

THE SOUTH BAY SALT POND
RESTORATION PROJECT:
A CULTURAL LANDSCAPE APPROACH FOR THE
RESOURCE MANAGEMENT PLAN

By

Ellen Joslin Johnck

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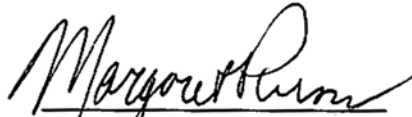
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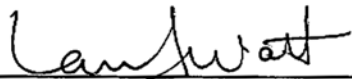
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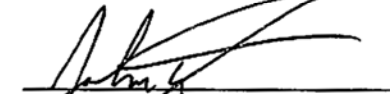
Cultural Resources Management



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ABSTRACT

Purpose of the Thesis:

The salt ponds and levees of southern San Francisco Bay are a culturally significant landscape wherein culture and nature have been linked over 150 years of industrial salt production through solar evaporation in an extensive wetland ecosystem. This 15,100-acre landscape is the subject of the South Bay Salt Pond Restoration Project (SBSRP), the cultural resources of which are receiving scant attention relative to the SBSRP's primary resource management goals for wildlife habitat, flood prevention and public recreation.

The intent of this thesis is to show how a cultural landscape analysis can be used in the SBSRP to:

- 1) document the landscape's cultural resources for the purpose of including them in the SBSRP's Resource Management Plan (RMP);
- 2) demonstrate how the landscape provides the organic and unifying context for the study of the interaction between humans and the natural environment characterized by revolving and cyclical patterns of exchange and adaptation over time and across space;
- 3) develop a heritage tourism plan, including a public interpretation program;
- 4) establish a basis for justifying the salt pond landscape's cultural significance and potential eligibility for listing on the National Register of Historic Places.

Methods:

Research was conducted on the history of the salt production industry and the Bay's environment, and a general cultural resources survey and inventory were completed. The history of cultural landscape analysis was explored including an academic and government literature review of cultural landscape studies and resource management plans for national and state parks, wildlife refuges, and other types of protected areas such as archaeological, World Heritage and eco-cultural tourism sites.

Findings:

In general there is ample information on methodologies for cultural landscape analysis and heritage tourism planning. While there are several examples where historic and environmental resources have been integrated using the landscape as a unified context for resource management plans, much remains to be done to make effective use of this practice.

Conclusion:

The cultural landscape analytical framework developed here and when applied to the SBSRP should yield a more holistic and enriching RMP.

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CHAPTER I

INTRODUCTION

A striking palette of color—red, reddish-brown, pink, green, yellow, gray-white—is the view of South San Francisco Bay from an airplane window. (Figure 1) This amazing array of colors is the commercial production of salt in its varying stages of evaporation through a pond system on its journey to kitchen, cattle salt lick, or pharmacy. “Salt has been produced from sea water since the dawn of history, but San Francisco Bay is one of the few places where age-old methods have been perfected”(Goldman 1967:20).

Salt has been called the fifth element essential to human life after water, air, fire and earth. (Sandoval 1988; Kurlansky 2005; Goldman 1967). Homer called salt a “divine substance”. Jesus called his disciples the “salt of the earth”. The early Chinese used coins of salt. Some Mediterranean peoples used cakes of salt as currency. In fact, the word “salary” comes from “sal,” the Latin word for salt (Kurlansky 2005:5). Salt is an important and valuable commodity and is the primary ingredient in over 14,000 products used in peoples’ daily lives (U. S. Bureau of Mines 1985). About half of the salt used in the United States is by the chemical (chlor-alkaline) and plastic industries with about 26 percent used in deicing highways and the remainder used in paper and food products, water treatment, petroleum, and metal production.

This thesis is about the very special landscape comprising the evaporation pond and levee system whereby commercial salt is produced in South San Francisco Bay. Culture and nature have been linked here for 150 years, through industrial salt production via solar

evaporation in an extensive wetland ecosystem. In 2002, Cargill, Inc., the current owner of

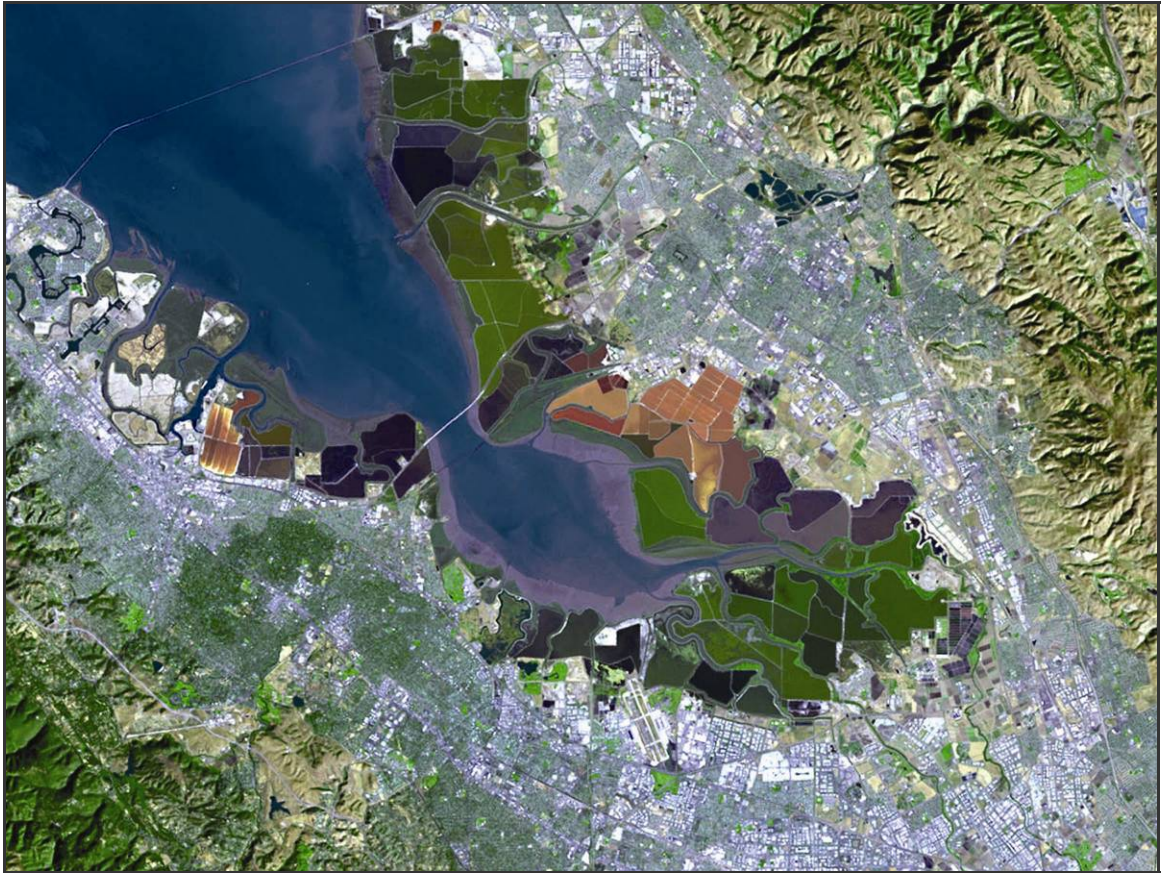


Figure 1: Aerial view of salt ponds (U.S. Geological Survey)

this vast system of salt ponds and levees decided to cease salt production on 15,100 acres of the 28,000-acre complex selling these acres to the U. S. Fish and Wildlife Service and the California Department of Fish and Game. Jointly, these agencies, along with a diverse range of stakeholders, have embarked upon a planning process, called the South Bay Salt Pond Restoration Project (SBSPRP), to restore the wetland habitat to its approximately mid-to-late-19th-century condition. When it is completed, it will be the largest wetlands restoration project on the west coast of the U. S.

The restoration process is expected to take place in stages over the next fifty years in a phased construction process. For planning purposes, the 15,100-acre SBSPRP has been

divided into three salt pond landscape complexes as follows: the 5,500-acre Eden Landing pond complex, located south of the San Mateo Bridge adjacent to the town of Hayward; the 8,000-acre Alviso pond complex, located at the very edge of the South Bay adjacent to the city of San Jose and the towns of Mountain View and Fremont; and the 1,600-acre Ravenswood pond complex, located in San Mateo County near the western end of the Dumbarton Bridge. (Figure 2) A major task in the restoration process is the completion of a standard planning document called a resource management plan (RMP). This document guides the actions of land managers, such as the United States Department of the Interior's National Park Service, Fish and Wildlife Service and Bureau of Land Management, who have responsibility for maintaining and managing the public lands authorized by the U. S. Congress in their respective jurisdictions. A management plan generally includes a broad range of guidance and policies related to the protection of environmental and historical resources, e.g. fauna, flora, water, soil, archaeological sites and buildings factored in with visitor use and public interpretation programs through special area zoning. The resource management plan also may include recommendations covering partnerships and funding.

For the SBSRP the RMP will be completed after the adoption of the joint federal Environmental Impact Statement-state Environmental Impact Report (EIS-EIR). The EIS-EIR will select a preferred management alternative for the 15,100-acre project restoration design for the 15,100-acre project after a public review process. The RMP's primary focus is on developing resource management goals and recommended engineering and land use strategies in three resource areas: endangered species habitat, flood prevention, and public recreation. The lands will be managed as designated public lands of the Don Edwards National Wildlife Refuge and California State Fish and Game Preserve System.

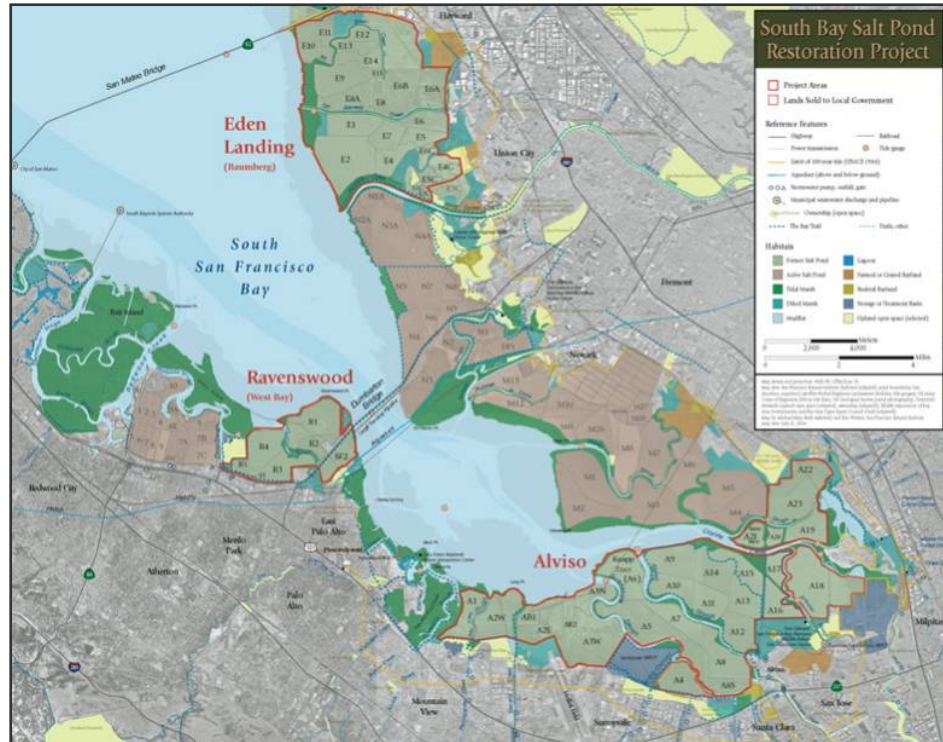


Figure 2: SBSPRP Map (California State Coastal Conservancy)

This thesis serves the SBSPRP planning process firstly by identifying the landscape's cultural resources, which have received scant attention relative to the three resource management objectives identified above. Cultural resources are defined and included by reference under the broader term, historic properties or historic resources. The National Historic Preservation Act (NHPA) of 1966 and its regulations 36 CFR 800 established new national policy related to the preservation of historic properties beyond the Antiquities Act of 1906 and the Historic Sites Act of 1935. In addition to recognizing the significance of national historic properties with the establishment of a National Register of Historic Places (NRHP), it specified the importance of preserving local and state properties that reflect common historical patterns at the local, state and national level in American history, archaeology, engineering and culture (human lifeways and practices). The NHPA also defined historic properties to include both historic and/or cultural resources and includes

any prehistoric or historic district, site (location of an event), building, structure, or object covering such items as archives, artifacts and physical remains related to these properties (NHPA Section 301; 36 CFR 800.16; National Register Bulletin 15).

Further, the thesis describes procedures for conducting an analysis of the landscape to illustrate how it provides a unifying and organic context for revealing the process of interactions between humans and the environment and which analysis then can serve as a basis for a new category of management objectives within the RMP. Lastly, the thesis presents recommendations on how to use the landscape analytical framework to evaluate the landscape's cultural significance (Chapter V) and potential eligibility for listing on the NRHP and also on the California Register for Historical Resources (CRHR).

In general, and for this study of the salt pond landscape in South San Francisco Bay in particular, a cultural landscape approach can be helpful as a tool for critical thinking about the process of human settlement which comprises a rich and varied history about people's lives, their values and ideas. The cultural landscape approach can follow the trajectory of development on the landscape through the depth of time and across space by identifying sites of historical events enabling an analysis of the combined local and national social, economic, and political forces that shaped the landscape. In addition, added value to the SBSRP's RMP is identified for cultural heritage and environmental tourism and associated public interpretation benefits. A heritage tourism plan would reflect the scope and diversity of local cultural and environmental history, thereby serving community enrichment goals and promoting an awareness of the role of humans as agents in the modification of the landscape.

The phenomenon of the salt pond landscape is a metaphor for the history of the Bay itself. This is the place where humans have interacted with the environment and played out

their lives beginning with small-scale salt farming in 1850 and evolving into a major industrial complex by 1940. By incorporating the concept of “cultural landscape” and associated methods of analysis into resource management and preservation planning generally, and for the salt ponds, specifically, it is possible to understand how culture and nature have interacted in a long-term dynamic relationship over more than 150 years. This relationship is characterized by a revolving and cyclical pattern of exchange, adaptation and mediation between humans and the land. This interaction has defined economic, social, and environmental functions of the land and its inhabitants at different points along the Bay’s development history.

In the case of the industrial production of salt, historical archives document the expansion of the industry over the past 150 years from 20 small family farms covering about 1,000 acres to a substantial industrial enterprise of 28,000 acres. With the SBSPRP, today almost half of this acreage within the south Bay ecosystem now is being restored to its mid-to-late- 19th century ecological function. In this context, environmental restoration becomes the most recent chapter in the unfolding story about the relationship between humans and the land. The new chapter reflects the shifting ideas and values about public land and resource management practices for wildlife protection, flood control, recreation and tourism based on the fluctuations in social, economic and political circumstances.

This thesis follows a sequence of tasks for carrying out a cultural landscape analysis for the SBSPRP. The procedures for a cultural landscape analysis described in the following chapters involve documenting the characteristics of the landscape, showing its transformation and the agents of change over time, and assessing the landscape’s cultural significance.

To lay the foundation for following the progression and development of the analysis framework, it is important for the reader to have a grasp at the beginning of this study on the sequence of events and basics of salt production through the solar evaporation process in South San Francisco Bay. Therefore the first chapter following this introduction is dedicated to a summary of the salt pond landscape's history. This chapter includes research on the salt production industry, the human settlement and environmental history of the Bay, including some aspects of the social history of the people and laborers who worked in the industry and related businesses. This information is culled from a general cultural resource survey compiled for this study documenting the human and environmental interactions that shaped the landscape. The survey provides the foundation for what is called the historic context, a key aspect of the cultural landscape analytical framework.

The next task, following the historical survey, was to conduct research on the theoretical underpinnings for the study of the concept of cultural landscape and landscape analysis in academic and government (gray) literature. In addition the literature review included a search for planning models that merged culture and nature to yield a comprehensive resource management approach for public parks, wildlife refuges, and other types of protected areas such as wetlands and endangered species preserves, archaeological, World Heritage, and eco-cultural tourism sites.

Traditionally, historic properties, such as buildings and other types of physical structures, and environmental resources, such as fauna and flora, have been treated separately due to the different laws enacted for their protection and management. However, increasingly there has been a trend in the regulatory process and among planning professionals to recognize the need for a combined management of these resources. For the purpose of this study and for the practice of the cultural resources management profession

in general, it is of interest to determine how these laws have been and could be used collaboratively based on a cultural landscape framework.

In the literature review of cultural heritage tourism, which is a fairly new phenomenon in the U. S. tourism industry, the research revealed some significant opportunities for tourism in the SBSPRP by using a cultural landscape approach. The results of a landscape analysis for the SBSPRP could show that the salt pond landscape of today is layered over and is inherited from past landscapes providing the lens through which to study how humans played out their lives in conjunction with industrial salt production. The analysis should provide a composite story and a basis for a cultural itinerary of the salt production industry and human settlement in South San Francisco Bay. The itinerary could supply a wide variety of tourist attractions documenting and interpreting the landscape's historical events. This information is presented in Chapter III.

The literature review supplied a template for a cultural landscape analysis methodology involving an initial survey of both cultural and natural resources in the salt pond landscape which was applied as a demonstration template to the SBSPRP. This survey provided the data for two basic components of the analysis: the description of the historical context and the inventory of the landscape's characteristics or features (Chapters II and IV). The results of this research provided the foundation for the cultural assessment, a synthesis of the historic context and inventory data and which was used to develop an initial evaluation of the landscape's cultural significance. The cultural assessment is presented in Chapter V and is the basis for this study's recommendations for the SBSPRP's Resource Management Plan (RMP) and includes ideas for heritage tourism and public interpretation of the landscape's cultural and natural history. Chapter VI presents conclusions and topics for future research.

The cultural landscape approach developed in this study is intended to yield a more meaningful and inclusive RMP as follows: 1) cultural resources would be reflected in the preservation and management objectives and would be applied in the selection of specific restoration engineering alternatives in the SBSPRP's EIS-EIR); 2) the integral relationship between humans and the environment would be revealed providing a more in-depth knowledge of the historical process and how it is shaped by social and political influences, such as class structure, power relationships and authority; 3) opportunities for heritage tourism and public interpretation would be identified and reflect the scope and diversity of local cultural and environmental history.

Both for the SBSPRP now and for other restoration projects in the future, the overarching goal in this study is to illuminate the benefits of the cultural landscape analysis to increase knowledge about valuable and disappearing cultural and natural resources, which may represent a landscape's last frontier. Moreover, as mentioned earlier, a cultural landscape analysis can enable a more inclusive approach to public resource management and interpretation offering significant opportunities for sustained use by both people and wildlife. It is hoped that this thesis will contribute to the literature and methodologies for cultural landscape analysis and use in the field by cultural resources management (CRM) professionals. (Figure 3)

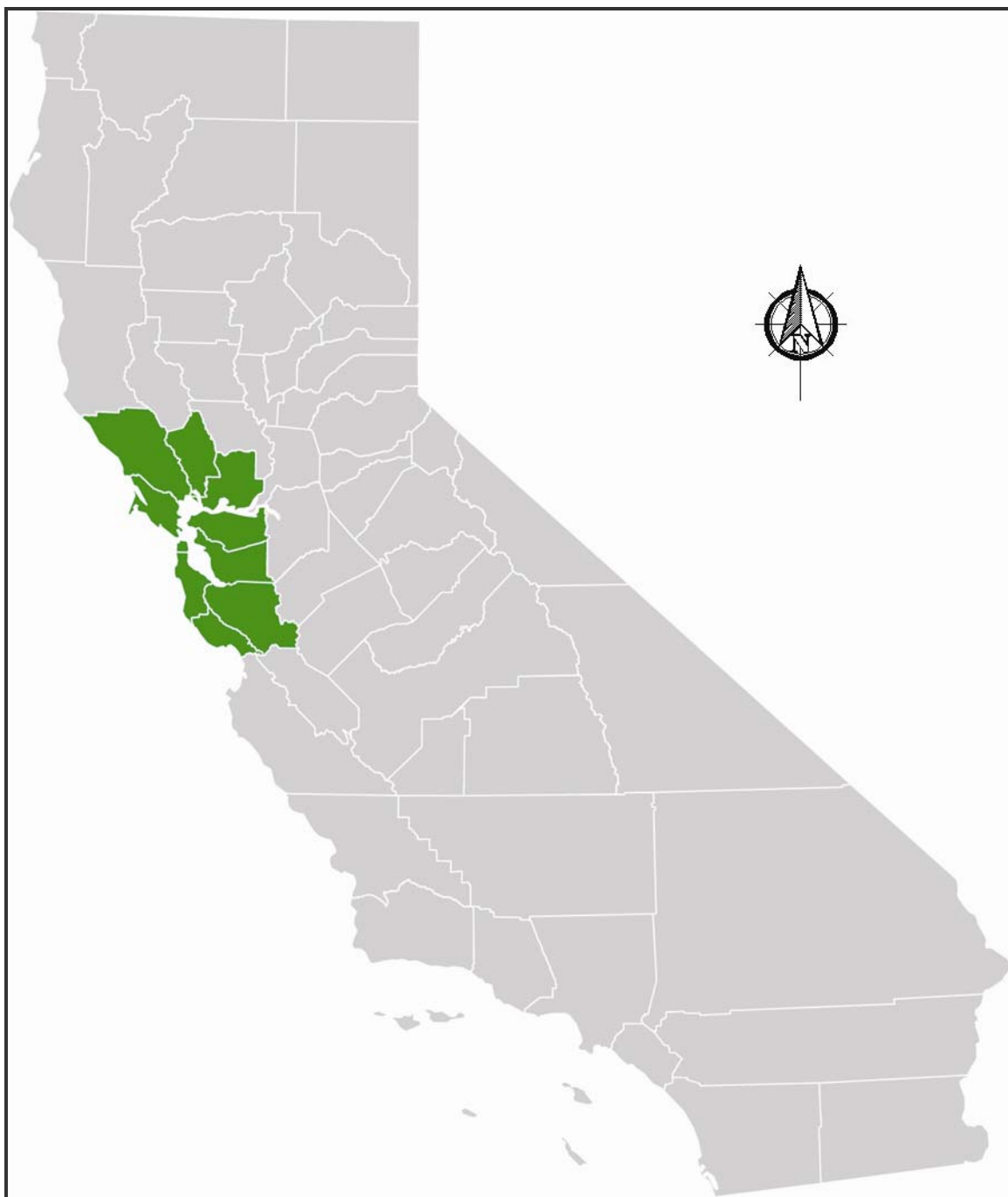


Figure 3: Region Overview Map of the S.F. Bay Area, California (Wikipedia)

CHAPTER II

HISTORICAL CONTEXT

The cultural and environmental history of the South San Francisco Bay and the salt industry is a dynamic story of human endeavor and interaction with the landscape. This story tracks the transformation of the landscape into one of the largest production centers of salt in the U. S. through the method of solar evaporation (Goldman 1967).

According to author William Ver Planck, the solar salt industry is considered one of the major factors in the growth of California's resource-based economy in the nineteenth and twentieth centuries, along with mining, farming, and water development (Ver Planck 1958; Goldman 1967; Robbins 1994). For the purpose of documenting this astonishing history, the first task in the development of the cultural landscape analysis for the SBSRP was to conduct a survey of the cultural and natural resources of the landscape. This involved collecting historical facts in archives and government (gray) literature and conducting field surveys on land and water.

The National Park Service's (NPS) National Register Bulletin 15 (NRB 15) "How to Apply the National Register Criteria for Evaluation" provided the basic guidance and the foundation for the survey procedure, which results in what the NPS identifies as the landscape's "historic context" (NRB 15:7). As specified in NRB 15, an historic context is a narrative that describes historical patterns based on events and human actions—the forces that shaped the landscape. For example, an historic context includes such information as geography, human settlement, and economic and social history. Moreover, NRB 15 suggests themes that then can be used to further assess historic significance, e.g., Peopling Places, Westward Expansion of the United States 1763-1898—Exploration of the West; Developing the American Economy, Mining Frontier, Mineral Extraction, and Shipping and

Transportation of Goods to Markets—by Water, by Rail; Transforming the Environment, etc. (7). Change over time can be analyzed and interpreted both chronologically and physically in a landscape using any one or more of these themes. Therefore an essential aspect of the historic context is to identify the material or physical evidence associated with these themes. The identification is done by conducting an inventory of the historic property (ies), and these are the landscape features or characteristics, such as sites (location of an event), buildings and objects, both human-made and natural. The presence or absence of such elements may be used to evaluate the landscape's historic significance. For the purpose of this study, the inventory was conducted at a very general reconnaissance survey only. A snapshot of the inventory results and the procedures for developing a more comprehensive inventory are described in Chapter IV. A recommended procedure for evaluating the historic significance of the landscape based on the historical context combined with the landscape resources' inventory, called a cultural assessment, is presented in Chapter V.

Physical History: Bay Geography and Geology

The task of assembling the landscape's historic context of the South Bay salt flats meant tracing the history of human actions and events involved in the production of salt and the resulting modifications to the landscape. Thus, it is important to begin with a discussion of the natural resources of landscape—its geography and geology and how the landscape came into being—as this information provides the very basis for the production of salt through solar evaporation.

The relationship between the geography, geology, the environment, and the economy has contributed to the Bay's position as one of the largest environmentally and economically strategic estuaries on the Pacific Coast. Otto Van Geldern, a noted coastal engineer, wrote in 1922, "San Francisco Bay as a harbor is not only best but by far the best

on the entire Pacific Coast of the United States. Therefore, it may be taken as a self-evident conclusion that the future of the Bay of San Francisco is assured because nothing can deprive it of its natural advantages and commanding position” (File SFB 4.2-6/4 1913).

(Figure 4)

The Bay Area region occupies an area between 36 degrees and 39 degrees N latitude. It is situated across the lowest and narrowest segment of the Coast Ranges in Central California and adjacent to the west boundary of the Great Valley of California. The region covers about 7,500 square miles with 24% of its mass being the fairly flat lowland areas that comprise the alluvial plain surrounding the actual waters of the bay. The region has a Mediterranean climate with dry summers and wet winters.

About 10,000 years ago is the commonly accepted time period for the end of the Pleistocene/Holocene era and it corresponds to a change in the rate of sea level rise. The glaciers retreated and warmer temperatures prevailed, and the present Holocene epoch began (Howard 1970:94). The area between the San Francisco Golden Gate Bridge and the Sacramento Delta that is now the central-northern part of San Francisco Bay was once a terrestrial valley trough through which the combined freshwaters of the Sacramento and San Joaquin Rivers (also referred to as the California River) flowed to the sea via the Golden Gate (Moratto 1984).

The local record of Holocene sea level changes indicates that the rising sea entered the Golden Gate about 10-11,000 years ago. The newly-formed bay then spread across land areas as rapidly as 100 feet (30m) per year when it reached the vicinity of the Dumbarton Bridge and South San Francisco Bay near the City of San Jose about 8,000



Figure 4: San Francisco Bay (U. S. Geological Survey)

years ago. Subsequent shoreline changes have been more gradual because of a decrease in the rate of sea level rise about 5-6,000 years ago (Moratto 1984:220). At 4,000 years ago, estuarine features began with the formation of marshlands with many of the marshlands bordering the bay established no more than 3,000 years ago (Atwater and Hedel 1976; Grossinger 2003). The flat marshlands of the Bay, and particularly in South San Francisco Bay, in combination with the atmospheric conditions of minimal rainfall, mild temperatures, and a steady northwest wind created the unique circumstances for the establishment of the salt industry based on solar evaporation (California Dept. of Natural Resources 1958).

Prehistory-1850s: Bay Flatlands Settlement and Early Salt Farming

“The Bay’s recent geologic history is highly significant to archaeology” (Moratto 1984:221) because it is in the marshlands and adjacent uplands that evidence of Native

American presence has been found in the intersecting creeks and sloughs, and adjacent uplands. This correlates with information about the possible earliest presence of humans in California about 10,000 years ago. Archaeological fieldwork in the past 25 years has determined that parts of California were inhabited by humans in early Holocene times (Moratto 1984). The earliest people most likely migrated down the coast from the north as early as 12,000 years ago (Kroeber 1936; Roberts 1989; U. S. Department of the Interior 1990). This information on the Bay's evolution and geologic history is important for understanding the salt pond landscape as it identifies geology's major role as the foundation for the landscape and its influence on early human settlement patterns and setting the stage for the eventual establishment of the salt industry.

In the San Francisco Bay region, shellfish deposits provide evidence of campsites and villages established in the intersections of creeks and marshlands. In 1900, anthropologist Nels Nelson found massive hills surrounding the Bay shoreline. Upon excavation, he discovered that these were huge heaps of shells, bone, and soil. He advanced the theory that these "shellmounds," about 400 in number, were the remnants of settlement sites built by Native Americans, and that there was a well-developed marine economy in place by 5500 years ago with lagoons, embayments, and estuaries as favored sites (Nelson 1909).

At the time of Native American settlement, the ecosystem was a mosaic of tidal and inter-tidal habitats including deep and shallow bays and channels, tidal mudflats, tidal marshlands and sloughs and pannes (areas of standing water) or ponds. The tidal mudflats were flooded by the bay tidal waters at high tide but exposed at low tide. Adjacent to the tidal mudflats were the tidal marshlands. Sloughs and pannes interspersed the tidal marshlands, and the shallow ponds filled with water at high tide. (Figure 5)



Figure 5: South Bay Marshes (Photo by L. Watt)

There were over 3,000 miles of sloughs and channels throughout the South Bay. The tidal marshlands' landward edge graduated into alluvial valleys and plains. (Santa Clara Valley Water District 2005). This vast landscape was abundant with fish and wildlife. Not only were these natural resources available to the Native Americans for hunting and fishing but also there was another natural resource that was due to become very important in the lives of the Native Americans and subsequent populations. This was the salt that crystallized every summer in the shallow ponds and which the Native Americans figured out how to harvest both as a food as well as a commodity for trading.

Moratto identified several collector-type cultures, including the Miwok, Costanoan, Salinan, Esselen, and the Chumash in the Central Coast and San Francisco Bay regions that inhabited these marshland areas at the time of the arrival of European explorers in California in the eighteenth century (Moratto 1984). In the SBSRP historic landscape, the main Indian

groups were the Ohlone, also described as Costanoan (Spanish for costano, coastal people). The descendants of the Costanoan in the Bay today refer to themselves as Ohlone and trace their arrival in Central California to about 1500 years ago. The Costanoan Indians were the first salt farmers on the Bay. They collected salt encrustations on the rocks along the Bay shoreline and also collected the salt marsh plants and burned them as firewood. The ashes made brine that evaporated over the campfire, and then they mixed the salt ashes in their acorn stew. The Native Americans also produced and harvested salt through solar evaporation. They used salt as a barter item for pine nuts and obsidian. When the Spanish arrived in the Bay in the late eighteenth century, the Native Americans had long been producing salt through solar evaporation. The diary of a Spanish exploring party in 1795 described the best site for a proposed new mission near San Jose as containing “nearby salt ponds to the north of several small hills.” (Sandoval 1988:4)

In 1827, an American settler, Jedediah Smith, traveling with his party of fur traders, upon reaching the newly- established Mission San Jose, wrote in his journal, “From the southwestern extremity of the Bay extends a considerable Salt Marsh from which great quantities of salt are annually collected and the quantity might perhaps be increased. It belongs to the Mission San Jose” (1988:4).

The Native American practice of producing and harvesting salt through solar evaporation relied on some basic principles, several of which remain unchanged today. During the low tides of April and May, the sun evaporates the saline water which is contained in marsh pannes and barely a foot or so from the marshland surface. By late summer, (August, September and October), the ponds and salinas began to dry out leaving crystallized brine, and with further drying out, the residue was salt. To harvest the salt, the Native Americans inserted 18-inch-long willow branches into the brine and waited until the

salt had crystallized on the branches. Then they would pull the branches out of the ponds, knock the salt off onto a rock, and sweep the salt into their baskets. Some of these ponds are more elongated at the landward edge of the marsh, and the Spanish *rancheros* called these *salinas*. [A *salina*, covering more than 1,200 acres near the city of Hayward evolved into what is known as the Crystal Salt Pond. This was documented in the 1857 U. S. Coast Survey].

The Spanish essentially adapted the Native American practice for producing and harvesting the salt, but they discovered that they could speed up the evaporation process by making a ditch in the clay mud of the natural salt ponds by diking them off from the water at higher tides. They found that they could accumulate a light brine with triple the amount of solid salt as occurred in the regular sea water, and if they began this process after the June and July high tides, this brine was preserved. The labor for harvesting required about a thousand Native Indian and mission workers to produce several tons of salt each year, which was exported to Europe as well as to other Spanish missions.

Robin Grossinger, director of the Historical Ecology Program at the San Francisco Estuary Institute, developed a matrix for describing the South San Francisco Bay landscape modification tracing the evolution of the salt production process over time according to three general eras: Indigenous, Prehistory (or precontact) to 1850s (first-generation: Ohlone/Spanish); Traditional American, 1850s to 1920s (second generation); and Modern Industrial, 1920s-1950s (third generation) (Santa Clara Valley Water District 2005:49).

For the purpose of this thesis, Grossinger's three-era-matrix (Table I) is useful as a method to categorize salt production practices and trace the development of those practices over the last 150 years. However the research into historical archives and correspondence among the salt producers indicates that the activities characterizing the third-generation,

(1920-1950) or the more industrialized salt production era actually began earlier post 1880s and circa 1900.

Table I

Eras of Salt Pond Management

| | Era | Scale | Ownership | Product / Distribution Use | Water Control | Percent ponding (per landscape unit) |
|-----------------------------------------|---------------------|------------------------------------------------|---------------------------------------------------------------------|----------------------------|-----------------------------------------------------|--------------------------------------------|
| First generation: Ohlone/Spanish | Prehistory to 1850s | Tens of acres to 1000 acres | Indigenous families/tribes; Mission San Jose; Mexican land grantees | Local and regional | High tides, potentially tide gates | ~50-60% (Crystal-Eden's Landing area) |
| Second generation: Traditional American | 1850s to 1920s | Tens to several thousand acres | 10-20 American businesses | Local and regional? | High tides, levees, tide gates, windmills | ~40-60% (1896 Crystal-Eden's Landing area) |
| Third generation: Industrial | 1930s to 2003 | Several thousand to tens of thousands of acres | Single American business | National and international | High tides, tide gates, windmills, electrical pumps | ~100% |
| Fourth generation | ? | ? | ? | ? | ? | ? |

Source: Santa Clara Valley Water District

In the Indigenous era or first pond generation (precontact to 1850), salt ponds were developed and managed by the Ohlone as modifications of natural salinas and tidal marsh pannes. The scale of individual pond complexes grew during the Traditional American Era or second generation (1850s-1920s). The definitive salt pond landscape in this era consisted of ponds and levees. A levee is an embankment which is built by digging up the mud along

side of the marsh thereby forming a ditch on either side. Most of the ditches, which were connected to tidal gates to the Bay, were cut across basins for bringing water to the ponds (Dobkin 1994).

The solar evaporation salt making technique developed in the 1860s is generally followed in principle today, although technological advances in mechanization for harvesting, washing and refining have greatly increased the scale and efficiency of production. Water from San Francisco Bay is taken in through a slough and moved through a series of ponds (receiving to concentrating to crystallizing ponds) where, through the process of evaporation in successive stages, a brine solution is created as the salt is allowed to increase in concentration. In the last stage, in the crystallizing pond, in the 19th century, when the salt fell to the bottom and dried, it was raked into piles that resemble haystacks. Today, harvesting is done by mechanized harvesting equipment run on tracks. The crude salt produced in these early salt farms was not washed but was kept in stacks through one rainy season. A technique for washing salt was developed by the Oliver Salt Company.

An important step in the evaporation process is to continually remove bittern, an impurity that is formed in the crystallizing ponds, by bringing in new brine from the concentrating ponds. The receiving pond had to be large enough to supply the inner ponds in between tides. This was done by the installation of a wooden gate or floodgate which turned on pivots and was opened inward with a lever. Men stood by the gates and opened and closed them just long enough to allow water to flow in but prevent water from flowing out. A picket fence was built in the channel in front of the gate to keep debris from floating in to the receiving pond. A typically large salt production company in the 1860s and 70s had about fifteen flood gates, twelve feet wide (Dobkin 1994).

During the Traditional American Era (second generation) of salt pond construction, levees and wind-driven pumps (e.g. the Archimedes screw) were being used to enlarge the salt ponds, but essentially only in tidal marsh drainage systems that had reached an advanced, larger channel stage in their development. Levees did not cross larger channels, (as occurred later), and each pond complex consisted basically of equal areas of tidal marshland and salt ponds.

The Modern Industrial Era (third generation) of salt pond landscape construction began post-1880s with consolidation of the small local salt farms that had been operated by individual companies. The scale of salt pond operations expanded to cross major sloughs and channels. Most of the saline tidal marshlands, brackish tidal marshlands, and riparian tidal areas of the South Bay were converted to highly managed salt pond-marsh systems (Santa Clara Valley Water District 2005:49). (Figures 6 and 7)

Thus far, this history has covered the geography, the geology, and the Indigenous Ohlone/Spanish era related to salt production and the modifications to the landscape. This chapter now turns to a more detailed account of the second generation of salt farmers in the Traditional-American era and identifies the historic-cultural events and actions that occurred that would further transform the landscape.



Figure 6: Crystallizer Ready to Harvest (Photo by L. Watt)



Figure 7: Harvested Salt, Cargill (Photo by L. Watt)

1850-1900s: Second Generation of Salt Farmers

Shortly after California became a state in 1848, federal and state laws were passed that became the catalyst for the land reclamation movement—a massive program of extensive diking and levee-building to create productive land out of the Bay’s swamps, marshes, and wet lands, all considered mosquito-infested and wasted lands at the time. It was the Arkansas Act of 1850 that granted “swamp and overflowed” lands to the states and directed the states to sell these lands to individuals who could make them productive as well as provide flood protection (Hundley, Jr. 1992).

Many levees were built to keep water out so that grain and other crops could be developed; while other levees, particularly those in the South Bay, were built to enclose the salty bay waters for the production of salt. If levees were not maintained, as frequently happened in the early mid-19th century days of conventional salt pond levees, then entire sections of pond complexes would fail and revert to tidal marsh. Building levees in the early days of salt farming was a tedious and precarious undertaking as the surface crust of the marsh could be broken if the levee was built up too rapidly. A typical levee in 1850 was about three feet in height over the marsh and about two feet wide on top. According to Dobkin, an historical geographer, “levees were built in stages with settling intervals of as much as 18 months between stages” (Dobkin 1994:12). Dredging equipment, introduced in the 1880s, made it possible to build wider, higher, stronger, and therefore longer-lasting levees. Many of the handmade levees were destroyed in the 1906 San Francisco earthquake and were rebuilt with the new dredging equipment. (1994; U.S. Dept. of the Interior 1917). In the 1950s, a typical levee was three feet high, and five feet to twelve feet wide at the top (1917:43-44). Much of the levee system built in the Traditional American Era through the Modern Industrial Era is in place today; however, there have been successive generations of

levee maintenance and reconstruction during the last 100 years. Today, the massive system of levees serves as a dominant natural and cultural resource feature in the South San Francisco Bay landscape.

California established its first method for selling swamp and overflowed lands authorized under the Arkansas Act in 1855. It sold such land for a maximum of 320 acres at a dollar per acre. If the land was purchased with cash, there were no restrictions; if the land was bought with credit, at least 50% of the land had to be reclaimed within five years or the title would revert to the State. The State also provided for the creation of swampland reclamation districts on a county-by-county basis to ensure that the construction for the drainage would actually occur and/or to repay private individuals for the capital spent in the reclamation work (Hundley, Jr. 1992).

Initially, there were not many subscribers to this offering, and so the State raised the acreage allowance to 640 acres. Still, there was not much progress until the legislature, in a desperate attempt to sell swamp and overflowed lands, passed the Green Act in 1869. The Act removed the 640-acreage limitation, thereby allowing individuals to purchase swamplands on credit. The State subsequently handed over 790,000 acres of swampland to about 200 individuals within only two years (Booker 2005). Of these 200 individuals, most, if not all, were soon to become the entrepreneurs and the leading industrialists of the late 19th and early 20th century and actively involved in the modification of the landscape through salt production as well as in agriculture, transportation, and other industries.

In the South San Francisco Bay, there were about 60,000 acres of marshlands that were affected by the “swamp and overflowed” sale running from southern Alameda and San Mateo and Santa Clara counties’ shoreline varying from two to four miles in width. (File SFB 4.7/1 1971). J. L. Beard was one of the buyers in the sale. Immediately following the

adoption of the green act in 1869, he sent a petition to Alameda and Santa Clara Counties to establish Reclamation District No. 82, which included 17,000 acres of marshlands in the East Bay, and Reclamation District No. 95, including 10,000 acres in Santa Clara County. The Board of Supervisors approved both Districts: #82 for a levee reclamation cost estimate of \$177,769 (\$18.25 per acre); #95 for a cost of \$25,000 (\$2.50 per acre). These two reclamation districts covered almost all of the marshland acreage in the South Bay existing at that time (File SFB 4.7/1 1971). The Districts were authorized to repay money spent by landowners to reclaim marshes within the district boundary. The money for the Districts was to be paid out of the state Swamp Land Funds apportioned to each county from the sale of swamplands. Their money was indeed spent on land reclamation for the construction of levees within the two Reclamation Districts, but after 1873, “no further district work was recorded and the ventures appear to have failed” (File SFB 4.7/1 1971:4).

Another landowner whose name appears prominently in the archives of Bay marshland reclamation was C. E. Whitney and the Dumbarton Land and Improvement Company (DL&IC). DL&IC was incorporated in September 1891 “to acquire, hold and own lands in the state of California by purchase, lease, bond or otherwise, and to cultivate, reclaim, fill, drain, ditch, and otherwise improve same” (File SFB 4.2/1 1891). DL&IC’s charter also enabled it to operate railways for transporting passengers and freight. Author, William Ver Planck, described DL&C as a “subsidiary of A. Schilling and Company (California Dept Natural Resources 1958). It was Whitney and Schilling who reactivated the two reclamation districts #’s 82 and 95 in 1905 and 1906 for agricultural use but the

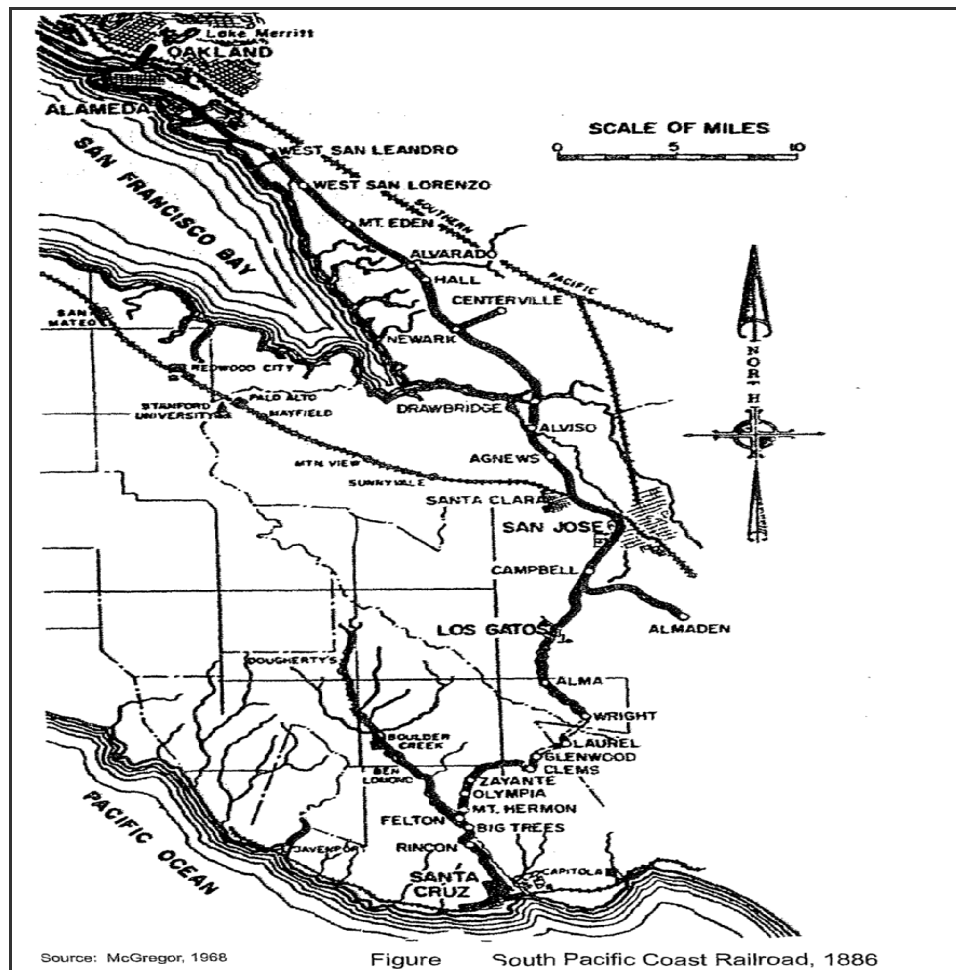


Figure 8: South Pacific Coast Railroad, 1886 (McGregor, 1968)

abandoned them leaving the levees unmaintained. It is unclear what was the reason for the levee abandonment but perhaps it was because of flooding or perhaps they had started to think about the potential increase in the value of the property for commercial use. The South Pacific Coast Railroad, established in 1880, ran through DL&IC land on its route to Alviso, San Jose, and Santa Cruz and was successful (McGregor 1968). (Figure 8) In early 1908, correspondence between them showed their worry about the agricultural failure: Whitney wrote to Rudolph Schilling that “we now have something over 4,000 acres of land in Santa Clara County under levee, only 500 of which are rented” (File SFB 4.2-1/15 1908).

Whitney was not deterred by the failure to produce arable land and began to focus more on solar salt production on a vaster industrialized scale. Schilling and Whitney's interest in grand industrial development both individually, as well as in consolidation with other companies such as the Oliver Salt Company, is evident in two interesting pieces of correspondence. A 1907 letter to Mrs. E. O. Oliver in Mt. Eden from DL&IC describes the goal to build "what will certainly be the most extensive chemical plant on the Pacific Coast and, eventually, will probably be second to none in the United States, at least." The letter goes on to say to Mrs. Oliver, "I think your boys have better ability in the construction and operation [of salt works] than any one that I know of, and, together with our unexcelled marketing facilities, we should make a very strong combination" (File SFB 4.2/9 1907b; Watt 2005). It is apparent that DL&IC had great vision into the possibilities of the Bay as an important trading hub as indicated by the correspondence outlining a plan to build a shipping and distribution terminal at Dumbarton Point. Schilling patented his design for a terminal warehouse and system for the distribution of goods between ships and rail lines on December 5, 1916 (SFB 4.13-1 1916; Watt 2005). In a letter to Herbert Hoover, who was at Stanford University in 1919, Schilling said that this Dumbarton parcel "would be the most valuable piece of property for harbor industrial development in the world—for it is on the Pacific Ocean—the coming theater of the world..." (File SFB 4.13-1 1919; Watt 2005:10)

This information is included here to demonstrate the strong relationship among the players and the who's who in Bay marshland reclamation. The salt industry was beginning to forge links with other industries that would expand salt production for new markets building a foundation for the Bay's future economic growth and seaport development and hence further changes to the landscape.

The Gold Rush and New Salt Farms

Another major event took place in the middle of the 19th century that preceded and affected the future of salt production and related landscape changes: the discovery of gold in 1849. Hundreds of thousands of people came to California by land and sea from all over the world for “free” gold. The small port of San Francisco exploded into a busy commercial shipping center. Concurrently, salt grew in its importance and demand. The Mexican ranchos in the South Bay shipped meat preserved with salt to the ships anchored in the Bay and hauled salt to the gold mines in the Sierra foothills. Hides were tanned with salt for leather goods, which were then shipped to Europe. Most of the gold seekers returned empty-handed to the Bay and then faced the challenge of finding a new life. For some of them, this meant mining the natural resources of the Bay region: redwood forests, fish and wildlife, and salt. The result was new “industries” in logging, fish and wildlife hunting for sale (market hunting, as it was called), and grain and salt farming (Sandoval 1988).

The state’s first artificial salt pond for actual commercial production was constructed in 1853 by a Scandinavian, John Johnson. Johnson, like several other pioneers at the time, could see the growing need for salt in hide tanning and leather processing (Sandoval

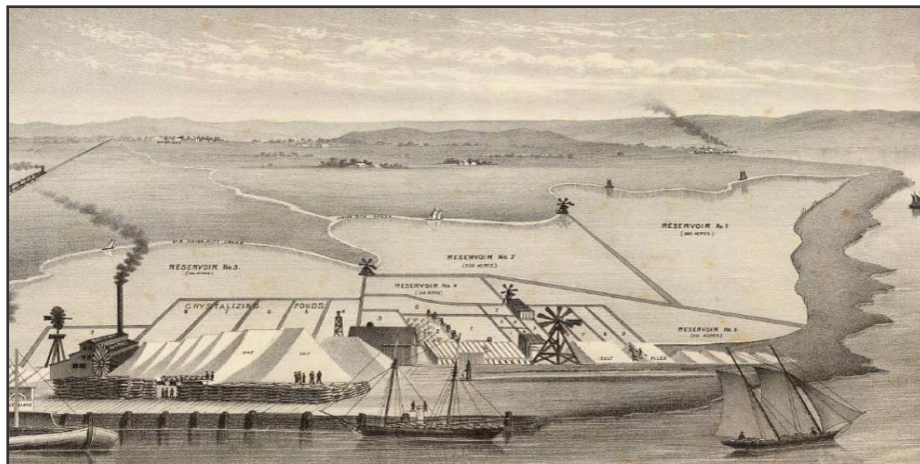


Figure 9: Typical landing 1890 (Thompson & West)

The early pioneers often hired surveyors to locate land with the most natural salt marsh production possibilities in the area from San Lorenzo to Mowry's Landing on the eastern shore of South San Francisco Bay. Some of them bought land in the "swamp and overflowed" land sale (1988:19-49). Adolph Oliver, a salt farmer of the 20th century, wrote in his biography that many landowners simply took possession of the land by "squatting." However, Johnson appears to represent a more typical early salt farmer prior to the major marshland reclamation boom.

His homestead was on a Mexican land grant in what is known as the Mt. Eden area of Hayward in Alameda County on a slough about a mile inland from the Bay. At the high-tide mark, he built Johnson's Landing, which consisted of a wharf and warehouse on pilings, and on the land he built a small house. Eventually, he built a hotel and a picnic grove for the frequent hunters and recreational visitors (Sandoval 1988). On the outer tidal salt marsh, Johnson built a crude 14-acre salt pond with hand laborers, who dug out the crystallized salt with picks and shovels. At his first salt harvest, he produced 25 tons, which sold for \$50 per ton. Johnson's harvest eventually grew to annual shipments of 2,500 tons. He shipped the annual crop of crude salt by schooner to the Barton Brothers, who had built a salt refining company consisting of a grinding mill and packaging warehouse on Sacramento Street close to the bay front—the Embarcadero in San Francisco (1988:31). Remnants of this first salt farmer's operations are visible on the landscape today on the shoreline near the city of Hayward.

During the 1860s, Bay salt was generally considered to be of poor quality compared to imported salt and it did not command a high price. Much of the salt was shipped in its crude crystallized form from East and South Bay farms, having been washed only by rainwater (as discussed earlier in this chapter) and possibly ground to a smaller size at a

grinding mill in San Francisco, packaged, and then shipped out of the port of San Francisco. However, a local producer, John Quigley, founder of Quigley Salt Works, had an idea to improve both the quality of the salt and the cost-efficiency of his operation. He built one of the first salt refining plants in the town of Alvarado, now Union City (Dobkin:7). (Figure 10)

The concept of a salt plant, an actual building serving as a refinery, was now being introduced into the salt pond landscape, whose features heretofore had included the bare essentials such as evaporation ponds, a windmill for pumping water, and a barge landing. The first windmills were paddle-wheel driven, which was a prototype of the Dutch windmills that were used to reclaim land from the sea. Andrew Oliver introduced the Archimedes screw pump in 1870, and these replaced the paddle-wheel windmills. Archimedes screws (named after the Greek mathematician who discovered the principle of lifting water) were used until 1930 when they were replaced by gasoline and electric pumps. An original

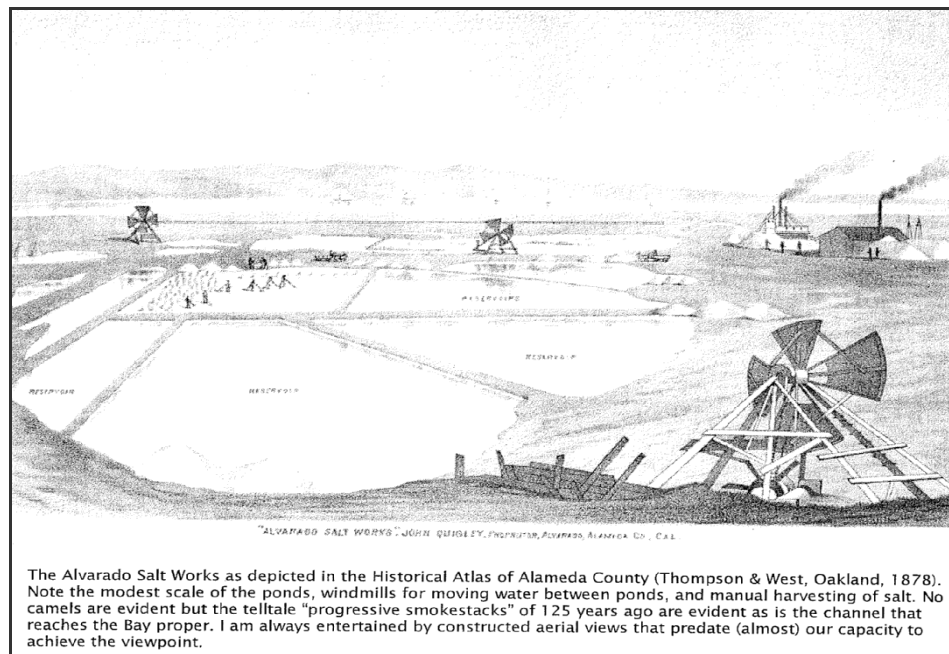


Figure 10: Alvarado Salt Works (Thompson & West)



Figure 11: Archimedes Screw Pump (Photo by author)

Archimedes screw pump has been rebuilt and is located in the Mt. Eden salt pond complex; it has been designated as a Historic Mechanical Landmark. (Figure 11) Eventually these early salt farms would expand into salt works with the installation of buildings and mechanized equipment for washing, refining, harvesting, and transporting salt—all of which can be considered cultural resources for the purpose of this cultural landscape analysis study

Another shift in the demand for local salt occurred with the discovery of the Comstock Silver Lode in Nevada in 1859. Salt was used in the process of extracting the silver ore. The Bay salt was shipped from San Francisco to Virginia City, NV, and sold for \$150 per ton (California Dept of Natural Resources 1958). By 1868, salt production had increased to 17,000 tons annually produced by 17 companies employing about 100 workers.

By 1900, 15 miles of marshland in Alameda County were dedicated to solar salt evaporation ponds. Production had risen to 100,000 tons annually, with the Bay Area supplying salt to most of the West as well as to fisheries in Alaska and Siberia (Parker 1897).

The Turn of the Century—Beginning Modernization

The economic conditions were favorable for modernization in the salt production industry at the beginning of the twentieth century which resulted in a new chapter in the landscape's history. There were advances in the transportation industry and in the mechanization of salt production equipment. The primary event that caused significant changes in the transportation industry towards the end of the nineteenth century was the completion of the railroad in San Francisco Bay. The South Pacific Coast Railroad, a narrow gauge railroad, was built along the west side of the Bay from Santa Clara in the south running north along the Bay shore to Alameda Point. Completed in 1878, it carried passengers and freight from Mt. Eden in Hayward to Alameda Point near Oakland, and from there, freight was unloaded onto a ferry that traveled to the San Francisco Embarcadero. The railroad bought a parcel of land from John Johnson and built a short access road called Depot Road. This piece of the railroad was taken over by the Central Pacific Railroad, which later became the Southern Pacific Transportation Company in late 1886.

Despite access to the railroad, Johnson and fellow salt farmers continued to ship salt to San Francisco by barge (Dobkin 1994). It is likely that price and the efficiency of operations already established did not encourage a shift from water to rail until the early 20th century. This shift is evident in correspondence between A.L. Whitney and A. Schilling in 1908 that discusses methods for shipping salt in bulk and comparing costs, distance and pricing between water and rail. The letters show that transportation was becoming a vital factor in the success of the salt business and its ability to increase the scale of production (File SFB 4.2/7 1908). By 1950, trucking had replaced both ship and rail transport for salt (Sandoval 1988).

One of the catalysts causing the mechanization of salt refining equipment was the expanding demand for a higher quality of salt and a greater range of salt grades for the dairy and meat industry and other domestic uses. Mechanization also became important for improving the efficiency and speed of the production of salt and at the least cost to the producer through the use of such devices as electric water pumps and harvesting equipment.

In addition, the over twenty- plus salt production companies that had been run as small family-owned enterprises using hand labor with relatively minimum capital investment were bought out and a merger and consolidation trend began. The mergers of companies were brought about by a shift in the business strategies and practices of salt production and these trends further became the agents of further changes to the landscape. Consolidation meant reducing the number of plant operations and a corresponding increase in the scale of operations at the remaining plant. From 1900-1905, four large scale producers had entered the picture and were the sole four companies producing salt over 10,000 tons annually (File SFB 4.7/1 1971). One of these new companies was the Leslie Salt Company. Leslie had its beginnings with the C. E. Whitney Company in 1892. Whitney joined hands with August Schilling likely on DL&IC-owned lands and wanted to start salt production in the west bay. C.E. Whitney died in 1904 and the C.E. Whitney Company changed its name to the Leslie Salt Refining Company. Leslie began the reclamation of marshland in San Mateo County on the west side of South San Francisco Bay and built a salt refining plant. Another company, the Continental Salt & Chemical Company purchased the Quigley Salt Works and reclaimed an additional 1000 acres. The other two companies were the California Salt Company, who purchased the Carmen Salt Works and reclaimed 1300 acres south of Coyote Slough and the Oliver Salt Company who had purchased all the early salt companies in the Mt. Eden area by 1901 (Dobkin 1994; Leslie Salt Co. 1984; File SFB 4.7/1 1971).

1920-1980: The Modern Industrial Era

The merger and consolidation trend continued with the Leslie Salt Refining Company merging with two others (California Salt and Continental Salt and Chemical Company) to form the Leslie-California Salt Company in 1924, which then managed the operation of 25 salt plants on 6,000 acres of salt ponds. The Oliver Salt Company properties merged with Leslie-California in 1931. All salt pond operations in the East Bay were combined into two pond systems serving two refinery plants. The only company producing salt, other than Leslie-California, was Schilling's Arden Salt Company which ended in 1936 when Leslie bought Arden. This event marked the beginning of the present-day large modern industry under Leslie-California Salt producing 350,000 tons of salt annually on 13,000 acres of salt ponds with four existing salt plants (File SFB 4.7/1 1971).

Salt plant expansion, modernization, and consolidation of operations continued under Leslie. (Figure 12) A new and modern refinery was constructed adjacent to the Newark No. 2 crude salt plant. In 1941, the Newark refinery began operations, and the original California Salt Co. refinery near Alvarado was shut down. In 1945, a crude salt processing plant was added to the Newark refinery, and the Arden No. 1 plant closed. All operations were concentrated at the Baumberg crude salt plant and the Newark No. 2 plant and refinery with all shipments going by rail and highway. Within ten years, under Leslie-California Salt Company, the volume of salt had increased to 450,000 tons produced from over 25,000 acres (Ver Planck 1958). By the late 1950s, another shift in demand for new industrial uses of salt had occurred. Almost half of the state's crude salt production was now being sold in bulk to chlorine-caustic manufacturers (by the 1950s, salt was being produced through solar evaporation also in other regions of California, e.g., at the southern end of San

Diego Bay, Newport Bay, and a portion of Moss Landing). Other industrial uses of salt were expanded to include water treatment, refrigeration, and livestock ranching (Ver Planck 1958).

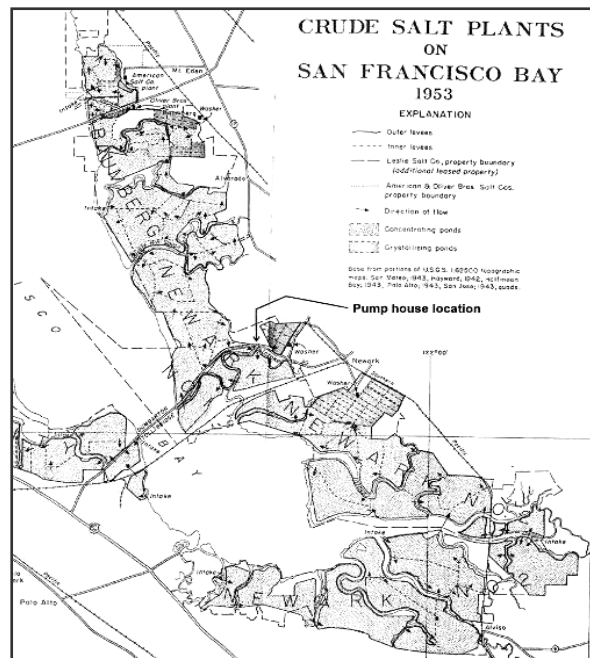


Figure 12: Leslie Salt Company Operations (Leslie Salt Company, 1953)

Salt Industry: Linking Wildlife and People

The preceding narrative about the history of salt production describes some of the events and human actions that comprise the beginnings of a documentation of the cultural and natural resources (e.g. ponds, levees, salt plants, pumps) for the landscape’s historical context. However the focus thus far in this study has been on the physical and economic attributes of the landscape for solar salt production. An expanded list of landscape features would document in more detail the value of the cohesive natural infrastructure supporting a rich environment for wildlife. Strung together, the salt production landscape’s natural features-- the open water, tidal mudflats, tidal marshlands, sloughs, channels, creeks, pannes, and salinas formed a vast habitat for waterfowl, fish, shorebirds, and other wildlife species. Throughout the period of salt industry expansion in the nineteenth and twentieth centuries,

the landscape continually supported waterfowl habitat and a thriving sport hunting, fishing and related recreation for the local communities. (Figure 13) The journal *Overland Monthly* described “thousands of shooting clubs and resorts...[from] San Leandro Bay down south to Alviso” in 1910 (Bay Nature 2004:26). Remnants of the 1910 hunting days exist today in the form of duck blinds and crude shacks in and around the marshlands adjacent to the salt ponds today. Many of the early business pioneers and residents of the South Bay towns of the salt pond landscape were duck hunters, fishermen, and enthusiastic recreationists. Today local clubs actively use the marshlands and salt pond levees for hunting and recreation.



Figure 13: White Pelicans near Alviso (Photo by author)

The South Bay in the early 1900s was thriving. The town of Alviso was the main transshipment center between San Francisco and San Jose for the distribution of agricultural produce. The town’s Bayside Canning Company was the third largest vegetable cannery in the world. The population of Alviso and its neighboring town, Drawbridge, was over 4,000. The solar salt industry also spawned a new fishing industry: brine shrimping. Alviso resident, Tom Laine, was a “shrimper.” He discovered a new business behind the levees. He contracted with Leslie Salt to clear the ponds of trapped fish and then trolled the salt pond waters for the coral-pink brine shrimp, towing a fine mesh net behind a raft. In nearly 25

years of working the ponds, Laine usually netted a massive harvest: “One pond yielded 500,000 pounds of shrimp—used for fish bait—in 42 days” (Bay Nature 2004:29).

These examples introduce yet another aspect of the historical context of the salt pond landscape, i.e. the social history of the salt pond landscape’s residents and their relationship to the landscape. The social history should be explored in more detail and documented in the cultural landscape analysis for the SBSRP.

Post WWII: The Changing Bay

By 1945, further reclamation and consolidation coupled with the building of pipelines and siphons crossing under several tidal sloughs completed a 24,000-acre system in Alameda and Santa Clara counties. Salt tonnage bound for the Northwest coast chemical industry and the Asian export trade was shipped from the Newark and Baumberg plants by rail cars to the Port of Oakland (built in 1920) and transferred to cargo ships (File SFB 4.7/1 1971).

Due to the lengthy time needed to move large volumes of salt from plant to ship from the Alameda-Santa Clara pond system, in 1940 Leslie looked into other areas of the Bay for more efficient shipment. It selected the Redwood City salt plant site in San Mateo County, which was processing bittern for Stauffer Chemical Company, and the 1300 acres bordering Redwood Creek flowing into San Francisco Bay as a good location. The adjacent Port of Redwood City had been built in 1930. Leslie purchased the Stauffer site and also consolidated additional acres south from the University of California at Berkeley and Dow Chemical Company. Levee construction for new crystallizing ponds and construction of salt washing, storage, facilities, and a terminal was begun in 1942. The first salt shipment out of the Port of Redwood City occurred in 1951.

In 1949 Leslie purchased an additional 300 acres further south of the Dumbarton Highway from the City of San Francisco. It was here that Leslie built a pipeline underneath the Bay to provide a connection between the Redwood City plant and the salt ponds and Newark plant operation

About this time, the population of the San Francisco and adjoining counties had increased rapidly during and post-WWII, stimulating the demand for more land for housing. By 1958, the San Francisco Bay salt production acreage had reached 31,500 acres with approximately 7,200 acres in San Mateo County, 16,000 acres in Alameda County, and 8,400 acres in Santa Clara County. By 1971, the acreage in salt production was reduced by about 3,500 acres in San Mateo County as this acreage was sold for housing and commercial development in the building of Foster City and adjacent Redwood Shores.

In 1978, Cargill, Inc. purchased Leslie Salt. At its high point of production in 1985, Leslie was producing salt on about 40,000 acres of evaporation ponds along with co-managing 12,000 acres dedicated to the South San Francisco Bay Wildlife Refuge, (now the Don Edwards National Wildlife Refuge) and the largest urban wildlife refuge in the U. S., along 25 miles of Bay shoreline.

The Environmental Movement

In the 1970s, two significant trends occurred. The post-WWII increased flow of people into the Bay region continued in ever more massive proportions. The cities of San Francisco, Oakland, and San Jose had been expanding since the mid-1940s, and the region's highway system was being built around them. San Francisco and Oakland airports were built. People needed housing and jobs, and the most cost-efficient location for housing and offices was on the mudflats and adjacent flat land and its major transportation routes. The goods movement system and human settlement pattern established at the marine-shoreline

interface to move freight in the nineteenth century—farm products, hides, and salt—was now providing the base infrastructure to accommodate residential and commercial development. Urbanization increased in greater proportions than ever before.

By the end of the 1960s, a new sensitivity to the congestion and pollution impacts of growth and urban development was spawning. A movement began to “save the Bay” with the goal of stopping the filling of San Francisco Bay for homes as well as stemming Bay pollution. Until the ‘60s, the salt industry’s success and achievements both for its economic as well as its environmental track record as co-manager of its lands with the USFWS had continued unabated. However, it may be that Leslie’s decision to sell its acreage for the building of Foster City, as well as the commercial and residential development proposed by other companies based on Bay fill, led people to begin questioning the salt industry’s long-term goals in the wake of its modernization and intensification. Ironically, another perspective was that the salt industry actually had become a savior for the Bay while producing salt and essentially co-managing the landscape for multiple uses-- economic, wildlife habitat and recreation. It was the retention of property in salt production that prevented the turnover of Bay shoreline for even greater residential and commercial development that had been occurring over a century of steady population growth.

The result of the Save the Bay movement was the adoption by the California State Legislature in 1969 of the McAtter-Petris Act. The Act established a government commission, the San Francisco Bay Conservation and Development Commission (BCDC), and empowered it to prevent the filling of the Bay for homes and other non-water dependent uses. It also adopted the San Francisco Bay Plan, which contains policies governing the use of the Bay’s tidal waters and shoreline areas including the use of the salt pond acreage. Any change of use of the salt ponds requires BCDC’s approval as well as

several other state and federal agencies whose enabling legislation followed the McAteer-Petris Act. The State Legislature also enacted the Porter-Cologne Water Quality Act the same year and established an organization of regional boards and a permit system to control the discharge of pollutants into the Bay.

In 1972, the U. S. Congress adopted legislation establishing the San Francisco Bay National Wildlife Refuge on 20,000 acres of salt production land under a partnership agreement with Leslie (now Cargill), which retained the right to produce salt on most of the acreage.

Since 1978 Cargill has continued to produce salt on the Leslie Salt pond system at about the same production levels until 2003. At that time, Cargill sold 15,100 acres to both the State of California and the U. S. Fish and Wildlife Service for restoration to the landscape's approximate-19th century tidal wetland habitat condition thereby launching the SBSPRP, and the restoration planning process is underway today.

This chapter has described the events and human actions that have shaped the South San Francisco Bay landscape over a 150-year history, 1850-2000. The time period of 150 years was chosen for this study's historical context because the period represents the full cycle of historic activity reflecting the evolution of the salt production industry from a few small family farms to a modern industrial complex. With the launch of the SBSPRP in 2003 a new cycle of landscape change and chapter in the history of the salt pond and levee system of South San Francisco Bay begins. The history of the struggles in land reclamation to secure production and necessary transportation for a commodity essential for human life is a process of human endeavor characterized by both ingenuity as well as failure. It is a story told over and over again in the successive generations of levee modification; a cultural

landscape analysis documenting the cultural and natural resources embedded therein can reveal this amazing history.

The next chapter discusses the results from the literature review covering cultural landscape theory in various academic disciplines as well as how the theory has been applied in cultural landscape studies and resource management plans. The process of weaving the historical context into an analytical framework can now begin.

CHAPTER III

LITERATURE REVIEW: CULTURAL LANDSCAPE ANALYSIS

A primary task in developing a framework for cultural landscape analysis for the SBSPRP was to conduct a literature review on cultural landscape theory in various academic disciplines. The literature review also involved a search for cultural landscape studies that applied landscape theory focused on the integration of culture and nature as an organic whole with the purpose of achieving a more inclusive approach and resource co-management. The research question was Had anyone conducted a cultural landscape analysis combining the history of human settlement and its interactions with the natural environment over time and across space, and if so, what was the outcome in a resource management plan for a national or state park, wildlife refuge or World Heritage Site?

Cultural Landscape Theory—What Is a Cultural Landscape?

Cultural landscape is a term that has a currency of interest for academic study. It is addressed from different perspectives in several disciplines: geography; landscape architecture; architectural, environmental, economic (industrial), and ethno-history; and archaeology. All of these perspectives have contributed to this study, and they form a foundation for considering how a cultural landscape approach could be employed in the development of the Resource Management Plan (RMP) for the SBSPRP.

There are many definitions of cultural landscape ranging from the most general, such as that found in UNESCO's World Heritage List Guidelines (cultural landscapes as properties that represent the "combined works of nature and of man") (UNESCO 1972) to the more specific, such as that found in the U. S. Secretary of the Interior's Guidelines for the National Register of Historic Places (a "geographic area [including both cultural and natural resources and the wildlife or domestic animals therein], associated with a historic

event, activity, or person or exhibiting other cultural or aesthetic values”) (cited in Birnbaum and Peters 1996:4).

A cultural landscape analysis involves documenting the characteristics of a landscape and showing its transformation and the agents of change over time. Authors from the above-mentioned academic disciplines have identified a wide spectrum of cultural phenomena that reflect the ways in which humans have interacted with and shaped a natural environment over a particular period of time. The overarching perspective of the theories is that landscapes are dynamic and are in a state of constant change modified by humans and vice versa. Shifts in national and global events can be a catalyst for change and subsequent landscape adaptation as people react and build and rebuild the landscape, e.g. the ever evolving rural to urban landscape. In the case of salt production and the continuing technological evolution of the industry, each stage created a new chapter in the history of the landscape as the industry reworked the existing terrain to meet the changing social purpose and economic needs of the era.

For the purposes of this study, three academic disciplines have been examined—geography, archaeology, and history (specifically, economic and industrial history). Ideas from scholars in these disciplines have been gleaned to further elucidate the meaning of “cultural landscape” and to understand the methodologies for a cultural landscape analysis. All three disciplines have made a significant contribution to the study of cultural landscapes, since geographers study the earth’s natural surface; archaeologists study the material culture contained under and on top of the earth’s surface; and historians write about past events that happened on the earth’s surface.

Geography

Traditionally, the term landscape has been the province of the artist and the geographer. The idea of landscape as the expression of a culture and the concept of cultural landscape was first introduced by Carl Sauer in 1925 in *The Morphology of Landscape*. It was he who “formulated the concept of a ‘cultural’ landscape as fashioned from a ‘natural’ landscape” (cited in Ashmore and Knapp:3). Sauer thought that by understanding how a culture changed its environment, one could gain a more thorough understanding of the culture itself. As he noted, “Culture is the agent and the natural area is the medium” (15). Sauer had studied the work of the nineteenth-century European geographer, Alexander von Humboldt. Humboldt discussed the role that the physical landscape played in national culture development and how these national cultures could in turn influence and change their surrounding landscape (cited in Norton 1989).

Geographer Paul Groth (Groth and Bressi 1997) defines the term landscape as denoting the interaction of people and place. He agrees that a social group and their spaces, i.e., the spaces to which the group and its members belong, have a shared identity and meaning. “All human intervention with nature can be considered as cultural landscape” (1997:1). According to Groth, basic works in cultural landscape studies have been written by six senior authors: John Brinkerhoff (J.B.) Jackson, Peirce Lewis, Donald W. Meinig, Wilbur Zelinsky, David Lowenthal, and Michael P. Conzen (1997:224). Groth outlines some of the tenets of cultural landscape studies of the 1990s:

“Ordinary, everyday landscapes are important and worthy of study.... Research subjects in landscape studies are likely to be urban as well as rural and focused on production as well as consumption...Landscape meanings can be interpreted as noble, nostalgic or

uplifting expressions of choice and group life or those of economic exploitation, racism, capitalist accumulation, and a lack of choice.”(1997:3).

Groth discusses how landscapes represent both the actions of individuals and local communities as well as national and universal cultural values and actions. The salt pond landscape can be interpreted as both an urban and a rural landscape, a landscape representing both essential production (of salt) and economic exploitation as well as a place of uplifting scenic beauty at the intersection of water and sky.

Groth considered J. B. Jackson as the father of the cultural landscape study and central to many of its principal ideas. He pointed out that Jackson saw landscape not as a scenic or environmental entity, but as a cultural or political entity—an entity that changes in the course of history.

In *The Necessity for Ruins and Other Essays*, Jackson (1980) pointed out that the significance of space in the landscape is reflected in the allotment of land for public or private use, and that space makes the social order visible. Space identifies the occupant, confers status, and establishes relationships and boundaries. Certain landscape elements represent concepts or notions; e.g., the railroad changed the way manufacturers organized production and movement; and the Archimedes screw wind pump on the salt pond landscape represented a way of thinking about how to lift water from one place to another.

Jackson went on to say that one can study the transformation of a basic element of the landscape such as a parcel of land, a farm or a road. The elements of the landscape are symbols of how humans have learned to organize space and movement. These symbols in the context of the landscape reflect “a process of steady, uninterrupted flow of energy and productivity”, and emerging ideas about community and mobility can be studied (1980:124).

In *A Sense of Place, a Sense of Time*, Jackson discussed landscape in terms of the evolving notions of wilderness vis à vis agriculture. He explains that sixteenth-century European landowners saw the forest as a resource for production and community use, not as a natural environment for preservation and protection from people as has come about in the twentieth century environmental protection movement. A landscape's natural resources were meant to be assimilated and sustained for human use and supported a life of prosperity (Jackson 1994). The South Bay water/land interface in 1850 was seen as a precious economic opportunity to make a living after struggling in the California foothills panning for gold.

Jackson's method of landscape analysis included historical research, observations of behavior, photographs, and conversations. He emphasized using generic activities for landscape analysis, such as production and consumption. In Jackson's and Groth's terms, the cultural landscape analysis for the salt ponds could illustrate how people intervene with nature through production to make a living and how the landscape may be valued as an object both of beauty and of sustainable exploitation. Jackson's and Groth's ideas on the cultural landscape provide an excellent foundation to this argument because they both pointed out that humans interact with and are very much a part of the environment and the natural world, and it is possible to observe these interactions by studying the landscape.

This thesis builds on their ideas to illustrate how a cultural and environmental resource analysis of human mediations with the landscape can result in a comprehensive approach to public land management in the case study of the SBSRP.

Archaeology

The concept of cultural landscape as a study tool for analysis was adopted by archaeologists in the 1970s and 1980s. In *Archaeologies of Landscape*, archaeologists Ashmore

and Knapp (1999) wrote that space is a determinant and expression of culture—the backdrop against which archaeological remains are plotted. They cited Tilley (1994), who said that landscape is not just natural but also a structured landscape (4). Landscape is something that “not only shapes but is shaped by human experience” (Ashmore and Knapp:4). This view is an extension of agency theory (Foucault 1980) and Giddens 1984) to landscape analysis.

Tilley also wrote that space is a medium for action. He considered space as it is shaped by history, politics, and individual action as distinguished from environmental determinism. He also thought that space in a capitalist society is regarded as a commodity to be exploited (cited in Ashmore and Knapp 1999:20). The history of salt production in Chapter III is illustrative of how human activity (human agency) has shaped the landscape, and it can also serve as evidence of how a capitalist society has viewed the landscape and its resources as commodities for economic production.

Ashmore and Knapp highlight archaeologist, Carole Crumley’s, definition of landscape:

Landscape is thus the entire surface over which people moved and within which they congregated. That surface was given meaning as people acted upon the world within the context of the various demands and obligations which acted upon them. Such actions took place within a certain time and at certain locales. Thus landscape, its form constructed from natural and artificial features, became a culturally meaningful resource through its routine occupancy (1999:7).

As described in Chapter II, the history of salt production can be traced from the Native American practices to the substantial industrial complex fully developed by 1940.

Ashmore and Knapp (1999) described three types of landscapes: formally constructed (parks, gardens); conceptualized (socio-economic initiatives); and ideational (ritual/sacred promontories). They explained that using a landscape perspective, inter-relationships among people and the evidence of places and features in space and time can be revealed and greater understanding is gained about humans and their mediations with the land. Landscape studies should identify the features of a particular landscape, e.g., field systems, farms, industrial sites, and roads. In addition, they observed that the three types of landscape represent inhabited space reflecting certain themes: (1) Landscape maps memory (a mnemonic index); (2) landscape declares identity; (3) landscape has a role in the social ordering of human relations; (4) landscape represents transformation and individuals make differing demands on the world (13-19).

Using the Ashmore-Knapp frame of reference for landscape analysis, the South Bay salt pond landscape is compatible with the definitions of both the constructed as well as the conceptualized landscape. The salt pond landscape contains both natural features, such as salt pannes (areas of standing water), tidal marsh, sloughs, deep water channels, natural levees, open water, and landings as well as constructed features, such as levees and ponds, duck blinds, drawbridges, railroad track, physical remains of salt works equipment (Archimedes screws, pilings, pump houses, wash plants, and other materials, such as brick and pottery), and refinery and wash plant buildings. The landscape reflects the integration of these physical features into an organic whole and the unique social and economic imprint of salt production.

Contributions to cultural landscape theory also came from authors who have combined the academic disciplines of archaeology and history, e.g. historical archaeologists, Dell Upton, Susan Lawrence, Donald Hardesty and Barbara Little. In 1988, Dell Upton began to investigate how meaning could be found in historic designed landscapes, and he researched the question of how to know social relationships through a landscape analysis. In his study of the Mt. Airy plantation, Upton asked: “How can we describe the living, experiential encounters between people and the landscape they create?” (1986:369). He emphasized relying on traditional research in print and archival sources for landscape study to get at both the seen on the landscape, such as buildings and physical structures, as well as the unseen, such as historical information about social and political events and activities (1997).

Susan Lawrence (2000), a historical archaeologist, in her study of Dolly’s Creek, investigated the archaeology of mining and the history of technological processes and how social relationships are structured around industrialization in the landscape.

Donald Hardesty studied how the evolution of technological change is arranged on the landscape and how change occurring over time can be studied and interpreted. For this study on the salt pond landscape, the shift from water transportation to railroads and roads can be studied by observing the physical remnants of structures and their land use connectivity such as the warehousing in Redwood City which is located adjacent to a barge landing. Hardesty wrote that information about the archaeology of landscape comes from middle range theory which emphasizes using the next highest level of information to describe an archaeological or historic property. Hardesty wrote further that:

Middle range theory focuses upon the processes of human behavior that have a material manifestation and the

transformational processes that affect such material traces.

The result is an interpretation of human activities and natural processes responsible for the formation of an archaeological property (Hardesty 1997:1).

History (Economic, Industrial)

In *Colony and Empire: The Capitalist Transformation of the American West*, Robbins explained historical change by studying the material world of economics and the economic relationships among people in the nineteenth century American West. Robbins' focus on the landscape of the American West presents another perspective on what a cultural landscape may reveal. He writes that the American West landscape is the study of capitalism, a system of social relations expressed in class structures, power relations, and authority. He points out that it was a new mode of transportation, the railroad, that "redirected the demographic makeup of the West" (Robbins 1994:171). The long-range effect of the advent of the railroad was to centralize population and institutions and create an "urban-based capitalist network" (1994:171). Robbins' sees the west as a distinct region of a larger national "aggregate of political, economic and cultural events" (1994:171) and economic development and social relations are reflected in its landscape.

In applying the Robbins' model to an analysis of the salt pond landscape and the broader San Francisco Bay setting, San Francisco Bay can be considered a unique region but also reflective of national political, economic and cultural movement.

Since the early twentieth century in the San Francisco Bay Area, the salt production industry has been increasingly capitalized resulting in new methods of mechanization and technologies and consolidation under one owner. This process was driven by the need to achieve greater production efficiency necessary to meet the demand for salt in the

production of chemicals and other products for an expanding industrialized global economy. The Bay region's industrial transformation occurred concurrently with the national trajectory of the Industrial Revolution. Robbins' ideas fit well into a discussion of the salt pond landscape as it can be viewed as a prototype landscape representing new means of production as reflected through mechanization, new technologies, and the use of chemicals.

Moreover, the salt industry in the Bay owed its existence not only to its natural advantage but to the new mode of transportation, the railroad, which when combined with the financial investments in mining and the other "capitalizing" activities, produced an extensive urban-based, capitalist-trading network.

In *Rivers of Empire*, Donald Worster believes that to understand the history of the West, one must walk along any of its landscapes, such as an irrigation ditch. Worster recounted the story of the West as the story of "people encountering difficult environments and striving to overcome them by technological means of creating the necessary social organization to do so..." (1985:11). For him, the technological control of water became the basis for the new West as a "modern hydraulic society" controlled by agromanagerial experts (7). Worster cites Karl Wittfogel as his historical reference for the hydraulic society concept and which influenced Worster's focus on the study of culture and ecology. Wittfogel studied the relationship between irrigation ecology and social power in ancient societies and thought that "human domination derives from the incessant modern drive to remake nature" (53). Wittfogel thought that societies who controlled the production and delivery of water were typically the ruling class—a techno-bureaucracy. Using the Wittfogel-Worster perspective, an analysis of the salt pond landscape could characterize the history of salt production as the seizing of the Bay's waters to control the means of mining production. The pioneer salt miners and the successive generation of business owners who expanded and intensified salt

production became the agromanagerial experts and the technocrats and hence the ruling class in the south Bay's society and economy.

Cultural Landscape Approach in UNESCO

Following the academic theory and literature review, the next question to be answered for this study in the development of a cultural landscape analysis for the SBSPP is whether anyone had developed a specific protocol based on the landscape as a unifying theme in a resource management plan. Answering this question involved acquiring more knowledge about approaches or frameworks that have been used in other studies and resource management plans. Therefore, an investigation was conducted to identify a model approach. The research involved a review of cultural landscape studies and resource management plans for international and national and state parks, wildlife refuges, and other types of public protected areas such as endangered species preserves, archaeological, World Heritage, and eco-tourism sites. The review revealed the substantial work being done and the progress achieved, however slowly, stitching together cultural and natural resources for designating preserved areas and creating heritage tourism and public interpretation programs. Also, information was discovered about how, through the integration of cultural and natural resources, more effective preservation and management of currently designated sites was being achieved, both in the United States and abroad.

Birth of the Heritage Movement

On the international scale, the beginnings of the cultural landscape movement and the emerging integration between cultural and natural resources and values can be traced to the World Heritage community movement. This term is shorthand for the entire United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage structure, which includes the World Heritage Convention, its implementing Heritage

Committee, the World Heritage Centre, and its three advisory bodies, the World Conservation Union (IUCN) for natural properties (Switzerland), the International Council for Monuments and Sites (ICOMOS) for cultural properties (Paris), and the International Center for the Study of Preservation and Restoration of Cultural Property (ICCROM) in Rome.

In 1972, the General Conference of UNESCO adopted the Convention Concerning the Protection of the World Cultural and Natural Heritage, i.e., The World Heritage Convention. Its mission is to advance the conservation and protection of cultural heritage properties of “outstanding universal value” (1972:2). UNESCO was the first entity on the international level to recognize, through its name, the association between culture and nature. However, it took several years before a full implementation of a firmly established and meaningful link between culture and nature within the World Heritage structure was realized.

The Convention defines “cultural heritage” as “monuments, groups of buildings and sites”; “natural heritage” is defined as natural features consisting of physical, biological, and geological formations and areas that represent the habitat of threatened species of animals and plants as well as natural areas that have “outstanding universal value from the point view of science or conservation” (2).

The World Heritage Committee is the main entity organized to implement the Convention. The Committee developed criteria for the registration of properties on the World Heritage List, which would enable those properties to be eligible for international assistance under the World Heritage Fund. The criteria are included in a document entitled “Operational Guidelines for the Implementation of the World Heritage Convention.” The Convention has become an important legal tool in heritage conservation around the world.

Since 1972, 788 properties from 128 countries have been deemed of universal value and are listed as World Heritage sites. (In 1973, the first registered site was the Galapagos Islands, based on their natural values.) There are 20 World Heritage designated sites in the U.S.—twelve natural sites, e.g., Yellowstone, Yosemite, Everglades, and eight cultural sites, e.g., Pueblo de Taos, Chaco Canyon, Cahokia Mounds, Statue of Liberty. Of the 788 properties, 611 are identified for their cultural values and 154 for their natural properties. There are 23 “mixed” sites that fall under both natural and cultural categories and are considered “combined works of nature and man.” According to Mechtild Rossler of the World Heritage Centre, the low number of mixed sites “may be due “to the different approaches of the advisory bodies IUCN and ICOMOS in evaluating these properties”(US/ICOMOS 2004:6).

New operational guidelines took effect on March 1, 2004, wherein the cultural and natural heritage criteria were merged; this shift is likely to result in more mixed site registrations in the future (O’Donnell 2004:6). The new guidelines reflect the growing use of the word “heritage” as well as a major shift from considering only the built environment to considering both the built and natural environments. There is also an increasing coincidence of natural values, such as wildlife biodiversity and habitat functions within the World Heritage Cultural Landscapes, and this has become a new paradigm in the drive to further conserve protected areas (Phillips 2004:8).

In 1992, a milestone event occurred. After ten years of debate, the World Heritage Committee adopted a new category of “living cultural places,” including natural sacred sites and cultural landscapes, into the Operational Guidelines as eligible for the World Heritage List of landscapes of universal value. The trajectory of this movement drives recognition away from consideration of only nature and monument sites to entire landscapes indicating that cultural landscapes integrated with ecological values are significant. Concurrently, the

Committee established a definition and criteria for defining cultural landscapes as follows (NB: the number following each criterion indicates the number of landscapes currently listed under those criteria) (UNESCO 2004:72):

- A “landscape designed and created intentionally by man” (8);
- An “organically evolved landscape,” one that “has developed its present form by association with and response to its natural environment,” with two subcategories: a relic (or fossil landscape), one in which “an evolutionary process came to an end at some time in the past...” (3), and a continuing landscape, one that retains an active social role in contemporary society closely associated with the traditional way of life...”(22)
- An “associative cultural landscape” derived from its “powerful religious, artistic or cultural associations of the natural element rather than material cultural evidence, which may be insignificant or even absent” (7)

In all likelihood, all three of these definitions could be applied to the salt pond landscape in South San Francisco Bay.

The eligibility criteria for cultural landscape registration on the World Heritage List are based on a landscape’s degree of functionality and intelligibility. For example, some of the landscape categories for registration are historic towns, town centers, and heritage canals. The level of functionality and intelligibility means that a landscape’s meaning, its cultural and natural value and interpretation of such, can be derived from what can be known and identified about culture and nature based on an analysis of the landscape today. By applying the World Heritage criteria of functionality and intelligibility to the salt pond landscape, it may be possible to establish the salt pond landscape’s significance as long as certain salt

pond functions are maintained for both production of salt and wildlife habitat. This is discussed further in Chapter V.

The World Heritage Centre then proceeded in cooperation with ICCROM and IUCN to write management guidelines for cultural landscapes. ICCROM already had begun adding a new emphasis on cultural landscapes to its Heritage Settlements Program. Based on the registration of 36 cultural landscapes onto the World Heritage List between 1993 and 2003, what has emerged is a strong relationship between cultural and natural features in these landscapes, and a more definitive merging of heritage values (US/ICOMOS 2004). For example, four of Australia's World Heritage Areas (Kakadu, Uluru, Willandra Lakes, and the Tasmanian Wilderness) are registered as "mixed sites" based on their indigenous cultural World Heritage values in addition to their natural values. What's more, Tongarira National Park in New Zealand was the first cultural landscape to be registered on the World Heritage List in 1993 for a non-built or intangible cultural value following the adoption of the new guidelines. The Tongarira National Park listing acknowledged and identified the Maori peoples' cultural and religious significance and the spiritual linkage between the Maori and its natural environment.

7th US/ICOMOS International Symposium

To focus attention on the movement towards the melding cultural and natural values and the inclusion of cultural landscapes on the World Heritage list, the Scientific Committee of the 7th US/ICOMOS International Symposium assembled in Natchitoches, LA, in March 2004 to discuss a variety of items under the title "Learning From World Heritage: Lessons in International Preservation and Stewardship of Cultural and Ecological Landscapes of Global Significance." More than 100 professionals from 12 nations gathered

to discuss the interface of nature and culture in the landscape and the opportunities for a multi-disciplinary approach to preservation, conservation, and management.

In a summary report, O'Donnell pointed out that the theme throughout the symposium was the "recognition of mixed values and the management of both." In her definition, "valued cultural landscapes are places where nature and culture have interacted to shape a place over time; the results of the interaction have imbued heritage values, and the cultural landscape is worthy of our respect and stewardship to preserve and conserve it into the future" (2004:1). The landmark Natchitoches Declaration on Heritage Landscapes was adopted at the symposium's conclusion. It stated:

There is a convergence of natural and cultural values in the landscape, and a growing recognition that the traditional separation of nature and culture is a hindrance to protection and is no longer sustainable. Further heritage landscape protection is required at the local, national and global levels in order to transmit these universally valuable heritage landscapes to future generations. (O'Donnell 2004:2).

The term *heritage landscapes* was used in this 2004 declaration to describe the combined natural and cultural resources inherent in the landscape, recognizing that either or both may be of outstanding universal value. The declaration, addressed to national and local authorities as well as institutions and international organizations, but especially to ICOMOS and its partners, IUCN and ICCROM, urged these entities to "press forward a series of initiatives around the protection of heritage landscapes using a more holistic approach, interdisciplinary collaboration, response to threats, community engagement, and national and international cooperation" (O'Donnell 2004:2). The declaration emphasized the importance

of the “multiple values in heritage landscapes and the multiple voices to be included in their protection and management” (O’Donnell 2004:2).

The papers from the 7th Symposium trace the developments in linking culture and nature since 1992. Dr. Rossler (2004) noted the importance of adding agricultural landscapes to the World Heritage List. He noted, “The recent publications of the Ferrara meeting (UNESCO 2003b) and the study by Fowler (2003) show the importance of agricultural landscapes for the survival of humankind. The Globally Important Agricultural Heritage Systems (GIAHS) project focuses on outstanding agricultural systems and case studies including World Heritage cultural landscapes, such as Cinque Terra in Italy” (Rossler 2004:4). Rossler also noted:

World Heritage cultural landscapes and sacred properties can be models for effective landscape management, excellence in conservation practices and innovation in legislative protection. They are places where we can learn about the relation between people, nature and ecosystems and how this shapes culture, identity and enriches cultural, and in some cases, biological diversity. (2004:9)

On the 30th anniversary of the World Heritage Convention in Ferrara, Italy, in November 2002, Rossler commented:

Cultural landscape management and conservation processes bring people together in caring for their collective identity and heritage, and provide a shared local vision within a global context. Local communities need therefore to be involved in every aspect of identification, planning and management of the areas, as they are the most effective guardians of the landscape heritage. The outstanding landscapes are selected examples,

which could offer stewardship, models in effective management and excellence in conservation practices (Rossler 2004:10).

Phillips observed that while gains have been made with the inclusion of cultural landscapes on the World Heritage List, more sites could be added and the entire system could be strengthened if the IUCN adopted a different approach to the protection of natural areas. He noted the shortcomings of the strictly natural values approach because it is in fact based on the strict protection of most natural areas. This approach overlooks the fact that natural areas have been modified by people over long periods of time. He commented that “nature conservation has to be concerned with the lived-in landscape because it cannot be achieved sustainably within ‘islands’ of strict protection surrounded by areas of environmental neglect”(2004:15). These same shortcomings noted by Phillips may be applicable to the SBSPRP given the landscape’s geographic location in the heart of a major urbanized region and the current focus of the restoration planning, which is giving relatively minor attention to the cultural “lived-in” values of the landscape.

Phillips conducted four case studies in 2002, three of which are pertinent here, that looked at the natural and cultural characteristics of four registered World Heritage Cultural Landscapes to find additional support for his position advocating the significance of the humanized, lived-in landscape as worthy of protection under a mixed “heritage landscape” site (2004:14):

- 1) The Philippines Rice Terraces, registered in 1995, was the first site to be listed under the “continually organically evolved category.” According to Phillips, these terraces are considered the most inspiring human-shaped landscapes in the world and provide an

example illustrating the sustainable use of natural resources and how a protected area should be extended beyond natural and near-natural areas to include lived-in, working landscapes.

2) Ferto/Neusiedlersee (Austrian-Hungarian) Cultural Landscape: This landscape was identified as an important wetland under The Ramsar Convention on Wetlands. (The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty that is a framework for international cooperation for wetlands conservation.) It was evaluated for both cultural and natural values, but it was only inscribed as a cultural landscape and was seemingly ignored for its wetland designation.

3) Pico Island Vineyard Culture, Azores, Portugal: This landscape represents the achievement of farming in barren, lava areas and the struggle between people and their environment. Natural values were considered too minor for listing this landscape as a World Heritage site.

Phillips' case studies contain themes that are applicable to a cultural landscape analysis for the SBSPP. Of particular interest are the Philippines Rice Terraces. The emphasis on Filipinos as pioneers in land reclamation could become an aspect of a public interpretive cultural heritage exhibit describing the social and labor history of people working the salt ponds. Filipinos immigrated to the U.S. in the early 20th century and became the early laborers providing the necessary talent and skills in salt production. The Portuguese landscape that illustrates the achievement of farmers in a barren land is also applicable as the historical archives of the early days of salt production describe the struggles of the pioneer salt farmers and their difficulties with land reclamation and frequent levee failures.

One of the problems in developing a more meaningful paradigm linking culture and nature within the World Heritage Convention is the definition of "integrity" as a criterion for evaluating a potential listing of a landscape on the World Heritage List. The IUCN

policies define integrity as that aspect of a cultural landscape that exhibits retention of its “essential qualities”—a kind of status quo. However, in IUCN terms, a lived-in, or human-altered landscape may not exhibit integrity and therefore may not be worthy of listing and protection on the World Heritage List. This interpretation of integrity has excluded some sites from heritage listing. Phillips proposed an expanded definition of integrity that would recognize that, as Phillips stated, it is the “integrity of the relationship with nature that matters, rather than the integrity of nature itself” (2004:19). The idea of the cultural integrity of the human-nature relationship within the landscape rather than integrity meaning nature in status quo will be important in the consideration of establishing the cultural significance of the salt pond landscape. While the salt pond landscape is not lived in per se but rather lived around, the SBSPRP will need to determine whether there is sufficient industrial and ecological information reflected on the landscape to tell the story of the relational significance to the historical development of the Bay. This will be further explored in Chapter V.

The US/ICOMOS symposium presented additional case studies that are relevant to developing a cultural landscape analysis for the SBSPRP:

1) *The Pilgrim Paths, Ireland*. The Pilgrim Paths’ project was initiated by the Heritage Council of Ireland in 1997. It is an example of the Council’s approach to heritage conservation as described in the Council’s enabling legislation, the Heritage Act of 1995. The Act defined Ireland’s national heritage as including both cultural and natural resources as follows: monuments, archaeological objects, heritage objects, architectural heritage, flora, fauna, wildlife habitats, landscapes, seascapes, wrecks, geology, heritage gardens and parks, and inland waterways (O’Caoimh 2004). Also the Heritage Act featured landscape as a method of providing a context for an integrated approach linking culture and nature, and the

Council's projects, such as the Pilgrim Paths' project, provide valuable ideas for application to the salt pond landscape (O'Caoimh 2004).

The objective of the Pilgrim Paths' Project was to develop and secure support for a network of walking routes along medieval pilgrim paths in local communities. The aim was also to raise awareness of the natural and built heritage along these routes, while contributing to community development and sustainable tourism in the areas through which the route passed. The study for the project began with an analysis of direct heritage impacts, such as the socio-economic benefits derived from the natural and built heritage. This was to be assessed by the local communities and agencies in the areas of the heritage routes. The study then identified sites of heritage interest and the ones best suited for promotion along the route along with a program for monitoring and reporting on the sites' conditions through a set of indicators. The survey team included persons with both cultural and natural resource interest areas, e.g., a geologist, an architectural historian, an archaeologist, an ecologist, and a community development/rural tourism specialist.

To inspire a sense of local ownership in the project, the Heritage Council established a development committee and encouraged participation of the local communities and local heritage specialists in the study. The development committee included representatives from several local interest groups: economic development organizations, walking and cyclist groups, youth organizations and schools, tourism organizations, county sports partnerships, regional tourism offices, vocational education committees, and groups such as the Irish Farmers Association, the Irish Creamery Milk Suppliers Association, the local authority heritage officer, the Heritage Service of the Dept. of the Environment, local government, the Regional Archaeological Service, and local wildlife rangers (O'Caoimh 2004).

The Pilgrim Paths' Project serves as a model to the SBSPRP in the following ways: First, the landscape is a unifying theme. Second, the Project relies on the integration of both culture and nature to achieve its heritage conservation mission. Third, the Project relies on a team approach to identifying heritage sites and values involving a broad array of disciplines and the local community. The Pilgrim Paths' project could be replicated as a heritage tourism program in the SBSPRP. A network of walking routes could be designed within the San Francisco Bay Trail system which would follow the historical itinerary of salt production and the industry's co-evolution with the South Bay's transportation history from the sloughs, landings, roads, ports, and terminals. Cultural heritage markers would benchmark events along these routes. Additional discussion on heritage tourism concepts appears in the latter part of this chapter and also in Chapter III.

2) *Traditional Agriculture: The Japanese Farmer as Gardener.* Japanese building traditions, similar to salt-making, are based on the local climate, materials, equipment, and traditions. Humstone noted that the significant features of the Japanese cultural landscape include rice storage buildings, storehouses for household goods, barns and other farm outbuildings, irrigation canals, rural shrines, stone markers, and ponds built to heat water from the mountains for irrigating rice fields. While preservation districts in Japan have traditionally included shrines, recently a new direction is taking place to designate rice terraces as "Places of Scenic Beauty." This has led to increased discussion in Japan about how to protect notable agricultural landscapes (Humstone 2004).

Cultural Landscape Approach in the United States

The previous discussion on the World Heritage structure and 7th US/ICOMOS symposium presented some valuable information for use in developing a resource management plan linking culture and nature for the SBSPRP. The balance of this chapter is

devoted to the results of the literature review of resource management plans and landscape studies in the United States.

National Historic Preservation Act (NHPA) 1966

Enabled by the passage of the NHPA in 1966 and the adoption of implementing regulations in 36 CFR Part 800, the federal government through the Secretary of the Interior and the National Park Service (NPS) provides the primary legal framework for the recognition and preservation of historic properties (historic and cultural resources) within federally designated parklands. Companion legislation passed in 1970, the National Environmental Policy Act (NEPA), and in 1972, the Endangered Species Act (ESA), provides comparable vehicles for the protection of environmental or natural resources including endangered fish and wildlife. The NHPA contains guidelines on evaluating resources for significance and eligibility for listing on the National Register of Historic Places (NRHP).

However, similar to the World Heritage Convention, the link between culture and nature for resource management was not fully realized until the birth of the heritage movement in the U. S. in the 1980s. Much progress has been made in the last 26 years with the writing of cultural landscape reports submitted for NRHP eligibility determination and resource management plans for national parks. However, specific obstacles to effectively link cultural and natural resources through the application of these three laws continue to arise. This will be discussed in subsequent chapters.

The NHPA's initial emphasis was the protection of historic buildings, and a National Historic Register of Places was established for this purpose. Guidelines for determining eligibility for listing of historic buildings were developed in 1976. In 1992, the NHRP standards were revised to include all historic resource types: buildings, structures, sites,

objects, districts—and landscapes. Cultural landscape was defined as a “geographic area (including both cultural and natural resources, and the wildlife or domestic animals therein) associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values” (Birnbaum and Peters 1996:4). Two National Register publications, *Bulletin 15, How to Apply the National Register Criteria for Evaluation, (NRB 15)* and *Bulletin 30, Guidelines for Evaluation and Documentation of Rural Historic Landscapes, (NRB 30)* are useful as background references for applying cultural landscape analysis to the SPSRP.

Under the federal guidelines, there are four types of landscapes: historic sites, historic designed landscapes, historic vernacular landscapes, and ethnographic landscapes. A vernacular landscape is a landscape that evolved through use by the people whose activities shaped that landscape; hence, function plays a significant role in vernacular landscapes (NRB 15). The salt pond landscape could likely be classified as a vernacular landscape.

Another useful reference document is the *Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* (Birnbaum and Peters 1996). There are four recommended treatments for landscapes: preservation, rehabilitation, restoration, and reconstruction. The NPS guidelines recommend several approaches for the selection of a treatment or management strategy for cultural landscapes. A strong emphasis is placed on conducting thorough research and an inventory to establish a documentary record of the landscape as it exists at the present time. The inventory provides a baseline from which to conduct further analysis leading to an assessment of the value and significance of the landscape. The assessment, which is a process to establish a continuum through history, involves an analysis of the landscape’s resources as documented in the inventory and the change over time. For example, in the salt pond landscape, the Archimedes screw wind pump is a mechanical device that was used to move water from

pond to pond in early salt farming; today, a very different kind of machinery is used to move water from pond to pond. The device can be considered an historic resource represented on the landscape today and analyzing its use and change over the last 150 years, along with other landscape features, would be a typical task in the cultural landscape analysis. Further information on the use of the inventory is discussed in Chapter IV.

The guidelines specify the additional information that is needed in order for a landscape to be considered significant. Features that reflect the landscape's character and their historical importance must not only be present, but they also must possess historic integrity. The location, setting, design, materials, workmanship, feeling, and association are aspects of a landscape and its character-defining features that must be considered in determining whether the historic integrity standard is met (NRB 15:2).

National Heritage Areas

In the U. S., there are 24 national heritage areas and corridors designated by the U. S. Congress and managed by the National Park Service. In addition to the federal government, the states of Maryland, New York, Pennsylvania, and Utah have heritage area programs.

The first national heritage initiative, the Illinois and Michigan Canal National Heritage Corridor, was designated in 1984. The 97-mile canal corridor connected Lake Michigan to the Illinois River and to the Mississippi through a heavily used Indian portage. Interestingly, this area is not managed by the NPS, but by a federal commission that includes local citizens. This particular variation on public land management is pertinent to the future management of the salt pond landscape. As mentioned previously, the addition of local residents to the landscape management structure would potentially build a stronger sense of ownership and stewardship of the cultural and natural resources under the public-private, federal-local land management format.

There is increased interest and pressure to ensure the economic value and long-term success of heritage areas. The NPS is developing data collection methods to quantify the physical, social, and economic characteristics of existing heritage areas. Several categories of information have been developed for its inventory process, e.g., social, economic, and resource characteristics of the region; overlapping designations, programs, and employees; the heritage area-sponsored education and grants programs; measures to evaluate the economic leveraging impact of NPS appropriations; and tools to measure the regional economic impact of heritage tourism.

To date, the National Heritage Area program has not embarked on identifying environmental or ecological values associated with these heritage areas, which could be a next step. A National Heritage Area initiative should be considered for the salt pond landscape.

In 1988, the NPS formed the Conservation Study Institute as a forum to help it and its partner agencies become more effective and creative, through new tools and strategies, in improving park management. According to the Institute's website, its vision of conservation is inclusive and interdisciplinary; it encompasses natural and cultural heritage to define a sense of place, and it emphasizes the role of people in stewardship. The Institute is located specifically at the Marsh-Billings-Rockefeller National Historical Park in Woodstock, Vermont. The NPS thought that this park reflected the history of conservation and the story of evolving land stewardship in the U.S. The Institute has an extensive program of conferences and lectures dedicated to promoting the protection of landscapes emphasizing the co-management of natural and cultural values both in the U. S. around the world. The Institute is another good source of information and guidance for the SBSRP's RMP

because of its program emphasis on heritage landscapes and the role of citizens in landscape stewardship.

One of its first national symposia, held in November 2001, was entitled “Speaking of the Future: A Dialogue on Conservation.” The key themes emphasized conservation as a core value for national park management as well as other values such as community participation in park management. Again, a major conclusion of the participants was that community-based conservation with citizen participation and the formation of land management partnerships was also very important.

Although the symposium topic was focused on the conservation of natural areas and how to achieve that goal, the outcome of the symposium was to recognize the integrated relationship between humans and the land and building a local stewardship tradition based on that relationship is essential to successful conservation. “Stories that speak to the connections between humans and nature can be instrumental in developing a sense of place and a personal connection to the land” (Conservation Study Institute:28). “Today there is recognition of cultural and working landscapes. Conservation has been placed in the broader context of overall community needs, rather than being held in isolation from the community. We have begun embedding community within the landscape, rather than thinking about humans and nature as separate entities...”(28). This conversation is reminiscent of the theories of J.B. Jackson, who emphasized that landscape evaluations should consider the relationship and interaction between the humans and the land and that humans are not separate from but integral to the shaping of the landscape in their everyday lives.

The Superintendent of the Marsh-Billings-Rockefeller National Historical Park, Rolf Diamant, best describes the new philosophy of the National Park Service in his paper, “From Management to Stewardship: The Making and Remaking of the U. S. National Park

System (Diamant 2000). Diamant points out how several recent park management plans represent good models for protecting and managing working landscapes and provide for the integrated management of both cultural and natural resources in their park lands.

One of the most remarkable examples of a park management plan that stitches together culture and nature in a resource management plan, the principles of which are very adaptable to the SBSRP, is Ebey's Landing National Historic Reserve in the state of Washington. Ebey's Landing, on Whidbey Island north of Seattle, is a 17,500-acre reserve that was promoted as a new kind of national park when it was created by Congress in 1978. Its mission was to document and preserve a rural community that demonstrates a mostly unchanging historical record beginning with nineteenth-century exploration and settlement in Puget Sound to today. The Reserve is a cooperative effort among the National Park Service, Washington State Parks and Recreation Commission, Island County, and the Town of Coupeville.

The local area partnership, a mixture of federal, state, county, and private property owners, began in 1988 with the establishment of a Trust Board (more commonly known as a Board of Trustees). Trust Board members represent each of the above partner organizations and their respective jurisdictions over recreation, historic preservation, and open space. The partnership is a model of cooperative management for the Reserve's cultural and natural resources. Under the management plan, the goal is to manage the Reserve in a way that preserves its historic essence. The Board may approve changes in the Reserve's cultural landscape but approves only those changes that are respectful of the past and consistent with the Plan.

The cultural landscape methodology developed by the NPS and its state and local partners included a vision statement as its defining constitution. The Ebey NPS team

conducted an extensive cultural landscape analysis that included the following steps:
(Comprehensive Plan: Ebey's Landing National Historical Reserve NPS 1980).

Step I. Conducted a study of the patterns of settlement, types of land use, and the structures that reflect human use and adaptation to the natural environment at Ebey over time. The settlement studies identified five general historic periods. These "eras" are general and overlap, but this organization provides a framework for understanding the human impacts, artifacts, and historic remnants on the landscape that can be seen today.

Step II: Evaluated the natural and cultural resources of the area that influenced and were affected by these settlement patterns. The evaluation included both the natural and human-built landscape(s). The process of classifying natural features involved identifying the individual elements and resources that taken together created the entire landscape. Natural features, such as landforms, soil types, and vegetation, form the physical parameters within which the built landscape develops. The study team characterized the evolution of landforms, such as soils, vegetation, forest vegetation, salt marsh, and beach vegetation as well as below-ground structures that are represented as archaeological sites.

Step III: Wrote a "reading techniques" orientation manual and workbook section that illustrates techniques for reading the relationships among individual features, patterns, or qualities that comprise the entire landscape.

Step IV: Recommended preservation principles for the protection of the Reserve's historically significant landscape elements, both built and natural. The preservation principles are based on the information culled from the historic settlement patterns, land uses, and resulting structures, and also the natural and cultural resources and the landscape relationships among them.

The Reserve is considered a single landscape; however, within it are ten distinct land units or character areas. For each of the ten land units, an evaluation of the landscape resources includes:

1. A description, including location and boundaries, general character, and primary access.
2. A statement summarizing the historic patterns and significant elements that remain and contribute to an overall landscape integrity.
3. A set of principles to guide preservation of significant historic landscape patterns, features, and structures (Land Protection Plan: Ebey's Landing National Historical Reserve NPS 1984).

There are five distinct character areas that comprise the natural landscape: Coastal Strip, Woodlands, Uplands, Prairies, and Penn Cove. Overlaying each of these natural character areas are land features that reflect human activity on the land. When the natural and physical character-defining features are combined together they form a cohesive character area representing a history of humans interacting with the land, e.g.—old fence lines, hedgerows, orchards, field patterns, weathered barns and Victorian farmhouses (NPS 1980).

The methodology for Ebey's cultural landscape analysis is useful as a template in the development of the SBSRP's RMP in some of these general areas: 1) The Reserve size of 17,000 acres is comparable to the salt pond landscape of 15,100 acres; 2) The Reserve's Trust Board is a partnership of federal, state, local, and private landowners; and this structure could be replicated on the salt pond landscape governance structure incorporating federal, state, local, and private landowners; 3) The concept of dividing the 17,000-acre Reserve into 10 distinct cultural districts may have application to the salt pond landscape as

there are currently three pond complexes or zones outlined in the SBSPRP's boundaries with several local communities and cultural and natural features distinct to each local area within each zone; 4) The landscape "reading technique" workbook and the "preservation principles" represent innovative ideas adaptable to the SBSPRP's RMP.

NHPA, NRHP and NPS Issues

Christina MacDonald in her thesis, "F is Not for Forgotten F Ranch, A Chronology of a California Landscape"(2004) discusses the difficulties that have arisen in attempting to fit the cultural landscape concept, which embodies both cultural and natural objects and values, under the NHPA registration framework. As noted previously, the NHPA enacted in 1966 is the primary national legislative framework governing the designation of historic landmarks and any additions to those, including cultural landscapes to the National Register of Historic Places. The NHRP's primary focus is the built environment and the preservation of physical objects in the landscape; it is much less concerned with the natural environment as reflected in a vernacular landscape like the salt pond landscape, containing natural features such as singular and distinctive land forms, plants, and animals.

MacDonald also points out that a treatment technique under the Secretary's Standards such as ecological restoration "can be thought to diminish integrity if this requires the removal of character-defining features"(2004:50). This issue could pose a problem for NRHP eligibility determination of the significant cultural and historic properties in the salt pond landscape because the basic purpose of the SPSPRP is environmental restoration; therefore, the SBSPRP could be interpreted as destructive of the landscape's integrity under the conventional legislative definition.

Goetcheus (2002) also described the integrity problem when she commented that the National Register nominations usually contain a thorough documentation of the "building"

but rarely a comprehensive description of the relationship of that building to its site, its landscape context, or any unique details of a designed or vernacular landscape. She noted that this traditional description in a National Register nomination only tells part of the story (2002:23).

The NPS has tried to address the problem by producing guidance in the form of bulletins related to cultural landscapes identification and management and, according to Goetcheus, proposes to greatly improve the consideration of the cultural landscape as a comprehensive historic representation of both cultural and natural features and forms in the NHRP nomination process and also within the national park system.

In addition, the NPS has launched three other programs: the Historic Landscape Initiative, the National Center for Preservation Technology and Training, and the Park Cultural Landscapes Program. This last program has published a *Cultural Landscape Inventory* (CLI), an inventory of all cultural landscapes that have historical significance in each of the 386 units of the national-park system. It is presently being used to determine eligibility of landscapes within the national parks.

MacDonald noted that there continues to be a disconnect between categories of properties. The NPS cultural resource management guidelines and cultural landscape descriptions of the four types of landscapes are NPS policy only: historic sites, vernacular landscapes, for example, but the NHPA defines properties as “districts, sites, buildings, structures and objects.” (National Register Bulletin 15:4). The NPS recognizes the four landscape descriptions but still only officially lists landscapes as either “districts” or “site[s].” More work is needed to bring law, policy, and practice into evaluating cultural landscapes for National Register listing (MacDonald 2004).

The preceding discussion of the NHPA and the National Park Service programs, including the Conservation Study Institute, provides a strong foundation of themes and issues for consideration in developing a resource management plan linking culture and nature for the salt pond landscape.

Additional information was discovered in academic journals presenting theories and additional perspectives on the use of cultural landscape analysis in resource management that is useful for application to a salt pond cultural landscape analysis. Toupal, (2003) in her article “Cultural Landscapes as a Methodology for Understanding Resource Management Impacts in the Western United States”, challenged the attitude that nature is what is untouched by people and that preservation of nature requires protection from people. She pointed out that many environments that are thought to be “natural” are often products of traditional cultural uses and practices (1). In her research on natural resource use and the role of people in landscape, she discovered that resource inventories and consultations were mostly based on material culture such as artifacts, sites, special features, and crafts. She interviewed people from Native American communities and learned that the people were equally concerned about important natural resources including plants, animals, minerals, landforms, water, and air. The result of her work was a place-specific form (a landscape assessment), which can be used to record site use and history and types of resources from an ethnographic perspective. The form has been used in Zion National Park and Pipe Spring National Monument and involved tribes in those park regions. Toupal pointed out that when traditional human-nature relationships are acknowledged as contributors to healthy ecosystems, doors are opened to co-management and partnerships that achieve protection of both natural and social elements (Toupal 2003).

Toupal's study is helpful to the development of the SBSPRP's RMP in many ways. She involved the local community in the identification of important resources, and she developed a valuable interview method with multiple-choice questions on the use and meaning of resources to identify local concerns. In addition, the concept of incorporating an ethnographic perspective in the SBSPRP's RMP will be important as tribal consultations will be required in the review and adoption of the federal-state EIS-EIR for the SBSPRP.

Winthrop, in "Historical Ecology: Landscapes of Change in the Pacific Northwest," explored how a study of environmental change can inform the adoption of land management alternatives to achieve resource sustainability. Winthrop's perspective is useful for the salt pond landscape. She noted that "historical ecology is based on several premises. First, ...it recognizes that human beings are part of the ecosystem and that understanding the diverse and complex relationship of humans to the environment must proceed within a framework that integrates the natural and cultural realms" (2001:205).

Moreover, Winthrop's history traced the links governing the integration of humans and the ecosystem. She studied the land management practices of the Pacific Northwest Indians and discovered that each group had individual techniques to increase the volume of resources need to support their life. For the Indians, it was fish, acorn, and deer; the nineteenth-century settlers, on the other hand, were driven by a new set of changing economic patterns. These concepts will be further explored in the balance of the thesis.

Watt, Raymond, and Eschen, in *Reflections on Preserving Ecological and Cultural Landscapes*, presented the view that historic preservation and protection of endangered species, while guided by different laws, have much in common. Both the NHPA and the federal Endangered Species Act (ESA) are statutes with the same preservation ethic and a registry list; yet, in general, it appears that the primary difference between the two is that one

seeks to protect threatened buildings, the other to protect threatened plants and animals. What is interesting to analyze is that both laws have basic philosophies about preserving their respective subjects on a landscape scale, yet “neither law fully succeeds in preserving at a large integrated, landscape scale” (Watt et al 2004:261). It seems that both laws would need reform in order to achieve their objectives in full; however, in the meantime professionals rely on juggling the NHPA and NEPA and in California, CEQA, the ESA, and the NPS heritage structure to bring these goals closer together. Watt’s analysis yields valuable insight into the challenges of fully implementing a cultural landscape analysis in resource management plans due to the encumbrances of the legal framework. This issue will be discussed in more detail in Chapter V.

Cultural Heritage Tourism

The SBSPRP presents an as-yet unexplored opportunity for the development of a cultural heritage tourism program. The academic literature contains some interesting discussion highlighting the major challenges, issues, and strategies for carrying out cultural heritage tourism programs. Many of these ideas and “lessons learned” can be applied to heritage tourism planning in the SBSPRP’s RMP.

The academic study of tourism in the discipline of anthropology and applied anthropology began with a critical attitude toward tourists, citing the negative impact they had on the places and societies they encountered. However, recently this attitude has changed as more studies indicate that tourists have positive impacts on a local area. The beneficial impacts of tourism became noticeable as alternative forms of tourism, such as ecotourism, which developed around those tourists interested in nature travel and recreation, and ethnic and cultural tourism, have taken root. Cultural tourism is the emerging

partnership between tourism and cultural heritage management (McKercher and du Cros 2002).

The categories of issues and topics in the literature relevant to the consideration of heritage tourism in the salt pond landscape are the following: 1. identifying heritage assets and tourist values; 2. heritage preservation vs. commercialization; 3. heritage tourism as an opportunity for local economic development vs. protection of fragile environments and level of intensity of public access and protection of wildlife habitat; and 4. public interpretation of cultural heritage in the design of tourism facilities and exhibits.

Identifying heritage assets & tourist value

MacCannell in “Sightseeing and Social Structure: The Moral Integration of Modernity,” discussed the place of attraction and the role of the tourist in modern society. He derived his theories from Durkheim, who invented the use of systemic variables for sociological analysis and who named tourist attractions (“works of art” and “historical monuments”) as his basic listing of social facts (MacCannell 2004). As described below, theories about the characteristics of tourists and what the tourist is interested in can serve as a springboard for the design of a heritage tourism plan for the SBSRP.

MacCannell went on to say that the tourist value of a modern community lies in the way that community organizes its social, historical, cultural, and natural elements into a stream of impressions. Tourists want to see society and how it works. For example, transportation networks connect the urban areas of society and, therefore, the segments and intersections in these networks become tourist attractions, e.g., Golden Gate Bridge. MacCannell’s idea is that people can be reconnected to their culture and its history in the role as a tourist in the act of sightseeing. The tourist is the one who becomes responsible for change and creating positive impacts on a community (2004).

Applying MacCannell's theory to the SBSPP, "the tourist value" of the salt pond landscape lies in the way its social, historical, cultural, and natural elements are organized into a stream of impressions. These impressions can be found in the landscape. MacCannell's ideas are relevant for use in the cultural landscape approach in the RMP and a heritage tourism plan. Within the cultural landscape approach, the landscape itself becomes the "attraction," the event. A tourism plan could be designed based on the landscape's cultural inventory as further described in Chapter IV. The inventory provides the information for the placement of a series of cultural markers: industrial material culture, e.g., Archimedes screw pump; transportation networks, e.g., landings; or public works, e.g., flood control channels. These cultural features replicate the taxonomy of the community's social structure.

McKercher and du Cros (2002) in *Cultural Tourism: The Partnership between Tourism and Cultural Heritage Management* contribute some additional ideas for consideration in the development of heritage tourism plans. These authors noted that there are key variables in assessing the tourism potential of a cultural heritage asset, such as the importance of maintaining the integrity of cultural resources; the availability of financial resources; the characteristics of the physical setting, such as the landscape; the identification of local and regional stakeholders; and the task of matching visitors with the attraction.

McKercher and du Cros recommended that an audit be conducted to assess a property's cultural heritage asset. The audit should determine how well a cultural asset can work as a tourist site, the degree of political support, a plan for regular maintenance and monitoring, and the involvement of key stakeholders. A plan should be devised to design and manage the tourist experience yet serve many publics at the local and regional level. This

approach is very similar to the Irish Heritage Council's approach to the design of the Pilgrim Paths' Project discussed earlier.

Amanda Mason, a member of the Western Erie Canal Heritage Corridor Planning Commission, was interested in "developing meaningful resource management strategies that value the hopes and needs of the local residents and prepare the groundwork for community-enhancing initiatives that will also serve as the basis for tourist attractions" (2005:153). Mason's experience on the Western Erie Canal's Planning Commission is a useful guide for heritage tourism planning for the SBSRP. The Commission provided for active participation from the local citizens resulting in a strong management and stewardship program for the cultural and natural resources of the Canal's Heritage Corridor.

Hyland (1997) observed that in any locale there are multiple views about what the focus of tourism should be and multiple groups of people who should have a voice in tourism development. Hyland studied tourism in the Lower Mississippi Delta and the issues surrounding the proposal to build a new casino. He said that the struggle was intense and prolonged due to the competing images of the region, each represented by powerful political groups. For example, one group supported a regional heritage theme emphasizing cultural and environmental diversity while another group wanted to exclude groups in public decision-making in order to secure approval for casino gambling. Hyland suggested that it is important in heritage tourism planning to not only identify the appropriate heritage resources but also to encourage regional integration of views and politics.

Cultural heritage preservation vs. commercialization

There is public sensitivity about heritage tourism in general because of the inherent conflict between heritage preservation, the goal of which is to protect a fragile or disappearing resource, both cultural and/or natural, vs. tourism, which can often develop

into over-commercialization of the heritage resource and destroy the very essence of the object of protection. Recently, the federal government has become involved in promoting tourism as a strategy to encourage both the protection and use of historic properties owned by the Federal government. *Executive Order 13287* was signed by President George W. Bush in March 2003. The Order followed on the heels of the Preserve America Initiative established by the White House in cooperation with the Advisory Council on Historic Preservation (NHPA 1996) and several federal agencies: the U. S. Departments of Defense, Interior, Agriculture, Commerce, Housing and Urban Development, Transportation, and Education; the National Endowment for the Humanities; the President's Committee on Arts and Humanities; and the President's Council on Environmental Quality. This initiative and its partner organizations show the amazing breadth of interest in cultural heritage from several agencies that could be tapped for involvement and support of the SBSPRP.

The *Executive Order* complements the Preserve America initiative, which promotes intergovernmental and public-private partnerships for the preservation and use of historic properties to support economic development and other public benefits. The Preserve America Initiative first announced in March 2003 gives grants to communities for programs that build regional identities and bolster pride in local cultural and environmental history. The SBSPRP should consider applying for a grant to assist in the development of a heritage tourism plan.

Tourism and economic development: public recreation vs. environmental protection

Stonich (2005) studied how to enhance tourism development and natural resource conservation in tourist destinations with very diverse social groups and fragile environments. She was concerned that environmental groups do not always consider the positive social and cultural impacts of tourism. She advised that understanding the structure of community

power relations and establishing networks among communities is necessary for reconciling diverse views to achieve effective community-based tourism and conservation. Stonich conducted her study in Honduras; however, her recommendations are applicable to the SBSPRP as there are several diverse groups involved in the SBSPRP and varied opinions as to how the ponds should be managed.

The tourism studies (Chambers 2000; McKercher and du Cros 2004) discussed the trend to expand upon traditional nature-based recreation and tourism to include heritage-based recreation and tourism. The heritage movement has brought shifts in philosophies about tourism and the concept of fulfilling the dual goals of heritage education and public access and stewardship. Yet this trend has encountered the same issues that confront recreational tourism in local, state, and national parks. How to protect fragile areas? The question must be asked: Are tourists compatible with the site?

Tourists can be invasive because they take up and trample space. Zukin (1991) in her analysis of Baltimore's Inner Harbor development and Florida's Disney World describes her concern about the trend toward capitalizing on tourists as consumers. If tourism is allowed to happen before careful planning is completed, chaos can result. Again according to Zukin, only a small group of people really seek a meaningful experience and appreciate historical and archaeological assets.

Chambers emphasized that place makes a difference—populated vs. unpopulated areas, heavily urbanized vs. rural (2000). The tourism challenge within the SBSPRP is that the salt ponds and levee system sits in the middle of a highly urbanized area yet contains extensive ecological and cultural attributes. This study recommends that tourism planning will need to consider how to provide public access to significant cultural sites in balance with sensitive treatment of fragile resources.

Public interpretation and authenticity

Another concern expressed in the literature is the issue of how tradition and authenticity are represented in public interpretation exhibits. This issue is relevant for heritage tourism planning in the SBSRP because there are several historical sites that could be developed into tourist attractions, such as the ghost town of Drawbridge, where authenticity as well as other issues will likely be controversial.

Anthropologists come to differing conclusions about historical accuracy or the reality of experience and the packaging of history. In developing public interpretation themes for historical exhibits, how believable and convincing must the information or exhibit be? Is authenticity important to tourists? One perspective is how a person identifies with an historic exhibit, whether as a local resident or a tourist is not a static or fixed experience. A person's viewpoint can change over time. Tradition and authenticity are linked together. Handler and Linnekin investigated national and ethnic identification in Quebec and Hawaii and concluded that tradition should be understood as a "symbolic process" (1984:286) and that traditional is not an objective property of phenomena but an assigned meaning. They noted that "that the past is always constructed in the present" (286).

In further discussion on the topic of authenticity, meaning is generated when a tourist experiences a site. In a case study of the reconstructed village of New Salem, IL, for example, Bruner (1994) identified what is not authentic based on what the presenters did to make the town *more* attractive to visitors, e.g., the houses looked newer and had gutters, and the stories the guides told about the people who lived in the houses weren't necessarily true. Handler and Saxton (1988) stressed that there are qualitative differences in our experiences, and the results are gradations in authenticity.

It would be reasonable to conclude that if the site looks like 1830, i.e., if the site and the old houses are represented as a reasonable facsimile of 1830, then it is credible. Tourists generally, whether they are school children, women or men, or from different national origins, will find something at the historic site that they can understand or that is relevant to their lives. Tourists do not need a perfect simulation, but they may complain if they sense that little white lies are being told. An important principle in establishing a public interpretation design, site staging, and rules and standards for authenticity should be to include a wide variety of local stakeholders in the development of a public interpretation program (Wingard class discussion, November, 2005).

Bodie State Historic Park is called a re-creation of the ghost town of Bodie, CA. The ghost town is what visitors experience today, yet this tourist “façade” of a ghost town is not accurate because Bodie was once a booming gold-mining town. Today there are over 200,000 visitors annually. Bodie is renowned in the tourist industry for its authenticity. It appears that what Americans want is being involved in the mythic West, a “romanticized image of the Anglo-American past” (DeLyser 1999:602).

Gable, Handler, and Lawson challenged the historic town of Williamsburg and its emphasis on black vs. white history. They believed that histories are interpretations that change in relation to changing social circumstances. This idea competes with a notion of history as “just the facts.” “All historical narratives involve selection and interpretation, influenced by ideology” (Gable et al 1992:791). Applied anthropology must remember not to slip back into selectivism. Designing a public interpretation program for a cultural heritage tourism plan for the SBSRP will be challenging. Gable et al admonished that history is not simply facts strung together (791). This is important because there are likely to be differing views as to how the production of salt and its relationship to the landscape should be

represented. This becomes environmental vs. business ideology. Some see salt production and its expanding industrialization as anathema to nature; others see the value of salt production to the economy and the changing landscape as a consequence. A cultural landscape approach should enable a corroboration of these views in the form of a public interpretation design that reflects all perspectives.

This chapter has explored the literature on the theory and interpretation of cultural landscapes contributed by geographers, archaeologists, and economic and industrial historians over the last 100 years. Some intriguing case studies have been discovered for application to the SBSPP. The next two chapters further develop the cultural landscape analytical framework derived from this research.

CHAPTER IV

CULTURAL LANDSCAPE INVENTORY—A SNAPSHOT

The theory and literature review presented in Chapter III revealed two basic elements in a cultural landscape analysis: the cultural resources survey from which is derived the historical context and the cultural resources inventory. The techniques for conducting the survey (collecting facts from historical archives and field survey data) and compiling the historical context were applied to the salt pond landscape and presented in Chapter II. This chapter considers how to conduct the resources inventory—the documentation of the landscape’s character-defining features-- and what this inventory might look like when applied to the salt pond landscape.

One of the objectives in this study has been to find a suitable method for conducting a resource inventory that takes into account two categories of resources, culture and nature, combined in the unifying theme of a landscape, for use in the development of a resource management plan for a national park or other publicly protected area and hopefully for adaptation to the SBSRP’s RMP. The research on inventory methods has, of necessity, extended beyond the NHPA guidance on conducting inventories because the NHPA has been focused largely on the preservation of cultural resources represented as physical structures, such as historic buildings and objects and less on natural features. Fortunately, landscapes were added to the list of historic properties that could be considered eligible for listing on the NRHP, and since then several methods have been developed for documenting a landscape’s character-defining features, both natural and built structures, beginning in 1989 with the publication of the NPS’ National Register Bulletin 18: How to Evaluate and Nominate Designed Historic Landscapes (NRB 18). Subsequent publications were the National Register Bulletin 30: Guidelines for Evaluating and Documenting Rural Historic

Landscapes (NRB 30) in 1990 (revised in 1998 and 1999); The Secretary of the Interior's Standards for the Treatment of Historic Properties and Guidelines for the Treatment of Cultural Landscapes in 1996; A Guide to Cultural Landscape Reports: Contents, Process, and Techniques in 1997; and the Cultural Landscapes Inventory Professional Procedures Guide in 1997, revised in 2001, known as the CLI Guide.

The most useful inventory guides for this study are the NRB 30 and CLI Guide. They contain comprehensive lists of landscape characteristics that can be used to connect with the landscape's historical context and provide the supporting framework for documenting both cultural and natural resources in the unifying theme of the cultural landscape. For the purpose of this study, the NRB 30 was selected over the CLI because the salt pond landscape seemed to fit well into the NRB's definition of a "rural historic landscape" (NRB 30:4) and the NRB's method of landscape documentation. A "rural historic landscape" is defined as:

a geographical area that historically has been used by people, or shaped or modified by human activity, occupancy, or intervention, and that possesses a significant concentration, linkage, or continuity of areas of land use, vegetation, buildings, and structures, roads and waterways, and natural features (NRB 30:4).

NRB 30 recommends 11 landscape characteristics by which to analyze the evidence of human land and water modification: land uses and activities; patterns of spatial organization; response to the natural environment; circulation networks; cultural traditions boundary demarcations; vegetation related to land use; buildings, structures and objects; clusters; archeological sites; and small-scale elements (NRB 30:5). The first four on this list are examples of general processes representing the influences in shaping the land—the

landscape formation process; the other seven are elements or features that usually can be seen on the land. For example, on the salt pond landscape, the land feature next to a waterway, such as a slough or a creek, was called a “landing” and was used for loading salt onto barges for shipment to San Francisco in the early days of salt production. This is a landscape element that can be seen on the landscape today and can be classified into at least two of the four characteristics listed above, response to the natural environment and circulation networks. When a feature of the landscape, such as the landing, is identified with a human activity and/or technological process, e.g. salt production and its industrial expansion between 1850-2003, the landscape feature and historic context can then be linked and seen as an organic and integrated whole within the landscape (NRB 30:8).

The landing can be established as a baseline feature, a physical remain of a synchronic process. It can be identified as an historic site and part of the archaeological record (which is cumulative) and a “product of all human activities at the site” (Hardesty and Little: 29) from which to measure continuity of function and evolution over time in the successive stages of the industrialization of salt production. A site, such as a landing, can provide a huge repository of information about the changes in daily life over a period of 100 years or more. At each stage of cultural change, new landscape features are added onto and connected with the baseline landscape feature, such as the addition of other structures. For example, the changes that can be traced in the south Bay using the landing as the baseline component are the addition of wharves, warehouses, roads and the railroad.

These features can be considered linked systematically and then evaluated for their significance to understanding the historical influence of transportation and the gradients and intensity of changing modes of the technology of bringing goods, such as salt, to the market over time and across space (29). Donald Hardesty developed the concept of “feature

system” as an analytical tool to establish the connection among the elements in a cultural landscape (1988:9-11). A feature system is “a group of archaeologically visible features and objects that is the product of a specific human activity” (Hardesty 1988:10) and may include components that are distributed over a large geographic area and exist in different time periods.

The historical archive facts and field survey data presented in Chapter II yielded a set of landscape characteristics both natural and man-made for the three complexes or zones of the 15,100-acre salt pond landscape: Eden’s Landing, Alviso, and Ravenswood. A partial list of the characteristics in these three zones is presented in Table II. They have been grouped into separate categories of landscape features or sites: creeks, channels and sloughs; landings; wharves, piers and pilings; bridges and railroads, wind-driven pumps; pump stations, submarine pipes and trestles; salt ponds, levees, cuts and closures; communities and roads (“Sites” are one of the 4 classifications of properties eligible for listing on the NRHP and also include buildings, structures, objects and districts”) (NRB 15:4). (Figures 13, 14, 15) This type of table could be useful to the SBSRP because it serves to identify these landscape characteristics as a system of features linked through the four processes of landscape modification: circulation networks, response to natural environment, land use and activities and patterns of spatial organization.

Metaphorically speaking, the “book” of the salt pond landscape can be opened and “read” page after page following the successive stages of development and change as reflected through the landscape characteristics and feature systems, both functional such as circulation networks and stationary objects such as the Archimedes screw pump. Each feature of the landscape holds the physical evidence of past uses and events of the historic landscape formation process.

Table II. A Sample Inventory of the SBSPRP according to NRB 30

| Activity Category | SITES - Creeks, Channels, and Sloughs | National Register Characteristics |
|-------------------|---------------------------------------------------------------------------|-----------------------------------|
| Waterway | Eden's Landing Complex – Alameda County | Circulation Networks |
| | Lion Creek Alameda County Flood Control District (ACFCD) – local drainage | Response to natural environments |
| | East Creek Slough ACFCD –local drainage | |
| | Arroyo Viejo ACFCD – local drainage | |
| | Elmhurst Channel – local drainage | |
| | San Leandro Creek CE project 1973 | |
| | Estudillo Canal ACFCD – local drainage | |
| | San Leandro Creek CE project 1962 | |
| | Bockman Canal ACFCD – local drainage | |
| | Sulphur Creek – local drainage | |
| | Winston Avenue Channel – local drainage | |
| | Mount Eden Creek – local drainage | |
| | (Old) Alameda Creek ACFCD – local drainage | |
| | Alameda Creek Flood Control Channel CE project 1977 | |
| | Cerrin Ave. Channel/Plummer Creek ACFCD – local drainage | |
| | Cushing Rd. and Albrae Channels/Mowry Slough – local drainage | |
| | Agua Caliente Creek/Mud Slough – local drainage | |
| | Agua Fria Channel – local drainage | |
| | Alviso Complex – Santa Clara County | |
| | Coyote Creek – Santa Clara Valley Water District (SCVWD) | |
| | Guadalupe River/Alviso Slough (SCVWD) | |
| | San Tomas Aquino Creek Slough | |
| | Calabazas Creek Slough | |
| | East Sunnyvale Channel – local drainage | |
| | West Sunnyvale Channel – local drainage | |
| | Stevens Creek SCVWD | |
| | Permanente Creek/Mtn. View Slough (Channel) | |
| | Adobe Creek | |
| | Barren Creek | |
| | Matadero Creek (All three creeks) | |

| | | |
|----------------------|------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| | discharge into Palo Alto Flood Basin) | |
| | San Francisquito Creek Local Project | |
| | Ravenswood Complex – San Mateo County | |
| | | Archaeological sites |
| | | Objects |
| | | |
| Activity Category | SITES - Landings | National Register Characteristics |
| Water Meets the Land | Eden’s Landing Complex | Response to natural environments |
| | Robert’s Landing Eden Landing, also known as Barron’s 1855-95; Peterman’s 1895; Jarvis/Mayhews Landing, | Circulation Networks |
| | Alviso and Ravenswood Complex | Land Use and Activities |
| | Cooley’s Landing | |
| | 17-mile House Landing | |
| | Phelps’ Landing | |
| | Castro’s Landing | |
| | Strawberry Landing (Palo Alto area) | |
| | Mountain View landing: Guth, Jagels, Ynigo, Rengstorff | |
| | SITES – Wharves, Piers, Pilings | |
| | Eden’s Landing Complex | Circulation Networks |
| | | Response to natural environments |
| | Alviso and Ravenswood Complex | Small Scale Elements |
| | | |
| | Holder & Cottam’s Wharf | |
| | Clarke’ s Landing & warehouse on Mayfield Slough, later Wilson’s warehouse | |
| | J.V. Diller Wharf | |
| | | |
| | McLeod Yards | |
| | Charles Hanson’s “Steamboat Wharves” | |
| | Ralston’s pier, Belmont | |
| | Ravenswood Wharf | |
| | SITES – Bridges and Railroads | |
| | Eden’s Landing Complex | Response to natural environments |
| | Alviso Complex | Circulation Networks |
| | Dumbarton railroad bridge | Structures |
| | Dumbarton automobile bridge | |
| | Drawbridge built across Redwood Creek | |

| | | |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| | in 1854 | |
| | Ravenswood Complex | |
| | San Mateo – Hayward Bridge | |
| | Short line built from Rancho de las Pulgas – San Mateo to San Francisquito Creek | |
| | SITES – Pump Stations, Submarine pipes, trestles | |
| | Spring Valley Water Co. Dumbarton Pt. to Ravenswood 1888 | Response to natural environments |
| | | Buildings, Structures, Objects |
| | SITES – Wind-Driven Pumps | |
| | Eden’s Landing Complex | Small-scale Elements |
| | Archimedes Screw | |
| | | |
| Activity Category | SITES – Salt Ponds, Levees, Cuts, Channels, Closures | National Register Characteristics |
| Waterway Modification | Eden’s Landing, Alviso, and Ravenswood Complexes: Salinas | Response to natural environments |
| | Marsh Pannes | Circulation Networks |
| | Concentrating Ponds | Boundary Demarcation |
| | Crystallizing Ponds | Land use and activities |
| | Levees | Structures |
| | | |
| Activity Category | SITES – Communities | National Register Characteristics |
| Land Features | Hayward, Fremont, Warm Springs, Union City, Newark, Alviso, Drawbridge, Redwood City, Belmont, Ravenswood (East Palo Alto) | Clusters |
| | Cemeteries | Land Use and Activities |
| | Ranch Complexes | Response to natural environments |
| | | Clusters |
| | | Vegetation Related to Land Use |
| | | Boundary Demarcation |
| | | Circulation Networks |
| | | Structures |
| | | Archaeological Sites |
| | Sites - Roads Circulation networks | |
| | | Response to natural environments |

Based on a reading of Table II, and then integrating this information with the historic context in Chapter II, it is possible to draw conclusions about the significance of the inventory sites in a feature system evaluation. This is what a partial story might tell about San Francisco and the south Bay's development in particular. The Bay in the 1800s and earlier was the primary transportation route for goods and people, and the tidal sloughs provided the link between land and water. Tidal flows in and out of the marshes dug natural deepwater channels, which extended throughout the tidal flats. When the channels came particularly close to land, early business entrepreneurs, such as the salt farmers, used these natural landing places to ship agricultural produce, animal products, redwood logs, and salt to San Francisco and around the world. These natural landings had an important role in the maritime transportation network and economic activity in the 19th century and they do so today. These landings are the bayward endings and beginnings of roads in our present-day regional street, highway and overall freight movement system.

Landscape features associated with the natural landings that have been added over the years are the wharves, piers, pilings and construction, such as dredging, equipment. These features provide further evidence of the evolution of the transportation network for the transshipment of goods and related economic activity. In the Ravenswood complex, in Redwood City, Charles Hanson's Steamboat Wharf was a large platform that covered a high-tide flood plain. This wharf is now located at the present-day intersection of Marshall and Jefferson Streets (Hoover 1966). In 1873, Jeremiah Clarke of Clarke's Landing on Mayfield Slough erected a large warehouse; this site is now part of the Palo Alto Airport (Hoover 1966; Marsh 1996).

A historic dredge, used to remove mud and silt from harbor areas to create deeper draft for boats is parked at Cooley's Landing in what is known as East Palo Alto today. The

landing derives its name from Lester Cooley, who bought the wharf in 1868. Before that, the wharf was owned by Isaiah Woods, who called it Ravenswood Landing because of the birds that inhabited the area. Cooley was a successful gold miner and dairyman, and he used the pier primarily for shipping grain and products from his dairy. Ravenswood saw an economic boom in 1874 when Cooley leased five acres to Hunter, Shackleford, and Company. The firm built a brick factory that operated seven kilns and employed approximately 100 Chinese laborers. It made about 50,000 bricks a day and shipped them to San Francisco for the construction of the Palace Hotel. Business was so promising that a second wharf, Clarke's Landing, was built to the southeast. In later years this became known as the Palo Alto Yacht Harbor. The factory's clay pit can be seen in the bowl-shaped contours of the present-day Jack Farrell Park. Once the Palace Hotel was complete, though, business dwindled and the factory closed after 10 years (Hoover 1996).

Archaeological sites

One of the NRB's 11 landscape characteristics is archaeological sites—locations of prehistoric or historic activity and settlement. Examination of information pertaining to the feature of archaeological sites illustrates the type of archaeological information that is available from a comprehensive inventory. The archaeological site record for the salt pond landscape on file at the Northwest Information Center in Rohnert Park, CA was examined in addition to other literature. The small amount of research to date indicates that there are 57 recorded archaeological sites in the SBSRP mostly located in Alameda and Santa Clara Counties. The record shows evidence of foundations, changes in vegetation, and surface remnants of settlement and salt production practices. Of these records, 40 are prehistoric period sites located mostly in Santa Clara County. These sites show accumulated materials left behind as a result of Native American habitation, including deposits of oyster shell, other

marine shells and chiseled stone (Jones & Stokes 2001; U. S. Army Corps of Engineers 1988).

The 17 remaining sites are in Southern Alameda County and the town of Alviso. They are listed as historic period sites and contain isolated trash dumps containing Chinese and Japanese ceramics for food storage and tablewares dated to 1870-1910, red-clay brick, bottles dated to 1880, leather, sawed bone and numerous architectural features of abandoned salt production companies. The historical sites consist of wooden structures associated with salt production such as pump houses, tie gates, small-gauge railroad bridges, boardwalks, culverts, and outbuildings. A very large site has been identified as Eden Landing, a historic shipping and warehouse complex that has been discussed previously in this study. The Primary Record (P-01-000217/CA-ALA-501H) for this site describes the following archaeological evidence:

“Feature 1: an area paved in brick and stone

Feature 2: a heavy concentration of historic refuse

Feature 3: a modern wharf and associated historic-era refuse

Feature 4: a modern duck hunting blind

Feature 5: the ruins of a timber bridge over Mount Eden Creek

Feature 6 and 7: two concentrations of broken concrete foundations that are likely twentieth century features” (California Department of Parks and Recreation 1996)

The Port of Alviso, which is listed on the National Register of Historic Places, consists of a group of buildings and structures, such as warehouses, docks, residences, stores, a railroad depot, a boarding house, a yacht club, a constable’s office, and a jail. There is also a complex of bridges and buildings located at Drawbridge, a small community

located adjacent to Alviso and near the mouth of Coyote Creek (U S Army Corps of Engineers 1988). (Figure 17)

The archaeological record of the SBSRP deserves considerable attention and research. While the landscape has been greatly modified over many, many years, the area retains hundreds of surface and subsurface features that potentially can provide a huge repository of information about the changes in daily human activity, both prehistoric and historic, over the past several hundred years. Several techniques that may be used to identify cultural landscape activity include an analysis of soil stratigraphy, pollens and sediments to determine vegetation patterns; surveys to investigate boundary demarcations; remote sensing and excavation to find buried pipelines and remnant canals and ditches. A wealth of information has yet to be uncovered. The SBSRP will need to conduct more extensive



Figure 14: Remnant Pilings (Photo by L. Watt)



Figure 15: Former Salt Pond Levees (Photo by J. Sanger)



Figure 16: Red Algae in Salt Evaporation Process (Photo by L. Watt)

research on this topic as the archaeological evidence will be important for further validating the historic significance of the salt pond landscape. In addition, the archaeological evidence can be used to assist in the identification of SBSPRP restoration alternatives following remnant canals and ditches.

This chapter described a method that could be used to conduct a comprehensive inventory for the SBSPRP landscape. The next chapter will take this study into the next phase and present the amazing opportunity for the application of a cultural assessment to the SBSPRP's RMP. No longer will buildings and the natural features of the landscape be viewed as two separate elements, but together within the landscape framework, a composite picture of the salt pond landscape and the trajectory of salt farming and production can be experienced and its significance revealed.



Figure 17: Remnants of Drawbridge (Photo by author)

CHAPTER V
THE CULTURAL ASSESSMENT
and the
RESOURCE MANAGEMENT PLAN

The previous chapters discussed the fundamental components of a cultural landscape analysis including a resources' survey and its associated historic context and the resources inventory as they could be applied to the SBSPRP. This chapter embarks on the formulation of more specific recommendations and tasks for the evaluation of the landscape's "cultural significance" through a procedure called a cultural assessment. The cultural assessment, which is a synthesis of the historic context and resources inventory, completes the development of the cultural landscape analytical framework that is proposed for the SBSPRP.

The elements of this chapter include a discussion of the cultural landscape analysis and its role under state and federal law; the procedures for the cultural assessment and ideas for the use of the assessment in heritage tourism planning and evaluating the landscape's cultural significance. A goal of this chapter is to demonstrate that if these procedures are followed in the SBSPRP, the outcome should be a successful integration of both cultural and natural resources and evaluation of cultural significance in the RMP. Also the SBSPRP will be further enriched by the addition of a heritage tourism plan to guide the public interpretation of the landscape's resources and promote their value and use for both people and wildlife.

Legal structure

As noted in Chapter III, the National Historic Preservation Act of 1966 (NHPA)'s Section 106 (amended in 1986 and 1991 [36 CFR 60) and the implementing regulations of the Advisory Council on Historic Preservation in 36 CFR 800, the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) form the legal structure within which federal and state (acting as lead) agencies must consider the potentially adverse effects of their projects or activities on both historic (includes cultural resources) properties and the environment (natural resources). An activity or "undertaking" (NHPA Section 106) includes a project such as the building of a highway or dam or in the case of the SBSPRP, an ecological restoration project. It is because of the potential for damage to the cultural resources, the salt pond landscape and its character-defining features, that the adverse effects evaluation process becomes the primary method through which cultural resources will receive attention and evaluation in the SBSPRP.

Typically, if a construction project has the potential to damage a historic building or a Native American burial ground, then a historic evaluation report must be prepared to assess the adverse effects of the "undertaking" and either recommend alternative courses of action, including finding ways to avoid the project or identify appropriate mitigation. In the case of the SBSPRP, a similar type of historic evaluation report must be completed, but in this case, it is an evaluation, not of the adverse effects of a development project, such as a highway, on the landscape's resources, but of an ecological restoration project and its adverse effect on historic sites and other cultural resources. In this instance, it is the cultural landscape analysis that can be used to write the historical evaluation report and therefore the cultural landscape analysis becomes the essential tool to accomplish the adverse effects' evaluation.

The challenge for the SBSPRP will be to conduct the historical evaluation report and analysis in a way that complies with the NHPA but that does not cause the project to fall into a Catch-22 because of the evaluation requirements for the retention of integrity. It will be necessary to ensure that the overall project purpose of the SBSPRP which is, restoration, but which is also an act of destruction can still be achieved and not be considered an aspect of destruction which in essence is what must happen to achieve rehabilitation and restoration of the landscape. Strategies to resolve this issue will be discussed later in this chapter.

The following is a summary of the steps in the application of the state and federal laws to the SBSPRP. The federal lead agency is the U. S. Fish and Wildlife Service [USFWS] under NEPA; the state lead agency is the California Department of Fish and Game (CDFG) under CEQA. These agencies must identify and evaluate the potential adverse impacts of the SBSPRP in the federal/state Environmental Impact Statement (EIS)-California Environmental Impact Report (EIR) on both cultural and environmental resources. For the cultural resources evaluation, the USFWS must complete five steps under what is called a NHPA Section 106 project review as follows:

1. Determine if Section 106 of NHPA applies to a given project, and if so, initiate a review of historic properties
2. Gather information to decide which historic properties in the project area are listed in the National Register of Historic Places, or may be eligible for listing
3. Determine how historic properties might be affected
4. Explore alternatives to avoid or reduce harm to historic properties

5. Reach agreement with the State Historic Preservation Officer (SHPO), Indian tribes, and other stakeholders (possibly the Advisory Council for Historic Preservation (ACHP) on the need to address any adverse effects (36 CFR 800).

In order to be evaluated during a Section 106 review, an historic property must be already listed on the National Register or be eligible for listing. A property is considered eligible for listing when it meets specific criteria established by the NPS.

In a NHPA Section 106 review, a project is considered to adversely affect an historic property if there are changes to the characteristics (features) that qualify the property for inclusion on the National Register of Historic Places in a way that would diminish the **integrity** of the property. Examples of adverse effects are 1) physical destruction or damage, 2) alteration inconsistent with the Secretary's Standards for the Treatment for Historic Properties, 3) changes in the character of the property's uses, 4) neglect or deterioration, etc...(36 CFR 800).

The National Register identifies seven criteria all of which must be met in to warrant integrity-- location, design, setting, materials, workmanship, feeling, and association. There may be some balancing in the Section 106 review that would allow some flexibility for the interpretation of integrity, particularly as it may be applied to the salt pond landscape. While the landscape could possibly fail the integrity test under a strict constructionist interpretation, it may pass the significance test because, as author, Catherine Howett, points out that a definition of "significance"... must be... based on "either an association with important historical events or personages or on the intrinsic value of the site as an historical resource" (Howett 2007:188).

In addition, the USFWS must comply with other requirements under Section 106 as follows:

1. Determine the area of potential effects (APE) on the historic property(ies)
2. Identify the historic properties within the APE
3. Coordinate and meet the requirements of NEPA (36 CFR 800.16d)

The USFWS has already initiated the Section 106 consultation for the SBSPRP with a letter sent to the State Historic Preservation Office (SHPO) on July 16, 2004 (Kolar 2004). The letter requested a consultation as well as SHPO's comments on the SBSPRP's Area of Potential Effect (APE)'s geographical boundaries and the proposed approach for consultation. The Area of Potential Effect is the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character of or use of historic properties..."(36 CFR 800.16).

Three separate maps showing three separate APE boundaries for each of the three salt pond complexes (Eden's Landing, Alviso, and Ravenswood) within the 15,100-acre landscape were proposed in the letter. The SHPO has confirmed that the proposed APE boundaries delineated by USFWS are acceptable. Also, the USFWS has said it would accept the results of the *Cultural Resources Inventory Report for the Habitat Mitigation Planning Sites, San Francisco International Airport Proposed Runway Reconfiguration Program* (Jones and Stokes 2001) as the fulfillment of the historic properties' documentation requirement under Section 106 (CFR 36 800.11). The 2001 Cultural Resources Inventory Report contains an extensive listing of the cultural resources in the South Bay, including archaeological sites as well as environmental resources; however, this study recommends that a more comprehensive inventory of both cultural and natural resources should be conducted for the SBSPRP. The division of the salt pond landscape into three smaller units (as identified above) within the

very large 15,100-acre is helpful for conducting the landscape analysis as it will provide a basis for a more thorough documentation and in-depth evaluation of resource significance around a landscape unit's hub of activity within the SBSPRP area. Ebey's Landing [Washington state] National Historic Reserve's Comprehensive Plan also contains a similar concept that of dividing the 17,000-acre parent landscape into ten smaller character-defining units.

Generally speaking, the legal structure, under the federal NHPA Section 106, NEPA, and state CEQA, has many benefits supporting the evaluation and management of cultural resources and the opportunity to use the cultural landscape mode of analysis. For example, the law mandates that the lead agency for the SBSPRP must consult with the state Historic Preservation Office (SHPO); Indian tribes and other parties, such as the Native American Heritage Commission; local governments and local historical preservation groups; and the lead agency also must identify the interests and issues in the Section 106 adverse effects evaluation process on historic properties and how those effects should be addressed, in accordance with guidance provided by the Advisory Council on Historic Preservation (ACHP) or the implementation of Section 106.

However, given the goals of this study, it appears that there is a major drawback to the existing legal structure as applied to the SBSPRP, i.e. there is no formal process for an integrated evaluation of cultural with environmental resources for inclusion as joint preservation and management objectives in the RMP and which would assist in the evaluation of the landscape's cultural significance. To realize the full potential of a landscape approach in the SBSPRP, new strategies will be needed, such as lead agency collaborations and/or procedures, such as the cultural assessment, to address this issue.

Cultural Landscape Assessment

The task of a cultural assessment involves synthesizing the information from the historic context and the inventory based on an analysis of the key landscape (feature-system) relationships. For example, using the historical context (Chapter II) and the landscape inventory (Chapter IV), a cultural assessment for the Eden's Landing salt pond complex might begin with a listing of Eden's Landing resources, e.g. the landing, waterway, salt ponds, levees, Archimedes screw wind pump, remnant pilings and duck hunting blinds. These resources would be identified as Eden Landing's character-defining features for the earliest commercial salt works in the Bay. This particular salt pond complex could be described as a prototype landscape reflecting the historical beginnings of salt production and the functional relationship between the land, water, and human enterprise for salt production, the transportation of goods, as well as for recreation in the mid-19th century. It is recommended that the next step would be to apply the landscape "reading" techniques developed for Ebey's Landing National Historical Reserve Comprehensive Plan as a guide to interpret the relationships among the feature-system(s) of the landscape and identify what story (ies) the landscape reveals.

Adapting the Ebey's Landing landscape analysis procedures to the SBSRP involves research on several "reading" levels: 1) Archaeological sites: A comprehensive Primary Records' search for all archaeological sites covering both prehistoric and historic sites should be completed at Sonoma State University's Northwest Information Center in Rohnert Park, California, as well as other archives. In the Ebey's Landing Plan archaeological sites are described as below-ground structures. However, as discussed in Chapter IV, sites may be both above as well as below ground because while there are some historic shipping and warehouse sites with no surface evidence, there are several sites above ground that are

providing the modern functional equivalent of their original historic shipping use; 2) Visual quality: The visual quality of the resources should be evaluated to identify “visual cohesiveness” on three different dimensions. For the salt pond landscape these could include a sweeping overview or broad vista, such as the view from the Don Edwards National Wildlife Refuge visitor center; a more detailed view, such as the four cabins sinking into the marsh in the ghost town of Drawbridge; and lastly, a view of small-scale elements, such as a fence or a group of remnant pilings. The visual quality reading level also should include an analysis of whether the landscape view conveys a feeling of entry and access. 3) Built landscape: A reading of the built landscape covers three separate aspects of human settlement activity: patterns, types of land use, and structures. Applying this reading level to the salt pond landscape, Grossinger’s template covering the Three Eras of Salt Pond Management (Table 1, Chapter II), could be used as a reading technique for analyzing the human influence on the land and the history of land use patterns; 4) Natural features: Adapting from the Ebey technique, a reading of the SBSPRP’s natural features would include the geology, the evolution of landforms and the establishment of soils and vegetation patterns, such as the tidal salt marsh upon which the built landscape is constructed; 5) Transportation structures: A reading of the salt pond landscape’s transportation-related structures would include such facilities as bridges, piers and wharves, railroad track, and roadways, which are present, either intact or in remnants, on the landscape today. Table II in Chapter IV could be used as a reading checklist of the system of features linked to both the natural and built network for transporting salt products and goods from other industries (Ebey’s Landing Comprehensive Plan 1980).

Other Ebey’s Landing assessment tools recommended for use in the SBSPRP’s cultural assessment is its planning template, which includes a vision statement and

preservation and management principles; and the survey, inventory, and field manuals as described in Ebey's Landing's Building and Landscape Inventory and Land Protection Plan documents. In addition to the Ebey's Landing methods, other general sources of information and procedures for documenting and recording landscape features are the NPS' Historic American Buildings Survey (HABS 1933), the (HABS 1933), the Historic American Engineering Record (HAER 1969), and the Historic American Landscapes Survey (HALS 1999).

The results of the cultural assessment should serve as a basis for site-specific cultural and natural resource management actions for the RMP and for the development of a heritage tourism plan and public interpretation program for these sites. Also the cultural assessment should serve as a basis to evaluate restoration design options as the layers of the salt pond landscape can be peeled back, levee after levee, going back in time following the successive stages of salt production.

Cultural Significance and Integrity

It is expected that the cultural assessment reading techniques described above could be helpful in the development of an integrated approach to cultural and natural resource co-management as well as drive the evaluation of the 15,100-acre salt pond landscape's cultural significance or a smaller division thereof. There are several issues which are yet to be resolved to accomplish this task.

In *Assessing Site Significance*, historical archaeologists Donald Hardesty and Barbara Little describe the challenges of and approaches to evaluating a historic property for its significance and potential eligibility for listing on the National Register of Historic Places (NRHP). An historic property, to be listed or be eligible to be listed, "must be considered significant to "the archaeological, historic, architectural, engineering or cultural heritage of

the United States.”(Hardesty and Little 2000: ix). “...cultural resources are significant if they meet the registration requirements for listing on the National Register of Historic Places. These are integrity; significance at either the local, state or national level; age of at least 50 years; or being of exceptional value if not meeting any of the other requirements”(2000:31). In addition to eligibility under the four significance criteria, the resource must retain “enough integrity to convey their significance to people in the present” (2000:44).

The analysis process for identifying significance of an historic property begins with the application of these four criteria listed above. Significance must be further evaluated within the historic context (a pattern or trend in history wherein the meaning of a cultural resource is understood) and according to four criteria (NRB 15:2):

- Associated with an event (Criterion A), e.g., founding of a town
- Associated with a person (Criterion B), e.g., individuals who made important contributions to history
- Building form (Criterion C), e.g., buildings unique in design or construction
- Information potential (Criterion D), e.g., specific research questions can only be addressed by the presence of cultural resources

For example by applying this criteria and using the historic context information in Chapter II, it is proposed that the Eden’s Landing salt pond complex and its several character-defining features, such as the landing, remnant pilings, and the Archimedes screw pump, provide the evidence of the human settlement pattern in the post-Gold Rush period in San Francisco Bay history and justify the designation as a significant historic site or district under Criteria A-D.

Section 106 regulations mandate that there be coordination between the cultural and environmental reviews under NHPA and NEPA/CEQA; however, coordination may not be

sufficient to achieve the broader goals for successfully establishing an integrative (culture-nature theme) approach to the SBSPRP's RMP. The issue is partially related to the interpretation and application of the term "integrity" in the process of evaluating the significance of a resource.

Both CFR 36 800 and the Secretary of the Interior's Standards for the Treatment of Historic Properties [14 CCR Section 15126.4(b)(1)] provide guidance for the evaluation of adverse effects and mitigation standards. These regulations and guidelines were adopted before landscapes were recognized as an important cultural resource including the recognition of the value of both built and natural features, the dynamics inherent in natural processes, and the continued use and interaction between culture and nature. Because of the origin of the NHPA, the historic properties' regulation is focused on constructed resources such as historic buildings and their preservation. Consequently, destruction of a property's features is traditionally interpreted as destroying the property's integrity, thereby disallowing the property's eligibility for listing on the NHRP. The non-destruction policy may likely become a catch-22 for the SBSPRP because all of the SBSPRP's restoration design alternatives consider some form of levee breaching and lowering and raising of levees to achieve different resource management objectives. This action could be interpreted under 36 CFR 800 as an act of physical destruction of the SBSPRP's historic properties/cultural resources, i.e., the salt ponds and levees, thereby disallowing the landscape's eligibility for a determination of significance.

A possible solution to the catch-22 is to argue for a revised interpretation of the term "integrity" for the evaluation of significance for the salt pond landscape. As discussed in Chapter II, Phillips (2004) proposed an interpretation of the term that considers the dynamics of the interactive processes between humans and nature on the landscape.

Although Phillips was focused more on nature than on culture per se, he was really arguing for moving away from integrity meaning the status quo. He said that it is the “integrity of the relationship with nature that matters, rather than the integrity of nature itself” (2004:19). Phillips believed that his interpretation of integrity would enable many more sites to be determined eligible for the World Heritage List as mixed sites. A similar interpretation of integrity under NHPA would be very beneficial for the SBSPRP. It would provide the flexibility needed to allow the destruction of certain cultural and natural resources in the cause of reengineering to achieve an overall project purpose of restoration thereby retaining the landscape’s eligibility for potential listing as a culturally significant landscape. The challenge is to identify significance when rehabilitation and reengineering (as discussed earlier in this chapter) is the purpose of the undertaking. Moreover, it is like that retention of some portion of salt ponds either in production or through public interpretation would be necessary mitigation to comply with NHRP guidelines. Author Catherine Howett provides a useful idea on the interpretation of integrity:

To speak of the integrity of historic sites is rightly to define their potential to provide that important and meaningful physical reality; they are or less complete fragments of the record, and we want to hold on to as much as we can of what might help us to make sense of the past. But the quality and importance of any preservation project is determined not by the integrity of the site, but by the quality of what is made of the site through interpretation of its history.” (Howett 2007:44)

Heritage tourism

Heritage tourism on the 15,100-acre salt pond landscape could create experiences that build a cultural identity and relationship with the local historic landscape for both outside visitors as well as local residents. There are exciting opportunities for public education through visitor enhancing services that can build knowledge and raise awareness about historical and ecological processes on the landscape. The salt pond landscape provides an opportunity to inspire a sense of wonder offering a visitor or resident the unprecedented opportunity to go back in time and experience what the Bay might have been like 150 years ago and through its successive stages of evolution. The landscape is eloquent in revealing shared history, continuity, and the beauty of something enduring through time. Yet the landscape's resources are fragile, and there are challenges for balancing visitor use with protection of sensitive wildlife habitats particularly when the landscape is adjacent to the dense urban area of San Jose and Silicon Valley and serves as a much-needed recreational outlet.

Some suggested elements of a heritage tourism plan and their implementation in the SBSPP are as follows. 1) A tourism plan should be incorporated into the public access and recreation objectives of the SBSPP. The definition of public access should include access for activities such as walking, bicycling and bird watching, but also access to heritage resources represented as cultural sites on the landscape; 2) The syllabus for a heritage tourism and public interpretation plan could follow the story of the successive modifications to the salt pond landscape as represented in Grossinger's matrix outlining the Three Eras of Salt Pond Management (Table I, Chapter II) and include information from the historical context, the inventory and the cultural assessment; 3) A cultural itinerary, modeled after the

Irish Pilgrim Paths' concept (Chapter III), could be plotted along the San Francisco Bay Trail as the primary route and designated as a heritage corridor.

Features of the landscape identified in the resources inventory (Chapter IV) could be scripted into social-cultural trail markers positioned at designated sites along the S. F. Bay Trail. The cultural assessment should be of immense value in the marking of the heritage corridor, as it would have identified the relationships between specific cultural and natural resources and sites on the landscape. For example, at the Eden's Landing salt pond complex, the itinerary could begin with a trail marker and interpretive exhibit designating the site of the first commercial salt farm and homestead of John Johnson in 1859. Another marker and interpretive exhibit could be installed at the Archimedes screw wind pump.

The story and transformation of the South Bay can be traced through the salt industry's history and its role in the economy, transportation, natural environment, and life ways of the people. Salt-making was anchored in family ownership and family tradition. For many families, the salt ponds and levees were their backyards and the theater in which their lives played out. The cultural itinerary along the heritage trail corridor should include the social history of the people involved in salt production and identify the Native Americans (Ohlones); early twentieth-century salt industry laborers such as the Chinese, Japanese, Mexican, Central and South Americans, Italian, Portuguese, and Filipinos as major laborers and producers, as well as groups and institutions active in the communities surrounding the salt pond landscape, such as the civil works engineers; the universities, churches, social improvement clubs; the hunters and local and state elected officials.

Other ideas for elements of a heritage tourism plan include creating a demonstration or working salt farm illustrating the early salt-making techniques and an annual salt festival as a way to reconnect people with the South Bay salt pond landscape (Grossinger 2004; Santa

Clara Valley Water District 2005). The exhibits at the Don Edwards National Wildlife Refuge visitor center could be expanded to include the information produced by the cultural assessment. Graphic displays and interactive exhibits could be created on salt pond engineering and levee-building over the past 150 years and presentations on how information is used in the development of the SBSPRP's EIS-EIR management alternatives could be created.

Recreational and visitor-serving facilities could be considered for the historic towns of Alviso and Drawbridge. The Alviso landscape zone has been proposed as a destination for the expansion of visitor access. Alviso's residents want to dredge their marina and build a ferry terminal and visitor-enhancing services, such as a hotel and restaurant. However, environmentalists and bird watchers fear degradation of the surrounding wetlands from increased visitor use. They are concerned that traffic, whether by foot, bicycle, or commercial ferry, could conflict with one of the major goals of the SBSPRP, which is to preserve habitat for endangered species. Yet some level of traffic would be needed in order to support public access to historical sites.

A strategy to help resolve issues over the type and intensity of visitor-serving facilities in an area of resource sensitivity such as the Alviso pond complex would be the formation of a community-based group culled from the various stakeholders in the SBSPRP stakeholder forum and others. The group could develop the tourism plan using a design charette, an urban planning technique used for consulting with all stakeholders on a project plan. The charette technique can typically result in joint ownership of the final plan and diffuse traditional confrontation among different interest groups.

In tourism planning for SBSPRP, decisions will need to be made to identify types of users and intensity of use for a wide range of people: walkers, birders, bikers, kayakers,

schoolchildren, the local residents, out-of-towners and occupational sightseers, such as flood control engineers; geologists, and scientists. Additional planning elements to be decided are the location and content of trail markers, viewing stations, public interpretation themes, and the architectural and environmental design of boardwalks. On the salt pond landscape, a suggested guideline for the construction of boardwalks and other public access viewing and walking areas is that they should be designed to enhance the experience of the visitor with a sense of space and time. (Figure 18)



Figure 18: Remnant levees (Photo by L. Watt)

Public interpretation in tourism planning involves the presentation of historical information--the stories of the past-- to the public. A recommended approach is that information from the cultural assessment should be incorporated in public interpretation themes and that the story content should reflect the many diverse voices of the community in the salt pond landscape's history. The vision for heritage tourism on the salt pond landscape is that it would serve community enrichment goals by educating both visitors and

residents about humans' role in landscape modifications of their shared cultural landscape. A heritage tourism program may serve to promote a sense of shared ownership among both local residents and visitors and hopefully inspire people to become public stewards for the care of their neighborhood landscape.

In summary, this chapter described the key legal requirements that should be followed by the SBSRP and that drive the analysis of resources and the evaluation of their cultural significance. The cultural and environmental adverse effects-based evaluation is very dependent on a cultural landscape analysis, and it is important to continue to fine-tune the analytical techniques for maximum effectiveness in the SBSRP's RMP. The next chapter offers conclusions about the cultural landscape approach as well as topics for future research.

CHAPTER VI

CONCLUSIONS AND TOPICS FOR FUTURE RESEARCH

Is it possible to endow civilization with greater awareness and knowledge of human actions throughout history and their relationship to the ecosystem so as to result in smarter decisions about the use of land and the improved management of its public resources? Is it possible to realize a vision where people celebrate the relationship between industry and nature and the value of human enterprise and become responsible for the sustainability of both culture and nature as an organic whole? The answer to these questions, a hopeful “yes,” may well reside in the cultural landscape approach to resource management.

The foregoing review of the academic and government literature has yielded information about cultural landscapes and a model for a cultural landscape analysis that includes a resource survey, inventory and a historical context. This study has illuminated the possibilities of a cultural landscape analysis when applied to the SBSRP for identifying the linkages and mediations between people and the natural environment within the organic whole of the landscape. The study also pointed out how a cultural assessment can be conducted through a reading of the landscape represented by multiple types of landmarks, such as physical structures and natural features. These contain a complete story of the place called the south San Francisco Bay salt pond landscape and could be useful in establishing the 15,100-acre salt pond and levee landscape (or cultural zones or districts therein) as a culturally significant landscape and its potential eligibility for listing on the NRHP. Moreover, the cultural assessment could be helpful in the development of public interpretation themes in a heritage tourism plan, particularly for use in establishing cultural markers on a heritage corridor trail system.

SBSPRP's RMP--Scope of Work

This study provides only a suggestion as to what the scope and content of a cultural landscape analysis might look like when applied to the SBSPRP. It is anticipated that when this analysis is actually conducted, it will be a very labor-intensive task. For each phase of the analysis, a more extensive historical survey and field work will be needed to document and record a great number of natural and cultural features, including an archaeological site(s) record search, to derive a more detailed and composite picture of the landscape. This study recommends that to proceed with a more expeditious and efficient resource documentation process, the 15,100-acre landscape should be divided into a minimum of three cultural zones or complexes, e.g., Eden's Landing, Alviso, and Ravenswood, as has been mentioned previously. (Figure 2 Chap 1) Also the three zones could be divided further into smaller units. Another idea is that each zone's social or development hub could be identified and a cluster of historic properties (sites) could be evaluated within that hub. For example, the Eden's Landing cultural zone or complex might be further divided with Johnson's Landing or Robert's Landing as the development hub or social center. Within the cultural hub of the "landing," the cluster of properties would include the waterway, the levees, the salt ponds, remnants of the wharf and piling system, the salt farmer's house, and the hotel.

Historical Archives Research

A wider search in the historical archives for additional types of data and data sources should be conducted. The types of data would include primary and secondary literature sources, historical maps, photographs, and lithographs for selected time periods (e.g., 1850, 1870, 1900, 1930, and 1970). Coastal surveys, e.g., U. S. Coast and Geodetic Survey; legal documents, e.g., federal and state laws, land purchases, federal and state land use permits, and zoning regulations. Archaeological records at the Northwest Information Center at

Sonoma State University should be investigated. An analysis of the stratigraphy of the built and natural environment tracing the continuum of changes over time could be conducted. Sample sediments could be collected to use as supporting data documenting the science of the earth, biological and chemical cycling, and their relationship to stratigraphy. This stratigraphy analysis could illustrate more definitively the linkage between the geological and environmental evolution of San Francisco Bay and the built landscape, i.e., when the levees were built and the salt production history (Watt 2005).

Social History Research

Research is needed to identify and incorporate the social history of the salt pond landscape into the cultural landscape analysis. The people who lived and worked in the southern San Francisco Bay were the authors of the actions that shaped the landscape and can best tell the story of the landscape and their relationship to it. To reveal these stories, oral history interviews could be conducted with South Bay residents, Cargill salt company employees; Native Americans, e.g., Ohlone descendants at Mission San Jose; local historians and association staff. A further benefit derived from these interviews would be to identify heritage values--what they think is important about their life living and working next to the salt ponds. This information could then be used to develop public interpretation themes for the heritage tourism plan.

Assessing Significance

The task of assessing the landscape's cultural significance might begin with an assessment of a cluster of sites (see Table II Chapter IV) in one of the cultural landscape zones. Marjorie Dobkin, an historical geographer (Dobkin 1994) assessed the cultural significance of the 189-acre former salt works owned by Oliver Bros. Salt Company in Alameda County, and her method is recommended for application to the SBSPPR Dobkin

identified the Oliver Bros salt works acreage as a culturally significant salt farm landscape that had been in continuous salt production from 1850 to 1970. In Dobkin's analysis, the cultural properties and natural features comprising the salt works' landscape included a landing, a processing plant for washing and drying salt, an Archimedes screw wind pump, and other resources. She proposed that the Oliver Bros salt works' landscape is eligible for listing on the NRHP based on National Register Criterion A, a property's association with events that have made a significant contribution to the broad patterns of the region's history (NRB 15:4). She recommended that two historical themes from NRB 15 could apply to the historic salt works, i.e., Industry and Exploration/Settlement and described how the 189-acre salt works site had all of the seven aspects of historic integrity required for the National Register—location, design, setting, materials, workmanship, feeling, and association.

Based on Dobkin's method of evaluation, this study proposes that Eden's Landing could be described as culturally significant because it meets at least two and perhaps all of the NRHP criteria A through D. It meets Criteria A (association with events) because John Johnson is considered the first pioneer of salt farming at Eden's Landing and associated structures and objects show a significant contribution to the area's economic prosperity and identity as a place of industrial enterprise; Criterion B because the landscape in this zone is associated with the life of a person in the past with remarkable vision and purpose; Criterion C because the natural features, structures, and objects contain the distinctive characteristics of a method of industrial construction (mining) and illustrate the application of technology to create a successful enterprise; and Criterion D because the landscape zone reveals, and may continue to yield information important in prehistory or history.

GIS Mapping Technology

Another use of the cultural landscape analysis for the SBSPRP's RMP is its potential for the application of new mapping technologies, such as the Geographic Information System (GIS). A GIS map can represent different layers of data within a defined geographical space. Theoretically, GIS can display all the natural, built and social information of a defined geographical area. For example, for the South San Francisco Bay region, an elemental geographical or topographical map could be used as the baseline map showing boundaries of the current cities and towns, the Bay waters, landforms, and the streets and highway system; another layer could show the prehistoric condition of the Bay in the Pleistocene and the mid-Holocene eras and the evolution of the marshes; yet another could show the environmental conditions in 1850 according to the U. S. Coast and Geodetic Survey when salt production began. Another layer could show an inventory of landscape features in 1900, 1920, 1940, and 1970; yet another layer could show the archaeological sites. The GIS map file could be programmed to answer such questions as "Where are the archaeological sites in the vicinity of the Eden's Landing salt pond cultural zone?" or "How should a heritage corridor be plotted to coordinate with the S. F. Bay Trail and where on the corridor should cultural markers be placed?"

Restoration alternatives

An additional benefit of the cultural landscape analysis is that it can guide the design of the RMP's restoration alternatives for the SBSPRP. As described in the Guadalupe Watershed Stewardship Plan (Santa Clara Valley Water District 2005), the methods of salt pond engineering used during the period from the 1850s to 1920s serve as a template for the restoration design, a major goal of which is to reintegrate tidal marshes into the present-day landscape. (Table I, Chapter III) An integrated analysis enables a combined analysis of

the South Bay ecological conditions and processes and the relationship to the history of salt production may provide useful lessons and reveal solutions for achieving the objectives for flood damage reduction, habitat creation, and public access for recreation, and heritage tourism.

Topics for Future Research

This study has produced valuable information for the cultural resource management profession regarding the use of a cultural landscape framework in general, and it forms the basis for the following recommendations on topics for future academic study as well as practical application to law and policy development.

1. Connecting sites. The cultural landscape in the SBSRP's RMP can be used as a tool to connect individual landscape (features) sites (see Table II, Chapter IV) across the South San Francisco Bay to develop conclusions about historical processes based on the land in a broad context. Just as artifacts, such as pottery, e.g., a food storage bowl, can be studied by archaeologists to investigate an evolution of style and use over time, so can the cultural landscape and the human modifications made to it, such as levee and salt pond reconfiguration, be considered an artifact that can be studied for continuity of use, action, and function. A cultural landscape approach allows a shift from the traditional archaeological focus on individual sites and drives the connection among sites across a region, such as the South San Francisco Bay region.

2. Landscape as laboratory. The landscape can be used as a field laboratory serving as a classroom setting for interdisciplinary studies for urban planners, fish and wildlife land managers, local government decision-makers, and Cultural Resources Management professionals to study land-use practices and resource management. The curriculum would include subjects such as the historical and environmental processes and the interaction that

shaped the salt production landscape and illustrating the relationships between humans and nature over time in an increasingly urbanized setting. In the context of burgeoning population growth and increasing demands on the use of land for housing and infrastructure, this laboratory could function as a forum to develop informed choices leading to smarter decision-making for sustaining dwindling land resources. A class project would be to write a regional cultural resources management plan documenting the Bay's local cultural assets and the linkage to the natural environment for the greater San Francisco Bay area using the SBSPRP's RMP as a local demonstration planning study. Commensurately, as part of a regional resource management plan, an investigation could be conducted to show how a SBSPRP heritage corridor could be a model to establish a 9-county Bay-wide heritage corridor in conjunction with the San Francisco Bay Trail.

3. Heritage tourism and public awareness. The salt pond and levee system remains a vital and prominent feature on the South San Francisco Bay landscape as salt production continues on 7,000 acres alongside the SBSPRP and represents possibly the West's and San Francisco Bay's last frontier. The SBSPRP's heritage tourism plan developed through the cultural landscape analysis offers an opportunity to perpetuate a living history—a sense of continuity with the land and the public's changing relationship to it.

The cultural landscape approach points to the co-management of lands for cultural and environmental purposes (not managing for one set of values over the other). Co-management involves bringing together a number of professionals across government agencies and citizens at large over decision-making on the use of lands in the public domain. The landscape is a good geographical model for learning about environmental history because you can follow industrial archaeology as a critical path to documenting environmental history.

The key to success of the cultural landscape approach in the SBSPP RMP lies in the willingness of the land managers, regulatory agencies, and stakeholders to expand their vision for a more inclusive and publicly accessible restoration project. The vision is that through the context of the landscape, both the cultural and environmental resources, representing what may be the last frontier of the salt pond landscape, would be understood and valued resulting in a sense of shared ownership and stewardship within the community and among the stakeholders.

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