, from AD 500

to AD 800. The shell midden accumulated and was abandoned within a few hundred years. The midden at Op A dated from AD 500 to AD 1800, deposited by the native peoples over a thirteen hundred-year period.

Occupation by native people at English Camp covers a two thousand-year period. Tentative testing at Op D, a horseshoe-shaped midden, suggests an early type of shelter similar to a site at Beach Grove in British Columbia. The exact nature of the structure is not clear and further testing may provide more data.

The structures at Op A, on what is now the parade ground, were more likely to correspond to the plank houses that represent the shelters of late northwest Native American culture.

Stein has reported on the English Camp investigations in both *Deciphering a Shell Midden* (Academic Press 1992), and *Exploring Coast Salish Prehistory* (University of Washington Press 2000). A book about the findings at Op D is in draft, but currently remains unpublished.

Museum Collections

The park maintains a significant museum collection of about one million objects, covering a vast array of time, disciplines, and understanding. Only a few dozen items are on exhibit in the American Camp visitor center. The remaining objects are housed in repositories, in order of extent, at the Burke Museum Archeology Collections at the University of Washington, the Marblemount Curation Facility at North Cascades National Park, Fort Vancouver National Historic Site, and San Juan Island National Historical Park (approximately 170 objects on exhibit).

There are 105,000 catalog numbers for the park's museum and archival collections: 66,000 are housed at the Burke Museum, 35 are housed at the Marblemount Curation Facility, and 5,000 are at Fort Vancouver National Historic Site. Because quantities within catalog numbers vary, the item count differs from the catalog number count. These off-site locations provide preservation and protection to the collection and allow scholarly research and comparative analysis of these collections; however, off-site collections also make the collection difficult to access by park visitors and park staff.

The collections are a dynamic set of resources. Research is ongoing in marine biology, landscape and prairie restoration, archival research and in many fields

of archaeology. Collections are better understood with continued access, study, interpretation and description.

The archaeological artifacts are extensive. The NPS conducts research, works to refine descriptions of artifacts, produces analyses of artifacts, and publishes findings. American and British historic artifacts are of particular historic interest and include the Hudson Bay Company farm on San Juan Island, the military presence of the U.S. Army and the British Royal Marines co-occupation (1859-1872), the settlers present during military co-occupation of the island, and immediate occupation by Americans of the English Camp following British withdrawal. Excavated materials include soil, minimally sorted material, well-sorted material and identified artifacts. The items include prehistoric items associated with American Indians, specifically the Lummi tribe, people related by family, culture, and history.

Natural history specimens will increase in the collection as inventory work continues. The natural history collection is chiefly vascular plant specimens collected for the herbarium by NPS staff as part of the inventory component of the Natural Resource Challenge's Inventory and Monitoring Program. Paleontology and geology specimens shape the remainder of the collection. A soil survey conducted in 2003 developed soil voucher specimens, which are stored at the Natural Resource Conservation Service facility in Mount Vernon, Washington.

The park archives document the park's administrative history, legislative action, annual reports, historic structures descriptions and compliance documentation, interpretive programs, research proposals, and facility development. Field notes and documentation from archaeology fieldwork, maps, and photographs comprise another portion of the archives. As homesteaders and caretakers of English Camp lands, the Crook family's documents and letters provide clues of life on the island around 1900, and letters composed by the Harvey Allen family-to-family off-island, weave an 1860's correspondence web. These materials are located at Marblemount, the Burke Museum, Fort Vancouver National Historic Site and at the National Archives and Records Administration in Seattle.

The Marblemount Curation Facility at North Cascades National Park provides a center for resource protection, research, education and interpretation. The collection room has tight temperature and relative humidity requirements and the environment is closely

monitored. Emergency operations plans, fire and security plans and systems conform to NPS museum standards. Housekeeping is performed regularly, and a pest management plan is in draft form. Data sharing is limited at present to museum staff members. Access to collections is with a museum staff chaperone. Access to the Burke Museum collection is under the direction of the Burke museum staff. The exhibits are viewable on San Juan Island at park visitor contact stations and at the Burke Welcome Center.

Since its establishment as an historical park in 1966, NPS professionals and scholars alike have accepted that the *in situ* archaeological resources, including foundations, artifacts and features, are one of the two most important park resources. The historic documentation of military life during the peaceful boundary resolution has continually been strengthened and enhanced by the analysis of the data and artifacts resulting from excavations at San Juan Island National Historical Park. As a result of the archaeological investigations, a primary interpretive theme at the park is the archaeological resources of the camps as much as it is the story of the Pig War.

As a result of 50 years of archaeological investigations at San Juan Island National Historical Park, one million artifacts have been retrieved and a score of scholarly reports have been produced and archived.

The preservation, management, and interpretation of this collection continue to be one of the most important cultural resource issues for the park. Representing the original fabric of English Camp and American Camp and providing insight into the lives of its occupants, it is an internationally significant resource.

San Juan Island National Historical Park Archival and Material Cultural Collections

The institutions below house original historic documents, maps and images that pertain to the cultural history of San Juan Island National Historical Park.

- U.S. National Archives, Washington, D.C.
- University of Washington Library, Seattle, Washington
- Washington State Historical Society, Tacoma, Washington
- Public Record Office, London, England
- Royal Provincial Archives of British Columbia, Victoria, British Columbia
- Washington State Library, Olympia, Washington

- National Archives of Canada, Ottawa, Ontario
- National Collections, Ottawa, Ontario
- American Antiquarian Society, Philadelphia, Pennsylvania

Technology Options for Collection Availability

It is the intent of the park to explore options for making natural and cultural resource collections available on the internet for researchers and interested public. However, in keeping with the Archaeological Resources Protection Act (16 U.S.C 470hh [a]) and the National Historic Preservation Act (16 U.S.C. 470w-3) information on the location, character or ownership of historic resources will not be disclosed if disclosure may (1) cause a significant invasion of privacy, (2) risk harm to the historic resource, or (3) impede the use of a traditional religious site by practitioners.” In addition to internet applications, the park could also consider other innovative methods to convey a virtual “hands-on” experience in order for visitors to better experience the collections and park archeology. Examples of these techniques could include viewing field notes and maps, archeological tools, holographic images, and “electronically” looking into storage drawers.

This interface between visitors and the collections can provide a crucial link between the science and the public, and a study collection located at the park can be an excellent tool to help support that connection.

Currently, the San Juan Island National Historical Park archaeological collection is available to the public through a variety of integrated, technological means. An “online collection” project uses several different features to make artifacts accessible to researchers and interested persons.

The Automated National Catalog System (ANCS+) used for recording artifact data has a function that allows a digital image to be attached to an electronic catalog record. Staff and volunteers at the park have been producing digital images for each object in the archaeological study collection, a grouping of approximately 1,000 artifacts. These are designed to show views of an object and a detail of any diagnostic traits. This entire process of digitizing the artifacts and importing the images into the cataloging software can be shown on a monitor in the Marblemount Curation Facility. Visitors to the site can view the artifact image and catalog data as a Museum Technician or volunteer works on the project. During other times, the monitor shows a slide show of images so visitors

can be introduced to items from the archaeological collection.

These data, the ANCS+ catalog records and related digital images, are used as the basis for the online collection. Re:discovery Software, in conjunction with the National Park Service Park Museum Management Program (MMP), has developed templates so that the data can easily be accessible through the World Wide Web. A visitor to this Web Catalog can browse the catalog records, view images, and compose searches and queries to sort or filter data according to their personal research needs.

In addition to the Web Catalog, which is hosted on a server managed by the NPS Park Museum Management Program, the San Juan Island website will include archaeological and curatorial features designed to increase the availability of the collection. Articles on current excavations can be tied to artifact descriptions and images, highlighting the most recent additions to the collection. An online Research Guide will introduce visitors to the collection and guide them to representative artifacts and archival references. Additional features will illustrate conservation projects.

Utilizing technology to increase the availability of the collection would be an integral component of the transition to a research and education center. In addition to continuing the online collection project, several technology options could improve the availability of the San Juan Island National Historical Park collection and other archaeological collections the park holds that are associated with the Pig War and Hudson's Bay Company material culture and prehistoric artifacts. One project could integrate the ANCS+ catalog records with GIS data, visually tying individual artifacts to the units and strata from which they were excavated. This would allow researchers more flexibility when looking at stratigraphic variety, distribution patterns, and other types of spatial analyses. Various software programs could make this visual representation accessible through the Web, and visitors to the website, or to a park kiosk, could interact with map layers (historical features, archaeological excavations, and existing conditions) and corresponding artifacts from the collection. This would in essence place an artifact in time and space, giving visitors a historical context for an item from the collection.

Additionally, the World Wide Web could be more intensely utilized to promote the availability of the collection through virtual exhibits; interactive

educational features based on cultural resources, and online versions of archival documents like archaeological reports and photos. Overall, a research center would require online services that address collection availability for both visitors to the park and those who come via the website, and are capable of meeting the needs of researchers as well as visitors who desire an introductory or engaging view of the collection. The NPS museum management program oversees and makes the majority of decisions about museum technology.

The mission of the research and collection management for the park is to foster the analysis, interpretation, and dissemination of information relating to archaeology, archives and historic architecture. The foundations of the curatorial facility are the park's archaeological collections, the archaeological resources remaining *in situ*, the archives and the existing historic architecture of the park area. These cultural resources form an unparalleled opportunity for researchers, students, and members of the public to study within the fields of archaeology, curation and collections management, museum studies, preservation and conservation, and historic architecture. Possible research topics would include U.S. Army forts and related sites, British Royal Marine forts and related sites, fur trade farm sites, and island homesteading. The mission of the curation facility will be accomplished through the following: repository for archaeological excavations and field school, analysis of existing collections and data, expansion of archival materials, development of web-based educational tools, and the archiving of research papers.

THE NATURAL ENVIRONMENT

Geology

Located in the Puget Sound basin, the San Juan Island Archipelago consists of approximately 473 islands at low tide or 428 at high tide with a wide variety of rock types and formations. Two key geologic processes are responsible for the rugged landscape the islands are known for today—accretion of small microcontinents to the mainland and several glaciations. However, millions of years of geologic activity laid the groundwork for these events to take place. The oldest rocks date to the Devonian Period with a minimum age of 360 million years and include a complex of diorites, amphibolites, gneisses and gabbros. These ancient crystalline rocks are overlain by chert, shale, limestone, greywacke sandstone, and volcanic rocks (Easterbrook and Rahm, 1970).

Over 80 million years ago, plate tectonics set the stage for the complex geologic structure of bedrock underlying the region. Small landmasses moving eastward along the Juan de Fuca plate collided with the coastline in a relatively short period of time. Due to the intense pressure created by the collisions, the smaller landmasses were forced upward against the continental plate producing an intricate system of thrust faults along the tectonic plates and lenses (Brandon et al., 1988). Many fractures and joints in the varied bedrock are associated with this thrust system.

Later, during the Pleistocene Epoch, commonly referred to as the Ice Age, at least four glaciations occurred with alternating warmer periods. As the glaciers advanced from north to south around 18,000 years ago, they accumulated and transported eroded rock material of all kinds that varied from the size of clay to gigantic boulders (McKee, 1972). These materials aided in scraping and scouring the bedrock. Glaciers carved bays, channels, and other waterways. They shaped and rounded more resistant rock material. Striations, or gouges in the rock, are still visible today. (See photo below.). Good examples of glacially grooved bedrock occur along the southern tip of San Juan Island at Cattle Point and on glacially polished bedrock on top of Young Hill (McKee, 1972).

As the edges of the ice below, in front of, and along the sides of the glacier melted, accumulations of debris were deposited creating glacial moraines and outwash plains. Mount Finlayson, located at American Camp, is a moraine formed from glacial till and outwash sand (McKee, 1972). When the glaciers began retreating around 13,500 years ago, the lowland areas were covered with unconsolidated deposits of glacial till

and marine deposits including clay, silt, gravel, and boulders (Easterbrook and Rahm, 1970).

At the most recent glacial maximum, the ice sheet depressed the crust in this area several hundred feet. As the landscape rebounded from the immense weight of the glacier during deglaciation, waves cut benches and terraces at various elevations. Long, horizontal benches on the south side of Mount Finlayson record the emergence of this landscape, and date to approximately 13,500 years ago. The lack of tree cover and the size of these features make them some of the most visible reminders of crustal movements associated with glaciation in this part of the world (Riedel, 2004).

When compared to deposits on the mainland, glacial and interglacial deposits on the islands are relatively thin. In fact, most of San Juan Island has less than 20 feet of sediment cover. Some of the thickest deposits are associated with the southern portion of the island. Nearly all deposits at American Camp measure roughly 100 feet deep, while sediment cover at English Camp is 20 feet or less (White, 1994).

Since the end of the Ice Age, the primary geomorphic agent has been water in the form of rain, runoff, and ocean currents and tides. Because the park manages 6.67 miles of shoreline that have been greatly affected by these processes, it is important to understand how they interact. The development of beaches requires an input of loose sand and gravel along the shoreline (Downing, 1983). Coastal bluffs supply this material as they erode, and the sediment accumulates below to form beaches. Loose sand and gravel is moved in and out with the rising and falling of the tide and along the shoreline with longshore currents. Eventually, most of it is transferred to form sand bars, spits, and small capes in shallow water (Terich, 1987). Bluff erosion is critical for the natural maintenance of these shorelines because beaches will begin to narrow or erode if this sediment supply is reduced or stopped (Terich, 1987).

Topography

Most of San Juan Island is less than 400 feet in elevation. However, occasional steep slopes and rock bluffs occur throughout the gently rolling landscape. The highest point on the island is Mount Dallas at 1,036 feet located halfway between American and English camps.

The landscapes of the two park units are quite different. Located on the southeastern tip of the island, American Camp is characterized by a rolling,



Glacial striations found on bedrock within the park. NPS Photo.

windswept prairie with the highest point atop Mount Finlayson at 290 feet. The unit is open to Haro Strait to the west, the Strait of Juan de Fuca to the south, and Griffin Bay to the north. Along the southern shoreline, long gravel beaches are broken up by rock outcroppings and protected sandy coves. The northern shoreline also exhibits long gravel beaches with three temperate, marine lagoons occurring on Griffin Bay (National Park Service, San Juan Island National Historical Park, Statement for Management, 1997).

In contrast, English Camp, located on the northwest corner of the island, is settled along the tree-sheltered cove of Garrison Bay. Bell Point divides Garrison Bay to the south from Westcott Bay to the north. Much of the camp itself and part of Bell Point are somewhat level with a gradual rise from the shoreline. East of the camp, Young Hill rises abruptly to 650 feet. Rocky outcrops rise sharply along Bell Point on Westcott Bay before leveling out into woodlands. Short gravel/mud beaches occur at this unit.

Soils

Soil is an environment for the exchange of water, nutrients, energy, and air, thus, providing several essential functions. First, it supports plant growth by providing a medium for plant roots and supplying essential nutrients to plants (Brady and Weil, 2000). Soil also regulates the distribution and storage of water, recycles nutrients and organic wastes, acts as a filter for air and water, and provides habitat for organisms. It also supports physical structures and protects archaeological objects (U.S. Department of Agriculture, 2001).

Soil throughout San Juan County is derived largely from glacial sediments. Many of the soil types feature a cemented or densic horizon of glaciolacustrine (glacial lake) sediment, which serves to restrict root and water penetration through the soil profile. These soils tend to have management limitations due to seasonally

high water tables and susceptibility to soil quality degradation. Other soil types throughout the county have formed in coarser grained glacial sediments from weathered bedrock. Typically, these soils are found associated with landforms of greater local relief and have historically remained forested due to steep slopes or non-suitability for agriculture.

Both English and American camps encompass soil of both general soil types. At American Camp, most soils are at least 15 feet deep with depths greater than 50 feet in the dune area north of South Beach (U.S. Department of Agriculture, 1962). Very shallow soils and bedrock occur along the coastline. Soils associated with the prairie and slopes of Mount Finlayson are gravelly to cobbly and are somewhat excessively drained. Depending on slope gradient, runoff can be very low to low. Native vegetation is critical for preventing excessive erosion. Soils north of the redoubt tend to have a seasonally high water table because of the presence of a densic horizon.

In general, the soils at English Camp are shallow to moderately deep extending down to bedrock or densic material. The entire unit is characterized by scattered rock outcroppings and gentle to steep topographic relief. As with American Camp, there are soils with seasonally high water tables perched on a densic or cemented horizon. Generally, these soils occur on low slope gradient areas and have historically been utilized for agricultural and cultural practices. At the top of Young Hill, runoff is high due to the prevailing exposed bedrock. Between the outcrops are patches of gravelly soil that is well-drained. Forested soils on the side slopes and base of Young Hill are gravelly to cobbly and well-drained. On the north side of Young Hill, forested soils tend to have a component of volcanic ash from the eruption of Crater Lake mixed with glacial sediments. South of Young Hill, soils typically have a dark surface horizon indicative of historic grassland or an open overstory plant community. Maintaining a native vegetative cover is crucial to preventing excessive erosion where runoff is significant.

Monthly and Annual Averages for Temperature and Precipitation

Month	Maximum Temp (°F)	Minimum Temp (°F)	Precipitation (inches)
March	51.0	37.6	2.38
June	66.3	47.9	1.35
September	65.2	48.1	1.69
December	45.5	36.2	4.44
Annual Average	57.0	42.4	28.94

A detailed soil survey, *Soil Survey of San Juan Island National Historical Park, Washington*, was completed in 2005 for the park by the Natural Resources Conservation Service in cooperation with the National Park Service and the San Juan County Conservation District.

Climate

The climate of the San Juan Islands is affected by its geographical location. With the Olympic Mountains situated to the southwest and Vancouver Island, British Columbia, to the west northwest, the “rain shadow” effect produces less rainfall in the islands than the rest of the northern Puget Sound region (Heater et al., 2000). Prevailing westerly winds shed much of their moisture prior to reaching the islands.

On San Juan Island, precipitation varies significantly. Moving from south to north, the effect of the rain shadow subsides and precipitation increases. Rainfall also increases with elevation gain. The average annual precipitation near American Camp on the south end of the island is 19 inches, while ten miles to the north, English Camp’s upper slopes receive 29 inches average annual precipitation (Cannon, 1997).

The maritime air surrounding the islands also affects the climate by moderating the temperature. Compared with other northern Puget Sound locations, the summers on San Juan Island are short and cool with very little precipitation, and the winters are mild and moderately dry. Snowfall may occur, but most winter precipitation falls as soaking rain (Flora and Sharrow, 1992). At the weather station at Olga, Washington on Orcas Island, the average annual maximum temperature recorded is 57.0° Fahrenheit and the minimum is 42.4° Fahrenheit.

In general, the prevailing wind patterns are south southeast in the winter and west northwest in the summer (Washington State University and U.S. Department of Agriculture, 1966). Occasionally in the winter months, freezing temperatures and strong northeasterly winds occur when low-pressure systems off the coast mix with outbreaks of cold air moving down through the Fraser River Valley (Garland, 1996).

Weather Station

A fire weather station operated at American Camp from the spring of 1983 through 1998. It was used to obtain weather readings pertaining to fires and fire hazards. It functioned each year from June 1 until

September 20. Current technology does not require a permanent fire weather station. RAWS data are obtained from a station on Whidbey Island. Portable devices are used when fire weather is needed for park activities.

Climate Change

Climate change is defined by the United Nations Framework Convention on Climate Change (UNFCCC) as “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods” (UNFCCC, 1992). In recent years, scientific data have shown that human influence on climate systems is taking place, and evidence of climate change has already presented itself. A 2001 report by the Intergovernmental Panel on Climate Change (representing 39 countries and reporting on the greenhouse effect) projected that the average global temperature will increase by 1.4 to 5.8 degrees Fahrenheit between the years 1990 and 2100. Based on climate change modeling, the IPCC reports that most land areas will warm more rapidly than this global average. The northern regions of North America are highlighted as an area that exceeds global mean warming by more than 40 percent in each model. A 0.09 to 0.88 meter (3.5 inches to 2.9 feet) global average sea level rise is predicted by the year 2100 using computer simulated models (IPCC 2001).

According to Washington State climatologist Philip Mote, summertime temperatures in Washington State have increased an average of over 1 degree Fahrenheit in the last century. The University of Washington’s Climate Impacts Group (CIG) has done extensive research on the potential impacts of climate change in the Pacific Northwest. In the San Juan Islands specifically, concerns related to climate change include rising sea levels and intensified storm events. CIG computer modeling has predicted accelerated warming in Washington State from 1990 to 2050. This modeling shows an increase of approximately 2 degrees Fahrenheit for the San Juan Island area. According to CIG, sea level rise could affect the San Juan Islands, and would affect different areas of the island differently, based on local factors such as beach slope, vertical land movements, land use, and land cover. Potential effects of higher sea levels could include increased erosion, bluff landsliding, salt water intrusion of coastal aquifers, and inundation of low-lying areas (University of Washington, 2007). Climate change could also result in increasing water temperatures, threatening the island’s surrounding

marine areas, including the habitats of salmon and the endangered southern resident Orcas. On land, non-native plants as well as pathogens are expected to increase. Already-rare plant and animal species that have narrow habitat requirements and limited dispersal ability may be particularly vulnerable to loss. While precipitation in the rainy season is likely to increase, there is also the likelihood of increased summer droughts. Moisture stress, higher temperatures, and invasive non-native species could all be expected to contribute to a change in the fire regime.

Within lands managed by the National Park Service nationwide, climate change has already had noticeable impacts on both natural and cultural resources (National Park Service and NASA, 2006). Conditions for sustaining the health and prosperity of animal and plant habitats, glacial, marine, and wetland ecosystems have been diminished and changing patterns of weather and natural hazards such as flooding and wildfires have damaged habitat areas and cultural resource sites. Invasive species of plants and pests, such as bark beetles, are encroaching into areas where they have not previously survived, and threatening the native plants, as well as the animals that rely on those plants for food and shelter.

In response to the increasing need for understanding and action related to climate change impacts in the parks, the NPS has partnered with the Environmental Protection Agency through an interagency agreement to create the Climate Friendly Parks Program. This program enables the NPS to educate its staff about climate change issues, assess the park's contribution to greenhouse gas emissions, create short- and long-term strategies for reducing emissions, determine potential effects of climate change on park resources, and develop skills and strategies for communicating these effects to the public.

Air Quality

Air quality on San Juan Island is regulated by the Environmental Protection Agency and the Washington Department of Ecology. The EPA has established National Ambient Air Quality Standards (NAAQS) to protect the health and welfare of the public for the six so-called "criteria" or conventional pollutants: carbon monoxide, ozone, nitrogen oxides, sulfur dioxide, lead and fine particulate matter. Ecology has established ambient standards for the state of Washington, which are identical to the federal NAAQS except for more stringent sulfur dioxide standards. The Washington

Department of Ecology is also responsible for developing and implementing state implementation plans that will assure compliance with state and federal ambient air quality standards. Both agencies share responsibility for conducting air quality monitoring, evaluation, and regulation of hazardous air pollutants and the regulation of industrial sources, motor vehicles, and area sources (such as woodstoves, open burning, and small scale sources like dry cleaners and gasoline stations).

Air quality in the Pacific Northwest region is good compared with other areas of the United States (Eilers, Rose, and Sullivan, 1994). Principal air masses for the region are derived from the atmosphere over the Pacific Ocean where the air is clean and moist. Occurring on a regular basis, wind-driven mixing through the Strait of Juan de Fuca effectively disperses air pollution (Puget Sound Clean Air Agency, 2003). Consequently, air pollutant loads are relatively low. However, long-range transport of pollution from Asia may become a growing concern as development occurs in that region (Jaffe, et. al. 2003).

As demonstrated by the emission inventory for San Juan County, sources of air pollutants on the islands are few, predominately from occasional outdoor burning, wood burning stoves, and vehicle emissions. Only two industrial sources of air contaminants in the county have been listed in the state emission inventory. These sources are the Friday Harbor Incinerator and Friday Harbor Sand and Gravel, both of which are now closed (Garland, 1996). There are several large industrial sources in the adjacent counties including petroleum refineries in Bellingham and Anacortes, an aluminum smelter in Bellingham, and a large pulp mill in Port Townsend. Air quality is generally good with nearby particle monitoring stations at Oak Harbor, Anacortes, and Mount Vernon showing no danger of exceeding ambient air quality standards (Franzmann, 2003).

However, the islands are located in the Puget Sound/Georgia Basin airshed subject to the movement of air pollutants between the large urban/industrial areas of Seattle/Tacoma/Everett and Vancouver/Abbotsford/Bellingham, as well as, the busy Interstate 5 corridor and increasing marine vessel traffic. Recent international efforts to characterize cross-boundary airflow indicate that ozone pollution from both countries may converge around the northern San Juan Islands creating a heretofore unknown hotspot. Additional modeling and/or monitoring will be needed to verify these preliminary results. Concern is also growing over increasing marine vessel traffic and

associated emissions in the Georgia Basin and Puget Sound airshed (Environment Canada, 2004).

In response to the international study which indicated the possibility of an ozone “hotspot” in the San Juan Islands, the NPS deployed passive ozone samplers at both American Camp and English Camp for one summer in 2004. Passive ozone monitoring provides a low cost means to immediately provide basic ozone exposure data for areas that have not previously been

monitored. However, because the measurement is an integrated ozone exposure over a one-week period, the results cannot be used to determine nonattainment of the EPA NAAQS for ozone which are based on 8-hour averaged ozone levels. The passive samplers can only provide basic information on the ozone exposures and information about spatial variation in ozone exposure (National Park Service 2007). The results of the 2004 sampling are displayed in the table on page 121.

San Juan County Emission Inventory for 2005

	PM-10	PM2.5	DPM	SO2	NOx	VOC	CO	NH3
Industrial Sources								
Surface Coating & Solvents						81		
Gasoline Stations						15		
Residential Fuel Use	1	1		6	6	0	2	
Woodstoves, Fireplaces	65	65		1	8	136	491	
Outdoor Burning - Agricultural								
Outdoor Burning - Residential	18	16		1	4	22	78	
Livestock Waste								48
Fertilizer Application								31
Agricultural Tilling and Harvesting	5	1						
Wildfires, Structure and Vehicle fires						0	1	
Natural Emissions (Soil and Vegetation)					64	3,031	727	5
Onroad Vehicles	2	2	1	2	94	65	805	3
Paved and Unpaved Road Dust	224	20						
Land-based Nonroad Mobile Sources	16	15	8	12	106	251	2,517	0
Locomotives								
Commercial Marine Vessels	49	40	40	501	834	28	86	
Recreational Boats	4	4	0	2	26	249	687	0
TOTAL	384	164	50	524	1,143	3,878	5,394	87

San Juan County Emission Inventory for 2005 as reported by the Washington Department of Ecology¹

Sources of Emissions	County-Wide Emissions in Tons per Year ²							
	PM-10	PM2.5	DPM	SO2	NOx	VOC	CO	NH3
Industrial Sources								
Architectural Surface Coating						25		
Gasoline Stations						15		
Residential Fuel Use	1	1		6	6	0	2	
Woodstoves, Fireplaces	65	65		1	8	136	491	
Outdoor Burning - Agricultural								
Outdoor Burning - Residential	18	16		1	4	22	78	
Livestock Waste								48
Fertilizer Application								31
Agricultural Tilling and Harvesting	5	1						
Wildfires, Structure and Vehicle fires						0	1	
Natural Emissions (Soil and Vegetation)					64	3,031	727	5
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Locomotives								
Commercial Marine Vessels	49	40	40	501	834	28	86	
Recreational Boats	4	4	0	2	26	249	687	0
TOTAL	384	164	50	524	1,143	22,838	5,394	87

¹ http://www.ecy.wa.gov/programs/air/EmissionInventory/EmlnvSummary_2005.xls

² **PM-10:** particulate matter less than or equal to 10 microns in diameter
PM2.5: particulate matter less than or equal to 2.5 microns in diameter
DPM: particulate matter less than or equal to 2.5 microns in diameter from diesel combustion
SO2: sulfur dioxide
NOx: nitrogen oxides
VOC: volatile organic hydrocarbons
CO: carbon monoxide
NH3: ammonia

Except for the passive ozone monitoring in 2004 conducted by the NPS (and the visibility camera noted in the following paragraph), no air quality monitoring has been conducted in San Juan County. Since there is no monitoring data that can be used to assess compliance with the NAAQS, San Juan County is “unclassifiable” for all criteria pollutants under the Clean Air Act. In other words, the county cannot be classified on the basis of available information as meeting or not meeting the NAAQS for any pollutant.

The park has been designated a Class II area under the Clean Air Act. The 1977 Clean Air Act amendments designated all national parks over 6,000 acres and wilderness areas over 5,000 acres as Class I. This classification affords the most protection from new major emitting sources. All other areas that meet the National Ambient Air Quality Standards are Class II areas for purposes of controlling increases in air pollution under the 1977 Clean Air Act. For a brief period in 2001-2003, the park operated a visibility camera at American Camp as part of the network inventory and monitoring program. This camera took three pictures daily of a fixed vista of the Olympic Mountains to the southwest in order to establish baseline visibility data and to detect visible air pollution that may travel through the Strait of Juan de Fuca (Air Resource Specialists, Inc., 2001). The photos have not been analyzed, as funding ran out and the camera was removed.

The park units, American Camp and English Camp are in rural areas of the island where there is a low level of development. There are no sensitive receptors (such as hospitals, schools, nursing homes) near the park.

Water Resources

Hydrology

Runoff, evapotranspiration, and groundwater recharge are three key components of the region’s hydrologic cycle, and they affect the yield and distribution of water within a watershed. Runoff is water that flows from the land surface to a water body with no filtering process, and it can carry pollutants, loose soil, and debris into the body of water in which it drains. It is affected by topography, vegetation, soil type and depth, and precipitation. The runoff on San Juan Island is proportionately high due to exposed bedrock and impervious soil layers. During the winter months, runoff is more prevalent due to heavy rainfall and saturated soils. Of the average annual rainfall, anywhere from 11 to 45 percent results as runoff (Heater et al., 2000). This figure is dependent upon variations in precipitation and the effect of evapotranspiration. (See Figure 17: English Camp: Hydrology and Figure 18: American Camp: Hydrology.)

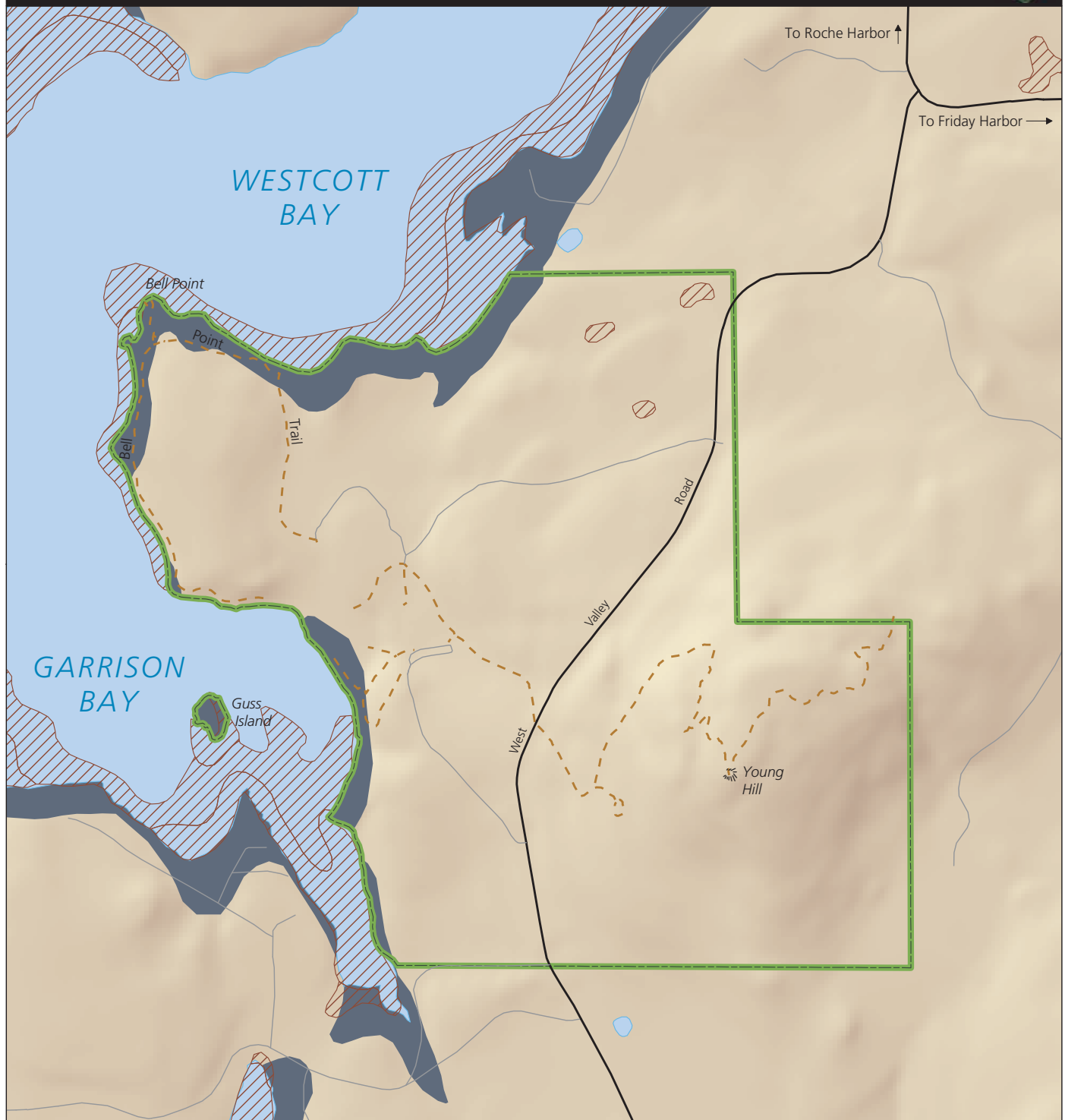
Accounting for the greatest annual water loss, evapotranspiration, or evaporation and transpiration, is the cycling of water to the atmosphere from surface water, soils, and plant surfaces. The amount of water lost to evapotranspiration varies with land cover and relief. An estimated 45 to 49 percent of the annual average rainfall is lost to evapotranspiration (Heater et al., 2000). However, depending on the characteristics of the watershed, the loss can be much greater. On the island, evapotranspiration is greater than precipitation during the summer months because rainfall is minimal and plants are actively respiring.

When the final melting of the glaciers occurred, all fractures, cracks, and loose glacial outwash materials underlying the region were supercharged with freshwater. Today, groundwater recharge is supplied in the form of local rainfall. Water available for groundwater recharge is the remainder of the total annual precipitation that is not lost to runoff or evapotranspiration. Recharge almost exclusively occurs from October through April when precipitation is high and evapotranspiration is low. Because geology,

Summer 2004 Passive Ozone Monitoring Summary (ppb)				
	Average	Maximum	Minimum	Standard Deviation
English Camp	14.1	21.4	4.3	4.5
American Camp	20.3	31.3	8.8	5.2

English Camp: Hydrology

San Juan Island National Historical Park GMP/EIS



- 100-Year Floodplain
- Wetland
- Park Boundary
- Primary Road
- Secondary Road
- Trail

0 500 1,000
Feet



Figure 17

Produced by: National Park Service
PWRO-Seattle GIS Group

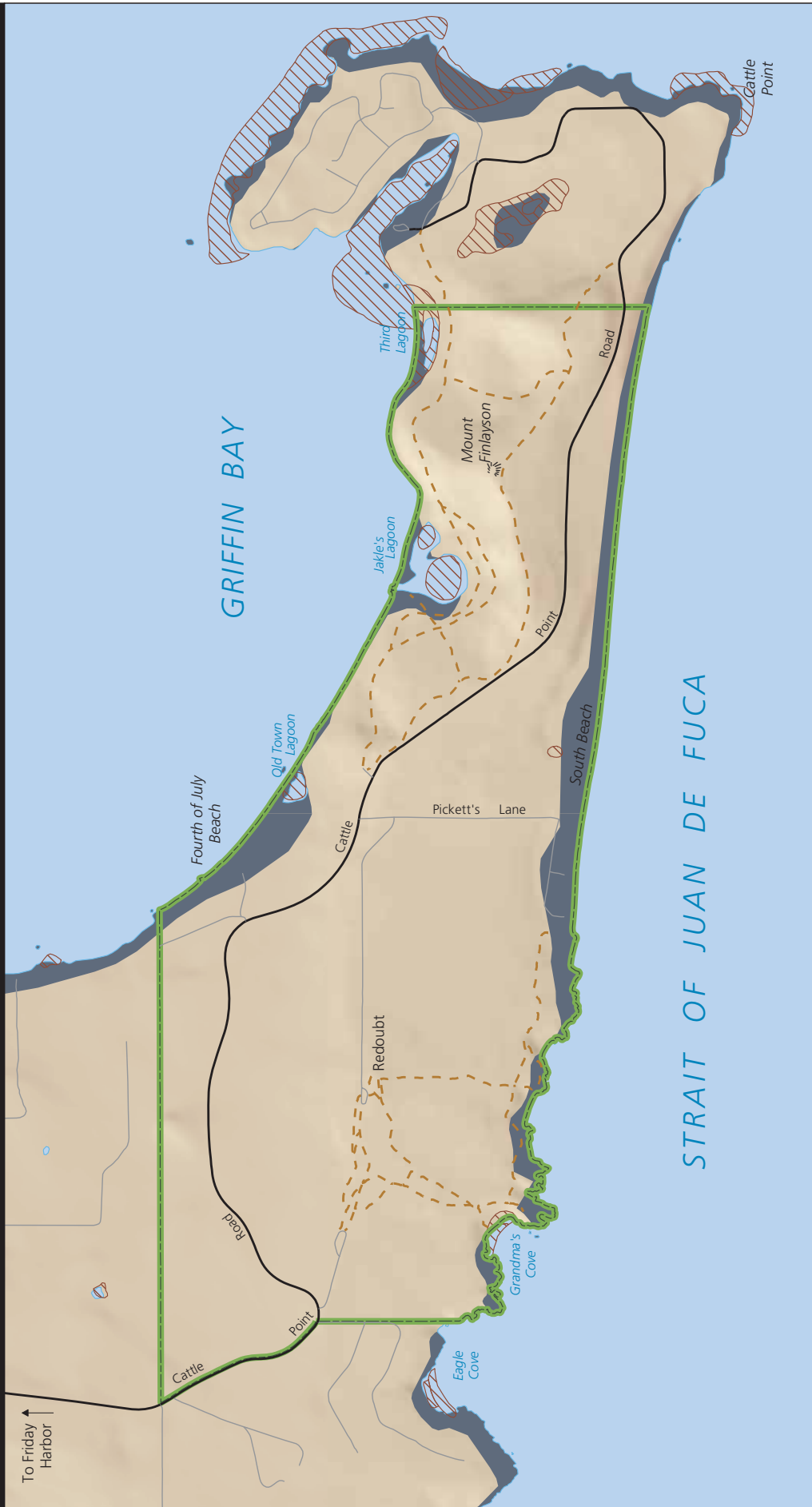
Date Created: February 28, 2007

Data Sources: FEMA - floodplains
NPS - lakes, park boundary, roads,
shoreline, trails
NWI - wetlands
USGS - shaded relief

i:\gis\arcmapdoc\sah\gmp\ec_hydrology_v4.mxd

American Camp: Hydrology

San Juan Island National Historical Park GMP/EIS



Produced by: National Park Service, PWRO-Seattle GIS Group
 Date Created: February 28, 2007
 Data Sources: FEMA - floodplains
 NPS - lakes, park boundary, roads, shoreline, trails
 NWI - wetlands
 USGS - shaded relief
 i:\gis\arcmapdoc\sjnh\gmpac_hydrology_v4.mxd

Figure 18

soil type, topography and vegetation influence the rate and amount of water infiltration, recharge rate is site specific (Orr et al., 2003). Wetlands increase infiltration by providing a water storage site. The water is filtered as it slowly seeps into the aquifer. Recharge for San Juan County is estimated at approximately 1.99 inches and 6 percent of total rainfall (San Juan County, Water Resource Management Plan, 2004). American Camp has been identified as an area of significant recharge (Klinger et.al., 2006).

Groundwater

In the region, fresh groundwater occurs as a lens floating atop the denser saltwater in two major aquifer types (Johns, 1997). Fractured bedrock aquifers provide little filtration and water yield is typically low. Glacial outwash aquifers can provide better filtration because the water occurs in the spaces between loose sand and gravel. The yield from these aquifers is generally greater than fractured bedrock, but they tend to be more susceptible to saltwater intrusion. Salt water intrusion occurs when fresh water is removed from an aquifer faster than it is replenished (Flora and Sharrow, 1992). Given the complex geology underlying the island, it is difficult to determine the amount of water available. Shortages often occur during summer months when rainfall is minimal and visitation is at a peak.

Groundwater is the only sizable source of fresh water in the park. It supplies domestic needs, contributes to the park's wetlands and springs, and is necessary for wildlife habitat and proper ecological function. Both aquifer types occur at American Camp, but only one well is in operation drawing from a fractured bedrock aquifer. Located on the western boundary of the unit, this well supplies the needs of the temporary visitor center. At English Camp, groundwater occurs in unconsolidated beach deposits, which are highly susceptible to saltwater intrusion, and in fractured bedrock aquifers. Water is drawn from bedrock aquifers by means of two wells with low yields at this unit. This water supplies the maintenance facility, the Volunteers in the Park (VIP) trailer pads, the Oregon Museum of Science and Industry (OMSI) summer camp site, and a drinking fountain in the parking lot. Low yielding wells (one-quarter to a few gallons per minute) are indicative of the water supply at English Camp (Werrell, 1994).

Water Uses and Rights

Maintaining a balance between the domestic, biological, and physical water supply needs is a goal

at the park. In order to properly meet each of these requirements, the park must balance three main water rights issues; water rights for administrative purposes, water rights for the protection of park resources, and responding to requests for the exportation of water to adjacent developments from wells within the park (Flora and Sharrow, 1992).

Local agreements recognize both units as separate water utilities, providing the NPS authority to review and accept or reject any action on park boundaries that may affect the water resources within the park (National Park Service, San Juan Island National Historical Park, Statement for Management, 1997). In accordance with NPS policy, the park has consistently denied requests from adjacent developments to access water from within park boundaries due to the possibilities of exhaustion of park freshwater supplies and detrimental effects on water-dependent resources. In addition, a shared water system is generally in conflict with NPS policy and laws (Johns, 1997). Water rights and supply issues vary between the two units.

At American Camp, with below average annual rainfall and increasing development adjacent to park boundaries, there is a great concern for water quality and availability. The well supplying water to the visitor center maintains a certified water right to pump 3.5 gallons per minute or 5,000 gallons per day. This supply is sufficient for current needs, but the water tests high in total suspended solids and chloride rendering it undesirable as drinking water. It is located within close proximity to several private wells, and all of them are situated within one-half mile of the ocean (Johns 1997). If all wells are in use simultaneously, the potential for salt water intrusion is high.

Another concern at American Camp is aquifer drawdown as a result of adjacent developments withdrawing groundwater from a glacial drift aquifer that extends across the boundary of the park. If occurring, this drawdown may have an impact on the unit's water quality and water-dependent resources including wetlands, seeps, and the three marine lagoons along Griffin Bay. As stated previously, it is difficult to determine groundwater availability given the complex regional geology. Most of the recharge area for this aquifer also lies within the park boundary. Jakle's and Third lagoons are located just north of the aquifer's perimeter. The hypothesis that the aquifer discharges freshwater into the lagoons has not been thoroughly researched, therefore, quantity and timing of discharge are unknown (Johns, 1997). No certified water rights are associated with the lagoons or wetlands, as it is uncommon for the Department of

Ecology (DOE) to issue a water right for an *in situ* use without some kind of 'control' of the water (Johns, 1997).

There is little documentation of the water rights associated with English Camp where two wells and a cistern are used to supply fresh water to the unit. The cistern collects water that is utilized for watering the formal garden. In 2000, a well was drilled to supply the needs of the maintenance facility including a low-water washing machine, two sinks, and one toilet. The water is not potable. This well replaced two low yielding wells that were constructed by the previous landowner on private property just east of the maintenance facility. A second well supplies water to the drinking fountain in the parking lot, two VIP trailer pads, and the OMSI summer campsite. It appears that both wells meet the exemption conditions set forth by the DOE; therefore, obtaining a certified water right is not required. Documentation of beneficial use establishes the priority of an exempt well. Exempt rights receive the same protection as certified rights. However, the need to protect the right may be unknown because the DOE does not maintain an official record of exempt rights. Ensuring the proper protection of the water supply is essential due to low yielding wells coupled with increasing subdivision and development taking place on the adjacent shorelines.

Surface Water and Wetlands

While no large bodies of fresh surface water occur within the park, significant wetland areas are present at both units. These wetlands support wildlife populations, and serve as key water filters and storage sites. Many are only small seeps and springs, but a variety of small mammals, reptiles, amphibians, and birds have been observed in and around these wetland sites (Holmes, 1998). Fresh water wetlands are critically important for wildlife on an island with very few fresh surface water features.

In 1998, the wetlands of the park were inventoried and mapped. A total of 35 wetland areas comprising 91.9 acres (5 percent of total park area) were identified (Holmes, 1998). At English Camp, nine wetlands were documented. Several of the sites have been invaded by non-wetland plants, presumably, due to the drought conditions in the early 1990s (Holmes, 1998).

Twenty-six wetlands are scattered throughout the American Camp unit. Many are small seeps and springs, but larger wetland sites occur on the northern side of Mount Finlayson. Located near the end of

Pickett's Lane on South Beach is the site of an historic spring that played a role in the siting of the first American Camp.

The three temperate marine lagoons (First, Jakle's, and Third lagoons) located along the shore of Griffin Bay are also designated as wetland areas. Because they are rare to the Pacific Northwest coast, these features are valuable ecological resources (Flora and Sharrow, 1992). Jakle's Lagoon, the largest body of surface water in the park, has been designated as an Environmental Study Area, and the University of Washington Friday Harbor Labs has conducted ecological research of marine life at this location (Flora and Sharrow, 1992). Studies show that regular circulation occurs with the bay, but salinity in the lagoon is lower than salinity of the seawater, possibly indicating a groundwater inflow from the aquifer underlying Mount Finlayson.

Water Quality

Overall, water quality in the region of the park is relatively high. Marine waters surrounding the islands are typically of high water quality and are rated class AA (Garland, 1996). Located at the intersection of the Strait of Juan de Fuca and the Strait of Georgia, these waters are well flushed by the strong tidal currents. However, little mixing occurs with enclosed inlets and bays making them susceptible to bacterial and nutrient loading particularly when anthropogenic inputs are a factor. Westcott and Garrison bays are protected bays that are poorly flushed. In 2000, the Washington Department of Ecology and the San Juan County Department of Health and Community Services conducted a water quality survey including a site located in Garrison Bay off the shore of the parade ground at English Camp. The site met Class AA standards for fecal coliform and pH, and Class A standards for temperature and dissolved oxygen (Wiseman, 2000). The Washington DNR recently initiated water quality studies in Garrison and Westcott bays in an attempt to determine possible causes for loss of eelgrass in the area. Data are not yet available

By far, saltwater intrusion is the primary source of groundwater quality degradation in this region, and high chloride levels are used as an indicator. Recovery to a suitable water source is a slow process once seawater has contaminated an aquifer. Acting to prevent saltwater intrusion is of utmost concern for the park, particularly at American Camp, in order to maintain an adequate fresh water supply.

The water systems at San Juan Island National Historical Park are monitored by a certified operator and properly disinfected. All drinking water construction projects are reviewed by the NPS office and reviewed/approved by the Washington Department of Health (DOH) drinking water program. There are no new projects currently under development at this time, however when these projects are proposed the NPS adheres to all applicable Federal/State drinking water regulations. The park currently works closely with the WA DOH since this is the primary agency for drinking water systems. All water systems have been surveyed.

The NPS also has a well head protection plan to ensure that no contamination will enter via the park's three wells, minimizing any potential adverse effects from activities. The most recent survey indicated no hazards to the American Camp well, other than proximity to the road. (John Leffel, personal email communication, 2008).

A Public Health Consultant and park staff routinely conduct tests to ensure the park is complying with the state of Washington Department of Health drinking water standards. Water samples are collected at each of the two public water systems twice per month for bacterial analysis. The samples are collected mostly at points of discharge in the restrooms at the American Camp Visitor Center, the outside faucets, and the hookup-faucets at the Volunteer-in-Park (VIP) trailer hookups. American Camp is monitored year-round and English Camp is monitored when the area is in use and/or being prepared for use, typically May through October. Samples are sent to a private, state-approved facility for analysis and results are then sent to the park and Washington Department of Health offices. To date, all bacterial samples have been negative (Christopher Davis, personal email communication, 2008). The park also conducts an annual nitrate test, also required by Washington state water quality regulations. To date, the park has been in compliance with water quality standards for this criterion. There park has one non-public water system located at the maintenance shop and bacteriological testing is performed on this site on an annual basis, even though it is not required by the state. (John Leffel, personal email communication, 2008).

Little work has been conducted regarding surface water quality in the park. Salinity and conductivity were recorded during the 1998 wetland inventory, but no other water quality parameters were tested. Even though relatively few surface water sources occur in

the park, up to date surface water quality data would be very useful information for determining resource management decisions.

Watersheds

English Camp is located in the approximate center of the 3,609-acre Westcott-Garrison Bay watershed (Larkin, 1999). A series of intermittent lakes, wetlands, and streams drain into Garrison Bay while two significant creeks and one, small drainage flow into Westcott Bay. This watershed was ranked third in importance in the San Juan County Watershed Ranking Report of 1988. It was given priority because the calm, protected waters of these bays exhibit unique intertidal and marine habitats. The moderate to low wave action has allowed for the formation of extensive mudflats. These conditions are required for the growth of large eelgrass beds, which are important habitat for forage fish. The bays are also very productive sites for shellfish, and they are the primary shellfish harvest location on the island. Additionally, they are popular locations for boaters, and overnight mooring occurs here often.

Land and water use can impact the quality of water in the watershed. Forested lands, which help reduce runoff, dominate the watershed with small agricultural plots scattered throughout. Primarily, these 10 to 20 acre farms raise livestock, and the animals have direct access to streams and adjacent riparian land. The average lot along the shoreline of Westcott Bay and the western edge of Garrison Bay is one-half to two acres in size, and the development potential has nearly been reached (Larkin, 1999 and Thompson, 2007). Several failing septic systems have been identified in the watershed, and a program has been established to repair those (Heater et al., 2000).

With regards to water-based activities, there are no mooring buoys in the bays, but the calm waters are an ideal location for boating gatherings. Boaters must drop anchor, which disturbs the marine floor, and the nearest holding tank pump-out facility is located at the Roche Harbor Marina. Because the shoreline directly affects the estuarine region of these water bodies, higher density housing and increased activity pose significant influences on the ecosystems associated with the bays.

In 1997 and 1998, water quality testing of sites within the watershed indicate that runoff events are the likely cause of bacterial pollution entering creeks and the bays (Heater et al., 2000). Areas with little vegetative diversity, primarily occurring on agricultural lands,

as well as the upper reaches of the watershed have a high potential for erosion and runoff. However, wetlands occur throughout the watershed where the soil is inadequately drained, and they help mitigate the effects of runoff by collecting and filtering water.

The land and water resources protected at English Camp are important for the quality of water and habitat found in this watershed. Wetlands and saltwater marshes are preserved, and development will not occur along the shoreline. However, the heavy boating associated with the bays is, in part, related to park usage. Another form of protection within the capability of the park is to provide information regarding the value of the bays and water quality in the watershed.

A watershed has not been defined at American Camp. However, water tends to flow from higher elevations toward the coastline. This premise can be applied to the slopes of Mount Finlayson. Problems associated with runoff are not as great at American Camp for two main reasons: the slopes of Mount Finlayson are not as steep as Young Hill, and the geology and soils occurring along the southern portion of the island allow for greater water infiltration. However, runoff escalates due to the presence of invasive species. (Refer to “Invasive Species” section under “Vegetation”.)

Marine Water

While the marine water and associated ecosystems are generally of high quality in the San Juans, many groups, organizations, and government agencies, including the park, are proactively working toward studying, preserving and restoring the resources of the marine waters surrounding the islands. In order to enhance the management of shoreline resources, the park is working toward defining tidal ownership of the 6.67 miles of coast along the borders of the park.

Jurisdiction is patchy along the coastlines at both camps, with tideland ownership sometimes being concurrent with adjacent uplands, but more often retained by the state and under the jurisdiction of the Washington Department of Natural Resources. The park has recently obtained records that document where tidelands were sold to the park and where they were retained by the state. From the cliffs west of Alaska Packer’s Rock to east of the restrooms at South Beach, the park’s jurisdiction extends to the extreme low tide line. East of that to the eastern boundary, jurisdiction extends to the mean high tide line. The jurisdictional line meanders from Grandma’s Cove to the western boundary of the park and along a short

stretch of shoreline north of Jakle’s Lagoon. The park’s authority extends to the mean high tide line along Fourth of July Beach from the northwestern boundary to west of First Lagoon. At English Camp, the park owns tidelands from the northern edge of the parade ground south to the park boundary. The remainder are owned by the state. An old oyster bed lease off Belle Point recently reverted to state ownership.

Marine Protected Areas

Executive Order 13158 of May 2006 was passed to help protect the significant natural and cultural resources within the marine environment by strengthening and expanding the Nation’s system of marine protected areas (MPAs). Marine protected areas are defined as “any area of the marine environment that has been reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein.” The purpose of this order “is to, consistent with domestic and international law: (a) strengthen the management, protection, and conservation of existing marine protected areas and establish new or expanded MPAs; (b) develop a scientifically based, comprehensive national system of MPAs representing diverse U.S. marine ecosystems, and the Nation’s natural and cultural resources; and (c) avoid causing harm to MPAs through federally conducted, approved, or funded activities.”

In the San Juan Islands, the Transborder MPA Initiative is a joint undertaking by the Islands Trust, San Juan County, and the Sound and Straits Coalition of nongovernmental organizations, whose purpose is to generate local, citizen-led efforts to increase public awareness of the state of the marine resources and to take action to protect and sustain them by designating a network of marine protected areas in the Orca Pass International Stewardship Area.

The Orca Pass International Stewardship area encompasses the entire boundary area between San Juan County and the Canadian Gulf Islands. The area is rich in natural scenery, marine biodiversity, environmentally sensitive habitats, and places of cultural and spiritual importance to Coast Salish tribes and First Nations on both sides of the border. The Islands Trust and San Juan County have little or no authority to influence fishery harvests, control international shipping, affect recreational boating activities, or control industrial pollution in these areas. However, these entities work to engage communities of people on the islands that live closely with the

marine environment and care deeply about the long-term effects of human activities on these critically important resources.

The Orca Pass Marine Protected Area Initiative promotes the creation of an integrated network of MPAs, with multiple areas designated on both sides of the border. These MPAs can protect and help to restore a range of habitat types. A network can accomplish much more than one or two small, isolated MPAs. This connectivity is increasingly important in the transboundary waters, where international vessel traffic of all kinds is among many competing human uses. Given the role of treaty tribes as co-managers of marine organisms and habitats, and the limited authority of local governments in the marine environment, the designation of MPAs by the Islands Trust and San Juan County requires voluntary restrictions and emphasizes public education and awareness about marine resources and their need for protection (Marine Resource Committee, 2007).

Additional Marine Stewardship in the Islands

In January 2004, the San Juan Board of County Commissioners designated the entire county as a Marine Stewardship Area in an effort to protect the rich marine diversity of the San Juan archipelago. This designation set the course for the Marine Resources Committee (MRC) to identify key action steps toward a healthier and more sustainable island marine ecosystem for the natural resources and the benefit of the people who live, work and recreate in the San Juan Islands. The MRC prepared and finalized the San Juan County Marine Stewardship Area Plan in July 2007, identifying education, community stewardship, management and planning, coordination, and research strategies in order to protect and restore the entire marine system in the San Juan Islands.

The Islands Trust and San Juan County have also developed a Marine Management Area Workbook. This Workbook is designed to help local island communities and others to identify sites for marine stewardship and establish Marine Management Areas in effective collaboration with other jurisdictions, citizen groups, and island communities. The workbook is available from the Islands Trust, the San Juan County Planning Department, and on the internet (Marine Resource Committee, 2007).

San Juan County Marine Resources Committee

The San Juan County Marine Resources Committee (MRC) is a citizen-based advisory committee

dedicated to the protection and restoration of marine resources in the San Juan Islands. The San Juan MRC was created to provide a citizen-based forum to advise the Board of County Commissioners on marine issues. First established in 1996, MRC serves to represent all members of the local community, including commercial users, scientists, environmentalists, fishers, and whale watch operators.

The MRC receives funding and support through the Northwest Straits Commission (NWSC) and San Juan County. Marine Resource Committee members are selected by the San Juan County Council and represent local government, tribal government, and the scientific, economic, recreational and conservation communities.

The goals of the San Juan County Marine Resources Committee are: to protect and restore nearshore, estuarine and rocky reef habitats; to support salmon and bottomfish recovery by establishing marine protected areas; and to promote public awareness about marine resource issues.

The San Juan MRC was created to provide a citizen-based forum to advise the Board of County Commissioners on marine issues. First established in 1996, the MRC serves to represent all members of the local community, including commercial users, scientists, environmentalists, fishers, and whale watch operators (San Juan County Marine Resources Committee, 2007).

Marine Managers Workshops

San Juan Island National Historical Park has participated in three marine managers' workshops sponsored by the Northwest Straits Commission and the MRC in recent years. This forum provides an opportunity for resource managers to collaborate on marine and tideland protection in a variety of ways, including the county's Marine Stewardship Initiative and an Aquatic Reserve nomination currently being drafted.

Northwest Straits Commission

The Northwest Straits Commission provides guidance and offers resources to the MRCs, with the goal of mobilizing science to focus on key priorities and coordinating regional priorities for the ecosystem. As with the MRCs, the Commission uses performance benchmarks developed by the citizens commission as measurable goals.

The Commission's principal work is to: provide focus on the overall health of the Northwest Straits marine ecosystem; develop and propose scientifically sound recommendations to existing governmental authorities; and to direct and coordinate scientific, technical and financial support to the marine resources committees.

The Commission serves as a "board of directors" for the Northwest Straits Marine Conservation Initiative. Its members represent each of the marine resources committees, tribes, the Puget Sound Action Team and additional appointments by the Governor. Financial administration is provided by the Department of Ecology through the Padilla Bay National Estuarine Research Reserve (Northwest Straits Commission, 2007).

Puget Sound Partnership

The Puget Sound Partnership is a state agency established in the Washington State Legislature in 2007. The Partnership works collaboratively with all levels of government, tribes, businesses, and citizen groups in its charge to lead and coordinate efforts to protect and restore Puget Sound by 2020.

The Partnership is governed by a Leadership Council of independent citizens from around Puget Sound and is advised by an Ecosystem Coordination Board and a Science Panel. An Executive Director leads day-to-day operations and employs a professional staff including the former staff of the Puget Sound Action Team. As of January 2008, the regional salmon recovery functions performed by Shared Strategy for Puget Sound become the responsibility of the Partnership.

The Partnership is working with a vast array of people, groups, businesses and governments to create a long-term plan called the "2020 Action Agenda" by September 2008. The Action Agenda will be informed by an independent Science Panel and it will cover the entire ecosystem affecting Puget Sound. The Action Agenda will identify and assign priorities to actions needed to get to a healthy Puget Sound by 2020, name those responsible for the actions, and identify funding. The Action Agenda will also hold all parties accountable for their actions by tracking progress and reporting the results publicly. In addition, the Partnership will launch an education effort to bring ordinary citizens, businesses and others up to speed on the Sound's health issues and to inspire them to action (Puget Sound Partnership, 2007).

Personal Watercraft Ban

Personal watercrafts (PWC) are also known by the trademark name "Jet Ski." Personal watercraft impacts can include water quality degradation, noise pollution, harassed and injured wildlife, and increased boating accidents. The two-stroke engine often utilized in PWC discharges up to one-third of its fuel, unburned, into the air and water. This engine style also produces hydrocarbons, a primary factor in the formation of smog. Emitting as much pollution over a period of just a few hours as a new car driven for 100,000 miles, many involved in the PWC industry are exploring alternatives to the two-stroke engine (New York State Department of Environmental Conservation, 2000).

In 1996, San Juan County passed an ordinance placing a two-year ban on personal watercraft. The ban was found unconstitutional by the Whatcom County Superior Court in November 1996 because state boat licensing does not distinguish a difference between PWC and other vessels (*Weden v. San Juan County* [135 Wn.2d 678]). The argument claimed that there was no basis for treating PWC differently than any other boat.

The county appealed and almost two years later the decision was reversed by the Washington State Supreme Court in November 1998, upholding the county's authority to ban PWC use (*Coastlines* 1999). The state constitution allows counties to pass laws that protect the public health, safety, and general welfare. Because PWCs are detrimental to the health of humans as well as the health of the marine environment, this finding allows counties to differentiate between PWCs and other watercraft even though Washington State boat licensing does not.

Forage Fish Habitat Assessment

Friends of the San Juans (Friends) is a local non-profit organization concerned with the health of Puget Sound. They are participating in the San Juan County Forage Fish Habitat Assessment. This multi-year project has combined federal, state, and county agencies with scientists and citizen volunteers to identify and map forage fish habitat in San Juan County. The project has covered 414 miles of shoreline, identifying 47 known surf smelt and Pacific sand lance spawning locations (Whitman, 2003). Since the inception of the project in 2001, Friends has surveyed over 500 potential spawning sites on 19 islands in the archipelago locating 25 previously unknown spawning beaches (Whitman,

2003). Partners involved in the project include the University of Washington Friday Harbor Labs and the Washington Department of Fish and Wildlife.

Oil Spill Prevention Plan and Preparedness

In the event of an oil or hazardous substance spill, the park is prepared with the proper procedures and protocol listed in the *San Juan Island National Historical Park Oil and Hazardous Substance Spill Plan* (1993). A spill within the park would be reported to the appropriate NPS staff, Washington State Department of Ecology, and the San Juan County Sheriff's office (County Dispatch-911). Either the Island Oil Spill Association (IOSA) or the county Hazardous Materials Incident Command Agency would respond to the incident. Park staff would monitor the activities, keep NPS support staff advised of the situation, and would assist as needed. Currently, two park employees are active members of IOSA.

Generally, if a spill occurs in the marine waters adjacent to the park, the Coast Guard would be informed before the park. They will be responsible for making the appropriate contacts and initiating clean-up. In this event, the park would provide assistance and comply with the procedures set forth by the Coast Guard.

University of Washington Friday Harbor Laboratories

The University of Washington Friday Harbor Laboratories (Labs) are world renowned for their excellence in marine biology and oceanography research and education. The facilities include nine laboratories and over 1,500 acres of biological reserves in the San Juan Islands. The park has partnered with the Labs on several occasions, and the results have produced a greater understanding of the shoreline, intertidal zone, and marine resources associated with the park.

The Whale Museum

The Whale Museum operates a Soundwatch Boater Education Program in order to respond to the pressures of whale watching on the marine environment in the San Juan Islands. The primary focus of the program is to offer education for whale-watching boaters. The program operates a Soundwatch boat that patrols the boundaries of marine protected areas, including national wildlife refuges and bottomfish recovery zones, as well as responding to marine mammal strandings (Marine

Mammal Stranding Network). Bird surveys are also conducted as a part of the Soundwatch program (Whale Museum, 2007). The Whale Museum is the most active and visible organization doing marine mammal education in the Puget Sound area. They have played a key role in getting the Southern Resident Orcas listed as endangered. They provide most of the coordination with the Whale Watch Operators Association Northwest and their voluntary guidelines. They are a strong partner with NOAA.

The Washington State University Extension Beach Watchers Program

The Beach Watchers program is a volunteer stewardship program sponsored by Washington State University Extension San Juan County. The program provides marine stewardship training to volunteers in exchange for 100 hours of community service in community education. Beach Watcher volunteers are educated in the physical, biological, and cultural aspects of marine stewardship, and pass on this valuable education to community members and visitors in a variety of venues, as well as assisting with research and data collection. Beach Watcher volunteers also work in cooperation with other local stewardship groups as appropriate (Washington State University Extension, 2007).

Coastal Observation and Seabird Survey Team

The Coastal Observation and Seabird Survey Team (COASST) is a partnership project between the University of Washington and the Olympic Coast National Marine Sanctuary. The project works on long-term bird monitoring programs in collaboration with citizens, natural resource management agencies, and environmental organizations. Surveys are conducted along the Pacific coast of Oregon and Washington, as well as Puget Sound, the Strait of Juan de Fuca, and the San Juan Islands. Citizen volunteers conduct monthly or bi-monthly surveys of marine bird carcasses along the shorelines. This research helps to establish a baseline of normal marine bird mortality, as well as demonstrate when events such as an El Niño event or an oil spill have an effect on the marine environment (COASST, 2007).

Vegetation

Vegetation data mining, which refers to using reference material only, was conducted March 2000 through April 2001. Field surveys were conducted April through September 2001, 2002, 2003, and 2004.

In the NPSpecies database, the park has a documented 373 plant species. Out of this total, approximately 121 species are not native. A greater awareness of the plants occurring in the park will improve the management of native and non-native species (Rocheft, 2007). (See Figure 19: English Camp: Natural Resources and Figure 20: American Camp: Natural Resources.)

Land Cover

A diverse native vegetative cover has many benefits. Animal diversity is directly related to the complexity of the vegetative cover. Vegetation of varying heights and thickness provide a habitat for a wide range of species. In addition, a range in vegetation protects soil from erosion by absorbing the energy associated with rainfall. Runoff is reduced as the vegetation distributes the rainwater to the soil slowly allowing for increased infiltration. Both park units have invasive species threatening the diversity of the native cover.

Prairie is the predominant cover at American Camp spanning nearly half of the unit's acreage from the bluffs along the southern boundary to the south facing slopes of Mount Finlayson. Non-native species have infested the prairie, but patches of native grasses and wildflowers still exist. Red fescue (*Festuca rubra ssp.*), Roemer's fescue (*Festuca idahoensis var. roemerii*), many-flowered wood-rush (*luzula multiflora*), great camas (*Camassia leichtlinii*), field chickweed (*Cerastium arvense*), and western buttercup (*Ranunculus occidentalis*) are some of the dominant species (Lambert, 2003). Non-native grasses and invasive species, including Canada thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), and Himalayan blackberry (*Rubus discolor*) are abundant in these areas. These species tend to form monocultures, thus decreasing the biodiversity of the prairie.

On the northern slopes of Mount Finlayson, the dominant species are Douglas-fir (*Pseudotsuga menziesii*) and western hemlock (*Tsuga heterophylla*) with western red cedar (*Thuja plicata*), grand fir (*Abies grandis*), and lodge pole pine (*Pinus contorta*) interspersed. The understory includes evergreen salal (*Gaultheria shallon*) and western sword fern (*Polystichum munitum*).

South-facing slopes are drier, thus, forest species composition is different. Douglas-fir is still dominant, but the shrubby understory is much thinner. Other trees associated with this forest type include big leaf maple (*Acer macrophyllum*), Pacific madrone (*Arbutus*

menziesii), and Pacific yew (*Taxus brevifolia*).

Young, dense Douglas-fir stands have become established on the abandoned agricultural fields north of the redoubt and south of the visitor center along the western boundary. Overlapping tree crowns and dense, impenetrable thickets are signs of a weak forest ecosystem. The trees are susceptible to wind throw, insect infestations, fire, and disease.

English Camp is dominated by mature Douglas-fir (*Pseudotsuga menziesii*) mixed with grand fir (*Abies grandis*), big leaf maple (*Acer macrophyllum*), red alder (*Alnus rubra*), Pacific madrone (*Arbutus menziesii*), and a few western red cedars (*Thuja plicata*) and Pacific yews (*Taxus brevifolia*). Immature cedars and other shade tolerant species form a dense understory in some areas while in other areas there is almost no understory. Much of the cover in the southwest region of English Camp is dense, impenetrable Douglas-fir with a closed canopy. The trees vary in age from 20 to 40 years and they are prone to wind throw due to the height of the trees, the shallowness of the rooting zone, and the wet, poorly drained soil (Rolph and Agee, 1993).

A remnant stand of open Garry oak (*Quercus garryana*) woodlands that once stretched from Vancouver Island to southern Oregon dominates the south side of Young Hill. Encroaching shrubs and young Douglas-fir trees have prompted the park to take actions to preserve the open oak woodland. These actions are discussed next under the "Vegetation Restoration Projects" section. The Sandwith orchard is also located on Young Hill. Approximately twenty fruit trees of about five different species date to 19th century varieties. One of the pear varieties is likely the oldest in the national park system. This site is also facing shrubbery encroachment problems, and a management plan is being developed.

Vegetation Restoration Projects

In the past, vegetation management goals focused on restoring the landscape at both camps to replicate the historic military encampment period. However, current goals call for restoring the native vegetation without compromising the historic landscape, realizing that native vegetation is critical for hydrologic features and ecosystem health. Two major projects fall under this management goal: restoring the grasslands to native vegetation at American Camp, and restoring the health of Garry oak woodlands at English Camp.

Approximately 600 acres of grasslands exist at American Camp (Rolph and Agee, 1993). These areas have been disturbed by fire, plant harvesting, farming, grazing, and invasive plant and animal species. Native people burned south facing slopes to promote the growth of camas, a bulb they harvested for food. The natural succession of encroaching trees and shrubs was likely reduced due to this practice (Stein, 2000). When the European settlers arrived, this area was used for livestock grazing as well as agricultural purposes. Because native plant species in this area are not hearty enough to tolerate heavy grazing, the establishment of non-native species occurred. Some of these species were introduced through contamination of seed stock, and others were purposefully planted in order to withstand grazing. Today, non-native and invasive plant species are found in the American Camp grasslands. These species are able to succeed at the expense of plants native to this area. The habits of the European rabbit, an invasive animal species, tend to favor non-native plants. As they burrow and dig out their warrens, the soil is exposed and compacted. Often, native plants are not adapted to establishing quickly at disturbed sites or growing in compacted soil. Non-native species are able to tolerate these conditions so they persist.

Currently, a graduate student is investigating the viability of prairie restoration methods as applied to the Northern Puget Trough Lowland Prairie. Her research will investigate the effectiveness of burning and herbicide applications followed by planting native vegetation with a goal of “effectively minimizing long-term maintenance costs” (Lambert, 2003). Because the European rabbits intensify the problem with invasive plants, management practices would need to include the reduction of both invasive plant and animal species

to successfully reestablish native grasses.

The park uses prescribed burning, mechanical and/or chemical control of invasive plants, and planting of native greases and forbs to achieve restoration goals. The discovery of the island marble butterfly at American Camp has created distinct management challenges. (See Special Status Species section.) A conservation agreement was developed by the park and the U.S. Fish and Wildlife Service, with the assistance of Dr. Robert Pyle that will guide management actions relative to the butterfly. It is expected that grassland restoration may increase island marble populations in the long-term by expanding suitable habitat in certain locations (National Park Service and U.S. Fish and Wildlife Service, 2006)

Garry oak woodlands, a once thriving and widespread ecosystem in the Puget Sound lowland region, are becoming rare due to urban growth, fire suppression, and the encroachment of Douglas-fir trees. Dense understories of shrubs and young Douglas-fir trees do not allow enough light and space for new oak trees to germinate and grow. Healthy oak woodlands are characterized by scattered trees among a prairie matrix. Native people in this region burned Garry oak woodlands as a hunting aid and to maintain an open prairie (Ericksen, 1993). Garry oaks are fire resistant, but pines, firs and shrubs are not (McGlaughlin, 2001). Thus, fire favors the oaks over conifers and herbaceous vegetation over shrubs.

At English Camp, the park has initiated a prescribed burn regimen to clear out the thick underbrush that is encroaching on the Garry oak woodland located on the southwest side of Young Hill. On July 1, 2003, the park conducted a prescribed burn of 25 acres in the oak woodland. The burn was successful with reports of young oak tree growth. Since then, the park has conducted two other prescribed burns consistent with the park’s 2005 Fire Management Plan. Resource management staff from North Cascades National Park is assisting with monitoring post-burn vegetation response. Prescribed fire will continue to be a tool used by the park to restore the Garry oak woodlands.

Wildlife

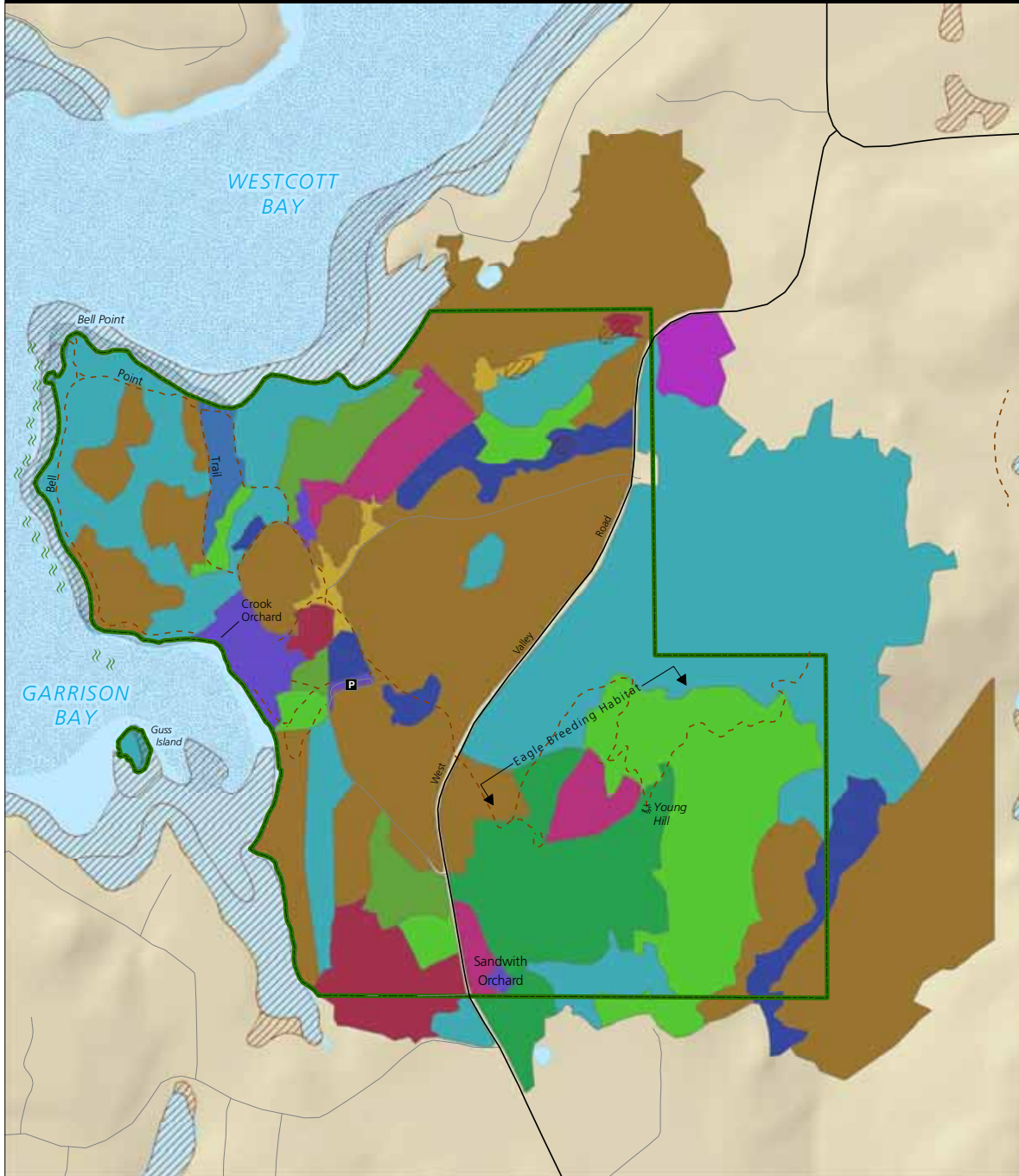
A wide range of species and biodiversity exist on San Juan Island, but there are fewer species than found on the mainland. The island biogeography theory describes this phenomenon. Smaller more remote islands will exhibit less biodiversity than larger islands



Vegetation restoration area on American Camp prairie. NPS Photo.

English Camp: Natural Resources

San Juan Island National Historical Park GMP/EIS



Vegetation - by Community

- Undefined
- Douglas-fir-Pacific madrone/ocean spray-snowberry
- Douglas-fir-bigleaf maple/grass
- Douglas-fir-garry oak-Pacific madrone/grass
- Douglas-fir-grand fir-western hemlock/salal-ocean spray
- Douglas-fir-grand fir-western hemlock/sword fern
- Douglas-fir-lodgepole pine/ocean spray-snowberry
- Douglas-fir/grass
- Mesic Grassland w/ shrubs and tree regeneration
- Mesic Grassland w/ tree regeneration
- Red alder-Douglas-fir/snowberry
- Red alder-cottonwood/salmonberry

- Wetland
 - Fish Forage Spawning Grounds
 - Herring Spawning Grounds
 - Eelgrass Outer Extent
 - Park Boundary
 - Primary Road
 - Secondary Road
 - Trail
- 0 500 1,000
Feet
- N

Produced by: National Park Service
PWRO-Seattle GIS Group

Date Created: October 8, 2008

Data Sources: NPS - lakes, park boundary,
roads, shoreline,
trails, vegetation

NWI - wetlands

San Juan County - roads

USGS - shaded relief

WDFW - wildlife zones, herring
spawning grounds

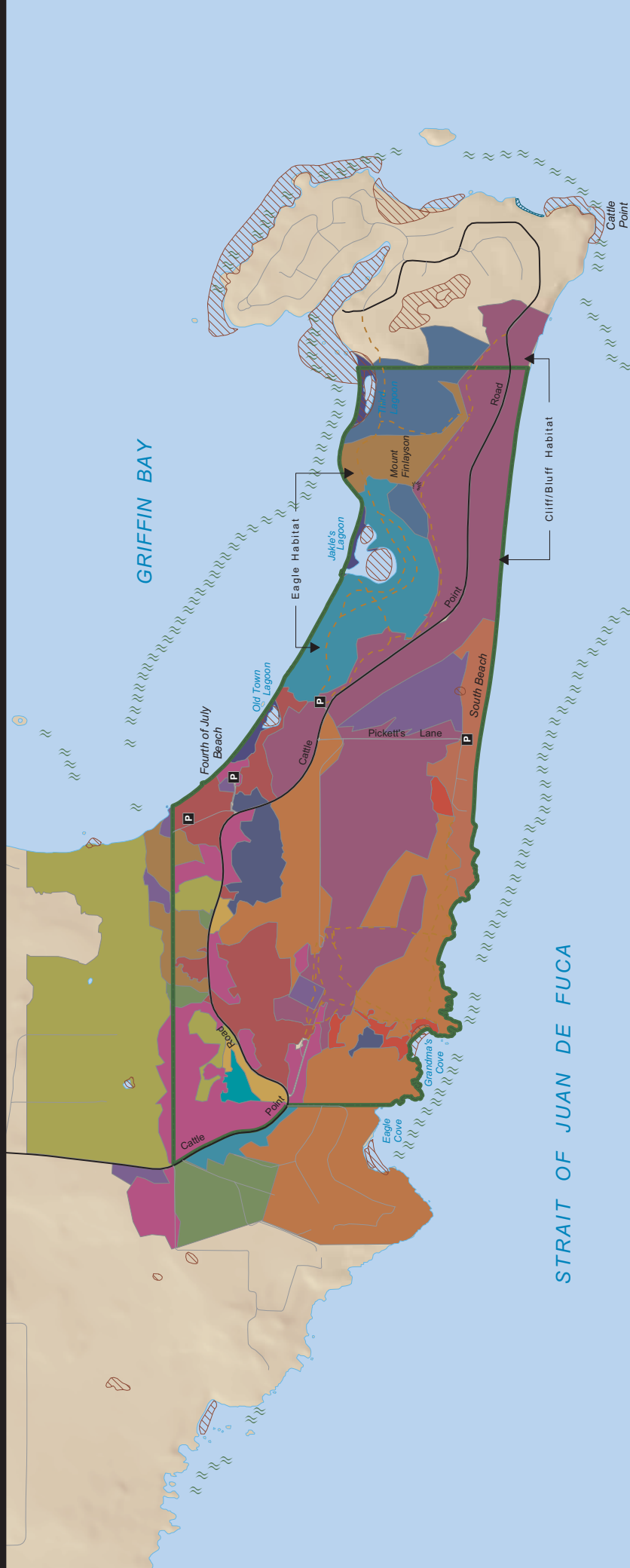
Friends of the San Juans - fish forage
spawning grounds, eelgrass

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Figure 19

American Camp: Natural Resources

San Juan Island National Historical Park GMP/EIS

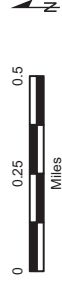


Vegetation - by Community

- Unknown
- Cold-deciduous shrubland
- Distichlis spicata - Salicornia virginica intertidal salt marsh
- Douglas-fir-Pacific madrone/ocean spray-snowberry
- Douglas-fir-grand fir-western hemlock/salal-ocean spray
- Douglas-fir-grand fir-western hemlock/sword fern
- Douglas-fir-lodgepole pine/ocean spray-snowberry
- Mesic Grassland

- Mesic Grassland w/ shrubs
- Mesic Grassland w/ shrubs and tree regeneration
- Mesic Grassland w/ tree regeneration
- Red alder-Douglas-fir/snowberry
- Red alder-cottonwood/salmonberry
- Sparsely vegetated sand dunes
- Sparsely vegetated sand flats
- Xeric Grassland with Shrub Islands

- Wetland
- Fish Forage Spawning Grounds
- Eelgrass Outer Extent
- Park Boundary
- Primary Road
- Secondary Road
- Trail



Produced by: National Park Service, PWRC-Seattle GIS Group

Date Created: February 28, 2007

Data Sources: NPS - lakes, park boundary, roads, shoreline, trails, vegetation
 NWI - wetlands
 San Juan County - roads
 USGS - shaded relief
 WDFW - wildlife zones
 Friends of the San Juans - eelgrass, fish forage spawning grounds

ig:\arcmap\pdc\ejh\gmplac_nat_resources_v6.mxd

Figure 20

closer to the mainland (Schmidt and Olin, 1993). A smaller range of species is sustained when limited space and resources exist. San Juan Island is moderate in size, but it is located approximately 20 miles from the mainland. Immigration and colonization is limited to those species that are capable of reaching the island.

San Juan Island's land and water ecosystems are varied and unique with the ability to sustain a range of wildlife including large, marine mammals, terrestrial mammals, bats, insects, reptiles, amphibians, and hundreds of bird, fish, and marine invertebrate species. There are no large predators on the island, except for the non-native red fox. Bear, coyotes, and elk inhabited the island prior to Euro-American settlement. These populations were quickly over-hunted and extirpated as the Euro-American population increased.

Mammals

In the spring and summer, it is common to see resident killer whales (*Orcinus orca*), Minke whales (*Balaenoptera acuturostrata*), and Dall's porpoises (*Phocoenoides dalli*) off the shore of South Beach. Orcas congregate off the western and southern shores to feed on salmon migrating to fresh water streams for spawning (Washington Department of Fish and Wildlife, 1999).

There are three distinct forms of killer whales, termed residents, transients, and offshores, in the northeastern Pacific Ocean. Resident killer whales in U.S. waters are distributed from Alaska to California, with four distinct communities known—Southern, Northern, Southern Alaska, and Western Alaska. The Southern Resident distinct population segment (DPS) resides for part of the year in the island waterways of Washington State and British Columbia (Strait of Georgia, Strait of Juan de Fuca and Puget Sound), mainly in the late spring, summer and fall. The Southern Resident DPS consists of three pods, known as J, K, and L pods (National Marine Fisheries Service, 2006). At this time, approximately 90 whales comprise the Southern Resident DPS. The population peaked at 98 whales in 1995 followed by a decline in numbers from 1996 to 2001 (lowest in 2001 with 80 individuals). Whether there will continue to be an increase in population is unknown (Center for Whale Research, 2006). (See Special Status Species section.)

Eighteen native and five non-native terrestrial mammals live, breed, or migrate throughout the park. The most commonly seen species include the Columbia black-tailed deer (*Odocoileus hemionus*

ssp. Columbianus), the European rabbit (*Oryctolagus cuniculus*), and the red fox (*Vulpes vulpes*). The latter two species are non-native, and the rabbits have negatively impacted the prairie ecosystem of American Camp. This impact is discussed in the "Invasive Species" section.

Three confirmed species of bats inhabit the park: the yuma bat (*Myotis yumanensis*), the big brown bat (*Eptesicus fuscus*), and the California myotis bat (*Myotis californicus*). The bat inventory was updated in 2006 using a variety of techniques at English Camp; however, weather conditions limited the inventory at American Camp (Christopherson, 2006). More than 1,700 yuma bats and big brown bats were counted exiting the Crook House (Christophersen, 2006). However, allowing bats to inhabit the house does not coincide with the preservation and stabilization of this historic building. The park has developed a strategy to relocate the colony into bat boxes, which are human-made fixtures that supply the bats with adequate space and appropriate conditions for breeding and roosting. A total of approximately 514 yuma bats were observed exiting the bat box in 2006, a significant increase from the 136 bats observed exiting the box in a 2005 inventory.

Birds

Approximately 160 species of birds are recorded on the park's species list. While several are assumed to be found in the park, the presence of 93 species has been confirmed. These include a variety of songbirds, shorebirds, seabirds, and waterfowl. Some only breed in the park, others are seasonal residents, and several reside in the park year round. In addition, the San Juan Islands are located along the Pacific Flyway migration route, and the park provides a critical resting stop for



Bald eagles tending their young at American Camp.
Photo by Russ Illig.

several species. Birds of prey including red-tailed hawk (*Buteo jamaicensis*), osprey (*Pandion haliaetus*), and bald eagles (*Haliaeetus leucocephalus*) are commonly observed in the park. A concentration of 40 to 50 breeding pairs of bald eagles resides in the islands year-round. Washington State has the fourth largest count of eagle pairs in the lower 48 states following Florida, Minnesota, and Wisconsin. Most nesting habitat is located in the San Juan Islands and on the Olympic Peninsula coastline. Two-thirds of all nests in Washington occur on private land (Center for Biodiversity, 2007). Several nests are located in the park, and the eagles utilize the terrestrial and marine habitat for hunting and rearing their young.

Reptiles and Amphibians

Two amphibian and one reptile species have been documented, and an additional four species of each are presumed to be found in the park. The Pacific chorus frog (*Pseudacris regilla*), the red-legged frog (*Rana Aurora*), and the northwestern garter snake (*Thamnophis ordinoides*) were observed during an amphibian study conducted in 2002.

Invertebrates

There are over one million known insect species. Because park funding is limited, a comprehensive insect inventory has not been conducted at the park. However, a butterfly inventory was conducted in 2003. Twenty-five butterfly and four moth species were documented at that time with three additional species confirmed in subsequent surveys. Butterfly monitoring will continue in the park, in part because the island marble butterfly (*Euchloe ausonides insulanus*), a rare species thought to be extinct, was recently found on the island, which has emphasized the importance of pollinators in the grassland ecosystem. (See Special Status Species section below.)

Special Status Species

Species of plants and animals that have undergone serious local, state or national declines and which may be threatened with extinction if they are not protected may be listed by the U.S. Fish and Wildlife Service (USFWS) and State of Washington as threatened, endangered, or rare. Species being studied for declines are often categorized as rare or sensitive.

Under Section 7 of the Endangered Species Act and Council on Environmental Quality regulations requiring analysis of whether proposed actions would

violate any federal, state or local law, impacts to species listed or being considered for listing by either the U.S. Fish and Wildlife Service or the Washington Department of Fish and Wildlife are considered.

The following tables identify species listed by the USFWS or National Marine Fisheries Service (NMFS) as threatened, endangered, species of concern, or candidate species; as well as those listed by the Washington Department of Wildlife (WDFW) as rare, threatened, endangered or species of concern. This information was obtained from the USFWS through informal consultation under Section 7 of the Endangered Species Act (ESA) and from the WDFW based on information provided at their website.

As shown in the table below, there are 12 federal or state listed plants. The following table shows federal or state listed wildlife, including one species listed as federally threatened, 5 state sensitive species, and none that are federally proposed candidates for listing or species that are candidates for state listing.

Special Status Plant Species

The following table shows those plants that are considered special status species by state or federal agencies, their current status, their habitat occurrence, and whether the GMP will have an effect on the species. (See definitions at end of table.)

Special Status Plant Species*

Plant Species	Status	Habitat Occurrence	Effect of the Alternatives
Marsh Sandwort <i>Arenaria paludicola</i>	FE, SS (potentially extirpated)	See detailed information below.	No effect
Golden Paintbrush <i>Castilleja levisecta</i>	FT, SE	See detailed information below.	May affect, not likely to adversely affect (wholly beneficial)
California Buttercup <i>Ranunculus californicus</i>	ST	<p>S1 Critically Imperiled. <i>Ranunculus californicus</i> grows on bluffs, rocky wooded areas, and in open grasslands along the coast at low elevations. This species generally prefers relatively dry grassland areas, but can be found in moister ecosystems. The plant typically flowers in May and June (Washington Natural Heritage Program, 2004). The taxonomy of <i>Ranunculus californicus</i> is complicated by the presence of <i>Ranunculus occidentalis</i> and the resulting hybrid swarms.</p> <p>During the field survey undertaken on Mt. Finlayson in the spring of 2005, the NPS identified 33 groups (consisting of 2 to 260 individuals) of California buttercup. The estimated total number of California buttercup plants is 1,839; however, due to the decumbent and multi-branched growth habits of this species, determining individual plants is difficult. Altogether, the plants occupy a total of approximately 0.5 acres within the project area. Within each group, the plants were distributed 'scattered-patchy' to 'continuous,' with no more than 16 feet between individual plants (NPS, 2005).</p> <p>The California buttercup also occurs on the American Camp prairie in approximately the same scattered patchy distribution documented on Mount Finlayson. A comprehensive survey, however, has not been conducted to determine the actual number of groups or individuals (National Park Service, 2005).</p>	No effect

Special Status Plant Species*

Plant Species	Status	Habitat Occurrence	Effect of the Alternatives
Nuttall's Quillwort <i>Isoetes nuttallii</i>	SS	GRSS1 Globally secure, critically imperiled. It is found growing in seasonally wet ground or seepages and mud near vernal pools at low to middle elevations (Washington Natural Heritage Program, 2004; National Park Service, 2004).	No effect
Erect Pygmy Weed <i>Crassula connata</i>	ST	G5S1S2 Globally secure, but critically imperiled / state imperiled. Its preferred habitat is chaparral and wet to moist vernal pools on coastal bluffs. Five populations of this species are known to be present on private land within San Juan County.	No effect
Sharppruited Peppergrass <i>Lepidium oxycarpum</i>	ST	G4S1 Globally secure, state critically imperiled. It occurs in moist areas in the salt spray zone and in direct sunlight (Washington Natural Heritage Program, 2004).	No effect
Coast Microseris <i>Microseris bigelovii</i>	SS	G4SX Globally secure, state extirpated. This species is distributed along the coast from southern Vancouver Island, to California. It is found in grasslands, on old dunes and on glacial deposits, in small crevices, and on rock usually with very little soil, near the high tide line (Washington Natural Heritage Program, 2004). The species was historically present at Cattle Point (Washington Natural Heritage Information System, 2005).	No effect
Annual Sandwort <i>Minuartia pusilla</i> var. <i>pusilla</i>	SS	R1 requires more field work to assign rank. It is found in plains, open pine forest, chaparral slopes, and dry rock cliffs at an elevation of 25 to 7900 feet (Washington Natural Heritage Program, 2004).	No effect
Bear's Foot Sanicle <i>Sanicula arctopoides</i>	SE	S1 critically imperiled – five or fewer known occurrences in state. It ranges from the southern tip of Vancouver Island to California and grows in coastal bluffs and grassy sand dunes (Washington Natural Heritage Program, 2004).	No effect
Slender Crazyweed <i>Oxytropis campestris</i> var. <i>gracillis</i>	SS	It is found in a diverse array of habitats, including prairies and is known from San Juan County (National Park Service, 2004; Washington Natural Heritage Program, 2004).	No effect

Special Status Plant Species*

Plant Species	Status	Habitat Occurrence	Effect of the Alternatives
Macoun's Meadowfoam <i>Limnanthes macounii</i>	Canadian rare species	Not known to occur in Washington. It is listed as a rare species in Canada, with populations known from southern Vancouver Island and adjacent islands (National Park Service, 2005). Macoun's meadowfoam is a small annual plant that grows in open areas, close to the Pacific Ocean shoreline. It prefers areas that are seasonally wet in winter (Canadian Biodiversity website, 2005). Suitable habitat for this species is found in the park.	No effect

*Definitions

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Plants

Marsh Sandwort

Marsh sandwort is an herbaceous perennial that has historically been found in Washington and California. It is an obligate wetland species, growing in or very close to water, found at low elevations. Marsh sandwort flowers from May to August. It can grow in saturated acidic bog soils and sandy substrates with high organic content (Washington Natural Heritage Program, 2004; Natural Resources Conservation Service, 2004).

Although marsh sandwort is classified by the state as potentially extirpated (Washington Natural Heritage Program, 2004), it is on the USFWS species list for San Juan County as potentially occurring in the county. Suitable habitat for this species occurs in the park.

Golden Paintbrush

Golden paintbrush is a rare regional endemic that has been extirpated from many of its historic localities. It is an herbaceous perennial found in open grasslands which prefers full sun. Flowering begins the last week of April and continues into July (U.S. Fish and Wildlife Service, 2000; Washington Natural Heritage Program, 2005). Although historically present at Cattle Point, it is currently thought to be extirpated from the park.

Special Status Wildlife Species

The following table shows those wildlife species that are considered special status species by state or federal agencies, their current status, their habitat occurrence, and whether the GMP will have an effect on the species. (See definitions at end of the table.)



Special Status Wildlife Species

Wildlife Species	Status	Habitat Occurrence	Effect of the Alternatives
Birds			
Bald Eagle <i>Haliaeetus leucocephalus</i>	Protected under the U.S. Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act	See detailed information below..	May affect, not likely to adversely affect.
Marbled Murrelet <i>Brachyramphus marmoratus marmoratus</i>	FT, SE	See detailed information below..	May affect, not likely to adversely affect
Peregrine Falcon <i>Falco peregrinus</i>	FSC, SS	Peregrine falcons nest mainly on cliffs along rivers or near lakes. In the spring and fall, migrant peregrine falcons may be present near the park for short periods.	No effect
Osprey <i>Pandion haliaetus</i>	FSC	Osprey nests are located on San Juan Island.	No effect
Black Oystercatcher <i>Haematopus bachmani</i>	SS	Black oystercatcher breeding colonies are located in the San Juan Islands.	No effect
Oregon Vesper Sparrow <i>Pooecetes gramineus affinis</i>	FSC	Vesper sparrows are migratory birds that inhabit dry prairies and rocky slopes in the San Juan Islands from mid-April to late September. This species was documented at the park during 2002 bird surveys and a stable breeding population resides on San Juan Island.	No effect
Streaked Horned Lark <i>Eremophila alpestris strigata</i>	FC, ST or SE	The streaked horned lark has a conspicuously more yellow breast and darker back than any other subspecies of horned larks in the Pacific Northwest. It nests on the ground in sparsely vegetated sites in short-grass dominated habitats (historically prairies) in lowland areas of western Washington and Oregon. It is considered rare and has been extirpated from much of its range	May affect, not likely to adversely affect (wholly beneficial)

Special Status Wildlife Species

Wildlife Species	Status	Habitat Occurrence	Effect of the Alternatives
<p>Streaked Horned Lark <i>Eremophila alpestris strigata</i></p> <p>(continued)</p>		<p>including the Puget Sound region and the San Juan Islands. It was historically a common breeder on the Cattle Point Peninsula. The greatest threat to the streaked horned lark is the loss of habitat, although introduced predators may also have played a role in its decline. For example, the loss of this species from the Cattle Point Peninsula may be attributable more to the introduction of exotic animal species (such as the Eurasian rabbit, Eurasian skylark, feral ferrets, and red foxes) because this area has not undergone a dramatic change in vegetation (U.S. Fish and Wildlife Service, 2003; Washington Department of Fish and Wildlife, 2004; Washington Natural Heritage Program, 2004).</p>	<p>May affect, not likely to adversely affect (wholly beneficial)</p>
Fish			
<p>Bull Trout <i>Salvelinus confluentus</i></p>	FT	See detailed information below..	No effect
<p>Dolly Varden <i>Salvelinus malma</i></p>	FP, SC	Dolly Varden are proposed under the similarity of appearance provision of the Endangered Species Act. They occupy the same habitats and have nearly indistinguishable characteristics from bull trout.	No effect
<p>Puget Sound/Strait of Georgia Coho Salmon <i>Oncorhynchus kisutch</i></p>	FSC	The evolutionary significant unit (ESU) for this species includes coho salmon from drainages of Puget Sound and Hood Canal, the eastern Olympic Peninsula, and the Strait of Georgia from the eastern side of Vancouver Island and the British Columbia mainland, excluding the Upper Fraser River north of Hope, B.C. (NMFS 2007).	No effect; No waterways sufficient to support spawning coho are present at the park and no development activities are proposed in intertidal areas.
<p>Puget Sound Chinook Salmon <i>Oncorhynchus tshawytscha</i></p>	FT, SC	See detailed information below..	No effect

Special Status Wildlife Species

Wildlife Species	Status	Habitat Occurrence	Effect of the Alternatives
Pacific Lamprey <i>Lampetra tridentate</i>	FSC	Pacific lampreys are found in streams from Hokkaido Island, Japan, and along the Pacific Rim, including Alaska, Canada, Washington, Oregon, Idaho, and California to Punta Canoas, Baja California, Mexico. Pacific lampreys are the most widely distributed lamprey species on the west coast of the United States (U.S.). Their distribution includes major river systems such as the Fraser, Columbia, Klamath-Trinity, Eel, and Sacramento-San Joaquin Rivers. Pacific lamprey distribution patterns are similar to that of anadromous salmonids (USFWS 2004).	No effect; this species has not been documented in marine waters adjacent to the park, and the park does not include waterways suitable for supporting the freshwater phase of this species.
River Lamprey <i>Lampetra ayresi</i>	FSC	River lampreys are found from just north of Juneau, Alaska, to San Francisco Bay in California most notably in association with large rivers, such as the Fraser, Columbia, Klamath, Eel, and Sacramento Rivers (USFWS 2004).	No effect; this species has not been documented in marine waters adjacent to the park, and the park does not include waterways suitable for supporting the freshwater phase of this species.
Mammals			
Pacific Townsend's Big-eared Bat <i>Corynorhinus townsendii townsendii</i>	FSC	Townsend's big-eared bats hibernate in caves and use caves, lava tubes, and abandoned buildings for breeding and roosting sites. Nursery colonies are extremely sensitive to human activity, and sites are readily abandoned if disturbed.	No effect; although the park supports suitable habitat for this species, it has not been documented in the park and none of the proposed actions would affect potential roosting/nursery sites.
Long-eared Myotis <i>Myotis evotis</i>	FSC	This species typically prefers forestlands and heavy chaparral. (Sumner and Dixon 1953). Captured in 2005 survey (Christopherson, 2005) – likely first recorded instance of species in park. Could also have been Keen's myotis – only DNA testing would confirm.	No effect; although the park supports suitable habitat for this species, and it likely has been documented at the park, none of the proposed actions would affect potential roosting/nursery sites.
Keen's Myotis <i>Myotis keenii</i>	SS	May have been captured in 2005 survey (Christopherson, 2005) – but identity likely long-eared myotis (see above).	No effect; although the park supports suitable habitat for this species, and it may have been documented at the

Special Status Wildlife Species

Wildlife Species	Status	Habitat Occurrence	Effect of the Alternatives
Keen's Myotis <i>Myotis keenii</i> (continued)	SS		park, none of the proposed actions would affect potential roosting/nursery sites.
Long-legged Myotis <i>Myotis volans</i>	FSC	This bat forages over ponds, streams, open meadows, and forest clearings. Night roosts are usually in caves or mines. Potentially found in Crook house sonar survey, although less likely due to habitat and range distribution (Christopherson, 2002).	No effect
Big Brown Bat <i>Eptesicus fuscus</i>	SS	Recorded as primary species present in Crook house maternity colony (Christopherson, 2002). This colony was documented in 2002 to be one of the largest maternity colonies in Washington. Captured in 2005 survey (Christopherson, 2005).	May affect, not likely to adversely affect
Yuma Myotis <i>Myotis yumanensis</i>	FSC	Recorded as primary species present in Crook house maternity colony (Christopherson, 2002). This colony was documented in 2002 to be one of the largest maternity colonies in Washington. Captured in 2005 survey (Christopherson, 2005).	May affect, not likely to adversely affect
Western Small-Footed Myotis <i>Myotis ciliolabrum</i>	FC	Potentially found in Crook house sonar survey, although less likely due to habitat and range distribution (Christopherson, 2002).	No effect
Southern (Resident) Orca Whale	FE, SE	On November 18, 2005, the Southern Resident killer whales were listed as an endangered species under the federal Endangered Species Act (ESA) (National Oceanic and Atmospheric Administration, 2005). The ESA requires that critical habitat be designated for listed species following public notice and an opportunity for public comment. On November 29, 2006, the final rule to designate critical habitat was published by the National Marine Fisheries Service,	No effect

Special Status Wildlife Species

Wildlife Species	Status	Habitat Occurrence	Effect of the Alternatives
<p>Southern (Resident) Orca Whale</p> <p>(continued)</p>	FE, SE	<p>NOAA, and Commerce, in the Federal Register and became effective December 29, 2006. Three specific areas were designated 1) the Summer Core Area in Haro Strait and waters around the San Juan Islands; 2) Puget Sound; and 3) the Strait of Juan de Fuca, which comprise approximately 2,560 square miles of marine habitat (National Marine Fisheries Service, 2006).</p> <p>The Southern Resident killer whales were also listed endangered in Washington State a year earlier in 2004 (Washington Department of Fish and Wildlife, 2004) and under the Species At Risk Act in Canada.</p>	No effect
<p>Humpback Whale</p> <p><i>Megaptera novaeangliae</i></p>	FE, SE	<p>Humpback whales migrate to the west coast of North America (from California to southern British Columbia) in summer/fall and have ranges are often relatively close to shore. The humpback whale is unlikely to occur in water close to the project area because waters are too shallow. As shown on the USGS topographic map, waters within 0.5 miles of the project area are no more than 20 feet deep, and most of the waters are less than 10 feet deep.</p>	No effect
<p>Steller Sea Lion</p> <p><i>Eumetopias jubatus</i></p>	FT, ST	<p>The steller sea lion inhabits the coastal waters of the North Pacific from California, northern Japan and Korea, to the Bering Strait. Steller sea lions may be present in the marine waters adjacent to San Juan Island, although no communal haul-out sites have been identified.</p>	No effect; because the proposed actions are entirely contained on land, it will not affect this species.

Special Status Wildlife Species

Wildlife Species	Status	Habitat Occurrence	Effect of the Alternatives
Harbor Seal <i>Phoca vitulina</i>	SS	Harbor seals inhabit coastal and estuarine waters off Baja California, north along the western coasts of the United States, British Columbia, and Southeast Alaska, west through the Gulf of Alaska and Aleutian Islands, and in the Bering Sea north to Cape Newenham and the Pribilof Islands. They haul out on rocks, reefs, beaches, and drifting glacial ice, and feed in marine, estuarine, and occasionally fresh waters (NMFS undated).	No effect; although this species frequents marine waters at and near the park, none of the proposed actions would affect intertidal or upland haul-out areas used by this species.
Reptiles			
Northwestern Pond Turtle <i>Clemmys marmorata marmorata</i>	FSC	Although this species has been observed on San Juan Island, it is suspected that such pond turtles were transported to the island by humans, as they are far from other known populations (Hays et al., 1999). The western pond turtle is associated with a variety of permanent and intermittent aquatic habitats found from sea level to approximately 1,375 m (4,500 ft); however, all records for Washington are below 300 m (985 ft) in elevation. Pond turtles are most often associated with rivers and streams; however, in Washington and many areas of Oregon the species is found in ponds and small lakes (Hays et al., 1999).	No effect; this species has not been documented at the park and none of the proposed actions would affect potential habitat for this species.
Amphibians			
Western Toad <i>Bufo boreas</i>	FSC	Western Toads are found west of the Rocky Mountains, from Mexico to southern Alaska. They are found in semi-arid and wet forested regions of the Pacific Northwest. They can be found at elevations from sea level to at least 2250 meters (7,425 feet). Western toads use three different types of habitat: breeding habitats,	No effect; this species has not been documented at the park and none of the proposed actions would affect potential habitat for this species.

Special Status Wildlife Species

Wildlife Species	Status	Habitat Occurrence	Effect of the Alternatives
<p>Western Toad <i>Bufo boreas</i></p> <p>(continued)</p>	FSC	terrestrial summer range, and winter hibernation sites. Preferred breeding sites are permanent or temporary water bodies that have shallow sandy bottoms. After breeding, adult Western Toads disperse into terrestrial habitats such as forests and grasslands. They may roam far from standing water, but they prefer damp conditions (BCMwLA, undated).	No effect
Invertebrates			
<p>Island Marble Butterfly <i>Euchloe ausonides insularis</i></p>	FP	The island marble butterfly was believed extinct for over 90 years, when it was rediscovered on Orcas and San Juan Islands. See detailed information following.	May affect, not likely to adversely affect
<p>Valley Silverspot <i>Speyeria zerene bremnerii</i></p>	FSC, SC	This butterfly has been documented within the park. It is dependent on early blue violet (<i>Viola adunca</i>) which is known to grow in the grasslands east of the redoubt and South Beach. Early blue violet flowers between April and June depending on the elevation (Washington Native Plant Society, 2004). During Pyle's field survey, it was flowering in early May (Pyle, 2004).	No effect
<p>Propertius Duskywing <i>Erynnis properties</i></p>	FSC, SC	The Propertius duskywing is a notable butterfly that occurs within the park (Pyle, 2004). It depends on the preservation of its larval host plant, Garry oak (<i>Quercus garryana</i>), and associated habitat for survival. The Propertius duskywing has been observed nectaring on common vetch (<i>Vicia sativa</i>), manroot (<i>Marah oreganus</i>), and common camas (<i>Camassia quamash</i>), typically in April and May (Pyle, 2004). The park contains Garry oak habitat, as well as common vetch and common camas.	May affect, not likely to adversely affect (wholly beneficial); the park's on-going efforts to enhance Garry oak habitat at English Camp will benefit this species.

Special Status Wildlife Species

Wildlife Species	Status	Habitat Occurrence	Effect of the Alternatives
Moss's Elfin <i>Incisalia mossii</i>	Canadian Candidate for Assessment /Washing-ton State Monitor List	The Moss's elfin is a notable butterfly that occurs within the park. It depends on broad-leaved stonecrop (<i>Sedum spathulifolium</i>) which grows on bluffs / rock faces, habitat that occurs on cliff faces or rocky areas in the park.	No effect; although this species has been documented in the park, none of the proposed actions would affect potential habitat for this species.
Taylor's Checkerspot (<i>Euphydryas editha taylori</i>)	FSC, ST or SE	According to the USFWS, four of the five known populations of this species are located in the south Puget Sound region. Historically, it was known to be present in 70 locations in British Columbia, Washington and Oregon. It is dependant on native grasslands. This species was not observed by Pyle during surveys undertaken in 2003 (Pyle, 2003) in the Cattle Point area.	May affect, not likely to adversely affect (wholly beneficial); the park's on-going efforts to restore native prairie at American Camp will benefit this species.

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Birds

Northern Bald Eagle

Bald eagles were federally listed as threatened within the lower 48 states in 1967. On June 28, 2007 a decision was made by the Secretary of the Interior to delist the bald eagle off the Endangered Species List. The bald eagle is still protected by the Migratory Bird Treaty Act and the 1940 U.S. Bald and Golden Eagle Protection Act passed by Congress. The Bald and Golden Eagle Protection Act makes it illegal to possess, sell, hunt, or even offer to sell, hunt or possess bald eagles. This includes not only living eagles, but feathers, nests, eggs, or body parts obtained before the act was established. The Act was amended in 1962 to include the golden eagle, a related species (Wisch, 2002).

Unlike the protection awarded to the bald eagle under the Endangered Species Act, protection under the Bald and Golden Eagle Protection Act does not include habitat protection (Mihelich, 2007). The U.S. Fish and Wildlife Service has also issued guidelines extending protection to bald eagle active or inactive nests. Washington State is also one of the few states with a special eagle law that directs state biologists to work with landowners to leave buffer zones around eagle nests. Both the nest tree and the trees that surround and screen the nest must be left standing (Mapes, 2007).

Bald eagles, the only species of sea eagle native to North America, range throughout much of the continent, nesting on both coasts. They can be found from Florida to Baja California in the south and from Newfoundland to the western Aleutian Islands of Alaska in the north. They are aquatic ecosystem birds primarily foraging on fish but occasionally water fowl, seagulls, carrion and prairie species. Wintering sites typically occur in the vicinity of concentrated food resources such as anadromous fish spawning areas or ungulate winter ranges.

Bald eagles use large trees and other elevated perching and roosting sites. They typically nest in remote areas free of disturbance, mostly in large trees near water but occasionally on cliffs. The nesting season lasts about six months and, in the Pacific Northwest, begins in January. Mated pairs are presumed to be long-term but if one of the mates disappears the other will take a new mate. Often returning to the same nest every year, they lay two to three eggs although usually only one survives (USFWS, 1996).

Based on information from the USFWS for the Cattle Point Road EIS, bald eagle wintering concentrations are located at nine locations within the county including southeast San Juan Island. There are also two communal winter night roosts in the county. Wintering bald eagles occur in the county from about October 31 to March 31 (USFWS Species List, 2004).

The USFWS indicates that 122 nesting territories are located in San Juan County, with nesting activities occurring from about January 1 to August 15. The WDFW priority habitat and species database shows six known nest sites near the Cattle Point area. The larger trees on the forest/grassland fringe on top of Mount Finlayson are likely utilized by bald eagles for perching and roosting.

Numerous bald eagle territories, including the Mount Finlayson Bald Eagle Territory and the Cattle Point Bald Eagle Territory, and Old Camp Bald Eagle Territory are within the park. Bald eagle territories and nest sites are also located on Lopez Island.

Marbled Murrelet

The marbled murrelet is a small seabird (Alcid) that ranges from the Aleutian Archipelago in Alaska to central California. They spend most of their lives in the marine environment foraging on small fish and invertebrates in near-shore marine waters and typically only travel inland to nest.

Murrelet nesting sites are generally in large trees of older coniferous forests, within 70 miles of the shore. Usually nesting is solitary although they are commonly found in groups; a single nesting pair may attract another to nearby habitat (U.S. Fish and Wildlife Service, 1996). Marbled murrelets nest from late March to late September laying a single egg in a season. While nesting, murrelets travel to feed at sea daily. For the purposes of consultation under Section 7 of the ESA, the murrelet breeding season is broken into two periods: April 1 through August 5 is the early season, and August 6 through September 15 is the late season, with some chicks hatched and approximately 50 percent fledged as early as August 6.

The murrelet population within Washington, Oregon, and California is thought to be declining at a rate of at least 4 percent per year (USFWS, 1997). Suitable nesting habitat in Washington, Oregon, and California is found in old growth coniferous stands that are multi-layered with moderate to high canopy closure (Hamer and Nelson 1995, Nelson, 1997). Forested stands with old growth remnants are also used. Trees

with suitable nest platforms are typically greater than 200 years of age and at least 20 inches in diameter at breast height although trees in productive ground may develop these characteristics at a earlier age (or faster rate) (Ralph *et al.* 1995). Younger trees may also develop platforms through mistletoe infestation or in reaction to damage from wind or ice.

The waters of the San Juan Islands are used extensively by murrelets and large concentrations of this species have been found in the waters off the San Juan Islands (Farris and Hall, 2002).

In 1999, NPS and WDFW biologists undertook an assessment of suitable nesting habitat for marbled murrelets within San Juan Island National Historical Park. They delineated the most suitable nesting habitat and recommended the best areas for conducting murrelet surveys. The most suitable potential murrelet nesting habitat within the park was identified at the eastern boundary of the park, within American Camp and adjacent to DNR land (Hall, 1999). Surveys were conducted during the 2001 and 2002 breeding seasons, following the Pacific Seabird Group Inland Survey protocol. During the 2001 survey season, one audio detection was recorded at Jakle's Lagoon; however this may have been a bird on the water. No birds were detected during the 2002 survey season. Since murrelets are capable of traveling up to 70 miles between foraging and nesting areas, and because habitat on the San Juan Islands appears to be less ideal than that available elsewhere, it is possible that birds observed foraging in the San Juan Islands could be nesting as far away as the Olympic Peninsula, Vancouver Island, or the northern Cascades (Farris and Hall, 2002). Results of the survey, therefore, suggest that murrelets feed in the waters off the islands, but may not nest on the islands.

Fish

Bull Trout

Bull trout were historically found in most major river systems in the Pacific Northwest and western Canada. Bull trout have been defined as a distinct species (Cavender, 1978). Biologists had previously identified bull trout as Dolly Varden (*Salvelinus malma*), largely because of the external similarity of appearance. Both species occur together in western Washington.

Bull trout are members of the char sub-group of the family Salmonidae and are native to the waters of western North America. They are well adapted to cold water; their range includes the Columbia River

and Snake River basins, the Klamath River basin of south-central Oregon and streams in Montana, Idaho and Canada, however their populations are scattered and patchy. Some bull trout complete their entire life cycle in the tributary streams in which they were born (resident) while others may migrate to either a lake (ad fluvial), river (fluvial), or salt water (anadromous).

Dolly Varden

Dolly Varden is proposed for ESA listing under the similarity of appearance provision of the Act. Dolly Varden occupy the same habitats and have nearly indistinguishable characteristics from bull trout. USFWS is opting to use the similarity of appearance provision to minimize the potential risk for take of bull trout by anglers fishing for Dolly Varden. Protection for Dolly Varden under the ESA is extended only in those areas where the Coastal-Puget Sound Distinct Population Segment bull trout overlap with Dolly Varden.

Puget Sound Chinook Salmon

Chinook salmon distribution historically ranged from the Ventura River in California to Point Hope, Alaska in North America, and in northeastern Asia from Hokkaido, Japan to the Anadyr River in Russia (Healey, 1991). The Puget Sound Chinook salmon Ecologically Significant Unit (ESU) was listed as threatened on May 24, 1999 (NMFS, 1999). The ESU includes all naturally spawned populations of Chinook salmon from rivers and streams flowing into Puget Sound. Chinook are likely to be present in the waters offshore in the San Juan Islands.

Invertebrates

Island Marble Butterfly

The island marble is a distinctive subspecies of the large marble butterfly (*Euchloe ausonides*), which generally occurs east of the Cascade Range in Washington and British Columbia. The island marble is in complete genetic isolation and is only known to occur in a few locations on San Juan Islands and nearby Lopez Island. Before its rediscovery on San Juan Island in 1998, the island marble had been believed extinct for 90 years (Xerces Society, 2006). Coastal shoreline and adjacent prairie on San Juan Island are vital habitat for the survival of the only known viable populations of island marble. The range of the island marble extends at least as far east as the DNR-administered Cattle Point Natural Resource Conservation Area (Pyle, 2004). It is one of a suite of

species that depend on the once extensive prairies found in the Puget Trough. These prairies have declined to less than 3 percent of their historic extent (Xerces Society, 2006). Because the park's grasslands serve as important habitat for this extremely rare species, its needs are a high priority consideration as those grasslands are managed and restored.

Surveys undertaken between 1998 and 2004 on the San Juan Islands and surrounding area revealed no new sites for the island marble butterfly. Since 2004, DNR, WDFW, and USFWS, NPS, and the Xerces Society have funded and managed several intensive and extensive investigations on the status of the island marble butterfly. Between 1999 and 2007, approximately 160 sites were surveyed for the butterfly (Miskelly, 2007).

In 2006, a survey was funded by USFWS and managed by DNR to determine whether sites occupied in 2005 remained occupied in 2006. Seventy-two sites were surveyed. The island marble was found at 16 sites on San Juan or Lopez islands, most in one of three areas; the southwest coast of San Juan Island, the San Juan Valley on San Juan Island, and the central valley of Lopez Island. The San Juan Valley site was a new discovery, as was a site on Lopez Island. These sites appear to represent two independent populations of the butterfly on San Juan Island and two independent populations on Lopez Island (Miskelly, 2007).

Lambert studied the population ecology and life history of the island marble over two flight seasons (spring 2004 and 2005). The life cycle of the island marble is closely associated with its host plants (tumble and field mustard and Puget Sound peppergrass). Its lifecycle begins in early April shortly after the emergence of leaves and flowering stalks on the host plants at which time adults begin to emerge from pupae. Based on preliminary results from Lambert's work, adults live for 6-9 days, during which they mate and lay eggs. Eggs hatch in May and by June larvae start searching for pupation sites where they wait until the following spring to emerge as adults.

The host plant on which the eggs are laid provides food for larvae in their early stages of development. Supplementary hosts are also used for food later in development; however, the larvae do not pupate on the host plant but rather in surrounding vegetation within approximately two to five meters of their host/food plant. They attach themselves to the base of senescing (dying) grasses, pupate and enter diapause (a waiting period) until the following spring.

All three of the larval host plants known to be utilized by the island marble, tumble mustard (*Sisymbrium altissimum*) and field mustard (*Brassica campestris*), and Puget Sound peppergrass (*Lepidium virginicum menziesii*) occur in the park (Pyle, 2004; Lambert, 2005). Puget Sound peppergrass grows above mean high tide among driftwood along the American Camp shoreline.

Tumble mustard and field mustard are invasive species which utilize a range of habitats throughout the United States, including grasslands (USDA 2004). According to Pyle (2004), during a site visit in May, all concentrations of island marbles were found in proximity to dense or dispersed stands of field mustard on the prairie. Pyle noted that field mustard was more abundant in May and tumble mustard was more abundant in June.

In addition to its larval food plants, the island marble depends at least ten different plants for nectar. Nectar plants used by the island marble are known to include: yellow sand verbena (*Abronia latifolia*), field chickweed (*Cerastium arvense*), field mustard, tumble mustard, yellow and blue forget-me-not (*Myosotis discolor*), sea rocket (*Cakile maritime*, *C. edulenta*), seaside fiddleneck (*Amsinkia spectabilis*), yarrow (*Achillea millifolium*), and death camas (*Zygadenus venenosus*) (Pyle 2004).

Lambert's preliminary results showed that island marble butterflies do utilize areas where their host plants are absent although they are more common in areas where host plants are present. According to DNR staff, there are stands of field mustard, which hosted the island marble butterfly in 2005, on DNR property. Pyle (2004) also documented excellent brooding and foraging habitat within American Camp.

Based upon the finding not to list the island marble butterfly as threatened or endangered, the USFWS and the NPS entered into an agreement for conservation of the species and to contribute to its recovery (National Park Service and U.S. Fish and Wildlife Service, 2006). This agreement defines general guidelines for a broad spectrum of activities at American Camp, including management and restoration of the grassland ecosystem there as a natural component of the cultural/historic landscape.

The activities considered in the agreement encompass the following management actions that would affect the grassland ecosystem or butterfly, including the:

- reduction or elimination of non-native European rabbits;

- proposed Cattle Point Road relocation project as well as ongoing maintenance on existing roads;
- removal of creosoted logs from island marble lagoon habitat along the north shore of American Camp, at Griffin Bay;
- issuance of special use permits at American Camp for certain visitor activities;
- continued cultural and natural landscape restoration activities at American Camp (e.g., prescribed burning, mechanical removal of certain invasive plants, herbiciding, and planting of native species); and
- the probable construction of a new visitor center.

Based on the guidelines, the park and USFWS will:

- Work together and participate in the conservation of the island marble butterfly and its habitat through the Conservation Agreement.
- Use appropriate procedures to ensure adherence to all requirements in the Agreement.
- Meet regularly, at least twice each year, to review the proposed actions for any given year. Review and evaluate the noteworthy successes of the year.

The FWS agrees to:

- Coordinate, consult and provide technical assistance to the NPS on actions that are proposed to conserve and minimize threats to the island marble butterfly.
- Review and provide technical assistance to the NPS on management actions that are proposed for the American Camp unit to ensure that actions will not adversely affect the island marble butterfly or its immature life forms.
- Assist with planning actions to be implemented on the ground. Coordinate with NPS on developing monitoring and reporting objectives.
- Assist the NPS with developing criteria that would trigger changes to their management if specific management goals were not being met.

The NPS agrees to implement the following conservation measures in regards to their management actions to minimize effect to island marble butterflies.

- Restore native grassland ecosystem components of the cultural landscape at American Camp through active management, including the use of prescribed fire. The NPS

will restore up to 10 acres of grassland per year to create a mosaic of early seral restoration units, for example a matrix of burn/mow/spray/control in different proportions and conditions. Individual management units will be two acres or less in size. National Park Service staff and cooperators will avoid and minimize prescribed fire treatments beyond the prescription boundary for the action. Staff will not construct fire breaks in island marble habitat and will take care not to trample host plants while applying a wet line or preparing the area for prescribed fire.

- Where NPS actions are proposed that would cause soil disturbance, conduct surveys of island marble habitat for the presence of host mustards. Any ground disturbing activities will be positioned where host mustards are absent or sparse. Care will be taken to avoid habitat with dense stands of *Sisymbrium* or *Brassica* and high numbers of marble sightings. This will also apply to marble nectar locations as well as larval host plant incidence.
- For proposed NPS actions in island marble butterfly habitat, survey any larval mustard plants that are present for the presence of eggs and larvae of island marbles and transplant any immatures that are found to host plants outside the activity area. If adults are observed nectaring in the zone, adults should be netted and transplanted to areas away from the ground disturbance.
- For proposed NPS actions in island marble butterfly habitat, herbicide application will occur according to label instructions and appropriate wind conditions to avoid drift to areas outside the treatment area.
- For proposed NPS actions in island marble butterfly habitat, all vegetation treatments (such as mowing, herbiciding, and burning) will occur in the fall, when pupation will have occurred. Actions will not occur in the spring, when most immature forms of the island marble butterfly will be present. Pupation often takes place some distance from the host plant, so some proportion of larvae present will have left the treatment area.
- Develop a monitoring plan to assess how and whether host plants and adult butterflies are responding to the management actions that are being implemented. All management actions should have pre-treatment and post-treatment assessments for island marble butterflies, eggs and larvae.

- Assess the presence of other butterfly species, and inventory their associated host plants, prior to any restoration action. This applies particularly to the Valley Silverspot (*Speyeria zerene bremneri*) and its host violets (*Viola adunca*) among the American Camp grasslands. (See Pyle, 2004 for existing management recommendations regarding several species of concern in the park.)
- Wherever mustard plants are present in sufficient numbers to provide habitat, avoid management actions that would damage them. This will allow for island marble butterfly dispersal and expansion of the core population found at American Camp.

In addition, there are other items agreed to for research and conservation purposes (see Agreement) (National Park Service and U.S. Fish and Wildlife Service, 2006).

Invasive Species

Invasive species are plant and animal species whose introduction into a non-native habitat may lead to economic and/or environmental harm or harm to human health (National Invasive Species Council, 1999). Because invasive species are not generally native to the area in which they are invading, they often have few predators or diseases to control their proliferation. Native populations are negatively impacted by invasive species through a variety of means including predation, competition, introduction of deadly pathogens or parasites, reduction of genetic diversity, and disruption of available nutrients (Ecological Society of America, 2003). Invasive species can also impact the entire ecosystem by altering habitat, species composition, hydrology, and the timing and severity of disturbances (such as fires, floods, and disease).

According to Executive Order 13112 signed in 1999, the National Park Service is responsible for managing invasive species populations. Invasive species management practices include preventing the introduction of such species, detecting and controlling invasive populations, restoring native species and habitat conditions, promoting public education and awareness about the effects of invasive species, and to conduct research and develop technologies to reduce introduction and distribution (National Invasive Species Council, 1999).

Invasive Plants

According to state and county Noxious Weed lists, seven Class B species and six Class C species occur in the park (Washington State and San Juan County Noxious Weed Control Boards, 2003). Additionally, the San Juan County Noxious Weed List names five non-listed species that are particularly invasive in the county. All five occur in the park. At present, thirteen exotic and invasive plant species are managed and monitored. Only seven of these plants are listed as noxious weeds. Both park units have infestations of invasive species. However, the distribution and effects are much greater at American Camp.

During the summers of 2000, 2001, and 2002, the park was able to hire a seasonal employee for the purpose of manually removing and monitoring exotic and invasive plants. The entire prairie at American Camp and small portions of English Camp were systematically covered to manually pull, dig, and cut plants. In subsequent years, various park staff and volunteers have manually removed selected exotics, such as tansy ragwort, teasel, and spotted knapweed from high priority locations. In addition, weed crews from the North Coast and Cascades Network Exotic Plant Management Team (EPMT), Washington Conservation Corps, and a variety of volunteer groups have provided assistance. Since 2003, the EPMT has used broadcast herbicide treatments, including applications of Reedeem (triclopyr + clopyralid), Transline (clopyralid), and Milestone (aminopyralid) to control isolated populations of Canada and Bull thistle at both American and English camps. At the request of the network science advisor and park management, the EPMT began assisting with the preparation of prairie restoration plots in 2005 through broadcast application of Roundup Pro (glyphosate). In 2006, the EPMT expanded chemical control to an 80 acre area in and surrounding the prescribed (Rx) burn units at Young Hill, primarily for the control of Canada thistle, bull thistle and St. Johnswort, in response to the Rx burn activity on the site. Representatives from the EPMT, fuels management, and fire ecology, and the park met in the spring of 2006 to discuss the relationship between fire and invasive plants in the prescribed burn units at Young hill. During the summer of 2006, the EPMT mapped infestations of cheatgrass (*Bromus tectorum*) and rip-gut brome (*Bromus rigidus*) in an effort to lobby for their control at the Young Hill site. This would require late fall/early spring broadcast application of Plateau (imazapic) (Neel, 2007).

The park also implements Integrated Pest Management strategies to control these species, including the use of herbicides. Manual removal methods can be successful for many species especially when the population is small and contained in one location. It appears that scotch broom (*Cytisus scoparius*) has been eradicated from the park, while tansy ragwort (*Senecio jacobaea*), and small patches of herb Robert (*Geranium robertianum*) and spotted knapweed (*Centaurea maculosa*) have been reduced in size. Removal efforts will need to continue to effectively reduce these populations. Other species are prolific and continue to spread, making management difficult. The species causing the most concern include Canada thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), California poppy (*Eschscholzia californica*) Evergreen (*Rubus laciniatus*) and Himalayan blackberries (*Rubus discolor*). In some locations, dense monocultures are forming as they outcompete all other vegetation.

Invasive Animals

The European rabbit (*Oryctolagus cuniculus*) was introduced onto the island in the late 1800s. By the late 1920s and early 1930s, the population was abundant. Because the rabbits favor open habitat over forest, the main rabbit population on the island occurs in the open grasslands at American Camp (Stevens, 1975). The population crashed in the early 1980's, and researchers postulate that a failure in reproduction and/or survival of offspring was the cause of the decline (Taber, 1982). Over the past twenty years, the population has fluctuated, but has not approached levels seen before the crash. The current population is estimated at just under 1,500 rabbits, down slightly since 2006 (Agee, 2007).

European rabbits are an invasive species that compound the problem with invasive plants in the grasslands at American Camp. In fact, the habits of the European rabbit favor the distribution of invasive plant species. Within its home range, a rabbit will eat almost any available vegetation (Stevens, 1975). Because the native plant species are less adapted to grazing than many of the introduced species, rabbit herbivory tends to favor the non-natives, which gradually changes the composition of the prairie.

In addition, over-grazing may result in exposed soil, a likely place for the establishment of invasive plants. As rabbits colonize an area, they create shelter by digging warrens, which are "complex underground burrow systems" (Stevens, 1975). Numerous large, well-developed warrens exist at American Camp.

The digging and excessive use churns and compacts the soil. This affects the soil-water relationship as infiltration is reduced and runoff is increased with soil compaction. It also disrupts the texture of the surface soil by bringing subsurface soil and gravel to the surface (Biggam, 2003). Again, the exposed soil allows for the spread of invasive plants. Thistles and blackberry patches provide rabbits with protection from predators, and rabbits eat thistles near the end of summer when the grasses are dry. Together, these invasive plant and animal species maintain a mutually beneficial relationship that is negatively impacting the native prairie ecosystem at American Camp.

Another invasive species that is 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 Willapa Bay and Grays Harbor on the coast of Washington and on Vancouver Island, British Columbia (Washington State Department of Fish and Wildlife, 2000). A native of Europe, the green crab 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 (Washington State Department of Fish and Wildlife, 2000). It disrupts and negatively impacts the ecosystem by outcompeting the Dungeness crab (*Cancer magister*) and other native crab species and by heavily feeding on clams and oysters. Additionally, it is a host to a parasitic worm that may affect the health of local shore birds.

Habitat

Marine Habitat

Because a variety of ecosystems are represented, the marine habitat in San Juan County is unique and species rich. Intertidal habitats include sandy beaches, rocky shores, and protected bays. Physical characteristics influencing the shore such as wind, waves, currents, tidal fluctuations, and beach composition (mud, gravel, sand, rock, and clay) are factors that determine the organisms inhabiting the intertidal zone. Biological components, including predation and competition, also influence species composition (Kozloff, 1993).

Located at American Camp, South Beach is composed of sand and gravel, and it is exposed to the open wind and waves of Haro Strait and the Strait of Juan de

Fuca. Sandy to gravelly beaches such as this offer little intertidal habitat because no protection is provided from the direct exposure to high wind and wave action. Longshore currents actively move sediment on sandy beaches. Thus, the intertidal zone is in a constant state of flux. However, hearty species such as the razor clam (*Siliqua patula*), and a variety of worms and crustaceans are found on wave swept beaches (Kozloff, 1993). The wetlands and salt marshes lining the shore adjacent to South Beach are critical for nesting and breeding shorebirds.

East of South Beach, the shore is comprised of small pocket beaches divided by rocky coves and headlands. Exposed to strong wave action during storm events, these rocky shores provide crevices, sills, and tide pools where marine organisms thrive. In fact, many species including bull kelp (*Nereocystis luetkeana*) and purple sea urchin (*Strongylocentrotus purpuratis*) favor a turbulent environment (Kozloff, 1993). Subtidally, the northern abalone (*Haliotis kamtschatkana*) is abundant along this stretch (Washington State Department of Fish and Wildlife maps, 2003). Strong tidal currents associated with the western side of the island regularly deliver nutrient rich waters allowing kelps and seaweeds to flourish. These beds support a variety of marine life, and they are prominent feeding areas for birds.

On the northern shore of American Camp, narrow channels and other islands provide protection for

Griffin Bay. The shore is less susceptible to strong wind and wave action. However, longshore currents carry sediments along the shoreline to form accretion beaches or berms, which divide the three marine lagoons (First, Jakle's, and Third lagoons) from the bay (Hanson, 2001). The shoreline has a gentle slope, and the substrate is comprised of mud with sand and gravel. Eelgrass (*Zostera marina*) grows in the lower reaches of the intertidal zone as well as the subtidal zone. The plant's spreading rhizomes and extensive root system form mats that help bind the substratum creating a stable habitat for a wide variety of small animals such as sea urchins and pandalid shrimp (Kozloff, 1993; Washington State Department of Fish and Wildlife maps, 2003). Off shore from Fourth of July Beach, two exposed clusters of rocks provide harbor seals (*Phoca vitulina*) with a place to rest, sleep, give birth, and nurse their young. The rocks are utilized year round as "haul-out" sites, and seasonally as pupping grounds (Washington State Department of Fish and Wildlife maps, 2003).

Along the shores of English Camp, Garrison Bay and Westcott Bay are also categorized as protected bays. Wave action is low to moderate allowing fine sediments to settle and form extensive mudflats where marine vegetation flourishes. As a foundation of the ecosystems associated with these bays, eelgrass (*Zostera marina*) supports a wide range of marine organisms. Algae and other diatoms, jellyfish, snails, sea anemones, sea slugs, small clams and other



View of Old Town Lagoon from Mt. Finlayson Trail. NPS Photo.

organisms live on the leaves of eelgrass. The leaves also provide protection for crabs, including the Dungeness crab (*Cancer magister*) and the red shore crab (*Cancer productus*), which primarily feed on small clams. Other species live in the mud on the roots of the eelgrass.

Eelgrass is an important breeding ground for forage fish including Pacific herring (*Clupea pallasii*), Pacific sand lance (*Ammodytes hexapterus*), and surf smelt (*Hypomesus pretiosus*). Surf smelt breeding grounds occur around the perimeter of Bell Point, and Pacific herring spawn throughout both Westcott and Garrison bays. Salmon, lingcod, marine mammals, and sea bird populations feed on forage fish (Larkin, 1999).

In February 2003, severe losses of eelgrass in Westcott and Garrison bays were discovered by the Washington State Department of Fish and Wildlife while conducting an annual Pacific herring spawn survey (Wyllie-Echeverria, Mummford, Jr, Gaydos and Buffum, 2003). Because eelgrass populations expand in spring and summer and decrease during fall and winter, the sites were surveyed again in May 2003. Prior documentation of bottom cover exists for Westcott Bay because it was randomly selected for the Submerged Vegetation Monitoring Project conducted by the Washington Department of Natural Resources in 2000 and 2001. It appears that approximately 35 out of 45 hectares of eelgrass have been lost. Quantifying the loss in Garrison Bay is more difficult. However, the results of the 2003 survey indicate patches south of Bell Point are virtually gone when compared to the DNR 1992 aerial photo of the bays (Wyllie-Echeverria et al., 2003). An explanation for the loss has not been determined. However, Washington State has a no net loss policy to protect eelgrass and the resources associated with it. When eelgrass beds are negatively impacted, mitigation is required to compensate for the loss. Currently, the Westcott Bay Taskforce is seeking out funding sources in order to continue studying the decline.

Wetland Habitat

Wetland is an all-encompassing word to describe any land habitat substantially saturated with water. As some of the most productive ecosystems in the world, wetlands provide important habitat functions such as protecting shorelines during storm events, cycling nutrients, and they store water, which alleviates flooding (Krukeburg, 1991). In addition, they function as natural reservoirs during droughts, they are nurseries for a variety of fish species including salmonids, and the moisture provided by wetlands is essential in the survival of reptile and amphibian

species. Fresh and salt water wetlands occur in both units of the park.

Twenty-six wetland sites are scattered throughout the American Camp unit. Common emergent vegetation includes Hooker's willow (*Salix hookeriana*), Pacific crabapple (*Malus fusca*), nootka rose (*Rosa nutkana*), salmonberry (*Rubus spectabilis*), and a variety of sedges and rushes. There are several small seeps and springs located along the southern boundary where river otter (*Lutra canadensis*) tracks and/or scat was observed (Holmes, 1998). Red-tailed hawk (*Buteo jamaicensis*) and bald eagle (*Haliaeetus leucocephalus*) nests were noted at other sites with larger trees. Important feeding and nesting grounds are located around the three temperate marine lagoons on Griffin Bay.

These lagoons are sites where fresh and salt water mix. The salinity in the lagoons is often lower than that in the bay. Vegetation associated with the lagoons and surrounding salt marshes include sharpfruited peppergrass (*Lepidium oxycarpum*), Nuttall's quillwort (*Isoetes nuttallii*), and erect pygmy-weed (*Crassula connata*), which are listed by the state as sensitive species (Washington Natural Heritage Program, 2003). Other plants unique to the salt marsh plant communities include saltgrass (*Distichlis spicata*) and pickleweed (*Salicornia virginica*). The ecology of these wetlands is linked to the eelgrass and microorganism communities in the bay, which are fundamental to the marine food web (Heater et al., 2000). Specialized algae, bacteria, snails, and anemones are just a few of the organisms contributing to this ecology (Kozloff, 1993).

At English Camp, nine wetland sites have been identified and recorded, and the primary emergent vegetation is red alder (*Alnus rubra*). These sites provide significant feeding, resting, and breeding grounds for a variety of resident and migratory birds including the black brant (*Branta nigricans*), great blue heron (*Ardea herodias*), and osprey (*Pandion haliaetus*) (Larkin, 1998). The red-legged frog (*Rana aurora*) and the Pacific treefrog (*Hyla regilla*) have been observed at a significantly wet site in the northern portion of the unit (Holmes, 1998). Marshes and tidal mudflats occurring along the shore are important to the ecology of the bays.

Terrestrial Habitat

The upland habitat in the park can be categorized into four habitat types: dry forests, wet forests, open Garry oak woodlands, and grasslands. Physical conditions including temperature, precipitation, sun exposure,

wind, and soil type are factors that determine the type of vegetation growing at a particular location. Because the island is in the rain shadow of the Olympic Mountains, the drier moderate climate allows for dry habitats that are not common in the Puget Sound Lowland region.

At American Camp, grasslands are the predominant habitat owing to low rainfall, well-drained soil types, southern exposure, and relatively windy conditions near the Strait of Juan de Fuca. American Camp prairie, like most prairies around Puget Sound, was the first choice for pastures and farms. As a result, its native species have been reduced and replaced by non-native pasture grasses and a host of weed species. In spite of that, some high quality remnants of native prairie remain, providing beautiful spring vignettes of blooming camas, chocolate lilies, and buttercups. Along with native grasses such as Roemer's fescue and Alaska brome, a number of other uncommon plant species are found in the prairie. These areas of native vegetation are becoming less common regionally and will serve as a valuable source of genetic material for restoration work at American Camp. The warrens of the European rabbit (*Oryctolagus cuniculus*) disrupt the soil composition in much of the American Camp prairie, which, in turn affects the hydrology associated with the prairie. Other non-native animal species inhabiting the prairie include the red fox (*Vulpes vulpes*) and feral cats. Northwestern garter snakes (*Thamnophis ordinoides*) and Townsend's vole (*Microtus townsendii*) occupy these grasslands, and a variety of birds utilize this area for foraging. Most importantly, from an ecological standpoint, the prairie is habitat for many invertebrates, including several butterfly species that are declining in the region because of habitat loss.

The transitional open Garry oak woodland at English Camp is also relatively dry. The soil is thin and has low moisture holding capacity. However, slightly more moisture is required to sustain a Garry oak woodland than a prairie. Garry oak woodlands are comprised of trees including Garry oaks (*Quercus garryana*), Pacific madrones (*Arbutus menziesii*), and rocky mountain juniper (*Juniperus scopulorum*) scattered throughout a prairie landscape with a variety of wildflowers present in the open understory. These woodlands are often in the transition zone between open prairie and coniferous forest landscapes, and they are susceptible to invasion by Douglas-fir. Historically, fire has played a role in maintaining these open stands by burning young Douglas-fir and thick shrubbery. Garry oak woodlands are known for their biological diversity and

are host to butterfly and insect species, amphibians, reptiles, and a wide variety of birds. Because they have significantly declined in extent, Garry oak woodlands (larger than one acre) are considered state priority habitats.

Wet and dry coniferous forests occur in both park units. Dry coniferous forests are more common to the island due to its geographical location. These forests are dominated by Douglas-fir (*Pseudotsuga menziesii*) with a sparse understory of shrubs. They tend to occur on southerly slopes, including Mount Finlayson, where exposure to sun and wind occurs. Wet coniferous forests are also dominated by Douglas-fir (*Pseudotsuga menziesii*) with a mix of western hemlock (*Tsuga heterophylla*) and western red cedar (*Thuja plicata*). Thickets of salal (*Gaultheria shallon*) and sword fern (*Polystichum munitum*) are common to the understory, and mosses and lichens cover trees, rocks, and soil. These closed canopy forests are common to northern slopes, including Young Hill and Mount Finlayson, where the environment is cool and moist.

The habitat value of both forest types is substantial. They provide nesting, breeding, and foraging opportunities for birds. Woodpeckers and flickers are attracted to the insects living in snags or standing dead trees. Some larger trees are suitable for marbled murrelet (*Brachyramphus marmoratus*) nesting, although this species has not been observed in the park. Reptiles and amphibians rely on moist, fallen trees rotting on the forest floor.

Natural Quiet and Night Sky

The NPS mission emphasizes the preservation and restoration of park natural resources, including natural sounds, referred to as soundscape. Due to the park's rural nature and island setting, the natural ambient sound is generally quiet at the park. Heard from many of the trails, natural quiet sounds include birdcalls, wildlife rustling in the underbrush, and the movement of wind in the trees and grasses. Louder natural sounds such as the crashing of waves are associated with the bluffs and beaches. The natural quiet preserved at the park appeals to many visitors, and it contributes to the purpose of their visit. Air traffic is the number one source of sound pollution in the park. Other noises include vehicles, boating activities in Garrison Bay, and routine ground maintenance.

Dark night skies are also considered an intrinsic natural resource protected by management policies in the National Park Service. Due to the absence

of artificial light, portions of the park are good places to view the night sky. Park programs highlight interpretation and education of the values derived from a dark night sky. Although park hours include day use only, one annual program invites visitors to walk to the from the American Camp visitor center at night to view the dark sky after a talk introducing the fundamentals of astronomy. However, night light pollution from Victoria, British Columbia, is considerable and increasing. This pollution impairs views in the western quadrant of the sky.

Fire

Fire History

Most forest, shrub, and grass ecosystems rely on fire to maintain their vegetative structure and species composition. Lightning-caused fires, though infrequent on San Juan Island, were undoubtedly a part of the park's fire history. Historical accounts have also established that Native Americans burned grasslands and oak woodlands to create habitat for game animals and promote the growth of weaving materials and foodstuffs (Agee, 1987). The frequency with which a given area burned depended most directly on a number of natural and human ignited fires. Other factors affecting fire frequency and fire intensity include plant community types, changes in topography (such as slope and aspect), varying fuel accumulations, and variation in seasonal precipitation.

Nearly a century of active fire suppression has disrupted the ecosystem-regulating effects of recurrent natural and aboriginal fire. This, along with human activity in the area, has resulted in changes to the fuel structure that can potentially generate unnaturally large and intense wildland fires that may threaten human life and property and have negative effects on natural ecosystems.

Between 1980 and 2003, 111 fires were reported in the park. All but five of these were human-caused. Most resulted from camp fires or warming fires that were not built in established fire rings and were not extinguished properly. The largest fire occurred in 1981 and burned 77 acres at American Camp. Most fires occur during the summer months with the majority of ignitions occurring in June, July, and August when conditions are generally warm and dry with little precipitation.

Prescribed fire activities in the park prior to 2003 were limited to pile burning to dispose of materials

generated from hazardous fuel reduction activities and/or maintenance activities. In July 2003, after several years of planning, a 25-acre prescribed fire was conducted on Young Hill, a crucial step in a long-term program to bring back fire as an ecological component of that ecosystem. Douglas fir trees had been thinned from the understory of the Garry oak woodland on the south slope of Young Hill several years earlier to release oaks from competition. The fire was successful in reducing fuel accumulations that had built up from a century of fire suppression and Douglas fir invasion. Fire effects monitoring plots, where fuel loads and a variety of ecological indicators were measured prior to and following the burn, showed enough successful results that prescribed fires have been ignited in two other management units on Young Hill in subsequent years

The park is bordered mostly by privately owned lands, although DNR land borders the southeast portion of English Camp and the eastern boundary of American Camp. Fire protection for the park is provided through a Memorandum of Understanding with San Juan Fire District #3 and DNR.

Current Fire Management

The park completed a fire management plan and environmental assessment in 2005, consistent with NPS Management Policies and Director's Order #18. The plan considers fire management activities over a five year period, and assists park managers in meeting cultural and natural resource management goals while ensuring that firefighter and public safety are not compromised.

The FMP for the park provides a full range of management options with respect to fire. All unplanned wildland fires will be suppressed



Prescribed fire treatment at American Camp. NPS Photo.

immediately upon detection. Mechanical/manual fuel reduction will be used to reduce the risk of wildland fire to life and property and help restore natural vegetative conditions. Prescribed fire will be used in conjunction with manual fuel treatments to reduce fuel accumulations, restore and maintain historical landscapes/view sheds, and manage exotic vegetation.

Under this plan, the fire management program would maintain an organization that would contain 95 percent of all wildland fires in the park within one operational period. Manual fuel treatment objectives would include treating 80 percent of the park's developed zones to change fuel conditions so that predicted flame lengths during a wildland fire under extreme conditions would be less than four feet.

Hazard fuel reduction projects would reduce by 40 percent the fuel accumulations on at least 50 percent of the areas identified at high risk of wildland fire due to fuel accumulations resulting from natural build up and human activities. The goal of the FMP is to meet these standards by 2008.

Prescribed fire will be used to reduce fuel accumulations and help restore natural vegetative conditions in the following areas:

- American Camp Grasslands – Prescribed fire would be one of a number of tools used to restore the grasslands currently dominated by non-native annual grasses and forbs and some sections being invaded by Douglas-fir seedlings. Periodic burning will help control invading weed species, increase biodiversity among native plants, and reduce accumulations of ground fuels. Under this alternative, a minimum 20 percent (approximately 120 acres) of the park's grasslands would be targeted for treatment with prescribed fire by 2009.
- English Camp Oak Woodland – The Garry Oak woodland will be restored using a combination of manual cutting of invading Douglas-fir and prescribed fire. The oak woodland will be burned periodically to remove any regenerating Douglas-fir seedlings that would compete with oak reestablishment. Under this alternative, a minimum 40 percent (approximately 40 acres) of the park's Garry oak woodlands would be targeted for treatment with prescribed fire by 2009.
- Mature Forests at Both Camps – The mature mixed conifer stands at both camps will be burned to regulate the amount of woody fuel accumulations on the forest floor, promote

species diversity, improve wildlife habitat by encouraging growth of plant and shrubs, maintain insect and disease populations at local normal levels, and provide ashy nutrients to the forest. Under this alternative, a minimum 5 percent (approximately 25 acres) of the park's mature mixed conifer forests would be targeted for treatment with prescribed fire by 2009.

Consistent with NPS policy, fire management plans are reviewed and updated as needed every five years.

Fire Camp

The fire camp for the park is presently located at American Camp along Cattle Point Road north of the visitor center. The camp, which is essentially an open area in a field, is a special use camping area that is utilized by groups for up to approximately two months at a time. Fire crews, up to about 20 people, are assembled from other parks to work on projects, such as prescribed burns or vegetation projects. The crew parks, camps, and stores equipment at this location. Facilities needed include tents, portable restrooms and showers. At this time, chemical toilets are brought in when needed and showers are available only in town.

RECREATIONAL RESOURCES

Recreational Activities at San Juan Island National Historical Park

At San Juan Island National Historical Park, beachcombing, picnicking, bird watching, viewing and photographing wildlife, hiking, fitness walking, general sightseeing and attending park interpretive programs



Children hike the trail to English Camp Cemetery. NPS Photo.

are popular activities. A small number of residents engage in horseback riding at American Camp.

On Garrison Bay, public shellfishing is permitted on roughly 900 feet of shoreline within the park. A 94-foot dingy dock is available for access to the park from the water.

The park is a day-use only area. Campgrounds are not available at either American or English camps. Hunting is not allowed in the park. Off-road travel by car, truck, motorcycle, or bicycle, is not allowed in the park. Pets are permitted as defined by the compendium and must be under physical (not voice) control.

Recreational Activities on the San Juan Islands

The San Juan Islands offer a wide variety of recreational activities. Water-based recreation includes whale watching excursions, sea kayaking, scuba diving, sailing and power boating, freshwater and saltwater fishing, windsurfing and clamming.

There are two county parks on San Juan Island. Rueben Tarte County Park is a four-acre day-use park

east of Roche Harbor on the north end of the island. The park features a north-facing forest slope and two small beaches on either side of a rocky peninsula. Amenities include two beaches and a walking path with views across Rocky Bay.

San Juan County Park is a 12-acre park on the west side of the island on Smallpox Bay. Amenities include a campground with 20 campsites and a group camp area, restrooms, a day-use area, beach, and a boat launch. There are views across Haro Strait to Vancouver Island and the Strait of Juan de Fuca. The park is popular for kayak users and is one of three county campgrounds designated as Cascadia Marine Trail campsites.

Five thousand-acre Moran State Park on Orcas Island offers 150 campsites, 30 miles of hiking trails, lake swimming and fishing and panoramic views from 2,400-foot Mount Constitution. Whale watching is a popular activity at Lime Kiln Point State Park; Spencer Spit State Park on Lopez Island has trails, beaches and camping. Eleven marine state parks with mooring buoys have opportunities for camping, picnicking and hiking. A dozen county parks and recreation sites are available for picnicking, some with camping facilities. San Juan County Park has ready water access and is popular with kayakers. The 140-mile long Cascadia Marine Trail for kayakers, which extends from the Canadian border south to Olympia, Washington, has a number of stopover sites in the San Juans.

The islands are also a popular destination for bicyclists and moped riders. Visitors and residents are able to enjoy golfing and lawn bowling. Skateboarding parks are located on San Juan and Orcas islands. The Whale Museum in Friday Harbor is a year-round attraction for visitors. Each of the four main islands has a historical museum.



Sign at Mt. Finlayson NPS boundary. NPS Photo.



Saltwater fishing is a popular San Juan activity. NPS Photo.

Regional Recreational Activities

A ferry ride to the mainland opens up still more recreational opportunities. Three national parks—North Cascades, Olympic and Mount Rainier—are each within a one-day drive, as is Ebey's Landing National Historical Reserve on nearby Whidbey Island; so too are Mount Baker-Snoqualmie National Forest, Olympic National Forest and Mount St. Helens National Volcanic Monument. A host of other federal preserves are also nearby, including the Padilla Bay National Estuarine Reserve, Ebey's Landing National Historical Reserve and the Dungeness Spit National Wildlife Refuge. Deception Pass State Park and myriad other state and local parks, historical sites and attractions are also present. Together these recreation sites have hundreds of campsites and hundreds of miles of frontcountry and backcountry trails for day and extended hiking for persons of all experience levels.

Many hikers trek sections of the Pacific Crest Trail as it winds through the Cascade Range. Challenging rock climbing sites are available and the area's lofty and rugged alpine zones draw mountain climbing enthusiasts from around the world. Snowboarding, downhill, and cross-country skiing are found at Mount Baker. All manner of boating and water sports are available on the area's many lakes as well as rafting on the Skagit River. Hunting, fishing, horseback riding, mountain biking and a host of guiding and outfitter services are available to the public. The annual Skagit Valley Tulip Festival attracts thousands in April. The Skagit Valley is fast becoming a birding hot spot: overwintering flocks of trumpeter swans and snow geese draw hundreds of viewers; hundreds more crowd the shores and waters of the Skagit River in winter to watch bald eagles feed on salmon. Indian gaming casinos in Anacortes and along the I-5 corridor attract crowds year round.

Seattle lies a short 80 miles to the south and contains a variety of museums, theaters, cultural and sporting venues. Lakes, parks, trails and greenways are scattered throughout the city. Attractions include the Woodland Park Zoo, Seattle Aquarium, Pike Place Market, the University of Washington's Arboretum and Burke Museum, and historic Pioneer Square with the Seattle unit of Klondike Gold Rush National Historical Park.

British Columbia's Vancouver Island is an hour and a half away by Washington State ferry. Here one can explore the rural Saanich Peninsula and the quaint

waterfront community of Sidney, BC. Ferries to Vancouver, the Gulf Islands, and northern coastal towns depart from nearby Swartz Bay. Victoria, capital of British Columbia, lies an hour south of Sidney. With its distinctly British flavor and Old-World feel, Victoria has excellent shopping venues and an Inner Harbour ringed with attractions and artisan stands. The Parliament buildings are nearby, as are the world-class Royal British Columbia Museum and Butchart Gardens. Less than a day's drive away is Vancouver, British Columbia, with spectacular Stanley Park and the Vancouver Aquarium, a vibrant international district and Chinatown, the University of British Columbia, the world-renowned Museum of Anthropology, and many cultural and sporting venues. It is the gateway community to a vast outdoor recreational world of parks and natural areas and the Whistler-Blackcomb ski area.

The incredible number and variety of opportunities found in this corner of the Northwest are more than enough to satisfy the year-round recreational needs of any individual or group, whatever their age, activity or skill level.



Aerial View of Friday Harbor. Photo By Robert Demar.

SCENIC RESOURCES

The San Juan Islands are the tops of a submerged mountain range creating varying elevations of topography ranging from sea level plains to gently rolling hilltops. The combination of water, rocky outcrops, forested hills and plains create stunning scenery. The islands are well known for their beauty, rural landscape character, and, since harder to reach, slower pace of life.

Friday Harbor Setting

Friday Harbor is a small town located above a sheltered harbor. The daily ferry traffic determines the amount of car and pedestrian activity. As the county's main transportation and commerce center, the majority of businesses, government offices, and organizations are located here. Views are of early 20th century small town structures, the ferry terminal, surrounding islands and residences and boats docked in the harbor.

English Camp Setting

English Camp is located on the northern and wetter portion of the island. Here, the trees grow taller and denser. Deciduous trees mix with evergreens. Once outside the forest, there are views out across the bay to forested Guss Island and the opposite shore, the parade ground, and to the historic garden and buildings. Remains of sun-bleached clamshells, some ancient, lie scattered on the beach. Bird life is abundant and the occasional deer can be seen. The only reminders of modern life are the residences lining the bay and boats anchored in the water. An entry from an 1860 diary described the camp:

...Captain Bazalgette & three other officers are here in charge. With the former I walked round to see the economy of the arrangements. I was struck with the richness of the soil & abundant fruitfulness of the vegetables which filled the gardens. Game of several sorts is plentiful. Deer can be had whenever wanted. Some of the post go out to shoot them, or Indians bring them. Wild fowl is abundant. There were hanging up in the larder of the kitchen geese, ducks, the common wild duck & canvas back,



*View of English Camp.
NPS Photo.*

teal & wild muscovy. A fine wild goose can be had for a half a dollar if you buy one, later they will be made much cheaper.” (Bagstraw, 1996: p.242)

Walking along the Bell Point Trail the visitor has views out across Garrison Bay. Shell middens are abundantly evident. Visitors can be observed clamming at the public beach or boating in the water.

English Camp cemetery is reached by walking up the slope of Young Hill through the tree canopy. Situated on a former clearing are the headstones of seven graves within a picket fence. It is a quiet and contemplative place with views across the oak woodland. Further up, the trail ends on a rocky granite outcrop with views over Haro Strait, Vancouver Island, numerous islands, and adjacent forests and farmland. The summit of Young Hill is 650 feet in elevation. On October 10, 1860, Anglican Colonial Bishop George Hills noted in his diary a description of the landscape adjacent to English Camp:

We had luncheon, after which I rode out with Lieutenant Sparshot to a lofty spot wherein could be seen the whole lower part of the

island spread out, as well as the various islands of the lovely archipelago. In the distance to the east & south were the magnificent elevations of Mount Baker & Rainier. The former some fifty miles, the latter 100 miles distant, being respectively 11,000 & 13,000 feet high. The light played upon the snowy heights & formed all sorts of colours. Upon the elevated ground which runs through the island I had a view of the lower portion which is more open. There were large flocks of sheep & settlers’ houses. The American Camp lay also at a distance before me some twelve miles... (Bagstraw, 1996: p.242)



*View of American Camp.
NPS Photo.*

American Camp Setting

American Camp has the longest undeveloped stretch of beach on the island and has become a favorite destination of both local residents and visitors. People come here for various recreational activities, including whale watching. Up the slope, an ancient prairie lies between the beach and its cliffs and the summit of Mount Finlayson. This vast open space offers outstanding scenic vistas to Mount Baker, the Cascade Mountains, the Olympic Mountains, Mount Rainier (on exceptionally clear days), the Strait of Juan de Fuca, Vancouver Island, and other islands. These views get more expansive as one travels up the slope to the top of Mount Finlayson, which is 290 feet in elevation.

A high bluff quite heavily timbered lies at the east. The valley south of us affords excellent grazing and has been used for that purpose by the Hudson's Bay Company who have had flocks of sheep on it. There are but few trees (oaks) scattered on the southern grassy slope of the mountains (Warren, 1860).

The scenery changes dramatically on the north slope of Mount Finlayson. Here, the forests are thick,

cool, and moist. A trail system has been developed within the park for hiking. Trails lead to lagoons and driftwood beaches with views out over Griffin Bay. A report from Henry Custer, Assistant on a U.S. reconnaissance of American Camp in 1859 states:

The harbor of San Juan, formed by a deep indentation of the south east shore of the island, is according to statement of sea faring men, one of the best and safest on the whole sound, with good anchorage almost everywhere. Small vessels will find excellent harborage in the north west part of the harbor; larger vessels can anchor with perfect safety in the southeast part of it in soundings varying from five to fifteen fathoms. I endeavored to locate the harbor and its islands and rock more correctly than heretofore represented on the maps.

From the eastern boundary of the park the trails continue onto county and state land. Residential development on both the east and west boundaries of the park is visible from some areas within the park.

INTERPRETATION

Interpretation at the park has been guided for many years by an Interpretive Prospectus written in 1984. That plan focused primarily on interpretation of the military period. More recently, park interpretation has evolved to incorporate a broader range of themes, including pre-European history and the natural environment. It is expected that a long-range interpretive plan, as part of an overall comprehensive interpretive plan, will be produced shortly following this general management plan. It should incorporate the broader range of themes as identified in Chapter 2, "Foundation for Planning and Management," "Primary Interpretive Themes," as well as current audiovisual technology and recent developments in professional interpretation.

Interpretive Programs and Opportunities

Wayside signs, exhibits, park publications, ranger programs, self-guided walks and all interpretive programs and media that communicate messages are derived from the Primary Interpretive Themes. Current interpretive programs and opportunities include the following:

Website

The park website provides interpretive materials including:

- Special resources for educators and teachers
- History of American and English camps
- The boundary dispute
- Nature and science resources
- Research materials and information
- Archaeological information

Anacortes Ferry Terminal

The Anacortes Ferry Terminal is run by Washington State Ferries. It serves as the departure point for the ferries to the San Juan Islands and is the primary route to the park from the mainland. Most visitors arrive at the terminal to drive onto the ferry, park their vehicles and walk or ride bicycles. The terminal offers one of the first opportunities to interpret the park. A new wayside exhibit is located at the north of the terminal by the passenger entrance. This exhibit introduces the park to those who may not be familiar with it, and offers photographic snapshots of various park sites. An identical wayside also is located by the restrooms in the vehicle embarkation parking area.

American Camp

American Camp has the only year-round visitor center inside the park. The facility is a 1979 double-wide trailer that houses interpretive exhibits and a small retail operation where visitors may purchase books, postcards and gifts. The trailer was moved to the site in 1979 as a temporary facility until a permanent building could be constructed. Interpretive opportunities at American Camp include the following:

- A historical self-guided walk is offered at American Camp. A self-guided nature walk is available at Jakle's Lagoon.
- Ranger and volunteer guided walks covering historical and natural themes are scheduled during the summer season and intermittently in winter.
- A full range of interpretive programming covering historical and natural themes is provided during the summer season. Programs include demonstrations of pioneer cooking, Indian use of natural materials in daily life, historical lectures, archaeological and nature walks, 19th century folk music.
- Interpretive displays and exhibits in the American Camp visitor center focus on the peaceful resolution of the Oregon Boundary Dispute, the joint military occupation of San Juan Island and the connections of each to local historical themes. An archaeology exhibit features more than 125 artifacts from the historical period.
- An interpretive slide program on laser disc is presented in the American Camp visitor center.
- Fifty-five pre-historical objects from the park's Burke Museum collection are available for viewing.



Re-enactors interpreting encampment history. NPS Photo.

- Access is provided to the library and archives by appointment at American Camp.
- Reenactments of life during the joint occupation are scheduled at American Camp on weekends during the summer season.

English Camp

The English Camp Royal Marine Barracks (barracks) serves as the visitor contact station during the summer season. At English Camp, the following opportunities can be explored:

- Within the barracks, visitors may watch an interpretive slide show on laser disc and view a “then and now” photography exhibit.
- A historical self-guided walk is offered at the English Camp parade ground.
- Ranger and volunteer guided walks covering historical and natural themes are scheduled during the summer season.
- A full range of interpretive programming covering historical and natural themes is provided during the summer season. Programs include demonstrations of pioneer cooking, Indian use of natural materials in daily life, historical lectures, nature walks, and 19th century folk music.
- Reenactments of life during the joint occupation are scheduled at English Camp on weekends during the summer season.
- The major summer season event at the park is Encampment at English Camp during which re-enactors from throughout the Pacific Northwest gather to celebrate the peaceful resolution of the boundary dispute. Reenactors stay on the parade ground in historic tents and play historic camp roles. Many activities are offered over the long weekend.



Needlework demonstration at 2007 Encampment. Photo by Ron Garner.



2007 Encampment at Dusk. Photo by Paul Goldberg.

- Though not currently interpreted, the nearby Crook house may provide future interpretive and visitor contact opportunities.

Other Programs

School Programs

Curriculum-based programs are offered from third through fifth grade and discuss peaceful resolution of conflict, natural history, 19th century history, American Indians, and civics. A teacher's guide was produced in 1999 that explores the boundary dispute and peaceful arbitration. Service learning opportunities are provided for a myriad of activities, including prairie restoration, beach clean-ups and the planting of the formal garden at English Camp. Other service learning projects are in the planning stages.

Junior Ranger Program

The park offers a booklet of historical and nature activities for children to complete while visiting. A junior ranger badge is awarded on completion of the booklet.

Educational Camp

The Oregon Museum of Science and Industry, among others, offers educational camps in the park. Students are taught by trained educators and naturalists who provide safe, high-quality outdoor learning experiences for children of varying ages. Programs vary in topics but include natural and cultural history and marine science. At San Juan Island National Historical Park, these programs are tied to the primary significance of the park and include the cultural and natural resources of the park. Sessions vary in duration from one to two weeks and are located in camping facilities at English Camp.

Volunteers in Parks Program

More than 200 volunteers, including 46 Canadian citizens, spend 10,000 hours annually serving the park in a variety of ways, but primarily in interpretation. For example, during summer reenactments, volunteers demonstrate blacksmithing, spinning and weaving, cooperage, military and naval skills and frontier cookery, in addition to staffing the information counters. Volunteers also provide valuable assistance in resource management, historical research, gardening and carpentry.

Regional Theme-related Sites

Fort Rodd Hill and Esquimalt Naval Station

Fort Rodd Hill, a national historic site in British Columbia, Canada, is a coast artillery fort built in the late 1890s to defend Victoria and the Esquimalt Naval Base on Vancouver Island, though there is also a strong connection to an earlier period. The naval base dates back to the 1850s when ships sailed from Vancouver Island to the San Juans and were part of the boundary conflict. The base maintains a museum and archives of value to historical research at San Juan. The Fort includes three gun batteries, underground magazines, command posts, guardhouses, barracks and searchlight emplacements. There are numerous interpretive signs and audio-visual stations, as well as period furnished rooms and friendly, knowledgeable staff. Visitors can explore gun batteries and underground magazines, searchlight emplacements, command posts and other features built a century ago (FortRoddHill.com, 2006). Reenactors from the fort partner with San Juan Island National Historical Park and participate in Encampment.

Gulf Islands National Park Reserve of Canada

The southern Gulf Islands are located in one of Canada's most heavily developed and urbanized natural regions—the Strait of Georgia Lowlands of British Columbia. The national park reserve was established on May 9, 2003 to protect the ecological integrity of a representative portion of this region. It is the first new national park reserve of the twenty-first century and includes thirty-five square kilometres of land and intertidal area spread over fifteen islands and numerous islets and reefs and approximately twenty-six square kilometres of marine areas. One of the most significant achievements of the Pacific Marine Heritage Legacy initiative of the governments of Canada and British Columbia, the new national park reserve offers a variety of opportunities for Canadians to learn about and experience an exceptional coastal island landscape and the cultures of the people who live there (Parks Canada, 2006).

VISITOR USE

Visitor Use Patterns

The NPS Cooperative Park Studies Unit in Moscow, Idaho conducted a Visitor Services Project at San Juan Island National Historical Park in 1994. This standard NPS method for obtaining information about park visitors and visitation patterns took place during August 10-16, 1994. Of 518 questionnaires distributed, 406 were returned.

Results showed that visitors were often in family groups (64 percent). Groups often consisted of two people (35 percent) or three to four people (38 percent). The most common visitor ages were 36-50 years old (37 percent) and 15 years or younger (21 percent). Most (68 percent) were first-time visitors to the park. International visitors were often from Canada (55 percent) and the United Kingdom (12 percent). United States visitors came from Washington (49 percent), California (13 percent) and Oregon (9 percent) and 37 other states. Twelve percent of the visitors lived on San Juan Island either year round or part of the year.

Just over half of the visitors (51 percent) said they were aware of the existence of the park. Most visitors learned about the park from maps/brochures (32 percent), travel guides (25 percent), friends and relatives (24 percent) and several other sources.

Common activities for visitors were sightseeing (94 percent), walking/hiking on trails (78 percent), taking photographs (70 percent) and viewing wildlife (45 percent). The most visited sites in the park were the historical camp at English Camp (72 percent), the American Camp visitor center (57 percent), the historical camp at American Camp (50 percent) and the redoubt/earthen fort (40 percent). One fourth of the visitors went to the Friday Harbor visitor center before visiting the other park sites.

Most visitors (87 percent) used the ferry to get to San Juan Island. To get to the park, most visitors (65 percent) used a private vehicle, followed by rental cars/vans (16 percent). The park was not a primary destination for 80 percent of the visitors. Visitors said their reasons for visiting were to view scenery (87 percent) and learn about history (64 percent). The most used interpretive services were the historical buildings/features (86 percent), visitor centers (72 percent) and outdoor exhibits (71 percent). The

San Juan Island National Historical Park Visitation

Year	Total Visitation	English Camp	American Camp	Friday Harbor
1993	228,817	73,962	154,851	22,171
1994	200,253	76,128	124,125	17,281
1995	205,001	84,233	120,768	15,598
1996	225,954	80,763	145,191	23,603
1997	225,626	80,435	145,191	23,517
1998	250,285	105,092	145,191	19,708
1999	270,668	125,477	145,191	16,923
2000	261,716	115,967	145,749	18,010
2001	286,935	128,025	158,910	14,892
2002	255,077	120,752	134,325	14,594
2003	223,433	73,649	149,784	14,305
2004	270,968	67,827	203,141	9,000
2005	246,779	62,942	183,837	(Closed)*
2006	258,801	68,066	190,736	(Closed)

(NPS Public Use Statistics Office 2007)

subjects visitors would most like to learn about in the future are natural history (68 percent), Native American inhabitants (64 percent) and the history of early settlers (63 percent). The most preferred methods of learning about the cultural and natural history in the future are trailside exhibits (63 percent) and visitor center exhibits (62 percent).

Over one-third of the visitors (38 percent) estimated their total expenditures during this visit as up to \$100. Twenty percent said they spent \$251 or more. The average visitor group expenditure during the visit was \$169; the average per capita expenditure was \$51.

According to statistics reported by the park to Washington DC, visitation has been generally trending upward. The most reliable traffic counter is at English Camp, where counts have increased 69 percent over the past ten years.

June, July and August are the months of highest visitation at the park (about 40,000 per month). There is substantial visitation in the shoulder seasons as well (March through May, and September through October). During the slower winter months of November through February, the park typically receives about one-quarter the monthly visitation of summer.

The San Juan County Public Works Department did a traffic estimate on Cattle Point and American Camp roads in 2000. Their sampling estimated that approximately 253,000 cars travel the road on an annual basis. About 100,000 of those cars go solely to park locations and 153,000 travel as far as the Cape San Juan residential area. These counts suggest that the park may be somewhat underestimating visits to American Camp. The county AADT (annual average daily traffic) predicts an annual traffic increase of 7.46 percent for this area. A new traffic counter was installed at American Camp in summer 2003. Tests in the fall of 2003 will determine the data-gathering protocols that will be used to determine the visitation at that unit.

According to the NPS Social Science Program, tabulations generated by running the NPS Money Generation Model show that the annual economic benefits to the community from San Juan Island National Historical Park are \$15,415,000 in Fiscal Year 2005, based on a visitation of 248,831. Based on this benefit, it is estimated that approximately 337 jobs in the tourism and service sector are tied to the presence of the park (NPS Social Science Program 2005).

Park Special Uses

The park manages the type, size, and location of group activities (larger than 20 persons) through a special use permit system. The goals are, generally, to limit conflicts between users, to prevent unacceptable impacts to natural or cultural resources, and to keep group sizes within the capacity of park facilities. Weddings comprise the largest percentage of special use permits. In recent years, the park has limited weddings to specific locations such as the English Camp parade ground (after regular hours), Fourth of July Beach, and South Beach, with a maximum group size of 75 persons. Because of limited parking, car pooling is strongly encouraged and a parking plan may be required of the applicant. Horseback riding at American Camp is also regulated by special use permit and is governed by a specific set of park regulations. The park often gets requests for groups to hold larger special events. It is clear that a demand exists on the island for large open-space activities. A percentage of these could be accommodated if parking and toilets were improved, particularly at Fourth of July Beach. Many school groups now use that area for field trips and strain its capacity.

Facilities are not the sole limiting factor. Visual intrusion and potential resource impacts may weigh as much or more heavily in the decision to permit a particular large group activity in the park. For additional information, see the "Carrying Capacity" section in the "Alternatives Chapter".

Federal Lands Recreation Enhancement Act

The National Park Service is participating in a program called the Federal Lands Recreation Enhancement Act (Public Law 108-447), formerly known as the Recreation Fee Demonstration Program. The program allows participating parks to retain generated income from fees and to use them for their own park operation and maintenance. San Juan Island National Historical Park is participating in this program through the shared 20 percent pool for smaller parks. The focus of this program is for improved visitor experience. The park does not charge recreational fees.

Park Hours and Seasons of Operations

The park is a day use park and is open from dawn until 11:00 pm. The administrative headquarters and the visitor center at American Camp are generally open year-round from eight until five o'clock.

SOCIOECONOMIC FACTORS

Regional Setting

San Juan Island National Historical Park is located in northwestern Washington State, approximately 80 highway miles north of Seattle, 18 water miles west of Anacortes, Washington, and 49 miles by ferry and highway from Victoria, British Columbia.

The San Juan Islands are bordered on the west by Vancouver Island and separated from that island by Haro Strait. To the east, Rosario Strait separates the islands from the Washington mainland. The Canadian Gulf Islands lie to the northwest and, to the north, the Gulf of Georgia and mainland British Columbia. The Strait of Juan de Fuca separates the islands from the Olympic Peninsula to the south.

San Juan County contains 172 named islands and islets. In San Juan County, about 20 islands have year-round residents, with the majority living on the four islands served by the state ferry system (Future Directions, Inc., 1999: p.13).

The San Juan Islands are bordered on the west by Vancouver Island and separated from it by Haro Strait, a major shipping channel to Vancouver BC, the largest city in western Canada. To the east, Rosario Strait separates the islands from the Washington mainland. The Canadian Gulf Islands lie to the northwest and, to the north, the Gulf of Georgia and mainland British Columbia. The Strait of Juan de Fuca separates the islands from the Olympic Peninsula to the south.

The park is located on San Juan Island, the second largest of the islands at 55.3 square miles. The other principal islands served by the ferries are Orcas, Lopez, and Shaw.

The park is within Washington's Second Congressional District in San Juan County, Washington.

Location and Access

The park's administrative headquarters is located in Friday Harbor, approximately one-half mile from the San Juan Island Ferry Terminal. Friday Harbor, population 2,040 (Washington State Office of Financial Management, 2003), is the county seat and is the only incorporated town in the San Juan Islands. The American Camp unit of the park is located six miles south of Friday Harbor on Cattle Point Road. The English Camp unit is located on West Valley Road, 9 miles northwest of Friday Harbor and 12 miles from American Camp. English Camp can also be accessed by boat by using the dock the park maintains on Garrison Bay.

Washington State ferries run between Friday Harbor and the mainland a half-dozen or more times a day; inter-island ferries transit Friday Harbor a similar number of times. An international ferry travels once daily to Sidney, British Columbia on Vancouver Island. From there one can travel by road to Victoria, or by road and BC ferry to Vancouver, British Columbia.

The San Juan Islands are popular for bicycling as well, Washington State ferries report that over 38,000 bicyclists ride onto the ferry in Anacortes annually, and a substantial number are carried by vehicles onto the ferry to the San Juan Islands (San Juan County, Nonmotorized Transportation Plan, 2004).

Two commercial airlines and a seaplane service plus several charter airlines serve Friday Harbor. An airport at Friday Harbor accommodates commercial and private planes; private aircraft can also land at a small airstrip at Roche Harbor.



Float plane landing at Friday Harbor. NPS Photo.

Land Use and Ownership Patterns

Though somewhat remote and difficult to reach, San Juan County is one of the fastest growing counties in the Washington State. Natural beauty, solitude, and pleasant weather have attracted many, particularly West Coast residents, to move to the island for recreation or retirement. This interest has prompted an active real estate market promoting purchases of waterfront and view property. The result has been increased subdivision of farms and forests. Conversion to non-rural use is one of the greatest impacts to the open space resources of the county.

There are a limited number of motels and restaurants on the island. The nature of the island and ferry service force either an overnight stay on the island or a rushed visit in order to be on board the last ferry back to the mainland. Long lines of cars waiting for the ferry are common on busy weekends and during the summer tourist season.

NPS Management Zoning

All lands within the boundary of San Juan Island National Historical Park were park-zoned by the NPS in the 1979 *San Juan Island National Historical Park General Management Plan*. The NPS zoning is for management purposes. There are no private in-holdings within the park. Local government zoning does not apply to federal land. Both English and American camps are broadly zoned Historic, thus protecting the historical integrity of these sites. Peripheral areas of the park units are zoned Park Development, for administrative and secondary recreational uses. To maintain the sanctuary qualities of the area for eagles, deer, and marine life, an area in the northeast portion of American Camp is zoned Natural, Environmental Protection Subzone.

Adjacent Town and County Government Zoning

Park Headquarters

In 2004, the headquarters for the park moved from Spring Street in downtown Friday Harbor approximately one-half mile west to Mullis Street. The building is leased by the NPS from a private owner through the General Services Administration. Land use is governed by the town's zoning code. The park's headquarters is located outside the downtown core and is zoned commercial.

English Camp

English Camp, encompassing 529 acres, is situated on Garrison Bay in the northwest section of the island. Lands adjacent to the boundary of English Camp are used for ranching, shellfish farming, timber production, recreation, and home sites. Roche Harbor Resort is located across Westcott Bay from English Camp. The park is situated in the center of the Westcott-Garrison Bay Watershed.

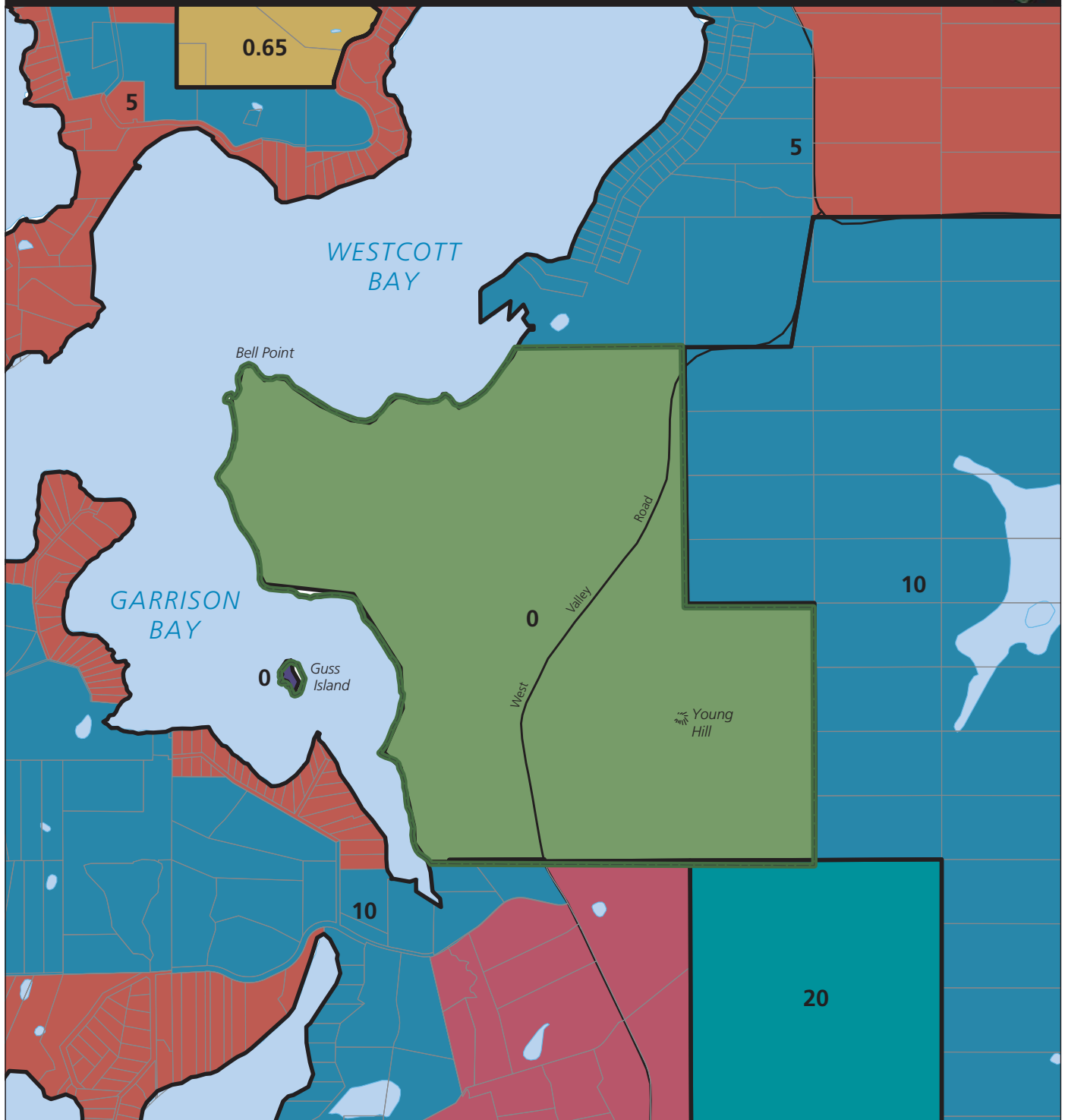
According to the Westcott-Garrison Bay Watershed Assessment Report, the park is recognized by San Juan County under a land use classification entitled Special Districts under the Conservancy designation. This class of lands was developed to "protect, conserve, and manage existing natural conditions, resources, and valuable historic, scenic, education, or scientific research areas for the benefit of existing and future generations without precluding compatible human uses" (San Juan County, *Westcott-Garrison Bay Watershed Assessment Report*, 1999: p.20).

The majority of the watershed is classified as Rural Land under two land use designations: Rural Farm Forest and Rural Residential. The Rural Farm Forest Land designation is designed to provide landowners with the opportunity for small-scale farming and forestry practices while maintaining the rural character of the land. The Rural Residential designation allows for varying densities of residential development. The 200-foot shoreline areas both north and east of the park allow for one residential unit every one-half acre. To the north of the park, the non-shore adjacent land is zoned one residential unit for five acres. Adjacent land to the east and south of the park is zoned one unit for ten acres. (See Figure 21: English Camp: County Zoning.) (Please note that residential density is indicated by a number, such as "10" which means one unit per 10 acres.)

The Roche Harbor Resort, on the northwest coast of San Juan Island, hired an architecture and community planning firm to develop a design plan for the future of the 2,200 acre resort. The plan was completed in 1994 and updated in 1996 in response to some community concerns about the physical scope of the village development and the possibility of including non-resort based commercial activities. The plan includes six districts with a core resort district and a variety of surrounding resort and rural residential areas. It also includes a district for existing subdivisions. Zoning in the Existing Subdivisions district ranges from one unit per .5 acres to two acres; however, the total number of dwelling units for this 500 acre zone is not known.

English Camp: County Zoning

San Juan Island National Historical Park GMP/EIS



Land Use

- Agricultural Resource
- Conservancy
- Forest Resource
- Master Planned Resort
- Natural
- Rural Farm Forest
- Rural Residential



Density*



Parcel



Park Boundary



Primary Road

*Residential Density is indicated by a number, e.g. **10** = 1 unit per 10 acres
0 = Publicly Owned Conservancy Lands

Note: Some smaller parcels predated the currently allowed residential densities.

Figure 21

0 500 1,000
Feet



Produced by: National Park Service
PWRO-Seattle GIS Group

Date Created: February 28, 2007

Data Sources: NPS - lakes, park boundary, roads, shoreline

San Juan County - density, land use, parcels, roads

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Zoning for the additional five districts ranges from one unit per .65 acres for the 177 acre Resort Core district to one unit per ten acres in the 1,430 acre Rural Farm Forest district, and allows for a total of 739 residential units over 2200 acres (Hewitt-Isley, 1996)

Development of shoreline lots on Garrison Bay and Westcott Bay and addition of boat docks are having increasing impacts on the English Camp cultural landscape.

Mitchell Hill Trust Land

The drainage basin also includes designated Resource Lands. One of these tracts, a 312.32-acre property on Mitchell Hill contiguous to the southern boundary of English Camp, is managed by the Washington State Department of Natural Resources (DNR) and is designated as Forest Resource Land. These lands are designated to “protect and conserve forest lands of long-term commercial significance for sustainable forest productivity and provide for uses which are compatible with forestry activities while maintaining water quality, and fish and wildlife habitat” (San Juan County, *Westcott-Garrison Bay Watershed Assessment Report*, 1999: p.24).

Washington State Department of Natural Resources manages the site as one of the “Common School Trust Lands” for the benefit of public schools. Much of this site is forested with trees ranging from seedlings to 120 years old. Grazing occurred in the past and timber was harvested in the 1940s and 1990s. A portion of the historic military road from English Camp bisects the northern edge of property (San Juan Islands Trust Land Advisory Committee, 1985).

In 1983, the San Juan Islands Trust Land Advisory Committee, established by the Commissioner of Public Lands, considered alternatives for this site. One alternative recommended adding it to San Juan Island National Historical Park. The recommended alternative suggested multiple-use forest management, including rehabilitation and reclamation, and compatible recreational activities such as walk-in or bicycle campgrounds, primitive cabins, and other uses. There was interest expressed from the county and local residents to convert the old military road to a general hiking trail connecting to other off-site trails. In recent years, subsequent discussions between the DNR, the San Juan County, and other groups, led to a consensus that Mitchell Hill should be added to San Juan Island National Historical Park.

American Camp

American Camp totals 1,223 acres and is located on the southeastern tip of the island. Adjacent lands are used for watershed and natural resource protection, recreation, and residential housing.

On the eastern boundary of the park unit are five publicly owned parcels, described in more detail in the next section. One is jointly owned by the San Juan County Land Bank and the Washington Department of Natural Resources. Three others are owned by the DNR. The fourth parcel is owned by the Bureau of Land Management (BLM).

To the east and north of the DNR properties are the Cattle Point Estates and Cape San Juan residential subdivisions. There are approximately 150 potential lots. One-half of these have been developed. Lot sizes vary from half an acre to nearly six acres, the larger lots being located in Cattle Point Estates. The subdivisions are served by several community wells and a desalinization plant located in parcel 2. Parcel 2 is owned by the Cattle Point Water District. This parcel contains a reverse osmosis treatment facility to serve certain residential portions of Cattle Point Estates. The major of the tract is in a wooded setting that surround the treatment facilities and an associated utility access road.

Each home has an individual septic system. Past water availability problems and saltwater intrusion issues have caused development to be limited to five units per phase in order to monitor the effect of water use on already developed adjacent properties. The current county zoning in Cattle Point Estates is R-3, Rural Residential, which allows an average density of one unit per three acres. Cape San Juan is zoned at one unit per half acre.

On the western boundary of the park are the Eagle Cove and Eagle Cove Estates residential subdivisions. Both subdivisions total 43 single-family lots, averaging approximately one acre in size. Over one-half of the lots have been developed. County zoning is Rural Residential, which allows an average density of one unit per five acres. Both were platted before enactment of the county zoning ordinance.

Under the current zoning ordinance, which is based on performance standards, industrial and commercial uses are permitted only as a conditional use subject to approval by the San Juan County Commissioners. County adherence to recent state Growth Management legislation is expected to

retain a somewhat rural status for lands surrounding both English and American camps. However, building density already platted before that act could greatly alter the character of the landscape. To date, availability of water has been a limiting factor in development; that could easily change anywhere on the island, as it did several years ago when a desalinization plant was built to supply residents at Cattle Point Estates.

Effects on San Juan Island National Historical Park include the increasing visual impact of homes along the western boundary of American Camp, particularly viewed from the redoubt, portions of the trail system and from the site of the former Belle Vue Sheep Farm. Visual impacts of housing are also increasing to the east side of American Camp. Increased residential development in the area has also resulted in increased vehicular traffic along Cattle Point Road. (See Figure 22: American Camp: County Zoning.) Increased development, with its increase in hardened surfaces, can affect surface water runoff, water recharge, and water quality. The addition of wells and increased water extraction is known to contribute to salt water intrusion into underground aquifers. Development can also fragment wildlife habitat and cause a number of other negative impacts to neighboring conservation properties.

Cattle Point Public Lands

The Washington Department of Natural Resources manages three parcels at Cattle Point, Parcels 1, 3, 4, and 7. Parcel 1 (20.08 acres) is known as the Third Lagoon Preserve and is jointly owned and managed by DNR and the San Juan County Land Bank. This property was acquired in 2000 using county and

Interagency Committee (IAC) funds. It includes upland forest and 1100 feet of shoreline and is 20 acres in size.



Parcel 3 (39.84 acres) and Parcel 4 (38.77 acres) are both contiguous to American Camp and include 1,430 feet of beach on the southern boundary of the Strait of Juan de Fuca. Both parcels were originally school trust lands, but DNR transferred (or more accurately, purchased and divested) the parcels out of that program and the parcels are now managed as the Cattle Point Natural Resource Conservation Area (NRCA). Natural Resource Conservation Areas in Washington State are lands designated to maintain, enhance or restore ecological systems and habitat for threatened, endangered, sensitive plants and animals while providing opportunities for education and low-impact public use.

Parcel 7 is a 10.29-acre site, known as the Cattle Point Interpretive Area with 1,265 feet of waterfront and



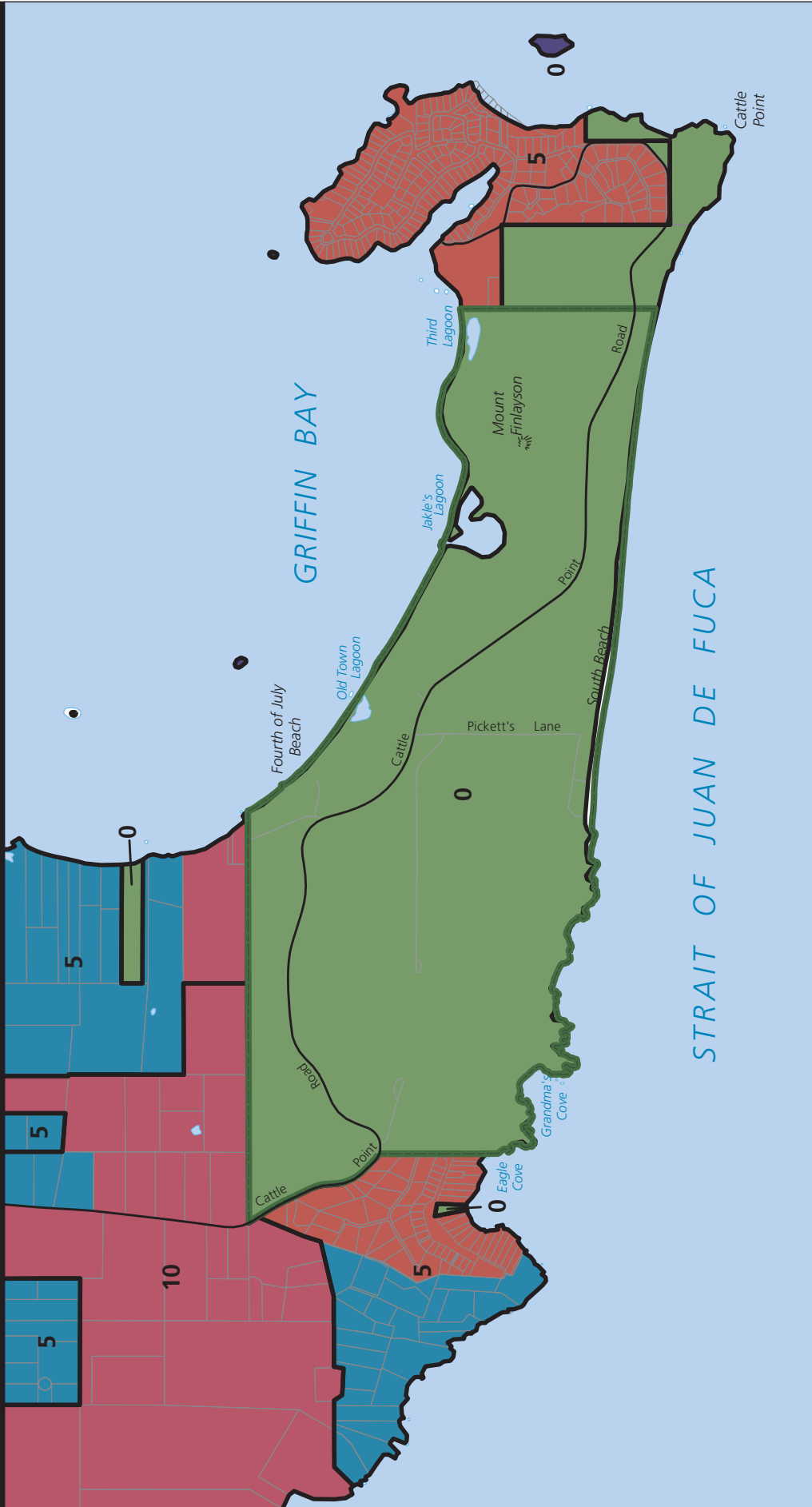
Laundress house and development to the west. NPS Photo.



Housing developments to the east of American Camp. NPS Photo.

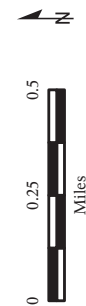
American Camp: County Zoning

San Juan Island National Historical Park GMP/EIS



- Land Use**
- Agricultural Resource
 - Conservancy
 - Natural
 - Rural Farm Forest
 - Rural Residential

- Density***
- Parcel
 - Park Boundary
 - Primary Road
 - Secondary Road



*Residential Density is indicated by a number, e.g. 10 = 1 unit per 10 acres
 0 = Publicly Owned Conservancy Lands
 Note: Some smaller parcels predicated the currently allowed residential densities.

Produced by: National Park Service, PWRO-Seattle GIS Group
 Date Created: February 28, 2007
 Data Sources: NPS - lakes, park boundary, roads, shoreline
 San Juan County - density, land use parcels, roads
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Figure 22

is located on the eastern edge of the Cape of San Juan. It consists of a former U.S. Navy radio compass station recently converted to a picnic shelter with trails leading to the beach. (The U.S. Navy radio compass station was established at Cattle Point in 1921 and operated during the 1920s. Other stations were located on New Dungeness Spit and Smith Island, which allowed triangulation. Ships used this service to figure out where they were, even in dense fog.)

Parcel 5 at Cattle Point is owned by the BLM. The DNR has a non-monetary Recreation and Public Purpose lease from BLM on the property and manages it similarly to its neighboring parcels. This 27-acre property has about 1,500 feet of shoreline and a Coast Guard navigation aid station, sometimes referred to as a lighthouse.

The DNR and NPS both manage the forests on Mount Finlayson, which according to the San Juan Island Trust Advisory Committee report, are the “largest expanse of natural forest land on the southern part of San Juan Island.” The stabilized sand dunes on the southern portion of the site are part of a fragile ecosystem and “should be considered as a possible Natural Area Preserve.” The committee stated that there is a strong ecological and spatial relationship of this ecosystem with adjacent NPS lands. Certain DNR parcels were identified as having “special biological values or natural undisturbed features that represent San Juan County before human disturbance,” and should be preserved. Cattle Point, due to its grasslands and shoreline, was identified as having “Preserve potential” (San Juan Islands Advisory Committee, 1983: p.xv). Those recommendations led to the transfer of the school trust parcel into the NRCA program and eventually to acquisition of the Third Lagoon parcel, whose land was cited as an “outstanding example of a freshwater marsh with a high priority for acquisition” in The Nature Conservancy’s 1977 inventory (San Juan Islands Advisory Committee, 1983: p.113). Because of legal obstacles, The Nature Conservancy opted not to purchase the property, which was later bought by the Land Bank and DNR.

An easement exists with Cape San Juan Associates (the community to the east of the DNR parcel) for a water pipeline right-of-way from DNR to the Cape San Juan community. The right-of-way includes the pipeline route, well, and storage tank. The well has been the only water source for part of the community and is located in an aquifer recharged by rainwater. Maintaining the quantity and quality of the water

supply was stated as a concern of the community. The Cattle Point Water District owns a 2.36-acre parcel sandwiched between Parcel 1, the Third Lagoon Preserve, and Parcel 3. The water district maintains a desalinization plant there, along with a pipeline to saltwater and an easement across the Third Lagoon Preserve for that pipeline.

One alternative recommended by the San Juan Islands Trust Land Advisory Committee in 1983 was for DNR to donate its land to the NPS. This alternative acknowledged that a transfer would have to be initiated by DNR and that the NPS may not want to acquire land with an encumbrance such as the Cape San Juan well. When Third Lagoon was acquired in 2000 by DNR and San Juan County Land Bank, the county’s stated intent was to transfer it in time to the NPS.

Population Trends

San Juan County

San Juan County, the smallest of Washington’s 39 counties, has a population of just over 14,000 people (U.S. Census Bureau, 2000). Agriculture, which took the form of fruit production and row crops, especially peas and potatoes, was a dominant use of the land early on but has shrunk to a few remaining livestock operations and a growing number of small farms catering to organic and specialty markets. Wholly agricultural lands constitute only 12 percent of the total county acreage. In addition to agriculture, the island economy was also fueled in earlier days by commercial fishing, timber harvesting, and limestone mining. All have given way in the post World War II era to tourism and recreation services, which are by far the largest contemporary industries in the county (San Juan County Profile, September 1999. Labor Market and Economic Analysis Branch, Washington State Employment Security Department).

Population forecasts for San Juan Island are provided by the Office of Financial Management, Washington State. In 2010, the population on San Juan Island is expected to reach 8,869 and by the year 2015, reach 10,065.

Tourism has a large impact on the county population. On an average day in August, county population can increase by approximately 60 percent, and if spreading out the number of tourist-days over the full year effectively increases the county population as much as 35 percent (San Juan County 2005. Washington State

Ferries reported that 717,372 people arrived in Friday Harbor by ferry in 2006.

Approximately 15 percent of San Juan Island is classified as open space, which includes parklands and other natural reserves; the remaining 85 percent of the land base is characterized as residential or potentially residential space.

Socially or Economically Disadvantaged Populations

Population Trends

San Juan County is one of the fastest growing counties in Washington. During the 20-year period 1980-2000, the population grew by nearly 80 percent (from 7,838 to 14,077); no other county grew at a faster rate. From 1990-2000, the rate was slightly over 40 percent; only Clark County expanded more quickly. By contrast, state population levels increased only half as fast—by 43 percent for the period 1980-2000 and by 21 percent from 1990-2000.

For the period 1980-2000, San Juan County gained 6,239 residents. Of that number, 378 or just 6 percent were the result of natural population increase (2,079 births and 1,712 deaths); the remaining 5,872 (94 percent) resulted from net in-migration. Projections for 2000-2025 show a gain of 8,457 residents; even though the natural population is expected to decrease by 3,477 (3,063 births and 6,540 deaths) during that time, these figures will be more than offset by an expected net in-migration of 11,934 people. (U.S. Census Bureau, Census 2000 and Washington State Office of financial Management, 2002)

The demographics of population change in the San Juans are unusual. Given the attraction of the islands, most people do not move there to work; they move there to live. In addition, many of the migrants are retirees. San Juan Island has the highest proportion of elderly people in the state.

Demographics

The gender makeup of San Juan County remained relatively constant between 1990 and 2000. Females accounted for 50.5 percent of the population in 1990 and 51.3 percent in 2000. Racial composition of the population changed subtly from 1990-2000. Whites comprised nearly 98 percent of the residents in 1990; ten years later, their estimated share size of the population had decreased to 95 percent.

While white residents only decreased a few points in share size, they increased by 36 percent in actual numbers during 1990-2000. During the same period the nonwhite population increased by 55 percent, but the actual numbers for this group are small. There were only slightly over 400 non-whites in the county in 2000. All racial groups registered positive growth during the period.

People of Hispanic origin can be of any race and are tallied separately. During the decade, the county's Hispanic population grew by 180 percent, increasing from 121 to 338. Their total population share size remains small, however, at only 2.4 percent.

When compared to statewide racial statistics, Hispanic, Asian and African American populations are significantly underrepresented in San Juan County and in the park's visitor population. The percentage of American Indians is also less than the state average (0.8 percent vs. 1.6 percent). Native American youth are occasional visitors to the park in educational groups; they are specifically recruited as students in the Oregon Museum of Science and Industry's summer science camp based at the park's English Camp unit. (U.S. Census Bureau, Census 2000)

Economically Disadvantaged Demographics

The most recent and readily available source for unemployment data characterized by race and gender is the 2000 Census. While Census data are valuable because they are one of the few sources for this type of information, the data were gathered at a single moment in time. The information from this "snapshot" of the population, therefore, should not be interpreted as annual averages.

According to the 2000 Census, the San Juan County civilian labor force totaled 6,822 individuals. Of this total, 2.4 percent of the male population of working age was unemployed; for females, the figure was 4.0 percent. Taken together, the county average unemployment rate was 3.2 percent. Unemployment rates are highest for Native American males (12.9 percent) and Hispanic females (13.8 percent), but these individuals comprise only a small portion (less than 1 percent) of the total labor force. Unemployment rates for all groups in San Juan County were less than those for Washington as a whole; statewide unemployment averaged 6.2 percent in 2000, rising to 14.7 percent for American Indians and 12.5 percent for the Hispanic population.

Statistics indicate that 6.0 percent of the families in San Juan County are in poverty; statewide, this figure is 7.3 percent. The rate for individuals in poverty is similar: 9.2 percent for San Juan County versus 10.6 percent for the state as a whole. For individuals over 65, the poverty rate falls to 3.1 percent, significantly lower than the state rate of 7.5 percent and likely a reflection of the relatively affluent retired segment of the county's population.

No survey or interview data exist for the percentage of park visitors who are unemployed or whose income is below the poverty line. Moreover, the park does not have current data on the racial makeup of its visitor population. Casual observations and the impressions of park staff who contact visitors are that park resources are enjoyed by a mix of visitors, including the economically disadvantaged. In this regard, it may be important that the park does not charge any entrance or recreational use fees that could operate as a barrier to visitation.

Contemporary Tribal Communities

Contemporary tribal communities descendent from indigenous populations of San Juan Island include residents of American Indian reservations; a federally recognized tribe without a reservation; First Nation reserves in Canada; and a small number of families still living in the San Juan Islands who are not federally recognized as tribes. At least some of the island American Indians are registered as members of other tribes, such as the Samish. In the United States, the Lummi and Swinomish Nations have reservations that are closest to San Juan Island. The Lummi reservation is 35 miles northeast on the mainland, north of Bellingham. The Swinomish reservation is about 25 miles east on Fidalgo Island, south of Anacortes and west of La Conner.

The land base of both the Lummi and Swinomish reservations was created by the 1855 Point Elliott Treaty and modified by an Executive Order in 1873. In contrast, the Samish were not identified in the final draft of the Point Elliott Treaty and they did not receive a portion of the Swinomish reservation in 1873 that was supposed to have been established for them. Some Samishes took up residence on the Lummi and Swinomish reservations where they intermarried, but others lived outside of reservations entirely. A Samish village on Guemes Island was occupied until 1912 when economic pressures led tribal members to sell land they had homesteaded (Suttles, personal communication). Throughout the early twentieth

century, the Samish lived at various places on the mainland and continued to use fishing villages in the San Juan Islands. Some resided outside of reservations, while others returned to Lummi and Swinomish reservations or even moved to more distant reservations such as Tulalip. Federal recognition of a group known as the Samish Nation took place in May 1996. Tribal headquarters are in Anacortes, but the tribe does not have a reservation.

There are three separate Klallam (also known as Clallam and S'Klallam) reservations in their primary historic homeland in the United States on the south side of the Strait of Juan de Fuca. Under the terms of the Point No Point Treaty of 1855, the Klallam were entitled to share a reservation with the Skokomish on the Hood Canal. Instead, they stayed in their traditional area and continued to travel to the San Juan Islands for fishing and other purposes. One group of Klallam families purchased acreage east of Port Angeles in 1874 and received federal recognition as the Jamestown S'Klallam Tribe in 1980. Another group maintained residency on the Kitsap Peninsula near the lumber mill town of Port Gamble where they acquired acreage purchased on their behalf by the federal government in the mid 1930s. At the same time, a third group that came to be known as the Lower Elwha Tribal Community received acreage near Port Angeles. Port Gamble and Lower Elwha received both federal recognition and land pursuant to the Indian Reorganization Act of 1934.

There are several First Nation reserves north of San Juan Island where descendents of the Songhees and Saanich tribes live. In British Columbia, Canada, west of Victoria, the Songhees reside on two reserves at Esquimalt. North of Victoria, there are Saanich living on four reserves on the Saanich Peninsula. The ancestors of both the contemporary Songhees and Saanich used fisheries on the west side of San Juan Island into the early 1900s. Likewise, their ancestors are among the ancestors of individuals in two federally non-recognized tribes that still reside on San Juan Island, the Mitchell Bay Band and the San Juan Tribe of Indians.

Mitchell Bay is a short distance south of Garrison Bay and the English Camp unit of San Juan Island National Historical Park. A survey was conducted between 1916 and 1918 to determine the number of Indians who were living outside of reservations (Roblin, 1919). It identified the following tribes and number of individuals as San Juan Island residents: "Mitchell Bay, 41; Klallam, 48; San Juan Tribe, 6;

Lummi, 4; Swinomish, 1” (as presented in Boxberger, 1994: p.39). Mitchell Bay and San Juan Indian Tribes may have been two distinct names used by certain individuals and families in earlier times to refer to their descent from certain individual tribes or different sets of Canadian and United States tribal groups such as the Songhees, Saanich, Samish and Lummi. Both the Mitchell Bay and San Juan groups pursued land claims and federal recognition, but by 1982 “the Department of the Interior defined the Mitchell Bay Indians, as a ‘group’ of Indians who are similar to the San Juan Island Indians” (Ruby and Brown, 1986: p.133). It is said that the membership was 110 individuals in 1989 (Suttles, 1998: p.22).

A *Seattle Post-Intelligencer* newspaper article in 2002 said that an extended family with Indian heritage continued to live on San Juan Island and nearby Stuart Island. At the time, one gentleman who was 72 years old and had “one-quarter Indian blood” lived in Friday Harbor and continued to own and use a reef net at Reid Harbor on Stuart Island near where his 94-year old aunt lived. She recalled a scene from her youth on Stuart Island: “Along this beach here there was nothing but Indian camps. Saanich, from Canada, used to come up in big long canoes.” A 50-year old nephew of the Friday Harbor resident also lived in Friday Harbor and said he had “three-sixteenths Indian and was an associate member of the Swinomish Tribe.” The younger man’s 80-year old aunt and Friday Harbor neighbor commented on herself and other Indians she knew:

There isn’t any of them left here on the island except our family. We didn’t get any allotment land in San Juan County. It’s sad. There isn’t any recognition of our ever being a tribe. That’s what I am. I am a San Juan Indian (Shukovsky, 2002).

As mentioned above, a number of island residents identify themselves as belonging to the Mitchell Bay Band or the San Juan Tribe, which are not federally recognized tribes. Many of these individuals maintain membership in federally-recognized tribes such as the Samish or Swinomish.

LEGAL AGREEMENTS

The following are legal agreements between the park and others to help with the management of collections, visitors, and fire.

- 1993 Memorandum of Agreement (MOA) between North Cascades National Park

Service Complex and the park for curatorial assistance and collections management.

- 2003 MOU between the Burke Museum and the park for curatorial collections management.
- Memorandum of Understanding (MOU) between NPS and San Juan County regarding American Camp road vacation.
- 2002 General Agreement between the San Juan County Sheriff’s Office and the park for law enforcement and mutual aid.
- 1994 MOU between the San Juan County Fire District #3 and the park for fire management.
- 1987-2007 Interagency Agreement between Washington State Department of Natural Resources and the park for placement of a dingy dock on state-owned aquatic land.
- MOU between Department of Interior Biological Resources Division and the North Coast and Cascades Network, which includes the park, for conducting research and inventory and monitoring activities.
- Memorandum of Agreement between San Juan County Public Works Department and the park for federal compliance and planning for the Cattle Point Road Environmental Impact Statement.
- Memorandum of Agreement between the National Park Service and Oregon Museum of Science and Industry for OMSI to use land at English Camp for a summer educational programs of mutual benefit to OMSI and the park.

LAND USE DOCUMENTS AND RELATED PLANS

Washington State Documents

Recommended Management Guidelines for San Juan Islands Trust Land

This document was published by the San Juan Islands Trust Land Advisory Committee in May 1985. In 1983, after growing concerns by the San Juan County Commissioners regarding DNR proposals in the county, the Commissioner of Public Lands established a committee to develop a long-range management plan for the Trust Lands in San Juan County. The purpose of the commission was to “provide a forum for discussion of issues and areas of concern regarding the wise and prudent multiple uses of DNR-managed lands.” The committee involved participation with state and local agencies, the general

public, and committee members on “how to integrate DNR trust obligations for environmentally sound land management with educational and recreational opportunities and with the concerns of island and regional residents” (p.x).

The committee’s recommendations were guided by five factors that included sound resource management and protection of public resources, multiple use provisions compatible with basic Trust obligations, and San Juan County plans and policies.

There are two DNR properties adjacent to San Juan Island National Historical Park: Mitchell Hill, which shares its northern border with English Camp; and Cattle Point NRCA, which shares its western border with American Camp. Both of these properties are discussed in the previous “Land Use and Ownership Patterns” subsection.

San Juan County Documents

San Juan County Comprehensive Plan

The *San Juan County Comprehensive Plan* is a set of goals and policies to achieve the vision for the future of San Juan County. It guides the physical, economic and community development of the county for the next twenty years. The Comprehensive Plan was adopted by San Juan County in October 2000 and is periodically updated.

The plan establishes five principal land use classes for the county. Each class permits a different level of activity. These five are Growth Areas (urban lands), Activity Centers (including areas of more intense rural development), Rural Lands, Resource Lands, and Special Districts which include Conservancy and Natural designations). There are districts within each class, which are individual land use categories. These land use classes and districts have been developed based on the needs and expressed desires of the community, existing land use patterns, natural systems and land capability, and coordination with the Shoreline Management Act and the Shoreline Master Program. The Unified Development Code identifies the uses and activities, which are allowed or prohibited within each land use district.

The goals of the Conservancy and Natural designations are to “protect, conserve, and manage existing natural conditions, resources, and valuable historic, scenic, educational, or scientific research areas for the benefit of existing and future generations

without precluding compatible human uses”, and “to preserve indigenous plant and animal species and ecosystems in a natural state for the benefit of existing and future generations..” San Juan Island National Historical Park is zoned under the Conservancy Land district. (For further analysis on land classification around the park, see the “Land Use and Ownership Patterns” section.)

Parks, Recreation, and Preserved Lands Plan for San Juan County, 1999-2004

This plan was prepared by Future Directions, Inc. for San Juan County and adopted by the county in May 1999. The plan provides a six-year direction to San Juan County Parks, Public Works, and the Land Bank “for the identification, development and management of parks, recreation, and reserved lands for 1999-2004” (p.3). The document’s goal was to inventory existing parks, road ends, and preserved lands, analyze demand and need, and develop an action plan.

The San Juan County Land Bank was established by voters in 1990 to identify and preserve the important conservation lands in the county through property acquisition. This program is funded through a one-percent real estate transfer tax paid by purchasers of property in the county. Since January 2003, the Land Bank has acquired a total of 413 acres in fee acquisition (purchase price \$6,135,861) on San Juan Island and other 243 acres in conservation easements (purchase price \$579,659) (Land Bank website). In 2000, in partnership with the DNR, the Land Bank purchased a significant 19-acre day-use hiking area, called the Third Lagoon Preserve, on Mount Finlayson adjacent to American Camp and the Cattle Point Natural Resources Conservation Area.

According to the *Parks, Recreation, and Preserved Lands Plan for San Juan County*, the Public Land Inventory for San Juan County lists 26 parcels of public land managed by San Juan County, Department of Natural Resources, Port of Friday Harbor, Washington State Parks, Town of Friday Harbor, and the National Park Service. The Town of Friday Harbor manages 10 parcels within the town limits (p.25-27).

In the Master Plan of Strategies by Year—1999, the NPS is listed as participating with the county in developing a comprehensive trail survey that would assist with local prioritization of resources, as new trails are desired by the community (p.79).

Plan for Parks, Recreation and Preserved Lands for San Juan County, 2005-2010; Section II: County Parks, Land Bank, and Public Works Overview

This plan is an update of the 1999-2004 *Plan for Parks, Recreation and Preserved Lands for San Juan County*.

The purpose of the plan is to provide direction to three county departments for parks, recreation and preserved lands. These departments are Parks, Public Works, and the Land Bank.

In 2004 since the last plan was written, the Land Bank joined with the San Juan Preservation Trust to develop a strategic plan to guide both land conservation organizations in establishing conservation priorities through the San Juan Islands. The Land Bank owns more than a dozen properties on San Juan Island and has conservation easements on many more. (In 2005, the Land Bank and DNR purchased a 70-acre parcel on the northern boundary of American Camp.)

The plan addresses community involvement in determining the existing resources of the county and how these resources are managed. A media campaign was developed to encourage public participation and public meetings were held. In addition, a survey was mailed to residents to randomly selected households within the county. The results of this survey revealed a community desire and need to improve existing parks (65 percent of respondents); that trails and bikeways should be an integral part of transportation planning for the county (82 percent) and that trails and bikeways should be a critical consideration in public land acquisition projects (71 percent). In addition, for land acquisition priorities, 87 percent assigned a moderate to high priority to land purchase for watershed conservation, preserving scenic views and habitat protection. The greatest desire was for beach and tideland access with or without parking availability (p.61-62).

In the "Master of Strategies" section, the National Park Service is listed as assisting the county in the following categories:

- developing trails and bikeway plans for Orcas, Lopez, and San Juan islands, identifying and prioritizing specific projects and resources
- maintain, improve, and expand trail systems on public lands
- preserve cultural and historic resources existing in county parks
- and maintain public ownership of Washington State DNR Trust Lands in the county through interagency cooperating and implementation

of multi-agency transfer package developed in 2003.

San Juan County Nonmotorized Transportation Plan

This plan is an element of the *San Juan County Transportation Plan* and was published in December 2004. The plan's purpose is to implement state and county directives that address nonmotorized transportation requirements, including alternative transportation, while addressing and incorporating public needs.

The San Juan Islands are beautiful and enticing environments. It is presently difficult for visitors and residents to access popular destination and parts of the islands without a vehicle. Many of the roads are challenging for biking and there are few walking corridors for public use. County staff and advocacy groups have worked together to develop specific goals projects which are represented in the plan.

The following policy and goals were developed as part of the plan that included input from the bicycle-pedestrian advisory groups from the three major islands:

- Promote the development of a safe and convenient non motorized transportation system in San Juan County that serves the needs of residents and visitors alike.
- Provide safe, integrated pedestrian and bicycle linkages between ferry terminals, village centers, parks, schools and major island destinations.
- Coordinate nonmotorized transportation planning with other county departments, agencies and organized island groups that may be part of a unified solution.
- Provide, as a minimum funding level, no less than 2 percent of the annual construction program budget for the construction of nonmotorized transportation projects.

While specific projects and goals were listed in the plan, the following general countywide needs should be addressed:

- Placement of bicycle staging areas and informational materials at each of the ferry terminals.
- Provision of linkages between ferry terminals and activity centers.
- Development of wider shoulders on main corridors, roads leading to schools or touring routes.

- Consideration of a broad range of safety-related issues including crossing improvements, pathways that link island destinations and school walk route improvements.

The remainder of the plan addresses design guidelines, to help mitigate visual impact of new facilities; increased maintenance needs; and county management and coordination to administer the plan.

San Juan County Open Space and Conservation Plan

The Open Space and Conservation Plan was prepared for the Board of County Commissioners by the San Juan County Planning Department and the Open Space and Conservation Committee in May 1991. The plan began as a grassroots effort to protect open space.

In 1990, San Juan County with help from the San Juan Preservation Trust initiated an open space and conservation planning process. The Board of County Commissioners appointed an Open Space and Conservation Committee to develop a plan to identify and protect open spaces, vistas, and view corridors that substantially contributed to the rural quality of the landscape. In addition, the committee was to address important natural resources whether they contributed to the visual quality or not. The plan addressed methods used in identification, any degrading factors, and effectiveness of existing conservation tools and presented recommendations for actions to conserve open space resources.

The analyses show which open space resources are significant to the community and how sensitive those resources are to adverse change. In the San Juan District, San Juan Island was divided into 27 units (areas) based on topography, vegetation, and cultural patterns. Each unit was analyzed using the nine following criteria: pastoral landscapes, water/mountain view landscapes, prominent geographic features, rural development pattern, diversity, landscape contrast, uniqueness, visual accessibility, and contributing to existing resource conservation areas. Each criterion for each unit was ranked. The units were then scored and ranged from highest to lowest. American Camp scored the highest and English Camp fifth highest. The score weighting reflects the general importance of the resource to the community.

San Juan County Shoreline Master Program

The Shoreline Master Program was originally adopted in 1976 in accordance with the Washington State Shoreline Management Act of 1971. The plan applies to all shorelines in the county except federal land, to the area 200 feet landward from the ordinary high water mark and to tidal waters. It is the intent of this program to manage the use and development of the shorelines giving preference to water-dependent and water related uses and to encourage development and use in harmony with natural conditions.

In response to the public's demand for greater marine habitat protection, a shoreline designation termed Marine Habitat Management Area Environment was added to the Shoreline Master Program. This area is designed to preserve and restore critical marine habitat areas and may be applied as an overlay to other shoreline environment designations.

All National Park Service plans need to meet federal requirements under the Coastal Zone Management Act. This general management plan will be reviewed by the Federal Consistency Coordinator for the Washington State Department of Ecology. The plan must meet the Washington State Coastal Zone Program to the maximum extent possible.

San Juan County Unified Development Code

This code is the tool for implementing the goals and policies of the *San Juan County Comprehensive Plan* in conformance with Washington State's Growth Management Act, Shoreline Management Act, Subdivisions Code, and State Environmental Policy Act. Development regulations and land use regulations are contained within this document. Zoning adjacent to the park is discussed in detail in the "Land Use and Ownership Patterns" section.

San Juan Island Trails Plan

The San Juan Island Trails Committee finalized this plan in September 2006. The intent of this plan is to foster the coordination of trail groups, both public and private, in the creation of a network non-motorized trail system. It is envisioned that this trail system would connect users to important destinations and key resources on the San Juan Island. The target user groups are walkers, bicyclists, and equestrians.

A number of new conceptual trails were developed during the planning process and listed as either Priority I or Priority II depending upon factors such as

expense of developing the trail, timing, and logistics. The following trails link to either English Camp or American Camp at San Juan Island National Historical Park. The following trail descriptions are excerpted directly from the *San Juan Island Trails Plan* (p. 24-26):

Proposed Priority I Trails

“Friday Harbor—American Camp Link

Identified as the top priority by respondents to the Committee’s 2005 Trails Survey, this proposed trail route would use National Park Service land, the public right-of-way along Cattle Point Road, and the new Terminal Trail at the airport to connect Friday Harbor with American Camp. If owners of private property along the route agree to participate, the trail may, in places, cross private land as well. This trail, approximately 7 miles long, is envisioned to be used mainly by walkers. Newly widened shoulders along most of Cattle Point Road provide a safer roadway for bicyclists to travel between Friday Harbor and American Camp.”

“Roche Harbor—Roche Harbor Highlands—English Camp Link

This proposed walking trail would connect Roche Harbor Resort and English Camp, via Roche Harbor Highlands. It could use National Park Service land, Roche Harbor Village property, and property owned by Saltchuk Resources, as well as the public right-of-way along Roche Harbor and West Valley roads. Much of the 5-mile trail already exists.”

“A Cross-Island Trail

Utilizing publicly owned land and willing landowners, this trail would connect the Roche Harbor-Mitchell Hill-English Camp area with Egg Lake Road through the center of the Island. This may be a component of the Friday Harbor-Roche Harbor Link. Being cross-country in nature, it might possibly accommodate walkers, horses, and mountain bikes. The creation of this trail would require significant cooperation of private landowners.”

Proposed Priority II Trails

“English Camp—American Camp Link

During the 19th century, while soldiers of England and the U.S. were concurrently stationed on San Juan Island, and before most of our current public roads existed, there was a roadway that connected the two camps. Commonly referred to today as the historic military road, or the Old military road, only remnants of this roadway exist, as well as sections that are now contiguous with modern roadways, both public and private. There has been much interest as well

as controversy on the Island about the Old military road over the last twenty or more years. The San Juan County Department of Public Works conducted an extensive trail feasibility study of it in 1990. Much of the road travels across what is now private property, and the possibility of reviving or restoring it has been greeted with great interest on the part of some and great resistance by others. The allure of recreating an historic trail across this lovely countryside is very compelling, but the potential for controversy and rancor discourages the Committee from pursuing this very aggressively as we would rather create trails (and supporters) in more feasible ways and locations.”

Historic Old Military Road, Trail Feasibility Study, Final Report

This study was produced by San Juan County in November 1990. The purpose of the study was to assess the feasibility of restoring the historic military road, constructed between 1860 and 1875 by the British Royal Marine Engineers, as a trail link between American and English camps. The military road eventually fell into disuse possibly due to population shifts on the island. Using historic surveys the route can be traced accurately.

The study team produced three trail design options defined by the type and intensity of use: pedestrian, bicycle, and equestrian. Three major alignments of the trail were developed and evaluated; these were defined as the Historic Route, Cady Mountain Historic Route, and Existing Road Route. A new alternative was developed after public involvement and labeled Alternate Route. The report also included a preliminary estimate of construction costs.

Though the route of the trail varied slightly, in all alternatives the two primary trailheads were located at English Camp and American Camp. The document states that the county would work cooperatively with the National Park Service.

Approximately 100 people attended two public meetings. Most people commenting on the plan agreed that a trail would alleviate safety hazards that are present when using the existing roads. Though the Historic Route maintains the historic integrity of the military road, it would have the most impact on private lands. Of the property owners that attended the meetings, all of them said that if the trail crossed their property, that they would not support it. However, most of them said that they would support a trail if it did not affect private property.

Most of the participants agreed that the Existing Road Route, which predominately used the right-of-way along the existing road system, would be preferred. Most of the public supported a minimum use unpaved trail that would be for hiking purposes only, the underlying reason being that this type of trail would most be used by local residents and not by island visitors.

The public felt that the trail does not have to follow the historic route but that the location of the historic route should be noted on a map or in a display at American and English camps. It could also be commemorated at locations where the trail crossed the historic route.

Westcott-Garrison Bay Marine Habitat Management Area Plan

This document is a marine habitat management plan and watershed plan for the Westcott and Garrison bays, published in July 2001 by the San Juan County Planning Department. One of several critical marine habitat areas on San Juan Island, the Westcott-Garrison marine complex was selected by the Board of County Commissioners as the first critical marine habitat area to be considered under the new Marine Habitat Management Area Environment in the county's Shoreline Master Program. The purpose of the report is to establish and present San Juan County's goals, policies and programs for the stewardship of the marine environment of Westcott and Garrison bays. The role of the plan serves to coordinate various county department actions into a comprehensive program to protect the marine resources. It provides background information about resources, the regulatory context, and potential development.

Under the "Management Plan Strategies" section, an interpretive display is proposed for English Camp. The plan proposes to work with the NPS to "provide an interpretive display at English Camp to inform the public about the marine resources of Westcott and Garrison bays, human impacts, and sustainable boating, nature visitation and watershed management practices" (p.17). In addition, a trail and interpretive center is proposed for the Mitchell Hill Trust Land. Under the Conservation Action Strategies, the plan seeks to "encourage the transfer of the Mitchell Hill DNR school trust land into a public conservation land status" (p.19).

There are plans to establish a Marine Habitat Management Area stewardship committee. As a

land manager within the watershed, NPS has an opportunity to participate.

Westcott-Garrison Bay Watershed Assessment Report

This assessment was prepared by San Juan County Planning Department, San Juan County, Washington, in January 1999. It describes the physical environment, land uses within the watershed, resources and water quality, and the potential impacts to these resources.

San Juan Island National Historical Park is mentioned as being located in the center of the watershed. A description of the recreational use, facilities, and infrastructure of the park are discussed in the report (p.27). The document also mentions the initiation of the park's general management plan.

San Juan County Watershed Management Action Plan

This watershed management plan was approved by the Board of County Commissioners in 2000 and was developed by the Watershed Management Committee, a citizens' advisory committee to meet the requirements of the Puget Sound Water Quality Management Plan. This plan identifies important water quality resources and uses, identifies pollution sources and management issues, and presents over 100 strategies to prevent water quality degradation in the county and Puget Sound from non-point pollution.

Town of Friday Harbor Documents

Town of Friday Harbor 2002 Comprehensive Plan

The comprehensive plan was adopted in September 2002 by the Town of Friday Harbor. It was developed in accordance with the Growth Management Act and represents the community's plan for guiding growth and development for the next 20 years. The Land Use Element establishes policies to guide growth and development. There are eight land use categories: Single Family Residential, Multi-Family Residential, Professional Service Commercial, Commercial, Shoreline Public Accommodation, Industrial, Public Service, and Utility.

The headquarters for San Juan Island National Historical Park are located within the part of town zoned Commercial. The goals and policies for downtown Friday Harbor are intended to promote the downtown's role as the commercial, civic and cultural center of the county. The town's vision is to

preserve the small town character and offer “a full range of personalized commercial and public services in an attractive and convenient pedestrian-oriented environment” (p.10). American and English camps are outside the town and within San Juan County jurisdiction.

Other Related Plans

San Juan Islands Community Opinion Survey

This document was prepared for The Friends of the San Juans and The San Juan Islands Economic Development Council by The Madrona Group in March 1990. This study was conducted to assess community attitudes on issues, focusing on quality of life, and to determine the community’s future goals. Questions that were analyzed included growth, the physical, social, and cultural environment, the economy, jobs, transportation and housing. A total of 1,060 questionnaires were sent to residents and 72 percent responded.

In general, the survey confirmed the importance of the environment to local residents. Protection of the natural environment was the highest priority for future goals for residents. Most were concerned about growth and “wanted population growth to slow or stop”. In addition, residents wanted restrictions placed on growth and development. Open space preservation was a top priority, as well as improving the ferry system. In the written comments supplied, the most frequently mentioned issue was about growth and its effects on the lifestyle and environment (Executive Summary, p.i-iii).

Related National Park Service Plans

National Park Service Ocean Park Stewardship 2005-2008 Action Plan

The 2001 National Park System Advisory Board Report, “Rethinking the National Parks for the 21st Century,” raised concerns about “dramatic declines in the health of marine ecosystems” and called for the NPS to focus more attention on stewardship and protection of ocean resources in the national park system. Responding to these concerns, NPS recently developed a strategy to increase its emphasis on marine resource management and conservation. The Ocean Park Stewardship Action Plan identifies critical issues and ways to address these concerns cooperatively with federal, state, and private partners. The action plan seeks to:

- Establish a seamless network of ocean parks,

sanctuaries, refuges, and reserves

- Discover, map, and protect ocean parks
- Engage visitors in ocean park stewardship
- Increase NPS technical capacity for ocean exploration and stewardship

Accomplishing these goals requires that the NPS address complex issues and shared authorities that extend across park boundaries. The NPS recognizes that real conservation and science-based management result from collaboration between federal agencies, states, citizens, local communities, and academia, all working to protect a shared ocean heritage. The National Park Service has begun to strengthen its science-based foundation for managing marine resources, working with the U.S. Geological Survey (USGS), National Oceanic and Atmospheric Administration (NOAA), states, universities, and other partners.

The critical keys to improved ocean conservation in the national park system are partnerships with other ocean-concerned agencies and communities to facilitate cooperation, collaboration, and communication. Connecting people to ocean parks may be one of the most important tasks ahead to build awareness and support with park stakeholders and the public.

The *Ocean Park Stewardship Action Plan* essentially offers a call to action for the NPS to continue fulfilling its leadership role as an ocean conservation agency and to actively collaborate with other agencies such as NOAA to promote management activities in four general categories listed in the action plan. San Juan Island National Historical Park is one of the networks of ocean parks and will be actively participating as this initiative develops. Establishing detailed mechanisms, such as cooperative agreements, will be crucial to the success of these interagency programs. At San Juan Island National Historical Park, the existing framework of the Northwest Straits Commission and the Marine Resources Committee already provide a base upon which such agreements can be built.

Assessment of Coastal Water Resources and Watershed Conditions at San Juan Island National Historical Park

This technical report was prepared by Dr. Terrie Klinger, Dr. David Fluharty, Kirsten Evans and Carrie Byron, School of Marine Affairs, University of Washington for the NPS Water Resources Division in Fort Collins, Colorado. The assessment provides a summary of the status of freshwater and marine

aquatic resources at San Juan Island National Historical Park. The report examines existing information pertaining to water quality, the condition of aquatic habitats and their biota, sources of point and non-point pollution in the region, and threats to the park's aquatic resources.

Fort Vancouver National Historic Site General Management Plan

The *Fort Vancouver National Historic Site General Management Plan* was produced by the NPS in October 2003. Fort Vancouver National Historic Site was established to preserve the site of the original Hudson's Bay Company stockade and surrounding historic features of the area. Fort Vancouver served as the headquarters, principal supply depot for the Columbia Department, and initial administrative center of the Puget Sound Agricultural Company.

Both San Juan Island National Historical Park and Fort Vancouver National Historic Site share the same period of history and Hudson's Bay Company themes. Both were shaped by the on-going competition between Britain and the United States over control of the region. The Hudson's Bay Company archaeological artifacts for San Juan Island National Historical Park are currently stored at Fort Vancouver National Historic Site.

EXISTING PARK DEVELOPMENT AND PROGRAMS

San Juan Island National Historical Park totals 1,752 acres. It is comprised of two units: English Camp totaling 529 acres on the northwest section of the island, and American Camp totaling 1,223 acres on the southern tip of the island. The park headquarters are located in a leased building in the town of Friday Harbor on the east side of the island.

Roads and Parking

Paved Roads

San Juan Island National Historical Park has a total of ten roads. Approximately four and one-half miles of these roads are paved road surfaces inside the park boundary. At American Camp, a 1,400 linear foot paved road leads from the main entrance road to the visitor center, ending in an 8,000 square foot parking lot. The NPS maintains a mile and one-half stretch of road along Cattle Point Road from the park's entrance

to the intersection at Pickett's Lane. San Juan County maintains one and one-half miles of the Cattle Point Road from Pickett's Lane to the eastern boundary. In addition, the county maintains the half-mile long Pickett's Lane, extending from its intersection with Cattle Point Road to South Beach. The NPS maintains the 16,000 square foot parking area at South Beach. (Refer to Figure 4 and Figure 5 for road locations).

At English Camp, the county maintains one and one-half miles of paved county road along West Valley Road within the park. West Valley Road is the main road connecting Roche Harbor with the west side of the island. The park also maintains a 9,068 square foot parking lot at the maintenance shop.

Gravel Roads

There are approximately four miles of gravel road surfaces in the park. At Cattle Point Road, a 600 linear foot road leads to the Fourth of July Beach picnic area. This road splits off to the north as an 800 linear foot spur to a horse trailer parking. The road beginning from the parking area at South Beach paralleling the beach, known as Salmon Banks Road, is 1,520 feet long. It has two spurs, each 120 feet long, leading to the beach. The redoubt road from Pickett's Lane to the redoubt is 4,100 feet long and ends in a parking area 14,250 square feet in size. The parking lot capacity is about 15 vehicles. The service road, which runs through the woods on the north side of Mount Finlayson, is one and a half miles long, but only foot traffic, park, and emergency vehicles are allowed on it.

The entrance to English Camp is a gravel road 1,790 linear feet with a 21,165 square foot parking area at the end. The service road from the maintenance facility to the back of the parade ground is 2,670 feet long and serves the VIP sites, the OMSI summer camp, the Crook house, the backside of the parade ground and the English Camp well house.

Signs

There are 78 park signs that are used for interpretation, safety, and direction throughout the park on roads, trails, buildings, and boundaries.

Trails

There are approximately nine miles of dirt and gravel trails in the park. At American Camp, five miles are available and mapped for general hiking. English Camp has four miles of trails.

Buildings and Facilities

The park has nine major structures managed by the National Park Service.

Headquarters

In 2004, the park's administrative offices were relocated from Spring Street to a new leased space by the General Services Administration on Mullis Street in the Town of Friday Harbor. There is approximately 1,400 square feet total of office space. The administrative offices are used by five permanent employees.

American Camp

Visitor Center

The park's primary and year-round visitor center is located at American Camp. The visitor center is 1,400 square feet and consists of a double-wide trailer constructed in 1979 to serve as a temporary visitor center. The interior of the building is divided into three sections: an 800 square foot public interpretive area, a 350 square foot office, and a 250 square foot office. Three employees work in the offices year-round with as many as six employees in the summer. Two accessible restrooms are connected to the building by a deck and are 40 square feet each.

Fire Cache

The fire cache was acquired with a 4.2-acre tract of land in 1968. It consists of a wood framed building with plywood siding and an asphalt shingle roof that is used for equipment storage, natural resource supplies and tools, and fire fighting equipment. It is approximately 900 square feet in size and is located off the American Camp entrance road adjacent to the VIP hook ups.

Historic Structures

Of the original 28 buildings constructed by the American military, only two remain onsite, the officers' quarters and the laundress' quarters.

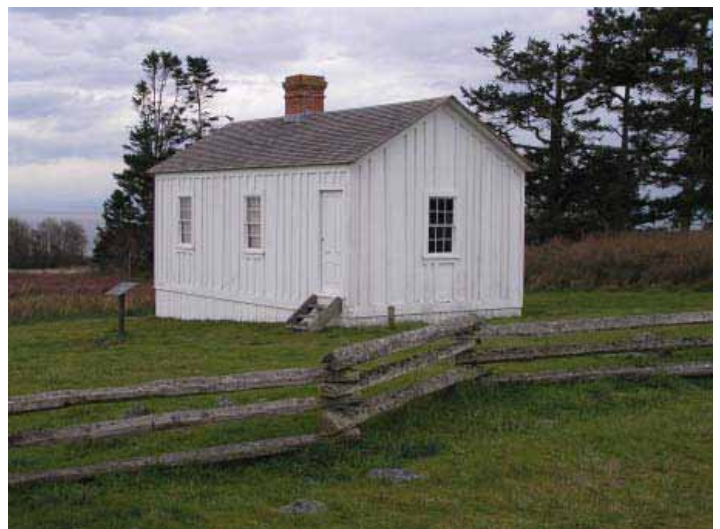
Officers' Quarters HS 11—the officers' quarters were built around 1860. It is a one-story duplex building with 1,221 square feet of living space and 540 square feet of covered porch. The construction style is typical of most buildings at both camps. There is no internal wall framing. The walls are composed of vertical planks covered by horizontal external siding. This style is known as plank or box construction. As with all camp buildings, it has a cedar shake roof. It is not open to the public.

Laundress' quarters HS 6—the laundress' quarters was built in 1860 and is 351 square feet. It is a one-story box construction building with board and batten siding (not typical) and a cedar shake roof. It is not open to the public.

English Camp

Maintenance Facility

The maintenance facility was built in 1990 and contains a shop and office building 3800 square feet in size. Adjacent is an 800 square foot metal shed with a 200 gallon (approximate) above-ground storage tank for storing diesel and gasoline.



Laundress' quarters at American Camp. NPS Photo.

Historic Structures

Of the original thirty primary buildings constructed by the Royal Marines only four remain. Another historic building, the Crook house, was built after the encampment period.

Blockhouse HS 1—the blockhouse is a two-story log structure measuring 250 square feet on each level. It was built in 1860 and was made primarily of interlocking stacked logs, what many people would refer to as “log-cabin” style. The upper level is set diagonally across the lower room. The lower floor is open for viewing from May to September.

Barracks Building HS 2—the barracks is a one-story rectangular building. It consists of two rooms and is 1600 square feet. It was built in 1860, using plank construction. Open from May until September, it serves as the English Camp public contact station and is staffed primarily by park volunteers.

The Commissary HS 3—the commissary building is a one-story, one room, gabled structure measuring 800 square feet built in 1860. It is not open to the public and is used primarily for storage of reproduction tools and tents for living history programs.

Hospital HS 18—the hospital is a one-story, rectangular building with a gable roof measuring 480 square feet. Built in 1860, it has three rooms. It is not open to the public.

Crook House—the Crook house is situated on a slope above the historic military structures. It was built between 1887 and 1903. The two-story, wood-frame

structure (1587 square feet) has a second story covered porch on the west side. An additional one-story wing was added onto the east side in the 1960s (397 square feet), making the total square footage 1984. Though not from 1853 to 1871, the period the park commemorates, it is of local historical significance as an example of an early San Juan Island farmhouse. It is now inhabited by a maternal colony of bats. No one is allowed inside the house due to possible histoplasmosis infection. It was determined eligible for the National Register of Historic Places in 1984.

Dingy Dock—the Dingy Dock, located on Garrison Bay, was donated by a Canadian organization in 1984. It was completed and dedicated in 1986 and is used by many boaters. The dock has four sections measuring 6 feet wide by 20 feet long and two sections measuring 8 feet side by 16 feet long for a total length of 112 feet. The park staff maintains it.

Formal Garden—the restored formal garden, a key visitor site and of historical significance, is approximately 2,000 square feet, round in design and sectioned into 12 pie-shaped areas by 16 inch tall box hedges. The water source is a hand dug well next to the Young Hill trail.

English Camp Cemetery—the English Camp cemetery is located on the slope of Young Hill above English Camp. It is a small plot surrounded by a white picket fence. Headstones in fair condition mark seven graves. A Royal Canadian Navy marker designating the site was installed in 1964.

Vault Toilets

There are four vault toilet comfort stations located in the park. One is located at American Camp at South Beach and another at Fourth of July picnic area. At English Camp, there is one at the visitor parking lot and another sited at the north end of the English Camp parade ground.



Commissary at English Camp. NPS Photo.

Utilities

Electricity to the park is supplied to the park units by Orcas Power and Light Cooperative. Century Tel provides telephone service.

At American Camp, water is supplied by one well. The system consists of a drilled well, submersible pump, continuous chlorination and a contained air hydropneumatic tank. This system serves two Volunteer-in the-Park (VIP) trailer pads, restrooms at the visitor center, and a drinking fountain. Most of the system components were replaced in 2006, including the pump, the chlorinator, the pumphouse, the tanks, and the water lines. The well itself was cleaned, but not replaced.

At English Camp, the public system is served by a low yield drilled well, hypochlorinator, a submersible pump that pumps chlorinated water to an above ground polyethylene chlorine contact tank. A high service pump takes the water from the contact tank to hydropneumatic storage for distribution. This system serves two VIP trailer pads, a summer youth camp and a drinking fountain. A second well and submersible pump serves the maintenance shop. The well water in the shop is not chlorinated, so it is not potable. Drinking water is delivered by a service company and kept in a cooler in the shop office.



ASSET BUSINESS PLAN FOR SAN JUAN ISLAND NATIONAL HISTORICAL PARK

Asset Business Plans are recent NPS planning efforts to implement improved facility management systems in the NPS. The purpose of these plans is to provide insight about the facility asset portfolios of each park in the NPS inventory. Data supporting the plans has been taken directly from the NPS Facility Management Software System (FMSS), as well as other supporting business tools and systems managed and supported by NPS.

The collection and dissemination of this type and level of asset management information is unprecedented for a public organization with an asset portfolio comprising the size and scope of NPS. The asset business plans represent a sound, businesslike approach to making smarter decisions about how to best utilize resources. They meet the requirements of Executive Order 13327—Federal Real Property Asset Management, as well as Department of the Interior guidance to create site specific asset business plans.

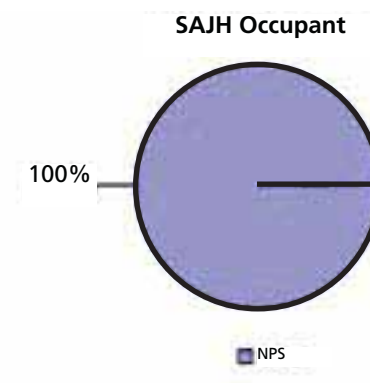
Park Asset Management Plans provide a 10 to 15 year asset management strategy for park units. More importantly, this NPS approach also helps park units and the NPS manage the gap between what should be spent on facilities using a life cycle-total cost of ownership approach, and what is actually being spent. The plans address facility management and asset issues, but also address the natural and cultural resources that are mission critical for the NPS.

These plans contain important information such as who occupies NPS assets, how important each asset is in supporting the park purpose, operations and maintenance funds spent at each park, and key information about current replacement values, quantities, condition based on the facility condition index (FCI), and amount of deferred maintenance. The plans also provide contextual information about the relative condition of each asset in comparison to how important the assets are in supporting the purpose of the park. Finally, the plans discuss predictive, future system replacement needs (component renewal), out-year project development, and planned disposition of unneeded park assets.

These plans are intended to help planners and park managers better understand asset portfolios in order to make more informed decisions about how to best maintain and sustain large asset inventories. Specifically, the use of this information will help managers make informed investment and resource utilization decisions about the future direction of the park's asset portfolio.

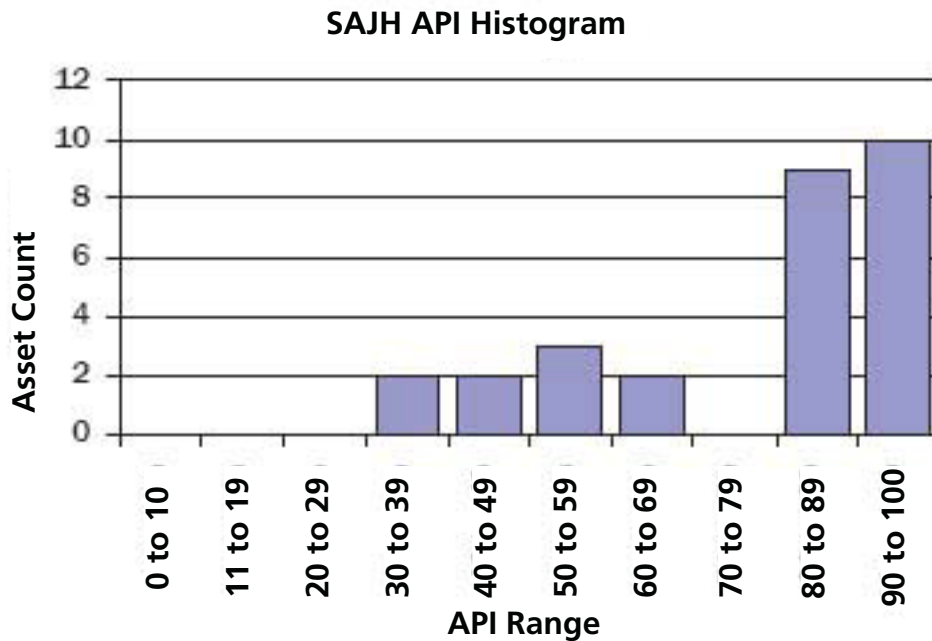
Strategic Asset Planning

The *Asset Business Plan* (ABP) has been developed to help parks better understand and manage their assets. Using the data on 'industry standard assets' (includes roads, trails, campgrounds, buildings, housing, water systems, and waste water systems) from the Facility Management Software System (FMSS), the ABP is a sub-section of the larger Park Asset Management Plan (PAMP). The ABP allows park managers to review their inventories, conduct analyses, and document requirements for operating and sustaining their portfolio of assets. This process supports budget formulation and is the first step in determining which resources are required to bring the portfolio up to acceptable condition and properly sustain it over time.



Asset Prioritization

Asset prioritization, using the Asset Priority Index (API), is a key element to improving the management of a large portfolio of assets. Understanding the relative importance of assets enables leadership to make critical budgetary and programmatic decisions, using resources efficiently. The NPS API ranks assets on a low to high scale ranging from 0 to 100. The API scores (banded in units of 10) and a summary of the inventory is shown below.



San Juan Island NHP Asset Summary

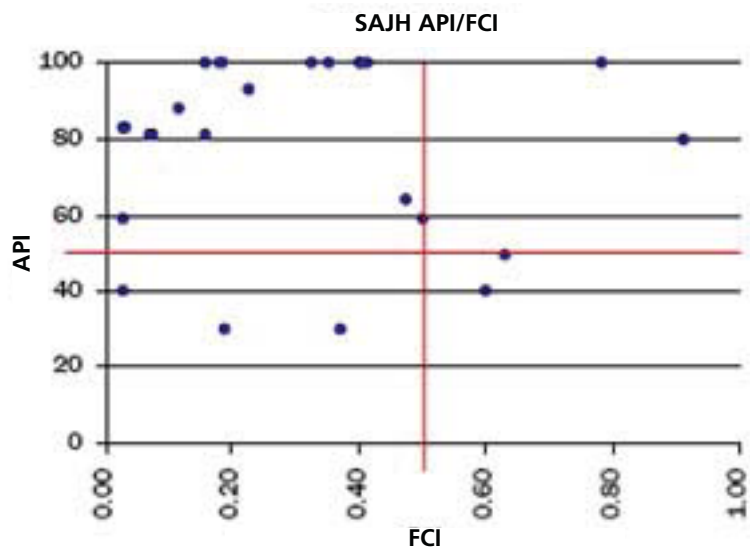
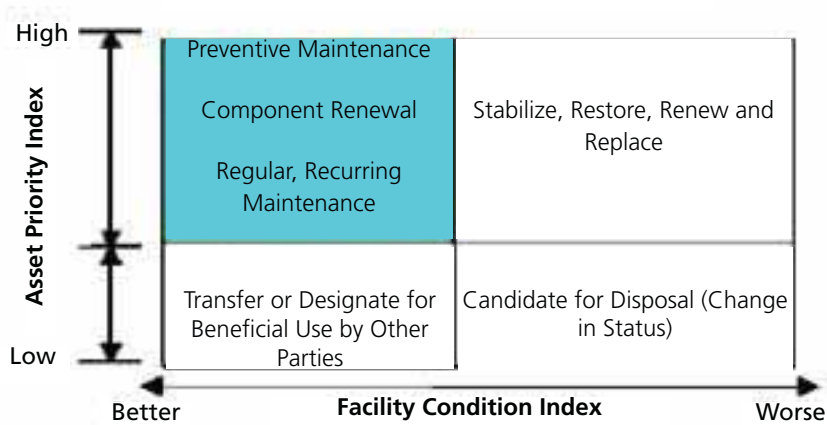
Asset Code	Asset Count	Total Quantity	Total DM (000)	Total CRV (000)	Average FCI
1100 - Roads	5	4	\$140	\$702	0.20
1300 - Parking Area	6	61,948	\$36	\$437	0.08
2100 - Trails	2	47,770	\$33	\$1,131	0.03
3100 - Maintained Landsc	2	13	\$211	\$1,266	0.17
4100 - Building	19	14,099	\$1,067	\$3,965	0.27
5100 - Water System	3	800	\$155	\$408	0.38
6300 - Marina/Waterfront	1	27	\$17	\$78	0.22
<i>Total</i>	38		\$1,660	\$7,986	0.21

Facility Condition Index

The Facility Condition Index (FCI) is a simple measurement of a facility’s relative condition at a particular point in time. The FCI uses a numeric rating system to rank assets. Dividing the collective value of all deficiencies (deferred maintenance) by the Current Replacement Value (CRV) equals the FCI. The calculated FCI is recorded within FMSS to document an asset’s relative condition. The weighted Facility Condition Index (FCI) by asset type is shown along with a summary of the inventory. It should be noted that figures for deferred maintenance on park trails, maintained landscapes, and maintained archeological sites are known to be incomplete at this date.

The vertical bar along the graph’s left side represents the API point value. A lower API indicates the asset’s contribution is less significant in relation to accomplishing the purpose of the park. Conversely, a high API indicates that the asset contributes significantly to the purpose of the park. The horizontal bar represents the FCI. A lower FCI indicates the asset is in better condition; a higher FCI point value indicates the asset is in worse condition. Using the API and FCI together, park managers can begin to identify their highest priority assets that are in the worst condition by plotting the API and FCI. San Juan Island National Historical Park’s API/FCI chart is shown on the right. The top ten high-priority assets with a high level of deferred maintenance are shown in the following table.

San Juan Island NHP FCI Quadrant Strategy



SAJH High Priority Assets with High DM

Asset	Description	DM(000)	CRV(000)	FCI	API
45941	BLDG Crook House	\$276	\$352	0.78	100
81050	UTIL SAJH Radio System	\$98	\$107	0.91	80

Operations and Maintenance (OM)

O&M includes work activities performed to meet daily park operational needs, as well as recurring and preventive maintenance activities. There are two critical steps in the O&M development process: 1) establishing requirements at the constructed asset level using O&M models or historical park records and 2) comparing the requirements to existing O&M actuals so that O&M priorities can be set and executed. The table below includes the park's O&M estimated actuals (FRPP Actuals), the modeled O&M requirements, and the variance between those totals.

Component Renewal, also known as recapitalization, is the planned replacement of a component or system that will reach the end of its useful life based on condition and lifecycle analysis within the facility's lifetime. Using lifecycle data (the year of last replacement, estimated design life, year to be replaced, and replacement cost), parks can predict and proactively plan for the replacement of components within their portfolios. Examples of component renewal include roof systems, utility components, pavement, and other major equipment. Understanding the component renewal requirements is a critical aspect of documenting and accounting for the total cost of ownership. A complete and accurate system inventory in FMSS, including lifecycle data fields, is key to this process. San Juan Island National Historical Park's component renewal profile for the next ten years is shown. Because this program is relatively new and certain definitions and procedures are still being implemented, this data is not considered complete for all park assets, particularly trails and maintained landscapes.

San Juan Island NHP O&M Summary

Asset Code	Operations	FRPP Actuals		Modeled Requirements		
		Maintenance	Total	Operations	Maintenance	Total
1100 - Roads	\$16,796	\$11,445	\$28,241	\$49,748	\$39,034	\$88,782
2100 - Trails	\$13,443	\$9,042	\$22,485	\$61,192	\$87,636	\$148,829
4100 - Building	\$42,037	\$25,206	\$67,244	\$58,667	\$17,496	\$76,163
5100 - Water System	\$5,648	\$2,526	\$8,174	\$3,456	\$913	\$4,368
<i>Total</i>	\$77,923	\$48,220	\$126,144	\$173,062	\$145,079	\$318,142



Project Development

All NPS projects are recorded in the Project Management Information System (PMIS). The list below represents the park's top ten projects by priority. The list of projects can be expected to grow as more complete information is incorporated about trails, maintained archeological sites, and maintained landscapes.

Rank	SAJH Project Title and Funding Year	Request Amount
1	Replace Fire Cache-2009	\$299,750.00
2	Pave English Camp Entrance Road-2006	\$260,035.00
3	Develop Group Camping Site at English Camp for OMSI Summer Camps-2008	\$108,560.00
4	Use EarthCorps to Involve Public with Land Stewardship – PLC-2012	\$24,000.00
5	Use EarthCorps to Involve Public with Land Stewardship – PLC-2013	\$24,000.00
6	Use Wash Conserv Corps to Restore American Camp Prairie for Public Benefits-2013	\$22,000.00
7	PLC Use WCC to Restore American Camp Prairie Landscape for Public Benefits-2012	\$20,000.00
8	Ccm - Replace Deteriorated Elements of American Camp Laundress' quarters-2008	\$54,300.00
10	Ccm - Replace Deteriorated Elements of English Camp Barracks-2009	\$61,900.00
11	Conduct Phased Removal of Exotic European Rabbits from American Camp Prairie-2008	\$30,000.00
11	Conduct Phased Removal of Exotic European Rabbits from American Camp Prairie-2009	\$30,000.00
13	Ccm - Replace Deteriorated Elements of Historic English Camp Hospital Building-2008	\$36,300.00
14	R/R - Replace Non-potable Water System at English Camp-2010	\$48,008.00
15	Rcm - Gravel English Camp Service Road-2008	\$38,000.00
16	Ccm - Stabilize Cultural Landscape Features at American Camp-2010	\$33,000.00
17	Rcm - Reroute Sections of American Camp Prairie Trails-2008	\$12,100.00
18	Ccm - Stabilize English Camp and Sandwith Homestead Cultural Landscapes-2009	\$32,000.00
18	Ccm - Stabilize English Camp and Sandwith Homestead Cultural Landscapes-2011	\$33,000.00
19	Rcm - Reroute Steep Section of Finlayson Trail-2008	\$15,640.00
20	PLC Use EarthCorps to Involve Public with Land Stewardship - 2010	\$22,000.00

Asset Disposition

There are no assets at the park under consideration for disposal, based on API, FCI, and expertise at the park.

