



# The Affected Environment

*The purpose of this chapter is to describe the physical, biological, cultural, and social environments of Ebey's Landing National Historical Reserve, including human uses that could be affected from implementing any of the alternatives described in the following chapter. Though this chapter contains topics that were identified as important issues by the public and the agencies during scoping, it also contains environmental background data relevant to both readers and park managers.*

## The Cultural Environment

### Physical Development and Historical Significance

The physical landscape of Whidbey Island has been shaped by natural and cultural forces for over 25,000 years. The landforms, soils, and shorelines that characterize the island landscape are the residue of the Vashon Glacier's moraine depositing sand, gravel and other materials over thousands of years. Receding ice left lakes and lagoons, which eventually formed into the rich and fertile prairies found in the Reserve. Human use and adaptation to the land has created a unique physical relationship between the built and natural environment that is reflected in the patterns of use present in the Reserve today.

The Reserve is unique in that the historical landscape provides the nation a vivid and continuous historical record of Pacific Northwest history. The land appears much as it did a century ago. Patterns of settlement, historic homes, pastoral farmsteads, and commercial buildings are still within their original farm, forest, and marine settings. A visitor can experience a variety of diverse physical and visual landscapes within a small, geographic area. The community comprising the Reserve is a healthy, vital one that allows for growth while respecting and preserving its heritage. (See Figure 4, Cultural Landscape Features for a more detailed map of the cultural landscape features or characteristics, refer to *Ebey's Landing National Historical Reserve*

*General Management Plan/Environmental Impact Analysis, Volume II, Technical Reports, An Analysis of Land Use Change and Cultural Landscape Integrity for Ebey's Landing National Historical Reserve by Nancy Rottle.)*

The Reserve has a long, rich history. Many scenic views that Captain George Vancouver of the Royal British Navy saw and noted in his 1792 journal are still evident today. American Indians inhabited the island at the time of Vancouver's expedition, and the captain described their activities. When the first white settlers set foot on central Whidbey

Island, they encountered not a harsh wilderness but a tempered

landscape already shaped by centuries of human use and occupation.

The Skagit Indians had permanent settlements along the shores of Penn Cove at what are now

Monroe's Landing,

Snakelum Point, and Long Point.

The native people had abundant natural resources at their disposal to sustain their community. They routinely cultivated camas, bracken fern,

and (later) potatoes on nearby prairies, and by selectively burning, they kept these naturally open areas clear of brush.

European exploration of the Puget Sound region increased beginning in the late 18<sup>th</sup> century. As the Indians had more contact with Euro-Americans, diseases such as smallpox spread through native villages decimating these indigenous communities. Within approximately one century's time, the native population on central Whidbey Island went from 1500 residents to three documented in 1904.



*Coupeville waterfront, Whidbey Island, Washington, ca. 1900. Permission of University of Washington Libraries. Special Collections Division.*



The explorations of the area by early sea travelers documented the natural riches and astounding beauty of the island. Reports of open meadows, natural prairies, abundant timber, and dark, rich, prairie soils did much to advertise the amenities offered by Whidbey Island, and within half a century white settlers were arriving. Spurred on by the Oregon Territory's Donation Land Claim laws of 1850 and 1853, settlers came to homestead lands not yet determined to be in the United States. By encouraging the land "give-away", the government was better assured of staking its claim to these fertile northern Puget Sound lands.

Isaac Ebey was one of the first to take advantage of the new law and claimed his allowable 640 acres—one square mile—of prairie, accessible from one of only a few low spots on the steeply bluffed western edge of the island (hence the name "Ebey's Landing"). Ebey paced off his own claim since the government had not yet sent surveyors out to map the area. His family and friends followed, and within three years, the remaining prairie lands on central Whidbey were claimed. While the prairies drew the farmers, the deep, protected waters of nearby Penn Cove drew the interest of sea captains who could travel down the coast to San Francisco and other ports with lumber for shipbuilding and return north with supplies for the growing community.

Slowly a community evolved as the population increased. Farmers were successful with their crops, and sea captains and other entrepreneurs em-

braced a commerce of selling local goods off island and returning with items not available on Whidbey. At the turn of the 19<sup>th</sup> century, central Whidbey had the basis of a stable and prosperous community. Recreation and tourism, and the arrival of the military, brought further benefits to the area, which continue to the present. The visible patterns on the land and extant historical buildings and structures define this cultural landscape today as a microcosm of Pacific Northwest history. It is the last place in the Northwest where these broad patterns of history are evidenced in the land.

## Archaeological Resources

A total of 35 archaeological sites have been recorded in the Reserve, all of which are in the locale of Penn Cove with the exception of one in the vicinity of Ebey's Landing. Many appear to be recent—the remains of Indian groups encountered by the early explorers. The location and nature of some of the sites, however, suggests a respectable antiquity, perhaps as old as 10,000 years. The sites have been recorded on statewide survey forms that are filed with the Office of Public Archaeology at the University of Washington.

Previous archaeological work in the Reserve and on the island as a whole has been limited. Archaeologists have surveyed little of the land within the Reserve because so much of it is in private ownership. The NPS's role in gathering field information has been limited for the same reason. The possibility of finding additional sites remains high, and recently, during some excavation work for real estate development on the north side of Penn Cove, cultural material was located, and project work stopped, to enable an archaeologist to visit the site and observe in order for construction work to continue. This resulted in the preparation of a draft National Register nomination form for the Penn Cove Park archaeological site at Monroe's Landing. This site is significant as a large, early historic Indian village associated with several locally prominent American Indians.

It is known that local property owners in the area of Ebey's Prairie and Crockett Prairie have uncovered and retrieved hundreds of items of cultural



*Front Street looking east, Coupeville, 1901. Oliver S. Van Olinda, Photographer, Permission of University of Washington Libraries. Special Collections Division.*

interest over the past century. Information about and access to many of these artifacts was granted to a historian under contract with the NPS in 1998, who prepared a narrative describing the materials, the approximate location where it was found, and other background information offered by the owners. The information gathered in the artifact documentation project reports on various collections and illustrates how these collections reflect stories other than Native American history—that of the descendents of the first white pioneers. Efforts were made to key each artifact collection to specific pieces of land, most often the old family farm, in order to provide a context for where the artifacts were found. These collections are in private ownership and not on display. However, the artifacts provide glimpses into the worlds of the prehistoric and historic native populations, white pioneers from the 1850s-60s and after, and the Chinese tenant farmers who lived and worked in the prairies of central Whidbey Island during the turn of the 20<sup>th</sup> century.

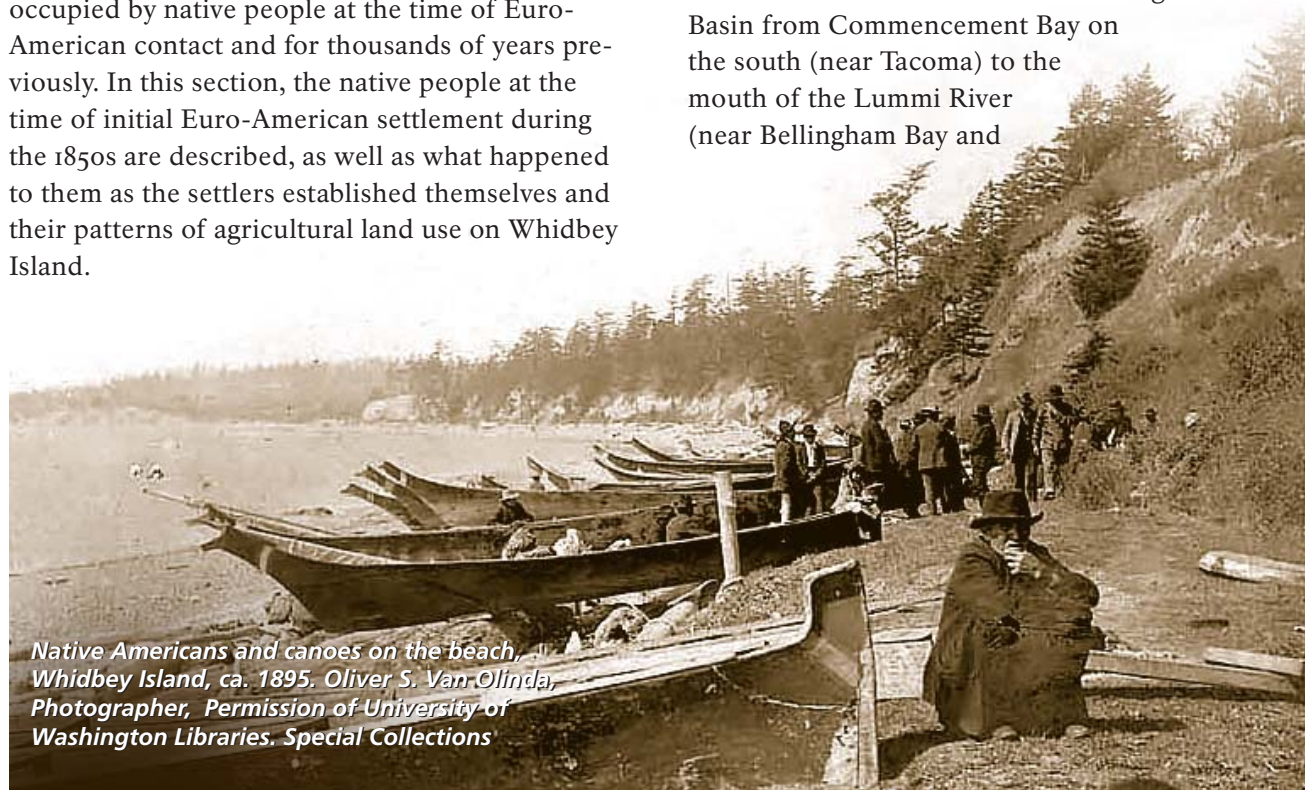
## Contact Period Tribal Presence and Displacement

The previous sections indicate that the Reserve, Whidbey Island, and the surrounding region were occupied by native people at the time of Euro-American contact and for thousands of years previously. In this section, the native people at the time of initial Euro-American settlement during the 1850s are described, as well as what happened to them as the settlers established themselves and their patterns of agricultural land use on Whidbey Island.

The Donation Land Claim laws stimulated initial homesteading, but it was the creation of Washington Territory in 1853 and the subsequent use of treaties with representatives of native people by Governor Isaac Stevens that formally acquired land for future homesteading and other purposes. Representatives of named tribes and bands of Indians sometimes referred to as chiefs and sub-chiefs signed the treaties and thereby simultaneously “cede[d], relinquish[ed] and convey[ed]” vast tracts of land and “reserved” certain other lands for the occupancy and use of their respective tribes and bands. One such “Stevens Treaty” was made at Mukilteo or Point Elliott, approximately 30 miles south of Ebey’s Landing National Historical Reserve, on January 22, 1855. Another dating to January 26, 1855 was made at Point No Point, on the Kitsap Peninsula just south of Whidbey Island and the Admiralty Inlet. Both of these treaties directly affected native people who once lived on different parts of Whidbey Island and elsewhere.

## The Treaty of Point Elliott

The Treaty of Point Elliott involved twenty-two named tribal groups and an unspecified number of “other allied and subordinate tribes and band of Indians.” It covered much of the Puget Sound Basin from Commencement Bay on the south (near Tacoma) to the mouth of the Lummi River (near Bellingham Bay and



*Native Americans and canoes on the beach, Whidbey Island, ca. 1895. Oliver S. Van Olinda, Photographer, Permission of University of Washington Libraries. Special Collections*

the Gulf of Georgia) on the north. On the west, the area went from the Gulf of Georgia, south to Hood Canal. On the east, the area was bounded by the summit of the Cascade mountain range. The treaty identified four areas that became known as the Lummi, Swinomish, Tulalip and Port Madison/Suquamish Indian Reservations, and it specified that the tribes and bands agreed to move to and settle on the reservations “within one year after the ratification of the treaty, or sooner.” The US Senate ratified the Treaty of Point Elliott on March 8, 1859 but people moved to reservations over an extended period of time. In the interim, it was lawful for them “to reside upon any land not in the actual claim and occupation of citizens of the United States, and upon any land claimed or occupied, if with the permission of the owner” (Sanger 1863: p. 927-932).

Based on linguistic analysis, anthropologists regard most of the indigenous people of Whidbey Island to be within a language grouping known as Southern Coast Salish (Suttles and Lane, 1990: 485-502). The two Coast Salish languages for the Southern Coast Salish are Lushootseed and Twana. Lushootseed was spoken by the vast majority of native people who lived in the area covered by the Treaty of Point Elliott and to the immediate south in an area that was addressed through the Treaty of Medicine Creek. The Southern Coast Salish people had 49 separate local communities with uniquely descriptive native language “tribal” names that were located throughout the Puget Sound Basin in the pre-reservation and early reservation period nineteenth-century (Suttles and Lane, 1990: 486).

On Whidbey Island, there were several named Southern Coast Salish tribes or bands who both had villages in various places on the island, as well as to the north on Fidalgo Island and on the mainland in the vicinity of the Skagit River and elsewhere. Despite their unique, locationally derived names, the native residents were neither isolated nor completely sedentary. They visited and were visited by members of many other tribes to trade, raid, and exchange members and for other purposes. Their extensive travels by canoe and by foot were made to have contact with other Coast Salish people as well as members of tribes who lived outside of the Coast Salish region.

The Skagit River Valley on the mainland runs from the western slopes of the Cascade Mountains to Skagit Bay on the northeast side of Whidbey Island. It was an area with nine separately named tribes or bands in 1855 (Sampson 1972). Among them was one of several Skagit tribes, the Mesekwegwils (the tribal name is variously spelled as Me-ske-wi-guilse and Mee-seequaguilch) who both lived near the Skagit River between Lyman and Birdview, and on Whidbey Island from Snakelum Point, south to Holmes Harbor (Sampson 1972: 21, Suttles and Lane 1990: p. 487). Other Skagit tribes, sometimes called Lower Skagit or Whidbey Island Skagits lived to the north of the Mesekwegwils and Snohomish people lived to the south (Sampson 1972: p. 21, Ruby and Brown 1986: p. 107-109). As noted in the previous section, there are two Skagit village archaeological sites located near Penn Cove. One is on the north side and the other is near Snakelum Point (Suttles and Lane 1990: p. 486). There are many other sites in addition to the larger villages in the immediate vicinity of Penn Cove (Bryan 1963).

## **The Point No Point Treaty**

The Point No Point Treaty involved four named groups and covered the area of Washington Territory from Whidbey Island on the east to within fifteen miles or so of the northwestern tip of the Olympic Peninsula on the south side of the Strait of Juan de Fuca. From the northwestern shores of Whidbey Island, the area covered in this treaty extended southward to include Hood Canal. As with the other Stevens Treaties, the signatories who represented the four tribes as named in this treaty (S’Klallam, Sko-ko-mish, Too-an-hooch and Chem-a-kum) ceded most of their traditional territory and were allowed to reserve only a much smaller area. In this case, only one reservation consisting of 3,840 acres located on Hood Canal was designated (Sanger 1863: p. 933-937).

The S’Klallam or Clallam is the one tribe among those involved in the Point No Point Treaty that is known to have lived on certain parts of Whidbey Island before and during the non-Indian settlement represented by Isaac Ebey and others in the early 1850s (Farrar 1917). Anthropologists regard Clallam to be one of five languages spoken among



a language group known as Central Coast Salish (Suttles 1990: p. 453-475). As a result of the Point No Point Treaty, the Clallam were supposed to take up residence in what became the Skokomish reservation on the Hood Canal. Instead, the Clallam continued to reside in various non-reservation areas throughout most of the late nineteenth-century and until various points in time in the twentieth-century. One group of Clallams purchased land in 1874 on the Olympic Peninsula and two other groups acquired land in the mid 1930s.

In summary, certain Southern and Central Coast Salish tribes were associated with what is now Ebey's Landing National Historical Reserve during the pre-reservation and early reservation period. However, the history of how the reservations developed during the mid to late nineteenth-century in terms of tribal composition and the status of Indians who did not necessarily move to reservations is complex. It will be addressed in a later section on the traditional associations of several contemporary tribal reservation communities. Suffice it to note here that a large number of Whidbey Island associated Skagits were among the 74 signatories of the Point Elliott Treaty. Among them were George Snatelum, Senior, George Snatelum, Skagit sub-chief and Chief Goliah.

## Culturally Significant Places

Although comprehensive studies have not been conducted in the Reserve to identify specific places of cultural significance to contemporary American Indians, it is widely known that ar-



Skagit man called Snaklum Charlie with family, Coupeville, Washington, ca. 1910. Permission of University of Washington Libraries. Special Collections Division.

chaeological sites, burials and a variety of cultural resources have special cultural significance to native people of the Pacific Northwest. In addition to archaeological sites, two specific places are culturally important to tribes and tribal members with traditional associations to the Reserve. One is the Snaklin Monument, a five-foot tall stone obelisk, located within a small chain link fenced enclosure on private land near Parker Road in the northeast section of the Reserve. The other is an area shown on a plat map as a "USA Indian Cemetery." The site of the cemetery is on a wooded hillside approximately one-quarter mile northwest of the Snaklin Monument. Both the monument and the cemetery are less than one-half mile away from Snakelum Point on the south side of Penn Cove.

In early 1995, the Snaklin Monument was the subject of a brief study undertaken by archaeologist Dr. Gary C. Wessen. In addition to describing the monument, nearby features and the setting, Wessen found and reviewed historic documents, and conducted interviews with 11 individuals. The information isn't definitive about exactly when or where the monument was originally erected. An item from the *Island County Times* dating to June 21, 1918 referred to the monument as a "tombstone" and described two inscriptions: "Old Chief Snaklin, died 1849", and below this the words "George Snaklin, died 1880, aged 60 years" (Wessen 1995: p. 7). Wessen notes that the 1918 description of the monument's location does not match the present location. Some of his interviews



Snaklin Monument, located near Snakelum Point, Penn Cove, Whidbey Island, Washington, ca. 2000, NPS Photo.

and references to the “memorial at Snakelin Pt. for Skagit Tribe” (Sept. 24, 1937 Minutes of Whidbey Island Chapter No. 6 of the Daughters of the Pioneers of Washington, as quoted in Wessen 1995: p. 8) support the idea that the obelisk and any associated human remains may have been relocated in the late 1930s or 1940s. By that time, there were two additional inscriptions on the opposite side of the obelisk: “Chief Charlie Snetlum, Died – June 5, 1857” and “Chief Charlie Snetlum, 1843-1934” (Wessen 1995: p. 5).

Whether or not burials are at the site of the obelisk, it is associated with the names of four members of at least three generations of a prominent Skagit Indian family who lived in what is now the Reserve before 1855 and until the 1930s. Regardless of spelling, the family name became a widely known place name that lives on for Whidbey Island. Old Chief Snaklin was an important man who died on December 16, 1852 according to the diary of Isaac Ebey’s wife Rebecca, who referred to him as “Sneetlem” (Farrar 1917: p. 56). Both the Chief’s son, George Snetelum, Senior, and grandson, George Snetelum, were among the signatories of the Point Elliott Treaty (Sanger 1863: p. 930). Another grandson of Old Chief Snaklin is represented on the monument in the inscription for Chief Charlie Snetlum, 1843-1934 (Wessen 1995: p. 7).

The second place of likely cultural significance for contemporary American Indians is a .39 acre parcel identified as a “USA Indian Cemetery” on an Island County plat map. The extent of the cemetery area was determined through a land survey in 2001. The information was shared with the Swinomish Tribe, and tribal representatives subsequently visited the site with staff of the Reserve and the NPS. In addition to the interests the Swinomish have expressed in the significance of the monument and the cemetery, the Snoqualmoo Tribe of Whidbey Island has held periodic memorial events at the monument and it is apparent that offerings are left by visitors to the monument. The future uses of these two places will involve the tribes, the landowners and the Reserve to the extent that is determined to be appropriate in each case. A comprehensive study of these and other places of potential cultural significance through-

out the Reserve will be conducted in collaboration with traditionally associated tribes when funding becomes available.

## **Cultural Landscape Resources**

Historic settlement and development patterns, natural features, and cultural features are important elements of the cultural landscape of the Reserve. Collectively, landscape patterns and their relationship over time, imprint and reflect human history in the land and gives it its character. Ten cultural landscape characteristics contribute to the character of the Reserve.

### **1- Overall Spatial Organization**

The Reserve is organized by four major natural landforms comprised of prairies, uplands, wooded ridges, and shorelines. These landforms historically provided a strong physiographic framework in which the early settlement of central Whidbey occurred, and structured development of the landscape into ten distinct character areas as defined by the NPS in 1983. The two shorelines are strong linear boundaries on the east and west sides of the island and historically influenced the development of transportation systems, access for trade, and the movement of goods. The two major ridges influenced early land use and development by physically channeling settlement onto the more accessible, open prairie lands. Historically, farmsteads were clustered along early roads that tended to follow property lines and natural landforms such as ridges. All services and market-related functions were concentrated in the town of Coupeville, platted in 1883 and the county seat of government. To a large degree, these historic trends and large-scale landscape patterns and organization are evident in the Reserve today.

### **2-Response to the Natural Environment**

There is a strong correlation between historic land use and current agricultural capability of the soils in the Reserve. Two large areas of fertile soils are found in Ebey’s and Crockett prairies. In addition to this prime resource, the majority of other areas in the Reserve are dominated by a variety of soils, which as a group, are suitable for agriculture with

proper management. In some areas of the uplands near San de Fuca and Fort Casey, farmers cleared woodlots for pasture and less intensive feed crops. These patterns of use, based on the physical properties of the soil, are still evident today throughout the upland areas, where farms are smaller and woodlots frame developments into pockets of land.

Natural vegetation influenced the ability of settlers to work their claims. Forests restricted development on the ridges until the later 1800s, as did three salt marshes at Crockett Lake, Perego's Lagoon and Grasser's Lagoon. Natural features strongly influenced transportation patterns. Roads generally followed the edge of the ridges, along shorelines and property lines, connecting settlers to each other and the west coastline of the island to Penn Cove.

In a similar response to natural features, the historic town of Coupeville was built on the inland waters of Penn Cove in part because that location was critical for providing access to ships carrying natural resources (timber) and, later, farmers' goods, to outside markets. The cove was deep and well protected, two important features for the sailing ships of the later 19<sup>th</sup> century.

### **3-Land Use Categories and Activities**

The Salish Indians beginning about 1300 were among the dominant people influencing the ecology of central Whidbey. Their occupation was characterized by the establishment of a winter village, which included a variety of activities, and the development of smaller, temporal, seasonal sites designed to maximize mobility in the gathering of seasonal resources. The Salish burned the prairies as a means of increasing plant production and to invigorate plant production for game animals along the edges of the prairies.

The white settlers claimed lands beginning in the 1850s, taking the prairies first and the uplands later. Farms were built and fences enclosed the large open prairies to define more discrete land uses. The cultivation of fields occurred within the fenced areas and grazing occurred outside. Lands were rented to those unable to own land or too late to claim any under the laws encouraging settlement.

Primary land uses in the Reserve today include the following: agricultural use of the prairies; concentration of residential, commercial, government, and service development in the town limits of Coupeville; the conservation of natural areas and systems (such as forests, woodlands, wetlands, lakes, and parklands); and the recreational use of shorelines and beaches along the coast and Penn Cove. While new development is occurring and land uses are changing in specific areas, these broad land use systems mirror historic patterns and reflect a continuity of use based on the needs of a growing community and the qualities of the natural resources found in the Reserve.

### **4-Vegetation Related to Land Use**

Vegetation in the Reserve can be divided into two categories: cultural vegetation (primarily associated with the agricultural landscape) and native communities (associated with the forests and beach/salt marsh vegetation along the low lakes and shorelines). Plant communities introduced or impacted by humans are a common occurrence throughout the Reserve but are most evident in the prairies and uplands. The introduction of crops, fencing of property, clearing of land to build homes, and a variety of land use practices related to the development of a viable market crop between 1855 and 1900, left the landscape of the Reserve permanently altered. Fencing properties led to the development of hedgerows.

The primary forest cover naturally occurs along the ridges and upland areas of the Reserve and along the shores of Penn Cove. The cover is dense in places and historically forced settlers onto open lands because the clearing of such large trees required a significant amount of labor. During the 1900s, the forests were heavily logged. Madrone trees along the shores of Penn Cove were planted in the early part of the 20<sup>th</sup> century to complement the existing numbers in an effort to beautify the shoreline and attract tourists.

Significant salt marshes are located at Crockett Lake, Perego's Lagoon, and Grasser's Lagoon. Some of these areas were used historically for grazing animals. Vegetation in the Reserve has been significantly impacted by human use and occupation over several generations, but in these



three areas, there remain remnant plant communities that reflect native species associations.

## 5-Circulation

The contemporary road system through the Reserve is largely based on historic routes and patterns. Early roads were aligned based on functional need, proximity to natural landforms, and property lines. At a smaller scale, local roads were required to link families and farms on the prairies. Routes following the base of both sides of the ridge between Crockett and Ebey prairies were created. Roads were also built to connect central Whidbey to other settlers and communities to the north and east-west from the Strait of Juan de Fuca to Penn Cove. The circulation network that was in place by 1899 is basically the primary circulation network found today in the landscape.

## 6-Structures

Like land use, structures found in the Reserve are a reflection of both individual needs and the inherent qualities and specific resources of the landscape. Historic buildings in the Reserve represent all of the important historical eras and reflect a variety of architectural styles. Some are significant as examples of certain types of architecture or construction technology; others are significant because they contribute to our understanding of Reserve history. Some of the more notable historic buildings in the Reserve include residences and outbuildings from the settlement era (1850s-1870s), from the Victorian era (1880s-1910s), and from the period of community development (1910s-40s). Whether vernacular or high style, these homes and commercial buildings are tangible reminders of the community's past.

Roads are structures and many of the primary and secondary roads in the Reserve are historic (see discussion about roads under "Circulation"). Other structures in the Reserve include historical monuments, memorials, log blockhouses, a wharf, and a cemetery; all these contribute to the significance of the Central Whidbey Island Historic District.

## 7-Cluster Arrangement

Clusters of buildings and structures found in the Reserve represent several historic eras and trends in the settlement and development of the landscape. There are fourteen primary farm clusters in the Reserve at Ebey's, Crockett, and Smith prairies. Building clusters in the Reserve are designated as such because of their historical association with each other, and because of a functioning relationship among several individual buildings.

Fort Casey is considered a cluster because of the historical associations and relationships among a variety of structures still present today. The cluster is spread out over a large area. The overall organization of the landscape and the formal hierarchical layout of the officer's quarters, barracks, parade ground, service areas, workshops, and defense structures still exist within its original setting and location on Admiralty Head. Much of this infrastructure has been in place since 1906. Other features include gun emplacements, sidewalks, service-related buildings, among other built structures, and all retain a distinct relationship to one another.

## 8-Archaeological Resources

See previous section "Archaeological Resources" under the "Cultural Environment" heading.

## 9-Views and other Perceptual Qualities

As a cultural landscape, the Reserve is viewed holistically as a collection of resources, many of which are significant. Historic views and perceptual qualities also contribute to the significance of the landscape. These views can be treated as tangible resources and are identified using the historical record and are based on character-defining features of the cultural landscape. Fifteen contributing views have been identified in the National Register nomination that documents the contributing resources of the historic district.

## 10-Small-Scale Features

A variety of small-scale features found in the Reserve adds character and texture to the cultural landscape. Many of these features are associated with historic structures such as old lampposts in

Fort Casey or individual specimen trees like the black walnut tree outside the Captain Thomas Coupe saltbox. There are historic gates and fences, wooden post and wire fencing along roads and property lines, remnant orchards, hedgerows, building ruins and the individual grave markers in the cemetery that collectively give richness to the cultural landscape of the Reserve.

## Museum Objects and Artifacts

The Trust Board currently does not hold any object collections in its possession, nor does it intend to be a repository for such items at this time. The Trust Board does have a slide and photograph library that includes both present-day and historical images. Many of the historical images are duplicates of material the museum holds; some are images duplicated from private collections (oral history participants). The slide and photograph library is frequently used by researchers, including members of the local community, children and young adults working on research projects for school such as History Day, and contractors working for the NPS or other organizations.

There is a small reference library in the Trust Board office, containing a variety of materials on topics including natural and cultural resource management, history, rural land preservation, architecture, preservation planning, natural history guides, among others. Augmenting the reference library are natural and cultural resource vertical files containing articles and manuscripts, both published and unpublished, and general ephemera on topics relevant to the Reserve.

The Reserve works with North Cascades National Park Service Complex to conserve and store the artifacts that resulted from work on the Ferry House foundation and the Jacob Ebey Blockhouse. Approximately 15,000 archaeological items were uncovered. The Ferry House artifacts con-

tained a mix of historic and prehistoric materials totaling approximately 12,000 items including the associated records. The Block House artifacts are all historic archaeology items that are in the process of being analyzed and are expected to number less than 3,000.

The Trust Board works in partnership with the Island County Historical Society, which is the official, though non-profit, repository for items associated with Island County history. Its museum has a large collection of items that have been donated to it over the years. Its capacity to take additional items is limited by the lack of adequate collections and storage space and staff to oversee its management. The museum and collections are managed by a group of volunteers and at various times participation can be sporadic.



*Island County Historical Museum  
Front Doors, ca. 2004. Courtesy of  
the Island County Historical Society.*

Should the Trust Board determine that collections are a positive and appropriate arena for the Reserve to expand into on-site, it will be necessary to devise creative solutions for collections management. This may include, though not necessarily limited to, entering into a formal partnership with the museum. This is also true for archival materials. The Trust Board is generating archival materials that represent its administrative history. These materials have been organized and placed in boxes that remain in the office (taking up valuable space). To date, no long-term solution has been consid-

ered for these important resources. A Scope of Collections Statement is underway to help determine solutions to some of these concerns. A Museum Management Plan for the Reserve's NPS collection was completed in 2005 by a regional NPS team.

## The Natural Environment

The Reserve is located in the western hemlock forest zone of Western Washington. It encom-

passes approximately 13,617 acres of land and 3,955 surface acres of salt water for a total of 17,572 acres. Central Whidbey Island contains the island's best farmland, broad prairies, a deep protected cove, high seaside bluffs, low rolling hills, shallow brackish lakes, and a narrow, rugged beach along Admiralty Inlet.

A great diversity of wildlife inhabits the wooded areas, wetlands, and shorelines of the Reserve. Deer, raccoons, coyotes, and a number of small mammal species are common in the wooded areas. Many species of waterfowl use the wetlands and shoreline for breeding, nesting, and resting during migration. Crockett Lake and the bordering agricultural land adjacent to Fort Casey State Park support a large population of permanent and migratory waterfowl as well as other birds and small wildlife. Kennedy's Lagoon and Penn Cove are also significant waterfowl habitats. The Reserve is located on the Pacific Flyway.

There is also a considerable variety of flora species, due in part to the different habitat zones encompassed by the Reserve. Representative species from woodland areas, prairies, coastal bluffs, beaches, fresh water kettle ponds, lagoons, wetlands, and marine ecosystems can be found. There are also several locations where sensitive species are located.

While there exists a variety of habitats and significant species, there has been little emphasis on the understanding or inventorying of natural species or processes within the Reserve. The majority of the land is privately owned and humans have manipulated virtually all of the land for many decades, mostly for agricultural purposes, including logging. The threats to the tradi-

tional land uses that affect its rural character are urgent and continuous.

## Climate

Several factors influence the maritime climate surrounding Whidbey Island. One major influence is the Pacific Ocean, which acts as a regional thermostat that generates moisture-laden air. Major bodies of water help to regulate temperatures on landmasses. They form a great atmospheric heat reservoir with a tremendous capacity for storing heat and releasing it slowly. Thus, for the most part, the maritime environment does not experience great influxes of extreme weather.

The other geographic climate influencing factors are the surrounding mountains. To the east, the Cascade Mountains deflect continental winds. The prevailing wind direction is from the south and southwest in the fall and winter and from the west and northwest in the spring and summer. Roughly one hundred miles to the west is Washington's Pacific Coast, where the continental United States receives its highest annual rainfall. The Olympic Mountains stand between the Pacific Coast and Whidbey Island, which places the Reserve within the rain shadow of the Olympic Mountains.

Data collected at the weather monitoring station in Coupeville documents that the area encompassing the Reserve averages only 20.77 inches of precipitation annually, compared to over 40 inches on the south end of Whidbey Island. An overall average rainfall for Whidbey Is-





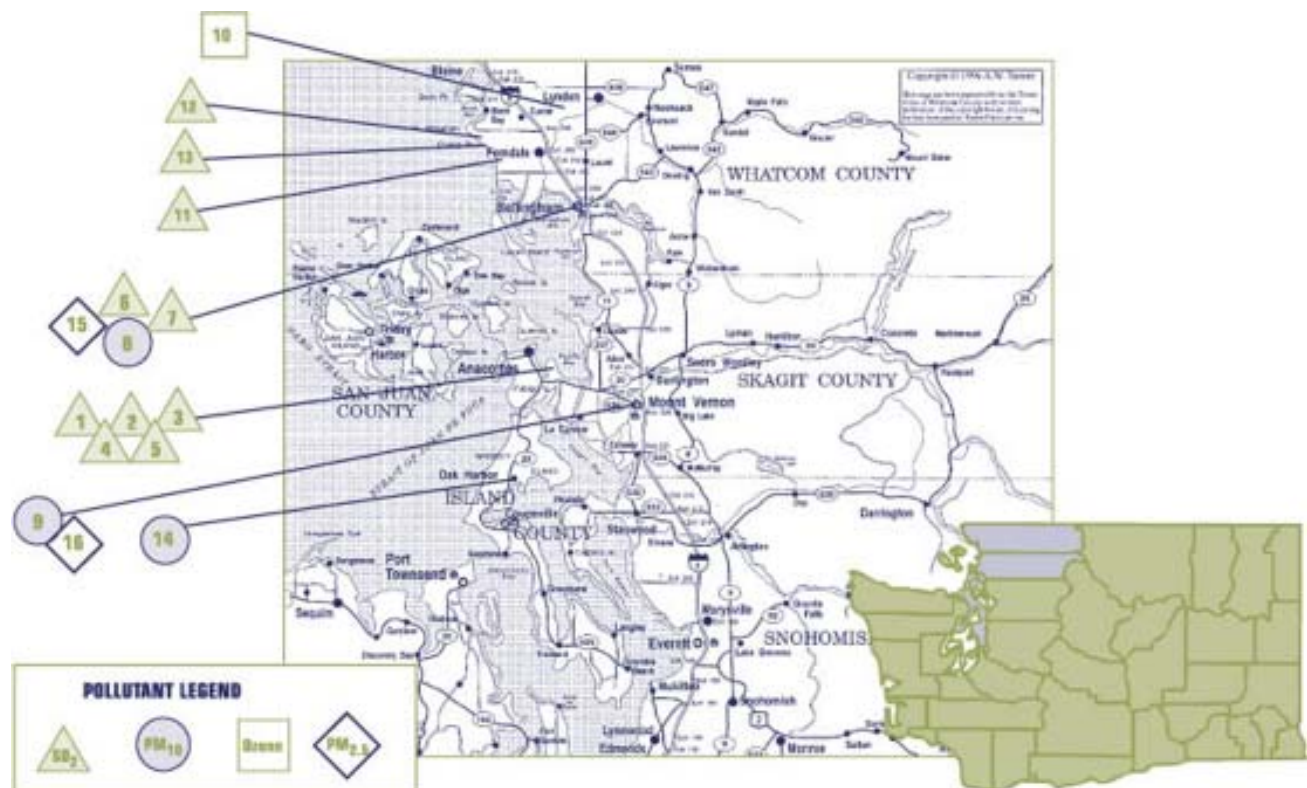
land would be close to 30 inches. About 80 percent of the annual precipitation occurs from October through May. The average maximum temperature is 57.9 degrees Fahrenheit; the average minimum is 41.7 degrees Fahrenheit. The extreme temperatures range from 90 to 0 degrees Fahrenheit. The growing season within the Reserve is 202 days. Total cloud cover averages 255 days per year with only 43 days of clear skies. (Island County 1990: III-14)

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% in each model. A 0.09 to 0.88 meter (3.5 inches to 2.9 feet) global average sea level rise is predicted using computer simulated models. This amount of sea level rise could result in significant

adverse environmental impacts on groundwater such as saltwater intrusion, inundation of shoreline environments and possible displacement of wetlands. (IPCC 2001)

## Air Quality

The Environmental Protection Agency (EPA), the Washington Department of Ecology (DOE), and the Northwest Air Pollution Authority (NWAPA) regulate air quality on Whidbey Island. 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. The DOE has established ambient standards for Washington State, which are identical to the federal NAAQS except for more stringent sulfur dioxide standards. The DOE is also responsible for developing and implementing state implementation plans that will assure compliance with state and federal ambient air quality standards. The NWAPA is the local air pollution control agency serving Island, Skagit, and



Location of sulfur dioxide (SO<sub>2</sub>), particulate (PM<sub>10</sub> and PM<sub>2.5</sub>) and ozone monitors in Island, Whatcom, and Skagit Counties from NWAPA's website as of December 2004 – [<http://www.nwair.org/measurement/monitoring.html>]

Table 1: Reported 2002 annual emissions for selected industrial sources

Source	2002 Emissions of Criteria Pollutants in Tons				
	CO	NOx	PM10	SO2	VOC
Naval Air Station – Whidbey Island	30	31	34	1	38
Tesoro Northwest Company	1,012	2,293	682	5,345	1,626
Puget Sound Refining–Shell Oil Company	621	1,152	146	3,494	496
Alcoa Primary Metals – Intalco	15,969	65	354	1,924	11
BP West Coast Products (ARCO)	845	2,367	145	1,883	505
ConocoPhillips Company	237	1,017	97	2,286	402
Port Townsend Paper Corporation	1,681	550	267	545	64

Table 1: Reported 2002 annual emissions for selected industrial sources within the airshed as published by NWAPA in their “2002 Air Operating Permit and Other Large Source Emission Inventory for Island, Skagit, and Whatcom Counties of Washington State” and by Olympic Region Clean Air Agency in their 2002 emission inventory for Jefferson County available on their website at <http://www.orcaa.org/EIJefferson02.pdf>

Whatcom counties and shares responsibility with DOE to develop and implement the state implementation plans. In addition, all three 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 (e.g., woodstoves, open burning, and small companies like dry cleaners and gasoline stations).

## Air Quality Monitoring

NWAPA operates a particulate monitoring station in Oak Harbor. No other air quality monitoring is currently conducted on Whidbey Island. The map on the previous page shows the locations of other monitoring stations within the three counties of NWAPA’s jurisdiction.

Three other counties border on Whidbey Island: the Puget Sound Clean Air Agency (PSCAA) conducts particulate and carbon monoxide monitoring in Snohomish County; no air quality monitoring is conducted in Jefferson or San Juan County. Additional monitoring is conducted in the large urban areas to the south (Seattle/Everett/Tacoma) and to the north (Vancouver, British Columbia) of Whidbey Island.

Although there has been little air quality monitoring on Whidbey Island itself, monitoring elsewhere in the airshed along with modeling indicate that all areas of the island are currently in attainment of the NAAQS ( Franzmann, 2001).

## Industrial Sources of Air Pollution

The only large industrial source on Whidbey Island is the Naval Air Station near Oak Harbor. Al-

though it is the only large industrial source on the island, the Naval Air Station is relatively small compared to other industrial sources in the airshed including Tesoro and Shell oil refineries at Anacortes in Skagit County; Intalco, ARCO, and ConocoPhillips in Whatcom County; and Port Townsend Paper in Jefferson County. Reported 2002 emissions from these selected large industrial sources are shown in Table 1 for comparison.

The Port Townsend Paper mill near Port Townsend in Jefferson County, approximately five miles west of the Reserve, is of particular concern to the National Park Service due to its proximity to the Reserve and because the prevailing winds are from the west, especially during the summer months. In addition, the plume from the mill is often clearly visible from Ebey’s Landing and the odor of sulfur compounds can sometimes be detected at the Reserve.

## Other Air Pollution Sources

Statewide data indicates that industrial sources are only responsible for about 13 percent of the air pollution in the state; motor vehicles contribute 55 percent of the air pollution; woodstoves and fireplaces 9 percent; outdoor burning 4 percent; and all other sources (such as small businesses like dry cleaners and gasoline stations) 19 percent. NWAPA indicates that a similar distribution would be found in Island, Skagit, and Whatcom counties with motor vehicles contributing the largest amount of air pollution. (See NWAPA’s “2002 Air Operating Permit and Other Large Source Emission Inventory for Island, Skagit, and Whatcom Counties of Washington State”.)

## Night Sky and Natural Quiet

As our cities and towns grow, the places where the public can enjoy the sounds of nature or find clear views of our nighttime celestial skies are increasingly becoming compromised. Natural quiet and night sky are resources that are often an overlooked part of the environment.

Light pollution is the visible intrusion of light into our nighttime environment. The source of much of this pollution can be attributed to poorly designed outdoor light fixtures that allow light to stray beyond the intended purpose. The impacts of poor nighttime lighting include urban sky glow (the brightening of nighttime skies), glare, the trespass of light and wasted energy (International Dark Sky Association 2001). Light pollution can adversely affect night-flying migratory birds. The areas within the Reserve experiencing higher concentrations of light pollution are the town of Coupeville and the State Route 20 corridor. Some light pollution within the Reserve is possibly stray light from the town of Oak Harbor. The primary sources of the light pollution are poorly designed building and roadway light fixtures and vehicle lights.

According to the Coupeville town planner (Cort 2001), the lighting regulations for the Coupeville area are fairly standard, but are effective in containing light onsite and directing it downward. In 2003, Island County passed a lighting ordinance to preserve the qualities of the island's night sky resources. All fixtures must be retrofitted if not in compliance with the new regulations. The county has printed a brochure outlining the new ordinance, which is available at the county offices in Coupeville.

Noise pollution is the audible pollution of the natural environment from foreign sources. The U.S. Navy maintains an Outlying Landing Field (OLF) that cuts through Smith Prairie within the Reserve. The field is used by pilots to practice simulated aircraft carrier landings. When in use, there is an extreme noise impact. The Public Affairs Office at Naval Air Station, Whidbey Island (Martin 2001), states that the flight schedules normally vary from several times per week to once a month. The time of day and length of practice ses-

sions also vary. This erratic schedule implies that significant noise impacts can occur on a regular, but inconsistent basis.

Another source of noise pollution is State Route 20. Part of the State Route 20 corridor runs through the Reserve and there is a sizable amount of noise pollution attributed to highway traffic. There are about 3 million vehicles per year (Washington State Department of Transportation 2004). Personal watercraft (commonly referred to as jet skis) usage in Penn Cove, though infrequent, is another source of noise pollution.

## Geology

The Puget Lobe of the Cordilleran ice sheet predominantly shaped the major surface features of Whidbey Island. This ice sheet formed during the Pleistocene Epoch between 2.2 million and 10,000 years ago. Continental glaciers advanced and retreated from Canada into Puget Sound during this time. The last period of glacial advance, known as the Vashon Stage of the Fraser Glaciation, reached its maximum between 18,000 and 14,000 years ago (Burns 1985). About 1,250 meters of ice covered the area near Whidbey Island during this time. This last period of glaciation left deposits of unsorted, boulder-clay layers referred to as Vashon till. This glacial till covers most of the upland areas of Whidbey and Camano islands, and varies in thickness from several feet to approximately 175 feet. This advance also left proglacial outwash sands at the lowest Vashon levels of Whidbey Island. These sands are overlain by till, which was later overlain by glacio-marine drift gravels (Easterbrook 1962, 1968, 1969). Other remnants of glacial impacts are kettle ponds, which were formed by large, soil-covered blocks of ice, left by the glaciers, which melted slowly leaving behind steep-walled depressions in excess of 200 feet deep and filled with water.

## Soils

Glacial upland soils cover approximately 75 percent of Island County. In these areas, the glacial parent material has resulted in surface soils of coarse to fine-textured material ranging from moderately good to somewhat excessive drainage.



The soil series occurring on glacial uplands on Whidbey Island include Hoypus, Keystone, Whidbey, Swantown, Casey, Townsend, and Bozarth.

Sediment washed from upper slopes during the glacial retreat collected in glacial lake bottoms, mixed with organic matter and formed the fertile soils of the prairies. These prairies have attracted populations of humans for hundreds of years. The prairies have been in continuous agricultural use for over 150 years by European-descended immigrants, and probably hundreds of years longer by American Indians.

The west coast beaches along Admiralty Inlet consist of materials deposited by glaciers and washed by wave action. At Ebey's Landing, the beach is gravel-sand subject to erosion from currents and to accretion from the upland erosion. (Gallucci, 1980).

All the coastal formations are mainly composed of Pleistocene sediments. At Point Partridge, these are Everson gravels (Everson interstade, Fraser glaciation, upper Pleistocene). Undifferentiated Pleistocene sediments comprise Ebey's Landing. Toward the south and Fort Casey, it is Vashon drift (Vashon stade, Fraser glaciation, middle Pleistocene), Everson glacio-marine drift, and Vashon till. Along the shorelines, these alternate with pre-Fraser non-glacial undifferentiated Pleistocene sediments (Gallucci, 1980).

The most common wetland mineral soils in the County include Norma, Bellingham, and Coveland series. The most common organic wetland soils are Semiahmoo muck, Tacoma peat, Mukilteo peat, and Tanwax peat series. These are all poorly drained soils with shallow water tables.

The best farmland in Island County is U.S. Department of Agriculture (USDA) Class II (productive agricultural) which comprises 5 percent of the total landmass. Over 45 percent of the existing Class II lands within Island County are found within the Reserve (Luxenberg and Smith 1995: p.17). (See Figure 5, Prime, Unique, and Important Agricultural Soils.)

## Topography

Elevations range from sea level to 200 feet. Generally, the narrow shoreline strip ends at steep slopes and cliffs. These fall away gradually inland to the low-lying prairies. No place in the Reserve is more than two and a half miles from the shoreline. The beaches and shoreline slopes and bluffs are in a constant state of erosion and accretion. Soils on slopes in excess of 15 percent grade, which includes some of the prairie edges, are subject to severe erosion when the vegetation cover is removed. Twenty-five miles of shoreline are included within the Reserve. This shoreline varies from the windswept cliffs on the west to the protected shores of Penn Cove.

## Water Resources

For its size, the Reserve contains a broad diversity of marine and freshwater resources. (See Figure 6, Hydrology.) The land within the Reserve is bounded on the east by the Saratoga Passage (Puget Sound) and on the west by Admiralty Inlet (between the Strait of Juan de Fuca and Puget Sound). The Reserve contains extensive marine resource areas including Penn Cove, Kennedy's Lagoon, and Grasser's Lagoon in the northeast, Admiralty Inlet and Perego's Lagoon to the west, and Admiralty Bay and Crockett Lake (lagoon) in the south.

These areas provide habitat and nursery grounds for marine invertebrates and fish at Grasser's Lagoon, Kennedy's Lagoon, and Crockett Lake, support important commercial fisheries at Penn Cove, and provide wildlife habitat for waterfowl and terrestrial animals at Penn Cove, Crockett Lake, and Perego's Lagoon.

The Reserve lies within two watersheds, the central/south Whidbey and north Whidbey watersheds. The central/south Whidbey watershed boundary is located directly south of Coupeville, continues west across the prairie to Ebey's Landing and continues south throughout Whidbey Island.

## Surface Hydrology

The only surface water that is used for domestic consumption in the general vicinity of the Reserve

is water piped from the Skagit River to Oak Harbor, the Naval Air Station Whidbey, and the North Whidbey Water District (Island County 1991). All other sources are obtained from groundwater (see “Subsurface Hydrology” section).

Surface freshwater resources within the Reserve are limited. These resources include Lake Pondilla, a kettle pond located in a heavily glaciated area of the West Woodlands, a forested area northwest of Ebey’s Prairie. There are also several small wetland areas, which include kettle holes, a freshwater wetland near the middle and high schools in Coupeville at Prairie Center, and human impacted salt marsh areas on the northern side of Crockett Lake. The near-shore habitat of Grasser’s Lagoon, Kennedy’s Lagoon, and Crockett Lake are vital to the juvenile life stages for many salmonid species originating from river basins in north Puget Sound and potentially other areas as well.

#### *Penn Cove and Kennedy’s Lagoon*

Penn Cove is the predominant surface water feature located within the Reserve. It is an appendage of eastern Puget Sound, which runs in an east-west direction for a length of approximately five miles from the Saratoga Passage. Penn Cove consists of roughly 3,955 acres of water bordered by a ten-mile shoreline, ranging from high sandy cliffs to muddy tidelands. Kennedy’s and Grasser’s Lagoons are located at the western end of Penn Cove. While small, these lagoons are highly productive biological systems.



*Sunrise at Blower’s Bluff, across Penn Cove from the Coupeville Wharf, Whidbey Island, ca. 1999. NPS Photo.*

Penn Cove supports extensive commercial and recreational fisheries. The high quality waters are used by the commercial aquaculture industry, Penn Cove Shellfish, LLC, for the production of locally and internationally renowned Penn Cove mussels.

There are two permitted effluent discharges into Penn Cove. The town of Coupeville and Penn Cove Park discharge sewage effluent after treatment into central Penn Cove. According to the Coupeville Town Planner, the effluent discharges meet all applicable water quality standards.

Occasionally personal watercrafts will enter the cove. The noise and water pollution attributed to their use is a concern to many living in the Reserve. The Coupeville town planner considers jet skis a minor problem, due to their very infrequent presence in Coupeville waters. The Town of Coupeville does not currently regulate the use of personal watercraft in Penn Cove.

Penn Cove is one of several Puget Sound marine areas monitored as part of the Washington DOE Marine Waters Monitoring Program. The habitat quality of marine waters are characterized by analyzing the stratification of the water column (layering of the water according to temperature and salinity changes) and by measuring dissolved oxygen, turbidity, and the availability of sunlight below the water surface. Penn Cove was found to exhibit persistent stratification. Stratification will affect the distribution of toxins and other biological stressors, such as low dissolved oxygen concentrations (Kearsley and Parvin 1998).

During the 1993-94 monitoring season, there were months when dissolved oxygen concentrations fell below 5 mg/l, and one month (October 1993) of nearly anoxic conditions. Some fish species are stressed by environmental conditions when dissolved oxygen concentrations fall below 5 mg/l (Kramer 1987; Whitmore et al. 1960), while others may not exhibit stress at 2mg/l (Pihl et al. 1992 ). Between October 1995 and September 1996, low dissolved oxygen concentrations were observed more frequently, and fell below 3 mg/l in November 1995 and September 1996. When oxygen concentrations drop below 3 mg/l, near hypoxic con-

ditions occur. Continuous or intermittent hypoxic conditions may result in a shift in species composition, a decrease in population numbers and species diversity, a disruption of predator-prey relationships, and a shift in trophic pathways (Newton et al. 1998). There is no site-specific information concerning the impact of stratification or low dissolved oxygen concentrations on salmonids in Penn Cove (Kearsley and Parvin 1998).

The Washington DOE Marine Waters Monitoring program recommends that human activities, which could stimulate plankton production, decrease circulation, or increase oxygen demand be carefully evaluated in the vicinity of Penn Cove (Newton et al. 1998). The low dissolved oxygen concentrations are believed to result from natural conditions (Kearsley and Parvin 1998).

#### *Grasser's Lagoon*

Grasser's Lagoon is a 19-acre salt marsh that is located at the head of Penn Cove. It is tidally inundated twice a day. The lagoon serves important functions as a shoreline buffer zone and wetland habitat. A viable salt marsh exists in the upper intertidal area of the lagoon that provides ideal habitat for waterfowl. Numerous bird species including great blue heron, western grebe, pied-billed grebe, and kingfisher have been observed. The rocky sandspit forming the outer boundary of the lagoon supports significant numbers of shorebirds, including high concentrations of turnstones, surfbirds, and rock sandpipers, normally found in comparable numbers only on jetties and offshore rocks of the open coast. The shallow waters of the lagoon are used by a number of fish species including juvenile chum, pink and coho salmon, herring, smelt, and flounder. The abundance of shellfish and finfish in the area of the lagoon and adjoining waters of Penn Cove support high numbers of diving ducks, mergansers, and herons feeding in the area (U.S. Fish and Wildlife Service, 1985). Although there is no riparian buffer separating the lagoon from the surrounding roads, it appears to be functioning relatively well (Kearsley and Parvin 1998).

#### *Lake Pondilla*

The area surrounding Lake Pondilla is topographically diverse, densely forested and remote, and

contains the highest ridges and deepest depressions within the Reserve (Gilbert 1985). This is the only area of kettles found on Whidbey Island. While many kettles remain within the area, Lake Pondilla is the only extant kettle pond. Little is known regarding water quality or biota associated with this interesting freshwater feature.

#### *Perego's Lagoon*

Located on the eastern shore of Admiralty Inlet, Perego's Lagoon is a coastal lagoon south of Point Partridge and north of Ebey's Landing. The lagoon is approximately 0.6 mile in length and generally about 0.1 mile wide. A narrow (100-150 foot wide) beach consisting of sand, gravel, and cobble separates it from the inlet. The coastal strip appears to be subjected to moderate wave action (0.5-2 feet) and is strongly influenced by long shore currents that deposit eroded upland sediments in this vicinity (Gallucci 1980). Slope changes abruptly inland of the lake with a cliff-face of approximately 240 feet rising almost immediately behind the lake.

#### *Crockett Lake*

Crockett Lake is the largest inland water feature and historically was a salt marsh opening to Admiralty Bay. It is a productive wildlife resource. The lake receives regular limited tidal inundation through tidal gates at its southwest corner.

When early settlers arrived in the area, Crockett Lake was a large tidal lagoon, separated from Admiralty Bay by an 800-foot wide sandy bar called Keystone Spit. At the time of settlement, the lake probably covered about 600 acres when full. Mudflats around its margins were regularly exposed and inundated as the water level changed in regular tidal and seasonal cycles. The lake was surrounded by tidal salt marsh and some brackish and freshwater marsh in areas where groundwater discharged into the lake. Though the amount of water exchange between the lake and Admiralty Bay varied with seasonal tides and the changing morphology of the channel, it probably had a regular flushing of seawater at all higher tides. Minor changes in salinity may have occurred due to winter floods or low tides and evaporation in the summer, but these were probably minor compared to what occurs today.



Tidal gates were installed in 1948 by Island County Drainage District No. 6 in an effort to drain Crockett Lake and some of the marshlands surrounding it. This reduced the lake to about ten acres in size in 1953. Draining the lake combined with the establishment of drainage ditches into the marshes was apparently successful and allowed agriculture to expand into the former marshlands.

In 1974, the flapper valves rusted off the gate and again allowed water to flow into the lake. The drainage district was no longer active so the valves remained open and the lake grew to about 750 acres by the spring of 1982. Flooding occurred and while the inundation of agricultural lands was no longer an issue (lands around the lake were no longer cultivated), it became an issue for surrounding residents. Residents of Telaker Shores, a nearby housing development whose residences had been flooded, reactivated the drainage district and installed new flapper valves on the gates in April 1982.

In the 1980 *Ebey's Landing National Historical Reserve Comprehensive Plan*, the National Park Service identified the natural resource values of Crockett Lake. The lake serves as an important staging area for spring and fall shorebird migration and an over-wintering area for waterfowl during the fall and winter. The NPS Manager to the Reserve said in an affidavit that reducing the lake to its former size would reduce and impair the scenic, historical, and natural values and therefore would adversely affect the preservation and protection of the lake environment.

In 1986, the drainage district contracted with Entranco Engineers to evaluate some of the management alternatives. Entranco suggested regulating water levels at 4 to 5 feet above MLLW (mean lower low water) to protect septic systems at Telaker Shores. Lower levels were predicted to be

better for wildlife because more of the mudflats would be exposed for feeding. The report neglected to mention that without regular inundation, the benthic organisms in the mudflat would quickly die.

In 1987, the Skagit County Superior Court issued a decision (in response to a lawsuit filed in 1985 by Seattle Pacific University) requiring the Drainage District No. 6 Commissioners to maintain lake levels at specific guidelines (Doody 1990). The drainage district agreed to allow staff from Fort Casey State Park to operate the gates and manage water levels. In 1989 or 1990, mosquitoes became a problem and lake water management operations were blamed. In 1992, the infestation was so severe that several local citizens began operating the gates to lower lake levels. They also initiated a program of biological and chemical control for the mosquitoes, with state approval. The university, state agencies, and Audubon Society have recognized the mosquito problem and have not objected to lowering the lake.

Observations indicate that the partially drained lake is unsightly and not very productive for wildlife except in the marshes. It appears that the productivity and scenic value of Crockett Lake have been greatly reduced by manipulation of lake levels.

Currently, according to the hydrogeologist for Island County, the tidal gates are still in place but in disrepair. While water may flow through the pipes that form the gates, it is unclear to what extent the gates still inhibit natural water flow and fish passage.

## Subsurface Hydrology

Residents of Whidbey Island are dependent upon a sole source aquifer with a finite water supply for domestic water and irrigation. As such, the aquifer



receives a high level of regulatory protection. The county, under the State Environmental Policy Act (SEPA) and the Planning Enabling Act (Chapter 36.70 RCW) is required to control development to protect groundwater sources (Island County 1989). The U.S. Environmental Protection Agency, upon the request of Island County government, designated the county a Sole Source Aquifer in 1982, which provides for an additional review of any federally funded projects to insure that there will be no degradation to the county's aquifer system. The designation has no effect on non-federally funded projects (Island County Hydrogeologist 2004).

According to the administrator for the Sole Source Aquifer Program, the EPA is not interested in reviewing policy plans such as this general management plan, but is interested in federally funded construction projects having a potential to impact the aquifer. There is a varying threshold for which projects are reviewed, based on the potential for threat to the aquifer. Whether or not projects are reviewed depends upon factors such as local geology, proximity to drinking water sources, and size (Bender 2004).

In 1986, the Department of Ecology designated Island County a Ground Water Management Area under the authority of WAC 173-100 and in 1987 provided a grant to develop a Ground Water Management Plan which was produced in 1991 (Island County 1991).

The groundwater system consists of five aquifer zones. Each consists of a series of water bearing zones, called aquifers surrounded by low permeability sediments called aquitards. Recharge for the aquifers comes from precipitation. Most of this precipitation is lost by runoff, transpiration by plants, or evaporation. Groundwater flows from recharge areas to discharge areas toward the sea (Island County 1991).

Precipitation contribution to the groundwater recharge is less than might be expected. This is because the rain shadow effects allow only an average of 20 inches of rain per year in the vicinity of Coupeville. Another factor that influences groundwater recharge is soil surface permeability.

Some of the glacial soils have low-surface permeability or they "hardpan" during times of precipitation. This retards percolation into the groundwater aquifer. It is estimated that an average of 6 percent of the precipitation percolates through the soils to recharge the aquifer.

Groundwater pumping exceeds recharge in the vicinity of the Reserve causing saltwater intrusion in some areas. Saltwater intrusion is a serious problem. As pumping exceeds the rate of recharge, saltwater displaces the freshwater. Once contaminated, the aquifer can remain salty for long periods. Preventative management of groundwater is more effective and efficient than remedial measures once contaminated (Island County 1991). Saltwater intrusion has been documented within the Reserve in the areas of West Beach, Coupeville, Ebey's Prairie, and outside the Reserve at Admiral's Cove.

According to the Island County's Ground Water Management Plan, the demand and withdrawals of groundwater in Island County show a 62 percent increase in consumption in 20 years (between 1980 projected to 2000). If population growth and accompanying development continues, there is the potential of decrease in groundwater recharge and an increase in groundwater contamination. Problems associated with this would include saltwater intrusion, nitrates, pesticides, and other contaminants without proper groundwater management.

Water rights are presently over appropriated in certain areas of the county, particularly northwest and southwest of Penn Cove. If these water rights are fully exercised, water will be removed from the groundwater system at a rate greater than the rate of replenishment (Island County 1991).

According to the hydrogeologist for Island County, the groundwater within the vicinity of Coupeville is "hard", with elevated iron and manganese levels. These are both secondary contaminants, meaning that they are not health risks but can cause aesthetic concerns involving taste, coloration or staining of fixtures. Dissolved solids, saline, iron, and manganese are virtually always present in some quantity in groundwater. Salinity, from salt water intrusion, is a problem in some ar-

eas of the county. Chloride levels that exceed the maximum contaminant level are often found in areas experiencing intrusion. This is also a secondary health standard, considered to be at levels that do not pose health risks.

The Town of Coupeville currently provides water service to residents within the Coupeville town limits and within a limited service area outside the town. Coupeville obtains its water from a wellfield located adjacent to the abandoned infiltration gallery of the former Fort Casey Military Reservation northeast of Crockett Lake. Two in-town wells provide backup supply during periods of peak demand. In the early 1990's the Town issued a moratorium on new water hookups, due to well and distribution system limitations. Since 1993 the Town has issued new water hookups within the town limits and continues to improve its supply and distribution system. The town also maintains a reservoir with a capacity of roughly 500,000 gallons but only 160,000 gallons can be utilized as an effective water supply. Whidbey Island groundwater yields range between 50 to 350 gallons per minute, with most wells yielding less than 100 gallons per minute.

## Wetlands

The most extensive wetlands in the Reserve occur within the kettles area at Fort Ebey State Park, around Crockett Lake, and near Prairie Center. Though not as extensive, important wetland resources are associated with Kennedy's and Grasser's lagoons and at Perego's Lagoon. Accord-



*Perego's Lagoon, Whidbey Island, ca. 2000. NPS Photo.*

ing to the county, several other small wetlands have been identified in the Reserve. The county has two generations of wetland maps: the National Wetlands Inventory maps from the mid-1970s, and some improved maps from the 1980s. The county has found that the maps are not comprehensive; they must also rely on finding hydric soils in the soil surveys, and site visits to identify wetlands.

The majority of wetlands in Island County are formed in depressions that occur in the glacial upland soils. Some wetlands have formed on glacial uplands where glacial lakes once occurred, and there are a number of wetlands in the deltas and tidal flats in the coastal areas of the islands. Some of these have been manipulated in the past to serve as water reservoirs for stock or irrigation use.

Marine wetlands run from Admiralty Head to just south of Perego's Lagoon, and start again at Point Partridge and continue north along the shore out of the Reserve's boundaries. Estuarine wetlands line the shore from Admiralty Head south around Admiralty Bay and south beyond Reserve boundaries. Also in Penn Cove, estuarine wetlands extend from beyond the boundaries at Snakelum Point and around Penn Cove through Blowers Bluff beyond Reserve boundaries into Oak Harbor.

## Vegetation

### Woodlands

Whidbey Island is within the western hemlock zone of western Washington and is characterized by the vegetation commonly associated with that zone. Most of the wooded areas were logged or burned by 1900. The remaining woodlands are second and third growth Douglas fir, western red cedar, and red alder, with thick underbrush of salal, Oregon grape, and ferns. Rhododendron and Pacific Madrone are also native species common to central Whidbey. There remain two large, densely wooded areas on the Reserve that comprise just over 4,500 acres.

Old growth or original forests on the Reserve are limited to a few remnant individuals along the



bluffs above Ebey's Landing; two small stands of large Douglas-firs in Rhododendron Park; and the Seattle Pacific University's Camp Casey forest qualify for listing on the Washington State Register of Natural Areas. There are areas where no cutting or burning has occurred since 1900 and where mature Douglas fir, grand fir and western hemlock can be found. The primary forest cover naturally occurs along the ridges and upland areas. Early settlement occurred in naturally open areas, primarily because clearing large trees involved not only great physical effort, but also required valuable time away from crop production, an activity essential to survival.

The following are common species of woodland vegetation: bald hipped rose, serviceberry, Indian plum, rhododendron, bracken fern, Douglas fir, foam flower, grand fir, ocean spray, Oregon grape, red alder, red elderberry, red huckleberry, salal, snowberry, star flower, western hemlock, western red cedar, western white pine, honeysuckle, and willow.

### **Wetlands, Salt Marshes, and Beaches**

Significant salt marsh areas are located at Crockett Lake, Perego's Lagoon, and Grasser's Lagoon. These areas comprise over 600 acres. These natural lowland areas provide food and habitat for numerous bird, small mammal, and invertebrate species. Salt marsh plant communities also create ecotones between different habitats, which enhance opportunities for the diversity of species.



Woodlands near the Jacob Ebey House, Whidbey Island, ca. 2000. NPS Photo.

Beach and associated bluff vegetation occurs primarily along the eight-mile coastal strip and along Penn Cove. In addition to routine disturbance by winds and tides, human use over many years has affected native plant species. This is especially evident in the public access areas around Penn Cove, and along the west shore of the Reserve at Ebey's Landing. Some native plants have survived in less accessible areas, such as around Perego's Lagoon and along the bluffs where flat-leafed cacti (*Opuntia fragilis*) occur.

The common species of salt marsh and beach vegetation include: cattail, orchard grass, pickleweed, seaside arrowgrass, slough sedge, silver cinquefoil, hardstem bullrush, salt grass, salt brush, blue grass, bracken fern, wild rose, seaside plantain, everlasting pea vine, yarrow, velvet grass, blue wild rye, California oat grass, caralline alga, creeping bent grass, dune wild rye, English plantain, green urchin, gumweed, Kentucky bluegrass, Nootka rose, northern saigas, orchard grass, purple snake root, rock weed, Rocmer's, fescue, sea lettuce, sea shore lupine, sea shore red fescue, snowberry, tomcat clover, wiry kelp, woolly sun flower, sea rocket, chick lupine, salt brush, sand verbena, and coastal mugwort.

### **Crockett Lake**

The lake is vegetated in the low marsh areas primarily by emergent, salt-tolerant species such as pickleweed (*Salicornia virginica* L.), saltmarsh arrowgrass (*Triglochin* sp.), threesquare bulrush, saltgrass, and spearscale. In higher areas, the wetland supports silverweed, yarrow, redtop, dock, and Puget Sound gumweed. There are unvegetated mudflats in the central portion of the west half of the wetland.

### **Smith and Ebey's Prairie**

Native Puget Lowland grasslands are one of the most endangered types of ecosystems in Washington State. There are only two remaining glacial outwash prairies in the northern Puget region and one of these is Smith Prairie. The undisturbed site at Au Sable Institute's property is the best example of the two remaining prairies and a good candidate for large-scale restoration for native prairie

plant community. A small four-acre restoration project on Ebey's Prairie near the Prairie Overlook was initiated in 2004.

The prairie remnant at Smith Prairie is estimated to occupy about five and one-half acres. It is the only known glacial outwash prairie site in this region where the prairie grass, *Festuca idahoensis* variety *roemerii*, achieves dominance. Foothill sedge (*Carex tumulicola*), and the exotic Kentucky blue grass (*Poa pratensis*) are abundant. There is a good diversity and abundance of native prairie forbs, including spring gold (*Lomatium utriculatum*), barestem desert-parsley (*Lomatium nudicaule*), western buttercup (*Ranunculus occidentalis*), common camas (*Camassia quamash*), fire chickweed (*Cerastium arvense*), showy fleabane (*Erigeron speciosus*), spikelike goldenrod (*Solidago spathulata* var. *neo mexicana*), and numerous others. Shrubs such as Nootka rose (*Rosa nutkana*), and common snowberry (*Symphoricarpos albus*), have invaded and now dominate other portions of the prairie.

This prairie remnant has been identified as an Idaho fescue-field chickweed community. This as-



Prairie Remnant on Au Sable Institute's property, Whidbey Island, ca. 1999. NPS Photo.

sociation is an "element occurrence" and is listed in the 2003 Washington Natural Heritage Plan (Washington State Department of Natural Resources) as a "priority 3" for protection. This plant association—as well as three other plant associations on the remnant representing the Puget lowland dry grassland—has been identified in the National Vegetation Classification. All four are considered critically, globally impaired (Frosty Hollow Ecological Restoration 1999).

## Grasser's Hill

Grasser's Hill is a privately owned 190-acre grass covered hillside located at the head of Penn Cove. The NPS holds a conservation easement on part of the hill. Grasser's Hill has scenic and archaeological values, and portions retain native vegetation associations—outwash prairies and oak savannas. Restricted to the west side of the Cascades in Oregon, Washington, and southern Vancouver Island, these vegetation types have been reduced 90 percent in extent since European settlement of the Pacific Northwest (Chappell 2003). Areas of Grasser's Hill are mapped as having soils supporting these vegetation types (U. S. Department of Agriculture 1958). The vegetation on all of the remaining areas of these mapped prairie and savanna soils has been converted to agriculture, residential development, roads, or grown into shrubfields. From 1997-2002 portions of the remaining prairie vegetation on Grasser's Hill were disturbed by new horticultural activity and subjected to regular mowing.

While there are no federally or state listed species on Grasser's Hill, extensive field surveys by Steve Erickson, a local botanist and conservationist, over a number of years have yielded the following information regarding several species of regional and local conservation concern, based on the number of occurrences and area occupied.

Recent genetic work on the blue flag iris (*Iris missouriensis*) found on Grasser's Hill indicates it is an unusual endemic native distinct from more common populations found east of the Cascades (Rochefort 2004), and is the only known occurrence remaining west of the Cascade Mountain Range crest in Oregon and Washington (Frosty Hollow Ecological Restoration 1999). The species

*Carex tumulicola* is known to occur only in Washington in the Columbia Gorge near Bingen (Hitchcock 1974), in the San Juan Islands (Atkinson, S. et al. 1993), and on central Whidbey and Fidalgo islands (Erickson 2004). There are eight reported occurrences on central Whidbey, including Grasser's Hill and Schoolhouse Prairie. (Erickson 2004).

Two species that formerly occurred on Grasser's Hill have possibly been extirpated since 1992. Construction of Sky Meadow Road in the 1980s was observed to have destroyed populations of *Brodiaea congesta*. These plants were not located in searches in 1993, 1994, 1995, 1996, and 1997 (Erickson 2004). These species are not known to occur at any other locations on Whidbey Island. Several plants of *Delphinium menzesii* also occurred on Grasser's Hill, but were apparently destroyed by activities associated with residential landscaping between 1994 and 1995. This species is not known to occur elsewhere on central Whidbey (Erickson 2004).

One occurrence of Grass Widow (*Sisyrinchium bellum*) is known on central Whidbey. It occupies an area of several hundred square feet on the upper portion of Grasser's Hill. *Triteleia hyacinthin* is found at two locations on Whidbey Island, including Grasser's Hill, where there were less than 325 plants reported in the mid-1990s. Indian Paintbrush (*Castilleja miniata v. dixonii*) is found at eight locations on Whidbey Island, including Grasser's Hill. Showy fleabane (*Erigeron speciosus*) occurs at six locations on Whidbey Island, including less than 20 plants on Grasser's Hill. Also located here are over 1,000 plants of the Chocolate Lily (*Fritillaria lanceolata* = *F. affinis*). This occurrence of *F. affinis* is one of only a handful known within the range of the species where it achieves this extremely high abundance. This density and high abundance are truly exceptional. *F. affinis* was regularly used as food by the aboriginal inhabitants, and the high abundance and density at this site may indicate long aboriginal use of the site for that purpose. Various other native herbaceous prairie species are also present at this site which include two five-acre parcels west of Skyline Drive, outside of the NPS scenic easement.

Death Camas (*Zygadenus venenosus*) has been reported at five locations on Whidbey Island, including Grasser's Hill. Roemer's Fescue (*Festuca idahoensis v. roemerii*) occurs on central Whidbey only in prairie and savanna remnants and on some coastal bluffs, including Grasser's Hill (Erickson 2004).

## Hedgerows

The Reserve recognizes the cultural and natural importance of hedgerows. In the Reserve, hedgerows define historic cultural land use patterns dating back to the early Euro-American settlement in the 1800s. Some of the first Donation Land Claim boundaries can be identified today by hedgerows.

Most hedgerow origins can be traced to abandoned or unmaintained fence lines. Birds landing on the fences excrete shrub, herb, and grass seeds. Seeds may also be deposited by wind, water movement, farm machinery, small mammals, and automobiles. As the vegetation establishes itself, the fence becomes obscured. Occasionally, trees can be found within hedgerows.

A hedgerow can provide many diverse benefits to the land immediately adjacent to it. Hedgerows slow down water run-off, allowing more time for it to filter into the soil and the aquifer. They reduce soil loss by wind and water action. Hedges break up wind motion near the ground and help maintain soil moisture. Local soil fertility is enhanced due to the activities of associated hedgerow animal communities. Hedgerow plant species draw minerals from deep within the soil and deposit them near the surface. The insect eating mammals, amphibians, birds, and other invertebrates, which make hedgerows their home, assist in pest control. Many mammals and migratory birds are attracted to hedgerows for shelter, feeding, and nesting. In the Reserve, at least 22 species of birds depend upon the hedgerows for breeding, nesting, feeding, or shelter from predators (NPS "Hedgerows" brochure—no date).

Common hedgerow plant species include Nootka rose (*Rosa nutkana*), snowberry (*Symphoricarpos albus*), bracken fern (*Pteridium aquilinum*), Tall



Oregon grape (*Mahonia aquifolium*), and the invasive exotic, Himalayan black berry (*Rubus discolor*).

The Coupeville town planner states that there is no specific language in the 1999 Coupeville Comprehensive Plan or development regulations that addresses hedgerow maintenance. The Trust Board of Ebey's Landing National Historical Reserve freely distributes an NPS-produced hedgerow brochure entitled, "Hedgerows: Dirty Fences or Farmers' Best Friends?"

## Exotic Plants and Noxious Weeds

An exotic species, as defined by the National Park Service (Director's Orders-77), is a species occurring in a given place as a result of direct or indirect, deliberate or accidental actions by humans. These species can be highly destructive, competitive, and difficult to control because of their aggressive growth and lack of natural predators. Exotic species can reduce crop yields, destroy native plant and animal habitat, damage recreational opportunities, clog waterways, reduce land values, and poison humans and livestock. The NPS manages the control of noxious weeds only on NPS-owned lands within the Reserve and relies on Island County Noxious Weed Control Board (ICNWCB) for managing exotics on private property.

Class A weeds are non-native species with a limited distribution in Washington State and Island County. Preventing new infestations and eradicating existing infestations is the highest priority. Law requires eradication. Class B weeds are non-native species presently limited to portions of the state. Preventing infestations and containment of these weed species are the primary goals in Island County. Class C weeds are non-native weeds found in Washington. Many of these species are widespread in the county. Long-term programs of suppression and control are encouraged and in some cases required in Island County.

The following noxious weeds are found within the Reserve and are designated for control by the ICNWCB:

### *Poison Hemlock*

Poison hemlock (*Conium maculatum*) is a class C weed. There is a sizable population along the bluffs at Ebey's Landing. Poison hemlock is toxic by touch, making its manual removal undesirable. Chemical controls have proven effective in eradicating this dangerous plant. In 1999, the ICNWCB released Hemlock moth (*Agonopterix alstroemeriana*), a biological control agent, in an attempt to control this species. The NPS also released this biological control in 2005, with limited success. In 2006, the NPS and partners (including Island County and Washington State Parks) initiated experimental control treatments, including cutting and applying herbicides.

### *Canada Thistle*

Canada thistle (*Cirsium arvense*) is a class C weed. It is abundant throughout the Reserve, with a sizable population on the Au Sable Institute property. Control methods that have been used by ICNWCB include mowing and biological control agents. In 1993, a population of thistle stem gall fly (*Urophora cardui*) was released on Grasser's Hill in an attempt at control. In 1997, populations of Canada thistle stem weevil (*Ceutorhynchus litura*) were released at four sites in Island County. A year later, a population of Canada thistle bud weevil (*Larinus planus*) was released. There is concern that these biological control agents may feed on native thistle and other plant species and may inadvertently affect these populations. Impacts associated with biocontrols are poorly documented. Broadleaf herbicides are effective in controlling this species.

### *Scotch broom*

There are known populations of Scotch broom (*Cytisus scoparius*) on the bluffs at Ebey's Landing and at the Prairie Overlook. Manually removing the broom has been effective. The Scotch broom seed weevil (*Apion fuscirostre*), a biological control agent, has been used by ICNWCB.

### **Gorse**

Gorse (*Ulex europaeus*) is a class B noxious weed that is found in the Reserve. Hand pulling has been a marginally effective means of control. The ICNWCB has released a population of Gorse spider mites (*Tetranychus lintearius*) a biological control agent, in an attempt to control this weed. Broadleaf herbicides are effective in controlling this species.

### **Tansy Ragwort**

Tansy Ragwort (*Senecio jacobaea*) is a class B weed that is found throughout the Reserve, with some populations on Potmac Road and Crockett Prairie. Manual removal has been effective. Populations of Ragwort flea beetle (*Longitarsus jacobaeae*), Ragwort seed fly (*Pegohylemyia seneciella*), and Cinna-bar moth (*Tyria jacobaeae*), all biological control agents, have been released by the ICNWCB in an attempt to control this weed.

### **Giant Hogweed**

Giant Hogweed (*Heracleum mantegazzianum*) is a Class A noxious weed. All known occurrences of this species within the Reserve have been controlled.

### **Spartina**

Spartina (*Spartina anglica*) a salt marsh grass, was introduced to Port Susan in the early 1960s in order to convert tidelands into pastureland for cattle. Since its introduction, it has spread throughout Puget Sound. The species is harmful in that it collects sediment, turning areas of mudflat into salt marsh. This changes the entire nature of the ecosystem, crowding out native vegetation such as eelgrass beds and impacting bird, fish, and marine invertebrate populations. *Spartina anglica* has been identified in Penn Cove. Both governmental agencies and citizen groups have worked to eradicate this Class B noxious weed. According to Gloria Wahlin, a former Island County Noxious Weed Board Coordinator, a resident of Stanwood planted spartina in the early 1960s. The resident planted it on a beach so that his cattle could graze on the shore. Washington State University supplied the seeds and it was erroneously believed that they were sterile and would not reproduce. It has since moved into Penn Cove, Kennedy's Lagoon, and it is at locations near Coupeville. The

ICNWCB has been mowing the spartina and then spraying it with the herbicide, Rodeo. Another effective control method is to cover it with 100 percent shade cloth and manually remove it.

Numerous invasive non-native plant species are rapidly invading the high salt marsh habitat of the eastern Crockett Lake wetlands, including the aggressive *Epilobium hirsutum* (hairy willow-herb). This invasion is occurring within and beyond the current Reserve boundaries. Left unchecked, this highly invasive species has the potential to invade much of the zone now occupied by *Potentilla anserina* (Pacific silverweed). This is a serious ecological threat to the native plant communities of the Crockett Lake environs, especially considering the high volumes of vehicular traffic through this area which can act as vectors for spread of seed throughout western Washington and southern British Columbia.

Other invasive, exotic species of concern are field bindweed (*Convolvulus arvensis*), bull thistle (*Cirsium vulgare*), horseweed (*Conyza canadensis*), and Himalayan blackberry (*Rubus discolor*).

Noxious weeds that are found in Island County and that may or may not in the future enter the Reserve are: Spanish broom (*Spartium junceum*), bighead knapweed (*Centaurea macrocephala*), clary sage (*Salvia sclarea*), purple star thistle (*Centaurea calcitrapa*), milk thistle (*Silybum marianum*), velvet leaf (*Abutilon theophrasti*), common cordgrass (*Spartina anglica*), Brazilian elodea (*Egeria densa*), orange hawkweed (*Hieracium aurantiacum*), yellow hawkweed (*Hieracium caespitosum*), meadow knapweed (*Centaurea pratensis*), diffuse knapweed (*Centaurea diffusa*), purple loosestrife (*Lythrum salicaria*), parrotfeather (*Myriophyllum aquaticum*), Eurasian watermilfoil (*Myriophyllum spicatum*), babysbreath (*Gypsophila paniculata*), reed canarygrass (*Phalaris arundinacea*), smoothseed dodder (*Cuscuta approximata alfalfa*), scentless mayweed (*Matricaria perforata*), common St. John's wort (*Hypericum perforatum*), common tansy (*Tanacetum vulgare*), yellow toadflax (*Linaria vulgaris*), and absinthe wormwood (*Artemisia absinthium*).

## Sensitive Species

The Reserve is the home of rare and regionally rare plant species and plant communities. Although only one plant species, the golden paintbrush (*Castilleja levisecta*), is listed as threatened at the federal level (and endangered at the state level), there are other species not protected that are of local importance and their preservation helps protect genetic diversity. Prominent among these species is *Aster curtus* (*Seriocarpus rigidus*) (White-topped aster). This species is considered by the U.S. Fish and Wildlife Service as a “Species of Concern.” *Aster curtus* is listed by the Washington Natural Heritage Program as “Sensitive.” The small occurrence at Schoolhouse Prairie is the only known location on Whidbey Island and within the Reserve. According to Frosty Hollow Ecological Restoration (1999), the areas of special status local flora are Grasser’s Hill; Smith Prairie and the former DNR game farm (now owned by the Au Sable Institute and managed as a summer environmental education campus); Ebey’s Bluff; Fort Ebey State Park; Naas Natural Area Preserve near Camp Casey; West Beach Road; Zylstra Road; Ebey’s Landing; and Point Partridge. The major threats to these species and plant associations include development, mowing, road maintenance, visitor impacts, noxious weeds, and increased competition from tree and shrub cover.

According to Frosty Hollow Ecological Restoration, private, for-profit business, the areas of unique local flora are Grasser’s Hill; Smith Prairie and the former DNR game farm (now owned by the Au Sable Institute and managed as a summer environmental camp); Ebey’s Bluff; Fort Ebey State Park; the former Bocker Environmental Reserve, now called the Naas Natural Area Preserve at Camp Casey; West Beach Road; Zylstra Road; Ebey’s Landing; and Point Partridge. The major threats include development, mowing, road maintenance, visitor impacts, noxious weeds, and increased competition from tree and shrub cover.

### Golden Paintbrush

Golden paintbrush (*Castilleja levisecta*) is a federally listed “threatened” species under the Endangered Species Act and an endangered species in the State of Washington. There are only 13 occur-

rences remaining on earth, five on Whidbey Island. Of these, three are found within the Reserve, at Fort Casey State Park, the Naas Natural Area Preserve (at the Seattle Pacific University’s Whidbey Island campus), and on TNC property south of Ebey’s Landing. A population study was conducted in 2003 at all three sites. At two of the three sites, where similar studies were conducted previously, the populations have dropped significantly. In 2006, populations continue to decline.

At Fort Casey, a previous survey in 1989 found more than 400 individuals, and in 1993, only 120 individuals were counted. At the Naas Natural Area Preserve, 1984 and 1985 surveys of a five by five-meter area found over 1200 and 2700 plants respectively. In 1993, 273 plants were counted in the same area; in 2004, only 68 plants were counted (Sheehan 2005). At the site south of Ebey’s Landing, no previous study is known to have occurred. In 1993, a random transect sampling estimated the population at over 4000 individuals, with a small sub-population of an estimated 120 individuals occurring directly below the main population.

Explanations for the declining population size at Fort Casey have included the pattern and timing of mowing, visitor use, increased cover by shrub and other competitive species, predation by rabbits, and natural succession of plant communities. At the Naas Natural Area Preserve, increased tree and shrub cover offer one explanation for decline in species numbers.

## Wildlife

The classification “Priority Habitats and Species” by the Washington Department of Fish and Wildlife (WDFW) are defined as key species use areas and key fish and wildlife habitats based on expert empirical knowledge. The compiled data does not represent exhaustive inventories. All the priority species areas mapped represent known use areas—they are not potential habitats. Priority habitats are areas that support diverse, unique and/or abundant communities of fish and wildlife. The Priority Habitat and Species Areas identified by WDFW within the Reserve include the following: Penn Cove; Crockett Lake; the bluffs north and south of Ebey’s Landing; Perego’s Lagoon;





*Heron at Crockett Lake, Whidbey Island, ca. 2000.*

Kennedy's and Grasser's lagoons; the bluffs north and south of Blower's Bluff; the coastal tidelines that line the shores of the Reserve; bald eagle nest and foraging sites; and numerous smaller areas which include fresh and saltwater wetlands, estuaries, bluffs, and urban natural open spaces. Approximately 78 Priority Habitat and Species Areas occur within the boundaries of the Reserve.

It is important to note that habitat and species information can only show that a species or habitat type is present. They cannot show that a species or habitat type is not present. Site-specific surveys are frequently necessary to rule out the presence of priority habitat and species. Detailed surveys have not been conducted by NPS.

## Terrestrial Mammals

Habitat fragmentation, development, and the introduction of exotic species have all contributed to the present composition of mammalian species in the Reserve. Mammals can be highly secretive creatures. Many of them are nocturnal; some are small, and therefore, difficult to study. There has not been a conclusive inventory of mammal species on Whidbey Island. Many of the wild mammals of the Reserve, such as coyotes, deer, and raccoons, breed in forested habitats, but suitable habitat for smaller species (such as shrews, voles, mice and rats) is also available along fence rows and at farm sites. Aquatic habitats are used as feeding areas by scavengers and carnivores such as raccoons, skunks and coyotes, otters, as well as for bats, which capture insects over the water.

According to staff at Fort Casey State Park, there were an undetermined number of feral guinea pigs released within the vicinity of Fort Casey State Park sometime around 1990. It is believed by park officials that they existed within the Reserve for roughly one month afterwards. Ten were captured. The rest, if any of the population remained, were assumed dead due to predation. No recent sightings have been reported.

## Marine Mammals

Little is known of significant feeding, rearing, or breeding habitat for marine mammal populations within the Reserve. To date, there has not been a comprehensive marine species inventory within the Puget Sound area. Whales, dolphins, and seals may be temporary visitors in the surrounding waters. A harbor seal (*Phoca vitulina*) haul-out site, located east of Oak Harbor, is operated by WDFW. The area has year-round occupancy by harbor seals. Due to the proximity to Penn Cove and the Reserve boundaries, seal visitation and use should be expected. Orca whales have been observed in Penn Cove periodically.

## Birds

There are many bird species that inhabit the area within and around the Reserve. The majority of species are using the natural habitat areas within the Reserve as feeding grounds, migratory resting places and wintering grounds.

Nesting communities are most likely found within the forested areas and to a much smaller extent along the shoreline border communities of Ebey's Landing, Penn Cove and Crockett Lake. Crockett Lake serves as an important staging area for spring and fall shorebird migration and, along with Penn Cove, an over-wintering area for waterfowl during the fall and winter. Crockett Lake has been an International Shorebird Survey site since 1997. In 2001, Crockett Lake and Penn Cove were both designated Important Bird Areas by Washington State Audubon. A year-long baseline bird survey of selected habitat types within the Reserve was completed in 2003.

There are nine known Bald Eagle (*Haliaeetus leucocephalus*) nesting sites in the Reserve in the

areas of Point Partridge, Kennedy's Lagoon, West Beach, Kettles Park, Coupeville, Long Point, Ebey's Prairie, Smith Prairie and Admiralty Bay. All nests are active and productive. The majority of nest activity occurs during late winter, spring and summer. In addition, there is a foraging area near Coupeville with regular large year round concentrations averaging up to 25 eagles. These nine nests and the foraging area are considered Priority Habitat and Species Areas by the WDFW.

During the 2002, Christmas Bird Count 11,291 birds of 82 species were counted in the Reserve. Included in the total were 20 Bald Eagles and 2 Peregrine Falcons (*Falcon peregrinus*). The Reserve supports a high density of both breeding and wintering birds of prey, including Red-tailed Hawk (*Buteo jamaicensis*), Bald Eagle, Northern Harrier (*Circus cyaneus*) and American Kestrel (*Falco sparverius*). The numerous Red-tailed Hawk nests probably indicate an equivalent breeding population of Great Horned Owls (*Bubo virginianus*). (Clifford D. Anderson, Falcon Research Group). Small flocks of Harlequin Ducks (*Histrionicus histrionicus*) winter off west side beaches from Point Partridge to Admiralty Bay. Pigeon Guillemot (*Cephus columba*) nest in the bluffs in Penn Cove and along West Beach and Admiralty Inlet.

Marine birds are most easily distinguished by habitat type. Some locally common species that can be seen in the different habitat types within the Reserve are the following:

- Rocky coasts—oystercatchers, Black Turnstones (*Arenaria melanocephala*), Surfbirds (*Alphriza virgata*), sandpipers, Harlequin Ducks
- Intertidal and tidal shallows—Harlequin Ducks
- Stone, pebble and cobble beaches—Killdeer (*Charadrius vociferus*), Pigeon Guillemots, kingfishers, gulls
- Mudflats and salt marshes—gulls, terns, cormorants, dabbling ducks. (This area is considered the richest bird habitat because of the quantity of plant biomass.)

## Reptiles and Amphibians

There is no known conclusive inventory of reptiles and amphibians for the Reserve; however, excellent habitat for reptiles and amphibians may be

found throughout the Reserve. The northwestern garter (*Thamnophis ordinoides*), red-legged frog (*Rana aurora*), and Pacific chorus frog (*Pseudacris regilla*) are found within the Reserve. Also present is the western toad (*Bufo boreas*) (Washington Department of Game and Soil Conservation Service 1979).

## Invertebrates

No information is available concerning terrestrial invertebrates within Ebey's Landing National Historical Reserve. Limited marine species information is available.

## Fish

There has been no systematic biological survey of the waters of Puget Sound (Kruckeberg 1991). However, according to a collection of surveys, it is estimated that there are about 211 species of fish that populate the Puget Sound area (Kruckeberg 1991).

The common fish that inhabit shoreline, tidepool, mudflat, estuary, kelp, and eel grass beds are the following: salmon, trout, sharks, little blennies, and sculpins. Beyond the reach of tides, the common pelagic, or free swimming, species are: salmon, dogfish sharks, rat fish, herring, hake, and some rockfish. Below the reach of tides within the benthic or bottom dwelling habitat, flounder, cod, sole, and rockfish are the most common species found.

The WDFW has identified Penn Cove as a spawning area for surf smelt and sandlance. For surf smelt, the spawning area exists in the subtidal zone and extends from Snakelum Point around Penn Cove to Monroe's Landing, with the western shore of Penn Cove used only sporadically for spawning. For sandlance, individual spawning areas exist on Snakelum Point, Long Point, Lovejoy Point, Monroe's Landing and just east of San de Fuca. No known rock sole spawning and herring spawning areas or herring holding areas exist within the Reserve.

The local salmon fishery is heavily used, as has been the case for many years. The marine and fresh water systems adjacent to and within the Reserve are very important for juvenile salmon rear-

ing and migration, particularly pink and chum fry. Some of the more common salmon species and nearby relatives that utilize the Puget Sound area are: pink salmon (*Oncorhynchus gorbuscha*), king salmon (*Oncorhynchus keta*), coho/silver salmon (*Oncorhynchus kisutch*), sockeye salmon (*Oncorhynchus nerka*), chinook salmon (*Oncorhynchus tshawytsa*), coastal cutthroat trout (*Salmo clarkii*), rainbow/steelhead trout (*Salmo gairdneri*), brown trout (*Salmo trutta*), brook trout (*Salvelinus fontinalis*), dolly varden (*Salvelinus malma*).

## Shellfish

Commercial resources include a substantial subtidal clam bed offshore from Ebey's Landing. Penn Cove clam beaches are among the most productive in the state and constitute a very valuable recreational resource. There is a Washington Department of Fisheries (public) beach on the south shore of Penn Cove, which is one of the most productive hard-shell clam beaches in the state. There is also a groundfish sport fishery of unknown magnitude in Penn Cove.

Penn Cove Mussels, Inc., a mussel culture operation, was established in Penn Cove in 1975. It was the second mussel culturing operation in the United States. In March of 1996, it entered into a joint venture with Coasts Seafoods Company, whereby becoming Penn Cove Shellfish, LLC. The site is located on the south side of the Cove, sheltered from prevailing winds by a high bluff. The geography of Penn Cove makes it a nutrient trap for the outflows of the Skagit and Stillaguamish river systems. The fresh water and nutrients, combined with the sunlight provided by the rain shadow effect of the Olympic Mountains, is advantageous for plankton growth. The mussels are cultured on floating rafts moored in the cove. Each of the 38 rafts (40 feet by 80 feet, 40 feet by 120 feet, and 30 feet by 90 feet each), hold approximately 1500-2400 of these mussel seed collector lines, on which the mussels grow (Penn Cove Shellfish 2001). The company plans to add three new rafts in the near future. Mussels grow consistently to two inches in eight to ten months, at which point they are harvested. Between three-quarters to one million pounds of mussels are produced a year (Jefferds 2000).

## Intertidal, Benthic, and Pelagic Communities

Below the influence of the tides, there is a submarine landscape of great variety. Habitable bottoms formed from sand, clay, and gravel substrates provide the predominant settling ground for life. These sediments are derived mainly from the rivers feeding into the sound but also, the erosion of submarine slopes contributes to sediment deposits. Life on submarine terrain is largely sedentary, or sluggish. The benthos, or bottom dwelling zone, ranges from the bottom of the submarine troughs up to the intertidal zone. In the intertidal and splash zones, when beyond the reach of tides, marine life waits for the water and revitalizing nutrients to come to it.

Some representative species within the coastal intertidal zones are the following:

- Rocky habitats—limpets, barnacles, periwinkles, mussels, rockweed, purple sea star, anemone, kelp, rockfish, sea urchins, sea cucumbers.
- Sandy or cobble habitats—sea gull, dune grass, sand piper, six-rayed star, Dungeness crabs, sun star, sand dollars, jellyfish, sand sole, razor clam, butter clam.
- Muddy habitats—marsh grass, black brant, eel grass, micro-crustaceans, English sole, juvenile salmon, marine worms, bentnose clam, ghost shrimp.
- Surface layer of the water—copepods, fish eggs, and fish larvae.

The major groups of marine invertebrates within Puget Sound are sponges, hydroids, sea anemones, ribbon worms, round worms, segmented worms, chitons, clams, snails, limpets, crabs, barnacles, other carapaced creatures, starfish, sea urchins, and sand dollars. Communities of sea urchins, Pandalid shrimp, hardshell subtidal and intertidal clams, northern abalone, and subtidal geoducks exist within the Reserve and can be found at the following locations:

- Sea urchin—a community is located offshore from Point Partridge on Partridge Bank in the Strait of Juan de Fuca.
- Pandalid shrimp—a community located from Admiralty Head north through Ebey's Landing



to Point Partridge. Another, much larger, community is located offshore from Ebey's Landing north over Partridge Bank in the Strait of Juan de Fuca and beyond the boundaries of the Reserve.

- Hardshell subtidal clam—a community located from Fort Casey State Park to Perego's Lagoon. Another small community is found in Penn Cove, near Kennedy's Lagoon.
- Hardshell intertidal clam—a community is located from Long Point around Penn Cove and beyond Blower's Bluff.
- Northern abalone—a community hugs the coast at Ebey's Landing.
- Subtidal geoduck—three small communities are located offshore from Point Partridge in the Strait of Juan de Fuca. A larger community exists off the western shore of central Whidbey, just north of the Reserve's boundaries.

The most extensive of the oceanic habitats is the pelagic zone where plants and animals are found floating or swimming. Common species that can be seen within this habitat zone are phytoplankton, floating plants, and microscopic algae, which form the basis for most marine food chains. This microscopic algae is able to absorb carbon dioxide from its environment, combine it with dissolved salts, and photosynthesize food using radiant energy from the sun.

Giant kelp (*Nereocystis luetkeana*) beds support lots of algal life in addition to larger life forms. This annual plant prefers to grow in places where the sea is in motion. It can reach lengths of up to 20 feet. The best beds occupy a zone that is just below the lowest low tide zone at a depth of 40-60 feet (mean low water).

Eel grass (*Zostera marina*) meadows with their subtidal waters and muddy bottoms are ideal habitat zones. Eel grass, also called the pasture plant, is distant kin to the cereal grains, the grasses. Its growth patterns provide ample biomass for itself and other organisms such as algae, sea anemones, marine worms, snails, limpets, crabs, ducks, and fish. Both kelp and eel grass beds serve as nurseries to many fish species. Eel grass is sensitive to changes in water quality.

## Marine Invasive Species

There are a number of marine species in the immediate vicinity of the Ebey's Landing National Historic Preserve that are not native but have been in the area for so long that they have become generally perceived by the public as being local flora and fauna. These include the Manila or Japanese littleneck clam (*Venerupis philippinarum*), Pacific or Japanese oyster (*Crassostrea gigas*), Eastern softshell clam (*Mya arenaria*), and the beach grass *Ammophila arenaria*. Three other species have either arrived more recently or have been found in nearby waters. Two of these are the European green crab and the purple varnish clam and are mentioned below. The third is a salt marsh grass (*Spartina anglica*), which is discussed in the "Vegetation" section of this chapter.

The European green crab (*Carcinus maenas*) is native to the Atlantic coast of Europe, ranging to Northern Africa. It was first documented on the West Coast of the United States in 1989 when it was found in San Francisco Bay. Spreading northward since then, numerous adult European green crabs have been collected in Grays Harbor and Willapa Bay on the Washington Coast and at least two live adults found at the head of Barkley Sound on the west side of Vancouver Island, Canada. To date, the European green crab has not been documented on Whidbey Island. This crab is described as a voracious predator consuming bivalve mollusks, small crustaceans, and other organisms and having the potential to impact populations of Dungeness crabs, bivalves, and other native species. In other areas where it has become established, the crab has fed not only on the larva of native crab species, but has also out competed them in capturing prey with its superior speed and dexterity. The Washington Department of Fish and Wildlife presently maintains a long-term monitoring and control program for this species.

The purple varnish clam (*Nuttallia obscurata*) is an Asian species believed to have been introduced to the Strait of Georgia in the late 1980s via ballast water from a ship. It has spread rapidly throughout the area and has been documented on Whidbey Island beaches at least as far back as 2002. Shells from this species have been found in Penn Cove. The clam is found 8-10 inches deep in

the substrate and somewhat higher in the intertidal than the area occupied by Manila and native littleneck clams. Impact of this species is not yet determined. Research indicates that it is preyed upon by birds and raccoons.

## Agricultural Resources

Traditional agricultural land use within the Reserve dates back to the first European settlers. American Indians practiced types of agricultural use, but their methods were much different from those practiced by the Europeans. American Indians often and regularly would perform prescribed burns on sections of the prairie in order to encourage the growth of edible plants, like camas, bracken fern, and chocolate lily. On the prairie, edible bulbs were dug with wooden hand tools.

European settlers' agricultural practices were much more similar to those employed today. Historically, within central Whidbey Island, agricultural use of the land has played a large part in the livelihood of the inhabitants. This is still true to some extent but the mainstay of the community economic base has shifted.

According to an official at the Washington State University Cooperative Extension Office (Meehan 2000), land use, over time, has changed to more, smaller-scale farms. Presently, the general trend is toward loss of farmed lands. This is true within the Reserve and is due in large part to strong residential development pressure. Due to the increased difficulty in making a profit on agricultural land, the number of people maintaining a working farm is dwindling.



Dairy farm operation within Reserve, Whidbey Island, ca. 2000. NPS Photo.

There is still an active farming community within central Whidbey Island. Typical commercial crops include grass, alfalfa, cabbage, and beet seed for export, lavender, conifer seed, strawberries, barley and peas. In 2000, within the Reserve there were 3,355.6 acres in cropland within the Reserve, 1,138.6 acres in pasture, 1,437.1 acres in grassland, and 5,290.7 acres in woodland. (Refer to *Ebey's Landing National Historical Reserve General Management Plan/Environmental Impact Analysis, Volume II, Technical Reports, An Analysis of Land Use Change and Cultural Landscape Integrity for Ebey's Landing National Historical Reserve* by Nancy Rottle.)

The Whidbey Island Conservation District provides conservation plans to landowners at no cost. As of 2000, they were assisting 73 farms (both commercial and small farms) within the Reserve, for a total acreage of 7,446.3. In addition, they are serving 25 woodland owners, with a total acreage of 1,120.5. (For a discussion of NPS-owned farms within the Reserve, see "Agriculture" in the "Alternatives" chapter.)

## Fire

Most forest and shrub ecosystems are dependent on fire to maintain their long-term stability. Ecological benefits of fire in these ecosystems can include reduction of woody fuel accumulations, maintenance of successional stages, increase of plant species diversity, and control of insect and disease populations at normal local levels. Disrupting and suppressing these ecosystem-regulating effects of naturally occurring fires and those that traditionally were set by American Indians creates abnormal fuel conditions. These conditions favor unnaturally large and intense wildfires, with erratic and unpredictable behavior, that further degrade the integrity of natural ecosystems and threaten life and property.

Fire has played an important role in shaping the landscape at Ebey's Landing National Historical Reserve. Historical accounts have established that American Indians burned grasslands and woodland forests to create habitat for game animals and to promote the growth of weaving materials and food products, such as camas (Agee, 1987). This

helped shape the vegetative patterns on Whidbey Island.

Natural ignitions were also a part of the Reserve's fire history. Forested hillsides and prairie grasses have all evolved with wildland fire. The frequency with which an area burned from natural ignitions depended upon a variety of factors including plant community type, site slope or aspect, wind direction and velocity, and variations in seasonal precipitation. Periodic fire has an important role in both the health of the natural systems and the integrity of the cultural landscape at the park. Without fire, forest plant communities no longer function as they would in the post-glacial ecosystem that included regular burning.

### **American Indian Use of Fire**

American Indians used fire as a tool to manipulate vegetation in the Pacific Northwest (Williams 1997). Humans used fire to hunt and harvest natural products, to ward off predators, and to maintain the habitat against natural succession that would convert the land into forest (Pyne 1982). There were three common patterns of American Indian fire use in the Northwest; frequent burning in westside prairies and dry Douglas-fir forests, maintenance of small patches of open prairie for agriculture or hunting by coastal or mountainous tribes, and widespread burning by inland or "plateau" tribes east of the Cascade Mountains (Knudson 1980). It is believed that American Indians burned where they lived to promote a diversity of habitats (Williams 1997).

### **Fire after Euro-American Settlement**

Evidence shows that the frequency of large fires increased with the appearance of American settlers in the 1840s (Pyne, 1982). Reasons for burning were mainly to clear land of trees and underbrush for farming. Embers from open hearths and American Indian burning were also ignition sources for fires.

The fire season of 1910 and the severity of fires that year had a profound influence in how society would deal with future wildland fire. Society launched into an effort to remove wildland fire from the landscape and active wildland fire sup-

pression became the goal for land management agencies.

Presently, the Washington Department of Natural Resources and local fire departments carry out wildland fire protection for the Reserve. Island County wildland fire starts for the previous ten years show that only four were caused by lightning and 233 were human caused (DNR 2001). The wildland fire workload can be influenced through continued or expanded use of wildland fire prevention programs.

### **Wildland Fire or Natural Fires**

Natural fires are those wildland fires caused by natural sources. The most common natural wildland fire ignition source for the Reserve is lightning. Other types of ignition sources, though rare, are spontaneous combustion or volcanic in origin. Lightning fires for the Pacific states represent approximately 37 percent of all wildland fires (Taylor, 1974). Lightning occurrence, with associated wildland fire starts, has an occasional rating on Whidbey Island. (Agee, 1993)

### **Fire Regime and Interval**

In studying the fire history on Whidbey Island, the fire regime for timber stands on Whidbey Island is a High Severity Fire Regime (Fire Regime 5) (Agee 1993). Common fire types in this type of fire regime would generally be low intensity surface fires with some torching early in the fire season. This would change to crown fires and severe surface burning after prolonged drought or during periods of high temperature and low humidity. When fires occurred, they would be severe surface fires that would replace entire tree stands. ). The fire return interval for timber stands in the Reserve is between 100-300 years. The fire return interval is defined as the amount of time between two successive fire events in a given area (Agee 1993).

### **Fire Ecology**

Wildland fire has had direct effects on the vegetation within the Reserve. Fire will eliminate individual plants thus setting the site back to an earlier successional stage. Negative effects from a human standpoint would occur if fire removed desirable plants or wildlife habitat from the site. If a plant



has adapted to fire effects the impact may actually be positive. (Agee, 1993)

## Fire and Air Quality

A significant by-product of the combustion process is smoke. Comprised of small particulates of fuels that did not completely burn; smoke is carried into the atmosphere by transport winds, which have a major bearing on where the smoke accumulates prior to atmospheric dispersal. Smoke impacts air quality in two ways: the first is in the form of airborne pollutants, which can adversely affect human health, and the second is the clarity of air, which affects the ability to see for long distances or creates regional haze impacts. From a health standpoint, air quality within the Reserve is good most of the year. This is due to the prevailing Puget Sound winds keeping the air mixed overhead.

Under the State of Washington Clean Air Act, the counties are required to minimize outdoor burning. Within the Reserve, in unincorporated Island County, some burning of organic waste by landowners is allowed, although it is very limited by the terms of the Outdoor Burning Ordinance (ordinance no. C-117-01). This includes yard waste, agricultural waste, and slash burning. For waste piles over four feet in diameter, a permit must be obtained by the Island County Fire Warden. For slash burning, landowners must receive permits from Washington State Department of Natural Resources.

## Interpretation

Interpretation of the stories of Ebey's Landing has relied primarily on a few wayside exhibits, the Island County Historical Society's self-guided walking tour, and on volunteers at the historical museum. The Reserve does not have an interpretive plan and currently has no interpretive staff to implement a plan. The process for developing a Long Range Interpretive Plan is expected to begin in 2005 and will incorporate the themes generated in this GMP, as well as specific recommendations for the best ways to interpret those themes, including recommended staffing. The plan will address non-personal interpretive services such as

wayside exhibits and web sites, and personal interpretive services including the use of volunteers, partnerships and staff.

## Interpretive Themes

The following primary interpretive themes are based on purpose and significance statements, which were developed from the enabling legislation of the Reserve. Primary interpretive themes are the big concepts that are the foundation for an interpreter to develop specific programs or products, which will provide opportunities for a visitor to form their own emotional or intellectual connections to the meanings and significance of a park. In order to provide a range of these opportunities for connections to each of the themes, every visitor should be given varied and multiple opportunities to understand the primary interpretive themes, ideally resulting in greater appreciation for stories of the Reserve and a sense of stewardship toward park resources.

*Change*—People have long been attracted to the Ebey's Landing area, making it their home for similar reasons yet bringing new motivations and uses. Principle topics include the following:

- Early exploration
- American settlement and commerce
- Water to land transportation
- Military history
- *Living Landscape*—Ebey's Landing National Historical Reserve is a living landscape, illustrating continuity among changes from early use of the land by Native Americans and later explorers and settlers to present day uses. Topics include:
  - Historical landscape
  - Agricultural connection of prairies to coast
  - Recreational and educational activities
  - Shellfish operation
  - Natural resources in Penn Cove
  - Biodiversity
  - Natural environment directed settlement patterns

## Visitor Experience Goals

Ebey's Landing National Historical Reserve is a new kind of national park, created to preserve and protect a rural community, its historic sites and natural beauty. It provides a place to learn about Pacific Northwest history from Native American settlement up to the present time, and to learn about this new type of park that depends on cooperative management. It also provides visitors opportunities for outdoor recreation and reflection. Visitors will:

- Have advance access to information through a variety of media, in a variety of locations, including the park website, exhibits at the ferry terminals, and published guides that will assist them in planning a trip to Whidbey Island and the Reserve, thereby maximizing their time, enjoyment and understanding of the history and resources.
- Receive interpretive information through exhibits, self-guided walks, the Reserve's brochure, and a variety of personal and non-personal services that orient them to the Reserve's features.
- Understand the ways that privately owned land is being protected as part of the Reserve for future generations.
- Safely enjoy a variety of accessible, sustainable recreational experiences.
- Understand the importance of resource protection and leave the park with a sense of stewardship toward natural and cultural resources protected by the park.



*Prairie Overlook interpretive wayside, Ebey's Prairie, Whidbey Island, ca. 2000. NPS Photo.*

- Learn about the unique and sensitive species of the area and the communities they inhabit.
- Understand that there has been a continuum of human /nature interaction at this place, probably since the end of the Ice Age.
- Have opportunities to continue to enjoy solitude, dark night skies, prairie landscapes, and ocean vistas.

## Interpretive Programs and Opportunities

In some years, the Reserve has hired seasonal interpreters to conduct interpretive tours, but most interpretation is through the wayside exhibits and two self-guided publications: the NPS's walking tour brochure of Coupeville and the driving and bicycling tour brochure. These are distributed at the Island County Historical Museum, Coupeville Library, Coupeville Chamber of Commerce and at other locations. The interpretive programs and media communicate messages derived from the primary interpretive themes. Current interpretive opportunities include the following:

### Website

The park website provides informational and interpretive materials with historical and current photographs and illustrations, including the following topics:

- History and Vision for the Reserve
- Cultural Landscapes and Hedgerows
- Settlement Patterns



*Interpretive wayside at Coupeville Wharf, Whidbey Island, ca. 2000. NPS Photo.*

- Landforms of the Reserve
- Research Materials and Information
- Archaeological Heritage and Resources
- Historic Buildings
- Management Documents

## Port Townsend Ferry Terminal

This is the arrival point for visitors taking the ferry to Whidbey Island from the Olympic Peninsula. Visitors have easy access to a three-sided kiosk with orientation information on the Reserve concept, a map of the Reserve and an interpretive panel on the Washington State Ferries System. This can also be a busy area during ferry arrivals so many visitors may not get oriented to the Reserve here.

## Coupeville

Visitors have another orientation opportunity at the Coupeville Wharf, with a kiosk containing a map of the Reserve and two other interpretive panels.

The Island County Historical Museum, located near the wharf, provides the Reserve's primary personal orientation services using volunteer staff in the museum and on some walking tours of Coupeville. The Island County Historical Society operates the museum and is a partner with the NPS and Trust Board through a cooperative agreement. They have permitted temporary exhibits on Ebey's Landing to be displayed in the museum, space permitting. The volunteers do not receive any interpretive training from the National Park Service and usually do not get any NPS orientation training about the Reserve. The Trust Board staff periodically provides some Reserve orientation information to museum docents.

The Island County Historical Society distributes the NPS produced self-guided walking tour (brochure) of Coupeville, which incorporates some information on Ebey's Landing. The NPS has interpretive exhibits on the porch of the museum and brochure holders so after-hour visitors can access Reserve information. Other orientation and interpretive kiosks are located at Ebey's Landing, Fort Ebey, and the Prairie parking lot.

Interpretive wayside exhibits and kiosks are located at key locations throughout the Reserve. These are Crockett Blockhouse, Ebey's Landing and Bluff Trail, Fort Casey, Fort Ebey, Keystone Spit, Monroe's Landing, Prairie Overlook and Prairie Wayside.

In 2001, the NPS assessed the existing interpretive media in the Reserve, which included an inventory of themes interpreted, the effectiveness of each exhibit, and recommendations for improved interpretation addressing the cultural landscape. The report will be a key piece in the development of the Long Range Interpretive Plan.

## Recreational Resources

The Reserve has a diverse range of recreational activities for visitors and residents. These vary from exploring the cobbled beach of Keystone Spit to attending performances of nationally known musicians and actors. Because of the temperate climate of the Pacific Northwest, virtually all of these activities can be enjoyed the year-round. While there is a choice of activities to participate in locally, the Reserve is also in close proximity to the recreational opportunities on the Olympic Peninsula, the San Juan Islands, and the North Cascade Mountains.

The primary recreational resources and opportunities within the Reserve are owned and managed by partner agencies including the town of Coupeville, Island County, and Washington State Parks. Their management would continue under current laws, policies, and regulations for those government agencies under all alternatives. The NPS and Trust Board would have authority and management responsibility over NPS-owned lands in the Reserve.

The town of Coupeville's current *Comprehensive Plan for Parks, Recreation and Open Space* assert goals and policies that include a recreation mission, a land acquisition mission, open space preservation, and a desire to improve coordination of park and recreational facilities between the town of Coupeville, Island County, the NPS, and the Coupeville School district. The plan states that it should be a continuing priority for the town to



provide for a wide range of indoor and outdoor facilities for both passive and active recreation. Another goal includes planning for pedestrian and bicycle travel within the town, to coordinate with Island County's non-motorized trails plan, and connect with public paths and scenic areas within the Reserve (Town Comp Plan, p. 107). The Town conducted a community opinion survey with residents in 1992 and again in 2001. Results from the 2001 survey showed that 43 percent of respondents thought having nearby outdoor recreation was "Very Important" (45 percent in 1992) and 44 percent thought it to be "Important"; 57 percent thought the pace of life was "Very Important" (53 percent in 1992); and 65 percent thought Coupeville's rural, village nature was "Very Important" (58 percent in 1992). When asked how they rated outdoor recreation opportunities, 61 percent (62 percent in 1992) responded they were "Satisfied". When asked about tourism (and the associated activities that come with that) being an advantage or disadvantage to Coupeville, 55 percent (43 percent in 1992) noted that the benefits outweighed the disadvantages; 82 percent (71 percent in 1992) thought tourism should be encouraged as a business that would provide jobs in central Whidbey Island.

In Island County's Comprehensive Plan, an appendix notes the results of a March-April 1991 Island County Survey (Phase B, Public Review Draft, July 14, 1998). There was a 3.64 percent response rate, considered a high response for surveys of this type. Respondents were asked to prioritize nine potential actions the county could take to improve the parks and recreation situation and the results for high priority actions were as follows: shoreline access (57.4 percent), scenic vistas (36.6 percent), natural area (35.8 percent), trail system (34.5 percent), improve existing parks (32.9 percent), small parks (22.2 percent), destination parks (19.8 percent), playgrounds (18.2 percent), and regional visitor parks (5.3 percent). The five highest priorities on central Whidbey Island are shoreline access, trail system, scenic vistas, natural areas, and improvements of existing parks. The highest priority in Island County as a whole was for increased access to and use of the shoreline. Increased shoreline access was significantly higher

than any other category in the survey. This is a remarkable finding in a county containing over 200 miles of saltwater shoreline and the County's plan suggests that this is a serious problem. The second highest priority in the County as a whole was to maintain scenic vistas from County and State roads.

Washington State Parks has numerous areas under its management on central Whidbey Island. These are very important recreational resources in the Reserve and provide services and opportunities to thousands of visitors a year (Ebey's Landing State Park visitation in 2003 was 84,143; Fort Casey State Park visitation in 2003 was 727,054; Fort Ebey State Park visitation in 2003 was 331,771). Numerous public comments received during the Comprehensive Area Management Plan (CAMP) process for Fort Ebey, Fort Casey and Ebey's Landing state parks included statements about linking the state parks together with bike and walking trails, and the need to coordinate all park planning efforts with the Reserve and other agency planning efforts. The Draft Recreational Resource Values stated for Fort Casey include:

- Develop and operate the park to offer a high quality recreational experience to all who visit;
- Partner with Beach Watcher staff to promote environmentally sensitive beach and trail use throughout the park;
- Work cooperatively with Washington State Ferries, Washington State Department of Fish and Wildlife and the Army Corps of Engineers, to provide boating and fishing access to the waters of Puget Sound and the Strait of Juan de Fuca;
- Offer an increasing number of interactive and educational tours of the park's cultural resources;
- Develop and encourage a variety of other day use activities as diverse as picnicking, bird watching, fauna identification and kite flying;
- Continue to provide a unique on-the-water camping experience, which also offers visitors a base from which to explore other park and area features; and
- Offer a high quality underwater park for the non-consumptive use of scuba divers.

(Note: there are no Recreational Resource Values developed yet for the other state parks in the Reserve).

## Washington State Parks

Most of the recreational activities in the Reserve occur on public state park lands. Fort Casey State Park is located at the Reserve's southern boundary at Admiralty Head. This park has breathtaking views of the Strait of Juan de Fuca and contains a historic military infrastructure designed and built beginning in the 1890s to protect the entrance to Puget Sound. Visitors to the park can enjoy overnight camping with showers and restrooms, hiking the bluffs and beachcombing, exploring historic gun emplacements, batteries and bunkers, visiting a 1901 lighthouse, reading interpretive exhibits, kite flying, picnicking, and scuba diving at the underwater preserve located off Keystone Spit near the ferry landing.

Fort Casey State Park manages Ebey's Landing State Park, located at the bottom of Hill Road intersecting Ebey Road. This ten-acre parcel of public land offers beautiful vistas of the steep western shoreline of Whidbey Island and across the strait to Port Townsend, the Olympic Peninsula, and Vancouver Island. It consists of a small parking lot, a picnic table, an interpretive kiosk, three low-mount interpretive panels, a vault restroom, interpretive facilities (NPS) a hiking trail up the bluff, and beach access. At times, visitors use remote controlled airplanes and hang glide off the steep bluff. It is one of the most popular public areas in

the Reserve and parking is often not available on summer weekends. Visitors and residents can enjoy hiking, walking, and beachcombing along Keystone Spit, nearly all of which is managed by Fort Casey State Park. Wildlife is common in this area, and the annual bird count conducted by the Whidbey Audubon Society takes place here and across the highway along Crockett Lake.

Fort Ebey State Park is located in the Reserve's central west area along bluffs overlooking the Strait of Juan de Fuca with commanding views of the water. This state park has a "wilder" character than Fort Casey, though it, too, was originally a military installation dating from the World War II era. Opportunities for visitors in the 645-acre park include hiking in the dense woodlands, walking to a glacial kettle (Lake Pondilla), camping (not available in the winter), reading interpretive exhibits, mountain biking in the kettles area, and hiking the beach or portions of the bluff.

Hikers and bikers can now walk from Fort Ebey State Park through the kettles and woods to access the Kettles Trail, which runs along State Route 20 and leads to Coupeville. An extensive trail system is intended for the entire Reserve with plans to link public use areas together through the purchase of conservation easements over private lands. (See Figure 7, Parks and Trails map.)

## Island County Parks

Rhododendron Park is a mixed-use County park. This 160-acre park is located in dense woods be-



*One of the historic guns of the Coastal Artillery Post at Fort Casey State Park, Whidbey Island, ca. 2000. NPS Photo.*



*Admiralty Head Lighthouse, Whidbey Island, ca. 2000. NPS Photo.*

tween SR 20 and Patmore Road, and offers primitive camping and picnicking (ten sites on 28 acres) available from April through September. It consists of a 32-acre ball field area, which includes a pump house, restrooms, and a picnic area. One hundred acres of the park are forested with mature Douglas fir trees and an extraordinary understory dominated by *Rhododendron macrophyllum*. In the spring, this park is a popular destination when native rhododendrons are in bloom.

Island County manages a quarter-acre site at the foot of Monroe's Landing Road under a 25-year use agreement with Washington State Game Department. This public land has been upgraded in cooperation with the National Park Service. Monroe's Landing contains a public boat launch for access to Penn Cove (one of only two in the Reserve), and limited beach access for swimming. Visitors and residents use the beach for clamming. Farther along the Penn Cove shoreline to the east is a three-quarter acre picnic area called Scenic Heights maintained by Island County. At the end of Libbey Road, on the northwestern edge of the Reserve, is Libbey Beach Park. This three-acre site has beach access to the Strait of Juan de Fuca, and includes a shelter, a picnic area with a barbeque, and a vault restroom.

## Town of Coupeville Parks

Coupeville offers a diverse range of recreational activities, including a new trail system. A newly installed 2000-foot trail along the east end of Front Street ends at Captain Coupe Park on Penn Cove. This trail will eventually reach the eastern edge of town on Parker Road to create an interconnected community trail system. The town has numerous historic buildings to visit housing galleries, shops, and restaurants. Coupeville has the greatest concentration of 19<sup>th</sup> century buildings in the state of Washington. Many of the buildings in Coupeville contribute to the historic integrity and significance of the National Register historic district.

The town owns and maintains two community parks, three neighborhood parks, and two mini-parks. Community parks include Town Park and Captain Coupe Park.

Town Park is 3.8 acres and consists of a grassy area with large, old trees. The park contains 500 feet of waterfront with a 440-foot trail leading to the beach on Penn Cove. The site includes a cookhouse, picnic tables, barbecue pits, restrooms, tennis court, shuffleboard and playground equipment, and a live performance stage called the Pavilion where concerts and other special events are held. Captain Coupe Park is one acre in size with extensive views across the cove. It has the only low bank waterfront with public access in town, a boat launch and floating dock, boat trailer parking, restrooms, picnic tables, and barbecues.

The three neighborhood parks include Sixth Street Park, Peaceful Valley Park, and Summit Loop Park (formerly Sunset Terrace Park). Sixth Street Park is 1.2 acres and includes playground equipment, picnic tables, a ball field, and tennis court. Peaceful Valley Park is a one-acre park and consists of open, undeveloped land behind the library. Summit Loop Park is a half-acre park situated in a picturesque location on Pennington Hill with views to the Cascade and Olympic mountains.

The town's two mini-parks includes 0.11-acre Cook's Corner Park (now called Triangle Park) at the corner of Ninth and Main streets where special events are held and a sculpture is displayed. Front Street Stairs, on the north end of Front Street, is a beach park accessing Penn Cove by a flight of stairs. The town also owns community



Annual Coupeville Arts and Crafts Festival, Coupeville, Whidbey Island, ca. 2000. NPS Photo.



open space areas, which include a 3.93-acre parcel in the Peaceful Valley development and a number of undeveloped street rights-of-way.

## Washington Department of Fish and Wildlife Public Lands

The Washington Department of Fish and Wildlife owns a small parcel of land along Madrona Way (.62 acres in Lot A-1 and 1.73 acres total within the Reserve) at the south shoreline of Penn Cove about .7 miles from the intersection of SR 20 and Madrona Way. Referred to as Salt Water Access Reserve A, the site has panoramic views across Penn Cove, Camano Island, and the Cascade Mountains. The beach area is separated from the upper land area by a damaged concrete sea wall. This day-use public site is not known to the public. Tribal members use it to access tidelands for shellfish harvesting and for informal recreational activities such as picnicking.

## Types of Recreational Activities

Penn Cove is an important recreational resource within the Reserve. Its deep, protected waters provide opportunities for kayaking, canoeing, sailing, and motor boating. A few jet skis are in use primarily during the summer months. Each year nearby Oak Harbor hosts “Race Week,” and scores of sailboats can be seen on Penn Cove waters for the competition. Sailing and other boating activities occur year-round in the cove. Fishing and crabbing are other activities that the cove provides for visitors and residents.

The Reserve contains several hundred National Register listed historic buildings and structures representing a diverse array of architectural styles and historic eras. The Trust Board distributes a driving and bicycling tour brochure of the Reserve and offers information about the area’s natural and cultural history. The tour leads visitors to various public access areas and scenic waysides and overlooks. Visitors can also learn about the area from the Island County Historical Museum, located in Coupeville. Operated by volunteers, the museum has displays and exhibits that speak to Island County history, and distributes Reserve interpretive materials to the public.

Coupeville is an attraction for heritage tourism enthusiasts because of its history and architecture. Throughout the year, the town or other organizations host special events such as historic car rallies, the Penn Cove Water Festival, Arts and Crafts Festival, Greening of Coupeville, Mussel Festival, among others, and parades for most major holidays. Residents from elsewhere on the island will participate in these parades and other activities.

Activities such as tennis, baseball, football, basketball, and track occur in the town limits. The schools provide these facilities. There are also baseball diamonds located in Rhododendron Park and in Coupeville off Haller and Sixth streets.

Hunting occurs within the Reserve on private lands with permission of landowners. Most are bird hunters who use the woodlands surrounding Fort Ebey State Park and agricultural fields in the prairies. Deer hunting has been allowed in the



*Paragliding in the Reserve at Fort Ebey State Park, Whidbey Island, ca. 1999. NPS Photo.*



*Hiking the Bluff Trail, Whidbey Island, ca. 1999. NPS Photo.*

Kettles area since the early 1990s for archers, black powder hunters, and rifle hunters. The season generally runs from late September through December.

## Scenic Resources

The setting within the Reserve is spectacular—the combination of sky and water, and the variation of landforms and vegetation such as prairies, wood-



*Partial view of historic Gould Farm, Ebey's Prairie, Whidbey Island, 1901. Oliver S. Van Olinda, Photographer, Permission of University of Washington Libraries. Special Collections Division.*



*Same view, historic Gould Farm, Ebey's Prairie, Whidbey Island, ca. 2000. NPS Photo.*

lands, kettles, agricultural fields, and uplands. The wealth of natural resources has influenced and shaped human settlement and the use of land over hundreds of years. Many of these settlement and use patterns are still present in the cultural landscape.

According to the 1995 visitor survey, visitors come to the Reserve predominately because of the beautiful scenery. Scenic resources are among the most important resources within the Reserve that need protection. Part of this protection involves the maintenance of the rural landscape that creates the scenic elements.

As part of the GMP planning workshops, the planning team identified the significance of the Reserve through the enabling legislation. In terms of scenic resources, the significance of the Reserve is that the historical landscape appears much as it did a century ago. Historic homes, pastoral farmsteads, and commercial buildings are still within their original farm, forest, and marine settings. In addition, one of the Desired Future Conditions or goals for the Reserve is that historic and scenic views would be maintained and enhanced. While changes in historic views are evident, especially in the addition of structures, the majority of views up to this point have retained their cultural integrity.

The threat of changing land use, particularly conversion from agriculture and woodlands to residential development, can significantly change the rural character of the Reserve. (Refer to *Ebey's Landing National Historical Reserve General Management Plan/Environmental Impact Analysis, Volume II, Technical Reports, Views and Vistas, Historic Changes from Pre-1950 to 2000 map, 2003 An Analysis of Land Use Change and Cultural Landscape Integrity for Ebey's Landing National Historical Reserve* by Nancy Rottle.)



## Landscape Character Areas

*Based on original work by NPS Landscape Architect Cathy Gilbert, on significant landforms and critical landscape components, the Reserve can be divided into ten character areas (Gilbert 1984). These character areas are useful in describing the Reserve's scenic qualities. These original character areas have been further refined by the planning team. (See Figure 8, Landscape Character Areas.)*

### San de Fuca Uplands

The San de Fuca Uplands are characterized by undulating and gently rolling hills that begin at the shoreline of Penn Cove and rise in elevation. The slope levels onto agricultural land, divided by woodlots and residential subdivisions. The visual continuity of open fields and Penn Cove is relatively unimpaired. Significant natural features include saltwater wetland areas, Garry oak plant communities, and remnant prairie plant communities. Significant areas include Grasser's Hill and Lagoon, San de Fuca's commercial and residential building clusters, Arnold Farm, Monroe's Landing, Muzzall Farm, Vandewerfhorst Farm, and Blower's Bluff.

The north entry into the Reserve is through the San de Fuca Uplands with entrance points via State Route 20 through San de Fuca, Monroe's Landing Road past the Oak Harbor Air Park, or Penn Cove Road. Other significant corridors include Arnold Road and Zylstra Road.



Grasser's Lagoon, Whidbey Island, ca. 1999. NPS Photo.

### Penn Cove

The Penn Cove character area is characterized by low beaches and uplifted banks. It consists of 3,955 acres of open water with nearshore and shoreline habitats of mudflat tidelands, high sandy bluffs, beaches, and eelgrass beds. The Penn Cove shoreline has more than thirty archaeological sites along the shoreline, including three permanent Salish villages. Significant areas include Blower's Bluff, Monroe's Landing, Grasser's Lagoon, Kennedy's Lagoon, Long Point, and Snakelum Point.

Penn Cove served as the historic water entry for the Reserve incorporating the historic Coupeville Wharf and San de Fuca Wharf and docks, and others no longer standing. Significant corridors are Scenic Heights Road, Penn Cove Road, and Madrona Way.



Penn Cove looking north, Whidbey Island, ca. 1999. NPS Photo.

## West Coastal Strip

The west shore of the Reserve along Admiralty Inlet is an eight-mile strip of narrow sand and stone beaches that give way to dramatic bluffs and ravines. Elevations range from sea level to just over 200 feet. Bluff instability, combined with steep slopes and well-drained sandy soil, prevents development of forest and shrub vegetation and helps maintain conditions allowing development of low-growing herbaceous plants. Nearshore areas include eelgrass and bull kelp beds. Remnant prairie populations and populations of a federally threatened and state endangered plant, golden paintbrush (*Castilleja levisecta*), are found at several locations along the bluffs.

Significant areas include Point Partridge, Fort Ebey State Park, Ebey's Landing Bluff Trail, Perego's Lagoon, Ebey's Landing State Park, Camp Casey, and Fort Casey State Park. Significant corridors are Hill Road, trails through Fort Ebey and Fort Casey state parks, Ebey's Landing Bluff Trail, and the coastal bluff and beach trail.

The West Coastal Strip character area, adjacent to Admiralty Inlet and the Strait of Juan de Fuca, is the western boundary of the Reserve, extending from Point Partridge south to Admiralty Head. There are several beach access points along public roads and trails.



*Ebey's Landing and bluff, Whidbey Island, ca. 2001. NPS Photo.*

## Kettle and Pratt Woodlands (West Woodlands)

The Kettle and Pratt Woodlands area is characterized by dense forests including Douglas fir, western red cedar, and alder, with salal, Oregon grape, and rhododendron understory. The interior portions of these woodlands are remote and isolated. The area contains kettles and trails that connect to Fort Ebey State Park. After owner Robert Pratt died, TNC purchased 400 acres of woodlands, eventually selling an easement to NPS.

The kettles are large depressions up to 200 feet deep, which are significant geological features, formed by retreating glaciers. Kettle holes are formed when huge blocks of ice melt. These melted ice blocks formed deep ponds and wetland areas. Most of the kettles found in the Reserve occur in forested areas. Lake Pondilla is the only kettle large enough to be classified as a pond. The remaining kettle holes are scattered and relatively small in size.

Other significant sites are historic Coveland and the Captain Whidbey Inn. Significant corridors are Libbey Road, State Highway 20, Madrona Way, and the Kettles Trail.

Access through this area is primarily along trails leading from State Highway 20, Fort Ebey State Park, and Ebey's Landing Bluff Trail.



*Lake Pondilla, Fort Ebey State Park, Whidbey Island, ca. 2001. NPS Photo.*

## Coupeville

This nineteenth century seaport town, set on the southern edge of Penn Cove, has the greatest concentration of historic buildings in the state and is the second oldest town in Washington State. It is also the commercial center of the Reserve. Within the town limits, one can experience dramatic views of Penn Cove, Mt. Hood, the Cascades Mountains, and prairies.

Significant areas within Coupeville are the Coupeville Wharf, Town Park, Captain Coupe Park, Summit Loop Park, historic Front and Main streets and Prairie Center. Coupeville's historic resources include historic buildings, structures, platted neighborhoods, and remnant orchards. Significant corridors are Main Street, Front Street, Broadway, Madrona Way, Coveland Street, Ninth Street, and Parker Road.

Entry to Coupeville is primarily via State Route 20, with secondary access via Parker Road from the east, Madrona Way from the west, Fort Casey Road and Engle Road from the south, and water entry via Penn Cove



*View of Coupeville looking east, Whidbey Island, ca. 2000. NPS Photo.*

## Ebey's Prairie

Ebey's Prairie is located in the central portion of the Reserve and is the largest natural prairie on Whidbey Island. It contains its most productive agricultural land, which reflects its agricultural character. It is characterized by its historic farm clusters, fields, fences and hedgerows, upland ridges, and forest edges. It has a long history of agricultural use by Skagit Indians, dating back 8,000 years, and by European settlers since the 1850s.

Significant areas and locations within this Character Area are Ebey's Landing, the Ferry House and ravine, Sunnyside Cemetery and the (Davis) Blockhouse, Jacob Ebey House and Blockhouse, Sherman-Bishop Farm, Smith Farm, Engle Farm, Jenne Farm, and the inter-prairie ridge between Ebey and Crockett prairies.

Primary access to Ebey's Prairie is along State Route 20 and Engle Road. Significant corridors include Ebey Road, Hill Road, Sherman Road, Cook Road, and the Ebey's Landing Bluff Trail (leads away from prairie).



*Segment of Ridge Trail near Prairie Overlook, Whidbey Island, ca. 2001. NPS Photo.*



## Fort Casey Uplands

The Fort Casey Uplands is characterized by undulating and gently rolling hills of forest, fields, and residential areas. Natural areas include remnant prairie communities, a Washington State Natural Heritage Forest, and golden paintbrush populations. Cultural areas include the historic buildings of Fort Casey State Park and Camp Casey.

Access is along Engle Road, Fort Casey Road, and Hill Road. Another significant corridor is the southern portion of the coastal bluff and beach trail.



Seattle Pacific University property, Whidbey Island, ca. 1999. NPS Photo.

## Crockett Prairie

Crockett Prairie is a natural, open prairie adjacent to Crockett Lake, Keystone Spit, and Admiralty Bay. Crockett Lake is a salt marsh, and is an important migratory bird habitat and nesting area. From Keystone Spit, the view of Crockett Prairie is complemented by the open water of Crockett Lake and the tree covered ridges beyond. Other significant areas include the inter-prairie Ridge between Ebey's and Crockett prairies, and the Washington State Ferry Terminal. Historic remnants in this area reflect the building of Fort Casey, including ponds, wharf, and dock remains.

Primary access routes are Engle Road from Coupeville and State Route 20 along Keystone Spit. Significant corridors are Wanamaker Road, Patmore Road, and Fort Casey Road.



Crockett Prairie and Crockett Lake, Whidbey Island, ca. 1999. NPS Photo.

## Parker and Patmore Woodlands

The Parker and Patmore Woodlands are a natural resource area characterized by densely wooded second and third-growth Douglas fir forest with western red cedar, alder, salal, and rhododendron undergrowth. It is located along a ridge on the eastern portion of the Reserve.

Significant areas are the Reeder Farm, Long Point, Snakelum Monument, and Rhododendron Park. Significant corridors are State Route 20, Parker Road, Patmore Road, and Keystone Road.



*Long Point, south shore of Penn Cove, Whidbey Island, ca. 1993. Copyright Washington Department of Ecology.*

## Smith Prairie

Smith Prairie is a 600-acre natural prairie surrounded by Douglas fir forest. The prairie is open, characterized by agricultural features reflecting its cultural history. Significant areas are Au Sable Institute (the former site of the Washington State Game Farm), Naval Air Station-Whidbey's Outlying Landing Field, and two commercial tree farms growing seed stock. The Au Sable Institute property is the site of the largest remaining remnant of a native prairie plant community on Whidbey Island.

State Route 20 provides the main south entry into the Reserve. Other significant corridors are Parker Road, Morris Road, and Keystone Road.



*Au Sable Institute property within Smith Prairie, Whidbey Island, ca. 1999. NPS Photo.*

# Visitor Use

## Visitor Use Patterns

The University of Washington conducted a visitor survey in the summer of 1995, between July 7 and August 28. The survey used a questionnaire format and 968 visitors were surveyed. The results and analysis of that survey are published in the *Ebey's Landing National Historical Reserve, 1995 Visitor Survey*. The following narrative on visitor use patterns summarizes the information generated on who uses the park and how visits are planned, trip information and satisfaction, and numbers of visitors, expenditures, and economic impact on the Reserve.

## Visitor Profile

According to the report, the average age of the sampled visitors, which included no one younger than 16, was approximately 47 years. Ages ranged from 16 to 85 years. Visitors 40-49 years of age were the largest group (26 percent), followed by 50-59 (22 percent), 30-39 (21 percent), 60 and older (20 percent), and 16-29 years of age (11 percent).

Fifty-six percent of the respondents were females and 44 percent were males. The majority of visitors (78 percent) were married. Caucasian/non-Hispanics comprised 97 percent of the sample. Those of Asian heritage made up approximately two percent of the sample; Native Americans/Alaska Natives accounted for approximately one percent of those surveyed. There was only one respondent of African American heritage. Approximately one percent of those sampled identified themselves as Hispanic.

Of the respondents to the survey, approximately 61 percent of the visitors were currently employed, 2 percent were unemployed, 17 percent were retired, 13 percent were homemakers, 5 percent were students and 2 percent were military. Of those employed, the majority of visitors were in occupations classified as managerial or professional. The average visitor had completed 16 years of education.

The most common group size for visiting parties was two people (36 percent) and groups made up of four people were the next most common size (21 percent). Almost half of visiting parties included children younger than 16.

The majority of visitors (88 percent) did not live on Whidbey Island. Residents made up 11 percent and approximately 1 percent lived within the Reserve. For those visitors not living on Whidbey, approximately one-half (59 percent) were from Washington State, 10 percent were from Canada and 8 percent were from California. Of those from Washington State, over one-third (37 percent) were from King County.

About 48 percent of visitors were visiting the Reserve for the first time. However, the mean number of visits was 5.9 because a minority of visitors had been to the Reserve many times—19 percent had visited the Reserve three to nine times, and 10 percent were returning for the tenth time or more. These statistics reveal that although the majority of those sampled had little previous experience with the Reserve, a small portion had visited there a great number of times.

## Planning the Trip

One-third of visitors made the decision to visit the Reserve on the same day as their trip and another third decided no more than three days before their trip. The majority (70 percent) reported that they intended to visit the Reserve when they were planning their trip. Most visitors (79 percent) did not seek information before the trip, but those who did used information from friends and relatives. Other sources were previous visits, maps, brochures and travel guides.

## The Trip

Reasons for visiting the Reserve varied, but included the scenery, state parks, family, Coupeville Arts Festival, nature, history, and to look at real estate. The vast majority of visitors were not aware that the area was a national historical reserve. Of those places visited within the Reserve, the places having the highest number of visitors was the town of Coupeville, followed by Fort Casey State Park, Coupeville Wharf, Fort Ebey State Park, the



lighthouse, and Camp Casey. The least visited places were Crockett Lake, Sunnyside Cemetery, Prairie Wayside, Driftwood Park, and the Bluff Trail.

Most visitors arrived by private vehicle (88 percent) with almost half (44 percent) coming via the Deception Pass bridge via State Route 20 from the north. About one-third arrived by ferry from Mukilteo. Only one-quarter sought information about the Reserve after they arrived in the Reserve. Most visitors spent two hours in the Reserve, while 30 percent spent three to four hours. Twenty-two percent were overnight visitors. The most common method of moving through the Reserve was by car (59 percent), but also walking, hiking, bicycling, and boating were mentioned.

## Visitor Satisfaction

The survey also asked visitors if anything detracted from their visit and 18 percent responded. The reasons visitors provided were in eight categories: unhappy with the lack of information and signage in the Reserve, upset that attractions were closed, had “some problems” in Coupeville, had problems at the campgrounds, were angry at the weather, encountered “some health hazards”, unhappy with services and facilities, and felt like they did not have enough time to experience the Reserve.

Visitors were also asked if there were educational and information services that they wished were available to them. Almost half (48 percent) of the respondents wrote an answer in the space provided. The comments were varied and included such items as the desire for more guides, maps, nature walks, history, and information on plants and animals.

For overall satisfaction with their visits, 36 percent of visitors stated that their visit was “very good” and 42 percent described it as “excellent” or “perfect”. Almost three-quarters of visitors (74 percent) said that they would visit the Reserve again.

## Numbers of Visitors, Expenditures, and Economic Impact

Since there are no entry gates at the Reserve, visitation numbers were difficult to estimate. Visitors

arrive on the island by three routes: the Mukilteo/Clinton ferry, the Port Townsend/Keystone Ferry, and over the Deception Pass bridge. A few visitors arrive by personal boat or by air. Other visitors live on the island. Though various options were explored, the method chosen to estimate total visitation was based upon the proportion of ferry riders who had visited the Reserve (determined by surveys at Clinton and Keystone). An equation including the total number of ferry riders, the proportion of ferry riders who visited the Reserve, and the proportion of Reserve visitors who rode the ferry produced an estimate of 113,106 visiting groups.

In estimating the direct economic impact of the Reserve, the study looked at the amount of money spent per group multiplied by the number of total estimated groups. The overall average amount of money that each visitor group spent was determined to be \$70 in expenditures. The greatest portion of money (34 percent) was spent on food.

When the \$70 in expenditures is multiplied by the 113,106 visiting groups, total expenditures of \$7,917,420 is estimated in economic benefit to central Whidbey Island. That means that visitors spent almost 8 million dollars in the Reserve during their stay over the peak visitation period (in 1995 dollars when the study was completed). Economists explain that money spent directly at such places as hotel, restaurants, and shops are then further invested by the owners of these places. These industries or trades buy from and sell to each other and to industries in other regions. Therefore, the impact of the money is actually larger than 8 million. The general trade and services multiplier is 2.055 and when calculated, the total economic impact of dollars spent at the Reserve is 16.4 million.

To project that figure to 2005 dollars, assuming an average annual inflation rate of 3 percent over ten years, the total estimated amount that visitors now spend in the Reserve is \$21.3 million. This figure does not take into account the population growth in the metropolitan region since 1995 when the study was completed and the increase in visitation that is likely to have occurred.

This analysis shows that the Reserve not only provides large numbers of visitors with enjoyable opportunities for recreation and education but also that the Reserve makes a valuable contribution to the health and diversity of the local economy.

## **Federal Lands Recreation Enhancement Act**

Due to the limited amount of land owned in fee by the federal government and the nature of the park unit, Ebey's Landing National Historical Reserve does not currently collect fees. However, the Reserve is eligible to receive, or have access to, monies that are collected by "fee parks."

## **Socioeconomic Factors**

### **Location and Access**

Situated in northern Puget Sound, Whidbey Island is 27 miles north of Seattle and 50 miles south of the Canadian border. To the east of the Sound is the Cascade Mountain Range and roughly one hundred miles to the west is Washington's Pacific Coast. The majority of Washington's population lives in the 75-mile corridor between Tacoma and Everett to the east of Whidbey Island. Ebey's Landing National Historical Reserve is less than a three-hour drive from Washington's most populous cities, from Tacoma (193,556 population), north through Seattle (563,374) and Everett (91,488) to Bellingham (67,171). The populations on the Olympic Peninsula are only a ferry ride away. Bordering the Reserve is the city of Oak Harbor (20,830), home of the Whidbey Island Naval Air Station.

The site is in the 2nd Congressional District in Washington State and the 10th State Legislative District. Ebey's Landing National Historical Reserve is situated in Island County, Washington, which is comprised of both Whidbey and Camano Islands.

### **Regional Context**

Land connections to Whidbey Island and the Reserve from the mainland are provided by State Route 20 from Skagit County using the Deception Pass bridge. This bridge and the road across

Fidalgo Island are serious transportation bottlenecks at times, given the population on North Whidbey, the presence of NAS Whidbey, Deception Pass State Park and the fact that the continuation of State Route 20 is the Cascade Loop Highway. Ferry service is provided by the Washington State Ferries (WSF) arriving on south Whidbey Island at Clinton, from the mainland city of Mukilteo; a ferry from Port Townsend arrives in the Reserve at Keystone Harbor adjacent to Fort Casey State Park. In addition, several public and private airfields presently exist on Whidbey Island.

Island County has a variety of parks and recreation facilities. (Refer to "Recreational Resources" section for additional information.). These recreation opportunities are owned and maintained by different governmental and nonprofit organizations including federal, state and local government, and private volunteer groups. Located on the very northern tip of Whidbey Island is Deception Pass State Park. The park is the most heavily visited state park in Washington, with almost 2.84 million visits recorded in 2000. The boundary of the Reserve encompasses several parks, including Fort Casey, Fort Ebey, Ebey's Landing and Keystone Spit, and Rhododendron Park managed by Island County (Island County Comprehensive Park and Recreation Plan 1999).

Over the past ten years, travel to and from Island County has been increasing. This is evident from the 140 percent increase in daily traffic at the Deception Pass bridge; and by the 52 percent annual vehicle traffic increase on the Washington State Ferry system to Island County. (Island County, *Island County Comprehensive Plan* 1999: p.8-51)

## **Transportation**

### **Island Transit**

The transit needs of Coupeville and its residents are served by Island County Public Transportation Benefit Area Transit (PTBA), operating as Island Transit. The agency's services include fixed route, paratransit service, vanpool program and ride matching programs. All of Island Transit's services are provided free to its users. The system is fully funded by a 0.3 percent sales tax, matched by

funds from the Motor Vehicle Excise Tax revenues generated within the PTBA.

Since Island Transit began in 1987, ridership increased by 1803 percent (from 13,024 to 247,794 users) after the first year. Ridership overall for Whidbey Island has increased dramatically over the years, peaking in 1998 at 792,947 with users traveling 1,048,854 miles. The year 2000 fixed ridership totals for Whidbey Island were 506,243 with users traveling 721,549 miles.

Island County has identified the following areas of interest to the Reserve that should be considered as candidates for local feeder service expansion (based on current and predicted use and discussions between the public and Island Transit):

- Service connections between Oak Harbor and the Mount Vernon/Burlington area
- Point Partridge area
- Recreational areas, such as Deception Pass, Oak Harbor waterfronts, the Kennedy's Lagoon to Coupeville, Fort Casey, Crockett Lake, South Whidbey State Park, Pass Lake area and Scenic Heights/Penn Cove area

## Ferry Service

Washington State Ferries provides passenger and auto ferry services to two routes that serve Whidbey Island. Just south of Coupeville, the landing at Keystone connects via ferry to Port Townsend in Jefferson County. The second route serves the terminal at Clinton at the south end of



Keystone Ferry Terminal, Whidbey Island, ca. 1999. NPS Photo.

Whidbey Island. This route connects to Mukilteo in Snohomish County and links Whidbey Island with the Seattle-Everett metropolitan area (Town of Coupeville, *Town of Coupeville Comprehensive Plan* 1999: p. 36-37).

Between 1977 and 1996, vehicle usage increased by over 106 percent on the Mukilteo-Clinton Ferry and nearly 185 percent on the Keystone-Port Townsend Ferry. During the same time, the total ridership increased by over 85 percent on the Mukilteo-Clinton Ferry and over 169 percent on the Keystone-Port Townsend Ferry. Since 1986, ferry usage has been increasing at a relatively steady rate.

The WSF's Long-Range System Plan anticipates that new vessel safety regulations for crossing Puget Sound's major shipping channel will require a new class of ferry vessel to be used for the Port Townsend to Keystone Ferry run. It is expected that these new ferries would have a 144-vehicle capacity. With these new vessels, WSF expects to meet the level of service standards for the next twenty years.

The *Island County Comprehensive Plan* states that the ferry terminals are valuable elements of the transportation system and should be maintained as such. In accordance, Island County plans to work with the WSF, WSDOT, and Island Transit to provide the following improvements:

- Highway improvements along SR 20 and Engle Road to improve access to the terminal, allowing for convenient vehicle waiting and loading.
- Permanent facilities for additional vehicle holding areas to accommodate future increases.
- Construction of a new multi-modal terminal facility to encourage high occupancy vehicle travel and accommodate walk-on traffic from transit, "kiss-and-ride", and park-and-ride passengers.

## Air Service

There are seven airfields currently operational on Whidbey Island. Two of these airfields, the Coupeville Naval Outlying Landing Field (OLF) and the Whidbey Island Naval Air Station, are restricted to military use only. Of the remaining five airfields, three are private and two operate com-



mercially. The two commercial airfields are the Oak Harbor Airpark and the Langley-Whidbey Airpark.

## Roads and Highways

Travel on local roads and highways accounts for the largest single element of Island County's transportation system. Two state highways transect Whidbey Island and the Reserve and serve as the primary north-south travel corridors. These state highways, SR 20 and SR 525, connect Whidbey Island to the mainland in Skagit County via the Deception Pass bridge, to Mukilteo in Snohomish County via the Clinton ferry, and to Port Townsend in Jefferson County via the Keystone ferry.

State Route 20 and SR 525 receive a large amount of commuting traffic. According to the 1990 Census, about 6,000 county residents work outside the county. During the summer months, traffic congestion increases considerably when seasonal population and visitor use is most noticeable in Island County.

The average daily traffic in Island County is forecasted to increase on county roads and state highways by approximately 18 percent between 1996 to 2003 and by approximately 64 percent by year 2020. These values represent average annual growth rates of approximately 2.6 percent and 2.7 percent per year. The growth rates are determined from future permanent population and employment estimates.

The average annual daily traffic taken from milepost 20.02, approximately one-quarter mile east of Rhododendron Park, depicts increased traffic along State Route 20 from 2001-2004 .

**Table 2: Average annual daily traffic along Hwy 20 at Milepost 20.02**

1996	6,900 cars per day
1997	7,300 cars per day
1998	7,600 cars per day
1999	7,600 cars per day
2001	7,600 cars per day
2002	7,700 cars per day
2003	8,000 cars per day
2004	8,200 cars per day (3 million per year)
2005	8,500 cars per day (3.1 million per year)

([wsdot.wa.gov/mapsdata/tto/annualtrafficreport.htm](http://wsdot.wa.gov/mapsdata/tto/annualtrafficreport.htm))

Island County is responsible for approximately 594 miles of roads, including 79 miles of major rural arterials, 131 miles of minor rural arterials, 370 miles of other local rural roads and 14 miles of urban roads. In addition, there are approximately 54 miles of state highways within Island County, of which approximately 51 miles pass through the unincorporated areas of the county. Most county and state roads are two-lanes.

Visitors use many of the state and county roads as the primary way to view the Reserve. A brochure provided by the Reserve highlights a 43.6-mile driving and bicycling tour. A system of interpretive roadside panels and kiosks provide additional information at several of the stops. There are ten waysides within the Reserve at the following locations: Monroe's Landing, Fort Ebey State Park, the Coupeville Wharf, Prairie Overlook at Sunnyside Cemetery, Ebey's Landing, Prairie Wayside at Engle Road, Crockett Blockhouse (at Fort Casey Road), Ft. Casey State Park and Keystone Spit, and the Keystone Ferry Landing.

### *Deception Pass Bridge*

Many residents and government officials believe that the traffic congestion leading up to and over the Deception Pass bridge in North Whidbey Island is a problem. Washington Department of Transportation (WSDOT) has conducted surveys and public outreach in an effort to determine the problem and possible solutions. This could involve constructing a new bridge, adding a new ferry route, or improving the road infrastructure approaching the bridge. Some citizens are concerned that increased access will negatively impact the rural island character that has attracted them

to the area, while others feel that increased access will be beneficial for the economy.

If a new ferry or bridge were to be built, there is much disagreement as to the location. There is also a distinct difference in opinion depending on the region of Island County in which one resides. South and central Whidbey Island residents, who may not travel across the bridge regularly, are more likely to be opposed to a new bridge, while north Whidbey residents tend to be the opposite. This is a concern for the Reserve, because increased access increases the pressure of development, hence threatening the rural character of the Reserve.

### *Highway Level of Service Standards*

There are six Levels of Service (LOS) categories used to describe the quality of a transportation system. For roadway sections, these levels of service categories range from LOS “A” through LOS “F” with LOS “E” being the point where the traffic demand on the roadway is equal to the capacity of the roadway. LOS “C” is a generally accepted level-of-service by transportation professionals for rural and low-density urban areas. Currently, WSDOT has set planning goals and have set LOS “C” as their level of service goal for state highway through rural areas. In urban areas, WSDOT has set their level of service goal at LOS “D”.

### *Safety Improvement Projects*

According to WSDOT, improvements are needed on two areas within the Reserve on SR 20. The

first is from Oak Harbor city limits south to Libbey Road and the second is from Libbey to Main Street in Coupeville. In both areas, the WSDOT plans to provide four lanes with left turn pockets. This action is of concern to the Reserve. Existing roads follow historic road patterns, which are part of the cultural landscape. Widening roads include smoothing and straightening curves and elevating roadways, which impact adjacent land by fragmenting farmland, increasing speeds, changing drainage and historic road patterns, and affecting views. Safety issues need to be addressed, but in a manner that recognizes that this is a unit of the National Park System and visitors may be traveling at slower speeds to experience and enjoy the scenery of the Reserve.

### *Six-Year Transportation Improvement Programs*

Island County and WSDOT plan improvements to the state highway and county roadway system on an annual basis through the development of six-year Transportation Improvement Programs. Projects are selected in part on their LOS grade. State and county funding for these road projects are determined by their priority rating; road projects with a higher rating are more likely to be funded. In these six-year programs, emphasis is given to safety improvements and operational improvements.

The following chart shows Island County’s six-year transportation improvement program projects that would occur within the Reserve. The

Table 3: TIP Projects within Reserve Boundaries

Priority	Project Title	Work Description
10	Madrona Way Phases 1, 3	R/W for road realignment away from embankment; retaining wall at beach; asphalt concrete paving (ACP) overlay; guardrail.
13	Madrona Way Section 2	Flood damage repair
27	West Beach Rd.Phase 2	Widen to 6 feet ACP shoulders; drainage; regrade vertical curves; ACP overlay; bicycle route.
28	West Beach Road Phase 3	Widen to 6 feet ACP shoulders; drainage; regrade vertical curves; ACP overlay; bicycle route.
38	Patmore/SR 20 Intersection	Intersection realignment
40	Monroe’s Landing Rd. Section 1	6 feet paved shoulders; drainage; bus pullout.
44	Monroe’s Landing Rd. Section 2	6 feet paved shoulders; intersection channelization; drainage; bus pullout.
47	Scenic Heights	Right of Way; grading; drainage
54	Parker/ SR 20 Intersection	Intersection realignment (Joint WSDOT/ County)
55	Parker/ SR 20 Intersection	Right of Way; realign; reconstruct; ACP overlay.

Source: Island County Comprehensive Plan 1999

county priority rating determines which projects will be funded first. Projects with low priority ratings that do not receive funding can be resubmitted in later rounds, which they often are.

According to the *Island County Comprehensive Plan*, “new roadways will be given the lowest priority rating. New roads should link and integrate roadway segments into a rational circulation system.” The following planned rural roads are located within the Reserve boundaries and according to the *Island County Comprehensive Plan*, they should be considered with new developments:

- Arnold Road to Balda Road
- Wanamaker Road to Houston Road
- Ft. Casey Road to SR 20

### ***Scenic Highways and Corridors***

For many roadways in the state, scenic resources have already been identified through WSDOT’s Scenic Highways Program. A total of 1,918 miles have been designated as scenic highways and another 1,360 miles have been determined to be eligible. The Scenic Highway Program was developed to assist corridor communities, agencies, and interest groups involved with the scenic highway by forming partnerships and strategies to address tourism and resource management issues. The only legislative requirement for highways with Scenic and Recreational designations is on outdoor advertising control outside corporate city limits. Any other requirements to protect scenic views originate at the local level and are incorporated into local comprehensive plans as ordinances. In Island County, SR 20 and SR 525 have been designated as scenic highways by WSDOT and are included in WSDOT’s Heritage Corridor Program.

In addition to the state program, Island County has defined its Scenic Corridors Program. A scenic corridor pertains to the land on the sides of roadways that is generally visible to the public traveling on the roads and is characterized by views and vistas of unusual natural significance in the county. A scenic corridor would continue to allow for the full use of its right-of-way for road and utility purposes, without restraints to design and safety standards. Capacity, safety, and maintenance needs would not be compromised in viewing surround-

ing land and seascapes. Nearly all roadways within the unincorporated areas of Island County could fall within the scenic corridor designation except for residential streets and commercially zoned areas (*Island County Comprehensive Plan*, Island County 1999).

## **Land Use and Ownership Patterns**

### **Industry and Economy**

The economy of central Whidbey is composed of public administration, agriculture, and tourism. The public administration sector makes up the largest portion of employment within the area, which includes Island County offices, Island County General Hospital, and central Whidbey schools based in Coupeville.

The historic town of Coupeville (approximately 1,785 population) is located within the Reserve and is a little more than one square mile in area. Due to its central location, Coupeville’s role for providing public and county services continues to grow. Although now primarily a residential community, Coupeville has served as the commercial center for the surrounding residential area since its founding in 1853. It was later incorporated in 1910. (Town of Coupeville, *Town of Coupeville Comprehensive Plan* 1999: p. 7)

Coupeville has always had an economy based upon service activities—the government services in the Island County Courthouse being a prime example. Second to this is retail businesses serving the residential, agricultural, and building activities of central Whidbey Island. In recent years, there has been significant growth in medical services. Whidbey General Hospital has expanded its facilities and services. In addition, a 92-bed convalescent home and many specialist physicians have established practices in Coupeville.

A 1995 visitor survey for the Reserve conducted through the University of Washington estimated visitation at 113,106 visitor groups a year. These groups spent an average of \$70 each, for a total of nearly \$8 million a year. The money tourists spend at places including hotels, restaurants and shops is then further invested by the business owners into



the local economy. These industries or trades buy from and sell to each other and to industries in other regions. Therefore, the indirect impact of dollars spent by Reserve visitors is much higher. The visitor survey estimated this number to be \$16.4 million (Ebey's Landing National Historical Reserve, 1995 *Visitor Survey*).

The Whidbey Island Naval Air Station also influences the economy. Although Oak Harbor absorbs much of the population associated with this facility, a small percentage of Navy personnel and civilian employees elect to live in Coupeville. In 1990, 64 workers, or almost 12 percent of the total Coupeville labor force (555 people) were in the Armed Forces (U.S. Bureau of the Census 1990).

In total, Island County is anticipated to increase its total employment from 21,589 in 1996 to 33,345 by the year 2020, representing an increase of 11,756 jobs (a 54 percent increase). Sixty four percent of the projected new jobs are anticipated to be located in the county's three Urban Growth Areas (UGA), and the remaining 36 percent in the unincorporated areas of the county. Central Whidbey is projected to gain 1,264 jobs, with 841 occurring within the town of Coupeville. A growth of 5,884 is anticipated to occur within the Oak Harbor Urban Growth Area (U.S. Bureau of the Census 1990).

Coupeville has a potential labor force of 1,120 persons over the age 16. Of these, 555, or almost 50 percent are actually in the labor force, including both civilian and military workers. The remaining 565 people are not in the labor force. Given the large number of Coupeville residents over age 65, many of those not in the labor force may be retired. Within the civilian labor force, 466 persons were employed and 25 were unemployed, for an unemployment rate of 5.1 percent (U.S. Bureau of the Census 1990).

## Port of Coupeville

The 1991 *Comprehensive Parks and Recreation Plan* for the Port of Coupeville states that "the Port was founded to promote the welfare of the residents of the Port District. To that end, the Port seeks to promote economic development of the area while recognizing and preserving the unique environ-

mental, historical, and cultural aspects of the area."

The Port of Coupeville owns several tax parcels at the foot of NW Alexander Street on Front Street, plus some 462 linear feet of tidelands. The Coupeville wharf and associated floats are on aquatic lands leased from the Department of Natural Resources. The National Park Service leases a section of the property owned by the Port at the start of the pier for an interpretive kiosk highlighting the Reserve.

Capital facilities owned by the Port District include the wharf, floating docks, pier and the building at 24 NW Front Street. Over the past five years, the wharf has been extensively rehabilitated. This includes the pilings and structural supports, utilities, and interior and exterior rehabilitation of the wharf building. The wharf is zoned for commercial use. Moorage floats are available on a first-come, first-served basis on the east side of the wharf, and a second float provides marine fueling service off the north side. In 1999, the Port received approval to extend the eastern float and add a west side float. The Front Street building houses retail space in the southern half and the Port administrative offices in the north half. (Town of Coupeville, *Town of Coupeville Comprehensive Plan* 1999: p. 55)

## Resource Industries

### Agriculture

Some of the first crops raised in the prairie by Euro-American settlers were hay, grains, and potatoes. Today, typical crops grown in the Reserve include grass, corn, barley, and alfalfa for silage, cabbage, beets, timber, lavender, conifer seed, strawberries, squash and peas. Over 45 percent of the existing Class II lands (productive agricultural) within Island County are found within the Reserve. The dominant crop grown is hay, comprising 7,608 acres of Island County farmland; this is due in part to the prevalence of dairy farms in the area. In 1997, only 106 acres of land was dedicated to growing vegetables in the county (U.S. Department of Agriculture, Federal Census of Agriculture 1997).

The exact number of farms and farmland within the Reserve is not clear. The Whidbey Island Conservation District, which provides conservation plans for landowners, serves 73 farms (both commercial and small farms) within the Reserve, for a total acreage of 7,446.3. In addition, the Conservation District is serving 25 woodland owners, with a total acreage of 1,120.5 (Weber 2000).

The largest and most significant farm operations in Island County are dairy farms. Currently, there are four dairies in Island County, three dairies on Whidbey Island and one on Camano Island. Live-stock products accounted for 85 percent of the total market value sales (\$10,538,000) in 1997, while crop sales accounted for only fifteen percent. In 1997, dairy products accounted for \$6,503,000 in sales, compared to \$1,561,000 in crop sales (U.S. Department of Agriculture, Federal Census of Agriculture 1997).

Lower milk prices have made it difficult for farmers with smaller farms. In 1995, there were five dairies in the Reserve; in 2001 there were only two. One of these farms, the Engle Farm, recently went bankrupt and was purchased from the bank by the Trust for Public Land (TPL). The National Park Service bought the property from TPL. The former owners, under a lease with the NPS, are currently operating a Holstein heifer herd replacement operation, with about 700 head of cattle.

Indeed, agriculture has been seriously impacted and is endangered within the Reserve, due to the result of low prices, loss of local crop processing plants, closure of support businesses, and impacts from urban sprawl (such as nuisance lawsuits, and vandalism). There are few alternatives for farmers to offset the increased liability issues. Newer installations or higher leveraged operations have a much higher cost of production and have been losing money heavily the last ten to fifteen years. According to the Island County dairy agent, the "last straw" was the mandated waste management facilities upgrades that were common in the 1980s and 1990s. They were very expensive and have not been financially possible for many farmers, even with matching grant funds. The milk support program only becomes effective if the price gets below \$10.60 per hundred-pound weight (cwt)

which is about \$1/cwt under the average cost of production.

A disturbing trend is the increasing number of farms with net losses. Both in 1992 and 1997, there were more farms with net losses than farms with net gains, and the gap is widening. In 1997, only 63 farms posted net gains while 198 had net losses. While the average market value of agriculture products sold per farm increased by 21 percent from \$33,278 in 1992 to \$40,376 in 1997, 195 of the county's 261 farms still made less than \$10,000.

The Federal Census of Agriculture shows that the amount of land dedicated to farming in Island County decreased by 19 percent between 1992 and 1997. Since 1978, the total number of farms has increased slightly from 244 to 262. However, the number of full-time farms has decreased by eight percent from 122 farms in 1992 to 112 farms in 1997. Since 1978, the average farm size has also continued to decrease from an average of 89 acres per farm to 61 acres. These changes appear to have come from the sale and redistribution of land that had been large and intermediate sized farms (U.S. Department of Agriculture, 1997).

**Table 4: Number of Farms by Size Class in Island County**

Farms by Size	1969	1974	1978	1982	1992	1997
1-9	19	15	31	48	40	51
10-49	119	112	110	151	138	126
50-179	76	72	70	80	76	66
180-499	22	31	28	24	18	16
Greater than 500	4	2	6	5	6	2
Total:	240	232	244	308	278	261

Source: Census of Agriculture

**Table 5: Market Value of Agriculture Products Sold in Island County**

Market Value (\$)	1978	1982	1992	1997
Less than 5,000	155	216	175	164
5,000-9,999	32	33	44	31
10,000-19,999	18	17	27	28
20,000-39,999	12	10	15	14
40,000-99,999	13	11	6	10
100,000-249,999	8	8	3	8
250,000 or more	6	13	8	6

Source: Census of Agriculture

According to Don Meehan, a member of the Washington State University Cooperative Extension faculty located in Coupeville, the changes in land use over time have typically seen more farms, but on smaller scales. The general trend is towards loss of farmed lands. This is true of the Reserve and is a growing trend because of strong development pressure. Due to the increased difficulty in making a profit on agricultural land, the number of people willing to make the sacrifice of maintaining a working farm is dwindling.

## Aquaculture

There are three existing aquaculture districts found within the surrounding waters of the Reserve. District 1E is located in Penn Cove on the south shore west of Coupeville and is permitted to Penn Cove Shellfish, LLC. District 2C has no current regulated activities, however geoduck harvesting has been allowed under previously issued shoreline permits. According to the DNR, District 3E, which is located offshore from Fort Ebey State Park, was harvested two to three years ago for geoducks by state and tribal officials. Although District 3E is a significant bed, the geoducks are too small and not of high commercial value. It is possible the tribes will harvest this bed again.

Penn Cove Shellfish, LLC. was established in 1975 and is the oldest and largest mussel farming in the country. It was the second mussel culturing operation in the United States. They now produce two varieties of mussels and clams and numerous types of oysters; but only the mussels are grown in Penn Cove. The mussels are cultured in 38 floating rafts. Three new rafts will be added in the near future. Between three-quarters to one million pounds of mussels are produced a year (Jefferds 2000). The shellfish are sold to restaurants and wholesalers locally and around the world.

Island County is responsible for regulating aquaculture districts and permits. For any new aquacultural district or expansion of existing aquaculture districts, an environmental review, public input, and aesthetic impacts must be considered. Conditional approvals of substantial development permits are made upon clear finding that the physical, aesthetic, environmental, and recreational quali-

ties of the shoreline are preserved for public enjoyment. Any new aquaculture projects are required to locate in existing districts that have remaining capacity. The countywide density of net-pen and raft culture operations is regulated to minimize cumulative environmental and visual impacts. (Island County, *Island County Comprehensive Plan* 1999: p. 3-29).

## Timber

The first major lumber company on the island, Grennan and Cranney, opened in 1856 and was followed a few years later by a small shipyard in Oak Harbor. By the 1860s, logging was a major part of the local economy. Originally slow operations that utilized axes and bull teams, loggers could only cut about an acre a month (White 1980), but they increased their output when they adopted the crosscut saw and used horses and larger crews. By 1900, a cheaper and more efficient system was introduced with the donkey engine, a steam engine outfitted with skids and a winch.

The biggest trees in the county grew on southern Whidbey and on Camano Island, but virtually all the mature trees were immense. For example, the hemlock's average diameter at maturity on good sites was 3 to 4 feet, and its height 125 to 200 feet. The diameter of the cedar was 4 to 6 feet and its height was approximately 200 feet. Spruces had a diameter of 6 to 7 feet and stood 230 to 245 feet. The fir was the largest of all, with a diameter of 5 to 7 feet and stood 245 to 330 feet (White 1980). By the end of the nineteenth century, most of the old growth Douglas fir had been cut, so loggers turned to cedar, hemlock, and second growth fir; however, by then the larger sawmill operations had transferred to Camano Island (National Park Service 1993). When Puget Mill logged off their last large tract of land—1,480 acres on north Camano Island in the early 1920's—large-scale logging in the county ended (Richard White). Afterward, only small logging contractors remained.

While commercial forestry activities were of primary significance to the area in historic times, their economic importance is currently minimal relative to other sectors of the economy. Projecting present trends into the future, the relative commercial significance of central Whidbey for-



ests as sources of logs and pulpwood will diminish. The majority of current forestry is conversion of forest to real estate development.

There is less land owned by DNR now than there was 20 years ago. According to DNR officials, this trend will continue, due to the urban interface and high visibility. Logging on Whidbey Island is difficult. The state agency recognizes the unpopularity of logging adjacent to residential areas. The trend for DNR is to transfer state owned lands to local governments and to lease lands to the county, state parks, and school districts. Rhododendron Park was recently transferred to the county. The last logging practice performed on state owned lands was a thinning project in 1997 in south Whidbey Island.

## Contemporary Tribal Communities

At present, there are no tribal reservations in Ebey's Landing National Historical Reserve or elsewhere on Whidbey Island. Nevertheless, present-day descendants of Whidbey Island's native residents at the time of the treaties of Point Elliott and Point No Point in 1855 are now members of several contemporary tribes with reservations elsewhere in the Puget Sound Basin. In addition, some descendants may belong to tribes that became federally recognized in the twentieth-century; and, at least one group that began to seek formal federal recognition in 1988. Finally, it is possible that descendants of Canadian First Nations who were referred to in the 1850s as "Tribes from the north" may have some combination of direct and indirect associations with the history and resources of Whidbey Island. The Reserve will initiate a study that will more fully document the contemporary

tribes and tribal communities with traditional associations to it during the fall of 2004. The summary here is based on a combination of preliminary research done to identify all native communities who are likely to be traditionally associated with Ebey's Landing and interaction with certain tribal representatives and tribes who have expressed interests in the Reserve during the time since its establishment.

## Point Elliott Treaty Reservations

Beginning with one of the four reservations established through the Point Elliott Treaty, the reservation that is closest to the Reserve is the

Swinomish Indian Tribal Community.

Located only twenty air miles or so northeast of Penn Cove,

the Swinomish reservation consists of 7,169 acres on Fidalgo Island. The reservation is bordered on the east by the Swinomish Channel.

It extends north to State Route 20 and Padilla Bay. When the reservation developed in the second half of the nineteenth-century, members of

other Southern Coast Salish tribes (Kikiallus, Suquamish and Skagits) and at least one Central Coast Salish

tribe (the Northern Straits speaking Samish) joined the Swinomish as reservation residents (Sampson 1972: p. 31-50; Suttles 1990; Suttles and Lane 1990; Ruby and Brown 1986: p. 230-233).

Members of the Swinomish community are actively involved with the Reserve and have recently expressed interest in San Juan Island National Historical Park.

The Tulalip Reservation, located a few miles north of Mukilteo on the mainland and north of Everett, was originally identified in the Treaty of Point Elliott as a "township of land" for both the site of "an agricultural and industrial school" and a place



*Local sculpture by Roger Purdue of Coupeville, Whidbey Island, ca. 2000. NPS Photo.*

to settle “all the Indians living west of the Cascades Mountains.” Initially known as the Snohomish Reservation, the early residents began to use Tulalip (a Lushootseed language name for the bay around which the reservation was located) as a preferred name (Suttles and Laner 1990: p. 488). Although the goal of settling all the Indians west of the Cascades was not realized at Tulalip, members of an impressive number of tribes in addition to the Snohomish became residents of the reservation over time. Among them were several Central Coast Salish tribes such as Stillaguamish, Snoqualmie, Skykomish, Skagit and Samish. An unknown number of Samishes lived on the Swinomish, Tulalip and Lummi reservations at different times. A separate Samish Tribe that has an office in Anacortes became federally recognized in 1996. Inter marriages took place and relationships persist among families despite which reservation they may live on or which tribal community they may belong.

The Lummi Indian Reservation is the third of four reservations established by the Point Elliott Treaty. It is located north of Bellingham and is primarily occupied by Lummis, Samishes and Nooksacks whose ancestors used the San Juan Islands and southern Gulf Islands in pre-reservation times. Representatives of the Lummi Tribe maintain interests in San Juan Island National Historical Park and regard San Juan Island to be part of their traditional territory in the vicinity of the international border. There may be members of the Lummi Tribe with relationships to individuals and families at both the Swinomish and Tulalip reservations. It is possible that they may maintain traditional associations through those relationships to areas traditionally occupied by Samishes on northern Whidbey Island.

The Port Madison/Suquamish Indian Reservation on the Kitsap Peninsula, to the northwest of Seattle, is approximately the same distance away from Ebey’s Landing National Historical Reserve as is the Lummi Reservation. It is the last of the four reservations designated by the Point Elliott Treaty. One reference indicates that in pre-reservation times their traditional use area extended as far north as Whidbey Island (Ruby and Brown 1986: p. 226). It is not known if the nature of their

use included village or other residential sites anywhere on Whidbey Island, or if it was limited to activities such as fishing.

## **Point No Point Treaty Reservation and the Clallam**

The only reservation designated by the Point No Point Treaty is adjacent to Hood Canal on the Olympic Peninsula. Known as the Skokomish Reservation, it was originally intended as a residence for the Twana speaking Skokomish, the Clallam (known also as Klallam and S’Klallam) and two other groups in an area where Southern and Central Coast Salish speaking groups occupied adjacent areas. The Skokomish are not known to have associations with Whidbey Island or Ebey’s Landing National Historical Reserve, but the Clallam have clear associations. Instead of taking up residence at Snohomish, the Clallam continued to live on the Olympic Peninsula, along the Strait of Juan de Fuca and elsewhere in Puget Sound where they lived and fished prior to 1855. They ultimately established three reservations within their traditional territory and the area covered by the Point No Point Treaty.

One group of Clallam families who maintained residence near Dungeness on the Olympic Peninsula purchased acreage east of Port Angeles, Washington in 1874 and established Jamestown. This group received federal recognition in 1980 as the Jamestown S’Klallam Tribe. A second group maintained residence near Port Angeles and the Elwha River. Acreage was acquired on their behalf in the mid-1930s by the federal government and it formally became the federally recognized Lower Elwha Reservation in 1968. A third group of families occupied a village “on the west side of Port Gamble Bay at Teekalet until 1853, when the lumber mill owners asked them to relocate across the bay to the spit of Point Julia” (Beckwith, Hebert and Woodward 2002: p. 51). They acquired land in the Point Julia area under the auspices of the 1934 Indian Reorganization Act and this became the Port Gamble Reservation (Lane 1977, Ruby and Brown 1986, Suttles 1990, Tiller 1996).

While the diaries of the Ebey family clearly document that the ancestors of the present-day populations of Lower Elwha, Jamestown and Port

Gamble were visitors and residents of Whidbey Island in the 1850s, the nature of contemporary Clallam interests in the Reserve is unknown (Farrar 1917). It is possible that future consultation with the three Clallam tribes and additional research may illuminate traditional associations for both these US tribes and their linguistic and cultural relatives who now live as members of First Nations in Canada.

## Tribes That Have Recently Received Federal Recognition

In addition to the Samish who received federal recognition in 1996, there are two other federally recognized tribes who may have direct or indirect traditional associations with various parts of Whidbey Island. These tribes are the Sauk-Suiattle and the Upper Skagit. Their histories have been closely intertwined before and since the time of the Point Elliott Treaty. The Sauk-Suiattle lived along tributaries of the Skagit River in the foothills of the Cascade Mountains. They are said to have traveled along the Skagit River to Skagit Bay in Puget Sound. They received recognition in 1975 and acquired reservation land in 1982. The Upper Skagit acquired reservation land and federal recognition in the mid 1970s (Ruby and Brown 1986, Tiller 1996). Both the Sauk-Suiattle and Upper Skagit are actively engaged with the National Park Service at North Cascades National Park and the extent of their interests in the Reserve have not been determined.

## Tribe seeking federal recognition

There is one local group of individuals who refer to themselves as the Snoqualmoo Tribe of

Whidbey Island. They petitioned the Branch of Acknowledgment of the Bureau of Indian Affairs for federal recognition in June 1988 (Marino 1990: p. 179). The Snoqualmoo have a mailing address in Coupeville and sometimes hold memorial services at the site of the Snakelin Monument that is located on private land within the Reserve.

The Snoqualmoo have adopted the spelling of their name as it appeared in the Point Elliott Treaty of 1855. They are a separate and distinct petitioner from the Snoqualmie Tribe that received federal recognition on August 29, 1997. The Snoqualmie have offices in Carnation and claim the Snoqualmie River and the Snoqualmie Falls areas as the heart of their traditional area.

## Population Trends

In 1942, the development and subsequent growth of the Whidbey Island Naval Air Station at Oak Harbor effected the population of the area. Between 1940 and 1960, the county's population increased by 222 percent compared to the state's 64.3 percent.

Island County's growth has continued to surpass the state average. Much of the population increase has been due to in-migration of residents. Since 1990 there has been a growth of 11,363 persons in Island County; of that number 5,249 were the result of natural population increase (9,896 births and 4,647 deaths) while 6,114 resulted from net in-migration (Washington State Office of Financial Management website 2001). During the 1980s, two-thirds of Whidbey Island's growth came from in-migration. This in-migration slowed to just over 50 percent during the 1990s (Island County, Island

Table 6: Population Trends 1970-2020

	1970	1980	1990	2000	2010*	2020*
State	3,413,300	4,132,400 (21.1%)	4,866,663 (17.8%)	5,894,121 (21.1%)	7,082,719	8,365,569
Island	27,011	44,048 (63%)	60,195 (37.0%)	71,558 (18.9%)	98,667	118,779
Central	2,993	6,144(106%)	8,205 (34%)	8,404 (2.4%)		
Oak Harbor	9,167	12,271	17,176	19,795		
Coupeville	703	1,006	1,337	1,723		
Island County	131.1	213.8	292.2	343.0		
Density Per Square Mile						

Source: Office of Financial Management 2000 and Port of Coupeville Park and Recreation Plan (page 4)

\* Forecasted



County Comprehensive Plan 1999: p. 4-12).

In 1995, the high series forecasts from the Washington Office of Financial Management (OFM) projected the population of Island County to increase to 78,651 by the year 2000 (the actual: 71,558). The same forecast has projected that growth will continue to 98,667 in 2010 and 118,779 in 2020 (refer to table 6). (Washington State Office of Financial Management 2001website).

The central Whidbey share of Island County's population has held relatively steady over the years, at 13 to 14 percent, and is expected to decrease only slightly through the year 2020. Although a significant number of unimproved lands and planned residential developments exist, continued water problems in this region are expected to stabilize growth rates. Central Whidbey is projected to show a population increase of about 3,800 people, or 9 percent of the county's growth by 2020.

## Demographics

### Age Distribution

The trend toward dramatic increases in retirement age populations was experienced in nearly all areas of the county. Since 1980, the older segments have continued to grow at a faster rate than the remainder of the population.

During the 1980s, population groups age 65 and over increased at twice the overall growth rate. Similarly, in Coupeville, the 65 and over age group

increased by 91.5 percent, more than twice the overall growth rate. In Coupeville, the population of those over the age of 85 grew by 293.8 percent during the 1980s. In contrast, the 18-24 year old age group increased by only five percent countywide and, in Coupeville, declined by almost ten percent.

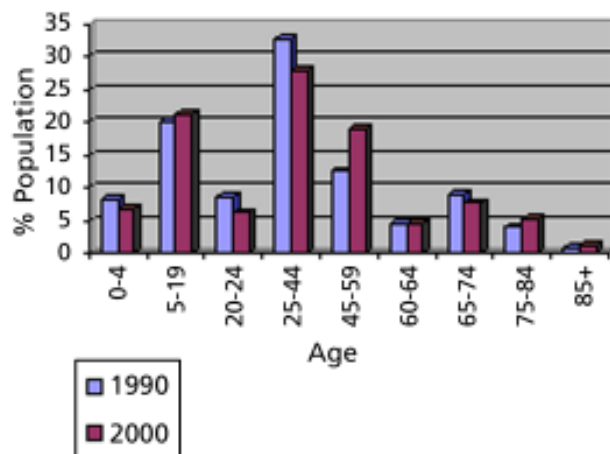
Groups older than 85 experienced the highest growth rates in the county between 1990 and 2000 with an increase of 47.5 percent. With 14.2 percent of the population in 2000 over 65, the percentage of elderly surpassed the state average of 11.2 percent. (Town of Coupeville, *Town of Coupeville Comprehensive Plan 1999*: p. 9)

While the largest changes have generally occurred in older populations. The largest demographic remains the middle-aged population, with the median age in 2000 for the county being 37 years old. In 1990, the median age in Coupeville was 41.5.

### Racial and Ethnic Distribution

In Island County, the large majority of the population remains Caucasian, non-Hispanic. Minority populations are small, but continue to grow. In the 1980s, African Americans and Asian/Pacific Islanders grew by more than 100 percent, African Americans composed 2.4 percent, and Asian/Pacific Islanders composed 4.3 percent of the population. People of Hispanic origin increased by nearly 60 percent and comprised the second largest ethnic group, with four percent of the population in 1990. In 2000, the racial and ethnic distribution has remained relatively the same (Office of Finan-

Table/ Chart 7: Island County Age Distribution for 1990 and 2000



Table/ Chart 8: The Percent Change by Age of Island County between 1990 and 2000

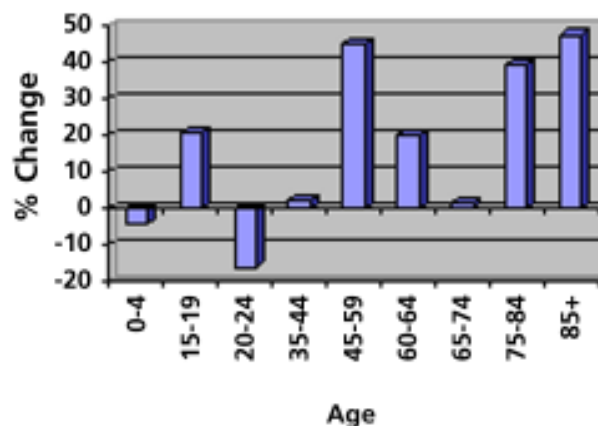


Table 9: Population by Race

	Population (Number of People)			Percentage of Total Population		
	Island	Central	Coupeville	Island	Central	Coupeville
Total Population	71,538	8,404	1,723			
Total	69,098	8,148	1,699	100%	100%	100%
Caucasian	62,374	7,772	1,547	87.20%	92.50%	89.80%
African American	1,691	85	27	2.40%	1.00%	1.60%
Native American	693	57	9	1.00%	0.80%	0.50%
Asian	3,001	127	37	4.20%	1.50%	2.10%
Pacific Islander	374	7	0	0.50%	0.08%	0%
Hispanic	2,843	247	92	4.00%	3.00%	5.30%
Other	1,025	100	49	1.40%	1.20%	2.80%
Two or more	2,460	256	54	3.40%	3.00%	3.10%

Source: Office of Financial Management 2000

cial Management 1999; Island County *Island County Comprehensive Plan* 1999: p. 4-12 to 4-13; Town of Coupeville, *Town of Coupeville Comprehensive Plan* 1999: p. 9).

## Economically Disadvantaged Demographics

### Household Income

Island County typically has a lower median household income than the state average. In 1989, Island County had an estimated 6.6 percent of its population below the poverty level, which is an estimated 4,719 persons. Of that total, 1,995 were under the age of 18.

In 1990, the median household income in Coupeville was \$20,758, significantly less than the county median of \$29,161. Household income estimates are an average of both family and non-family households. In 1990, median family income in Coupeville was \$32,995, while median non-family income was \$9,626. Income sources reported in the census reflect the town's large retired population; 358 households had wage and salary income, 232 had social security income and 153 had retire-

ment income (Town of Coupeville, *Town of Coupeville Comprehensive Plan* 1999: p. 10-11). In 1990, there were 144 Coupeville residents below poverty level; included in these numbers were 25 families, 44 were children under the age of 18, eleven were under the age of 5, and 29 were over the age of 65.

In 1990, of the 996 Coupeville residents who were 25 years of age and older, 18.2 percent of them did not have a high school diploma, 4.4 percent had less than a ninth grade education, and 21.9 percent had a bachelors degree or higher.

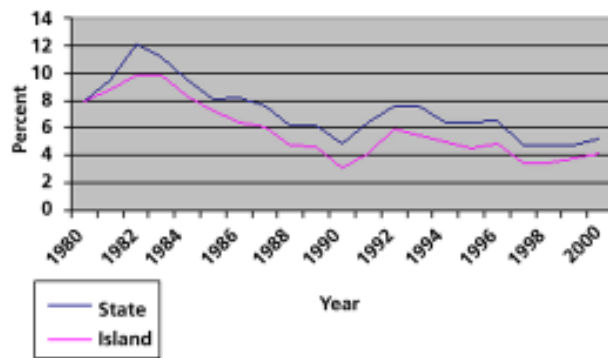
### Civilian Unemployment

The civilian labor force consists of those who are working and those without a job and are looking for work, but does not include military personnel. The unemployed does not include retirees or persons in institutions (including students). The Armed Forces employs 24.1 percent of Island County residents. Due to NAS Whidbey, it is important to look at civilian unemployment, to more accurately represent the county.

Table 10: Median Household Income: 1989 to 1999 and Forecast for 2000

	Census Estimate										Prelim. Estimate	Forecast
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Washington	31,183	33,461	34,374	35,880	36,519	37,674	38,707	40,808	43,460	46,080	48,289	50,152
Island	29,161	30,342	30,948	31,220	32,067	32,734	33,119	34,810	36,329	37,474	37,691	39,010

Table/ Chart 11: Unemployment Rates, Island County and Washington State, 1980-2000



The unemployment climate of the state and Island County has improved dramatically since the early 1980s. A string of national recessions (1970, 1973-75, 1980, and 1981-82) played havoc with unemployment. Over ten percent of the county's work force were idle in 1975 and 1977 and close to ten percent were jobless in 1982 and 1983. The recovery following the 1981-82 recession was very strong, even unprecedented in its duration, and unemployment declined every year until 1991. The 1990-91 recession was mild compared to the previous ones and while unemployment did increase in 1991 and 1992, it did not reach excessive heights. Each of the last two years brought declines. The 2000 rate in Island County was 4.1 percent while the statewide rate was 5.2 percent (Refer to table/chart 11).

Ethnically, the labor force composition of Island County is slightly less diverse than its general population. According to the 1990 Census, 92.1

percent of the county's labor force was white. The next largest racial group, Asian/Pacific Islanders, had a 4.3 percent share. The three remaining racial divisions, African American, Native American, and "Other Race", each accounted for less than 2.0 percent of the total. People of Hispanic origin, who can be of any race, made up 2.2 percent of the labor force.

While the general population of Island County is evenly split between males and females, the labor force is not. Sixty percent of the work force is male while 40 percent is female. Statewide, males also have a slightly larger portion of the work force at 55 percent.

Comparisons of the 1980 and 1990 censuses, however, show that the county is part of a nationwide trend of increased female participation in the work force. Even though males still outnumber females, there was significant change during the past decade. In Island County, the number of males that worked increased by 40 percent while the number of females increased by 61 percent. The type of employment was also changing. Women took full-time jobs at a higher rate than did men. The number of women working full-time in Island County increased by 93 percent from 1980 to 1990 while the number of men working full-time increased by 46 percent.

In Coupeville, the size of the labor force in 1990 was 555 people, including 64 in armed forces. Females were more than twice as likely to be unem-

Table 12: Island County Unemployment by Race and Gender for 1990

Race/Sex	Total Workers	Unemployed	Total/Sex	Employed	Unemployed	Civilian Unemployment
Caucasian/Male	26,940	1092 (4.0%)	16,637	16,149	488 (2.9%)	4.7%
Caucasian/Female			10,303	9,699	604 (5.9%)	6.5%
African American/Male	926	29 (3.1%)	695	670	25 (3.6%)	14.2%
African American/Female			231	207	24 (10.4%)	13.9%
American Indian/Male	392	27 (9.4%)	182	160	22 (12.1%)	23.1%
American Indian/Female			210	195	15 (7.1%)	13.8%
Asian-Pacific Islander/Male	1,182	125 (10.6%)	522	496	26 (5.0%)	8.5%
Asian-Pacific Islander/Female			660	561	99 (15.0%)	18.4%
Other/Male	354	33 (9.3%)	312	304	8 (2.6%)	9.4%
Other/Female			75	50	25 (50.0%)	50.0%



Table 13: Estimated Additional Households by Income Distribution for Central Whidbey

Planning Area		1996	2000	2010	2020	24-year	Additional Households
Central Whidbey, Unincorporated	Census Est. of Income Dist.	8,600	9,300	10,200	12,000	3,400	
Less than 50%	21%	1,848	1,999	2,192	2,579	731	292
50-80%	19%	1,625	1,758	1,928	2,268	643	257
80-100%	10%	862	932	1,022	1,202	341	136
100-120%	10%	834	902	989	1,164	330	132
More than 120%	40%	3,431	3,710	4,069	4,787	1,356	543
							<b>1,360</b>

Source: Island County Comprehensive Plan

ployed as males. The civilian unemployment rates show a greater division in racial backgrounds with whites making up 90 percent of the workforce (26,940 of 29,794).

## Housing

The numbers of low and moderate-income households in unincorporated Island County are projected to grow between the present and the year 2020. The unincorporated area of the county is projected to grow by 12,200 households through the year 2020. Of this, approximately 4,800 additional households for those below the 80 percent median income level are needed and 7,400 additional households are projected to be for those greater than 80 percent income sector of the population.

Island County recognizes that it is unlikely that those under 50 percent of the median income level will find housing they can afford unless incentives are offered for their development. People in the lower middle-income group might be able to afford housing at or below median price. (Island County *Island County Comprehensive Plan 1999*: p.4-16)

The numbers of low and moderate income (80 percent or less of the median) households in unincorporated central Whidbey are also projected to grow between the present and the year 2020. The unincorporated area of central Whidbey is projected to grow by 2,700 households through the year 2020. The unincorporated portion of central Whidbey is projected to need 1090 additional households for the sector of the population below the 80 percent median income level through 2020 (Island County *Island County Comprehensive Plan 1999*: p.4-13 to 4-20).

In 1990, forty percent of Coupeville residents rented and 60 percent owned homes. The median apartment rent was \$450 and the median house value was \$138,000.

## Public Assistance

Historically, the per capita income in Island County has been lower than the average for the nation and the state. For this reason, one might expect the proportion of public assistance recipients in the county to be relatively high; however, this has not been the case. In 1998, the Washington State Department of Social and Health Ser-

Table 14: Summary of the densities currently allowed under Island County's development regulations

Zone	Minimum Lot Size	% of County	% of Reserve
CA (Commercial Agriculture)	20 acres	4%	12%
R (Rural)	5 acres	30%	47%
RA (Rural Agriculture)	10 acres	18%	13%
RF (Rural Forest)	10 acres		
PK (Park)	N/A		7%
RR (Rural Residential)	14,500 SF to 2.5 acres	8%	5%

(For a complete analysis of each zone and to the extent that it supports the goals of the Reserve, please see Volume II, *Analysis of Island County Zoning and Development Regulations in Ebey's Landing National Historical Reserve* by David Nemens)

vices (DSHS) identified 14.3 percent (10,355) of Island County residents receiving a public assistance service compared to 22 percent of Washington State residents utilizing a DSHS service. Island County was ranked 37<sup>th</sup> out of the 39 Washington State counties for use rate of DSHS services. Island County residents accounted for 0.79 percent (10,355) of total DSHS clients and 0.63 percent (\$28,893,928) of the DSHS direct service dollars.

DSHS provide services to assist in problems caused by some combination of poverty, disabilities, family abuse or neglect, domestic violence, recent refugee status, substance abuse, and/or juvenile criminal behavior. Forty percent of children (birth – 17), 15 percent of “working age” adults (18–64), and 12 percent of seniors (65 or older) used at least one DSHS service during fiscal year 1999. More than half of DSHS’s 1.26 million clients used more than one type of service during a year.

## **Ebey’s Landing National Historical Reserve Agreements and Mandates**

The following agreements are existing legal agreements and legislative mandates that influence both planning and operations at the Reserve:

- Trust Board of Ebey’s Landing National Historical Reserve Rules of Procedure, October 25, 1988. (Specific rules relating to appointment, removal, and composition of members, terms, roles of officers, meeting and other procedures.)
- Interlocal Agreement for the Administration of Ebey’s Landing National Historical Reserve, recorded July 23, 1988. (An agreement to establish a joint interagency administrative board for management of the Reserve. Operation procedures established for Trust Board.)
- Cooperative Agreement between National Park Service and Ebey’s Landing National Historical Reserve Trust Board, July 25, 1988. (Agreement for NPS to partially fund, not to exceed 50 percent, the annual operational costs of the Reserve, subject to availability of appropriations.)
- Cooperative Agreement between Island County Parks and Recreation Department, National Park Service, and Trust Board of Ebey’s Land-

ing National Historical Reserve, July 29, 1990. (Agreement among parties for a project to undertake a project to plan and produce interpretive exhibits installed at the county sites of Monroe’s Landing and Crockett Blockhouse, Coupeville, Washington.)

- Cooperative Agreement between State of Washington, Department of Transportation, Marine Division, National Park Service, and Trust Board of Ebey’s Landing National Historical Reserve, June 24, 1990. (Agreement among parties to undertake a project to plan and produce exhibits which will be duplicated and installed at two DOT ferry terminals located at Port Townsend and Keystone, Washington.)
- Cooperative Agreement between Washington State Parks and Recreation Commission, National Park Service, and Trust Board of Ebey’s Landing National Historical Reserve, October 30, 1992. (Agreement among parties to undertake a project to plan and produce exhibits which will be installed at three state park sites known as Ebey’s Landing, Fort Ebey and Fort Casey, Whidbey Island, Washington.)
- Cooperative Agreement between National Park Service and Island County Historical Society, August 11, 1989. (Agreement to provide for the incorporation of interpretive facilities as part of the museum construction project by the cooperator, landscaping for enhancement of primary viewsheds, and the historic area and compatible with the restrictions for the site, and the payment of funds to accomplish these purposes.)

## **Land Use Documents, Related Plans, and Programs**

### **Analysis of Island County Zoning and Development Regulations in the Ebey’s Landing National Historical Reserve**

This report was prepared by David Nemens Associates, Inc., Seattle, Washington in May 2001 for the National Park Service. Its purpose was to identify the relevant Island County zoning designations and development regulations applicable to properties within the Reserve. In addition, this report was to assess to which extent these designations and regulations are consistent with the goals of the Reserve. Documents analyzed included the following:

- 1998 Island County Comprehensive Plan
- Applicable parts of the Island County Code
- Ordinance adopted by the Island County Board of County Commissioners
- Decisions of the Western Washington Growth Management Hearings Board

Information was also used from the 1980 *Ebey's Landing National Historical Reserve Comprehensive Plan*, the 2000 Washington State Yearbook (Public Sector Information, Inc. Eugene, Oregon), and interviews with Island County Planning and Public Works Directors, and the Ebey's Landing National Historical Reserve Trust Board. The entire report is included as a supplemental document in Volume II of this draft GMP/EIS.

This report provides background on Island County's Comprehensive Plan and Zoning Code (see following subsection) and the Land Use and Zoning Designations. Six zones are analyzed that apply to the Reserve: Commercial Agriculture, Rural, Rural Agriculture, Rural Forest, Park, and Rural Residential. Each zone is summarized as to minimum parcel size, base density, and permitted and conditional uses. The definition, goals and policies of the zone from the Comprehensive Plan are cited in addition to the purpose, designation criteria, permitted and conditional uses under the Zoning Code. Most importantly, an analysis is provided as to the extent the zoning does or does not provide support to the overall goals for the Reserve. (See Figure 9, Island County Zoning.)

The report found that Island County's zoning and development regulations vary in the degree to which they are consistent with, and supportive of, the purpose and objectives of the Reserve. The Rural zoning district, the largest zoning district in the Reserve, allows the subdivision of land into lots as small as five acres. Such a development pattern, were it to occur in an uncontrolled manner, would be inconsistent with the existing visual character of the Reserve. The county has adopted development standards (such as lot coverage limits and building setbacks) for the Rural zoning district; yet the report states that it is doubtful that such standards would mitigate the impact that development at a five-acre density would have on the Reserve's visual resources. Though the county regulations encourage clustering of lots and

houses through the use of the Planned Residential Development (PRD) process in the Rural zoning district, the regulations do not require use of the PRD process.

Another significant potential inconsistency between Island County's zoning regulations and the Reserve's objectives is in the area of allowed uses. Many of the permitted and conditional uses allowed in the zoning districts within the Reserve could be incompatible with the Reserve's objectives. Even the County's Commercial Agriculture (CA) district, arguably the most supportive of the Reserve's goal of preserving the farming legacy of the area, allows minor utilities as a permitted use and communications towers as a conditional use.

The report suggests that one way to address the issues of development density, development pattern, and allowed uses would be through the adoption by the county of an overlay zone that encompassed some or all of the Reserve. Island County could adopt special zoning restrictions and requirements applicable only in this overlay zone; for example, all land subdivision within this overlay district could be required to go through a PRD process with special, more restrictive PRD standards. Similarly, allowed uses could be restricted within this overlay zone. The advantage of this approach is that it would not affect the development standards, densities, or uses allowed in other parts of the county.

## Island County Comprehensive Plan and Zoning Code

The following background on the county's comprehensive plan and zoning code were provided by David Nemens and Associates, Inc., Seattle, Washington.

Island County's first comprehensive plan, the *General Plan*, was adopted in 1964, followed by the adoption of an Interim Zoning Ordinance in 1966. The county completed updating the *General Plan's* cultural and natural systems inventories in 1974 (*Phase I: Existing Conditions*), and soon thereafter adopted amended planning policies (*Phase II: Planning Policies*). However, the county never amended its zoning ordinance or development regulations to be consistent with the more recently



Table 15: Land use inventory in Coupeville

LAND USE	Vacant	Developed	Sensitive	TOTAL
Single Family	191.4	141.1	16.5	349.0
Multi-Family	8.3	36.7	0.3	45.3
Commercial	13.7	31.9	0.0	45.6
Public, Quasi-Public	8.0	45.6	0.0	53.6
Residential Reserve	193.1	22.9	11.9	227.9
Totals	414.5	278.2	28.7	721.4

Source: Town of Coupeville

adopted policies. In 1984, the county adopted a new Planning and Zoning Strategy along with implementing performance-based zoning and development regulations.

Work on the current *Island County Comprehensive Plan* began shortly after passage of the Washington State Growth Management Act in 1990. The county prepared several drafts of the plan for public review between 1994 and 1998. In September 1998, the County Planning Commission presented its recommended comprehensive plan to the Board of County Commissioners (BOCC). The BOCC held several additional public hearings, adopting the plan on September 28, 1998.

Plan opponents, including the Whidbey Environmental Action Network (WEAN) and the Island County Citizens Growth Management Coalition, filed several appeals with the Western Washington Growth Management Hearings Board (“the Hearings Board”), challenging the timeliness and adequacy of the plan and its implementing development regulations. One of the issues included in the challenges was the consistency with Growth Management Act requirements of the county’s proposed five-acre density (one dwelling unit per five acres) in the Rural Zone. After hearing these challenges, on October 12, 2000 the Hearings Board issued a Compliance Hearing Order validating the county’s position on most of the remaining issues, including the five-acre density in the Rural Zone.

### Land Use and Zoning Designations

This report refers to two separate but closely related sets of Island County land use designations: “Future Land Use” designations, as shown on the “Future Land Use Map” of the *Island County Comprehensive Plan*; and “Zoning” as shown on

the Island County zoning map. In Island County, the names of zones are identical to the names of corresponding land use designations. The county’s own maps sometimes use these terms interchangeably. However, the comprehensive plan and the zoning code are separate, distinct documents. The comprehensive plan establishes the more general policy basis for the county’s land use regulations; the zoning code contains these detailed regulations themselves. Because of the one-to-one correspondence between land use designations and zoning districts in Island County, these two sets of designations are discussed together in this report.

The “Future Land Use Plan Central Whidbey” (*Island County Comprehensive Plan Element 1: Policy Plan and Land Use Element*, Map L) illustrates the future land use/zoning designations for central Whidbey Island. According to the plan, these designations “describe the future land use plan for Island County ... based on the major issues as identified in Chapter I, the existing land use analysis in Chapter II, and the goals and policies that will be used to guide and accommodate future growth as presented in Chapter IV.” (Section III page I-III.) The “Future Land Use Plan Central Whidbey” labels its designations as “proposed zoning.”

Ebey’s Landing National Historical Reserve contains a mix of land use/zoning designations. At Ebey’s Prairie, the predominant designation/zone is Commercial Agriculture. To the west of the Prairie (in and around Sunnyside Cemetery), there is a small area designated/zoned Rural. West of this are substantial areas designated/zoned Rural Agriculture and Rural Forest. There is another area designated/zoned Commercial Agriculture in the Crockett Prairie area, and several scattered areas designated/zoned Rural Forest north and east of Crockett Prairie. Aside from these areas, and the

areas designated Park (Ebey's Landing, Fort Ebey, and Fort Casey State Parks) or Municipality (all areas within Coupeville municipal limits), and small areas of Rural Residential along the shores of Penn Cove, most of the land within the Reserve is designated/zoned Rural or Rural Agriculture. The following is a summary of the densities currently allowed under Island County's development regulations for those zones present in the Reserve.

## **Town of Coupeville Documents**

### *Town of Coupeville Comprehensive Plan*

The plan was prepared in compliance with the requirements of the 1990 Washington Growth Management Act and the 1992 Island County Countywide Planning Policies. The plan is intended to guide the future growth, character and development of Coupeville for the next ten to twenty years and was last updated in 1999. The comprehensive plan was last updated in 2003. Changes to the comprehensive plan include updated demographic profiles, economic information, and land use information. The town's designated Urban Growth Area coincides with the current town limits. As of 2000, it had a population of 1,723 people and an area a little more than one square mile.

Other than the required planning elements required by the GMA, the town has a strong sense of preserving its historic rural and "small" town character. It recognizes its beautiful natural setting on Penn Cove and small town atmosphere and develops planning goals that emphasize these points. The plan also recognizes the *1980 Comprehensive Plan of Ebey's Landing National Historical Reserve* in its Land Use element. One of the goals of the comprehensive plan recognizes the larger community of which the town of Coupeville is a member. Coordination with Island County and Ebey's Landing National Historical Reserve is encouraged.

### *Town of Coupeville Zoning*

Chapter 16.08 of the Coupeville Development Regulations and its corresponding Official Zoning Map establish the zoning districts for the town of Coupeville. The zoning code is intended to protect the public's health, safety, and welfare and to en-

courage the most appropriate use of the land. In 1973, when the Central Whidbey Island National Register Historic District was designated, there were 51 historic structures located within the town limits and an additional 40 properties in the county. After the historic district was created, the town established an historic overlay zone for design review.

The town of Coupeville has a total area of 721 acres and as the seat of Island County is significantly influenced by public uses including government offices. The town is primarily zoned single family residential, with 93 percent of the remaining vacant lots designated as a reserve for residential development and the preservation of the rural character of the town. A Cottage Housing Overlay District was enacted by the town in 2005. This floating zone provides a landowner/developer the option of increasing residential densities to up to 8 units per acre, if the project meets certain minimum design criteria specified in the Development Regulations and is approved by the Design Review Board. The Cottage Housing Overlay District option is available only to Medium Density Residential (RM9600) zoned parcels 1 acre or larger in size anywhere within the Town limits. Table 15 summarizes the land use inventory in Coupeville. (See Figure 10, Town of Coupeville Zoning.)

## **Related Washington State Park Plans**

### *Fort Ebey State Park and Fort Casey State Park*

Washington State Parks is currently in the process of developing a Comprehensive Area Management Plan (CAMP) for the state parks located within Ebey's Landing National Historical Reserve. This planning process determines what type of land classification would best serve the vision of each park. These range between three management options favoring natural resource protection, cultural resource protection, and recreation related development. Additionally, resource values are developed to support the parks' intent. These may include statements, which support the cooperative nature of the Reserve.

After development and review of the plans by both Washington State Parks planners and the

public, the final land classification process would be reviewed by the Washington State Parks and Recreation Commission. After approval, the Northwest Regional Office will develop the management plan for the region. This “umbrella document” will direct the development of park specific plans.

It is the hope of the National Park Service and Ebey's Landing National Historical Reserve Trust Board that the management plans of Fort Casey and Fort Ebey state parks are consistent and supportive of the mission statement of the Trust Board, the vision statement for the Reserve, and the current general management planning process the NPS is undertaking for the reserve.

## Related U.S. Navy Plans

The U.S. Navy plans to continue to use the Outlying Landing Field in Coupeville to practice simulated aircraft carrier landings as long as the EA-6B is stationed at the Naval Air Station (NAS) Whidbey Island, and may continue its use beyond that if the Navy decides to base the EA-18G at NAS Whidbey Island (Meelas 2004).

## Related National Park Service Plans and Studies

### *An Analysis of Land Use Change and Cultural Landscape Integrity for Ebey's Landing National Historical Reserve*

This document was prepared by Nancy Rottle, Assistant Professor, University of Washington Department of Landscape Architecture, and Jones and Jones Architects and Landscape Architects in April 2003 for the National Park Service. The document includes and explains the methodology, provides an analysis of land use changes from 1983-2000, and suggests recommendations. The entire report and accompanying graphics are included as a supplemental document in Volume II of this draft GMP/EIS.

The goals of the project are the following:

- To determine the patterns of landscape change that have taken place since the initial cultural landscape inventory in 1983, what contemporary pressures these patterns suggest, and what forces might compromise the future integrity of the Reserve's landscape.

- To determine what characteristics of the historic landscape (from 50 years previous and earlier) still remain and contribute to the historic integrity of the Reserve, as defined in the Department of Interior's guidelines for evaluating historic and cultural landscapes.
- To explore innovative preservation strategies used in other parts of the U.S., especially as applied to agricultural and forested working landscapes, and how might lessons from these examples be applied to the Reserve.

Goal three of the project was investigated in a separate report (see following report summary) on agricultural land preservation case studies and strategies.

Some of the findings documented within the Reserve between 1983 and 2000 include the following changes:

- Over 1,100 new structures were built, an increase of 49 percent (26 percent of the structures were in Coupeville, 24 percent in subdivisions, and 50 percent in other areas of the Reserve).
- Structures placed in the open and the addition of new subdivisions have had the most significant effect upon the cultural landscape of the Reserve, interrupting vistas of farmland, defining edges of hillsides with buildings instead of trees or open space against the skyline, dividing the landscape into smaller pieces, and changing the character of the ground plane from large continuous areas of vegetation to areas dotted with large new homes.
- Fourteen historic structures were lost despite NPS and Trust Board efforts to convey the value of these buildings to the historic integrity of the Reserve.
- There was a 41 percent increase in residential subdivisions, involving 233 acres and two new subdivisions.
- The visual impact of new subdivisions is substantial as they are located in primarily open areas rather than in forested areas.
- The land area for Coupeville expanded 30 percent, gaining 63 acres from the Urban Growth Area.
- Commercial land use grew by a total of 22 acres or 24 percent.
- Agriculture was reduced by 4 percent losing 158 acres primarily to subdivisions or rural residential uses.



- Woodland diminished by 2 percent, losing 111 acres primarily at the forest edge to residential and agricultural uses.
- The status of parklands appears to have increased. Due to lack of information in 1983, the status is unclear.
- There was an 11 percent increase in grassland (143 acres), a 14 percent loss of pasture (190 acres), and a 1 percent gain in cropland (32 acres). This change is probably due to a decline in active farming especially dairy grazing with fields becoming fallow or converting to residential lawns.
- Roads increased by 24 miles or 20 percent. Nearly all of these were “minor roads” (a 35 percent increase in that category). The proliferation of roads has created impacts to functioning agriculture and ecological integrity.
- There were slight gains in hedgerows (.2 miles) and windbreaks (1.8 miles) overall.
- All cluster arrangements remained between 1983 and 2000 with the addition or loss of individual structures within six farm clusters between 1995 and 2000. This suggests that an agricultural relationship to the land is still intact. However, the majority of new structures built on the Reserve did not follow the historic pattern of clustering indicating a direction change from the primarily agricultural relationship mode to a residential one.

The analysis suggests that urbanization, suburbanization, and residential pressures on the landscape are substantial, is a classic pattern in urbanizing areas, and without intervention will continue. Recent zoning changes in Island County are less restrictive than when the Reserve was created, which may accelerate the loss of the Reserve’s rural landscape. The loss of agricultural would be significant in altering the character and human relationship to the cultural landscape, and may undermine the Reserve’s purpose, “to preserve and protect a rural community which provides an unbroken historic record from...19<sup>th</sup> century exploration and settlement...to the present time.” As residential use of the land expands, the open agricultural fields will be replaced with houses. Unless successful measures are taken, farming will become increasingly challenged by conflicting interests, accelerating land values, and lack of support facilities.

The report recommends a combination of strategies for farmland protection such as overlay zoning, designation of special districts, zoning, purchase of easements and other incentive mechanisms. In purchasing easements, it is recommended that a study be done to determine those lands possessing the highest visual and historic integrity, but are least protected and vulnerable to development.

#### ***Farmland Preservation Case Studies for Ebey’s Landing National Historical Reserve***

This report was prepared by Nathaniel Cormier of Jones and Jones Architects and Landscape Architects in October 2001 for the National Park Service. The purpose of the report is to inform the Reserve about ways to protect the working cultural landscape, primarily agriculture and forestry. It identifies, discusses, and documents an array of strategies that government at all levels, land protection organizations, cooperatives, and farmers have used to promote sustainable working farms and woodlots across the United States. Existing programs available at the Reserve and innovative case studies are documented at each level. This report led to an accompanying *Farmland Preservation Recommendations* report (summarized below), which makes specific recommendations about the Reserve. These two reports are included as a supplemental document in Volume II of this draft GMP/EIS.

#### ***Farmland Preservation Recommendations for Ebey’s Landing National Historical Reserve***

This report was prepared by Nathaniel Cormier of Jones and Jones Architects and Landscape Architects in October 2001 for the National Park Service. The farmland preservation recommendations were based on case studies of farmland preservation strategies around the country and the character of the Reserve’s cultural landscape. The Reserve’s landscapes cannot be viewed as static because they will change as agricultural practices and land use goals change. Plans to protect the landscape must also protect the farmers responsible for sustaining the land. They are interdependent. Recommendations are grouped into three broad strategy categories and are based on a balance of restrictions and incentives:

- Protect the farmland—the Reserve should identify and protect the land in the Reserve best suited to farming and woodlots.
- Support the farmers—the Reserve should implement measures that make it easier for existing farmers to remain in farming and new farmers to begin farming
- Cultivate markets—the Reserve should help farmers to cultivate markets for the farm and forest products of the Reserve.

The report defines three important partners to carry out these recommendations. One of these is existing—Island County—and two others would be created, an Ebey's Farmland Trust and an Ebey's Farmers Cooperative. The county would be encouraged to create stronger agricultural protection through a special zoning or overlay district covering only the Reserve. The Farmland Trust would be a non-governmental organization to oversee acquisition of farmland and conservation easements and operate a development credit bank. The Trust could also pursue funding from foundations, citizens, and government agencies for its ongoing activities. The cooperative would allow farmers to share the costs of infrastructure needed to produce value-added products, which could be marketed under a Reserve label. In addition, the cooperative could run a community supported agriculture (CSA) business that sells produce to participating local and urban residents. The cooperative would give farmers a direct role in the management of the Reserve.

The report provides a matrix of the recommendations and denotes which partner would be the best to achieve them.

The remainder of the report explains in detail each strategy and provides examples.

### ***National Park Service Ocean Park Stewardship 2005-2008 Action Plan***

The 2001 National Park System Advisory Board Report, *Rethinking the National Parks for the 21<sup>st</sup> 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 em-

phasis 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. In 2004, President Bush and the Department of the Interior highlighted the development of the Ocean Park Stewardship Action Plan in the U.S. Ocean Action Plan, and announced that it would be completed in 2005.

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. Units of the National Park System that are interested in participating in the action plan or wish to obtain information for resource contacts and potential funding sources for protection of coastal areas are encouraged to contact the NPS Water Resources Division.

## ***San Juan Island National Historical Park General Management Plan***

The last general management plan for San Juan Island National Historical Park (NHP) was completed in 1979. A new GMP is in progress led by the NPS Pacific West Region, Seattle Planning Office. The purpose of the park is to interpret and preserve the sites of American and English camps and to commemorate the historic events that occurred from 1853 to 1871 in connection with the final settlement of the Oregon Territory boundary dispute.

Ebey's Landing National Historical Reserve and San Juan Island National Historical Park interpret the same period of history. Isaac Neff Ebey was a U.S. customs collector at the time, based in Port Townsend. One of his visits to San Juan Island in April 1854, created the first stand off between American settlers and the British when he threatened seizure of British property on the island to collect duties because he felt that the San Juan Islands were the possession of the Americans and not a duty free zone. Isaac Ebey's visits are recorded as part of the events in history leading up to the establishment of the permanent water boundary between the U.S. and Great Britain. (Vouri 1999: pp. 29-33).

## **Existing Park Development and Programs**

The total acreage of Ebey's Landing National Historical Reserve is approximately 17,572 acres. The



*Parking at the Prairie Overlook, Whidbey Island, ca. 1999. NPS Photo.*

NPS-owned lands total approximately 684 acres with another approximately 2,023 acres held in conservation easements and development rights. The remaining acreage includes primarily privately owned lands, with other public lands managed by Washington State Parks and Recreation Commission, Island County, town of Coupeville, Washington State Department of Transportation, Washington State Department of Natural Resources, U.S. Army Corps of Engineers, U.S. Department of Defense, and Washington State Department of Fish and Wildlife. Unless otherwise noted, this section only addresses property owned by the National Park Service.

## **Roads and Parking**

NPS-owned and managed roads (both paved and unpaved) total less than one mile and are located at interpretive and scenic waysides. Parking lots at the two NPS-owned waysides (one paved, one gravel) hold a total of 11 cars and 3 RV spaces.

Partner agencies including the town, county, and Washington State Parks have roads and parking areas under their respective jurisdictions and maintain them accordingly.

## **Boundaries**

The boundaries of the Reserve follow the historical patterns of development created by the 1850s Donation Land Claims. The northern boundary is irregular but can be generally marked by secondary roads in the Reserve, including West Beach Road, Van Dam Road, Zylstra Road, Arnold Road,



*Parking at Ebey's Landing State Park, Whidbey Island, ca. 2001. NPS Photo.*



Monroe's Landing Road, Scenic Heights Road, Penn Cove Road and Libby Road. State Route 20/525 bisects the Reserve in a generally north-south direction providing the primary means of transportation through the park unit; State Route 20 has a spur to the west leading to and along Keystone Spit and the Keystone Ferry terminal. Madrona Way follows the edge of Penn Cove and links the Grasser's Hill area with Coupeville. Parker Road travels east of Coupeville and is the main road along Penn Cove to the east and south, where it heads away from the cove and into Smith Prairie. Other primary roads along Ebey's, Crockett, and Smith prairies include Engle Road, Hill Road, Ebey's Landing Road, Terry Road, Fort Casey Road, Patmore Road and Wanamaker Road. The eastern edge of the Reserve is formed by the north-south running Keystone Road which ends at Admiralty Bay in the southeast corner of the Reserve. All of these roads are public, access various areas in the Reserve, and are maintained by the state, county, or town.

Water forms boundaries in the Reserve. The west boundary of the Reserve is the Strait of Juan de Fuca; to the south is Admiralty Bay and Keystone Spit; the eastern boundary is in Smith Prairie heading north to Snakelum Point, crossing over and including Penn Cove to a point north of Blowers Bluff. There are approximately 22 miles of coastline.

Private residential areas are located throughout the Reserve. There are over 6,600 tax parcels within the Reserve. The city of Oak Harbor lies to

the north approximately four miles from the Reserve's northern boundary; Saratoga Passage and Camano Island are to the east of the Reserve; the Olympic Peninsula lies to the west across Admiralty Inlet; and to the south are the Whidbey Island towns of Greenbank, Freeland, Langley and Clinton.

## Trails

The trails owned and maintained by NPS are a small component of the overall trail system that exists in the Reserve. National Park Service trails include a portion of the bluff trail (approximately  $\frac{3}{4}$  mile, including the spur to Buttercup Hill); a trail linking the County's Kettles Trail to the Prairie Overlook (approximately  $\frac{1}{4}$  mile); and a short trail from the Prairie Wayside to a viewpoint at Ebey's Prairie (less than  $\frac{1}{4}$  mile); and the Ridge Trail, a private/public partnership project connecting the Prairie Overlook with the Bluff Trail (approximately  $\frac{3}{4}$  mile). These are unpaved trails and range in width from approximately 18 to 48 inches.

## Buildings, Facilities, and NPS-owned Properties

The Reserve has ten primary buildings and many smaller outbuildings and agriculture structures owned by the National Park Service. In the vicinity of Ebey's Prairie is the Reserve's administration building, also known as the Cottage, a former Sheep Barn and Machine Shed, the historic Jacob Ebey House and Blockhouse, the historic Ferry







*Private residential development near Crockett Lake in the Reserve, Whidbey Island, ca. 2001. NPS Photo.*

House and outbuildings (shed and outhouse), the historic Rockwell House and the agricultural complex known as Farm I (no historic buildings). The historic agricultural complex known as Farm II is located in Crockett Prairie, and includes six historic structures, including the Reuble Barn, Gillespie House, granary, garage, calf barn and another building.

## **West Ridge Property**

The property consists of farmland and the National Register listed Jacob Ebey House and Blockhouse, the Cottage, a sheep barn and a deteriorated machine shed. It includes a two-party well and pump house, which is shared with an adjacent private property owner. This property was purchased from The Nature Conservancy in 2002. The parcel is an irregular shape and consists of 60.5 acres of farmland currently under agricultural lease, and approximately 8 acres of mature conifer timber along the west property line.

### ***Jacob Ebey House and Blockhouse***

These two buildings were originally built in the 1850s but likely altered during “restoration” efforts in the 1880s and 1930s respectively. The Jacob Ebey House is approximately 640 square feet and the Blockhouse is approximately 64 square feet and located approximately one-quarter mile southwest of the Cottage. Neither building is accessible to the public due to their deteriorated condition. These buildings are not ADA accessible and have no informational signing.



*Trail access to Fort Ebey State Park from State Route 20, Whidbey Island, ca. 1999. NPS Photo.*

### ***The Cottage***

Built in the 1940s as a single family dwelling, it was later altered with the addition of an attached garage, which doubled its size. This one story building is approximately 1,086 square feet and is presently used as the Reserve administration building by the Trust Board of Ebey’s Landing National Historical Reserve. It consists of two offices, a reception/office area, kitchen/lunch room, four small storage/supply closets (two of which double as a furnace room and telephone/computer line room), unisex ADA accessible bathroom, and conference/meeting space. Water is obtained from a two-party well (to the south), and well house, and the sewage disposal is served by a double concrete septic tank system with drainfield. The parcel totals eight-tenths of an acre and is located off Cemetery Road and to the south of State Route 20, less than one mile from Coupeville. It was purchased from TNC in 2002. While it is adjacent to the West Ridge property, it has its own tax parcel.

### ***Sheep Barn and Machine Shed***

These buildings are located to the northwest of the Cottage in the woods, but are part of the Cottage tax parcel. They are approximately 4,900 and 768 square feet respectively. The barn is used for storage and the machine shed is unused due to deterioration. The NPS needs to evaluate these structures for their National Register eligibility. These structures are not open or accessible to the public. There are no informational signs at the site.

## Farm I

The farm is located at the intersection of Terry and Fort Casey roads, southeast of Coupeville. The property was owned for decades by the Engle family until a 1998 bankruptcy resulted in a sale to the Trust for Public Land, which later sold to the NPS in 2000. The farm consists of 115 acres of farm land, and the built infrastructure for a former 940-head dairy farm. The structures on the complex include an assortment of non-historic metal, concrete and wood frame buildings, manure lagoons (ten million gallons) and associated pump

lines, silage pits, loafing sheds, storage sheds and barns, well and pump houses, equipment sheds, silos, and fencing. The dairy herd housing area totals 138,716 square feet in three buildings. There are electrical and telephone services provided to the property. The town of Coupeville provides water to the property. There are three water meters on the property and two wells provided water for the former dairy operation and field irrigation. None of the farm buildings are eligible for the National Register. The former owners of the farm retained a lease to continue farm operations until a final resolution is determined for the property.



*Historic Jacob Ebey House and Blockhouse, Whidbey Island, ca. 1999. NPS Photo.*

### *Farm Office*

This building is now used by the NPS as a resource management office. It is a one-story, wood-frame building, about 400 square feet in size. It contains two rooms and a storage closet and is supplied with electricity and telephone. This building is not eligible for the National Register. Should the farm property be exchanged, leased or sold, this building would be vacated by NPS.

### *Rockwell House*

The circa 1891 Rockwell House was built as a residence for the former property owners farming the land. It is now on a separate tax parcel owned by the NPS. It is a wood-frame, one and a half story Victorian style house with three bedrooms and a bath upstairs. The first floor consists of two bedrooms, one bath, a living/dining room, kitchen, entry hall, and mud/laundry room. The house is approximately 2,228 square feet in size. It is currently vacant (the public does not access this building) and in need of repair. This residence is listed on the National Register of Historic Places. It was purchased from the Trust for Public Land in 2001.



*NPS office at Farm I, Whidbey Island, ca. 2004. NPS Photo.*

### **Farm II**

This farm is located at the intersection of Fort Casey and Patmore roads, southeast of Coupeville. It was formerly owned by the Engle Family prior to the Trust for Public Land purchasing the property after bankruptcy, which later sold to the NPS. The property contains approximately 113 acres of tilled farmland, and a building complex consisting of a residence (the Gillespie House) and farm buildings, many of which are unused. The historic residence was built in 1912 and is a one-story wood frame building. It is 1,492 square feet in size and contains three bedrooms, a living and dining room, kitchen, bathroom, and laundry room. The historic outbuildings in the complex, which contribute to the integrity of the Reserve, include a large gambrel-roofed barn (Reuble Barn, 5,250 square feet), a gable-roofed barn, a garage, shed, and granary. Non-historic structures include an assortment of sheds, shops, a manure lagoon and two underground manure storage tanks (78,000 gallons), bunker silo, well and pump houses, feeder and loafing sheds, and fencing, dating from the circa 1940s to the 1990s; none of these contribute to the property or district due to age or alter-



*Rear view of historic Rockwell House at Farm I, Whidbey Island, ca. 2004. NPS Photo.*



ations. When the NPS purchased the property, the buildings were essentially unused except for the residence and were generally in a state of disrepair.

### **Ferry House and Associated buildings**

The circa 1858 Ferry House is approximately 1638 square feet and serves as a de facto exterior exhibit. The building is undergoing extensive preservation work and is not accessible to the public. The outbuildings (shed and outhouse) behind the Ferry House are approximately 690 square feet and are not currently used due to their condition. (Approximately 188 square feet of one outbuilding fell into ruin and has been documented and removed.) These are all contributing resources to the Reserve and are listed in the National Register of Historic Places. Due to vandalism activity that occurs periodically, “no trespassing” and “U.S. Government property” signs are located on these buildings. These historic buildings are not ADA accessible. This property was donated to the NPS by The Nature Conservancy in 2002.



*Historic Farm II, Whidbey Island, ca. 2004. NPS Photo.*

### ***Ferry Forest***

This irregular shaped parcel of 20 acres was purchased from The Nature Conservancy in 2002. The property has no improvements and consists of a conifer timber forest with approximately 250 feet of frontage along Hill Road, southeasterly of the historic Ferry House.

### ***Keystone Spit***

The NPS purchased a small lot along Keystone Spit, near the Keystone-Port Townsend Ferry Landing, along SR 20, from a private property owner in 2002. This undeveloped lot is 0.17 acres in size and will be retained by the NPS as an access point for wildlife viewing at Crockett Lake.

### ***Other Site Structures***

NPS has interpretive facilities located in ten areas throughout the Reserve. These facilities are located on non-federal lands with two exceptions: the Prairie Overlook and the Prairie Wayside are NPS fee-owned lands. The remaining sites are located on county, state park, Island County Historical Museum, Port of Coupeville, and WSDOT properties.



*Historic Ferry House, Whidbey Island, ca. 2000. NPS Photo.*





*Keystone Spit State Park, Whidbey Island, ca. 2000. NPS*

These facilities are minimally developed with the primary focus being the interpretive panels and scenic views. The panels range from low-profile interpretive mounts (24 inches x 36 inches, metal-framed mounts with fiberglass embedded panels) to 3-sided, wood-frame kiosks (48 inches x 32 inches) with wood-shake roofs holding three fiberglass embedded interpretive panels. Some waysides include a bench, fencing, landscaping, parking areas, a trailhead and/or trail, and a bike rack. The NPS has a total of 5 kiosks and 18 low profile mounts at these waysides throughout the Reserve.

## Site Vegetation

Generally, Reserve facilities are not landscaped. However, around the Cottage and some of the historic buildings such as the Ferry House, Jacob Ebey House, and Gillespie House, non-native plants (some of the original plantings) can be found, including lilacs, daffodils, ground cover, poplars, and fruit trees, which are all likely historic materials and add significance to the properties. All of the above-noted buildings have lawn that requires periodic mowing.

The Reserve promotes the use of hedgerows. The NPS has planted hedgerows consisting of snowberry, Nootka and rugosa rose, wild currant, and other native plants at its waysides. Trees in the area of the Cottage include willows and Douglas firs. Behind the Cottage to the north, two small planting beds were constructed to grow native plants for restoration work elsewhere in the Re-



*Prairie Overlook, Whidbey Island, ca. 2000. NPS Photo.*

serve.

Efforts have been made by NPS and the Trust Board to remove invasive species such as blackberries, hawthorne, poison hemlock, gorse, and scotch broom from government and partner-owned properties.

## Washington State Parks

There are four units of the Washington State Park System within the boundaries of the Reserve. They include Fort Casey State Park, which also administers Keystone Spit State Park and Ebey's Landing State Park at the south end of the Reserve (totaling 457 acres), and Fort Ebey State Park (226 acres), which anchors the northwest area of the Reserve. These areas of public open space are important properties for recreational and educational pursuits by residents and visitors. (See "Recreational Resources" in this chapter.) Forts Casey and Ebey each have their own park managers and staff who operate the four units with funds allocated through the state park system. In 2003, Fort Ebey and Fort Casey state parks began collecting day-use parking fees; this practice was discontinued in 2006. Fort Casey has 35 campsites available and many areas for hiking and walking. Fort Ebey has 54 camping sites and 28 miles of hiking trails, including 3 miles of coastline hiking (Washington State Parks, Fort Ebey State Park 2004). In the area, there are other camping opportunities at adjacent Deception Pass State Park, Rhododendron Park, and in Oak Harbor.

## Island County Historical Museum

Island County Historical Society is a nonprofit, 501(c)(3) organization that owns and operates the museum in Coupeville. The NPS purchased a conservation easement on the property, which enabled the museum to purchase the land and construct the museum building. For many years the Reserve's Trust Board had office space in the building. Rent covered both administrative and exhibit space. After the Trust Board's move to the Cottage in 2002, the museum relocated the exhibit space and no longer charges the Trust Board rent. The museum is important in that it serves as a "defacto" visitor center for the Reserve and provides interpretive materials, including two short videos, for visitors. There are brochure holders on the outside of the museum so visitors can still get information even if the museum is closed, and there are exhibits on the museum porch accessible all the time. The National Park Service has a cooperative agreement with the museum for interpretive and other programs.

## Oak Harbor Air Park

There is one privately owned and operated air park in the north of the Reserve called Oak Harbor Air Park three miles south of Oak Harbor. The airfield is approximately 73 acres and has one paved runway but no airline now provides service to it. Currently, it is only used by private plane owners. There have been recent discussions in the

local newspapers on the benefits of converting the property to public use.

## Utility Systems

Electricity to the Reserve is provided by Puget Sound Energy. The GTE/Qwest and General Service Administration provide telephone service. The town of Coupeville provides domestic water supply and sewer service within town limits; the remainder of the Reserve is served by private wells and septic/drainfield systems. Fire hydrants are located in town and in areas that are platted subdivisions. Currently, fire protection for the NPS-owned facilities in the Reserve is provided by the county volunteer fire departments, at the same level of service as provided to other property owners. None of the NPS-owned facilities have sprinkler systems.



*Island County Historical Museum. ca. 2004. Courtesy of the Island County Historical Society.*