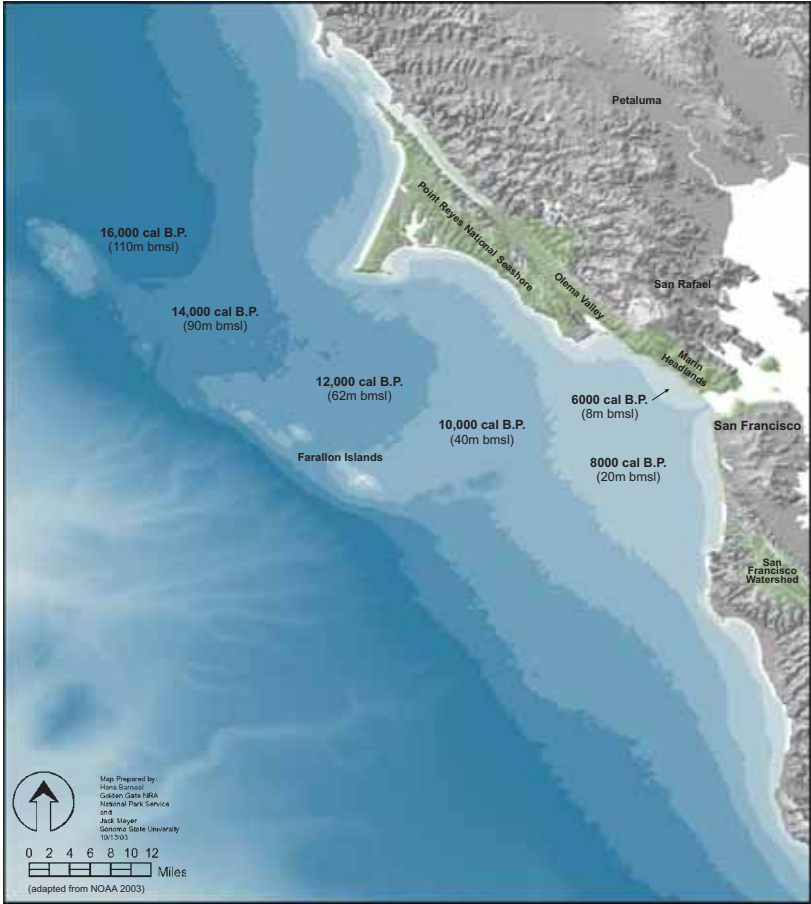


ARCHAEOLOGICAL RESEARCH ISSUES FOR THE POINT REYES NATIONAL SEASHORE – GOLDEN GATE NATIONAL RECREATION AREA



Prepared for the National Park Service Golden Gate National Recreation Area

cover: Timing and Extent of Sea-level Rise in the San Francisco Bay Area

**ARCHAEOLOGICAL RESEARCH ISSUES
FOR THE POINT REYES NATIONAL SEASHORE –
GOLDEN GATE NATIONAL RECREATION AREA**

for

**Geoarchaeology
Indigenous Archaeology
Historical Archaeology
Maritime Archaeology**

edited by

Suzanne Stewart and Adrian Praetzellis
Anthropological Studies Center
Sonoma State University
Rohnert Park, California

prepared for

National Park Service
Golden Gate National Recreation Area
San Francisco, California

November 2003

**ARCHAEOLOGICAL RESEARCH ISSUES
FOR THE POINT REYES NATIONAL SEASHORE –
GOLDEN GATE NATIONAL RECREATION AREA**

An Overview of Geoarchaeological Research Issues

by Jack Meyer

An Overview of Research Issues for Indigenous Archaeology

by Suzanne B. Stewart

An Overview of Research Issues for Historical Archaeology

by Annita Waghorn

An Overview of Research Issues for Maritime Resources

by Robert G. Douglass

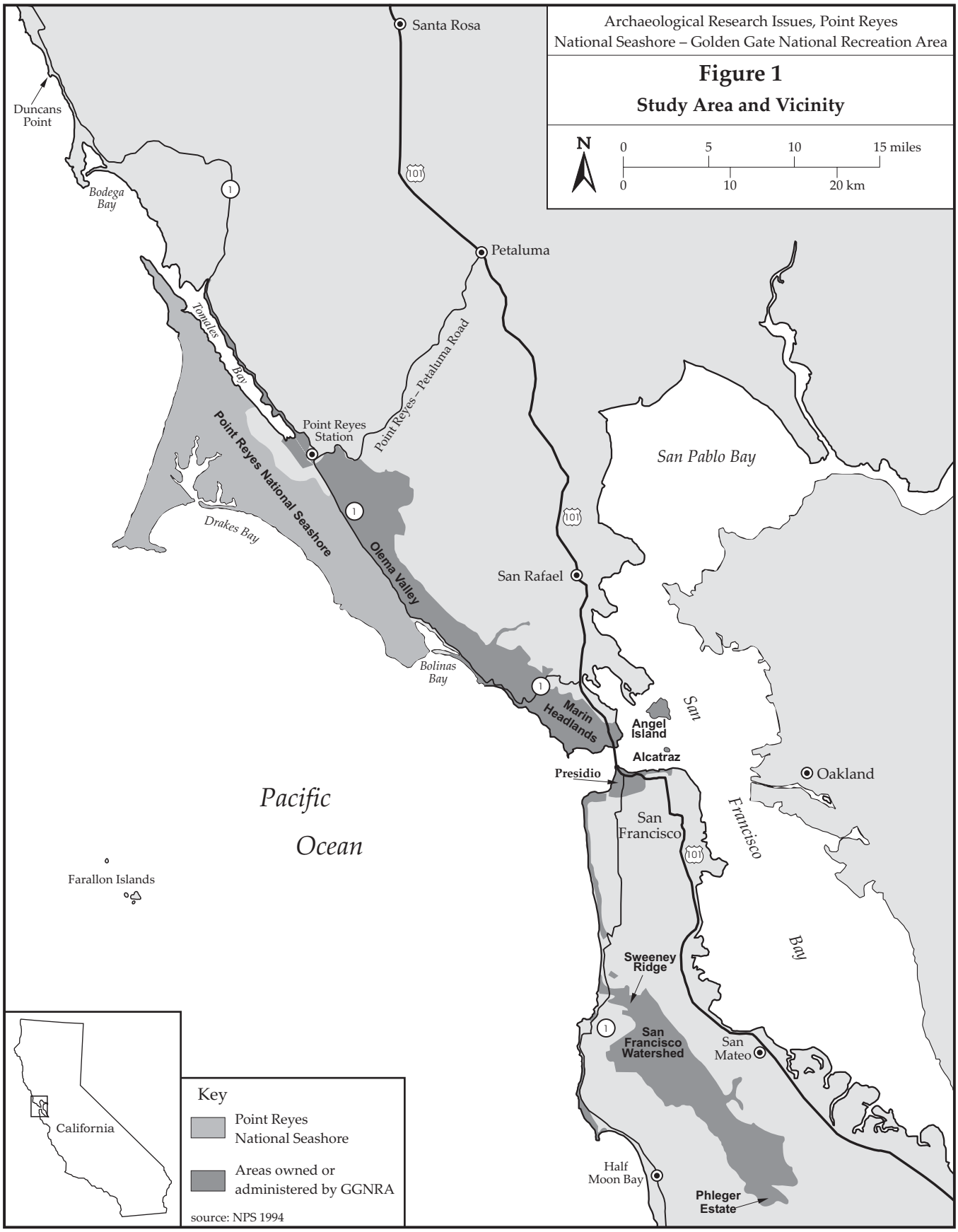
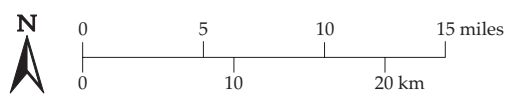
Anthropological Studies Center
Sonoma State University
Rohnert Park, California

prepared for

Leo Barker, Park Archaeologist
Division of Cultural Resources and Museum Management
Golden Gate National Recreation Area
National Park Service
San Francisco, California

November 2003

Figure 1
Study Area and Vicinity



Key

- Point Reyes National Seashore
- Areas owned or administered by GGNRA

source: NPS 1994

FOREWORD

As a part of the Archaeological Overview and Assessment for the Point Reyes National Seashore and the Golden Gate National Recreation Area, under a cooperative agreement between Sonoma State University and the National Park Service, the Anthropological Studies Center (ASC) has produced several overviews of research issues—or general archaeological research designs—to aid in management of archaeological resources in the PRNS–GGNRA parklands. The geographic scope of the study area is relatively vast, extending over 108 miles of coastline—from northern Marin County in the north into northern San Mateo County in the south (Figure 1). These overviews are necessarily general, as they are intended for use with all known and anticipated archaeological resources in the PRNS and GGNRA, an area of approximately 182,496 acres, of which only 6,000 acres have been intensively surveyed. The presentation of research issues in these overviews will assist managers and archaeologists in developing specific research designs for individual properties or specific land units as the need arises. While these overviews are presented here as a single, edited volume, each is designed to be printed out separately as a standalone document if desired. Each overview is listed below, along with a general statement of the topic and the name and credentials of the author.

The first, *An Overview of Research Issues for Geoarchaeology in the PRNS-GGNRA*, is by ASC Staff Geoarchaeologist Jack Meyer (M.A. in Cultural Resources Management [CRM], Registered Professional Archaeologist [RPA]). It takes a geoarchaeological landscape approach that incorporates human ecology, landscape evolution, and soil formation. With a focus on landforms available to human beings in the past, including buried features, it offers a new perspective on the current archaeological database. Geoarchaeological research issues that can be addressed by parkland resources are provided, along with their data requirements.

An Overview of Research Issues for Indigenous Archaeology in the PRNS–GGNRA is by Suzanne B. Stewart, a Staff Archaeologist at the ASC (M.A. in CRM, RPA). The overview discusses the evolution of research designs for prehistoric archaeology in California, and reviews local research designs and their uses. It then describes and evaluates past indigenous (prehistoric and historic Native American) archaeological research on various topics—such as chronology, settlement, social organization, and culture change—offering a discussion of research issues and data requirements for each topic. The last section brings together the research issues and data requirements for all topics to aid in developing specific research designs. (The study for indigenous archaeology had a more ambitious scope of work than the other overviews, which were conducted under modifications to the original project statement—hence its greater size.)

An Overview of Research Issues for Historical Archaeology in the PRNS–GGNRA is by ASC Staff Archaeologist Annita Waghorn (M.A. in CRM, RPA). It describes the legal context for archaeological research and enumerates the property types that are known or anticipated in the study area. Research issues and data requirements are provided for selected research themes that pertain to Spanish-colonial/Mexican-period and American-period urban and rural archaeological resources. A review of property types and research efforts related to the dairy industry (a dominant theme in the late-19th and early- to mid-

20th century on the Point Reyes peninsula) is provided in an appendix prepared by Christina MacDonald, CRM graduate student and archaeological specialist at the ASC.

An Overview of Research Issues for Maritime Resources in the PRNS–GGNRA is by Robert G. Douglass (M.A. in CRM, RPA). This overview looks at the history of the study area as it relates to human interaction with the sea, and reviews the major archaeological studies that have been conducted over the years to increase our knowledge and understanding of these local maritime activities. In order to establish a context for research, it examines current general directions in maritime archaeology and presents some relevant examples of recent activities within the discipline. The overview also suggests an organizational framework for parkland maritime resources, consisting of a range of physical property types and historical contexts that can be combined to describe most maritime properties likely to be encountered in the GGNRA and PRNS. Finally, it proposes some research questions and areas for potential study, and makes specific recommendations for future treatment of the maritime properties of the parklands.

Maria Ribeiro, ASC specialist, provided editorial assistance and graphics and production expertise in organizing and producing this volume. Her skill and diligence are greatly appreciated.

Leo Barker, Park Archaeologist, Division of Cultural Resources and Museum Management, Golden Gate National Recreation Area, provided direction from the National Park Service.

Suzanne B. Stewart
ASC Staff Archaeologist

Adrian Praetzellis
ASC Director

PART IV

**AN OVERVIEW OF RESEARCH ISSUES FOR
MARITIME RESOURCES FOR THE PRNS – GGNRA**

by

Robert Douglass, M.A.

AN OVERVIEW OF RESEARCH ISSUES FOR MARITIME RESOURCES

Robert G. Douglass

INTRODUCTION

THE MARITIME ENVIRONMENT

While San Francisco Bay forms a vast and excellent natural harbor, its seaward approaches can be extremely hazardous. Cold waters are drawn south along the coast by the California Current, and—in combination with the warmer waters farther offshore and cyclical summer weather conditions—frequently form a belt of thick fog along the shore. Winter brings storms that can pound the coast with heavy surf. Onshore northwesterly winds prevail, forcing vessels that happen to get in trouble into coastal shallows, and the rough and rocky coast stretching alongside the Golden Gate is unforgiving to mariners who drift too close. The volume of water within the Bay serves to amplify tidal flows through the narrow gate. In addition, a long, crescent-shaped sandbar lies off the Bay entrance, adding to the unpredictable waves and currents (see Espey, Huston & Associates 1988:9-11; Haller 1989). The historical importance of San Francisco and the Bay has ensured a heavy flow of marine traffic through the center of the present study area over an extended time. All in all, it is an environment conducive to the process of shipwreck, and has resulted in an abundance of maritime cultural properties in the Golden Gate National Recreation Area (GGNRA) and Point Reyes National Seashore (PRNS).

MARITIME ARCHAEOLOGICAL RESOURCES IN THE GGNRA AND PRNS

This study addresses the future of a unique class of cultural resources within the GGNRA and PRNS (aka Point Reyes–Golden Gate parklands) that lie within the Bay and ocean, and along their shorelines. Most of these sites consist of submerged shipwrecks, falling within the domain of underwater archaeology. Some sites at the edge of the marine environment, such as the remains of docks, landings, and beached wrecks, may not be underwater but are still integral parts of the maritime landscape. Maritime archaeology has been defined as the scientific study of human activity on the sea through its material remains (Muckleroy 1978:4). While the majority of these sites are indeed underwater, the more inclusive “maritime,” rather than “underwater” or “submerged,” better describes this resource group and its archaeology overall. The emphasis in this section is on historic-period properties. While possible submerged prehistoric terrestrial sites and prehistoric sites on the shoreline margin constitute a fundamental part of the larger view of human activity within the project area, those resources are considered elsewhere in this document (see Part I, Geoarchaeological Issues). Evidence of 16th-century contact at Native American sites on Drakes Estero, however, is discussed as a key part of the region’s historic-period maritime heritage. This brief overview will consider only those historic-period resources that are archaeological in nature. Thus some maritime properties potentially eligible for listing on the National Register of Historic Places (NRHP)—such as restored floating

historic vessels, substantially intact structures, and preserved buildings—are not addressed here. The kinds of archaeological resources that are under consideration can be broadly divided into shipwrecks (submerged and otherwise) and non-shipwrecks. A more detailed discussion of property types is presented below.

Sunken shipwrecks present a distinctive set of circumstances, problems, and advantages for study and management. The interests of preservation and archaeology are often in direct conflict with the agendas of professional salvors, treasure hunters, and souvenir-hunting sport divers, and much has been written about that competition (e.g., Carrell 1996; King 1998:202-204; Lenihan 1983:40-42; Vrana and Halsey 1992:82-84). The undersea environment served to limit wreck discovery and access by all parties until the invention of scuba gear in the 1940s. Subsequent technological advances in remote-sensing technology have resulted in the finding of increasing numbers of submerged sites by archaeologists and salvors alike. Defenders of the salvage ethic often contend that the destruction of the wrecking incident and the ensuing natural decay and dispersion leave little for the archaeologists to interpret. In contrast, Patty Jo Watson sums up the archaeologist's view of even the most disintegrated of wrecks, writing that George Bass's pioneering Mediterranean study at Cape Gelidonya showed that "...shipwrecks—far from being helter-skelter heaps of debris—are orderly universes of archaeological data" (Watson 1983:25).

With a combined 108 miles of coastline, much of it around the entrance to one of the world's great natural harbors, the GGNRA and PRNS contain a large number of maritime archaeological resources. The development of California, largely centered on the San Francisco Bay area, fueled the westward growth of the United States and had a profound effect on the entire Pacific Rim. Seen in this light, the historical and anthropological importance of the maritime properties of the Point Reyes–Golden Gate parklands is clear.

ORGANIZATION OF THIS OVERVIEW

This overview looks at the history of the study area as it relates to human interaction with the sea, and reviews the major archaeological studies that have been conducted over the years to increase our knowledge and understanding of these local maritime activities. In order to establish a context for research, it examines current general directions in maritime archaeology and presents some relevant examples of recent activities within the discipline. The overview also suggests an organizational framework for parkland maritime resources, consisting of a range of physical property types and historical contexts that can be combined to describe most maritime properties likely to be encountered in the GGNRA and PRNS. Finally, it proposes some research questions and areas for potential study, and makes specific recommendations for future treatment of the maritime properties of the parklands.

GGNRA AND PRNS MARITIME HISTORICAL OVERVIEW

Various authors have addressed the prehistory and ethnography (Kelly 1978; Levy 1978; Moratto 1984:217-283) and post-contact history (Delgado 1989a; Delgado and Haller 1989b; Hickman 1974; Lenihan 1984; Skiles 1984) of the study area. Only a very brief outline of the historic period is presented here.

Portuguese-born Juan Rodríguez Cabrillo, sailing under the Spanish flag, probably pushed as far north as Point Reyes in 1542. By 1565 the Spanish colonists of Mexico had established a trade route to the Philippines that required traveling along the California coast within sight of Point Reyes. In 1579 English privateer Francis Drake careened his ship *Golden Hind* on a California beach, frequently identified with a small cove at the mouth of Drakes Estero in the PRNS. Drake and the *Golden Hind* crewmembers were probably the first Europeans to set foot in California, naming the land “Nova Albion” and claiming it for England. A 1593 Spanish royal decree limited the treasure-laden “Manila galleons” to a single annual voyage, creating pressure to establish a California base (Rawls and Bean 1998:24). A Manila galleon captain, Sebastián Rodríguez Cermeño, was charged with exploring the California coast for a possible port on his return voyage in 1595. He lost his ship *San Agustín* along the coast in 1595, at a place well supported by documentary evidence to have been Drakes Bay, near the mouth of Drakes Estero. *San Agustín* survivors eventually returned to Mexico in a small launch they had carried with them, the *San Buenaventura* (Aker 1965; Lenihan 1984:29-34). Basque explorer Sebastián Viscaíno’s coastal expedition landed at Drakes Bay in 1603, in search of salvage from the earlier wreck. A crewman who had been with Cermeño identified the place as the site of the *San Agustín* disaster (Hickman 1974:5-6).

Early maritime explorers never found San Francisco Bay’s Golden Gate entrance. An overland expedition under Gaspar de Portolá, traveling north from San Diego, accidentally happened on the Bay in 1769, while trying to find Monterey. A small Spanish launch entered the Bay on 5 August 1775, followed the next day by the frigate *San Carlos*, the first two non-native craft to ply its waters (Rawls and Bean 1998:38). Later European expeditions visiting the northern California coast included those of Spaniards Juan Pérez (1774) and Francisco de Bodega y Cuadra (1775), Englishman George Vancouver (1792 and 1793), and Russians Nikolai Rezanov (1806) and Otto von Kotzebue (1816).

While Spanish colonization proceeded under the mission system, a profitable trade in furs—primarily of the sea otter that thrived in Upper California—developed along the coast. Yankee sea captains were taking West Coast sea-otter pelts to the Chinese market as early as 1796 (Rawls and Bean 1998:66). Intensive Russian fur-hunting activities began in California in 1808 at Bodega Bay, and in 1811, three Russian-American Company ships supporting 120 Aleut hunting *baidarkas* anchored in Drakes Bay. The main Russian colony was founded at Fort Ross in 1812. Sea otters in the study area may have been largely eliminated as early as 1817 (Hickman 1974:10; Lightfoot, Wake, and Schiff 1991:3,17).

The rancho-based economy, culminating during the period of Mexican control from 1822 to 1846, led to the development of a robust hide-and-tallow trade on the California coast. Dominated by Yankee traders, the trade brought New England ships laden with eastern manufactures as well as Chinese goods to be exchanged—for hides to supply East

Coast tanneries and factories, and for tallow to be traded to Lima (Delgado 1989a:8; Hitchman 1990:12).

The American conquest and the Gold Rush following on its heels brought a flood of people and trade, dependent on ocean transportation, to San Francisco Bay. As the city grew, farms, sawmills, and other producers sprang up in the surrounding region to fuel that growth. Much of the local trade and, until the completion of the transcontinental railroad in 1869, all non-local commerce depended on ocean shipping through the Golden Gate. Lumber, especially redwood from Santa Cruz north to the Oregon border, made up a large part of the local coastal shipping, leading to the development of specialized schooners adapted to the small “doghole” ports (McNairn and MacMullen 1945:2, 14-20; Sullenberger 1980:51, 53-54). In addition to lumber, other important products like cordwood, tanbark, butter, and potatoes were shipped up and down the coast to Bay Area markets (see Douglass 2002:287-300). Outbound ships took goods and supplies from San Francisco factories and warehouses to the small port hinterlands in return. Locally, redwood lumber and cordwood from Olema and adjoining valleys were shipped to San Francisco from Bolinas Lagoon, and many schooners were built in the GGNRA along the lagoon in the 1850s (Toogood 1980). Dairy and pig ranchers settling in the Point Reyes area found Drakes Estero to be a suitable port for shipment of their products, and a thriving fishing industry also came to use the little harbor as a base (Skiles 1984:21-24).

A shipbuilding industry developed around San Francisco Bay, with the first California-built steamer sent down the ways at Benicia in 1849. San Francisco shipyards, mostly in the Hunter’s Point area, built 18 steam and 49 sail vessels in 1870 (Hitchman 1990:26-27). Early transport around the Bay Area depended on ferries, scow schooners, and river steamers, connecting with a growing network of roads, and eventually with local rail lines like “Ferryboat King” Charles Minturn’s Petaluma & Haystack Railroad (Delgado 1989a:9; Kneiss 1956:1-5).

As California grew, immigration by schooner, clipper, and steamer, around the Horn or over the Panamanian land crossing, continued to expand the population. Railroad construction brought an increase in Chinese immigrants to fill the labor vacuum, and in 1867 Pacific Mail Steamship Company began regular service to China, Japan, Australia, and New Zealand (Hitchman 1990:19-20). After the opening of the transcontinental rails, Chinese laborers found work in agriculture, mining, fishing, construction, manufacturing, and service industries, and the trans-Pacific passenger transport continued, along with a trade in Asian goods to supply the immigrants. Not only were there large numbers of Chinese living and passing through San Francisco, but Point Reyes also developed a Chinese population (Hickman 1974:17).

The Presidio and other installations on the Bay brought military activities and Navy ship traffic to the Golden Gate, increasing in times of war. Other maritime pursuits bringing boats and ships into, along, or through the project area included fishing, sealing, whaling, and petroleum transport. By the late 1930s, the ocean transport of lumber had all but ceased. Sealing and whaling also passed into oblivion. At the present time, air flights and highway travel have eliminated practically all seagoing passenger transport except occasional cruise ships, and base closures have severely curtailed military activity on the Bay. East Bay facilities still support substantial tanker and container ship traffic, and a

commercial fishing industry still operates out of various ports on the San Francisco Bay and on the ocean coast to the north at Bodega Bay.

MARITIME ARCHAEOLOGY IN THE GGNRA AND PRNS

The historical importance of both the San Francisco Bay region and Drakes Bay has resulted in several significant local maritime archaeology projects. Pioneering work, especially in the area of remote-sensing survey, has been accomplished on the beaches of the Golden Gate parklands in the past several decades. Supporting the fieldwork, researchers have produced a large body of historical background material on the properties and their contexts.

GGNRA

GGNRA archaeologist Martin Mayer and GGNRA historian James Delgado relocated previously reported wreckage of a Gold Rush-era sidewheel steamer, *SS Tennessee*, at Tennessee Cove on the Marin County shore in 1980. The site was recorded and placed on the National Register of Historic Places (NRHP) in 1981. Storm erosion led to collection of exposed artifacts, limited excavation, magnetometer survey, and some diving at the site (Delgado 1989b:15-17). Delgado (1981) produced a research design for the *Tennessee*, in which he outlined several goals or possible benefits of the study. These included expanding then-current knowledge of archaeological technique and interpretation of widespread, discontinuous wreck sites, and increasing understanding of some of the technologies represented in the *Tennessee*. He also advocated combining the archaeological evidence with the broadest possible array of documentary evidence to produce higher-level interpretations of maritime history and frontier culture (Delgado 1980:18-23). Storms in the winter of 1983 revealed part of the sternson (a brace between the keelson and sternpost) from an unidentified early- to mid-19th-century wreck, possibly from a ship as long as 130 feet, at Rodeo Lagoon along the Marin Headlands. It was removed to prevent looting, documented, and placed at the San Francisco National Maritime Museum (Delgado 1989b:17-18).

Delgado and a volunteer crew completely hand-excavated, documented, and reburied shipwreck remains that had been partially storm-exposed on Ocean Beach at Fort Funston in late 1982. Analysis of the hull and historical research subsequently identified the ship as the 1882 West Coast-built schooner *Neptune*, wrecked in 1900. Delgado (1983) wrote up the project, which utilized wood analysis and comparison with a surviving West Coast schooner, *C.A. Thayer*. Also on Ocean Beach, near Ortega Street, storms exposed portions of a partially submerged wreck during 1982 to 1983, and again in 1984. The remains were documented, and historical research and wood-sample analysis identified the ship as the 1856 medium clipper *King Philip*, wrecked in 1878. The property is important not only as the most intact wooden wreck in California, but also as the only known archaeological example of an American medium clipper. Remains of a second vessel were found intermixed with *King Philip*, and were identified as belonging to the 1902 wreck of *Reporter*, an 1875 schooner wrecked in 1902. Both ships were listed on the NRHP in 1986, and as of

1995 had been completely reburied by natural sand accretion (Delgado 1989b:18; Jablonowski 1995:13-14).

GGNRA joined forces with the Nautical Heritage Museum of Dana Point, California, and the U.S. Coast Guard in a 1983 survey to locate the remains of the revenue cutter *C.W. Lawrence*, built in Washington, D.C., in 1848, and run aground on Ocean Beach in 1851. Magnetometer survey onshore covered an 1,800-foot-long stretch of beach near the foot of Sloat Boulevard. Anomalies, possibly representing remains of *C.W. Lawrence* or one of two other ships known to have wrecked in the area, were recorded. Offshore magnetometer survey aboard a Coast Guard vessel was severely hampered by surf conditions, so that very little of the targeted submerged area within GGNRA boundaries could be surveyed. An anomaly cluster, possibly representing the 1894 wreck of the lumber schooner *William L. Beebe*, was nonetheless identified (Delgado, Murphy, and Kelly 1984).

In 1987 Espey, Huston & Associates completed a magnetometer survey of 2,770 feet of Ocean Beach, between Noriega and Santiago streets, for a seawall construction project. This survey relocated the *King Philip/Reporter* site and found two more wreck sites, one of which was believed to be that of the 1851 whaler *Atlantic*. In addition, scattered debris possibly originating with the 1916 offshore breakup of the 1899 steam schooner *Aberdeen* was found in the project area. Espey, Huston & Associates conducted test excavations at the suspected *Atlantic* site, which was in an area of construction impact, in 1988. Although the excavations revealed a section of keel possibly belonging to the *Atlantic*, the investigators concluded that it was unlikely that any articulated remains would extend into the construction impact zone (Espey, Huston & Associates 1988).

In 1995 the Anthropological Studies Center at Sonoma State University and the NPS Submerged Cultural Resources Unit (SCRU, now the Submerged Resources Center [SRC]) surveyed the entire 3 miles of Ocean Beach within the GGNRA for the U.S. Army Corps of Engineers and the City of San Francisco, as part of a storm-damage-control study. For this survey, a proton-procession magnetometer mounted on a sled was towed along beach transects 3 meters apart, with the resulting data linked to the global positioning system (GPS). The study found 38 anomalies, 19 of which were tested by hand-excavating 3 x 3 foot units to depths of around 4 feet. Where soil consistency allowed, auger holes were placed in the bottom of units, to additional depths of 2 to 3 feet. No actual shipwreck remains were found by this subsurface testing, and even the formerly exposed *King Philip/Reporter* site could not be relocated, although anomalies possibly associated with the wrecks were noted (Jablonowski 1995).

PRNS

In 1940 Robert F. Heizer conducted an excavation under University of California, Berkeley auspices at a Coast Miwok site on Drakes Estero (CA-MRN-232). He recovered iron spikes and Chinese Ming dynasty porcelain sherds, many of which dated to the Wan-li period, from 1573 to 1619. The following year, further U.C. Berkeley excavations under Richard Beardsley at CA-MRN-232 and three nearby Native American sites recovered more spikes and Chinese porcelain. Heizer posited that the artifacts derived from the wreck of Cermeño's *San Agustín* (Moratto 1974:50-51, 1984:234). Clement Meighan

conducted additional excavations at Estero sites in 1949 and 1950, finding more porcelain and possible stratigraphic evidence of a 16th-century deposit predating the supposed Cermeño materials. The Drake Navigators Guild (DNG) was formed in 1949 by avocationalists interested in identifying the Nova Albion site, and, focusing on the Drakes Cove area at the mouth of the Estero, conducted or participated in numerous surveys and excavations over the ensuing years (Moratto 1974:54-55, 1984:270-271). Various Native American sites around the Estero and adjacent coast underwent considerable excavation in the 1950s and 1960s. Among those investigating sites in the area were Aubrey Neasham, Adán Treganza, and DNG member Edward Von der Porten (with Santa Rosa Junior College students). By the mid-1970s, around 800 artifacts of 16th-century Asian or European origin had been recovered from Estero-area Native American sites (Kelly 1984:14-16; Moratto 1974:61). In his 1974 assessment of PRNS cultural resources, Moratto deplored the large number of excavations that had focused on 16th-century contact evidence at the expense of prehistoric study, saying that many of the studies had been “myopic and wasteful of data” (1974:61).

Analysis of the Chinese porcelain finds at Drakes Bay led Shangrow and Von der Porten (1981) to propose that stylistic differences between waterworn and non-waterworn specimens support assignment of the waterworn sherds to the *San Agustín* shipwreck event. They attribute non-waterworn sherds to an earlier Drake landing, bolstering the Drakes Cove Nova Albion theory. More recently, Jones (2000) has examined the collection and written observations of avocationalist Royal Jimerson, who collected and noted provenience of in excess of 282 sherds, ascribed to the *San Agustín*, along the beach at Drakes Bay between 1965 and 1989. Condition of the sherds seems to indicate a surf-driven movement from near the mouth of the Estero, eastward along the seaward Limantour beach. Although this appears to demonstrate that the sherds are coming ashore near the Estero mouth, Jones cautions against taking this as evidence that the Cermeño wreck is in that area.

In 1965 and 1966, John Huston of the Council on Underwater Archeology, in conjunction with the NPS, conducted the first systematic survey in the United States to use a rubidium marine magnetometer, along the shoreline at Limantour Spit. Huston died in 1968 before he could issue a report. Results of this study are therefore somewhat vague, but four anomalies were located, and some ground-truthing by divers may have been accomplished. In 1967 Sheldon Breiner, of magnetometer manufacturer Varian Associates, attempted to locate a large anchor and chain known to be submerged in the Chimney Rock area. His cesium magnetometer apparently found the object, but it was not recovered (Kelly 1984:16-20).

NPS SCRUC chief Daniel Lenihan headed the first large-scale remote-sensing survey of underwater archaeological resources on the West Coast at Drakes Bay in 1982 and 1983, a combined effort of the NPS and the National Oceanic and Atmospheric Administration (NOAA). Combining proton-precession magnetometer, side-scan sonar, and sub-bottom profiler data, the project developed baseline geological data, located 49 potential wreck sites in the form of magnetic anomaly clusters, and gained practical knowledge in the use of hardware and techniques in the central California coastal environment. The survey also resulted in the location of five shipwrecks: those of the steam schooners *Pomo* (1914), *Hartwood* (1929), and *Shasta* (1939); that of the freighter

Munleon (1931); and that of the oil tanker *Richfield* (1930). As an adjunct to the main orientation of the project toward shipwreck resources, a single non-shipwreck maritime site was also examined and documented during fieldwork. This consisted of the semi-submerged remnants of a wharf, located in the Schooner Bay arm of the Estero. The structure was tentatively identified as a 200-foot pier built sometime after 1879 and used by local ranchers (Carrell 1984:49-51; Skiles 1984:22). Media interest in a more glamorous aspect of the survey, the possibility of finding the *San Agustín*, resulted in favorable public exposure for the project. The survey produced two NPS reports (Carrell 1984; Murphy 1984), detailing the project and its results (Delgado and Haller 1989:20).

The 1984 Murphy report included analysis of a possible location of the *San Agustín* proposed by DNG historian Raymond Aker that concluded that the likely wreck site was somewhat farther west than Aker believed (Lenihan 1984:30-34). Soon after the report was issued, treasure hunter Robert Marx filed a claim on the *San Agustín*. He proposed to excavate using propwash deflection and pay for the project by selling artifacts. Resulting litigation prevented further archaeological testing by the NPS until 1990, when Marx gave up trying to obtain permission to excavate (Delgado 1989c:180, 1997:357; Schinske 1997; SCRUI et al. 1997:2). In 1997 and 1998, SCRUI, NOAA, the California State Lands Commission, San Francisco National Maritime Historic Park staff, DNG, and others joined to participate in a new underwater survey at Drakes Bay, once again using remote-sensing equipment (now linked to GPS locational technology), as well as diving. Location of the *San Agustín* was one of the stated goals of the project. Other objectives outlined in the research design included conducting further surveys of remote-sensing signatures obtained during the 1982-1983 study, ground-truthing those anomalies with diver inspections, comparing Drakes Bay sensing data to artifact signatures from similar projects, and verification of possible submerged paleodrainage channels suggested by the previous study (Kelly 1997:1). DNG also investigated a suspected Cermeño campsite on Limantour Spit using metal detectors. While experience was gained with newer technologies, and better mapping of magnetic anomalies and other data was acquired, both ship and camp remain unlocated (Kelly 1999; Schinske 1998).

1989 SUBMERGED CULTURAL RESOURCES ASSESSMENT

In 1989 Delgado and Haller published a combined Submerged Cultural Resources Assessment for the GGNRA, PRNS, and the Gulf of the Farallones National Marine Sanctuary (GFNMS). Much of the document details the results of historical research on wrecked ships inside the three-part study area. Of the 151 shipwrecks known to exist within that area, 136 are described in the document, 15 Drakes Bay wrecks having already been covered in the Murphy (1984) report. Also in 1989, Delgado and Haller published a popular-press book on the subject, *Shipwrecks at the Golden Gate: A History of Vessel Losses from Duxbury Reef to Mussel Rock*.

RESEARCH CONTEXT

GENERAL TRENDS IN MARITIME ARCHAEOLOGY

Maritime archaeology has had a tendency, perhaps related to funding, to be driven by historical particularism in a “discovery mode.” Additional pressure serving to encourage this approach comes from salvage/treasure-hunting activities, which generally find public approval. The search for *San Agustín* is a good local example: while many valid archaeological questions could, of course, be addressed by the wreck, the glamour attached to finding a Manila galleon has undeniably fueled the search over the years. With the rise of cultural resources management practice in the past 30 years has come an increasing call toward a more anthropological orientation in maritime archaeology (Gould 1983, 2000:24; Lenihan 1983:47-50). Gould points out that the discipline can use better physical sampling methods for areas under survey, and better cultural sampling to help move away from “the celebrity ship fixation that has characterized much of the field in the past” (2000:24). Lenihan (2000:23) points out the importance of the concept of cultural landscapes and whatever maritime variants may be derived from it. These trends in maritime archaeology fit in with the tone of the revised NPS Thematic Framework for evaluating cultural resources, which emphasizes a holistic approach based on people, time, and place (NPS 2003).

CONTEMPORARY MARITIME ARCHAEOLOGY

NPS initiated the Systemwide Archeological Inventory Program (SAIP) in 1992 in order to identify cultural resources within the park system and develop preservation, management, and interpretation strategies. As a result, SCRUC began a pilot project at Dry Tortugas National Park in the Florida Keys to generate a submerged-site survey program suitable for use in varying environments throughout the park system. Previously, the only systematic maritime survey accomplished within NPS had been the 1982/1983 Drakes Bay Project (Murphy 1996; see Carrell 1984; Murphy 1984; and above). Preliminary groundwork for the Dry Tortugas Project was laid by a comprehensive study resulting in the publication of a Submerged Cultural Resources Assessment (Murphy 1993). The survey was designed to utilize a regional and cultural approach: “The primary assumption was that a maritime site reflects cultural patterns in its unique features as well as in the features it shares with similar sites throughout the region” (Murphy 1996). The project solved the technical problems of large-scale, minimum-impact, underwater survey by a GIS-based array of remote-sensing equipment assembled on a towed platform. Three fieldwork seasons, in 1993, 1994, and 1995, covered approximately 27 square miles of the park.

The Underwater Archaeology Program at Florida State University has conducted surveys in the vicinity of Dog and St. George islands on the Gulf Coast from 1999 to 2002. The area has a rich and extended maritime history that has left a number of important shipwrecks and other properties. Students have accomplished identification and documentation of resources using diving and remote sensing, as well as excavation at some of the wrecks (Darmour and Horrell 2002:13-15). The 1999 research design stipulates an anthropological approach to the project, with goals of producing data that will address

questions of culture conflict, shipboard hierarchies, and a regional view of 18th-century Florida and the Caribbean (Meide 1999:15).

The role of the vagaries of nature in shipwreck investigation is illustrated by spur-of-the-moment fieldwork at the site of the 1911 wreck of the lumber schooner *Comet*, on San Miguel Island in California's Channel Islands National Marine Sanctuary (CINMS). A known beach-buried wreck, the site was found by a ranger when it was uncovered by sand erosion in 1999. With an impending storm threatening to rebury the site the following day, CINMS Cultural Resources Coordinator Robert Schwemmer had only a few hours to fly to the island and conduct a hurried investigation. The spontaneous fieldwork produced valuable structural details of the *Comet* (Schwemmer 1999).

Schwartz (1995) reported on a 1993 archaeological survey and associated historical research focusing on 19th-century Chinese abalone camps and processing sites on San Nicolas Island. The survey located 26 sites, some with distinctive rectangular hearth features. Schwartz proposes that camps may have been located to avoid conflict with ranchers, and also to take advantage of flat bedrock formations for drying the finished product.

An NOAA pilot project, the Pacific Coast Maritime Archaeological Summary (PCMAS), was initiated in 2002, with the goal of organizing existing data on maritime resources on the Pacific coast of the United States. There are an estimated 10,306 historically documented shipwrecks within that area. A major result of the project was the creation of the PCMAS Database, into which various existing databases are being merged and standardized within a newly devised typology system, and three related databases. The databases allow analysis to prioritize research and preservation efforts. The PCMAS Database promises to be a valuable study and management tool on the West Coast, and a model for other regions (Vezeau 2003).

MARITIME PROPERTY TYPES AND HISTORIC CONTEXTS AT GGNRA/PRNS

NPS defines a property type as "a grouping of individual properties based on a set of shared physical or associative characteristics" (NPS 1998:Appendix A). This definition leaves much room for interpretation, from the very general to the very particular. Property types are commonly described in terms of a combination of both physical and associative characteristics. NPS defines a historical context as "an organizing structure created for planning purposes that groups information about historic properties based on common themes, time periods, and geographical areas" (NPS 1998:Appendix A). A property type can consequently be viewed as a set of similar physical properties that fall within a given historical context. As it is clear that the primary physical type of maritime resource property in the project area is the shipwreck, maritime resources can be divided initially between shipwreck and non-shipwreck properties.

Shipwrecks

National Register Bulletin 20 lists five types of vessels that may be eligible for listing in the Register: floating historic vessels, dry-berthed historic vessels, floating or displayed small craft, substantially intact hulks aground on the shoreline, and shipwrecks (NPS

1992:2-3). Although there might be a point when a hulk becomes archaeological (such as the *Niantic* hull buried in downtown San Francisco), or when an excavated small craft might be displayed, vessels constituting archaeological resources almost always fall within the NRHP shipwreck category. Depending on wrecking circumstances and subsequent movement, shipwrecks can be submerged or on land, and buried or partially exposed in either environment.

Delgado and Haller (1989a:x) stated that research at time of the 1989 Submerged Cultural Resources Assessment showed 78 shipwrecks lying within the jurisdiction of the GGNRA and 32 within the jurisdiction of PRNS. These represent a broad range of time and vessel types, and include ships like the as-yet-unlocated 1595 *San Agustín* wreck, the hide-and-tallow-era brigantine *Ayacucho* (1841), the Pacific Mail passenger and cargo steamer *City of New York* (1893), and numerous coastal schooners.

Buller and Delgado (1984:35-37) introduced what might be regarded as an overall regional theme, “Maritime Development on the Pacific Coast, 1848-1940,” in the 1984 Phase I Reconnaissance report for the PRNS and Point Reyes–Farallon Islands National Marine Sanctuary (now the GFNMS). They also created four contextual vessel classifications for Drakes Bay wrecks: Manila Trade and Voyages of Exploration (1556–1776), Hide and Tallow Trade (1826–1848), West Coast Lumber Trade (1850–1936), and Coastal Trade (1848–1939). Assessing the combined submerged resources of the GGNRA, PRNS, and GFNMS several years later, Delgado (1989a:7-10; see also Delgado and Haller 1989b) expanded the larger theme to “Maritime Development on the Pacific Coast, 1542-1945,” spanning the four centuries from Juan Rodríguez Cabrillo’s exploratory voyage through the end of World War II. He also proposed the following 15 Maritime Trade Contexts to categorize the project’s 151 shipwrecks:

- Voyages of Exploration and Settlement
- Hide and Tallow Trade
- The California Gold Rush
- General Coastal Trade, 1848–1939
- Pacific Coast Lumber Trade, 1850–1936
- Whaling
- Fishing and Sealing
- Transpacific Passenger and Cargo
- Coastal Passenger Trade
- Tugs and Marine Salvage
- General Carrying Trade, 1854–1939
- California Grain Trade
- Petroleum Trade
- Pilots and Aids to Navigation
- Naval and Military Activities

Non-shipwreck Properties

Non-shipwreck maritime sites encompass a wide variety of resources, including docks and wharves; navigation aids; dumps; shipbuilding and repair sites; and fish-, shellfish-, and sea-mammal-processing sites. These might be found partly or completely underwater, or on dry land within the littoral zone. Certain resources, wholly or partially submerged and yet not strictly related to maritime activities can be considered pragmatically as maritime resources. An example of this property type would be underwater dumps such as the deposit of sawmill tramcar remains found on the seabed at Bawley Point, Australia (Tracey 1997:188-209). Another example would be submerged aircraft wrecks, present in coastal waters in many parts of the world. A survey of participants in the PCMAS project mentioned above found that 95 percent of respondents thought that aircraft should be included in the database (Vezeau 2003:12).

Carrell (1984:48) outlined 10 types of underwater non-shipwreck sites that might be found in the PRNS and included prehistoric sites, not considered in the context of the present maritime study. The proposed types are divided chronologically into 3 groups: Prehistoric Occupation (pre-1830), Early Historic (to 1900), and Historic (1900 to present). She emphasized that this was not a comprehensive list to cover all existing sites, but rather a starting point for future inventorying. Within the 10 site types, there was substantial overlap: for example, 6 of the 8 historic-period classifications included landings in their descriptions.

Physical Property Types

A structured approach, based on physical descriptions that can be combined with appropriate historic contexts, may be useful in describing GGNRA/PRNS property types. Placing shipwrecks at the top of the list, followed by non-shipwreck resource types derived in part from Carrell (1984:48), the following physical categories cover most historic-period maritime archaeological properties known or considered possible in the study area:

- **Shipwrecks and hulks:** includes submerged, beached, and buried wrecked vessel remains, and hulks of vessels intentionally abandoned or retired.
- **Fishing, hunting, resource gathering, and processing sites:** includes sites resulting from small-scale resource exploitation, like abalone- and other shellfish-processing, shrimp- and kelp-drying, and fish-processing.
- **Permanent habitation sites:** includes permanent domestic residence sites along the coast and related to maritime activities, characterized by either existing buildings or structural remains of habitations.
- **Coastal camps:** includes non-permanent coastal domestic sites related to maritime activities, such as campsites of stranded mariners (e.g., the as-yet-unlocated Cermeño camp) and fur hunters/trappers.
- **Wharves, landings, and anchorages:** includes permanent port facilities such as wharf structures, breakwaters, chutes and related anchorages, and shipping warehouses.
- **Dumps:** includes refuse deposits on the coastal margin resulting from maritime activities or from people using the ocean as a place to dispose of refuse.

- **Aids to navigation:** includes resources such as lighthouses, range lights, daymarks, and sound signals, and their related supporting infrastructure.
- **Shipbuilding/refitting/careenage sites:** includes sites where shipbuilding or refitting took place, ranging from single-use careenages to permanent facilities.
- **Processing/industrial sites:** includes larger-scale seaside industrial sites where marine natural-resource processing took place, such as sealing and whaling stations.
- **Submerged aircraft wrecks:** includes the remains of aircraft lost at sea or in the littoral zone, thus becoming part of the marine environment.
- **Other:** this category is reserved to accommodate those maritime resources that cannot be logically placed elsewhere.

Contexts for Property Types

The physical types of sites listed above can be associated with appropriate historic contexts to define property types. The following list of themes and periods of significance represent possible historic contexts for maritime properties within the project area. While these themes are intended to cover most property associations, the list should not be viewed as complete. The themes are based on the ideas of Delgado (1989a:10-12) and Carrell (1984:48), with some modifications and additions. The citations given are for determining the periods of significance, some of which may require adjustment in the future.

- Voyages of Exploration and Settlement, 1542–1800 (Delgado 1989a:7-8; Hitchman 1990:3-9)
- Hide and Tallow Trade, 1826–1848 (Buller and Delgado 1984:37; Hitchman 1990:12)
- Fur Trade and Sealing, 1786–1911 (Hitchman 1990:11,49)
- The California Gold Rush, 1848–1869 (Delgado 1989a:9)
- General Pacific Coastal Trade, 1848–1939 (Delgado 1989a:10)
- Pacific Coast Lumber Trade, 1850–1936 (Delgado 1989a:11)
- Whaling, 1800–1971 (Daugherty 1979:8-9)
- Bay and Ocean Fishing, 1848–present (Hitchman 1990:28)
- Transpacific Passenger and Cargo, 1867–present (Hitchman 1990:20)
- Coastal Passenger Trade, 1847–1940 (Hitchman 1990:19,66)
- Tugs and Marine Salvage, 1860–present (Hitchman 1990:19,66)
- General Carrying Trade, 1854–1939 (Delgado 1989a:12)
- California Grain Trade, 1864–1899 (Rawls and Bean 1998:160, 197)
- Marin County Dairy Ranching and Agriculture, 1857–1900 (Hickman 1974:16-17)

- Petroleum Trade, 1920–present (Hitchman 1990:60-61)
- Pilots and Aids to Navigation, 1849–present (Hitchman 1990:31)
- Naval and Military Activities, 1847–present
- Yachting and Recreation, 1867–present (Hitchman 1990:28)
- Prohibition, 1920–1933

RESEARCH AREAS AND QUESTIONS FOR MARITIME PROPERTIES WITHIN GGNRA/PRNS

Maritime properties are evaluated for their eligibility to the National Register under the NRHP Criteria for Evaluation, using either one or a combination of criteria (NPS 1992). Considering the number and diversity of resources within the parklands, it is almost certain that many properties would be eligible under a range of criteria. Site-specific historical research, however, would be necessary to address a property's eligibility under Criteria A, B, and C. Determining the eligibility of a particular resource under NRHP Criterion D, which is based on a resource's ability to yield information, would require the development of an extensive set of questions and data requirements. While this overview is not intended to support research programs of this nature, the following suggestions for potential study and related questions can guide the development of research programs for specific historic properties among the parklands' maritime resources.

- Delgado (n.d.:8, 1989a:13) noted that the large number of shipwrecks around the Golden Gate, with multiple examples of given kinds of vessels, creates a large body of individual study collections of different vessel types. This generates opportunities to make comparisons between similar vessels on many levels. How much did ship construction and repair quality vary within a group of like vessels? How are ethnicity, social stratification, and quality of life of officers, crews, and passengers reflected across a range of similar vessels?
- Coastal lumber (and related cordwood and tanbark) shipping was notoriously dangerous, especially at the loading end of the voyage. Small "doghole" ports along the rocky coast, steep cliffs requiring loading chutes, and treacherous surf and tides combined to make taking on a load of lumber, cordwood, or bark a hazardous proposition (Sullenberger 1980:51-56). Did the willingness to take risks required of captains and crews to call at the doghole lumber ports translate to a higher degree of risk-taking (and therefore more shipwrecks) at the Golden Gate end of the voyage? Did the high-risk behavior extend to ship repair and maintenance? What is the relationship, if any, between cargoes and risk-taking?
- The Chinese experience in California and the Bay Area is closely connected with the ocean, bay, and shoreline. Considering the historically large local Chinese population, as well as the fact that San Francisco was an immigration gateway to the entire west, a Chinese presence should always be considered as a possibility when interpreting archaeological evidence at parkland maritime sites. How do shrimping and fishing sites compare with sites resulting from lesser-known



Figure IV.1. San Francisco Fisherman's Wharf, ca. 1905 (*courtesy of NPS*).

industries like abalone and seaweed procurement and processing? How do maritime activity sites in the study area compare with like sites in dissimilar environments, such as the Channel Islands, in aspects such as processing methods and site selection (see Schwartz 1995)? Can comparing amounts of imported goods at sites near San Francisco with data from more remote sites provide insights into quality of life differences between similar groups in different environments? How is the difference between individual entrepreneur operations and contract labor situations reflected in the archaeological record, and how did diet quality differ between coastal and inland Chinese work sites (see Douglass 2002:106-109, 196,197)?

- Looking at the interaction and contrast between maritime and land-based cultures historically can help to clarify California's place in the world today. How did the maritime subculture affect and help define life in San Francisco and the Bay Area, and how did the distinctive Bay Area culture influence the coastal maritime subculture in return? In what ways did life aboard San Francisco-based vessels differ from life aboard ships home-ported elsewhere? Are such differences reflected in the archaeological record?
- Coastal areas in northern and central California depended on maritime trade well into the 20th century, and were strongly tied to the San Francisco Bay. In what ways did coastal shipping create a regional landscape? What were the elements of that landscape? How did people perceive the combined land-and-seascape? How do study-area maritime properties reflect the concept of regional landscape, and how can they help interpret that concept to the public?

RECOMMENDATIONS

The recommendations of previous studies form the core of the list presented here, along with a few new ideas:

Continued Historical Research. Carrell (1984:54-55), Delgado (1981:27), Delgado and Haller (1989a:182), and Lenihan and Kelly (1984:152) advise continued research of the documentary record. The value of historical research in order to better understand known maritime resources and to locate properties that have not yet been found is clear and should be pursued whenever possible. In regard to lumber and other coastal shipping resources, a study of the Richard Tooker collection of notes and papers at the J. Porter Shaw Library, San Francisco Maritime National Historical Park, is recommended. It reflects decades of Tooker's research into lumbering, ships, and shipping on the northern California coast and contains much valuable information, mostly developed from interviews with trade participants (see Tooker v.d.). A systematic study of historic maps, particularly 19th-century U.S. Coast and Geodetic Survey maps, should also be made. Such a study could form the basis for future surveys to pinpoint non-shipwreck maritime properties, and may help to locate some shipwrecks.

Continued Survey. Carrell (1984:54-55), Delgado and Haller (1989a:182), Delgado, Murphy, and Kelly (1984:41), and Lenihan and Kelly (1984:152) all recommend further survey. This recommendation continues to be of primary importance for inventorying and managing maritime properties. Improvements in remote-sensing and GPS in the past two decades have made better and more accurate underwater and terrestrial surveys possible, and future advances are likely to continue to make older surveys obsolete on an ongoing basis.

Ground-truthing of Surveyed Remote-sensing Anomalies by Divers. Lenihan and Kelly (1984:151), Delgado, Murphy, and Kelly (1984:41), and Delgado and Haller (1989a:182) emphasize the need to ground-truth underwater anomalies when they are detected. Dealing with difficult surf and tide conditions, as well as avoiding the danger of shark attacks are some of the problems impeding this aspect of survey work.

Site-specific Survey and Testing. Carrell (1984:53-54), Delgado (1981:28,29), and Delgado and Haller (1989a:182) call for expanded site-specific survey and mapping of known sites. Ways to accomplish this, with student and volunteer participation if possible, should be explored.

Monitoring for Exposed Resources. Delgado (1981:29-30) and Lenihan and Kelly (1984:151) recommend monitoring the shoreline for exposure of resources, especially after storms. A program of organized periodic visual shoreline survey by park personnel, especially during winter months, should be instituted. Particular attention should be paid to known buried wreck sites.

Contingency Plan for Exposed Resources. A basic plan should be designed for resources that may become exposed due to storm activity—to make treatment of such resources less reactive and more deliberate, and to ensure maximum data recovery. This could consist of an open-ended programmatic research design based on a brief study of previous cases where this situation has occurred, such as *Neptune* (Delgado 1983), *King Philip* and *Reporter* (Delgado 1989b:18; Jablonowski 1995: 13-14), *Pomo* (Delgado 1984:179-

184), and *Comet* (Schwemmer 1999). A basic package of tools, materials (such as caution tape, signage, and safety/first-aid equipment), and references could also be assembled and kept on hand to save time in the event of a wreck exposure.

Sport-diver Involvement. Although ocean conditions make sport diving difficult in the study area, some submerged wrecks in the parklands are possible sport-diving attractions. Murphy (1984:xxii) identified both *Munleon* and *Hartwood* as such, and the wreck of the Pacific Mail steamer *City of New York* has also been visited by sport divers (Haller 1989:93). A brief study of sport diving on study-area shipwrecks would help to assess possible impacts to the resources, as well as possible benefits from promotion of diving at selected sites (see Vrana and Halsey 1992). Ways to educate sport divers in the heritage value of maritime resources, and to involve them in resource management in constructive ways, should be explored.

Increased Public Interpretation Efforts. Ways to increase and improve public interpretation of maritime cultural resources should be sought. More awareness of the wealth of maritime cultural properties and their connections to California history would enhance the experiences of visitors to the parklands, and promote a more custodial attitude in the public. Further interpretation would augment the educational and recreational value of the parklands and would ultimately increase park use.

Emphasis of Future Research. Future archaeological studies within the parklands should maintain a broadly historical-anthropological orientation, and consider regional, pan-Pacific, and ethnic perspectives.

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