ARCHEOLOGICAL OVERVIEW AND BASEMAP OF AMERICAN AND BRITISH CAMPS 1988

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A TECHNICAL OVERVIEW OF THE PREHISTORIC ARCHAEOLOGY OF THE SAN JUAN ISLANDS REGION

by

GARY C. WESSEN, Ph.D.

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by
Wessen & Associates
15028 24th Avenue SW
Seahurst, Washington 98166

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INTRODUCTION

In the fall of 1986, the National Park Service's Pacific Northwest Regional Office contracted with Wessen & Associates for a series of research products relating to the prehistoric archaeology of the San Juan Islands. These products take the form of two reports: a technical overview of the prehistoric archaeology and a non-technical ethnography. Specified details of the technical overview include: description and review of the currently known archaeological research and resources of this region, recommendations for future research, specific accounts of prehistoric sites on National Park properties, and account of the current locations of all extant archaeological collections, and a series of annotated bibliographies. Specified details of the non-technical ethnography include accounts of subsistence, social organization, technology, and religion.

This report is the technical overview and assessment of the prehistoric archaeology of the San Juan Islands. The scope of the document is the entire San Juan Islands region, but it gives special emphasis to the San Juan National Historic Park properties of American Camp and British Camp*. The report includes background, current conditions, and recommendations, and it is supported by three appendices. Chapters One, Two, and Three present overview discussions of the environmental, ethnographic, and archaeological backgrounds of the San Juan Islands. Chapter Four is an account of the character of the currently known prehistoric cultural resources of the islands. Chapter Five presents discussion of the current status of research finding, and makes a series of specific recommendations for future archaeological research goals in this area. Appendix A is a collection of annotated bibliographies for relevant environmental, ethnographic, and archaeological references. Appendix B contains archaeological basemaps for prehistoric sites at American Camp and British Camp including individual descriptive accounts for each site in each of these areas. Appendix C is a brief summary of all extant archaeological collections from prehistoric sites in the San Juan Islands.

* The National Park Service has specifically requested the use of the term "British Camp" rather than "English Camp". The reader should be aware that a number of existing publications use the latter term.

CHAPTER ONE

ENVIRONMENTAL BACKGROUND

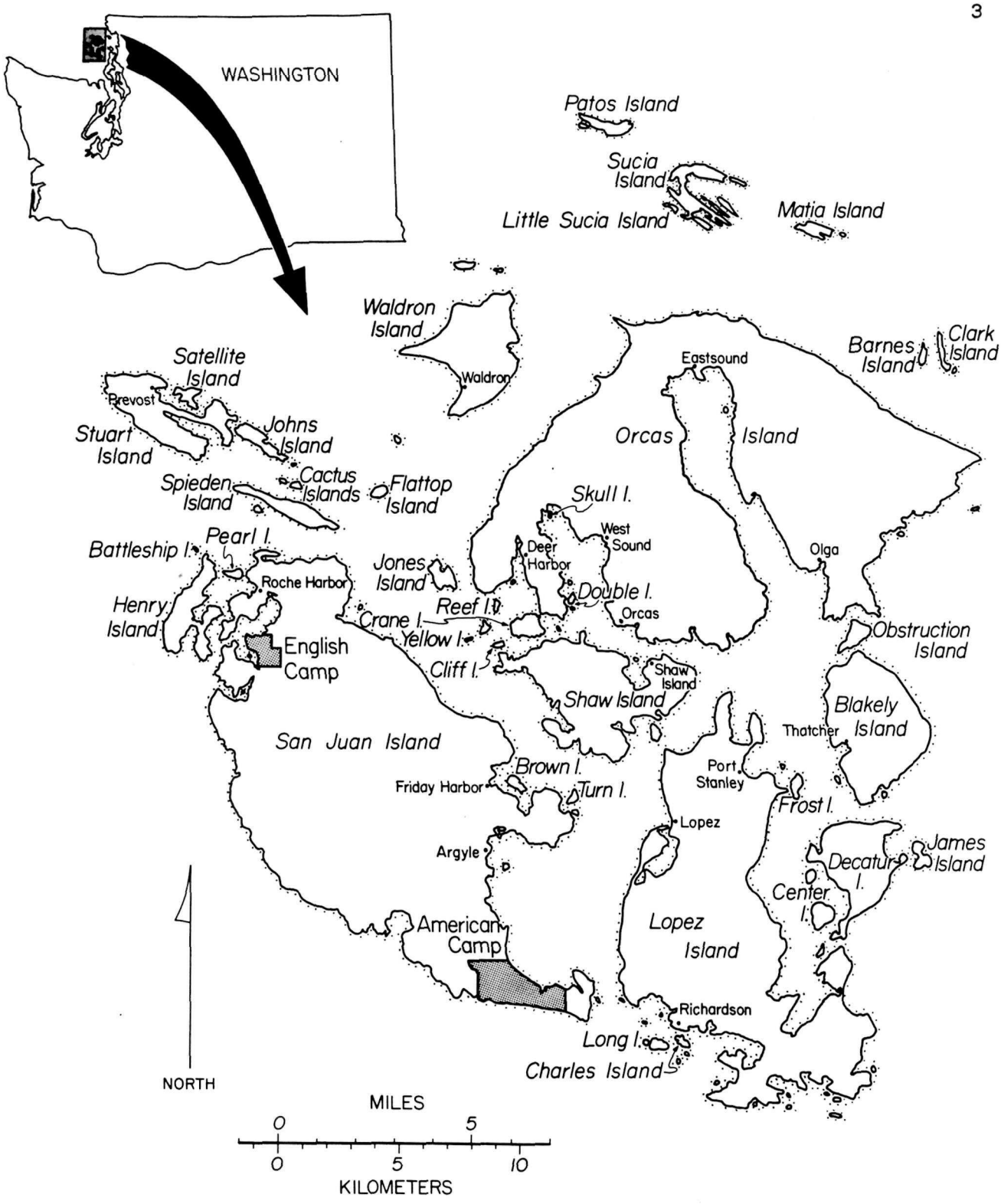
This chapter provides an introduction and overview to the environmental setting of the San Juan Islands. It will review details of the modern environment and present a discussion of the probable range of paleo-environments which have occurred here during the last ca. 18,000 years. In addition, it will provide brief accounts of the specific environmental character of the San Juan National Historical Park. While this environment is of interest because it is the setting of human occupations, it is the environment, and not the cultural behaviors, which is of concern here. Environmental aspects of the archaeological resources of the islands are considered in subsequent chapters in this volume; ethnographic and probable late prehistoric patterns of environmental use are considered in the accompanying ethnographic volume (Wessen 1988).

The San Juan Islands, as a physiographic unit, represent a group extended into several political jurisdictions. The Gulf Island of British Columbia can be considered members of the group. Similarly, islands in San Juan, Skagit, and Whatcom Counties of Washington can also be regarded in the group. For the purposes of this study, the term "San Juan Islands" will be restricted to the islands of San Juan County; other nearby islands will be referred to by name.

San Juan County is situated in the northwestern part of the state of Washington (see Map 1). The county consists of a mass of islands, rocks, and reefs located in the northern part of Puget Sound, between the Washington mainland and southern Vancouver Island. At high tide, the county includes at least 428 islands, rocks, and reefs, although only about 175 of the islands are large enough to have names. In total, the county has approximately 172 square miles of ground surface and more than 376 miles of marine shoreline. The vast majority of the ground surface is represented by a small number of relatively large islands including: Orcas, San Juan, Lopez, Shaw, Decatur, Blakely, Waldron, Stuart, Speiden, and Sucia.

THE MODERN ENVIRONMENT

This section provides an overview of the contemporary environmental setting of the San Juan Islands. It will include: climate, landforms, geology and soils, flora, and fauna.



Map 1. The San Juan Islands Region.

Climate

The San Juan Islands are characterized by a moist maritime climate; summers are cool and dry, winters are mild and moist (Schlots et. al. 1962). The islands are protected by a "rainshadow effect" from higher mountains to the west on the Olympic Peninsula and Vancouver Island and this "rainshadow" results in an unusually low annual precipitation for the area. Thus, while similar lowland areas in southern Puget Sound get 40 to 50 inches and nearby mountains may exceed 150 inches, most of the islands receive a total of less than 30 inches per year. Nevertheless, accumulations may vary considerably between islands or between different portions of the same island. Most precipitation occurs during the winter months and snowfall is rare. The predominant storm track in this area flows from the west and southwest; an occasional winter storm comes in from the northeast.

Air temperatures are moderate throughout the year. Winter temperatures average around 40 degrees (F); summer temperatures average around 60 degrees (F). The growing season in the islands is typically about 226 days.

Landforms

The San Juan Islands represent the exposed tops of a submerged range of mountains which extend from Vancouver Island to the Washington mainland (McClellan 1927). The islands show considerable relief, marked both by numerous rocky knobs and broad glaciated plains (see Map 2). Orcas is the most mountainous island with a high point at Mt. Constitution of 2,409 feet above sea level, and 14 other mountains in the islands exceed 1,000 feet. The glaciated plains and basins of the islands are low lying, gently rolling surfaces; Lopez has the greatest extent of these areas. Most portions of the islands are well drained and, given the low precipitation, there are only a few deeply entrenched drainageways.

The abrupt relief of the island landscapes also extend to the nearshore areas around the islands. Channels between the islands are typically narrow and deep, and depths between 600 and 1,000 feet are not uncommon. At the same time, these waters also are marked by numerous shoals, reefs, and other shallow obstructions. Tidal movements between the Strait of Georgia and the Strait of Juan de Fuca cause large volumes of salt water to move through these channels and significant riptides form in many places. Normal annual tidal range for the islands is about 10 feet.

The shorelines of the San Juan Islands are rugged and irregular. In most places the shore is rocky, although numerous sandy and gravelly beaches are also present. Shorelines are convoluted and contains many protected coves and bays. Several large fiord-like bays occur in the county; most notably East and

Map 2. Landforms of the San Juan Islands.

West Sounds on Orcas Island.

Since shorelines are a principal focus of interest for this study, it is worthwhile to consider them in somewhat greater detail. The modern shorelines of the San Juan Islands were shaped by the action of nearshore winds and waters on the land. For the purposes of this discussion, all coastal landforms will be considered in terms of whether they represent the products of depositional or erosional processes (Downing 1983). Beaches are understood to be segments of the shoreline where there is a supply of unconsolidated sand and gravel that can be moved by waves; they may be either depositional or erosional.

Depositional beaches form where the supply of sediments exceeds the capacity of the waves to remove them. The actual shape of such structures is influenced by tidal action, the shape and character of the adjacent shoreline, and the quantity and character of the available sediments. Deltas are formed where streams deposit sediments into estuaries or other coastal areas; they are not common in the islands. Tide flats and landscape trap beaches form where shoreline features cause nearshore currents to drop sediments. Spits form where the nearshore transport of sediments is diverted by a change in the alignment of the coast. Spits tend to straighten the shoreline in time; they bridge gaps across irregularities in the coast and create lagoons behind the new beach (Spit-Lagoon Complexes). Ultimately the lagoon silts in and the spit disappears. Cuspate forelands and tombolos may be thought of as more complex forms of spits. Cuspate forelands are triangular spits produced in areas where currents meet. Tombolos are spits which form in the lee of small nearshore islands. Lagoons may be present in either cuspate forelands or tombolos, and developed backshore areas may occur with any of these forms. All of the above spit formations are common in the San Juans.

Erosional beaches form where wave energy is sufficient to remove much of the available sediments. Erosional beaches and eroding bedrock outcrops account for the majority of the San Juan shorelines. Most erosional beaches in the islands have a similar form; they are usually a gravel and/or cobble dominated beach face in front of a wave cut terrace. The terraces are composed of glacial sediments and as they erode they leave an accumulation of the materials too large for the waves to remove. The beaches lack a developed backshore. Typically, the top of the beach face is marked by an exposed bank and the top of the terrace contains a thick cover of forest vegetation.

Geology and Soils

The San Juan Islands are composed of a wide variety of rock types arranged in a highly complicated structure. Further, these islands have been exposed to a variety of conditions which have deformed and obscured their bedrock and some basic interpretations of the islands geologic history and structure have been a

matter of debate (Vance 1975). For the purposes of this consideration it will be necessary only to briefly review the basic characteristics of the islands' geologic history, mineralogy, and soils.

The geologic history of the San Juan Islands shares much in common with the nearby Cascade Mountains (McKee 1972). The islands are composed of a basement of ancient Precambrian or Early Paleozoic (prior to ca. 300 million years ago) crystalline rocks mantled by a eugeosyncline, or trough-like basin, of rocks of Late Paleozoic to Early Mesozoic age (ca. 300 million to 200 million years ago). This latter structure has since been faulted, partially overlain with Tertiary (ca. 60 million to 2 million year old) deposits, and then scoured by glacial ice. Given this history, the islands contain a very wide variety of rock materials representing almost the full range of geologic time. Most of the oldest rocks are igneous materials: gabbros and quartz diorites of the Turtleback Complex. Above the Turtleback rocks are formations of other igneous rocks and limestones of Paleozoic and Early Mesozoic age. The later formations are heavily weighted toward sedimentary rocks; these deposits contain a variety of sandstones, siltstones, and conglomerates. In addition to the native rocks, large quantities of glacial erratics also occur in the islands. Granites are the most conspicuous of this latter group.

Above their bedrock foundations, the islands are mantled with a variable depth of Quaternary (less than 2 million year old) sediments. They include a range of glacial tills and outwash deposits, as well as Holocene, or post-glacial, alluvium and colluvium (redeposited glacial materials). The Soil Survey for San Juan County (Schlots et. al. 1962) recognizes 38 soils for this area, but this complexity may be reduced to four major soil associations. The Bellingham-Coveland-Bow and Roche-San Juan Associations are the two most common and widespread groups. The former includes poorly drained soils of the basins and glacial plains. The latter tend to be better drained soils of the uplands and other rocky settings. The San Juan-Everett and Pickett-Rock land Associations are both groups that occur on well drained slopes and glacial outwash. Both are of more limited extent, although soils of the Pickett-Rock land group are widespread on Orcas Island. Members of all groups tend to be gravelly or stony, and they are often of relatively shallow depth.

Flora

The San Juan Islands have a rich diversity of plant communities which share much in common with those from elsewhere in western Washington. Including introduced forms, more than 800 species of vascular plants are known to occur here (Atkinson and Sharpe 1985). From a broad regional perspective, Franklin and Dyrness (1973) consider all Puget Lowland forests to be in their

Tsuga Heterophylla Zone, a dense climax forest dominated by Western Hemlock (Tsuga heterophylla), Douglas Fir (Pseudotsuga menziesii), and Western Red Cedar (Thuja plicata). However, both the "rainshadow" influence of low annual precipitation and the very insular nature of their setting have resulted in communities which are in some contrast to those on the mainland. The San Juans contain some species generally more typical of eastern Washington and, conversely, other plants which are common to the west side of the Cascade Mountains are virtually unknown here. Thus, much of the San Juan Islands host plant communities which are somewhat atypical of the regional Tsuga Heterophylla Zone.

There has been relatively little formal study of the Island plant communities, but important contributions have been made by Atkinson and Sharpe (1985) and Fonda and Bernardi (1976). Both of these studies have proposed very similar suites of local plant community types, and the present discussion employs a scheme of plant communities using nearly the same units. The community types are considered to be generalized associations of plants determined by topography, air temperature, wind, soil moisture, and other factors. Most plant communities have reasonably consistent physiographic expression, although some are more variable than others. The entire range of San Juan Islands floral landscapes can be considered to be composed of ten such plant community types; the types, their physiographic expression, and a few of their most characteristic species are summarized below.

1. Meadow/Grassland. This community occupies open wind swept south-facing slopes and flat areas near the shore. The group is dominated by grasses such as Festuca idahoensis and Bromus sterlis. Trees such as Douglas Fir (pseudotsuga menziesii) and White Oak (Quercus garryana) are often present as scattered individuals, but this community is open parkland.

2. Rocky Bald. Rocky bald plant communities occur on bedrock outcrops with thin soil cover of any aspect and many are situated near the shore. This community also contains the occasional oak, Pacific Madrona (Arbutus menziesii), or Rocky Mountain Juniper (Juniperus scopulorum), but it is also open parkland. The most common plants here are smaller drought resistant forms such as Selaginella (Selaginella wallacei) and several types of Stonecrop (Sedum spp.).

3. Open Transitional Forest. This is the forest community for all the south-facing nearshore areas; it is transitional between the south-facing grasslands and the more densely timbered Dry Coniferous Forest. The community is dominated by Douglas Fir and Pacific Madrona. Typically the understory is very brushy and plants such as Ocean Spray (Holodiscus discolor), Snowberry (Symphoricarpus albus), and Nootka Rose (Rosa nootkanensis) are well represented.

4. Dry Coniferous Forest. The Dry Coniferous Forest is the forest community of exposed north-facing nearshore areas and gently rolling interior settings below approximately 2,000 feet. It is dominated by dense stands of Douglas Fir and Western Red

Cedar (Thuja plicata). Salal (Gaultheria shallon) is extremely common in the understory.

5. Moist Mixed Forest. This is the forest community of protected north-facing slopes and interior valleys. Here, Douglas Fir and Red Cedar are mixed with Big Leaf Maple (Acer macrophyllum) and other trees. Sword Fern (Polystichum munitum) is a dominant understory plant.

6. Upland Forest. The Upland Forest is present at elevations greater than 2,000 feet which occur only near Mt. Constitution on Orcas Island. The community is dominated by stands of Western Hemlock (Tsuga heterophylla) and Lodgepole Pine (Pinus contorta). This is the islands only montane plant community; it is also the one which most closely resembles the regional Tsuga Heterophylla Zone of Franklin and Dyrness (1972).

7. Saltwater Shoreline. This is the community of beach backshores, estuaries, and spit and/or lagoon margins. It may contain the Hooker's Willow (Salix hookeriana) and any of a wide variety of salt tolerant forms such as Orache (Atriplex patula), Arrow Grass (Triglochin maritimum), and yellow Verbena (Abronia latifolia).

8. Freshwater Shoreline. The community of lake, stream, and marsh margins; examples of this group often merge into the larger forest communities which surround them. The Freshwater Shoreline community is most clearly marked by understory plants such as Slough Sedge (Carex obnupta), Cow Parsnip (Heracleum lanatum), and Bedstraw (Galium trifidum).

9. Disturbed Forest. This group includes a variety of second growth forest settings including old timber harvest sites and fire scars. While virtually any type of tree may be present, the community is usually characterized by a relatively high proportion of Red Alder (Alnus rubra).

10. Disturbed Open Land. This group includes a variety of disturbed open settings, but it most typically is an abandoned agricultural field. Such plots are invaded by a wide variety of both native and introduced plants. Thistles (Cirsium spp.) Blackberry (Rubus discolor) and Bracken Fern (Pterridium aquilinum) are all common.

Fauna

The San Juan Islands have rich faunal resources much like those of other nearby portions of the southern Northwest Coast. The islands and their nearshore waters host a broad range of marine fish and shellfish, marine mammals, and birds. However, the terrestrial mammal fauna here is much reduced as compared to the mainland. Most of the islands' wildlife are highly mobile and many are present only seasonally. Terrestrial birds and mammals are wide ranging and many are present in several of the plant communities noted above.

The islands are best known for their marine faunas and nearshore waters can contain large numbers of marine and anadrom-

ous fish. Salmon (Oncorhynchus spp.) are the most conspicuous of these and all five species - Chinook (Oncorhynchus tshawytscha), Coho (O. kisutch), Pink (O. gorbuscha), Chum (O. keta), and Sockeye (O. nerka) - are present. While the islands have only limited spawning grounds themselves, a large proportion of the returning Fraser River salmon pass through the islands. Other prominent marine fishes in the area include Dogfish (Squalus acanthias), Pacific Cod (Gadus macrocephalus), Lingcod, (Ophidon elongatus), Herring (Clupea hareengus), and several varieties of Sea Perch (Embiotocidae) and Sculpin (Cottidae).

Intertidal and subtidal portions of the islands contain large marine invertebrate populations, and both infaunal and epifaunal communities occur. The most important infaunal bivalves include the Steamer Clam (Protothaca staminea), Butter Clam (Saxidomus giganteus), Bentnose Clam (Macoma nasuta), and Basket Cockle (Clinocardium nuttalli). The epifaunal community contains only a single widespread bivalve, the Blue Mussel (Mytilus edulis). The epifaunal community also contains a relatively higher proportion of gastropods such as limpets (Acmaea spp.) and dogwhinkles (Thais spp.) and chitons such as the Black Katy (Katherina tunicata). Sessile barnacles (Balanus spp.) are very common in the islands and both crabs (Cancer spp.) and echinoids (Stronglyocentrotus spp.) are locally abundant.

A very broad range of birds are either permanent or seasonal residents of the San Juan Islands and more than 100 species probably occur here (Richardson 1976). The islands' avian fauna may be considered to be composed of interior (forest and meadow) birds, shore-associated birds, and marine or offshore birds. Common interior birds include the Raven (Corvus corax), Pileated Woodpecker (Dryocopus pileatus), Winter Wren (Troglodytes troglodytes), Barn Swallow (Hirundo rustica), and Goldfinch (Spinus tristis). Shoreline birds include the Great Blue Heron (Ardea herodias), Common Crow (Corvus brachyrhynchos), Kingfisher (Megaceryle alcyon), and Glaucus-winged Gull (Larus glaucens). Marine birds represent the greatest proportion of transient species; they include cormorants (Phalacrocorax spp.), grebes (podiceps spp.), and alcids.

The nearshore waters of the San Juan Islands contain significant populations of marine mammals and, like the birds, they include both seasonal and year round residents. Harbor Seals (Phoca vitulina) are probably the most common marine mammals, although California Sea Lion (Zalophus californianus), Northern Sea lion (Eumetopias jubata), and Northern Elephant Seal (Mirounga angustirostris) may also occur (Everitt, Fiscus, and Delong 1980). Harbor Porpoise (Phocoena phocoena) and Dall Porpoise (Phocoenoides dalli) are frequently seen around the islands, as are Orcas (Orcinus orca) and Minke Whales (Balaenoptera acutorostrata).

The terrestrial mammal faunas here are, relatively speaking, limited and weighted toward the smaller mammals. Black Tail Deer (Odocoileus hemionus) are common and Elk (Cervus canadianus) were

formerly present, but the islands' largest terrestrial predator is probably the River Otter (Lutra canadianus). Among smaller mammals, Raccoons (Procyon lotor) and the Douglas Squirrel (Tamiasciurus douglasii) are probably the most conspicuous. The most diverse groups of mammals here are rodents and bats.

PALEO-ENVIRONMENTS

This section presents a discussion of the probable range and sequence of paleo-environments which have occurred in the San Juan Islands since the onset of the last major glacial advance (ca. 18,000 years ago). In contrast to the preceding accounts, this discussion will be somewhat more broadly based as there has been very little direct study of paleo-environments within the islands themselves. As such, the San Juan Islands will be considered within the context of paleo-environments of western Washington as a whole. The discussion will include: chronology, stratigraphy, sea levels, paleo-climate, paleo-flora, and paleo-fauna.

Chronology

The period considered in this discussion includes the last major glacial advance of the Late Pleistocene (prior to ca. 10,000 years ago) and the subsequent Holocene (ca. 10,000 years ago to the present). In this regard, it should be noted that although subdivisions of both Pleistocene and Holocene are essentially climatic, Pleistocene subunits are tied to glacial events and their associated depositional strata, while Holocene units are more typically manifest in plant communities. The last major glacial episode in this region is generally referred to as the Fraser Glaciation (Crandell 1965). It is roughly equivalent to the Late Wisconsin glacial episode of the midcontinental North American sequence and the Late Wurm glacial episode of the western European sequence. In lowland western Washington, the Fraser Glaciation is normally divided into three sub-units: the Vashon Stade, the Everson Interstade, and the Sumas Stade. The Holocene is normally divided into the sub-units: the Early Postglacial, the Hypsithermal, and the Late Postglacial or Neoglacial.

The onset of Fraser Glaciation is marked by the Vashon Stade, a major advance of a lobe of the Cordilleran ice sheet into western Washington. While the actual time of arrival of the ice sheet in the San Juan Islands is not known, dates available to the north and to the south suggest that it was probably ca. 18,000 years ago (Easterbrook 1969 and Clague, Armstrong, and Mathews 1980). The Vashon Stade ice front reached its maximum advance, in the vicinity of Tenino, Washington, by ca. 14,000 years ago. At this time the thickness of ice overlying the San Juan Islands was probably in excess of 4,000 feet.

The Vashon Stade is followed by the Everson Interstade. This period is marked by the invasion of sea water into the region with the retreat of glacial ice. Here again, an actual date for the retreat of the ice from the San Juans is not known, but dates associated with Everson Interstade deposits in the islands suggest that it was ca. 13,000 years ago (Easterbrook 1969).

The final phase of the Fraser Glaciation is the Sumas Stade, a second advance of the Cordilleran ice sheet. In comparison to the Vashon, the Sumas advance is a much smaller event. The Sumas Stade ice front attained its maximum extent ca. 10,500 years ago, at which time it had reached into the northern portions of Whatcom County, Washington. There is no direct evidence of the Sumas Stade ice from the San Juan Islands. The end of the Sumas Stade, and the end of the Late Pleistocene, are generally placed at ca. 10,000 years ago.

As noted above, subdivisions of the Holocene are climatic units which are usually manifest in plant communities (which will be discussed below). Further, there has been no direct study of these units within the San Juan Islands and therefore their duration can only be approximated.

The Early Postglacial is the first major subdivision of the Holocene. The climate during this period was generally cool and moist, but warmer than that which marked the end of the Pleistocene. Climatic conditions continued to improve through the Early Postglacial and, near its end, the climate probably approximated that of today. In the San Juan Islands, the Early Postglacial extends from ca. 10,000 to 8,000 years ago.

The Hypsithermal is the longest interval of the Holocene. The period saw continued amelioration in climatic conditions and mean annual temperatures over much of this time were probably higher than those of the present. In the San Juan Islands, the Hypsithermal extends from ca. 8,000 to 3,000 years ago.

The Late Postglacial is the last portion of the Holocene. The Late Postglacial period is characterized by a decline in the warm climatic conditions which peaked during the Hypsithermal. While the decline was not constant, a retreat to cooler conditions is clear and this trend resulted in the modern climate of the San Juan Islands.

will be considered to extend from ca. 10,000 to ca. 8,000 years ago; the Hypsithermal from ca. 8,000 to ca. 3,000 years ago, and the Neoglacial from ca. 3,000 years ago to the present (Heusser 1960).

Stratigraphy

Paleo-environmental insights derived from regional stratigraphic units are based upon inferences about the depositional environments of these units. As noted above, the identification of such depositional units is largely restricted to the Late Pleistocene portion of the temporal period under consideration

here.

Two major regional stratigraphic units are associated with the Vashon Stade: the Esperance Sands and the Vashon Till (Easterbrook 1969). The Esperance Sands are gravelly sands deposited on a broad outwash plain to the south of the advancing Vashon ice sheet. Esperance Sand deposits are widespread in the San Juan Islands and elsewhere in the Puget Lowland. With the arrival of the Vashon ice, Vashon Tills begin to be deposited on top of the proglacial sands. Vashon Till is usually a fairly compact, poorly sorted mixture of boulders, pebbles, sand, silt, and clay; it includes both lodgment till and ablation till deposits. Vashon Tills are extremely common and widespread in the islands; they lie uncomformably on a wide variety of older units ranging from the Esperance Sands to paleozoic bedrock.

The Everson Interstade is marked by the Everson Glaciomarine Drift (Easterbrook 1969). It is a poorly sorted till-like matrix of pebbly silt and clay which was deposited in sea water. Marine shellfish living on the sea floor were occasionally buried by these sediments and so many Everson Glaciomarine Drift deposits are fossiliferous. These drift deposits mantle much of the landscape at lower elevations in the San Juan Islands, but they are often discontinuous due to subsequent local erosion.

The Sumas Stade is associated with a range of till, outwash, and ice-contact sediments collectively referred to as Sumas Drift (Armstrong et. al. 1965). The Sumas Drift lies directly upon Everson Glaciomarine deposits in areas to the north and east of the San Juan Islands; it does not occur in the islands themselves.

The vast majority of the soils which cover the modern ground surface of the San Juan Islands are Holocene formations which have developed from the above described Late Pleistocene sediments, notably the Vashon Tills and the Everson Glaciomarine Drift. As the soils developed in situ, they became less directly effected by sedimentry depositional environments. Post-depositional conditions which have influenced them probably include climate, relief, biota, and time. Unfortunately, however, there have been no direct studies of these dynamics in the islands.

Sea Levels

The northwestern Washington region has experienced considerable change in relative sea levels during the last ca. 18,000 years (Mathews, Fyles, and Nasmith 1970). Changes in relative sea level reflect complex land-sea relationships, and they may have eustatic, isostatic, and tectonic components. Eustatic effects are those which reflect changes in the actual volume of water in the ocean basins; changes in the volume of sea water result in direct changes in the levels of the oceans. In contrast, isostatic and tectonic effects are vertical movements of land masses which are independent of the volume of water in

the ocean basins. Isostatic movements are expressions of the compression, and subsequent rebound, of land masses which were covered by glacial ice. Tectonic movements are expressions of the earth's internal heat-flow properties which result in the so-called "floating" behavior of the continents. The changes of interest here have been largely, though not wholely, related to the dynamics of Late Pleistocene glaciation, and they have undoubtedly had a major impact on the landscape of the San Juan Islands.

During the Fraser Glaciation, worldwide sea levels were probably eustatically depressed several hundred feet (Curry 1965). The worldwide eustatic curve suggests that sea levels rose rapidly following the Late Pleistocene glacial maximum, and that they reached close to modern levels by ca. 6,000 years ago. In the second half of the Holocene, sea levels continued to rise, but at a substantially slower rate. However, local interpretation of this general sea level curve must be tempered by knowledge of local isostatic and tectonic effects.

At the onset of the Vashon Stade in this region, it is likely that depressed sea levels dramatically changed the configuration of the San Juan islands. Compared to the present, a smaller number of larger islands probably existed; some islands merged together and others merged with the mainland. With the coming of the ice sheet, the islands were wholely overridden and sea levels are not an issue.

The end of the Vashon Stade saw the return of sea water to this area and the Everson Interstade is marked by sediments deposited in marine contexts throughout the islands. Everson Glaciomarine Drift deposits currently are known to occur at elevations as high as +250 feet on Orcas Island; similar deposits on the mainland just to the east of San Juans are found at elevations of +400 feet (Easterbrook 1963). This distribution of marine deposits indicates substantial isostatic depression of the region at this time. Compared to the present, a smaller number of smaller islands probably existed.

Following the Everson Interstade, a number of effects combined to lower relative sea levels in the region. Climatic conditions which triggered the Sumas Stade probably resulted in a brief eustatic lowering. After the Sumas episode, the generally upward trend of the eustatic curve appears to have competed with an isostatic rebound effect, at least early in the Holocene. During the period ca. 9,000 to ca. 6,000 years ago, relative sea levels stood as much as -35 feet below the modern shore line over much of the area. Sea levels approximating those of the present first appear ca. 5,500 years ago.

Paleo-Climate

Climate is the underlying variable implied by most paleo-environmental conditions reviewed in this discussion of the last ca. 20,000 years in the San Juan Islands. Here again however,

there has been virtually no direct study of paleo-climates in the islands and this account must rely upon generalizations from a broader geographic area. In broadest terms, the period includes the Late Pleistocene and the Holocene, and the former may confidently be considered to have been colder than the latter. More detailed assessments of climatic conditions have been developed from study of pollen assemblages and marine oxygen isotope ratios (Heusser 1977 and Heusser, Heusser, and Streeter 1980).

In general, the Late Pleistocene of this region is considered to have been substantially cooler and drier than the present. The mean July temperature during the Vashon Stade has been estimated to have been approximately 7 degrees (C) lower than the contemporary July mean (Heusser 1977). Precipitation at this time was probably reduced, but specific estimates are not available. Mean temperatures rose significantly during the following Everson Interstade, and then decline somewhat during the Sumas Stade. The mean July temperature during the Sumas Stade maximum was approximately 4 degrees (C) lower than the contemporary July mean. Mean annual precipitation appears to have increased along with temperature, but was probably still below modern levels.

The Holocene began with continuation of the increasing mean temperature and precipitation trends which followed the Sumas maximum. Nevertheless, the Early Postglacial period in the northwest was probably slightly cooler than the present. Mean temperatures continued to rise during the first half of the Hypsithermal; by ca. 6,000 years ago the July mean was approximately 2 degrees (C) higher than its contemporary equivalent. Precipitation patterns appeared to have varied during this time, but much of the Hypsithermal was probably reasonably moist. The period closed with declining mean temperatures and strongly humid conditions. The subsequent Neoglacial was briefly marked by mean temperatures slightly cooler than the present, then rising to essentially modern conditions.

Paleo-flora

The range of climatic and climatic-related conditions which have occurred over the last ca. 18,000 years have undoubtedly been reflected in dramatic changes in plant communities in the San Juan Islands during this period. While pollen studies elsewhere in the region (Heusser 1977 and Mathews and Heusser 1981) provide the broad patterns, it is important to note that direct data from the islands is not available. This qualification is significant because, as noted above, the islands' insularity and "rainshadow" location support modern plant communities in some contrast to those typical to most of western Washington.

Much of the Late Pleistocene of western Washington was characterized by open tundra and parkland plant communities. In

the San Juans Islands, ca. 18,000 years ago, steppe-like plant communities dominated by grasses (Gramineae), sedges (Cyperaceae), composites (Compositae) and a variety of herbaceous and shrubby forms were probably present. When the Vashon Stade ice reached and overrode the islands, all such local plant communities must surely have been removed. When the ice later retreated, similar communities probably reappeared. During the Everson Interstade Lodgepole Pine (Pinus contorta) and Red Alder (Alnus rubra) became more common in western Washington, but the landscape was still relatively open. There is a brief dominance of pine-spruce-hemlock pollens during the Sumas Stade, then the Pleistocene ends with continuation of the ameliorating trends begun during the previous Everson period.

It should be mentioned that Late Pleistocene pollen data from Sequim, Washington, indicates that an open herb-and-shrub dominated landscape persisted there until ca. 11,000 years ago (Petersen, Mehringer, and Gustafson 1983). This persistence is attributed to relatively drier conditions, in part due to the same "rainshadow" which shields the San Juan Islands. As such, it seems likely that similar xeric open communities also persisted in at least some portions of the islands.

The Holocene of western Washington opens with improving climatic conditions manifest in rising percentages of Douglas Fir (Pseudotsuga menziesii) and Red Alder. The maxima for these trees occurs during the early Hypsithermal (ca. 7,000 years ago). After this time, Western Hemlock (Tsuga heterophylla) slowly became more important; the modern Tsuga Heterophylla Zone proposed by Franklin and Dyrness (1973) probably emerges ca. 3,000 years ago.

In broad terms, the Holocene history of the San Juan Islands is probably similar to the rest of the region. The islands clearly experienced the amelioration of the first half of the Holocene, but the widespread Neoglacial Western Hemlock forest is only weakly developed there. Rather, the late postglacial plant communities of the islands reflect their own relatively drier and more isolated conditions. Nevertheless, it is probably the case that forest communities in the islands expanded during the later Holocene, just as they did elsewhere in western Washington.

Paleo-fauna

Wild animal populations in the San Juan Islands have also undergone significant changes due to climatic, and climatic-related, conditions during the last ca. 18,000 years. As was the case with the flora however, there has been only very limited direct study of this subject in the islands. Further, the available Late Pleistocene Paleontological data (Shaw 1972, for example), emphasizes mollusca and other invertebrates rather than the vertebrate animals of interest to this study.

It is likely that the succession of faunas in the San Juan Islands during the last ca. 18,000 years both closely mirrored

the broader regional pattern and retained the character of insularity which marks them now. Prior to, and shortly after, the presence of glacial ice, the peri-glacial conditions of most of northern Washington surely included the islands. The late Pleistocene fauna of this period included both large now-extinct forms of elephants, camels, and bison, and surviving forms such as elk and caribou. In fact, all of the large mammals, birds, and fish present in the Early Holocene were also present in the Late Pleistocene. The major distinction between the faunas is the loss of many large terrestrial mammals at the end of the Pleistocene.

Against this regional background, the insularity of the islands must be considered. While their configurations may have changed considerably, it is likely that islands were present here whenever the area was ice free. Thus, it may be that many of these areas were relatively isolated throughout much of the Late Pleistocene, and that they did not support significant numbers of the large terrestrial animals which marked this period. The Holocene fauna of the islands reflects this insularity. It is most diverse among birds and fish which enjoy easy access to the area; terrestrial mammals, on the other hand, are limited. As compared to the contemporary mainland fauna, the island mammals are less diverse and they tend toward smaller and more mobile forms such as rodents and bats. It seems likely that this tendency toward a reduced terrestrial fauna also characterized the Late Pleistocene here.

SAN JUAN NATIONAL HISTORIC PARK

This section provides a brief introduction and overview of the environmental character of the San Juan National historic Park. The Park consists of a total of 1,751 acres divided between two park properties - American camp and British Camp - on San Juan Island (see Map 1). They mark the locations of the American and British garrison camps which occupied the island during and after the so-called "Pig War" of 1859 (Richardson 1971). Each of these properties represents a different combination of environmental settings and each will be discussed below.

American Camp

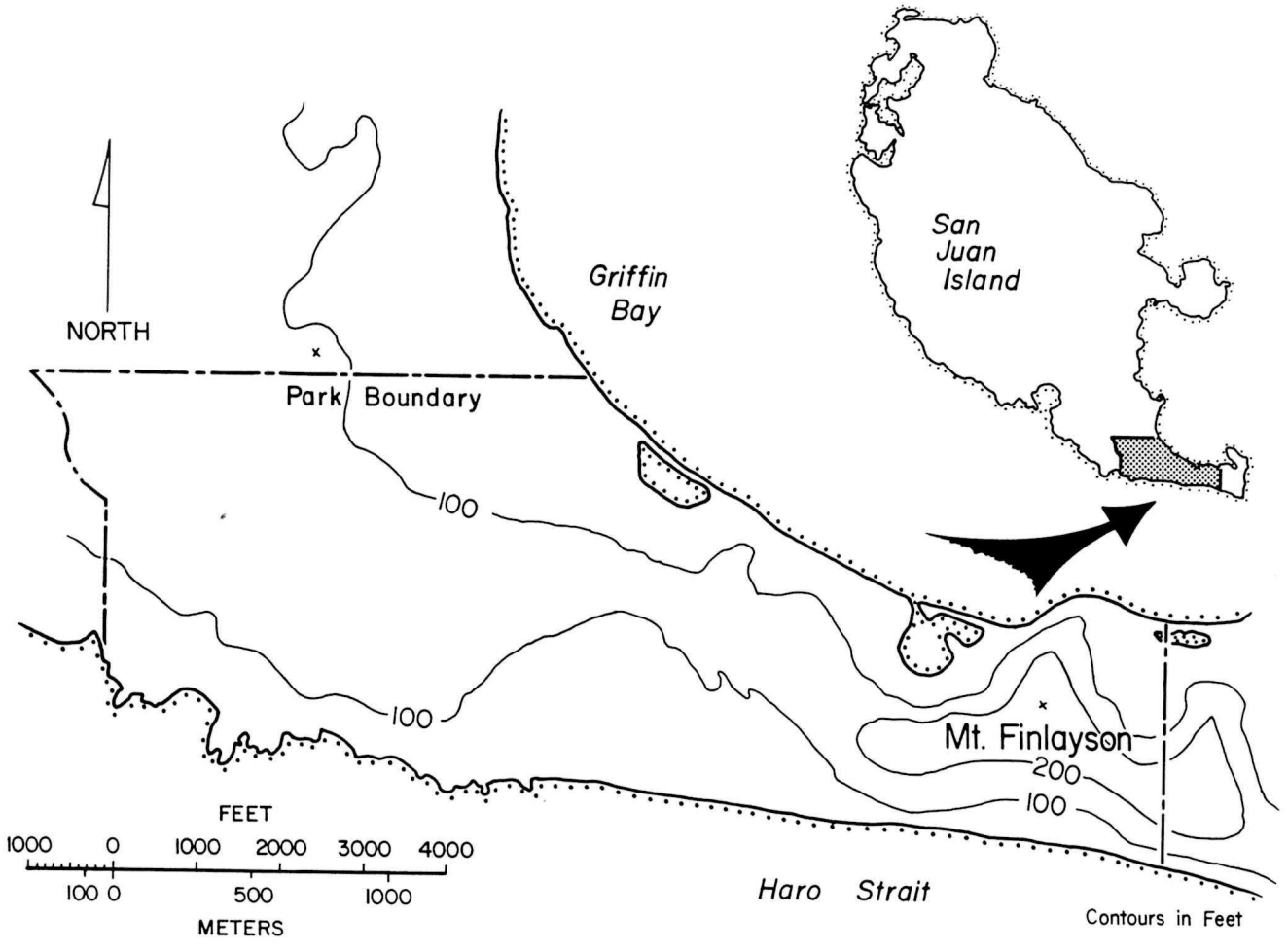
American Camp, at 1,205 acres, is the larger of the two park properties. It occupies a broad strip completely across much of the southeastern end of San Juan Island (see Map 3). On its southern shore, along Haro Strait, the park extends from the east side of Eagle Cove to a point approximately 1 mile east of Cattle Point. Along Griffin Bay, the park's northern shore is substantially shorter.

The most dominant feature of the American Camp landscape is

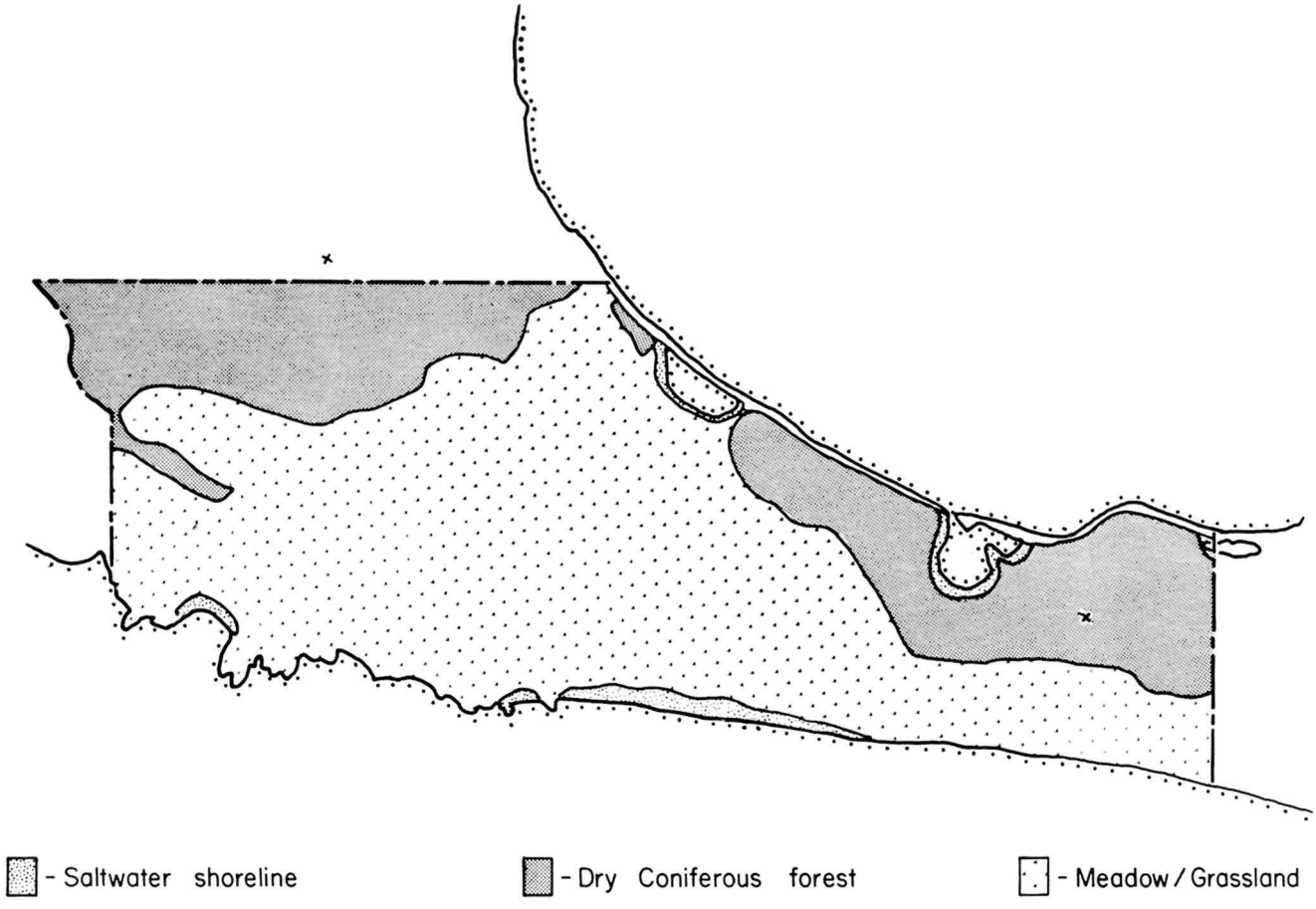
a Vashon Stade recessional moraine marked by Mt. Finlayson, a large ridge which rises to +295 feet in the eastern portion of the park. To the south and west of Mt. Finlayson, is a broad sloping plain with several marine terraces. The beach here has both depositional and erosional features, but it appears to be largely depositional and it has developed a thick mantle of stranded drift logs. Offshore, a large shallow submarine bank (Salmon Bank) is present to the southeast; to the southwest, the water gets deep very quickly. To the north and west of Mt. Finlayson the slope is somewhat steeper with less clearly developed terraces. The northern shore is marked by three large spit-lagoon complexes in varying stages of development. Erosional cut-bank beaches occur between them. Offshore, the waters of Griffin Bay are relatively shallow.

Being dominated by the Mt. Finlayson moraine feature, virtually all soils at American Camp are developed from glacial sediments. To the south and west, the broad sloping plain is covered with San Juan Series soils; gravelly sandy loams on the ridge flank and stoney sandy loams further west. This side is also marked by several areas of sand deflation and active sand dune development. On the northern side of Mt. Finlayson the upper slopes are an Everitt Stoney Sandy Loam. Roche Stoney Loams cover the lower slopes.

Plant communities mantle virtually the entire landscape of American Camp and their distributions reflect the topographic and edaphic variations represented by Mt. Finlayson and its lower flanks (see Map 4). Most of the broad south and west facing slope is covered by an open wind-swept Meadow/Grassland plant community. Along its base, in small protected pockets, are examples of Saltwater Shoreline communities. The top of Mt. Finlayson and most of its northern side is covered by a developed Dry Coniferous Forest plant community. The spit-lagoon areas on this northern side also support Saltwater Shoreline communities, but as compared to the south, these areas are much more extensive and here they include a variety of brackish water plants.



Map 3. American Camp, San Juan National Historic Park.



Map 4. The Approximate Distribution of Local Plant Communities at American Camp, San Juan National Historic Park.

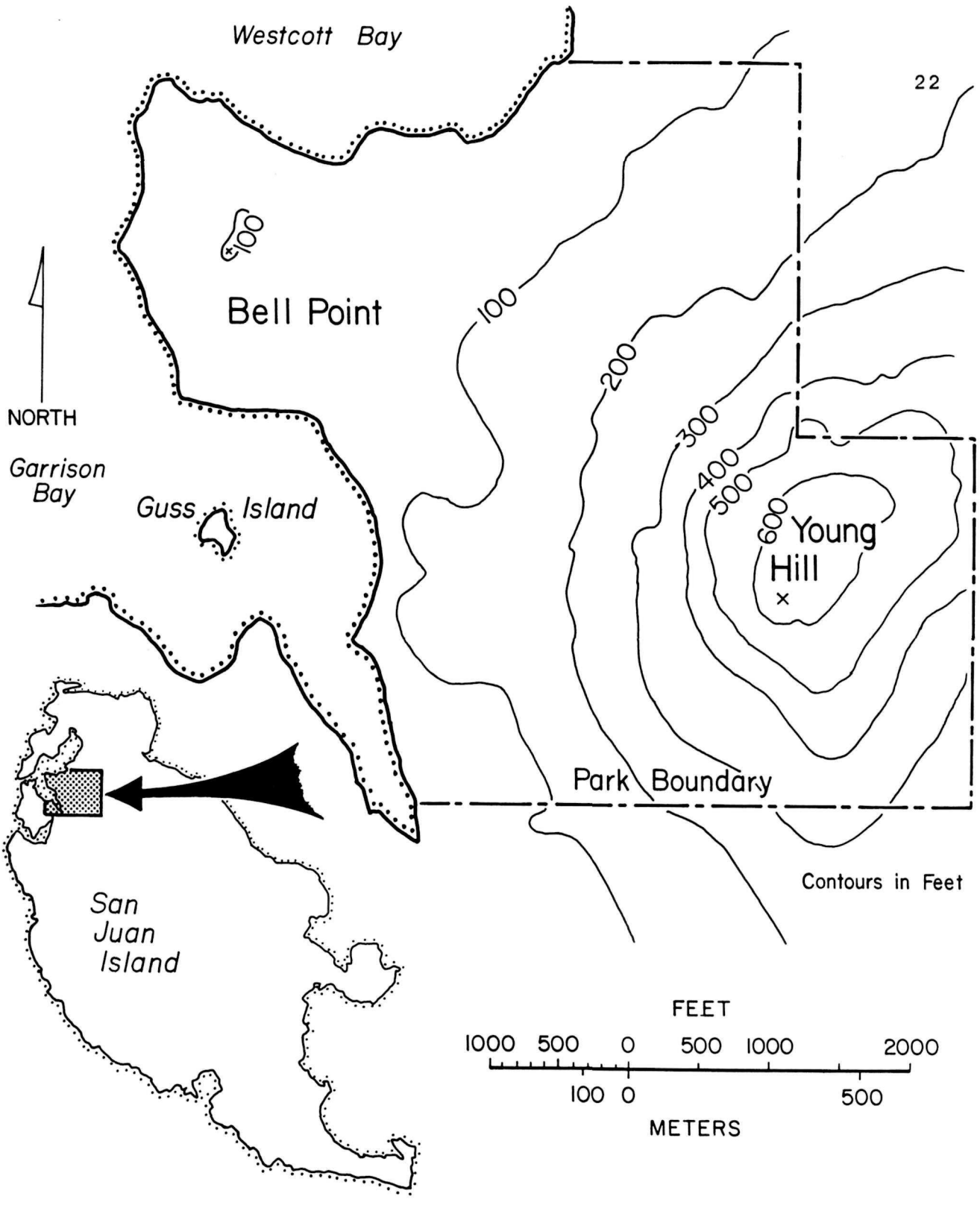
British Camp

The British Camp Park, some 546 acres, is located between Garrison Bay and Westcott Bay on the northwest end of San Juan Island (see Map 5). The park includes the Bell Point area, virtually all of the eastern shore of Garrison Bay, Guss Island (in Garrison Bay), and interior areas immediately to the east for a distance of approximately .75 mile.

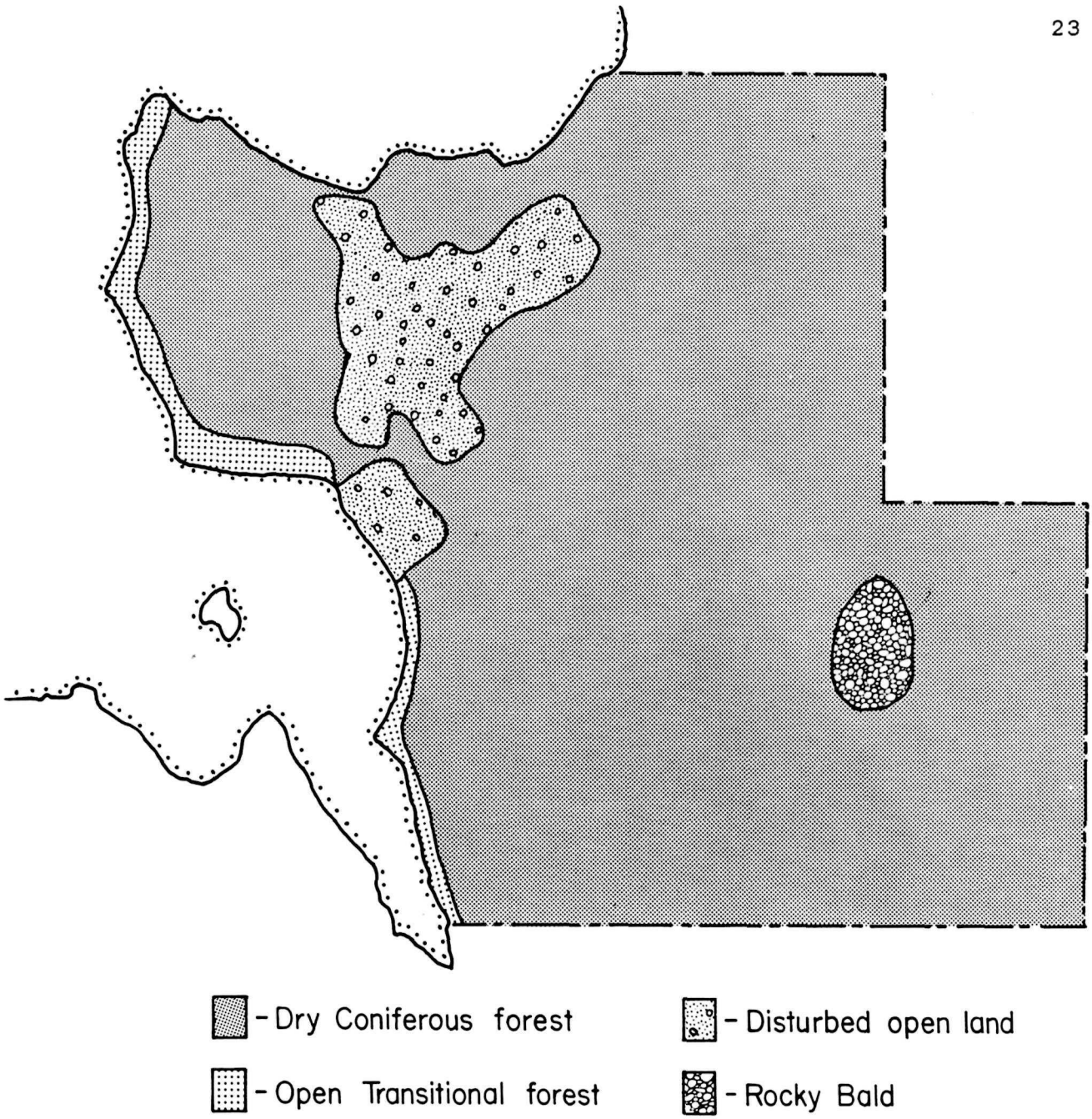
The most dominant feature of the British Camp landscape is Young Hill, a resistant knob of bedrock which rises to +650 feet in the southeastern portion of the park. The slope of the hillside is steepest to the east and declining in gradient toward the north; several terrace features appear to be present between the +100 and +200 foot contours. A smaller hill is located at Bell Point. Garrison Bay, which forms the western margin of the park, and Westcott Bay, on the north, are well protected, shallow, saltwater bays. Garrison Bay is a relatively small body which receives runoff from a small drainage basin to the south. The shore here is marked by a low wave-cut bank and extensive mud/silt flats are present at low tide. Westcott Bay is significantly larger; though beach sediments are slightly coarser, its shoreline is much like that of Garrison Bay.

As was the case with American Camp, most soils at British Camp are developed from glacial sediments. The vast majority of British Camp is dominated by Roche Series Soils. Most of the higher ground - Young Hill, Bell Point, and a number of smaller bedrock knobs - represent the Roche-Rock Outcrop Complex. The slopes of Young Hill contain first Roche Stoney Loams then, still further downslope, Roche Gravelly Loams. A low lying trough joining Bell Point to the northwest flank of Young Hill and an area near the head of Garrison Bay are the only areas with fine textured soils; a Bow Silt Loam.

A number of local plant communities are present at British Camp and, again, their distributions reflect the topographic and edaphic variations in this landscape (see Map 6). Forested areas near the shore of Garrison Bay represent the Open Transitional Forest. The Westcott Bay shoreline and much of the interior portion of the park, including the lower slopes of Young Hill, represent the Dry Coniferous Forest. Upper portions of the hill and other localized bedrock knobs support stands of the Rocky Bald plant Community. Finally, areas of Disturbed Open Land are present in the low lying trough near Garrison Bay and in the vicinity of the former British Camp parade ground. As most of the British Camp shoreline is characterized by wave-cut banks, there are few examples of the Saltwater Shoreline plant community here.



Map 5. British Camp, San Juan National Historic Park.



Map 6. The Approximate Distribution of Local Plant Communities at British Camp, San Juan National Historic Park.

CHAPTER TWO

ETHNOGRAPHIC BACKGROUND

This chapter provides an introduction and overview to the ethnographic peoples of the San Juan Islands. "Ethnographic" refers to written accounts of native peoples and, as such, ethnographic resources describe these peoples during the early historic (or so-called ethno-historic) period. The chapter will emphasize the organizations and associations of these peoples, amongst themselves and with respect to their neighbors in the southern Northwest Coast region. Basic characteristics of their economy, technology, and social behavior are discussed, but most details of these cultural behaviors are presented in a companion document (see Wessen 1988). Finally, a brief consideration of the ethnographic occupation of the San Juan National Historical Park is presented.

The ethnographic peoples of the San Juan Islands are not well documented. The documents which do exist are uneven in their emphasis within the area; some groups are the focus of a number of reports while others are hardly ever directly mentioned. Further, there are few early historic descriptions of Native Americans actually in residence in the islands; most accounts describe these groups during the twentieth century, when they occupied other nearby areas. As such, the following discussion will draw upon resources from a somewhat broader regional focus.

THE REGIONAL ETHNOGRAPHIC PEOPLES

The discussion of ethnographic peoples shall begin on the broadest level of regional classification and proceed to more localized and specific groupings.

Coast Salish

The broadest level of regional classification recognized for Northwest Coast cultures is that of language family affiliation. Language families have been used in this context because they represent the clearest and most unequivocal basis for associating cultural groups. Further, it should be noted that these associations of related languages reflect shared cultural phylogenies and thus the language families represent major groups of peoples which often shared distinctive cultural features other than language.

In early historic times, the native occupants of the San Juan Islands were all members of a broad group of cultures referred to as the Coast Salish (Suttles 1951). Coast Salish is a subdivision of the Salishan language family, a widespread group

of related northwest languages which ranged from eastern Montana to the Pacific coast. Coast Salish represents one of the two major subdivisions of the family; members of the group occupied most of western Washington and southwestern British Columbia. At least 18 languages belong to the Coast Salish group (Jorgensen 1969). Suttles and Elemendorf (1963) have suggested that the earliest Salishan languages originated from within the Coast Salish region.

Coast Salish peoples exhibited virtually all of the cultural traits which characterize the Northwest Coast as a culture area. They exploited a wide range of marine, riverine, and terrestrial resources utilizing sophisticated, and at time intensive, procurement technologies. Toward this end, they followed patterns of seasonal movement between large winter villages and smaller resource collection camps occupied in other seasons. They were able artisans and technicians who produced a wide range of goods from plant, bone, and stone materials; like all southern Northwest Coast peoples, they were noted particularly for their skill with wood and other plant fibers.

Coast Salish communities participated in a wide range of social and ceremonial activities. They recognized three broad categories of social standing for individuals and family groups: nobles or upper-class freemen, commoners or lower-class freemen, and slaves (usually captives taken from other groups). Marriage patterns tended toward local group exogamy with wives taking up residence in their husbands' group. Descent patterns tended toward the father's group. Actual examples of marriage and descent are, in fact, somewhat variable and the above noted norms appear to have been most important to upper-class families. These relations created a broad network of extra-group and even extra-areal social ties which supported a significant amount of economic and ceremonial exchange.

Straits Salish

Within the range of Coast Salish cultures a number of regional groupings may be recognized; the peoples of the San Juan Islands are generally considered to be members of a group referred to as the Straits Salish (Suttles 1951). Only a few features distinguish the Straits Salish from their neighbors. They shared a common language - "Lkungen" or "Lkungeneng" - which differed from that of other nearby Salish groups. Further, the Straits Salish peoples pursued a distinctive subsistence and settlement system which placed heavy emphasis upon exploiting the resources available in the salt water channels immediately around them.

Speakers of the Straits Salish language occupied much of the northern Puget Sound - southern Gulf of Georgia region. Dialects of Straits Salish were spoken on the northern Olympic Peninsula, southeastern Vancouver Island, in the San Juan Islands, southern portions of the Gulf Islands, and on the mainland from the

vicinity of Samish Bay northward almost to the Fraser Delta. This range includes the Klallam, Lummi, Samish, Semiahmoo, Saanich, Songish, and Sooke peoples. Among Coast Salish languages, the Straits language is most closely related to Halkomelem, which was spoken just to the north on the lower Fraser, the northern Gulf Islands, and adjacent portions of Vancouver Island.

The single most distinctive feature of the subsistence strategy of the Straits Salish was the use of the reef-net, a large cooperatively maintained structure used to catch sockeye salmon. Reef-nets were large nets set underwater near submarine obstructions ("reefs") in order to intercept migratory schools of fish bound for the Fraser River. Reef-net locations were the property of particular individuals who arranged for the considerable gear and manpower (10 to 15 people) necessary to exploit them. These nets were used during the summer months and seasonal camps were located onshore in their immediate vicinity. Reef-net fisheries have the potential to be enormously productive and historic documents indicate that, when fish are running in good numbers, as many as 2,000 salmon could be taken in a single day (Collins 1892).

Tribal Ethnic Groups

The Straits Salish can be subdivided into a number of smaller and more localized groupings generally referred to as "tribes". While this term is commonly and widely used for such ethnic groups, it is important to appreciate that such groups in this region lacked the social and political cohesion normally associated with this word. Rather, similar patterns of economy, technology, and social organization (particularly the aspects of seasonal movement and local group exogamy) resulted in a broad cultural continuum throughout the region. This condition has lead some researchers to treat all of these peoples as a single group (cf. Suttles 1951, 1958, 1960 and Allen 1976). Allen (1976) in fact, has suggested that tribal boundaries are relatively fragile and transitory phenomena.

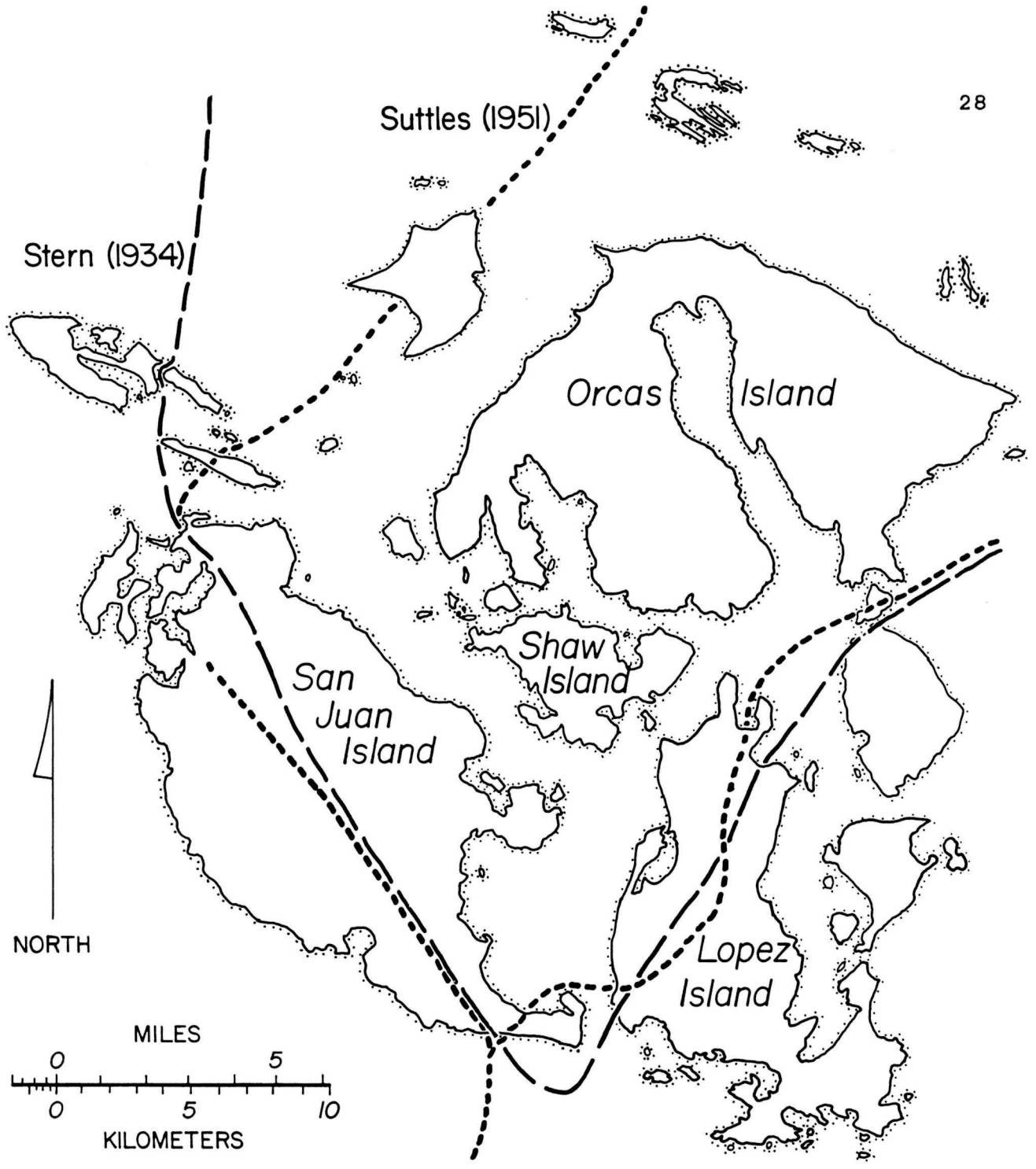
Most types of economic, political, and social affiliation in this region focused around local lineal groups. Local lineal groups were essentially extended families; they were often single autonomous households and they were associated with particular winter villages. They controlled particular resource collection localities and owned the rights to ceremonial properties such as dances, songs, and titles. As the term "tribe" is used, each tribe was composed of a number of largely autonomous local lineal groups. Such tribes shared relationships of speech, kinship, community of interests, and community of habitual acts, but all of these elements were also shared beyond the bounds of what are usually recognized as individual tribes. Nevertheless, the use of tribal units is common in the ethnographic literature of the region, and this report will consider these units.

Within that portion of the Straits Salish area of primary

interest to this study, at least four Straits Salish tribal groups were present. The groups are the Lummi, Samish, Saanich, and Songish; their approximate distributions within the San Juan Islands are presented in Map 7. These distributions are derived from ethnographic sources (principally Stern 1936 and Suttles 1951) which contradict each other in some details, and a number of factors must be stressed when considering them. First, while the map appears to suggest fixed territories, these were highly mobile peoples and they maintained extensive contacts with their neighbors. In fact, given the tendency toward intergroup marriage, many communities may have had a mixed ethnic character. (The graphic depictions of group boundaries in Map 7 is intended to reflect that boundaries were porous, and probably zones rather than lines.) An additional condition to bear in mind is that ethnographic sources document a period of substantial change and upheaval in the lifeways of native peoples; tribes both appeared and disappeared during this period. Finally, none of these groups were wholely restricted to the islands. They all had access to additional territories, either on the mainland or on Vancouver Island.

The group with the broadest presence in the San Juan Islands was the Lummi, who occupied Shaw Island, Orcas Island, most of the smaller islands north of Orcas, much of northern and eastern San Juan Island, and some of the northwestern portion of Lopez Island. Elsewhere, the Lummi people also occupied Lummi Island and the mainland in the vicinity of Bellingham Bay and the lower Nooksack River. Ethnographic sources differ somewhat on the nature of Lummi presence in the San Juans. Stern (1934:124) reports that they occupied a number of seasonal resource collection camps in the islands, but that their winter villages were all on the mainland. In contrast, Suttles (1951:33) reports a number of winter villages in both places (thereby implying that at least some lummi were in the islands year round). Elsewhere, Suttles (1954:42) suggests that the Lummi originated in the islands and spread to the mainland just prior to the historic period. He reports that a number of San Juan villages were nearly wiped out by smallpox, and that the survivors from these communities subsequently moved to mainland villages (from which they continued to use the islands seasonally). In this regard it is worth noting that Spier (1936:38) briefly mentions a group he refers to as the "Swallah"; apparently a sub-division of the Lummi who occupied Orcas and San Juan Islands.

The southeastern San Juan Islands were occupied by the Samish people. They were present on the southern and eastern shores of Lopez Island, on Blakely and Decatur Islands in the San Juans, and further east on Cypress Island, Guemes Island, Fidalgo Island and on the main land in the vicinity of Samish Bay. Suttles (1951:45) also suggests an early historic Samish winter village at Fish Creek, on the southern end of San Juan Island. (Alternatively, Stern's (1934) data for the Lummi disputes the claim of a Samish settlement at Fish Creek.) While the Samish presence in the San Juans appears to have in been largely



Map 7. Approximate Ethnographic Distributions of Tribal Groups in the San Juan Islands, as Rendered by Stern (1934) and Suttles (1951).

seasonal, this may be the result of an early historic dislocation much like that suggested for the Lummi. Historic Samish winter villages were located on Fidalgo and Guemes Islands, and on the mainland.

The Songish people were present along most of the western side of San Juan Island and on the southern end of Henry Island. Across Haro Strait to the west, they also occupied Discovery Island and the southeastern corner of Vancouver Island between Cordova Bay and Parry Bay. As was the case with the Samish, the historic Songish presence in the San Juans appears to have been largely restricted to seasonal resource camps. Most of their winter villages were located on Vancouver Island.

The Saanich held the smallest territory within the San Juan Islands. They were present in the vicinity of Stuart and Johns Islands. To the west and north, Saanich people also occupied the Saanich Peninsula on Vancouver Island, all of Sidney, Pender, Saturna, and Mayne Islands, and southern portions of Galiano and Saltspring Islands. The Saanich collected resources over much of the northwestern San Juans and had a winter village at Reid Harbor on Stuart Island; all other Saanich villages were in Canada.

Tribal Groups During the Historic Period

The earliest European presence in the San Juan Islands was probably that of Quimper in 1790 and Eliza in 1791 (Wagner 1933). Both were part of spanish explorations in the region. Quimper explored both shores of the Strait of Juan de Fuca, but penetrated the San Juans only as far as the Songish country. The following year Eliza saw much more of the islands and also explored some of the mainland coast in what is now Whatcom County. Neither explorer left much information about native peoples in the San Juan Islands, although Eliza did describe what were probably Saanich and Semiahmoo peoples operating reef-nets near Point Roberts. Shortly after the Spanish visits, Vancouver also sailed through this area, skirting the east side of the San Juans; his accounts of native peoples are similarly limited.

Following the earliest explorations, much of the coast became involved in a lively trade with sea-bound Europeans seeking sea otter pelts. However, as sea otters were uncommon in the San Juan Islands, it is unlikely that Straits Salish peoples had much participation in this trade. A little later, reconnaissance for trade missions penetrated the area. Simon Fraser reached the Fraser Delta by in 1808, but he did not actually travel to the islands. In 1824, McMillan and Work examined the area for the Hudson's Bay Company and McMillan returned in 1827 to establish Fort Langley. Fort Langley became the principal center for trade in this region and Straits Salish peoples frequented this locality until the rise of the trading center at Victoria in the early 1840's.

During the period when Victoria became important, the first

missionaries entered the region. The Roman Catholic priests Blanchet and Demers arrived in the late 1830's; between 1839 and 1843 they preached to indians at Nisqually, on Whidbey Island, at Fort Langley, and at Victoria. Suttles (1954:40) suggests that the first priest to have contact with the Straits Salish was Demers in 1841. Several missions were established in the region during the following 20 years, but none were located in the San Juan Islands.

Pressure from Euro-Americans settling within traditional Straits Salish territory began to build during the late 1840's and political agreements were arranged during the following decade. In 1850 and 1852 Governor Douglas negotiated a series of treaties with the Straits Salish people on Vancouver Island, but these agreements had little effect on their presence in the San Juan Islands. A few years later in 1855, Governor Stevens of Washington Territory signed the Treaty of Point Elliot with the Lummi which obligated them to leave the islands and take up residence on a reservation in western Whatcom County. (Recall, however, that there may have been substantial relocations from the islands to the mainland due to the effects european diseases prior to this time.) Representatives of the Samish people also signed the Treaty of Point Elliot, but they were subsequently considered to be a division of the Lummi and expected to move to the Lummi Reservation.

In addition to the four tribal groups noted above, at least two other groups have claimed tribal status in the San Juan Islands during the historic period. On the west side of San Juan Island is a small group identifying itself as the "Mitchell Bay Tribe". Claiming affiliation with a village considered to have Songish ties (Ruby and Brown 1986:133), they have been unable to secure federal recognition. A second such group in the area is the "San Juan Tribe of Indians" (ibid:181). The San Juan Tribe has been described as represented by both Lummi and Samish peoples, as well as Canadians and one Alaskan Indian family.

SAN JUAN NATIONAL HISTORIC PARK

Given the limited nature of the available resources, it is impossible to provide an unequivocal account of the ethnographic character of the San Juan National Historical Park. Nevertheless, some data on this subject is available, and this section provides brief summaries of the circumstances of ethnographic period occupation for each of the park properties.

American Camp

The American Camp Park was undoubtedly the scene of considerable Native American cultural activity. Overall, the close proximity of contrasting subtidal, intertidal, and terrestrial environments along the park's northern and southern shores must

have been a significant attraction. The relatively open and exposed character of the southern shore of the park made it unattractive for the establishment of winter villages, but it offered a number of important resources which probably attracted substantial spring and summer occupation. In particular, a major sockeye salmon migration route in Haro Strait passes near the southern shore of the park. The shallow submarine bank located near Cattle Point was also an important local halibut ground. In contrast, Griffin Bay and the lagoons of the protected northern shore of the park offer shellfish resources which are unavailable along Haro Strait. The protected northern shore also offers several locations which favor wintertime occupation.

Despite these potentials, the available data seems to suggest only a limited early historic Native American presence here. While the park contains at least six Native American archaeological sites (see Chapter 3), none contain demonstrated evidence of early historic occupation. Similarly, there do not appear to be any ethnographic or historic sources which describe early historic Native American occupation within the park. The earliest written records from this area represent the period of the so-called Pig War of 1859, but these accounts describe Euro-American rather than Native American activities. It should be noted however, that this latter circumstance may simply be a reflection of historic preoccupation with the Pig War events. Therefore, the absence of accounts of Natives Americans here may not be significant and the actual case for an early historic Native American presence is unclear.

Ethnographic sources suggest that American Camp was in the general vicinity of one or more cultural boundaries, and these sources report several early historic Native American settlements near the boundaries of the park. Much of the American Camp Park probably lies within the area used by the Lummi people; while no ethnographic Lummi settlements are described here, Suttles (1951:34) reports a Lummi seasonal camp near Low Point on Griffin Bay, perhaps a mile north of the park. It is likely, therefore, that Lummi people fished the waters around the park and some degree of intertidal and/or terrestrial resource exploitation is also probable. Along its southern shore however, the park extends into an area utilized by Songish people. Suttles (ibid:14) reports a Songish reef-net location and an associated fishing camp at Eagle Cove, near the southwestern corner of the park. Finally, Suttles (ibid:45) also reports the brief early historic presence of a small winter village of Samish affiliation in the relatively well protected Fish Creek area, just beyond the northeastern corner of the park. Thus, there is reason to consider that several different ethnographic groups may have more-or-less simultaneously used the American Camp area in different ways.

British Camp

British Camp Park, though a very different setting than American Camp, was also a scene of considerable Native American activity. Located between Garrison and Westcott Bays, this area is well protected from prevailing winds and high wave energy. Nevertheless, it is only a short distance from the sockeye salmon migration routes in Haro Strait. Further, the bays themselves are important spawning grounds for flounder and herring, and they host large numbers of shellfish and waterfowl. In short, this area offers both a wide range of seasonal resources and excellent locations for potential winter villages.

As was the case with American Camp, the issue of early historic Native American occupation at British Camp must be regarded as unclear. At least nine Native American archaeological sites occur within the park (see Chapter 3), two of which are located in the immediate vicinity of the British Camp. Early historic materials have been noted at these two sites, but their actual associations are uncertain. Similarly, while ethnographic sources cited below report a village here, the relationship between this village and the British Camp is uncertain. The earliest recorded descriptions of this area concern the arrival of the British Garrison in 1860 and these accounts do not report an indian village here. While this might be regarded as yet another reflection of historic preoccupation with Euro-American events, it seems unlikely that the British Commander would have chosen to locate his camp in the immediate vicinity of, indeed virtually within, an active indian village. In fact, given that the British Camp was not a trading post, nor were the British Garrison Commanders particularly interested in civil administration, the choice of this location might be taken as evidence that the village was not here in 1860! Disease-induced relocations may be considered to be a likely explanation for the apparent absence of the village at this time.

Ethnographic sources suggest that the British Camp Park, much like the American Camp Park, appears to be located in the general vicinity of one or more cultural boundaries. As noted above, Suttles (1951:34) reports that a Lummi winter village was located on the eastern shore of Garrison Bay in the immediate vicinity of the British Camp. However, he (ibid:14) also indicates the possibility of a Songish winter village in essentially the same place. In this regard, it should be noted that Stern (1934:124) places Garrison and Westcott Bays outside of Lummi territory. Thus, while a winter village is reported here, there is some question regarding its tribal affiliation. This confusion may reflect the potentially mixed ethnic character alluded to above. Alternatively, the affiliation of this community may have changed over time. Finally, Suttles (1951:22) also reports that Saanich people hunted waterfowl in Mosquito Pass, just to the west of the park, and therefore Saanich seasonal camps may have been located in this area as well. In sum then, the possible more-or-less simultaneous use by more than

one group noted for the American Camp area may also have been true of the British Camp area.

CHAPTER THREE

ARCHAEOLOGICAL BACKGROUND

This chapter provides an introduction, overview, and evaluation of archaeological research in the San Juan Islands. It will review the sequence and findings of archaeological efforts on a regional scale, consider the history and accomplishments of studies undertaken within the islands themselves, and offer a discussion of problems inherent in the database which has been generated by this latter body of work. The chapter concludes with a brief account of those studies have which occurred on properties of the San Juan National Historic Park.

AN OVERVIEW OF REGIONAL ARCHAEOLOGY

Archaeological research in the northern Puget Sound-Gulf of Georgia region of the southern Northwest Coast began during the last decade of the 19th century. Most of these efforts were casual descriptions and, occasionally, small uncontrolled excavations undertaken by residents of the area. A regional focus to such studies began to emerge with the Jesup North Pacific Expedition (ca. 1897 - 1902), out of the American Museum of Natural History. While the expedition was under the overall direction of Franz Boas, virtually all of the archaeology in this region was conducted by Harlan I. Smith. Other researchers who made contributions during this period included William Thacker, Charles Hill-Tout, and Albert Reagan. Following this flurry of activity, interest in the archaeology of the region waned and very little fieldwork was conducted during the next several decades.

The era of modern archaeological research in the northern Puget Sound-Gulf of Georgia region began during the years following World War II. In 1946, Arden King from the University of Washington began a multi-year program of excavations and site survey in the San Juan Islands. At about the same time, Charles Borden from the University of British Columbia began long term work at a number of prehistoric sites in the vicinity of the Fraser Delta. (While King's efforts had concluded by 1950, Borden continued to work with Fraser Delta materials for more than 20 years.) Keith Thomson from the University of Washington surveyed sites in San Juan county in 1951 and Alan Bryan, also from the University of Washington, surveyed coastal portions of Island, Skagit, and Snohomish counties in 1953 and 1954. The Provincial Museum of British Columbia also became active during this period; Wilson Duff excavated sites on Pender Island in 1957 and 1958, and Michael Kew and Robert Kidd surveyed and tested sites between Sooke and Saanich on Vancouver Island in 1958 and 1959.

The 1960's saw a marked increase in research in the region. The University of Washington remained the dominant force in western Washington, but a number of additional institutions enter the field in British Columbia. Donald Mitchell of the University of Victoria began to work in the Gulf Islands during the mid 1960's. Roy Carlson from Simon Fraser University began work at Helen Point on Mayne Island in 1968. Meanwhile, the Provincial Museum remained active through the efforts of Donald Abbott who worked at various locations on southeastern Vancouver Island, in the Gulf Islands, and on the lower mainland of British Columbia. The major University of Washington efforts during this period included the work of Robert Kidd at Fossil Bay on Sucia Island in 1960 and David Munsell on Lopez Island in 1968.

The heightened pace of efforts which characterized the 1960's continued into the following decades, and was increasingly propelled by cultural resource management studies during the late 1970's and 1980's. All of the above noted institutions remained active during this period. A major focus of University of Washington efforts has been San Juan Island; a joint project with Roderick Sprague of the University of Idaho at Moscow examined both historic and prehistoric deposits between 1970 and 1973, and Julie Stein has worked with prehistoric materials at British Camp between 1984 and 1987. A second focus of efforts has been the Skagit Delta. Members of the Washington Archaeological Society worked here during the 1960's. John Mattson worked in the delta in 1970 and 1971, and he was followed shortly later by Gail Thompson. To the north in Whatcom County, Garland Grabert and Western Washington University field crews began to investigate sites along the mainland coast between Bellingham Bay and the Canadian border. In the Fraser Delta, Borden's long term efforts were augmented by R. G. Mattson's excavations at Glenrose Cannery on the lower Fraser in the early 1970's. Other important Canadian studies in the region include Donald Mitchell's work in the early 1970's at Montague Harbour on Gailano Island, Leonard Ham's work at Crescent Beach on Boundary Bay during the early 1980's, and Roy Carlson's recent work at Pender Canal on North Pender Island.

The above noted growth of cultural resource management studies represents a relatively recent trend in the region's archaeology. The enactment of environmental laws protecting cultural resources has given rise to a body of literature which represent site surveys conducted in association with proposed construction projects such as residential subdivisions, marina developments, and road improvements. For the most part, however, such studies have been limited in both scope and scale, and many report negative results (i.e., cultural resources are not present in the project area). This type of study has been conducted by both the traditional academic institutions, and by a number of recently established archaeological consulting firms.

The vast majority of the archaeological research undertaken in the northern Puget Sound-Gulf of Georgia region has been descriptive, with goals which can be considered to be

classificatory-historical. This is to say that the work has been dominated by a concern for establishing regional chronologies. Archaeologists have sought to identify consistent associations of archaeological materials, and then to link and relate these units in a time ordered fashion. Almost without exception, the region's archaeologists have relied upon presumably diagnostic artifact styles to define their units.

Further, there has been some debate over the significance of and/or nomenclature for these archaeological units. Such units have traditionally been referred to as "phases". Following Willey and Philips (1958:22), a phase is an "...archaeological unit possessing traits sufficiently characteristic to distinguish it from all other units similarly conceived, whether of the same or other cultures or civilizations, spatially limited to the order of magnitude of a locality or region and chronologically limited to a relatively brief interval of time." In the early 1970's Abbott (1971) and others questioned the use of the term "phase" because individual phases may not be the equivalent of individual cultural groups. As an alternative, Mitchell (1971) has proposed calling the units "Culture Types". To a certain extent, the differences between "Phases" and "Culture Types" are semantical; in their substance, they address differences in the conceptions of the relationship between an archaeological assemblage and the cultural system responsible for it. As Willey and Philips (1958) do not suggest that phases are, in fact, the equivalent of cultures, this term is here considered to be appropriate and it will be used in the following discussion.

The earliest known cultural occupations in the northern Puget Sound-Gulf of Georgia region are, at present, only poorly understood. Further, taking the wider perspective of the western Washington and southwestern British Columbia area, there is reason to suggest that examples of the oldest manifestations of a cultural presence in the latter area have not yet been found within the former. Thus, it is worthwhile to briefly consider the areal situation. The very earliest cultural materials for the area are, also, only poorly understood and there is some heterogeneity among the possible members of this group. The oldest demonstrated materials come from the ca. 12,000 year old Manis Mastodon site on the Olympic Peninsula, where only relatively undiagnostic bone tools have been found (Gustafson, Gilbow, and Daugherty 1979). Elsewhere in western Washington, large stemmed shouldered lanceolate points, morphologically similar to so-called "Windust" or "Lind Coulee" points from eastern Washington, have been found (Welch, per. comm.). In eastern Washington, these points are dated between 8,000 and 10,000 years ago (Rice 1972); in western Washington such objects are undated and thus their actual antiquity here is uncertain. While a few examples of possible fluted lanceolate points have been encountered in western Washington (Osborne 1956), actual demonstration of the presence of the Llano or Folsom paleoindian traditions has not occurred. Finally, certain flaked cobble assemblages from Whatcom County (Gaston and Grabert 1976) have been suggested to

be of great antiquity and related to the Late Pleistocene Pasika Phase in British Columbia (Borden 1975), but this is also undemonstrated and similar flaked cobbles occur widely in this region in much more recent contexts. In sum, there appears to be a good case for Late Pleistocene and/or Early Holocene cultural occupation in western Washington, but its character remains unclear. While examples of such occupation have not yet been demonstrated in the northern Puget Sound-Gulf of Georgia region, their future discovery seems likely.

The earliest cultural occupations actually demonstrated in this region are also only poorly known. They have been referred to under such terms as "Old Cordilleran Culture" (Butler 1961), "Olcott Complex" (Kidd 1964), "Lithic Culture Type" (Mitchell 1971), and "Olcott Phase" (Mattson 1985). All regional archaeological assemblages associated with these terms are similar; they are collections composed exclusively of chipped stone. Typically, they contain medium to large well-made leaf-shaped lanceolate points (often referred to as "Cascade" or "Olcott" points), a variety of flaked cobble forms, flake crescent forms, and debitage. Ground stone objects and tools of bone, antler or shell do not occur. Such early sites are widespread in the region. They generally occur on alluvial floodplains and relic terrace features; none are clearly associated with modern saltwater shorelines. While economic data is almost wholely lacking, these sites are generally considered to represent a cultural adaptation oriented toward the use of terrestrial resources. Few of these sites have been dated, but it is likely that they are Early or even Middle Holocene in age. The oldest actual date for such an assemblage in this area is a radiocarbon date of 8,150 +/- 250 years B. P. from the Fraser Delta (Matson 1976).

Following this early period, there appears to be an interval - ca. 6,000 to 3,500 years ago - for which very little archaeological data is available. (This perception, however, is directly related to the above-noted fact that most early assemblages are undated, and thus their specific temporal placement is unclear; hence, this gap could be more apparent than real.) A few assemblages have been dated to this period and terms such as Mayne Phase (Carlson 1970) and Charles Phase (Borden 1975) have been proposed for them. These collections are marked by medium-sized chipped stone leaf-shaped, stemmed, and shouldered points, flaked cobble forms, microblades, ground slate points, various unilaterally and bilaterally barbed bone or antler points, and unbarbed bone or antler unipoints. Such materials are known from the Gulf Islands (Carlson ibid) and the lower Fraser River (Matson 1976) in British Columbia and from a few localities in Whatcom County, Washington (Grabert, Cressman, and Wolverton 1978 and Grabert 1983). While much about this period remains unknown, it is clear that these peoples were making considerable use of maritime resources; marine fish and shellfish are well represented in some Charles Phase sites.

A much better documented group of collections referred to as

the Locarno Beach Phase (Borden 1951) or Locarno Beach Culture Type (Mitchell 1971) begin to appear in the region about 3,500 years ago. Locarno Beach assemblages contain medium-sized chipped stone points with contracting stems, flaked cobble and cobble spall forms, microblades, ovoid chipped slate knives, ground slate points and knives, ground stone labrets, earspools, bilaterally barbed antler points, bone toggling harpoons (both single piece and composite forms), and ground mussel shell points and adze blades. Sites with occupations of this type occur along saltwater beaches, or in locations which were formerly associated with saltwater. Borden (1951) originally visualized a strong sea mammal hunting orientation for the occupants of these sites, but subsequent studies of Locarno Beach occupations have shown a very high proportion of land mammals, birds, marine and anadromous fish, and shellfish.

Marpole Phase (Borden 1951) or Marpole Culture Type (Mitchell 1971) assemblages follow Locarno Beach Assemblages. The transition between these two units occurred about 2,500 years ago and there appears to have been some temporal overlap during which both types of tool kits were being used. Marpole assemblages contain a variety of medium-sized chipped stone points of both stemmed and unstemmed form, microblades, ground slate points and knives, large ground stone adze blades, pecked stone mauls, labrets, earspools, portable stone sculpture (often bowls with anthropomorphic or zoomorphic motifs), large unilaterlly barbed bone points and non-toggling harpoons, split bone awls, and bone or antler wedges. The Marpole adaptation appears to have utilized much the same range of food resources as in the preceding Locarno Beach Phase, but Marpole peoples seem to have made particularly heavy use of anadromous fish. Marpole occupations are situated in locations which maximized access to anadromous fish runs and many communities were relatively large. Further, Marpole occupations are oldest occupations with large post molds and other indications of the presence of large split-cedar plank longhouses like those of the early historic period.

The final period of prehistoric occupation in the region began about 1,200 to 1,500 years ago and is most commonly referred to as the Gulf of Georgia Culture Type (Mitchell 1971). In contrast to earlier assemblages, Gulf of Georgia collections show a relatively strong emphasis on bone, as opposed to stone, artifacts. These collections contain small chipped stone triangular points, ground stone adze blades, ground slate knives and points, pecked stone mauls, whetstones, unilaterally barbed bone points, small unbarbed bone unipoints and bipoints, composite toggling harpoon valves, and bone or antler wedges. The settlement and subsistence systems of the Gulf of Georgia and Marpole occupations appear to be quite similar (indeed, both assemblages often occur in the same sites). Gulf of Georgia occupations are large; they often contain evidence of plank longhouses and they show an strong emphasis on anadromous fish resources.

Taking a broad perspective on the regional culture history

reflected by these units, several observations can be made. There appears to be a clear trend toward greater use of marine and anadromous resources over time, although this impression may be biased by poor organic preservation in the early assemblages. The earliest occupations lack strong continuities with later periods, but do show common elements with contemporaneous collections from elsewhere in the Pacific Northwest. Following the Early and Middle Holocene, the Locarno Beach, Marpole, and Gulf of Georgia units exhibit strong continuities, particularly strong between the latter two units. In this regard it is worth noting that Gulf of Georgia occupations are essentially equivalent to late prehistoric Coast Salish, and thus cultural patterns broadly similar to the ethnographic Northwest Coast culture have probably persisted for at least 2,000 to 3,000 years.

ARCHAEOLOGY IN THE SAN JUAN ISLANDS

The San Juan Islands occupy a central position within the above-noted Puget Sound-Gulf of Georgia region. Many of the region's studies have been conducted in the islands and the interpretations of materials from the islands have frequently relied upon other regional findings (particularly those from the Fraser Delta). Thus, the following discussion of archaeology in the San Juan Islands will be within the context of the regional perspective just presented. The treatment will be somewhat more detailed, and it will consider survey studies and excavation studies separately.

The early reconnaissances of prehistoric cultural resources in San Juan County were among the earliest anywhere in the Pacific Northwest. These efforts included works by William Thacker (1898a, 1898b, and 1901), Harlan Smith (1907), and, slightly later, by Arthur Colley (Sprague 1975). This early flurry of studies, some of them associated with the Jesup North Pacific Expedition, presented the first recorded descriptions of many important sites and demonstrated the rich diversity of cultural resources here. However, these reports provide only limited information about individual sites and, while typical of their time, they lack many of the basic scientific controls which would have made them compatible with more recent data sets.

There were no site survey studies in the San Juan Islands between this early period and the beginning of Arden King's efforts in 1946. As a part of this work (King, Helligas, and Daugherty 1946, King 1947 and 1950), students under his direction began extensive survey activities along the marine shorelines of many of the islands. Site surveyors who contributed to this effort include: Warren Caldwell, Richard Daugherty, Malcom Forbes, Byrd Helligas, Peter Kilburn, Robert Lane, Donald Nyman, and Wayne Suttles. Their activities extended through the field seasons of several years, and resulted in the recording of approximately 200 prehistoric sites. While their survey records occasionally make reference to test excavations, in almost all

cases the test were not specifically documented and they appear to have been of very limited scale (possibly just shovel-test holes?). This period of sustained effort was concluded by an extensive shoreline survey undertaken by Keith Thomson in 1951. He visited a total of 189 sites, including both sites previously recorded by King's students and new sites recorded during his field work (Thomson 1951).

After Thomson, the pace of site survey efforts in the San Juan Islands slackened considerably. Further, most subsequent studies were of much more limited geographic scope. In the early 1960's Sonia Solland (1963) visited a number of sites on State Park properties around the county; like Thomson, she reported on both new and previously recorded sites. A similar small scale survey was conducted by Randy Greenfield and Lee Stilson in the Garrison Bay area of San Juan Island in 1970 (Greenfield 1970). During the 1970's and 1980's, almost all survey efforts were culture resource management reviews of properties where construction projects were planned. These studies were usually brief in terms of both field inspection and documentation (indeed, many are documented only in brief letter reports submitted to state and/or federal agencies or individual private developers). Researchers who were active at this time included: Richard Chesmore, Steve Kenady, Hal Kennedy, Lynn Larson, Guy Moura, David Munsell, Joan Robinson, and Steve Wilke.

Finally, in 1985, the largest and most extensive survey project in the history of the islands was undertaken. Gary Wessen (1986) conducted a study aimed at verifying all previously reported prehistoric sites within the county, and sampling portions of as yet unexamined micro-environmental settings there. As such, this study conducted the first investigation of interior areas on the larger islands and enlarged the sample of known prehistoric sites in the county to 322. The findings of this study are discussed in detail in Chapter Four (see below).

Summarizing the survey work from the San Juan Islands, a number of observations can be made. Clearly, these efforts have shown that the islands are rich in prehistoric cultural resources. At the same time, it is important to note that virtually all of the surveys have been restricted to a single environmental setting - the modern saltwater shoreline. While most of the recorded sites are undated, their association with the modern shoreline suggests that most of these sites are relatively recent. Further, it is clear that much of this modern saltwater shoreline remains unsurveyed; in the process of verifying all known sites, Wessen (ibid) examined less than 30% of the shoreline. The interior areas of the islands have barely been touched; Wessen examined less than 3% of the islands' interiors. Despite this bias, the existing site records are a valuable database, but they also contain descriptive flaws and this latter issue will be discussed in the following section of this chapter (see below).

The history of archaeological excavations in the San Juan

Islands parallels that of the surveys in many ways. While the early period archaeological investigations of Thacker, Smith, and Colley included some uncontrolled digging in sites, the reports of their efforts generally provide only limited detail with respect to individual localities. Nevertheless, these accounts provide important insights into the earlier character and condition of many of the region's cultural resources. Particularly valuable in this regard is Harlan Smith and Gerald Fowke's (1901) work with rock cairns. Despite its early date, this latter report contains more descriptive data than any subsequent study of rock cairns in this region.

The era of modern controlled excavations in the San Juan Islands began with King's activities in 1946 and 1947. The major focus of this work was a series of detailed excavations at Cattle Point (45-SJ-1) on San Juan Island. King published the Cattle Point materials in 1950 and included with them the first proposed chronological scheme for the region. He proposed four "occupation phase" units: Island, Developmental, Maritime, and Late. While the significance of King's units is problematic and their names are no longer used, his basic sequence does share many elements noted in the more recent reconstructions. In broad terms, he saw a sequence of occupations which were originally oriented toward terrestrial resources and which became more maritime over time. Among King's units, his Island has some similarities with the Lithic Culture Type noted above, his Late is probably equivalent to the Gulf of Georgia Culture Type.

University of Washington field schools directed by Carroll Burroughs and/or Aden Treganza between 1948 and 1951 undertook additional smaller scale excavations at 45-SJ-1, and similar testing at five additional sites on San Juan Island (45-SJ-2, 4, 5, 24/25, and 99). During this same period, Warren Caldwell did similar work at 45-SJ-3 on southern San Juan Island and William Liston and Malcom Forbes dug at two sites on the south end of Lopez Island (45-SJ-185 and 186). These efforts were written up by Roy Carlson in 1954, and then in a revised form in 1960. Carlson rejected King's chronological reconstruction and proposed another one which was strongly influenced by Borden's findings in the Fraser Delta. Carlson's (1960) scheme includes a Locarno Beach Phase and a Marpole Phase nearly identical to Borden's. He called his latest phase the San Juan Phase; it is essentially equivalent to the Gulf of Georgia Culture Type.

Also during this period, Caldwell excavated two rock cairn burials near Bazalgette Point on San Juan Island. Caldwell (1955) referred to them as "Cist Burials", and his account remains one of the very few to describe this type of prehistoric feature. This site was unnumbered when he worked there, but it has subsequently been designated 45-SJ-325 (Wessen 1986).

Robert Kidd led a University of Washington team in excavations at Fossil Bay on Sucia Island (45-SJ-105) in 1960. Kidd conducted excavations in several portions of the site and later reported the presence of two separate cultural components: Fossil Bay and Fox Cove (Kidd 1964 and 1969). He recognized that his

Fossil Bay Component was a Marpole Phase occupation and his Fox Cove Component is consistent with Gulf of Georgia Culture Type materials.

In 1968, a University of Washington field school under the direction of David Munsell undertook test excavations at three sites on the southeastern part of Lopez Island (45-SJ-215, 278, and 280). While portions of the resulting samples may have been characterized by Munsell and/or by students in subsequent University of Washington classes, a formal report on these sites has never been prepared.

A joint University of Washington-University of Idaho field program returned to the 45-SJ-24/25 site area at British Camp on San Juan Island in 1970. The program addressed both historic and prehistoric deposits; Roderick Sprague directed the historic efforts, Steve Kenady oversaw the prehistoric work. This program lasted four years and Kenady apparently also undertook test work at a number of other nearby sites (45-SJ-28, 31, and 221) during this time. A few brief accounts of the prehistoric materials from British Camp have appeared (Kenady 1970 and 1973; Sprague 1976), but a formal report on the prehistoric deposits and materials at these sites has never been prepared. (Oral tradition among Northwest Coast archaeologists suggests that much of the documentation for Kenady's work was lost in an automobile fire.)

In the late 1970's and 1980's, a number of relatively small scale cultural resource management projects tested sites in several parts of the county. Robert Logsdon and a Western Washington University crew worked at Decatur Head (45-SJ-169) on Decatur Island in 1974. Jerry Bailey and another Western Washington University crew dug at Reid Harbor (45-SJ-84) on Stuart Island in 1978. The next year a second small project at this same site was conducted by Maryann Duncan and Lynn Larson from the University of Washington. In 1980, James Benson and another University of Washington crew undertook test work at Spenser Spit (45-SJ-274) on Lopez Island. Most recently, Gary Wessen tested cultural deposits at Smallpox Bay (45-SJ-11) on San Juan Island in 1987. All of these projects were limited in scope, and most produced relatively small artifact samples which contained few diagnostic items. Nevertheless, all produced valuable economic and stratigraphic data sets.

A third large multi-year University of Washington research program returned to the 45-SJ-24/25 site area at British Camp on San Juan Island beginning in 1983, now under the direction of Julie Stein. This program (still in progress at this writing) differs from most previous studies in that cultural chronology reconstructions are not a major goal; rather its principal focus addresses understanding depositional and post-depositional effects on site structure. A secondary focus of this program concerns prehistoric and early historic subsistence at the site.

A total of 19 radiocarbon dates have been reported from seven of these archaeological sites (see Table 1.). The dates indicate that all of the sites contain late prehistoric deposits

Table 1. A Summary of Radiocarbon Dates from Cultural Deposits in San Juan County, Washington.

Site	Date	Sample No.	Reference
45-SJ-1	2,270 +/- 75	(USGS-20)	Thompson 1978*
	2,630 +/- 75	(USGS-21)	"
	2,660 +/- 50	(USGS-79)	"
	2,700 +/- 90	(USGS-22)	"
45-SJ-11	560 +/- 50	(BETA-24923)	Wessen 1988
	2,840 +/- 60	(BETA-24924)	"
45-SJ-24/25	109 +/- 1	(WSU-2917)	Stein 1984
	580 +/- 70	(WSU-2918)	"
	630 +/- 55	(WSU-2919)	"
	820 +/- 240	(WSU-1208)	Thompson 1978*
	1,030 +/- 240	(WSU-1207)	"
	1,580 +/- 60	(GAK-4934)	Thompson 1978*
	2,180 +/- 100	(GAK-4933)	"
45-SJ-84	2,570 +/- 140	(GX-5653-G)	Bailey 1978
	2,785 +/- 128	(GX-5652-G)	"
45-SJ-105	1,514 +/- 40	(UW-24)	Kidd 1969
45-SJ-185	2,545 +/- 155		Forbes n.d.
45-SJ-274	278 +/- 60	(TX-4018)	Benson 1981
	2,860 +/- 121	(TX-4017)	"

* San Juan County radiocarbon dates reported in Thompson (1978) are previously unreported dates obtained by other researchers and compiled by Thompson.

and based upon these dates and associated diagnostic artifacts, all of the dated assemblages are assignable to either the Marpole or Gulf of Georgia Culture Types. While the range of dates presented in Table 1. appears to suggest that many of these sites represent relatively brief occupations, this is not necessarily an accurate interpretation. All of the dated sites contain cultural deposits more than one meter thick; in many cases the appearance of brief occupation may be due to the limited number of radiocarbon dates.

As was the case with the site surveys, a broad perspective on the archaeological excavations conducted in the San Juan Islands reveals a number of trends. Most excavation efforts have

been of relatively small scale and they have been concentrated in only a few portions of the islands. In total, 27 excavation projects have been conducted (see Appendix C), but 16 of these have been on San Juan Island, another six have been on Lopez Island, and there have been two projects on Stuart Island. Further, at least three sites have been the focus of more than one excavation; 45-SJ-1 and 45-SJ-84 have been investigated twice, and the 45-SJ-24/25 site area has been the focus of three different programs. Beyond spatial clustering, the excavations have shared other types of similar focus. As noted above, all excavations have addressed relatively recent cultural deposits. The vast majority of the sampled sites are large, relatively deep, high-density shell midden deposits. Small and/or shallow sites have rarely been tested. This last trend almost certainly reflects the archaeologist's desire to recover diagnostic artifacts, and his or her assumptions about where relatively large numbers of such artifacts are likely to be found. Nevertheless, the diagnostic artifact collections from most of these sites are small. At the same time, while faunal remains constitute the largest class of cultural materials represented in all of these sites, the analysis of faunal materials has generally been limited. Finally, due to the small scale of most excavations, there have been few efforts to investigate intra-site structure (and therefore, the context of the recovered sample) in any sense other than the determination of chronological units.

PROBLEMS OF SITE TYPE AND SITE BOUNDARY DEFINITION

While archaeological studies in the San Juan Islands have demonstrated that this area is rich in prehistoric cultural resources, relatively little is known about most of them. One major reason for this condition is that only a small portion of work undertaken here has been completed, adequately described, and publicly reported. Another reason is that much of the available database is flawed by numerous internal inconsistencies and/or miss-statements of fact. This condition is particularly apparent in the site survey records. (It is also evident in some excavation reports.) Many of the most serious flaws with the San Juan site database result from inconsistent, and generally unexplicated, applications of site type and site boundary concepts. In fairness however, it should also be noted that the problems to be discussed in this section are hardly unique to San Juan County; they are widespread in western Washington.

The condition of the site records data is due largely to the fact the various survey programs were never unified into a single organized effort with a consistent explicit methodology. In this regard it can be suggested that many of the problems appear to result from the use of overly simplistic conceptual models, but as few studies have explicitly described their methodology or conceptual models, this suggestion is difficult to demonstrate.

In fact, Wessen (1986) was the first San Juan Islands survey report to provide detailed discussion of its methodology, site typology, and site boundary concepts.

By far the most pervasive subject of inconsistent and/or inexplicit application is the term "shell midden". This issue is important because the term has been applied, almost invariably without definition, to most of the sites in this region. At least some of the researchers who have used the term have clearly associated it with particular behavioral assumptions, again without explicit statement or justification. Further, in many of the earlier site survey records the terms "shell midden" and "shell mound" are used interchangeably. This is unfortunate and misleading as "mound" clearly denotes a heap or pile and the very same records indicate that actual heaped up accumulations of shell midden matrix are relatively uncommon.

A similar situation is apparent in the use of the term "rock cairn" and the associated assumption that any pile of rocks represents a prehistoric burial. As was the case with shell middens, piles of rocks in the islands have routinely been referred to as rock cairns without definition or any type of justification. While demonstrated rock cairn burials do occur in the region, the use of this term without a clear definition (or objective criteria for its application) has probably resulted in the misidentification of historic piles of rocks in some cases.

The determination of site boundaries have been conducted with a similar lack of rigor, and the practice has resulted in considerable variation as some surveyors "lumped" while others "split". Thus, site records for the San Juan Islands are very heterogeneous. The situation is most confused in areas which contain a relatively high density of prehistoric deposits and, unfortunately, such areas are relatively common in the Islands. Two types of inconsistencies are particularly apparent: aggregations of discontinuous, but similar, cultural deposits grouped as a single site and aggregations of discontinuous and dissimilar cultural deposits grouped as a single site.

Aggregations of discontinuous, but similar, cultural deposits grouped as a single site is a condition which is common with shell midden sites. The condition is particularly troublesome in that most such sites are, in fact, composed of a series of closely spaced discontinuous deposits rather than a single continuous mass. The problem has arisen because there are no generally accepted standards which govern site boundary definition with respect to the spacing intervals between discontinuous deposits. The problem is further complicated by the environmental constraints under which most survey observations are made (see Chapter Four). As a result, in some places nearly contiguous deposits are recorded as separate sites while elsewhere deposits as much as .5 kilometer apart are recorded as portions of the same site.

Another dimension to this problem has been the nomenclature used to designate site segments. Site segments have been designated by alphabetic suffixes, but usually with no explanat-

ion of their use. In some cases, they indicate discrete deposits in a close proximity. In other cases, they indicate separate portions of what was previously a single continuous deposit.

A final aspect of this problem worth mentioning is that in a number of studies, site surveyors have been less than adequately informed about previously recorded sites in their study areas; thus some sites, or portions of sites, have received more than one site number.

Most aggregations of discontinuous and dissimilar cultural deposits grouped as a single site are assumed associations of shell middens and rock cairns. In a smaller number of cases, they are assumed associations of shell middens and possible rock shelters. In either circumstance, a single site record describes a shell midden deposit and one or more rock cairns, or one or more possible rock shelters, located somewhere nearby. Often, the site record provides a descriptive account of the shell midden and mentions the rock cairns or possible rock shelters only as an afterthought. This practice provides little direct information regarding the cairns or shelters and tends to obscure their presence. Wessen (1986) took all confirmed rock cairns thus listed and recorded them as separate sites, but a number of additional aggregations of this type remain in the site records.

SAN JUAN NATIONAL HISTORIC PARK

The prehistory of the San Juan National Historic Park is not well known, this despite the fact that the two properties of the park have probably received more sustained archaeological study then any other portion of the San Juan Islands. In many ways the archaeological resources of the park are very typical of the region as a whole and similarly, due to the concentration of efforts here, the research and resulting database shares many characteristics with that for the region as a whole. The following sections briefly summarize the history of research at American Camp and British Camp.

American Camp

The American Camp Park area was the scene of some of the earliest archaeological study in the region. Smith (1907) described at least two sites (45-SJ-3 and 6) which are now within the park. Subsequent site surveys here were conducted by King's students in the late 1940's and they recorded most of the sites now known here (45-SJ-1, 3, 6, and 59). Keith Thomson examined the area again in 1951, but he added no new sites to the record. The park was investigated again by Wessen in 1985; he confirmed the presence of all previously recorded sites and reported two additional ones (45-SJ-322 and 323).

Two archaeological sites recorded at American Camp exhibit a type of site boundary condition discussed above. Both 45-SJ-3

and 6 are single sites composed of two or more discrete areas of shell midden deposits separated by distances of as much as 150 meters. In both cases the site area is a large lagoon with shell midden deposits located at various points along its margin. Arguably, these two areas might be considered to represent as many as five separate archaeological sites.

In addition to site survey, American Camp has also been the subject of several excavation studies. The major effort in this regard was Arden King's work at Cattle Point (45-SJ-1) in 1946 and 1947. In 1948, Cal Burroughs directed additional test work at Cattle Point. During this same period, Warren Caldwell tested a portion of the site at Jekyll's Lagoon (45-SJ-3). Finally, Joan Robinson undertook limited additional studies at Cattle point in 1975.

King's work at Cattle Point was the earliest of the modern research in the San Juan Islands and it remains one of the most extensive and best documented studies to have been conducted here. This work addressed a large area of shell midden deposits distributed along the crest and the base of an old marine terrace behind the modern beach, approximately three kilometers west of Cattle Point on San Juan Island (see Appendix B). University of Washington field schools working under his direction conducted extensive excavations in several areas along the crest of the terrace and, to a lesser extent, on the beach below. In addition to deep stratified cultural deposits, these efforts also exposed a number of in situ habitation features. Such features included hearths, pits, post holes, stone slab structures, and clay-slab bowl structures. While hearths, pits, and post holes are commonly reported in this region, the stone slab and clay-slab bowl structures are unusual. Structures made of stone slabs generally had a box-like or trough-like form; some of these may have been some type of storage structures. The clay-stone bowl structures may represent some type of cooking equipment. The excavations here also exposed a number of human burials, both with and without associated rock cairns.

King's interpretative efforts at Cattle Point focused upon regional chronology concerns. As noted earlier in this chapter, he organized his findings into a four unit chronological scheme of Island, Developmental, Maritime, and Late Phases. While relying heavily upon diagnostic artifacts, aspects of the associated fauna and physical stratigraphy are also cited in the definition of these units. The Island Phase is marked by leaf-shaped chipped stone points similar to the early Olcott or Lithic Culture units proposed by later researcher, but in contrast to those units the Island Phase also contains ground slate knives and a variety of bone tool forms. These materials continue into the Developmental Phase, and are now accompanied by a proliferation in stemmed and notched chipped stone point styles and the appearance of composite toggling harpoons. The following Maritime Phase contains many artifacts similar to the Developmental Phase, but is marked by a high proportion of triangular points and much greater use of ground slate. (The Maritime Phase

is similar to the Marpole unit subsequently described by other researchers in this region.) Rather than additional new elements, the Late Phase is characterized by a dramatic reduction in the diversity of bone and stone tool forms common to the Developmental and Maritime Phases. No objects of European or Euro-American origin were associated with Late Phase materials. King visualized this sequence of phases as a series of occupations which were originally oriented toward terrestrial resources and which became more maritime over time. While radiocarbon dates were not available, it is clear that he considered that his chronological scheme represented a significant portion of the Holocene. (In this last regard, see discussion of Robinson's work, below.)

In 1948, another University of Washington field school under the direction of Cal Burroughs returned to King's East Bluff area at Cattle Point. They dug a trench in the immediate vicinity of King's excavation units here, but they recovered some materials and a depositional interpretation different from that proposed by King (1950). This material was presented by Carlson (1954 and 1960), wherein he suggests that there is essentially only one cultural stratum in this area. On stylistic and stratigraphic grounds, Carlson equates this stratum with both King's Developmental and Maritime Phases. Further, he identifies this occupation as a representative of the Marpole Phase. Carlson also notes that lamellar microblades and polyhedral cores are present in the site. King (1950) reported no such objects here; however, Carlson indicates that some were present, but were miss-classified as "worked quartz crystals".

While Burroughs work at Cattle Point, Warren Caldwell conducted excavations at Jekyll's Lagoon (45-SJ-3). Jekyll's Lagoon is a brackish water lagoon separated from Griffin Bay by a sand and gravel spit on the north side of the American Camp Park. The site includes three separate areas of shell midden deposits located along the margins of the lagoon (see Appendix B). Caldwell dug a trench and a number of smaller test pits near the eastern end of the spit; no other portions of the site were examined. The depositional structure exposed in these excavations suggested to Caldwell that at least four or five occupations were represented, but no cultural changes were apparent between them. With the exception of a single small pit, no in situ habitation features were observed at Jekyll's Lagoon.

The excavations at Jekyll's Lagoon produced a relatively small sample of artifacts heavily dominated by items of bone. The majority of these are either barbed bone points or simple (unbarbed) bone points. Stone artifacts of any kind were rare and the recovered sample includes only a single piece of chipped stone. As was the case at Cattle Point, no objects of European or Euro-American origin were collected at Jekyell's Lagoon. Overall, the collection is not incompatible with either the Maritime or the Late Phase described at Cattle Point. Subsequently, Carlson (1960:576) assigned these materials to his San Juan Phase (arguably the equivalent of King's Late Phase).

The final episode of archaeological testing within the American Camp Park occurred in 1975 when Joan Robinson undertook additional activities at Cattle Point (Robinson per. comm.). Robinson's efforts focused on the soil chemistry of cultural deposits here and her samples were obtained from a series of soil auger cores rather than from test excavations. She cored portions of the crest of the marine terrace previously sampled by King. Robinson examined soil ph values in an effort to evaluate the decomposition of marine shell in these deposits, but her results were inconclusive. Robinson also obtained the radiocarbon dates for 45-SJ-1 cited above in Table 1; all of these dates are from bones collected by King from Maritime Phase deposits.

British Camp

As was the case with American Camp, the British Camp Park area has also long been a focus of archaeological activities. Harlan Smith's 1907 report described a shell midden at British Camp (45-SJ-24/25) and a prehistoric trench at Bell Point (45-SJ-264). It is also likely that Arthur Colley collected artifacts in this area during the 1920's (Sprague 1975). Arden King's students surveyed here as well, and they recorded the sites 45-SJ-21, 23, 24/25, 26, and 27 (King, Helligas, and Daugherty 1946). Again, Keith Thomson (1951) followed King's students and he recorded the sites 45-SJ-201 and 202. Also in 1951, the site 45-SJ-264 was recorded by Marilyn Knowles, but it is unclear whether she actual observed the site (see Appendix B). Sonia Solland and Nancy Stenholm provided additional descriptions of many of these sites in 1963. In 1970, Randy Greenfield surveyed the area of Garrison Bay, and he filed a record for the site 45-SJ-291. Finally, Gary Wessen's 1985 study covered this area and added the sites 45-SJ-330 and 332.

The British Camp Park site inventory also contains examples of site boundary problems. In this case, the problems concern multiple site numbers for single areas of continuous or nearly continuous cultural deposits. The most conspicuous example of this condition is the midden at British Camp itself; the site numbers 45-SJ-24 and 45-SJ-25 have been applied to what is clearly a single mass of cultural debris, hence the use here of the term 45-SJ-24/25. The sites 45-SJ-23 and 45-SJ-291 are also essentially continuous and herein referred to as 45-SJ-23/291.

With reference to archaeological excavations, the British Camp area has been the subject of the most sustained and repeated study of anywhere in the San Juan Islands. At least four excavation programs (Aden Treganza in 1950, Cal Burroughs in 1951, Steve Kenady in 1970-73, and Julie Stein in 1983-87) have investigated prehistoric cultural deposits in the 45-SJ-24/25 site area. Unfortunately, however, very little of this work been formally reported. In addition, limited salvage excavations on Guss Island (45-SJ-21) were conducted by Julie Stein and Pam Ford

in 1983, and it is possible that Treganza may also have dug here during his 1950 field work.

The earliest modern archaeological research at British Camp was the University of Washington field school directed by Aden Treganza in 1950. This site is an extensive area of shell midden deposits along the eastern shoreline of Garrison Bay; it extends across the western half of the old British parade ground and at least several hundred meters further to the northwest (see Appendix B). Treganza investigated deposits at and just beyond the northwestern margin of the parade ground. He dug two trenches and a number of smaller test pits. He sampled portions of the parade ground itself, a mound-like structure at the margin of the parade ground, and an area just beyond the parade ground which may contain the remains of one or more house platforms. While a descriptive account was prepared (Treganza 1950), no effort was made to relate these findings to those coming from Cattle Point.

The following year another University of Washington field school returned to this area, now under the direction of Cal Burroughs. (This work is sometimes attributed to Roy Carlson, but this not correct; Carlson wrote the report, but Burroughs directed the field work). Burroughs worked at the western end of the site, approximately 300 meters to the west of the parade ground. Several trenches were dug in this area. His efforts revealed at least three major occupational strata here, but there was little difference in their contents. In situ habitation features were limited to hearths and pits. A single human burial (without an associated rock cairn) was also encountered. This effort recovered a small collection of artifacts containing roughly equal quantities of bone and/or antler and stone. The bone and antler tool sample is marked by points and flakers. The stone tool sample contains both chipped stone and ground stone with triangular chipped stone points being most common. A few European goods were also recovered, but these were obtained from the surface of the site and they are not considered to be associated with the Native American strata. On the basis of diagnostic artifacts, Carlson (1960:563) has suggested that these deposits represent Marpole Phase occupations.

The next effort at British Camp was a joint University of Washington-University of Idaho investigation conducted between 1970 and 1973. This project investigated both historic and prehistoric materials with Roderick Sprague directing the historic studies and Steve Kenady directing the prehistoric studies. Excavations at this time focused on the parade ground itself, with exposures being dug near the center of its western margin and along it southern margin. Excavations in both areas revealed shell midden deposits, but much of this material had been disturbed (apparently by the British, who leveled and filled the area in order to develop the parade ground). Despite this extensive disturbance, in situ habitation features such as hearths and pits were encountered, as were a number of human burials. Additionally, work at this time demonstrated that

cultural deposits here extend down into a waterlogged stratum which contains plant fiber artifacts such as basketry, cordage, and matting (Sprague 1976). The excavations produced a collection of more than 1,700 prehistoric artifacts and, with the exception of the above noted waterlogged materials, it is much like those earlier recovered by Treganza and Burroughs. An analysis of the artifacts conducted by Kenady (1973) suggested that four different "functional components" were represented, but the significance of these units is unclear. While Kenady's "functional components" offer no insights regarding the relationships of these units to the chronological units favored by all previous researchers, consideration of the reported artifacts and the available radiocarbon dates (see Table 1) suggests that both Marpole and Gulf of Georgia occupations are probably represented.

The most recent investigation of the British Camp area is a research program initiated by Julie Stein of the University of Washington in 1983, and which is still ongoing at this writing. Stein's effort has also focused upon the parade ground itself (45-SJ-24/25); she has dug in the center of its western margin and in its northwestern corner (in the immediate vicinity of Treganza's 1950 exposures). The latter area contains a series of earthworks and may include one or more Native American house platforms located in the forested area just beyond the parade ground (see Appendix B). In addition, this project has undertaken considerable soil auger probing of cultural deposits elsewhere on the parade ground in order to determine the limits of the site.

The Stein effort at British Camp is a long-term project which differs from previous studies in the San Juan Islands in that the reconstruction of cultural history is not a major focus. Rather, a principal concern of the project is investigation of the depositional and post-depositional processes responsible for the shell midden. To this end, Stein has been excavating portions of the site utilizing recovery techniques designed to sample individual small-scale depositional units or facies. The contents of these facies have been subject to detailed descriptive analysis in an effort to establish the particular cultural behaviors represented. Portions of the contents of selected facies have also been subject to a variety of sedimentological and soil chemistry analyses in order to assess possible post-depositional effects. While final results are not yet available, this approach appears to have considerable potential to clarify the dynamics of shell midden formation here and the relationships between particular cultural behaviors and the deposits resulting from them. Further, this effort should provide important insights into the internal structure of the site area.

A number of secondary research goals have also been incorporated into the Stein program at British Camp. These include: investigation of the possible house platforms at the end of the parade ground, documentation of the range and character of the prehistoric cultural behaviors that occurred there, and evalua-

tion of possible Native American subsistence changes between the late prehistoric and early historic occupations. As is the case with the primary research goal, the results of efforts on these secondary issues are not yet available.

The only other subject of archaeological excavations in the British Camp Park area has been Guss Island (45-SJ-21). Guss Island is a small island in Garrison Bay located immediately in front of the British Camp parade ground; it contains a shallow shell midden deposit and a number of prehistoric human burials (see Appendix B). The island has low wave-cut banks, and human remains have been noted in these erosional exposures on a number of occasions. There is some reason to believe that Aden Treganza recovered one or more burials here during his 1950 field work, but if so, his report of them has been lost. Human remains were recovered here by park visitors in 1970. Additional human remains were observed here in 1983 and on this occasion they were recovered in a limited salvage excavation conducted by Julie Stein and Pam Ford of the University of Washington. Beyond the recovery of skeletal materials, there have been no efforts to investigate the shell midden deposits here.

CHAPTER FOUR

PREHISTORIC CULTURAL RESOURCES IN SAN JUAN COUNTY

This chapter considers the range of prehistoric cultural resources demonstrated to occur in San Juan County by an extensive archaeological site survey conducted during 1985. It describes the site types represented in this area and provides overviews and discussion of their forms, distributions, and current conditions. The chapter concludes with a brief summary of the prehistoric cultural resources demonstrated to occur on properties of the San Juan National Historical Park.

THE 1985 SAN JUAN ARCHAEOLOGICAL SITE SURVEY

The database to be considered in the following sections was produced by an extensive survey of cultural resources in San Juan County (Wessen 1986). The study was conducted for the Washington State Office of Archaeology and Historic Preservation, in cooperation with the San Juan County Planning Department. It had two principal goals: (1) verification of all previously recorded prehistoric archaeological sites and (2) investigation and documentation of unrecorded prehistoric archaeological sites in previously unsampled microenvironmental settings. As such, this study has addressed all currently known prehistoric sites in the San Juan Islands.

The primary focus of the 1985 survey was the existing sample of previously known archaeological sites, most of which had been recorded between 1946 and 1951. At the start of the 1985 effort, the actual number of prehistoric sites in this sample was uncertain due to both duplicate numbers for some sites and blocks of apparently unassigned site numbers. Subsequent investigation demonstrated that the sample contains records for 271 prehistoric archaeological sites. Of these, 190 sites were verified during 1985 field work. An additional 60 sites were searched for, but could not be located. The remaining 21 are sites reported to be located on private properties for which permission to search could not be obtained (thus their current condition is unknown).

The microenvironmental sampling of previously unexamined settings was the secondary focus of project efforts. As noted earlier, all previous surveys focused on the coastal zone and (not surprisingly) all but one of the previously recorded sites are located near the modern shoreline. Therefore, interior areas of the larger islands were the focus of this portion of the study. Sampling was extended to examples of all of the local plant community types (see Chapter One) and such localized landscape features as lake shores, springs, caves/rockshelters, and relic marine shorelines.

Beyond site verification, the survey recorded 51 new

archaeological sites in the San Juan Islands, but it must be emphasized that only about one in four of these new sites were located by microenvironmental sampling. The 51 newly recorded sites represent four different types of discovery situations. Twelve of the sites were, in fact, discovered during micro-environmental sampling. Nineteen new sites were encountered during the above noted verification efforts; that is, while attempting to locate previously recorded sites. An additional 18 sites were recorded following information provided by local residents of the islands. Finally, two of the new sites are previously known rock cairn areas which were formerly listed with nearby shell middens, but are better considered to be separate sites.

In total then, the site inventory for San Juan County, at the conclusion of the 1985 survey, contained records for 322 prehistoric archaeological sites. (It must be stressed, however, that this count continues to reflect many of the site boundary and site definition problems discussed in Chapter Three.) Of the 322, a sample of 241 archaeological sites could be confirmed in 1985. Unless otherwise stated, the following data and discussions are based upon this sample of confirmed sites.

While the 1985 site survey collected a large amount of data on archaeological sites in the San Juan Islands, this database is constrained by limitations of the methodology used to obtain it. Most importantly, the survey was designed to be a non-impacting examination and therefore field methods included no vegetation clearing or subsurface sampling techniques. As such, inspection was limited to those exposures which were already available at the time of the study; several important data limitations resulted. Certain classes of descriptive data are far more reliable than others. (For example: site lengths, as measured along the face of wave-cut banks, are probably far more credible than site widths, as measured by indications of cultural material on heavily vegetation-covered ground surfaces behind the banks.) Further, many of the negative data findings should be considered suspect. (For example: when previously recorded sites could not be relocated, this means they had no visible surface indications; subsurface cultural deposits may yet persist at many of these localities.)

In fact, the limitations imposed by poor ground surface exposure effect the survey data in many ways. The discovery circumstances of the newly recorded sites is considered to be a reflection of the difficulty of locating archaeological sites in heavily vegetated interior areas. All 19 new sites recorded during site verification and 14 of 18 informant reported new sites are located in the immediate vicinity of modern saltwater shorelines. Additionally, three of 12 new sites encountered during microenvironmental sampling are actually associated with modern saltwater shorelines which formed boundaries along some of the study tracts. In total, only 15 sites are reported in settings other than the modern shorelines. Most sites in this latter group are rock cairn sites which offer relatively substan-

tial above ground features. In contrast, interior sites with only surface or subsurface deposits were rarely encountered.

One additional expression of this same visibility-related limitation manifest in both the 1985 and original data sets is worth discussion in some detail. The most basic descriptive attributes of the San Juan sites are their physical dimensions (i.e., their lengths, widths, and depths). The 1985 survey was able to compare its findings to the originally reported site dimensions for each verified site, and the results of this comparison are summarized in figure 1. Note that the general level of agreement is quite low.

Length is the site dimension offering the largest directly comparable sample. All other factors being equal, it might be expected that if the reported and observed figures did not agree, then sites ought to be smaller now (due to an additional 30 years of erosion). While almost 70% of the compared cases do, in fact, show currently smaller length dimensions, note that almost all of the remainder are currently reported as larger. Actual agreement, or even near agreement (plus or minus 30%) is low.

Site widths offer the second largest sample to compare. In this comparison, the non-agreement between reported and observed dimensions is very strongly biased toward currently smaller measures. While this condition is consistent with expectations related to the accumulated effects of erosion, it is also here considered to be a reflection of the differences in field methodologies. Determination of a site width is affected by on site vegetation, and while the original surveyors frequently employed shovel tests to establish site widths, the current study did not. This factor alone could account for many of the currently reported smaller widths.

Site depths are the smallest sample of comparable measures, although this sample size is still large. While overall agreement is also low here, this group has the closest fit of any dimension. Site depths were obtained from the same source as site lengths (wave cut bank exposures along the beach) and the patterns of their agreement are similar. Both show a predominance of currently smaller dimensions, with the bulk of the remainder being larger rather than equal.

The generally poor agreement noted in this comparison between the originally reported and currently observed site dimensions is probably a reflection of two different conditions: erosion and sampling error. Erosion is unquestionably part of the story; virtually all of these sites were being actively eroded when they were first reported and most have been exposed since that time. However, erosion can only be cited where the currently observed value is a smaller measure. All of the currently larger measures (and an unknown percentage of the smaller ones) probably represent sampling errors. This latter condition is seen as reflecting the difficulty of obtaining accurate site dimensions during survey in areas with heavy ground cover. It is the author's belief that truly accurate determination of site dimensions in these settings will require vegetation

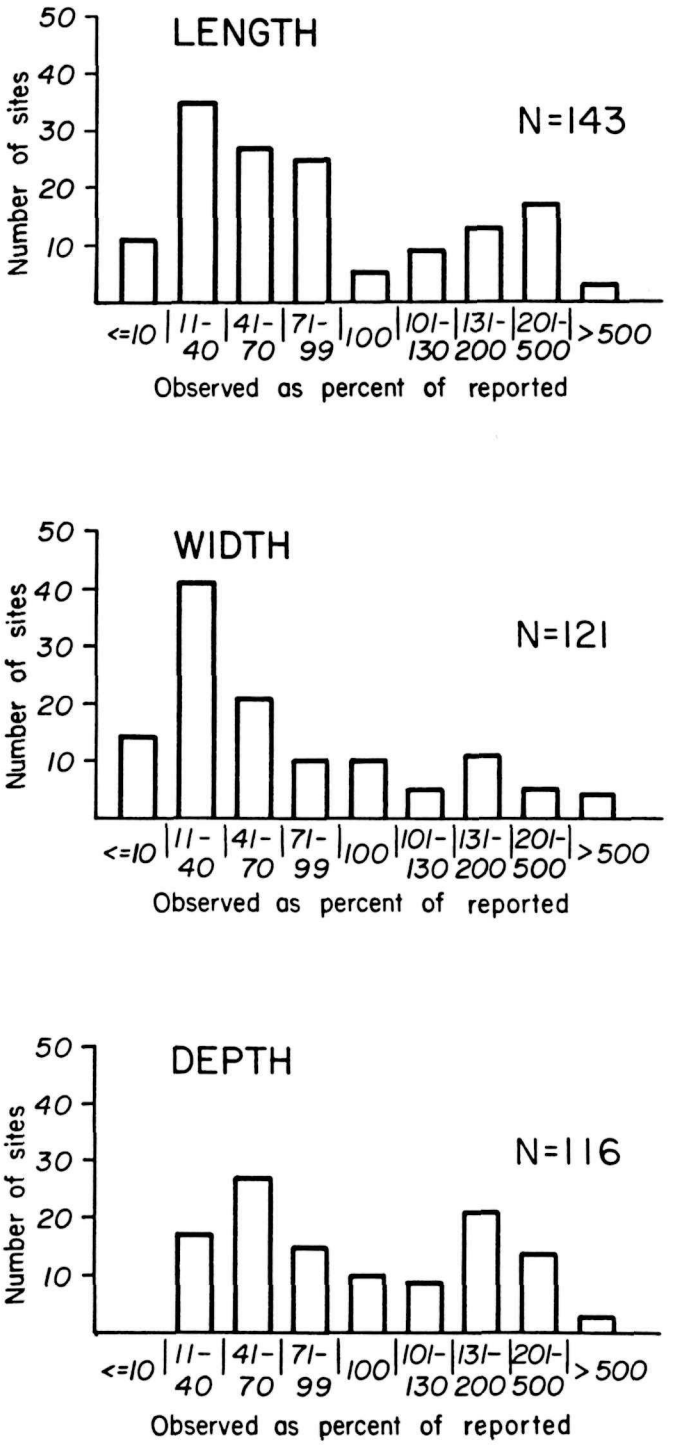


Figure 1. A Summary of Agreement Between the Originally Reported and 1985 Observed Dimensions for Archaeological Sites in San Juan County.

clearing and subsurface sampling. As such, both the original and currently updated site dimensions are probably best considered to be only rough approximations.

A SITE TYPOLOGY FOR THE SAN JUAN ISLANDS

Consideration of the character of the confirmed prehistoric sites of the San Juan Islands indicates that they all may be embraced within a simple system of site types. The types to be discussed here are based upon the basic physical characteristics of their deposits. While all of the site type names have a previous history in this region, and some may have behavioral connotations in contexts outside of this study, no particular behavioral dynamics are specifically implied by their use here. The following discussions will describe the physical characteristics of the types and offer some observations about their distributions in the landscape and the apparent condition of their representatives in 1985. Here again, the site types have not been defined on the basis of these distributions and the distributions are not presented as a model for their occurrence. The system of site types employed here is adequate because its purpose is limited to providing a basis for the descriptive discussion of these cultural deposits. Given different research goals, the database generated by the 1985 study could support the investigation of a wide range of other typological schemes.

The sample of 241 confirmed prehistoric archaeological sites in San Juan County can be embraced by a site typology which includes seven basic types. The distribution of the sites among these types is heavily skewed however, and two closely related types - the shell midden and the shell midden with earthworks - account for almost 90 % of all sites. The site types and their frequencies are summarized in Table 2. The following sections provide individual discussions of each site type. (While some of these sections contain individual table summaries, for convenience other tables combine data of a particular category for all site types in a single place; specifically, Tables 7 through 11 present combined data and these tables appear at the end of the site type sections.)

Shell Middens

Shell middens are sites wherein a significant portion of the cultural matrix is composed of the shells of marine shellfish. They were the first type of site to be reported in this region, and they constitute the vast majority of the reported sites in every subsequent study. While considerable variation is apparent within the group, the present typology recognizes only one major distinction among them: whether earthworks are associated with the deposit. Shell middens in this section are composed of horizontally-bedded strata without evidence of earth construc-

tions; those with any type of large scale structure are discussed in the following section.

Table 2. Site Type Frequency For Confirmed Prehistoric Sites in San Juan County, Washington.

Site Type	Frequency
Shell Middens	197
Shell Middens with Earthworks	18
Earthworks	1
Rock Cairn Sites	17
Lithic Sites	6
Rock Art Sites	1
Wet Sites	1
total	241

Shell midden sites have been the subject of considerable speculation regarding their behavioral significance. Widely regarded as merely refuse, this view is simplistic and equally true of most archaeological sites whether they contain shell or not. On the Northwest coast, some (Fladmark 1975, for example) have suggested that shell middens represent large villages while others (Minor 1983, for example) have implied that they represent specialized shellfish processing camps. The present study holds to the view that shell middens are a broad, diverse, and poorly understood class of archaeological deposits. In this region, it is likely that they represent a range of occupations including both of the types noted above. It follows therefore, that the behavioral significance of any particular shell midden deposit (beyond the simplistic observation that shell fish were being used) is not immediately obvious and is an appropriate question for detailed investigation.

The observed dimensions of shell middens in the San Juan Islands are summarized by grouped ranges in Table 2. These figures indicate that while almost half of the sites are relatively small, significant numbers of large sites also occur. The figures also confirm the original perception that these tend to be highly linear deposits. While this observation is probably influenced by the sampling errors noted above, it unquestionably reflects a real condition. In evaluating these figures it is

worthwhile to note that only 85 of the sites are represented by a single continuous mass of midden; in most cases the sites consist of a zone of discontinuous deposits in close proximity.

Table 3. A Summary of Observed Site Dimensions, by Grouped Ranges, for Shell Middens in San Juan County.

Length (Ms.)	<30	30-100	101-200	>200
# of Sites	79	54	30	27
Width (Ms.)	<5	5-15	16-30	>30
# of Sites	100	66	12	5
Depth (Cms.)	<50	50-100	101-150	>150
# of Sites	89	61	15	6

The basic physical characteristics of the shell midden deposits are sufficiently similar that they lend themselves to a single synthetic description. The "typical" shell midden is composed of faunal materials and small quantities of artifactual debris (predominantly lithic materials, although occasional bone and shell objects also occur) in a mineral matrix in the fine sand to silt range. Charcoal and significant quantities of ash are also common. Matrix color is often somewhat internally variable, but colors in the Munsell range of 10YR2/1 to 10YR4/1 are most common. The vast majority of all middens contain highly fragmented shell materials and most shell densities are moderate; that is, few deposits contain truly high or truly low densities of shell.

Nearly all of the San Juan shell middens occur at the top of their associated soil profiles and only a small percentage of them were noted to contain features or other obvious internal structures. When present, the most common features were lenses of ash, sea urchin (Strongylocentrotus spp.) test, or intact bivalve shells with low species diversity. Post molds and other small cut-and-fill structures also occur. (It should be noted that this apparent lack of internal structure in most sites is almost certainly related to survey sampling; more detailed investigation would probably show structure in most sites.)

Marine shellfish are the most abundant class of faunal

remains in these sites, and all 197 of them contain identifiable materials. Taxonomic variation is considerable and most sites contain at least six to 15 species; bivalves dominate these sites with lesser quantities of univalves, chitons, arthropods and echinoids also present. The sites may be considered in terms of their dominant species, and from this perspective, taxonomic variation may be reduced to a more manageable situation. Approximately 80% of all shell middens may thus be assigned to one of five similar Shellfish Dominant Types (see Table 4) and many of the remaining sites can be regarded as variants of these types. Note that the steamer clam (Protothaca staminea) is represented in all types. While rarely dominants, chitons, barnacles, and echinoids are also well represented in most sites. To a certain extent, the variation in bivalve dominants in these sites probably reflects the variation in intertidal environments that they are associated with.

Table 4. Shellfish Dominant Type Frequency for Shell Midden Sites in San Juan County, Washington.

Dominant Type	Frequency
Protothaca only	20
Protothaca and Saxidomus	66
Protothaca, Saxidomus, and Mytilus e.	29
Protothaca and Mytilus e.	18
Protothaca, Saxidomus, and Clinocardium	24
total	157

Almost half of all shell middens were observed to contain at least some bone, although in most cases bone frequency was quite low. Mammal bones were the most commonly occurring bones and deer (Odocoileus hemionus) was represented in at least 80 sites. All other mammals were far less frequent and marine mammals of any kind were particularly uncommon. Among marine mammals, harbor seal (Phoca vitulina) was most common (noted in only six sites). Fish bones were noted in at least 65 sites, but in most sites the bone was not identified. Among identified fishes, salmonids were encountered in 16 sites. Bird bones were noted in only 20 sites. It is likely that this pattern of bone occurrence is also effected by sampling methods; mammal bones may be most common simply because they are the largest, and therefore most visible, bones.

Beyond faunal remains, cultural materials such as fire-cracked rocks and debitage were common at many shell midden sites, but potentially diagnostic artifacts were rare. While 147 sites contained fire-cracked rocks and debitage was observed at 62 sites, actual tools or tool fragments were encountered at only 23 sites (This latter figure is exclusive of private collections). The total tool sample for the 23 sites includes only 32 objects and thus most sites were represented by only a single artifact. Flaked cobbles and preforms or blanks make up the majority of these materials and pecked or ground stone forms account for most of the rest. Chipped stone points and bone tools of any kind were particularly uncommon. Most chipped stone objects were made of a relatively fine-grained basalt which is common in the islands. A dark green microcrystaline stone (a chert?) is also present in some sites, particularly in the vicinity of West Sound on Orcas Island and the Neck Point area on Shaw Island. Examples of obsidian were very rare.

Shell midden sites are very widespread in the San Juan Islands and a number of generalizations may be made about their occurrence. Nearly all such sites are associated with modern saltwater shorelines (see Table 7). While the microenvironmental sampling portion of this study has demonstrated the presence of shell middens associated with relic shorelines (the Lowland Hillside landform type in Table 7), this latter sample is so small that it supports few generalizations. Almost 90% of the sites occur on protected shorelines. More than half of all shell middens occur on erosional beaches (see Table 8), although this may be a function of the relatively greater visibility in these settings. Among depositional beach forms, the spit-lagoon complex appears to be a favored site location.

Shell midden sites occur in a wide variety of local plant communities, but they show a strong association with the Open Transitional Forest plant community type (see Table 9). However, as this community is confined to south facing settings, the association may be a function of aspect. Considering aspect directly (see Table 10), southerly exposures are, in fact, most common, but they do not account for a majority of the sites and all other aspects are also well represented.

In 1985, nearly all shell middens in the San Juan Islands exhibited some degree of disturbance, but in most case the disturbance did not appear to be complete. Either one or both of two mechanisms account for most disturbance: wave erosion and modern development. Wave erosion is a serious problem in this region. While most of the sites occur on protected shorelines, most are situated in low lying areas close to sea level (see Table 11) and are subject to erosion due to high tides and storms. Modern developments have also had a significant impact on shell midden sites, particularly in the vicinity of larger communities such as Friday Harbor on San Juan Island, East Sound on Orcas Island, and Lopez Village and Stanley on Lopez Island. Elsewhere, the construction of private homes, parks, and roads have taken a considerable toll. In a number of places, such

developments have included the construction of sea walls in shell midden sites and, while destructive, these containment structures may also have had a positive effect in stabilizing the cultural deposits behind them. Direct vandalism to shell midden sites appears to be relatively limited (probably due to the relatively low densities of artifacts in them).

Shell Middens With Earthworks

Shell middens with associated earthworks are here considered to be distinct variation of the sites described above. They are so treated because their associated earthworks are usually large conspicuous structures which are readily apparent during quick field inspections such as those which characterized the 1985 study. Shell middens with earthworks do not appear to be numerous in San Juan County, but they occur over much of the county and some early historic accounts (particularly Smith 1907) suggest that they may have been formerly more common.

Three different types of earthworks occur in association with shell midden deposits. The earthworks include: circular depressions, semi-circular trenches, and mounds. All of these structures are also reported at archaeological sites in other nearby regions of the southern Northwest Coast. In some cases more than one type of structure is present at the same site, and for this reason the present discussion will treat all sites with such structures as a single group.

Seven sites in the San Juan Islands were noted to contain circular depressions either within, or in the immediate vicinity of, the shell midden deposit. Such features were also observed during the original surveys in the islands, at which time they were referred to as "pits". Similar features have also been reported by Bryan (1963:78) on Whidbey Island. The depressions are roughly circular to oval in shape; most are approximately two to three meters in diameter, although a few are as much as six meters in diameter. Typically, the depression has a circular berm around it (backdirt?) and its depth is usually on the order of 50 centimeters. Sites which contain such features invariably contain at least several of them.

During the original surveys, these depressions were apparently assumed to be cooking features and superficially they are not inconsistent with camas (Cammassia leichtlinii) steaming pits described by Suttles (1951:61). In fact, a few depressions noted during the survey were large enough to consider that they may represent housepits. Investigations conducted as a part of this study failed to observe any evidence of fires associated with these depressions and clarification of their significance will have to await more detailed examination.

Five sites in the San Juan Islands were noted to include large semi-circular trenches. At two of the sites the trench isolates an area on a steep rocky point, and these sites are much like those reported elsewhere on the southern Northwest Coast by

Bryan (1963:73) and Mitchell (1968). In the remaining three cases, the site is an area of shell midden deposits on a bedrock outcrop on a steep slope, and the trench is present only on the up slope side of the outcrop. Such trenches were almost invariably thickly covered with vegetation, but they appear to be approximately three to four meters wide and less than two meters deep. Trench lengths are variable; the largest enclosed areas are up to 150 meters across. An associated berm may be present either within, or on both sides of, the trench arc.

Semi-circular trench sites have traditionally been interpreted as defensive positions and all of the trench sites observed in San Juan County are consistent with this suggestion. The single previously reported trench which could not be relocated by this study (45-SJ-264) is suggested to occupy a location which makes little sense in terms of defensive fortifications; the author is inclined to doubt its existence. There are some early historic accounts (Gibbs 1877 and Kane 1925) which indicate that log palisades may have been associated with some of the trench sites, but the 1985 study did not observe any evidence in support of this view.

Sites with mounds of shell midden sediments represent a third variety of earth work associated shell midden sites. Previous discussion in this report (see Chapter Three) has already noted the confusion between the terms "shell midden" and "shell mound". While the vast majority of the shell middens in San Juan County do not appear to contain heaped up accumulations of cultural sediments, features of this type were noted at at least six sites. It should be stressed that in each of these cases, the site does not consist of a shell mound per se, but rather each is an area of shell midden deposits including one or more such artificial heaps. At each site, the volume of the mound (or mounds) is probably small in comparison to the volume of the entire site. The mounds observed by the 1985 study vary considerably in shape and size, and since the total sample is quite small, a typical form cannot be described.

It seems likely that these structures represent as wide a range of activities as the shell midden sites themselves, and their interpretation should be within the context of the sites they occur in. Some mounds may be related to house platforms or other deliberate constructions; others may be simple refuse heaps associated with large scale shellfish processing.

The observed dimensions of shell middens with earthworks in the islands are summarized by grouped ranges in Table 5. In comparison to the dimensions reported for shell middens in Table 3, note that these sites tend to be rather large. There do not appear to be consistent differences in size between sites with different types of earthworks. Like the previous group, they also appear to be highly linear and most consist of zones of discontinuous deposits in close proximity.

Beyond the presence of earth structures and their generally larger size, there is currently little to distinguish shell middens with earthworks from other shell middens. Their matrix

characteristics are very much like those described above. The range of faunal remains associated with them is also similar and the Shellfish Dominant Types noted in Table 4 are present in this group with very similar proportional frequencies. Very few artifacts were observed with these sites, but this is probably a function of sample size, and those which were noted were consistent with objects seen at other shell midden sites.

Table 5. A Summary of Observed Site Dimensions, by Grouped Ranges, for Shell Middens with Earthworks in San Juan County.

Length (Ms.)	<30	30-100	101-200	>200
# of Sites	1	4	4	6
Width (Ms.)	<5	5-15	15-30	>30
# of Sites		10	3	1
Depth (Cms.)	<50	50-100	100-150	>150
# of Sites	3	6	3	1

As noted above, shell middens with earthworks are not numerous in the San Juan Islands. They occur widely in the region and data collected during the 1985 survey suggests that most of them are associated with two geographic clusters within the islands. The major cluster is located in the northwestern part of the county; it includes Stuart Island, Johns Island, Henry Island, and the northern end of San Juan Island. This area contains five of the six sites with mounds, four of the seven sites with circular depressions, and one of the five semi-circular trench sites. The single unconfirmed, semi-circular trench site is also within this area. A second smaller cluster is located on the southern end of Lopez Island. Four of the five semi-circular trench sites occur in this area.

On a more localized scale of reference, shell middens with earthworks appear to have locational associations much like those of other shell midden sites. Most are located on modern protected saltwater shorelines (see Table 7). Most are associated with erosional beaches (see Table 8). With respect to local plant communities, they are also widely dispersed (see Table 9), but

they lack the strong association with the Open Transitional Forest noted for other shell middens. Despite this lack of clear preference for the southward-facing Open Transitional Forest, more than half of the sites have southerly aspects (see Table 10).

In 1985, Shell middens with earthworks show most of the same kinds of disturbance noted for other shell midden sites. Further, in many cases earthworks on private property have been partially or completely destroyed by property owners who wished to remove irregularities from their ground surfaces. This has been particularly true of mounds and circular depressions located in areas now being used for cultivation or as sheep ranges. In contrast, many of the semi-circular trenches are associated with relatively steep-sided slopes and have suffered fewer modern impacts.

Earthworks

A single site in San Juan County consists of a concentration of circular depressions which are not associated with a shell midden. This site (45-SJ-94 on Waldron Island) contains at least ten small (ca. 2 to 3 meter) depressions which are indistinguishable from those described above. The site occurs on a low terrace adjacent to a cuspate foreland (see Table 8) on an exposed saltwater shoreline (see Table 7). It is associated with the Saltwater Shoreline plant community type (see Table 9) and it has an eastward aspect (see Table 10). The nearest shell midden site is approximately 900 meters away; no other earthworks occur on this island.

While only represented by a single example, the concentration of depressions without associated midden is considered a site type because it is clearly distinct from shell middens. Several longtime residents of the San Juan Islands suggest that sites of this type were formerly more common.

In 1985, this single earthworks site appears to be in relatively good condition. It is situated in an area which is unlikely to be developed and is protected from wave erosion on all but the highest storm tides. Many of the current Waldron Islanders are aware of it and interested in protecting it.

Rock Cairn Sites

Rock cairn burials have been reported in the San Juan Islands, and in nearby areas, since the turn of the century (Smith and Fowke 1901, Smith 1907, King 1950, Caldwell 1955, and Bryan 1963). Nevertheless, there have been few direct studies of these structures and there is considerable confusion regarding them. In particular, no previous work has proposed criteria for identifying prehistoric rock cairns and there appears to be some confusion between these structures and historic rock piles

related to agricultural or other land-clearing activities.

The 1985 survey recognized rock cairns as a site type and it employed three criteria as an aid to field identification. The criteria were derived from the existing literature on rock cairns and applied to features encountered in the field. It must be stressed that they are provisional and that they are not regarded as either exclusive or unequivocal. These criteria are size, clustering, and setting.

1. Size - Demonstrated rock cairn burials appear to be single individual internments. Hence, such structures are generally not large. If a rock pile is much larger that about four meters in diameter and one meter tall, it is considered suspect.

2. Clustering - Demonstrated rock cairn burials appear to occur in groups. Single isolated rock piles are considered suspect.

3. Setting - Demonstrated rock cairn burials appear to occur only in certain settings, and almost invariably they are situated either within, or in the general vicinity of, shell midden sites. Preferred locations appear to include: low hillsides, headlands, and small nearshore islets. Rock piles in interior areas or areas with an agricultural history are considered suspect.

The 1985 Survey investigated 32 rock cairn areas in the San Juan Islands. These included the 17 rock cairn sites recorded by this study and 15 other areas where cairns had been previously reported, but not confirmed by this study. (In a few of the latter cases, the reported feature may have been located, but the author declined to identify it as a prehistoric structure.) As such, it should be noted that most of the previously reported rock cairns were not found, while most of those referred to here represent new site records.

Given the uncertainties regarding them, the actual conditions of these sites, and this study's restrictions on digging or vegetation clearing, only limited data is available for the rock cairns. In almost all cases, currently reported rock cairns are thickly covered with vegetation (usually Rosa or Rubus). The plant cover effectively obscures the rock piles and makes it difficult to assess their size and number. As a result, the reported values are approximate at best and only a few rock cairns could be photographed. This condition also made the determination of site dimensions problematic and no dimensions were offered.

The rock cairns reported by the 1985 study all appear similar in form. They are circular to oval rock piles and few, if any, exceed about three meters in diameter and 70 centimeters in height. All of the cairns appear to be composed of from 50 to 150 cobbles with maximum diameters of 50 centimeters of less. They are simple heaps; borders, cysts, slab covers, or other formed structures were not observed. Associated artifacts were never observed. Typically, cairns were noted in groups of less than six, although a few sites may contain several times this

number.

The observed characteristics of the distribution of rock cairn sites in the San Juan Islands is consistent with trends in the literature noted in the above discussion of criteria. Most rock cairn sites noted by this study are situated on low hillsides; lesser numbers were encountered along protected saltwater shorelines and on small islands within bays of larger islands (see Table 7). This preference for hillside settings is also seen in the observation that 10 of the 17 site occur at elevations between 12 and 24 meters (see Table 11). These sites also appear to exhibit a preference for southerly aspects (see Table 10). They are generally associated with either the Open Transitional Forest or Rocky Bald plant community types (see Table 9). Almost all of these sites are situated within 500 meters of one or more shell midden sites, but none were observed in direct association with one.

In 1985, the condition of rock cairns in the San Juan Islands is highly variable. All of the cairns confirmed by this study appeared to be intact, but, as noted above, all of these structures are thickly covered with vegetation and are difficult to observed. In contrast, in a number of cases where rock cairns were formerly reported, but were unconfirmed by the 1985 survey, the author did encounter scatters of cobbles. Such cobble scatters may be the remains of vandalized cairns. In the author's experience, it is not difficult to locate longtime residents of the islands who knew of direct vandalism to rock cairns. In some cases the vandalism was in the form of quarrying a handy pile of rocks for some construction purpose; in other cases it appears to have been a morbid curiosity about human skeletal remains.

Lithic Sites

The term "Lithic Site" is used here to refer to an archaeological site wherein cultural remains are largely or exclusively limited to lithic materials. In contrast to the shell middens, marine shells and/or other faunal materials are generally scarce or wholely absent at such sites. Prior to the 1985 survey, only a single site of this type had been recorded in San Juan County. The 1985 study was unable to confirm this site (45-SJ-305 on Orcas Island), but did report six other sites represented exclusively by lithic materials. Unfortunately, they are a small and heterogeneous sample and little can be said about most of them. Two of the sites were encountered during microenvironmental sampling; the remaining four are reported on the basis of private collections. In three of the latter cases, examination of the reported collection source area failed to locate in situ cultural materials, but all of the collections were obtained during previous ground disturbances and the disturbance was some time ago in these three cases.

Although the sample of observed lithic sites with physical

dimensions is very small (three), consideration of their parameters suggests that lithic sites may differ considerably from the shell midden sites (see Table 6). In comparison to the shell middens, the lithic sites appear to quite small. Further, the lithic sites also appear to be somewhat less linear than the shell middens. While the extreme differences in sample size make these interpretations suspect, they do appear to be consistent with data from similar sites in other nearby regions of the southern Northwest Coast.

Table 6. A Summary of Observed Site Dimensions, by Grouped Ranges, for Lithic Sites in San Juan County.

Length (Ms.)	<30	30-100	101-200	>200
# of Sites	2	1		
Width (Ms.)	<5	5-15	15-30	>30
# of Sites		2	1	
Depth (Cms.)	<50	50-100	100-150	>150
# of Sites	1			

All of the lithic sites in the San Juan Islands are represented by chipped stone materials. The two sites encountered during survey are represented almost exclusively by debitage. In contrast, the four sites recorded from collections are represented almost exclusively by finished tools or tool fragments. (This latter condition is probably a function of the collector's failure to gather debitage.) Projectile points were the dominant tool forms in all private collections (probably also a collector bias). The vast majority of observed chipped stone from all six sites was basalt. While no detailed effort was made to assess possible cultural affiliations, preliminary examination suggests that Olcott Complex materials (Kidd 1964) are maybe present in several collections. Typologically more recent materials are common in all collections.

As was the case with physical dimensions, the small sample size for this group limits the strength of observations about the distribution of lithic sites in the San Juan Islands. Here again, however, these sites appear to represent patterns in some

contrast to the shell midden sites. Four of the six sites occur in interior settings; three of the four being located on lowland hillsides (see Table 7). Five of the six sites are associated with either the Meadow-Grassland or Disturbed Open Land plant communities (see Table 9). These latter two plant communities offer some of the best ground surface visibility in interior settings and therefore this association may be a sampling bias. Perhaps significantly, all lithic sites have southerly aspects (see Table 10). In two of the six cases, lithic sites are situated close enough (ca. 500 meters) to shell middens to consider the possibility of association between the sites; in all other cases, lithic sites are clearly unrelated to any other known occupations. An anticipated association between interior sites and freshwater sources was not strongly demonstrated by this sample.

In 1985, the condition of lithic sites in San Juan County is difficult to assess, although all of the known sites exhibit some degree of disturbance. Half of the sites in the sample of confirmed sites were previously disturbed by either agricultural or stock ranging activities, and then were subsequently surface collected by local residents; the extent of their disturbance is unknown. A fourth site has been disturbed by residential development, and has also been surface collected by its owner. The remaining two sites occur in natural wind-blown deflation areas. While the author is not aware of private collections from either of these latter two sites, some comments from island residents suggest that they are also subject to periodic casual surface collection. Finally, it should be noted that the author also had the opportunity to examine chipped stone tools in private collections which were reported to have been obtained from plowed fields in interior areas of Lopez Island; as none of the recorded lithic sites are on Lopez, this suggests additional disturbed lithic sites in this area.

Rock Art Sites

Rock Art sites are localities where either petroglyph or pictograph images have been rendered on stone surfaces. The inventory for San Juan County indicates that two rock art sites occur in the county, and they include one example of each type. Additionally, one shell midden is also reported to include a petroglyph. The 1985 survey was able to confirm only the pictograph site. The confirmed rock art site (45-SJ-303) is located on a bedrock outcrop (see Table 8) on a protected salt-water shoreline (see Table 7) on the west side of San Juan Island. The site is low lying (see Table 11) and it has a northwest aspect (see Table 10). It is not associated with any other type of site.

The confirmed pictograph site consists of a series of images rendered in a dark reddish-brown pigment, probably ochre. At least some of the images are anthropomorphic. Due to its

location on a vertical rockface over the water it was not possible to directly measure individual images or the site area as a whole, but the entire site does not appear to be large (probably less than 10 meters).

In 1985, the single confirmed pictograph site in San Juan County survives in a vandalized condition. The site has been defaced by aerosol spray paint which must have been applied by someone in a boat.

Wet Sites

Wet sites are a potentially heterogeneous class of archaeological sites wherein plant fiber materials have been preserved due to a perennially wet depositional environment. Only a single wet site was observed in San Juan County and, in truth, this site (45-SJ-329) cannot currently be demonstrated to be prehistoric. Additional wet site deposits have also been reported at 45-SJ-24/25 (Sprague 1976), but they were not exposed for examination during the 1985 survey. Given considerable prehistoric use of plant materials and the extensive presence of protected shorelines, it seems likely that additional wet sites will be found in the San Juan Islands in the future.

The site reported by the 1985 survey consists of an alignment of wooden stakes present on a tide flat immediately in front of a shell midden deposit on San Juan Island. This site appears to be a fish weir, but both demonstration of this identification, and the question of its possible association with the shell midden will require additional study. The site occurs on a protected saltwater shoreline (see Table 7) and is associated with a saltwater shoreline plant community (see Table 9). It has an eastward aspect (see Table 10).

In 1985, the condition of wet sites in the San Juan Islands is unclear. Neither site is currently known well enough to make an accurate assessment of its condition.

Table 7. A Summary of the Associations of Site Types and Local Landform Types in San Juan County, Washington.

Site Types	Local Landform Types*							
	1	2	3	4	5	6	7	8
Shell Middens	4	18	173		3			
Shell Middens with Earthworks		3	14		1			
Earthworks		1						
Rock Cairn Sites	2		2		13			
Lithic Sites		1	1		3		1	
Rock Art Sites		1						
Wet Sites			1					
totals	6	24	191		20		1	

* The Local Landform Types indicated by number are as follows: 1 = Small Island (surface areas of less than 10 acres), 2 = Exposed Saltwater Shoreline (facing at least 5 kilometers of open water), 3 = Protected Saltwater Shoreline (facing less than 5 kilometers of open water), 4 = Freshwater Shoreline, 5 = Lowland Hillside (elevations less than 120 meters), 6 = Upland Hillside (elevations greater than 120 meters), 7 = Alluvial Flat, 8 = Cave/Rockshelter.

Table 8. A Summary of the Associations of Site Types and Beach Types in San Juan County, Washington.

Site Types	Beach Types*								
	1	2	3	4	5	6	7	8	9
Shell Middens	133	2	10	1	24	5	6	4	9
Shell Middens with Earthworks	14	1	1		1				1
Earthworks						1			
Rock Cairn Sites	1								
Lithic Sites	2								
Rock Art Sites									1
Wet Sites			1						
totals	141	3	12	1	25	6	6	4	11

* The Beach Types (see Chapter Two) indicated by number are as follows: 1 = Erosional Beach, 2 = Depositional Beach; Delta/ Estuary, 3 = Depositional Beach; Tideflat/Landscape Trap; 4 = Depositional Beach; Spit, 5 = Depositional Beach; Spit-Lagoon Complex, 6 = Depositional Beach; Cuspate Foreland, 7 = Depositional Beach; Tombolo, 9 = Bedrock Outcrop.

Table 9. A Summary of the Associations of Site Types and Local Plant Community Types in San Juan County, Washington.

Site Types	Local Plant Community Types*													
	1	2	3	4	5	6	7	8	9	10	11	13	14	17
Shell Middens	6	10	70	39	1		17			35	1	15	2	2
Shell Middens with Earthworks	1	2		4	1		1			6		3		
Earthworks							1							
Rock Cairn Sites	1	4	8	2						1		1		
Lithic Sites	2		1							2		1		
Rock Art Sites		1												
Wet Sites							1							
totals	10	17	79	45	2		20			44	1	18	2	2

* The Local Plant Community Types (see Chapter Two) indicated by number are as follows: 1 = Meadow/Grassland, 2 = Rocky Bald, 3 = Open Transitional Forest, 4 = Dry Coniferous Forest, 5 = Moist Mixed Forest, 6 = Upland Forest, 7 = Saltwater Shoreline, 8 = Freshwater Shoreline, 9 = Disturbed Forest, 10 = Disturbed Open Land, 11 = combined setting; Types 1 and 10, 13 = combined setting; Types 3 and 10, 14 = combined setting; Types 4 and 10, 17 = combined setting; Types 7 and 10.

Table 10. A Summary of the Associations of Site Types and Site Aspects in San Juan County, Washington.

Site Types	Aspects*								
	N	NE	E	SE	S	SW	W	NW	NA
Shell Middens	21	34	17	30	19	41	13	23	
Shell Middens with Earthworks	2	2	2	2	1	6	1	2	
Earthworks			1						
Rock Cairn Sites	1	1	2	1	8	2			2
Lithic Sites				2	3	1			
Rock Art Sites								1	
Wet Sites			1						
totals	24	37	23	35	31	50	14	26	2

* Aspect refers to that cardinal bearing which is both perpendicular to the long axis of the site and facing the lower horizon or greater sky exposure.

Table 11. A Summary of the Associations of Site Types and Minimum Site Surface Elevations in San Juan County, Washington..

Site Types	Minimum Surface Elevations*						
	<2	2-4	4-6	6-12	12-24	24-60	>60
Shell Middens	96	69	15	17	1		
Shell Middens with Earthworks	7	5	2	1	2	1	
Earthworks	1						
Rock Cairn Sites		1	3	1	10	1	1
Lithic Sites		3			2		1
Rock Art Sites		1					
Wet Sites	1						
totals	105	79	20	19	15	2	2

* Minimum Surface Elevation refers to the ground surface elevation at the lowermost (usually downslope) portion of the site. Value ranges represent meters above the top of the active beach.

SAN JUAN NATIONAL HISTORICAL PARK

The variety and relative frequency of the prehistoric cultural resources of the San Juan National Historical Park are much like those of the entire San Juan Islands region. While each individual resource within the park is considered in detail in Appendix B, it is worthwhile to briefly summarize the park resources here in terms of the site typology and current condition evaluations presented in this chapter.

American Camp

The American Camp Park contains six recorded prehistoric archaeological sites, all of which were confirmed during the 1985 county-wide survey (Wessen 1986). The six sites include four shell midden sites and two lithic sites. It should also be noted that the broad open grassland which dominates the center of this park contains a number of large rock piles which might be considered to be possible prehistoric rock cairns. A number of these structures were examined during the 1985 survey, but as they failed to meet the provisional criteria for rock cairns discussed in this chapter, they were not recorded as a site.

The four shell midden sites at American Camp are 45-SJ-1, 3, 6 (only partially in the park), and 59. There are no earthworks associated with any of these sites. In 1985, all four of these sites have been disturbed to some degree, but all appear to retain substantial intact deposits. The sites 45-SJ-3, 6, and 59 are all subject to wave erosion and varying degrees of recent cultural disturbance; casual vandalism is evident at 45-SJ-3 and all three sites have been impacted by the development of access roads and trails. 45-SJ-1 is located above the zone of active wave erosion and it is well consolidated vegetation; it is probably the most intact and most stable prehistoric site in the park.

The two lithic sites at American Camp are 45-SJ-322 and 323. One of them (45-SJ-322) is located sufficiently close to a large shell midden site (45-SJ-1) to at least consider the possibility that there might be some relationship between the two. The other lithic site (45-SJ-323) is unlikely to be related to any currently known site. As both of the lithic sites are exposed in active deflation areas, the possible presence of intact deposits at either site is uncertain. With respect to their condition in 1985, wind erosion is clearly occurring in these areas, but as noted above, the actual condition of these sites is difficult to evaluate. While no direct evidence of vandalism was noted in the field, information provided by local informants suggests that both of these areas may be subject to periodic surface collection by park visitors.

British Camp

The British Camp Park contains 12 recorded prehistoric archaeological sites, 11 of which were confirmed during the 1985 county-wide survey (Wessen 1986). It should be noted however, that this park contains two examples of two site numbers assigned to what is here considered to be a single site (i.e., 45-SJ-23/291 and 45-SJ-24/25) and thus the actual number of confirmed prehistoric resources here is nine. These nine sites include six shell midden sites, one shell midden with earthworks, and two rock cairn sites. The single unconfirmed site at British Camp is 45-SJ-264, a trench reported to be located in the vicinity of Bell Point. (As noted above in the discussion of trenches, the Bell Point area makes little sense as a defensive position and I am inclined to doubt the existence of this site.) If such a structure is (or was) present at Bell Point, it is likely that it was associated with the shell midden site 45-SJ-202.

The six shell midden sites at British camp are 45-SJ-21, 23/291, 26, 27, 201, and 202. In 1985, all six of the shell midden sites have been disturbed to some degree, but all except 45-SJ-26 appear to retain substantial intact cultural deposits. All six of the sites are subject to wave erosion and this effect appears to be significant in at least some portions of each site. Recent cultural disturbance is less apparent and, in this regard, three of these sites (45-SJ-21, 23/291, and 27) are located in areas where park visitors rarely go. The other three sites are located in portions of the park which are subject to greater numbers of visitors and these site areas contain trails and other park developments.

The single shell midden site with earthworks at British Camp is 45-SJ-24/25. In 1985, this site had been disturbed to some degree, but it appeared to retain substantial intact deposits. It should be recalled that this site also contains at least some waterlogged deposits, but, given their limited extent, it would be misleading to classify it as a wet site. Like all other shell middens at British Camp, this site has suffered from wave erosion which appears to be significant in some areas. 45-SJ-24/25 has also sustained substantial recent cultural disturbance. It is likely that the early historic development of the British Camp parade ground had a major adverse impact on the site. Agricultural activities here after the British left were probably also significant. The area currently receives the highest volume of park visitors, but the effect of this traffic is probably negligible in view of the early historic effects.

The two rock cairn sites at British Camp are 45-SJ-330 and 332. One of them (45-SJ-332)is located sufficiently close to areas which contained British occupation period structures that it may represent historic rock piling. The other site is far removed from the parade ground and it is probably unrelated to the British presence. Both of these sites are unobtrusive and are probably not noted by most park visitors.

CHAPTER FIVE

TOWARD A LONG TERM RESEARCH DESIGN FOR THE SAN JUAN ISLANDS

This chapter presents an evaluation of the research, the findings, and the research environment of prehistoric archaeology in the San Juan Islands and discusses possible directions for future research efforts here. It then offers specific recommendations for pursuing such directions with cultural resources within, and materials from, the San Juan National Historic Park. Data to be considered includes all materials reviewed or generated by this project, including those presented in the Appendices to this volume. No specific research design will be advocated, however, as these will vary with the analytical interests of individual researchers and the actual potentials and constraints of individual research programs. Rather, discussion will be presented in terms of a series of proposed goals for future efforts in, and related to, the San Juan Islands.

The Current Status of Archaeological Research in the Islands

Archaeological research has demonstrated that the San Juan Islands are rich in prehistoric cultural resources. There are currently 323 recorded prehistoric sites in San Juan County and it likely that hundreds of additional sites are present here. This is probably among the highest site densities anywhere in western Washington. The resources are varied, but heavily weighted toward certain types of sites. The vast majority of all prehistoric sites are shell midden deposits along modern shorelines. However, this group is quite diverse; some shell middens contain various types of earthworks and there is considerable variation in their structure, contents, and size. Some shell midden sites in San Juan County are of a scale and a quality that is truly spectacular. Shell midden deposits associated with relic beach features are also known. The remaining sites are mostly either rock cairn groups or scatters of chipped stone debitage. Such sites occur in settings interior to the shoreline and, given their limited visibility and the typical ground cover here, they are probably more numerous than their low numbers suggest.

Recent inspection of the San Juan County prehistoric archaeological sites reveals that, while almost all sites show evidence of recent disturbance, substantial intact cultural deposits remain at many sites here. Disturbance to sites is generally from either of two mechanisms: development (i.e., the construction of roads, homes, boat launches, marinas, etc.) and shoreline erosion. Purposeful site vandalism does occur here, but it appears to be limited. Given their relatively high numbers, prehistoric sites occur in a wide variety of public,

private, and joint public-private ownership situations. While various county, state, and federal agencies deal to varying degrees with the resources in their jurisdictions, there are no broad-based programs effectively addressing the full range of culture resource management needs for prehistoric sites in the county.

The archaeological research activities which have produced our current knowledge of the prehistoric sites of the San Juan Islands is almost completely a product of the last 40 years. While most of these efforts have been university field schools engaged in academic research, culture resource management assessments have become increasingly common during the late 1970's and 1980's. In total, the survey efforts which recorded the above noted 323 sites have probably examined about 30% of the islands' shorelines and no more than 5% of their interior's. While it is true that the unsurveyed majority of the islands include substantial areas which are probably unsuitable for habitation, there is still considerable potential for additional sites here. Field work in the San Juan Islands has also included 29 archaeological excavation projects ranging from single test pits to large scale excavations.

The excavation projects and their recovered materials share many similarities. Nearly all prehistoric excavations have investigated relatively recent shell midden sites. All dated sites are less than 3,000 years old and, curiously, almost half the carbon samples fall within a 400 year span between ca. 2,500 to 2,900 years ago. (The significance of this latter observation is uncertain, and it may be nothing more than a sampling error.) Despite the noted range of variation in this group, excavations have focused upon large shell midden sites with relatively thick cultural deposits. The geographic scope of the sampling within the islands has also been limited; of the 29 efforts, 18 were on San Juan Island and another six were on Lopez Island. In fact, there has been a bit of re-investigation of the same site and nine of these projects have been conducted at only three sites. Most of these projects have been relatively small scale sampling efforts of what were described to be large and complicated cultural deposits. Most operated with research designs oriented toward the recovery of artifacts and the reconstruction of culture history.

The interpretations of prehistoric cultural materials from the San Juan Islands have been strongly influenced by findings in the nearby Fraser Delta. Particularly, by ideas about the culture history of this region during the last 3,000 years. All dated archaeological collections from the San Juan Islands date from this period and there are many obvious strong similarities between materials from the two areas. However, while it is possible to say that Marpole or Gulf of Georgia assemblages are well represented in the islands, we have only limited understanding of the behavioral and cultural significance of these units. Clearly, the latter at least represents late prehistoric Salish occupation very much like that of the early historic period, but

beyond basic economic and technological information, we still know relatively little about the specific activities and processes which are responsible for the formation of these deposits. Similarly, we have very little detailed knowledge about the range of variation in most matters, either regionally or even within most sampled sites.

There is virtually no direct information on the subject of pre-3,000 year old occupation of the San Juan Islands beyond the observation that both Olcott-like materials and large notched and/or stemmed projectile points occur in private collections recovered on several islands and these objects suggest that the islands may have been occupied for much of the Holocene. While King's (1950) Island Phase materials remain undated, it appears likely that they are not as old as he thought they were. Nevertheless, occupation of the region throughout most or all of the Holocene seems likely, and this has implications for early maritime adaptations because these have been islands throughout this period.

The research environment for the prehistoric archaeology of the San Juan Islands refers to the circumstances of the generated archaeological collections and associated data and their accessibility and potential utility to present and future researchers. The research environment for the prehistoric archaeology of the San Juan Islands is not good, although to be fair it must be noted that this is not inconsistent with most of the rest of western Washington. While the data and recovered materials undoubtedly have significant value for additional study, they are subject to a number of conditions which limit their use. In the first place, only about one half of all recovered collections have been subsequently studied and then published. Information about the unpublished materials is often difficult to obtain. The curation circumstances of these materials is also difficult. San Juan Islands collections are stored in a number of places and there was (prior to this study) no single account of their disposition. Further, most individual collections exist without detailed inventories. In sum then, it is often difficult for a potential researcher to assess the value of a particular collection for their study.

Goals for Future Archaeological Efforts

It is clear that a wide range of work remains to be done. The consideration of particular goals for San Juan Islands archaeology presented here will be organized in what are termed short, middle, and long range goals. They range from resource management issues to the explication of the dynamics of past cultural behaviors.

However, before considering goals which are to varying degrees academic, the immediate need for effective cultural resource management must be stressed. Archaeological deposits in this region are being lost at a rate which far exceeds the rate

at which they are being studied. In this regard, while various county, state, and federal agencies work to reduce and/or mitigate the effects of development-related disturbance, nothing is being done about the shoreline erosion which is attacking most sites in this area. There is significant variation in the extent of this erosion, but it is severe in many places and thus there is a real need for a program of bank stabilization and salvage excavations in the San Juan Islands. While many of the issues to be noted below also warrant attention, remedial action for the wave erosion of archaeological sites should be considered to be a high priority because of the ongoing and cumulative nature of this loss.

Short Range Goals

Short range goals for future archaeological efforts concern the matter of finishing up old business. Efforts should be made to complete the basic descriptive analyses for all extant, but as yet unstudied cultural materials, and then the details of these materials and their recovery circumstances should reported in well-documented published accounts. Further, all extant collections should be curated under conditions which maximize the likelihood of their subsequent use; chiefly with better control of their distribution and contents. Individual collection inventories are particularly important in this regard, they allow for more effective research resource management and support the compilation of regional data sets which will help to offset some of the limitations of the small sample size of many collections. The more complete documentation and dissemination of research data and materials will also support the compilation of regional data sets.

The completion of old business and the proper disposition of the extant cultural materials includes one aspect of this issue worthy of special mention. Archaeological and other activities in the San Juan Islands during the last 40 years have resulted in the collection of human skeletal remains representing several dozen individuals. In some cases these materials have been the subjects of detailed descriptive analysis, but in many other cases nothing has been done with them and they remain in storage at various curatorial facilities. These materials are the focus of interest and concern in the contemporary Native American communities of this region. While a simple solution is not proposed here, curatorial facilities with such materials should consult with representatives of the Native American communities in an effort to arrange for appropriate disposition of them.

Middle Range Goals

Middle range goals for future archaeological efforts concern the matter of broadening our understanding of the currently known prehistoric cultural resources of the San Juan Islands region. Thus, while short range goals address the research environment, middle range goals address the sites themselves as physical deposits. Nevertheless, completing the work already initiated will undoubtedly provide new information and new insights about the currently known resources. Several additional directions of study also hold significant potential to broadening our understanding of the currently known prehistoric cultural resources. Some are direct follow-ups to earlier research here.

The investigation of the site boundary characteristics of known sites is important because it is probably the only way that we will clarify our site boundary definition problems. While this type of study requires sub-surface sampling, a substantial amount of information on site morphology may be obtained utilizing soil augers. Site boundaries should be mapped in detail and attention should also be given to areas beyond the limits of the shell deposition; there are lots of cultural activities that involve little or no shell. Such site boundary investigations should be conducted at examples of each of the various site types, and it is likely that this work will lead to distinctions and nomenclature to clarify site boundary definition.

Beyond the site boundary characteristics, we need to know much more about the details of the internal structure of these sites. Southern Northwest Coast shell middens are complex structures and a number of recent studies (Campbell 1981, Wessen 1982, Ham 1983, and Miller 1984) have shown that their structures can contain substantial cultural information. As there can be significant internal cultural variation within a site, context becomes an important issue in evaluating samples; particularly samples from a small-scale sampling regime. Previously sampled sites are a reasonable place to examine details of structure because new findings can be articulated with the existing data. Sites which have already been sampled on more than one occasion may have particular value in this regard. Such compilations should be relatively easy to do and should be done. Like the site boundary, structural details should be investigated at examples of each of the various site types. Enhanced appreciation of the internal structure of these sites will support better conceptual models and more effective sampling for documentation and model testing.

The interpretation of the known prehistoric resources would also be improved by better understanding of the environmental circumstances of their represented occupations. Here again, previously sampled sites are a reasonable place to examine details of environmental context because new findings can be articulated with the existing data. Better understanding of the environment of occupation will support the investigation of both

cultural adaptations at the site and post-depositional effects influencing the deposit. It may also clarify details of site morphology.

A final dimension to broaden our understanding of the known sites is broadening the range of our sample, and this has already been referred to above. We need to sample sites more broadly within the islands and we need to sample a broader range of the site types. While a few projects may provide excellent data, we have only a limited basis to evaluate variation and it may be premature to conclude what portions of the reported patterns and relationships are typical or unusual.

Long Range Goals

long range goals for future archaeological efforts are the most diverse and open-ended group of goals, but they address two basic areas: the discovery, investigation, and evaluation of new cultural resources and enhancing our understanding of the details and dynamics of the cultural behaviors represented by those resources. In a very broad sense, these are the goals of archaeological efforts anywhere and their use here indicates both the common basis to all archaeology and the relatively limited stage of its current development here.

There is considerable potential for the discovery, investigation, and evaluation of new cultural resources in the San Juan Islands and future efforts should concentrate on new classes of resources. In particular, while there are probably substantial numbers of additional unrecorded late prehistoric sites, more attention should be given to locating and investigating evidence of older occupations in the islands. Such an emphasis will draw attention to more interior portions of the islands which have been largely neglected so far. Such an emphasis will also be an impetus for enhancing Late Pleistocene and Holocene environmental reconstructions to support models of earlier cultural behaviors and site distributions. Better data on earlier cultural occupations here will probably result in the recognition of site variations analogous to those noted for the late prehistoric period and these will be amenable to most of the site boundary, structure, and context issues noted above.

Enhancing our understanding of the details and dynamics of the cultural behaviors represented by the prehistoric cultural resources is the ultimate, and most open-ended, goal of archaeology. Further, it should be clear that, in the San Juans, the issues are wide open. With the exception of the very broad details of late prehistoric culture history as reflected in artifacts, virtually all details and dynamics remain to be determined. All of the great questions of Northwest Coast are fair game. The known sample of sites in the San Juan Islands offer great potential to investigate a very wide range of late prehistoric conditions and, hopefully, older sites exist with the potential to reflect their occupations as well. Given the time

depth provided by data from older sites, clear perspectives on the course of cultural developments will be possible. Not only will the region contribute to our appreciation of the development of ethnographic Northwest Coast Culture, but we should also be able to document and understand the development of the distinctive regional elements such as reef-nets which mark this area during the ethnographic period.

San Juan National Historic Park

While a very wide range of efforts and research directions are theoretically available, practical goals and research designs must articulate research interests with the resources actually available for study. The properties of the San Juan National Historic Park contain significant prehistoric archaeological resources with considerable potential for future management and research efforts. The following discussions will offer some specific recommendations for future activities at each park property in terms of the short, middle, and long term goals noted above.

American Camp

Though containing the smaller number of recorded sites, the American Camp park contains important cultural deposits and has considerable research potential. While the park has been the subject of less study, overall, work here has been generally more complete and research materials appear to be in better order. Most sites here are relatively stable, but bank stabilization and/ or salvage excavations are warranted at portions of 45-SJ-3, 6, and 59.

There are relatively few short range goals to be noted for American Camp. Most recovered collections have been studied and described; the only exception appears to be Robinson's materials from 45-SJ-1 and these appear to be limited. American Camp materials should have better curatorial control, but they are presently not too bad. The vast majority of the materials are those King collected at 45-SJ-1, and, despite the relatively early date of this effort, these are among the best described and best inventoried materials from anywhere in the islands.

A somewhat broader choice of middle range goal options is available for American Camp. Site boundary studies would be useful at all the sites, but particular mention in this regard should be made for 45-SJ-3 (apparently composed of three discrete deposits) and for 45-SJ-322 and 323 (sites in delation areas which may have greater sub-surface extent. Enhanced knowledge of their internal structures would also be useful at all sites, but here particular mention should be made of 45-SJ-1. Not only do we already have considerable data from this site, but it is already known to contain a relatively wide range of complex

cultural features including some without clear analogs elsewhere in the region. More data from this site would doubtless prove to be very interesting. Studies of the environmental context of occupation would also be welcome and, given their proximity, findings from such studies would probably relate to most, if not all, currently known sites in the park.

Long range goals are wide open at American Camp. With respect to additional resources here, American Camp has considerable potential to contain evidence of earlier occupations. In particular, the complex of old marine terraces along the south side of the park which contain 45-SJ-1, 322, and 323 may also contain additional cultural deposits. Still higher terraces appear to be present on the upper flanks of Mt. Finlayson and these features may also contain evidence of early cultural occupations. With respect to the details and dynamics of past cultural behavior, both late prehistoric and potentially earlier deposits are available for study and, in particular, the spatially close juxtaposition of the contrasting Griffin Bay and Haro Strait shorelines offer considerable opportunities to investigate cultural ecology here.

British Camp

British Camp presents both contrasts and similarities to American Camp. The park is rich with important cultural deposits with considerable research potential. While the focus of more field work, more incomplete and/or unreported work is involved. The park contains at least seven shell midden sites along the modern shoreline and all exhibit evidence of significant wave erosion, particularly on the Garrison Bay side. Slumped-out trees have also done significant damage to cultural deposits in a number of sites. Bank stabilization and/or salvage excavations are probably warranted in portions of all seven sites.

Short range goals for British Camp focus principally on Kenady's efforts at 45-SJ-24/25 and on curatorial conditions. Kenady's work with what was apparently a relatively large collection from British Camp is the major unanalyzed and/or unreported project. These materials need to be described and reported. British Camp collections also require better curatorial control; they are currently in four different locations without cross-referencing and inventory information is limited.

The middle range goals for British Camp are much like those for American Camp. Site boundary studies would be useful at all the sites, but particular mention in this regard should be made for 45-SJ-23/291 and 24/25; both are areas where two reports of sites appear to merge. Enhanced knowledge of their internal structures would also be useful at all sites, and here particular mention should be made of the 45-SJ-24/25 site area. We probably have more information about the internal structure of 45-SJ-24/25 than any other site in the region. Yet, correlations of the stratigraphy between any of the four separate efforts have never

been proposed and the nature of the earthworks at the northwest end of the parade ground is still largely uncertain. Studies of the environmental context of occupations here would also be welcome and, given their proximity, findings from such studies would also relate to most, if not all, currently known sites in the park.

Long range goals are similarly wide open at British Camp. With respect to additional resources here, this park may also contain evidence of earlier occupations. While older marine terraces are not as prominent here as at American Camp, and more forest vegetation makes them harder to discern, such feature do appear to be present and they may also contain evidence of early cultural occupations. With respect to the details and dynamics of past cultural behavior, British Camp does not offer the environmental variability of American Camp, but extensive late prehistoric and potentially earlier deposits are available for study here.

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