CHANNEL ISLANDS NATIONAL PARK

ARCHAEOLOGICAL OVERVIEW AND ASSESSMENT

Authors

Todd J. Braje
Julia G. Costello
Jon M. Erlandson
Michael A. Glassow
John R. Johnson
Don P. Morris
Jennifer E. Perry
Torben C. Rick

Compiler and Editor

Michael A. Glassow

Channel Islands National Park, Department of the Interior
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CHAPTER 1
INTRODUCTION

Consistent with section B2c in Chapter 6 of the National Park Service's Cultural Resource Management Guideline (National Park Service 1998), this overview and assessment is meant to serve as an element of the archaeological resource management program at Channel Islands National Park (Park) (Figure 1). The Park is blessed with unusually abundant prehistoric and historic resources spanning the period from about 13,000 years ago to the historic ranching period of the 19th and 20th centuries. The Park's careful management of its archaeological resources and promotion of their wise use for archaeological research will enhance the pursuit of knowledge of the prehistory and history of the Channel Islands and the Santa Barbara Channel region. Although the subject of only limited attention from archaeologists, investigation of historic archaeological resources also has considerable potential, particularly with regard to understanding the nature and activities of ethnic groups that used the islands and various forms of resourse exploitation (fishing, sea mammal hunting, whaling, ranching, etc.). Presented herein are a description of the nature and variety of the Park's archaeological resources, an assessment of the status of knowledge about prehistory and history generated through archaeological investigation, identification of issues to be addressed in the management of archaeological resources, and recommendations for further development of the Park's archaeological resource management program.

In addition to supporting the Park's cultural resources management program, this overview and assessment is meant to aid researchers interested in investigating the islands' prehistory and history. Although the status of knowledge about prehistory presented herein quickly will become outdated in light of ongoing archaeological research, the inventories of archaeological projects that have occurred on each of the islands since 1975 will remain an invaluable reference in determining the location and nature of past archaeological research and the location of repositories containing collections and records associated with this research.

Environmental Context of Channel Islands National Park

Channel Islands National Park comprises five of the Channel Islands, including all those in the northern group—Anacapa, Santa Cruz, Santa Rosa, and San Miguel—and one in the southern group—Santa Barbara. Although included within the Park, the western 76 percent of Santa Cruz is owned by The Nature Conservancy, and all of San Miguel is owned by the US Navy. The Park includes the smallest of California's Channel Islands, Anacapa and Santa Barbara, with areas of 2.8 and 2.6 km^2 respectively, and the largest, Santa Cruz, with an area of 249 km^2. (Santa Rosa and San Miguel Islands have areas of 217 and 37 km^2, respectively.) Santa Cruz Island is the most rugged topographically of the five islands, with elevations reaching 742 m, and it is the only one with an interior watershed between two mountain ranges.

The environment of the Channel Islands and the nearshore waters surrounding each of them is strongly influenced, on the one hand, by the cool-water California Current flowing southward along the California coast and along the outer margin of the Southern California Bight, and on

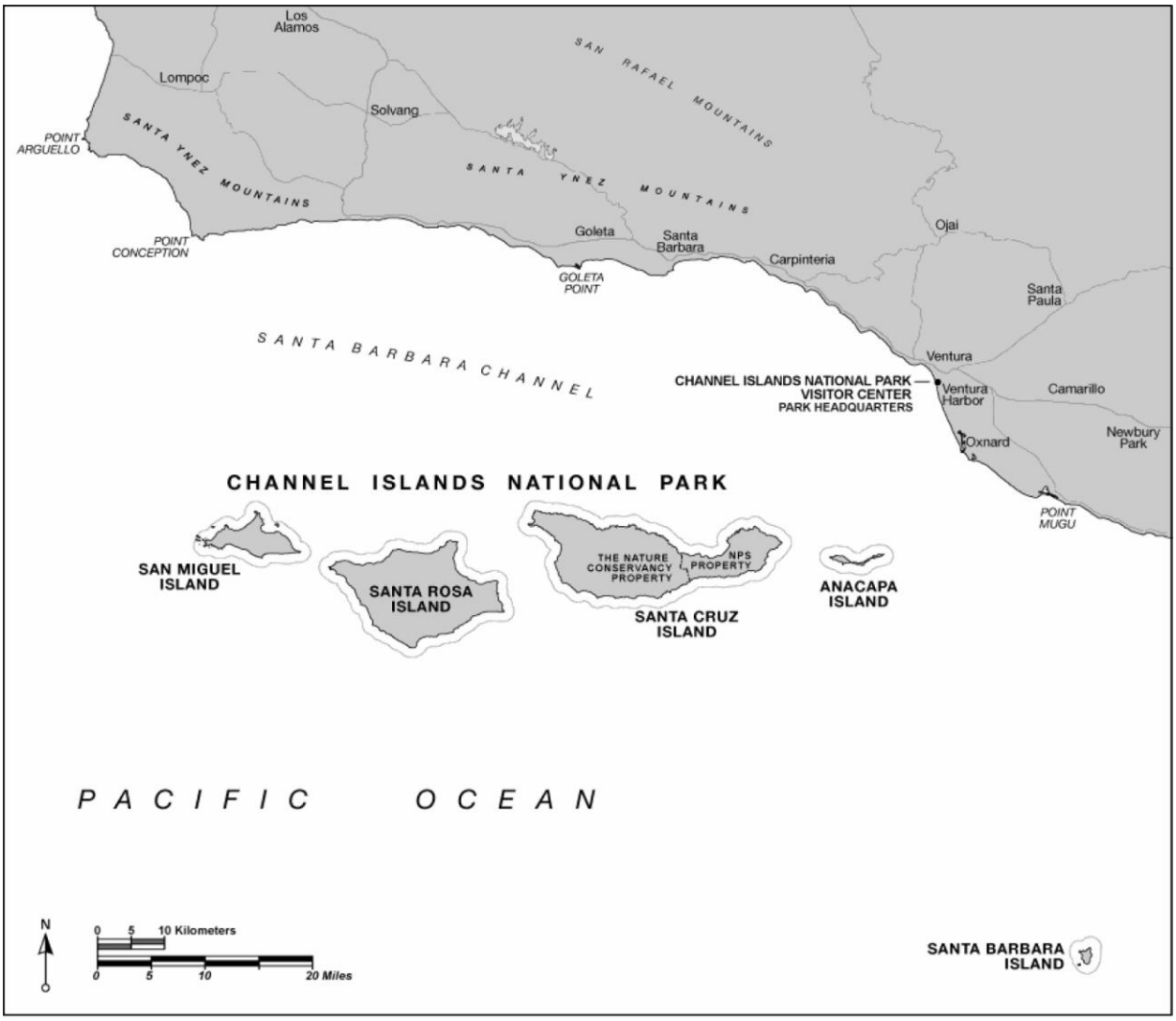

Figure 1.1. Channel Islands National Park

the other hand by the warm-water California Countercurrent (Davidson Current) flowing northward along the coast (Hickey 1992:39). The meeting and mixing of these currents forms an east-west gradient in water temperatures through the Santa Barbara Channel and a northwest-southeast gradient through the bight as a whole (Hickey 1992; Blanchette et al. 2009:163). Sea-surface temperatures at the eastern tip of Anacapa Island, the easternmost of the northern Channel Islands, average roughly 2°C warmer than waters adjacent to the western end of San Miguel Island (Blanchette et al. 2009:163). This variation strongly influences the distribution and abundance of marine faunal species. Located significantly south and east of the northern Channel Islands, waters surrounding Santa Barbara Island generally are warmer than those surrounding the northern Channel Islands (Blanchette et al. 2009:163).

The islands have a Mediterranean climate and vegetation heavily influenced by their maritime context. However, this characterization masks the considerable environmental

variation both on each island and between islands. Air temperatures are coolest from December through March, with coolest temperatures typically ranging between approximately 11 and 15°C. During the summer months the warmest temperatures typically range between 16 to 21°C, although the Central Valley of Santa Cruz Island experiences summer temperatures as high as 30°C. Generally, air temperatures are cooler on the westernmost and warmest on the easternmost of the islands, the difference generally being more than 2°C from western San Miguel Island to East Anacapa Island. Santa Barbara Island air temperatures typically are warmer than on the northern group of islands (Western Regional Climate Center n.d.). Prevailing winds are from the northwest to west during all seasons (Dorman 2002). They are strongest on San Miguel Island and western Santa Rosa Island, often reaching velocities 7 and sometimes 8 or 9 on the Beaufort scale. Winds are also relatively strong in exposed portions of western Santa Cruz Island, but the complex relief of the island generally results in many locations being protected from strong winds. Strong, dry, and often relatively warm Santa Ana winds coming from the east and northeast occasionally occur, particularly during autumn (Schoenherr et al. 1999:201). Precipitation on the islands falls mainly during the months from November to April (Western Regional Climate Center n.d.). The amount varies with topography (elevation in particular) and latitude, with parts of Santa Cruz Island receiving as much as 50 cm annually (Glassow et al. 2008:8) and Santa Barbara Island receiving only 21 cm (Western Regional Climate Center n.d.).

Diversity of plant communities varies with island size (Junak 1995:46), and only the two largest islands, Santa Cruz and Santa Rosa, have significant amounts of arboreal vegetation. Substantial stands of oaks exist only on Santa Cruz, although they are much less abundant in the extreme eastern and western sectors of the island. The nutmeats of their acorns were an important native food throughout California. Grasslands, now dominated by introduced species, are prevalent on all of the northern islands. Another important native food plant, blue dicks (*Dichelostemma capitatum*) is common in grasslands (Junak et al. 1995:278), although its abundance varies significantly. Unfortunately, impacts on island plant communities resulting from livestock grazing, the introduction of other exotic animals, the erosion resulting from overgrazing, and the expansion and the dominance of a number introduced plants have dramatically altered the distribution and abundance of many plant species (Brumbaugh 1980; Junak et al. 1995:37-41) that may have been important to the aboriginal diet.

Fauna important to both prehistoric and early historic occupants of the islands are mainly marine. Native terrestrial mammal species are very few, the largest being the island fox (*Urocyon littoralis*) and spotted skunk (*Spilogale gracilis*) that inhabit the three larger islands (Schoenherr et al. 1999:257), and neither served as a prehistoric food resource. Shellfish, particularly California mussels (*Mytilus californianus*), are abundant along rocky shorelines of all the islands, and their shells are usually the predominant constituent of prehistoric site deposits. Before depletion during the 1980s due to disease, abalones (*Haliotis* spp.) of various species were also locally abundant around the islands within the intertidal and nearshore subtidal zones (Richards 2002:356-357), and not only were they collected during prehistoric times, but they were a focus of intensive commercial shellfish collecting beginning in the late 19th century. The most prevalent marine mammals around the islands are California sea lions (*Zalophus californianus*) and harbor seals (*Phoca vitulina*), although Guadalupe fur seals (*Arctocephalus townsendi*), northern fur seals (*Callorhinus ursinus*), and northern elephant seals (*Mirounga*

angustirostris) also occur (Stewart et al. 1993). Rookeries of many of these pinnipeds are principally on San Miguel among the islands within the Park, although any of the species may haul out on the other islands (DeLong and Melin 2002). Sea otters (*Enhydra lutris*) historically inhabited the waters around the islands. Their bones in prehistoric site deposits reveal that they were hunted prehistorically, but intensive commercial hunting during historic times resulted in their local extirpation (Erlandson, Rick, Estes, et al. 2005). Nearshore fishes are taxonomically diverse and abundant around the Channel Islands (CINMS 2009:25), this being especially the case in waters over rocky substrates having dense kelp forests. Fishing has been an important industry around the Channel Islands from prehistoric times to the present.

Stone material for manufacture of tools is relatively diverse on the three largest islands within the Park. On all three islands, volcanic bedrocks yield tough, relatively fine-grained stone that was used for manufacture of relatively large, casually made flaked stone tools. Volcanic rock also was used for manufacture of pecked and ground stone artifacts such as digging-stick weights, mortars, and pestles (e.g., see Conlee 2000). Chert and chalcedony also occur on all three islands. Chalcedony, much of it derived from volcanic breccias, was occasionally used for flaked stone tools, although its quality does not always allow tool-making. Nonetheless, a source on San Miguel, known as Cico chert, was locally important (Erlandson, Kennett et al. 1997). The best known chert sources are on eastern Santa Cruz, on the west slope of El Montañon and at various locations east of the El Montañon crest (Arnold 1987; Kennett 2005:207-209; Perry and Jazwa 2005). A type of chert, known as Tuqan chert, also occurs on San Miguel (Erlandson, Braje, and Rick 2008), and sources apparently also exist on Santa Rosa (research in progress). Sandstone also occurs on some of the islands, but its hardness varies significantly. Durable sandstone appropriate for production of ground stone tools is known to occur in the southwestern sector of Santa Cruz Island and on San Miguel Island. Generally speaking, the three larger islands contain a variety of stone materials appropriate for both flaked and ground stone artifacts.

Paleoenvironment Change within the Park

Growing amounts of evidence from a variety of sources indicate that the environment within the Park has undergone considerable change since the inception of human occupation on the islands. Arguably the most dramatic change occurred between about 19,000 and 10,000 years ago, when the Pleistocene-aged island of Santarosae divided into the four northern Channel Islands of today as a result of relatively rapid sea level rise caused by glacial melting. As a result, the total land area of the islands diminished by more than 75%. Loss of land area continued after 10,000, probably largely due to seacliff erosion, but the amount of loss since that time has not been a subject of study.

Of particular interest to archaeologists over the last decade has been a record of sea-surface temperature fluction over the course of the last 11,000 years based on oxygen-isotope analysis of fossil foraminifera preserved in a sediment core from the floor of the Santa Barbara Channel, and a supplemental record of upwelling strength derived from this same analysis also is of interest (Kennett and Kennett 2000:384; Kennett 2005:64-69; Kennett et al. 2007:352-356). Because sea-surface temperature and upwelling strength are related to the productivity of marine organisms, they have implications for the distribution and productivity of marine resources. Sea-

surface temperature information also has been obtained from marine shells preserved in prehistoric midden deposits (Glassow et al. 1994; Kennett 2005:175-179; Rick et al. 2006), and it is geneally consistent with the record derived from the channel sediments.

Although evidence is still sparse, relatively dramatic changes to vegetation communities occurred through the course of human occupation of the Park. Carbonized plant remains from late Pleistocene sediments in Cañada de los Sauces on Santa Cruz Island imply that vegetation was similar to that currently existing along the coast of central California (Chaney and Mason 1930). The greater prevalence of conifers at that time is indicative of a cooler and wetter environment. The rate at which a more xeric flora expanded at the expense of the late Pleistocene flora is currently unknown. Axelrod (1967:298) proposed that much warmer and drier conditions began about 8000 BP[1], but the sea-surface temperature records indicates that relatively warm conditions existed as early as 10,500 BP (Kennett 2005:66), and a pollen record from late Pleistocene sediments on Santa Rosa Island reveal a rapid decline in coniferous pollen just after 13,000 BP, at the beginning of the Younger Dryas climatic interval (Kennett et al. 2008; Kennett et al. 2009). A pollen record from estuarine sediments on Santa Rosa Island (Coe and Liu 1994) indicates that climate was relatively arid between 5200 BP (the beginning of the record) and 3250 BP. The period between 3250 BP and the beginning of livestock grazing in the 1800s was one of generally wetter conditions during which plants of the Aster family became more prevalent. Although the data pertaining to vegetation change are limited, these few records imply that significant and perhaps relatively rapid shifts occurred at different times during the course of prehistoric time.

Also included in the paleoenvironmental record are the bones of extinct vertebrates that persisted, or may have persisted, into the period of human occupation of the islands. Some of these bones are from archaeological contexts, but many of the finds are from natural sediments. The bones are most prevalent on Santa Rosa and San Miguel Islands. Among the extinct animals present when humans were also present was a giant mouse, *Peromyscus nesodytes*, bones of which were found in a variety of depositional contexts, including noncultural strata of an archaeological site on San Miguel Island. This mouse species persisted until at least 8,000 years ago (Guthrie 1993:412-414; 1998:187-188; see also Walker 1980:703-712). Of greater interest are the remains of a flightless goose or scoter, *Chendytes lawi*, the bones of which occur in both paleontological and archaeolocal contexts on the Channel Islands (Guthrie 1993:413; 1998:188, 191; 2005:36; Glassow et al. 2008:37). This bird became extinct along the California coast and on the Channel Islands by about 2400 BP (Jones et al. 2008), but before it did, it was occasionally the prey of island occupants. A third extinct species, the pygmy mammoth (*Mammuth exilis*), persisted on the Channel Islands until approximately 13,000 BP (Agenbroad et al. 2005; Agenbroad 2009:16-17). Agenbroad et al. (2005) have proposed that its survival on the islands (at that time still one large island) may have overlapped with human occupation, although no known sites deposits clearly show that humans hunted this large-game animal.

Another reflection of paleoenvironmental conditions on the islands are characteristics of sediments exposed on the walls of seacliffs and arroyos cutting through the sediments of canyon

[1]All "BP" dates mentioned in the Overview and Assessment are in calibrated years before present, i.e., years before AD 1950. In some contexts dates are with respect to the Gregorian calendar (BC/AD), and these dates also are calibrated. Also, occasionally a date in radiocarbon years before present (RYBP) also is given.

bottomlands. A distinctive feature seen on these walls within specific locales on the three largest islands are "fire areas." First described by Orr and Berger (1966), these Pleistocene-aged features were initially thought to be baking pits created by humans. Subsequently they have been interpreted as being indicative of persistently damp soils (Cushing et al. 1986) or burning of tree stumps of conifers (Johnson et al. 1980; see also Wendorf 1982). Considering that some fire areas contain chunks of obviously fired soil and many are associated with wood charcoal, most fire areas probably are a result of ancient fires, presumably caused by lightning, and if so, are reflective of the the location of coniferous forests, or more generally woodlands, on the islands. Most recently, a distinct stratum of dark, organic soil dating 12,900 BP occurring on the arroyo walls of lower Arlington Canyon has been interpreted as a product of an extensive wildfire related to a large cosmic impact event (Kennett et al. 2008; Kennett et al. 2009). That such strata were preserved by overlying sediments indicates that canyon bottoms were aggrading beginning in the late Pleistocene. A recent study of sediments in Pozo Canyon on Santa Cruz Island indicates that this process of aggradation continued into late prehistoric times, the deposits in this canyon dating from 4300 BP to a time shortly before European contact (Glassow et al. 2009).

Changes in Archaeological Research and Resource Management since 1975

This overview and assessment is an update of the Park's original archaeological overview issued in 1977 (Glassow 1977) (see Appendix 1), prepared shortly before the Park was established in 1980. The 1977 overview considered archaeological research from the beginning of formal archaeological investigation in the 19th Century through 1975. Although the contents and organization of this document and the 1977 overview are similar, this new overview and assessment is much larger and more elaborate. This is due to two factors. First, archaeological investigation within the Park accelerated dramatically shortly after the 1977 overview was issued. Second, the Park's cultural resources management program has expanded substantially since the Park was established in 1980.

At the time that the 1977 overview was produced, only one academic institution, the University of California at Santa Barbara, was involved in archaeological research on the islands. Now, in addition to this university, the University of California at Los Angeles, the University of Oregon, Pomona College, and (temporarily) Southern Methodist University all have ongoing programs on one or more of the islands. As well, the Santa Barbara Museum of Natural History has reinitiated long-term research on the islands, which had terminated with the retirement of its archaeologist, Phil C. Orr, in the 1960s. As well, the Smithsonian Institution, which sent an archaeologist to the Channel Islands in the 1870s, is again involved in Channel Islands research. As a result of the significant expansion of archaeological research on the islands over the last 30 years, substantially more is known about the Park's archaeological resources and its prehistory. Nearly all of these investigations have focused on prehistoric archaeological resources. Historic archaeological resources have received much less attention, even though there is significant potential to enhance the history of historic occupation on the islands.

Another important change since 1977 concerns land ownership and commercial activities on the islands. In 1977, the Park had jurisdiction on Anacapa, Santa Barbara, and San Miguel Islands, the first two being the only ones owned by the National Park Service. Now the Park

Service also owns the eastern quarter of Santa Cruz Island and all of Santa Rosa Island, and The Nature Conservancy owns the western three quarters of Santa Cruz Island. The ranching enterprises that were ongoing on Santa Cruz and Santa Rosa Islands in 1977 have ended, and the livestock—cattle and sheep—were removed in the 1980s and 1990s. Feral pigs, whose rooting had serious impacts on some sites, also are gone, most recently from Santa Cruz in 2007. With the end of the ranching era, the focus of activities on the islands shifted toward public visitation and natural habitat restoration.

The Park now has camping facilities and hiking trails on each of the islands, as well as infrastructure in support of visitation. In addition to coming to one of the islands on scheduled and chartered boats from Ventura and Santa Barbara harbors, many visitors also come to the islands on their pleasure boats. The increase in public visitation, as well as construction of facilities for public visitors and to support Park personnel, have had some impact on archaeological resources, and of course the potential for more extensive impacts exists. As a result, management of cultural resources within the Park is now in the hands of both a historian and an archaeologist, who over the last 25 years have developed an active cultural resource management program.

Significance of Archaeological Resources within the Park

Both prehistoric and historic archaeological resources within the Park have an unusually high level of significance in terms of criteria for inclusion on the National Register of Historic Places. In fact, they may be considered among the most valuable in North America, if not the world. They relate to a rich heritage of island occupation over a period that may have begun as early as 13,000 years ago, and because of their abundance and high degree of preservation, they have the potential to inform on aspects of prehistory and history that cannot be adequately revealed through archaeological research on the mainland. Below are considered the specific factors that contribute to the significance of prehistoric and historic archaeological resources.

First, as discussed in Chapter 2, an unusual number of prehistoric sites on Santa Rosa and San Miguel Islands date before 9,000 years ago. In fact, nowhere else in North America is there as large a concentration of sites known to be of this antiquity. Second, dated site deposits are well distributed throughout the rest of prehistory, making the Park's archaeological record ideal for studying processes of cultural change and evolution. Third, the Park's prehistoric sites contain evidence for the development of maritime adaptations, particularly with regard to implications of new or improved technology in such realms as watercraft and fishing and relationship to population growth or decline. Fourth, existing records of environmental change, in particular a high-resolution record of sea-surface temperature fluctuation over the last 12,000 years, allow investigation of human responses to food-resource fluctuation. Fifth, environmental characteristics of the islands foster excellent preservation of prehistoric cultural remains. The combination of a semiarid environment and basic soils fosters preservation of faunal remains, and the lack of gophers and ground squirrels has resulted in less breakage of faunal and floral remains than is the case on the adjacent mainland. Finally, the minimal amount of land development and the access to large tracts of land for study—virtually whole islands—opens the possibility of studying settlement systems in their entirety as well as their landscape contexts.

Considering these various factors that enhance the value of the prehistoric archaeological resources within the Park, it is not surprising that archaeology within the Park has gained a great deal of visibility both nationally and internationally. In particular, the numerous publications by Arnold and Erlandson in a wide variety of professional outlets have introduced the archaeology and prehistory of the Park to an international audience. Moreover, with his 2005 book Kennett has demonstrated that the Park's archaeological resources may be used to address a variety of theoretical issues within evolutionary ecology, an important body of theory that has been used to gain an understanding of hunter-gatherer adaptations. Glassow, Rick, and Perry also have contributed to the growing visibility of archaeology within the Park through articles concerning culture change, maritime adaptation, and resource utilization (see listings by name in References Cited).

Although the subject of only a few archeological investigations to date, historical resources also have their unique values. The array of historical archaeological resources on the islands benefits from some of the same environmental factors that promote preservation of prehistoric resources: lack of land development that would affect the integrity of the resources and lack of prodigiously burrowing rodents. Similarly, the islands being under just two ownerships facilitates investigations at different spatial scales. Two historical themes, ranching and small-scale commercial marine resource extraction, have left the most extensive archeological records, and recent investigations, discussed in the following chapters, have demonstrated their potential. In addition, archaeological remains relating to military activities and oil exploration are present on some of the islands within the Park. The full value of historic archaeological resources cannot be known until many more of the individual sites and features are identified, recorded, and evaluated.

Organization of the Volume

This overview and assessment covers three categories of archaeological resources: prehistoric, historic, and submerged sites. These categories are based not only on their characteristics and contexts, but also on the kinds of expertise needed to study them. Prehistoric sites, as just mentioned, have seen by far the most attention, and they are the most abundant and extensive on the islands. They have been the subject of many academic research and resource management projects. In contrast, historic resources have seen comparatively little attention, although they have been given specific attention on eastern Santa Cruz and San Miguel Islands. Submerged sites, mainly shipwrecks, have been the subject of a number of survey and documentation projects, most instigated or coordinated by the Park archeologist. Given the much greater attention devoted to prehistoric sites, as well as the much larger volume of information concerning them, they naturally are given more attention in this overview and assessment.

An overview of the prehistory and history of the Park is the topic of the next chapter, and this is followed by a chapter concerning Chumash ethnohistory. Following this are a series of chapters that present discussions the status of resource inventories and descriptions of all known archaeological projects occurring since 1975. These chapters vary significantly in length as a result of variation in the number of archaeological projects from one island to the next. Not

surprisingly, the number of projects per island varies relatively closely with island size. The final two chapters concern archaeological resource management issues and recommendations based on these issues.

The project descriptions presented in Chapters 4 through 10 are based on available information, which varies considerably in quality and quantity. Because existing documentation of archaeological projects has not conformed to any particular standard, there are gaps in information about individual projects that probably never will be resolved. Some of the information in project descriptions required a good deal of effort to glean from diverse sources, including the memories of participants. Other projects are very well documented in reports, field records, and occasionally publications. In the course of research for the project descriptions, data occasionally were encountered hinting at fieldwork for which no definitive information could be found. Such projects undoubtedly were of relatively small scale and of no great consequence, even though ideally they should have been documented. Another issue with some of the project descriptions is information about the disposition of collections and field records. In some cases the whereabouts of collections and records is in doubt or could not be ascertained, and in other cases the information presented in a few of the project descriptions may not be entirely accurate.

The maps included in this overview and assessment are derived from the Park's GIS database. The GIS database at the Central Coast Information Center is not as complete with regard to areas that have been subject to intensive survey. No maps are included that show locations of sites or where excavation projects took place, although project descriptions do provide some information about location, and these locations are indicated on a series of placename maps. Maps showing site locations were not included because of the sensitivity of site locational information. Researchers and cultural resources managers may obtain map information concerning locations of sites and project areas from either the Park or from one of the two State of California Information Centers.

Although the 1977 overview was authored by just one archaeologist, the large amount of archaeological investigation since 1975 and the substantial increase in knowledge of prehistory required a team effort in preparing this overview and assessment. Glassow, working closely with the Park's cultural resources staff, served as the team coordinator, and he also was responsible for compiling information about archaeological research on The Nature Conservancy property on Santa Cruz and about prehistory during the earlier segment of the middle Holocene and the Late Holocene. Perry handled the research on the Park's property on Santa Cruz and the later segment of middle Holocene prehistory. Erlandson and Braje were responsible for research on San Miguel and late Pleistocene and early Holocene prehistory. Rick considered the research on both Santa Rosa and Anacapa, and he helped with the coverage of late Pleistocene and early Holocene prehistory. Johnson dealt with the protohistoric and historic Chumash occupation on the northern Channel Islands, Costello considered historic archaeological resources on the islands, and Morris considered submerged cultural resources within waters around the islands and within Park boundaries.

Acknowledgements

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CHAPTER 2
PREHISTORY AND HISTORY

PREHISTORY

As currently known, the prehistory of the Park spans as much as 13,000 years, including the end of the Pleistocene and all of the Holocene geological epochs. Although prehistory during the terminal Pleistocene and the beginning of the Holocene is still poorly documented, a number of archaeological sites are known to date between 12,000 and 9000 BP. Significantly, there is more evidence of occupation on the northern Channel Islands during this period than in most other areas of comparable size elsewhere in California or North America as a whole. Also impressive is the clear evidence of cultural evolution from relatively simple forms of cultural systems to some of the most complex forms found among hunter-gatherers worldwide. Increasing cultural complexity may be seen in such diverse arenas as settlement systems, technology, economic exchange, and socio-political organization. Increasing complexity is especially apparent after about 2500 BP, but it is also manifest in cultural changes occurring thousands of years earlier.

For purposes of presentation, this overview of the prehistory of the Park is divided into four broad periods: Terminal Pleistocene and Early Holocene (13,000-7000 BP), Earlier Middle Holocene (7000-5000 BP), Middle to Late Holocene (5000-1000 BP), and Late Holocene (after 1000 BP). The dates assigned to each period are to some extent arbitrary; they are based on the particular interests of the archaeologists who have been working within the Park and who have participated in writing this chapter. Nonetheless, the date intervals of some of the periods reflect the chronological divisions widely recognized by archaeologists in California. This is the case, for instance, with the beginning of the latest period, 1000 BP. This date marks the beginning of a time interval when populations living in the Santa Barbara Channel region, and elsewhere in North America, were experiencing the effects of adverse environmental conditions that correlate with changes in population size, settlement systems, and economic and socio-political systems (Jones et al. 1999, see also comments following the article). As well, the date of 7000 BP, which divides the first and second periods, appropriately divides the earlier island cultures from those that exhibit initial signs of complexity and relatively more intensive use of marine mammals and fish.

Minimal reference is made to one or another of the several chronological schemes that have been proposed over the last several decades (Rogers 1929; Olson 1930; Warren 1968). These schemes were proposed decades ago and are based on much smaller bodies of data than are currently available. Archaeological research over the last three decades has demonstrated that they have little utility in characterizing cultural changes occurring during the Park's long prehistory. The most recent of the schemes, however, remains widely cited: King's (1990) scheme, which is based on changes in the forms of shell beads and ornaments and radiocarbon dates associated with their occurrence in cemeteries. However, this scheme concerns changes in economic and socio-political organization and largely neglects subsistence and technology. In the following discussion, occasional reference is made to period and phase divisions within

King's scheme, in large part because they are widely used in the contemporary archaeological literature of the Park and the Santa Barbara Channel region generally.

TERMINAL PLEISTOCENE AND EARLY HOLOCENE, ~13,000-7000 BP

Introduction

The period from about 13,000 to 7000 years ago, commonly referred to as the Terminal Pleistocene (~13,000-11,000 BP) and the Early Holocene (~11,000-7000 BP), includes the earliest well-documented occupations of the Northern Channel Islands and the first clear evidence of their permanent human habitation. The earliest of these islanders, from about 13,000 to 9000 years ago, are frequently called Paleocoastal peoples, while the later sites are essentially contemporary with early Milling Stone sites along the mainland coast (see Erlandson 1994; Glassow 1996d). Mainland Milling Stone sites are technologically dominated by grinding stones (manos and metates) that are essentially absent from the Northern Channel Islands, which led some early archaeologists to conclude that the islands were not occupied until relatively late (e.g., Rogers 1929:339; Olson 1930; Rozaire 1967:328). Terminal Pleistocene and Early Holocene coastlines and coastal lowlands have largely been lost to postglacial sea level rise and coastal erosion, geographic changes that have clearly have had disproportional effects on Paleocoastal sites of the Channel Islands. Despite these problems, we know now that Terminal Pleistocene and Early Holocene sites are relatively abundant on the Northern Channel Islands, especially on San Miguel and Santa Rosa (see Erlandson, Braje, and Snitker 2008; Reeder et al. 2008; Rick and Erlandson 2009; Rick et al. 2005a). During the past 20 years, and particularly in the last decade, important progress has been made in reconstructing the lives of these early maritime peoples and the nature of the island ecosystems they inhabited.

Between about 13,000 and 7000 BP, sea levels rose roughly 40 meters (~130 feet), from about 50 meters to 10 meters below modern levels. Rising seas had dramatic effects on the earliest islanders and the landscapes and seascapes they lived in. For instance, Anacapa, Santa Cruz, Santa Rosa, and San Miguel islands were all united as a single landmass known as Santarosae Island at the end of the Last Glacial Maximum, the east end of which was separated from the mainland by a narrow strait only 6-8 km wide (Johnson 1983; Porcasi et al. 1999). Based on the most recent sea level curves and bathymetric data, Kennett, Kennett et al. (2008) suggested that Santarosae broke into its constituent islands only about 9000 BP. Until that time, the shorelines of Santarosae would have provided greater protection to maritime peoples than today, including the south coast where wave energy and wind velocity tend to be much reduced for most of the year. Graham et al. (2005) suggested that kelp forests around the Northern Channel Islands were more extensive during the Terminal Pleistocene and Early Holocene, providing higher marine productivity and greater shelter for people in small boats. Because they were protected from large terrestrial predators until the arrival of humans, it seems likely that marine mammal, fish, shellfish, and seabird populations on the Northern Channel Islands may have been extremely abundant. Although plant resources are often portrayed as limited on the islands, sea weeds, pine nuts, acorns, bulbs (e.g., blue dicks, or *cacomites* (*Dichelostemma capitatum*)), and a variety of other edible plants probably provided ample sources of carbohydrates and calories for Paleocoastal peoples, complementing protein-rich marine

resources. Geoarchaeological evidence also suggests that active dune building began in some areas of the islands during the Early Holocene (see Erlandson, Rick, and Peterson 2005a).

Only the larger islands within the Park have produced evidence for human occupation during the Terminal Pleistocene and Early Holocene, although early maritime peoples almost certainly visited Anacapa and Santa Barbara Islands as well, if only as way stations during voyages between the mainland and the islands, or between the Northern Channel Islands and San Nicolas Island. When the last overview was issued in 1977, Glassow (1977:10) correctly noted that legitimate questions still existed about whether the islands were occupied prior to 8000 BP (6000 BC). Today, with reasonable confidence, the antiquity of a human presence on the islands has been pushed back four to five millennia, to at least 13,000 BP. Currently, more than 50 archaeological sites on San Miguel, Santa Rosa, and Santa Cruz islands have been radiocarbon (^{14}C) dated between about 13,000 and 7000 BP—one of the largest and most significant clusters of early coastal sites known in the Americas. Many more early sites undoubtedly lie buried beneath the waves and younger dunes, alluvium, or shellmounds. Despite these serious taphonomic problems, however, the number of Terminal Pleistocene and Early Holocene sites continues to expand rapidly, partly because of systematic survey of caves, springs, toolstone sources, and other geographic features that would have attracted early coastal people into interior areas and away from now submerged shorelines.

There is much yet to be learned about the earliest Channel Islanders, but significant progress has been made in recent years in understanding the settlement, subsistence, technologies, and other life-ways of these Terminal Pleistocene and Early Holocene peoples. Early sites located within the boundaries of the Park have produced a series of milestones for the development of New World maritime peoples, including the earliest evidence for seafaring and island colonization (Erlandson 2007; Erlandson, Moss and Des Lauriers 2008), the oldest shell middens and fishhooks in North America (Erlandson et al. 2007), and the earliest basketry from the Pacific Coast of North America (Connolly et al. 1995; Vellanoweth et al. 2003). The archaeological evidence for early maritime settlement of the Channel Islands also has had a significant effect on the growing recognition that a maritime migration may have contributed to the initial human colonization of the Americas.

Here we briefly summarize the current state of knowledge about these early maritime peoples of the Northern Channel Islands. For convenience, we divide the Terminal Pleistocene and Early Holocene into three intervals: (1) the Terminal Pleistocene (~13,000-10,500 BP), a period that is only now beginning to take shape as a reasonably coherent entity; (2) the Earliest Holocene (~10,500-8500 BP), for which substantial amounts of data are available; and (3) the later Early Holocene (8500-7000 BP), when dense red abalone (*Haliotis rufescens*) shell middens first appear on San Miguel and Santa Rosa Islands and the first clear evidence of permanent human settlement has been documented along the northwest coast of Santa Rosa Island.

Terminal Pleistocene (13,000-10,500 BP)

Despite the progress of recent years, the Terminal Pleistocene is the least well understood cultural period on the Northern Channel Islands. On Santa Rosa Island, Orr (1968) proposed that

mammoth-hunting humans colonized the islands over 40,000 years ago—claims that very few archaeologists have accepted (see Glassow 1977; Moratto 1984; Erlandson 1994). Orr also reported several Terminal Pleistocene sites on Santa Rosa Island, including the extremely significant Arlington Man locality (SRI-173) and several deeply buried shell middens he believed were Terminal Pleistocene in age (Orr 1967:321, 1968). In the 1990s, Erlandson revisited each of these shell midden localities and showed that none was older than about 9400 BP (see Erlandson 1994:186-192; Erlandson et al. 1999; Reeder et al. 2008). So far, just one of Orr's controversial localities has held up to scholarly scrutiny, the Arlington Springs site where Orr discovered human bones eroding from near the base of an ancient arroyo cut about 11 meters (37 feet) below the modern surface. Orr (1962a, 1962b) and his colleagues (see Berger and Protsch 1989) obtained uncorrected ^{14}C dates of roughly 10,000 RYBP on collagen extracted from these human bones or charcoal associated with them, a date that is roughly equivalent to about 11,500 to 12,000 BP. More recent work led by John Johnson of the Santa Barbara Museum of Natural History has refined the stratigraphy and chronology of the Arlington Springs site, including direct dating of the Arlington Man skeletal remains to about 13,000 BP (Johnson et al. 2002). Small fragments of chipped stone tool-making debris were found in a block of soil Orr removed with the bones, as well as the 13,000-year-old paleosol in which the bones are thought to have been embedded (John Johnson, pers. comm., 2008). A thin stratum immediately above this paleosol has produced signatures of the Younger Dryas Boundary (YDB) Event (Kennett et al. 2008), a distinctive layer dated to ~12,900 BP across North America that Firestone et al. (2007) linked to an extraterrestrial impact that may have caused abrupt climate change, the extinction of the Pleistocence megafauna, and the end of the Clovis culture.

In 1986, Snethkamp and Guthrie reported evidence for a terminal Pleistocene occupation of Daisy Cave (SMI-261), located along a remote and rocky stretch of the northeast coast of San Miguel Island (Erlandson 2007; Erlandson, Kennett, Ingram, Guthrie et al. 1996). In the 1990s, University of Oregon archaeologists led by Erlandson conducted careful excavations that confirmed the presence of a brief occupation dated to approximately 11,500 BP. A small assemblage of chipped stone artifacts—mostly tool-making debris and a few expedient tools—was recovered from this paleosol (Stratum G), but none of them was diagnostic. The faunal remains associated with this low-density shell midden are dominated by rocky shore shellfish, including the remains of red abalone, black turban (*Tegula funebralis*), California mussel (*Mytilus californianus*), giant chiton (*Cryptochiton stelleri*), crab, and other taxa. As one of the oldest shell middens in North America, the Terminal Pleistocene assemblage from Daisy Cave is highly significant, but it represents little more than a "postcard from the past" (Erlandson 2007) and leaves numerous questions unanswered. For instance, who were these early maritime people, where did they come from, what technologies did they employ, and what was the nature of their broader economies and lives?

Recently discovered sites at Cardwell Bluffs (SMI-678, SMI-679, and SMI-680) on San Miguel, along with two new sites on Santa Rosa Island (SRI-707 and SRI-510) may provide answers to some of these questions. The Cardwell Bluffs sites, situated near the east end of San Miguel Island where cobbles of local Cico and Tuqan cherts can be found (Erlandson, Braje, and Rick 2008), have produced hundreds of chipped stone bifaces associated with several low-density midden loci dated between about 12,000 and 11,500 BP (Rick and Erlandson 2009). Although heavily eroded, these multi-purpose quarry/workshop/habitation sites have produced

numerous chipped stone crescents (Erlandson and Braje 2008b; Erlandson, Braje, and Snitker 2008) and small, stemmed Channel Island Barbed points. The recently identified Santa Rosa Island sites have also been dated between about 12,000 and 11,500 years ago and produced crescents and/or Channel Island Barbed points. Crescents and stemmed points are found across much of western North America and have been linked by some to a possible coastal migration following the North Pacific Rim from Northeast Asia into the Americas (Beck and Jones 2009).

Only limited testing of these Terminal Pleistocene sites has been accomplished, but sparse midden deposits at Daisy Cave and Cardwell Bluffs are dominated by shellfish remains, especially red abalone shells, with smaller quantities of giant chiton, California mussels, black turban snails, crab, and other rocky shore taxa. A small midden feature at SMI-679, recently excavated but not yet published, is dominated by black turbans, one of which has been ^{14}C dated to about 11,800 BP. Although the Terminal Pleistocene midden deposits at Cardwell Bluffs are dominated by shellfish remains, the abundance of crescents and stemmed points at the sites suggests that hunting and possibly fishing were also important economic activities, an issue we will return to.

There is currently a roughly 700 year gap between the youngest Terminal Pleistocene sites and the oldest Early Holocene site on the Northern Channel Islands (Kennett et al. 2008; Rick and Erlandson 2010). Kennett et al. (2008) have linked this chronological gap to intensive wildfires and other possible ecosystem disruptions following a YDB event, but only further research will show whether the islands were abandoned or largely depopulated during this period.

10,500-8500 BP

At least three San Miguel Island sites—Daisy Cave (SMI-261), Seal Cave (SMI-604), and SMI-522—contain discrete occupational horizons that appear to begin approximately 10,200 years ago. From roughly 10,000 to 8600 BP, Daisy Cave was occupied repeatedly by Paleocoastal peoples. Compared to the brief Terminal Pleistocene occupation of the cave, these Early Holocene peoples left a much broader range of materials with which to reconstruct their lives. Within Strata E and F, a series of finely stratified and well preserved occupational layers have produced a variety of artifacts made of stone, bone, shell, and plant material. The chipped stone assemblage consists primarily of expedient tools made on flakes or chunks that were only minimally retouched or utilized. The few projectile points or bifaces recovered, including a crescent and several leaf-shaped preforms or point fragments (Erlandson and Jew 2009), suggest that hunting was not a major activity of the early site occupants. Numerous spire-removed *Olivella biplicata* beads were also found in strata E and F, similar to those found at other early sites along the California Coast and interior valleys (Erlandson, Macko et al. 2005; Fitzgerald et al. 2005). An extraordinary aspect of the early maritime technology at Daisy Cave is more than 1,500 pieces of twisted sea grass cordage, along with a few woven items and bundles or clumps of unwoven sea grass (Connolly et al. 1995). Despite careful excavation and excellent preservation, none of the cordage pieces were connected. Instead, the small pieces of cordage appear to be the "cutoffs" and other leftovers from the manufacture of cordage, maintenance of fishing nets, and similar activities. Also recovered were an assemblage of small bipoints or fish

gorges made of bird and mammal bone—the oldest known fishhooks in North America (Erlandson 2007)—and roughly 27,000 fish bones (Rick et al. 2001).

Recent research on Santa Rosa and San Miguel islands has identified several other Paleocoastal sites dated between about 10,000 and 8500 years old. (see Erlandson et al. 1999; Erlandson, Moss, and Des Lauriers 2008; Reeder et al. 2008; Rick, Erlandson, Vellanoweth, and Braje 2005). Many of these are relatively small and low-density shell middens, situated adjacent to springs some distance from the contemporary coastline, that seem likely to be dry-season campsites. Some of these sites (e.g., SMI-606, see Erlandson, Rick, and Batterson 2004) contain abundant shellfish remains, but very few vertebrate remains or artifacts. Other sites (e.g., SMI-522 and SMI-608) are more substantial and seem to result from more sustained occupations. Not surprisingly, these sites have produced more diverse artifact assemblages, including bifaces, bone gorges, and *Olivella* spire-removed beads similar to those found at Daisy Cave (see Braje 2009; Erlandson, Braje et al. 2005).

Paleocoastal subsistence on the Channel Islands appears to have been both diverse and heavily maritime. Shellfish from rocky intertidal habitats dominate the faunal remains from most excavated sites (see Erlandson et al. 1999; Erlandson Rick and Batterson 2004; Braje 2009), but fish appear to have provided roughly half of the edible meat represented in the Paleocoastal levels at Daisy Cave, where seals, sea otters, and seabirds also appear to have been hunted. At SMI-507, a relatively large 9000-year-old shell midden located on the northwest coast of San Miguel Island, California mussels, black abalones, and other shellfish dominate the faunal remains, but numerous bifaces and projectile points hint at broader economy (Erlandson, Braje, Rick, and Davis 2009). It seems likely that plant foods, including pine nuts, acorns, blue dicks bulbs, and possibly seaweeds, were an important resource for Paleocoastal peoples, but there is currently little or no archaeological evidence for their use.

Although Paleocoastal population densities are traditionally thought to have been very low, the growing number of early island sites suggests that more people were present in the area than previously believed (Erlandson et al. 2007). Impressive clusters of sites dating to this time period have been identified in the Point Bennett area near the west end of San Miguel, along the northwest coast of Santa Rosa Island (Erlandson 1994; Rick, Kennet, and Erlandson 2005b), and around the Abalone Rocks paleo-estuary on the southeast coast of Santa Rosa (Rick, Kennett, and Erlandson 2005). The large (and rapidly expanding) number of Paleocoastal sites on the Northern Channel Islands seems consistent with the 3000-4000 years or so of demographic expansion expected given the presence of fluted points on the adjacent mainland coast and the age of Arlington Man. With shorelines dating to this time period heavily impacted by sea level rise and coastal erosion, the known Paleocoastal sites probably represent just a fraction of those that once existed on the islands.

8500-7000 BP

Sites dating to this period are known from San Miguel, Santa Rosa, and Santa Cruz Islands. Daisy Cave does not appear to have been occupied during this interval, but Cave of the Chimneys (SMI-603), located just a hundred meters or so to the east, has a basal component dated between about 8400 and 7500 BP. Only a very small sample is available from this

component, but it produced several extremely well-preserved *Olivella* spire-removed beads and woven "monkey's-fist" knots made of sea grass cordage (Vellanoweth et al. 2003).

Another important site dating to this time period is the basal component at SCRI-109 at Punta Arena on the south coast of Santa Cruz Island (Glassow et al. 2008). Dated to about 8400 BP, this stratified shell midden produced three whole or fragmentary Channel Island Barbed projectile points, providing the first conclusive evidence that these finely-made points were used by early maritime peoples on the Northern Channel Islands (although these points may have been used much earlier as well—see discussion above). A similar point was reported by Rozaire (1978c) deep in the midden strata at Daisy Cave, but its antiquity was not realized at the time. Recently, similar points have been found at several early sites on San Miguel and Santa Rosa islands. Although most of the points come from surface contexts that cannot be unequivocally linked to intact midden deposits nearby, no Channel Island Barbed points (or crescents) have yet been found associated with sites younger than about 8000 BP (Braje 2009; Braje and Erlandson 2008b; Erlandson, Braje, Rick, and Peterson 2005).

Yet another highly significant site dating to this time period is Cemetery A at Tecolote Point (SRI-3) on the northwest coast of Santa Rosa Island. Here, in the 1940s and 1950s, Phil Orr excavated 79 burials from a sand dune located just inland from the modern coast. Near the cemetery, Orr found a pile of large red abalone shells dated to about 7600 years ago (~7100 RYBP), and some of the burials had such shells placed over their heads. In sea cliff exposures just to the north, the low-density remnants of a roughly contemporary red abalone midden are calving into the sea, possibly the remnants of a more substantial Early Holocene village associated with the cemetery. Orr (1968:118) believed all the Cemetery A skeletons were from his "Dune Dweller" culture dated to about 7500 BP. Erlandson (1994:188-89) obtained a ^{14}C date of ~7700 BP for a red abalone shell associated with one of the burials, but also showed that some of the burials were related to a Middle Holocene midden that capped the dune, raising questions about the age of many of the other burials. Recently Patricia Lambert (personal communication, 2008) of Utah State University obtained several additional AMS ^{14C} dates on *Olivella* spire-removed beads associated with some of the Cemetery A burials at SRI-3. These dates suggest that the cemetery was used primarily between about 7600 and 7400 years ago.

The Early Holocene Cemetery A at SRI-3 is significant for several reasons. First, the large cemetery implies a permanent and relatively sedentary occupation of the Northern Channel Islands at a relatively early date. Second, recent bioarchaeological analyses of several early crania from the cemetery suggest that they are morphologically similar to the historic Island Chumash, supporting a deep cultural and genetic continuity for the Chumash in the Santa Barbara Channel area (P. L. Walker, personal communication, 2008). Third, several of the early burials in the cemetery appear to be associated with bone tools, "donut stone" digging-stick weights, and other artifacts that imply deep roots for the diversified economy, sedentism, and the early stages of an elaborated material culture that is one hallmark of cultural complexity among the maritime Chumash and their ancestors. Although *Olivella* spire-removed and barrel beads are the dominant ornament type in Early Holocene island sites—so far no beads are known from Terminal Pleistocene sites—a perforated purple rock scallop (*Hinnites multirugosus*) ornament was found at SMI-608 (Braje, Rick et al. 2008) and a Pismo clam (*Tivela stultorum*) bead from

Daisy Cave has been directly dated to about 7500 years ago, further evidence for an early elaboration of island material culture.

The limited information available on human subsistence during this period suggests that shellfish continued to be a major dietary constituent (see Braje, Kennett et al. 2007; Glassow 1993a; Kennett 2005; Rick et al. 2005b), but fish, sea mammals, birds, and plant foods were also exploited. Most faunal assemblages dating to this time period have shellfish assemblages dominated by California mussels and black abalones, but several sites on eastern Santa Rosa Island also contain significant amounts of estuarine shellfish, including clams and oysters (Erlandson 1994:193; Rick, Kennett, and Erlandson 2005a). As was the case with some earlier sites, however, the presence of Channel Island Barbed points at SCRI-109 and SMI-575NE suggests that marine hunting and fishing may be underrepresented in some of the faunal assemblages recovered (Erlandson and Braje 2009).

Significantly, red abalone middens first appear on San Miguel and Santa Rosa islands between about 8000 and 7000 years ago (Braje et al. 2009; Orr 1968:125). These distinctive sites, in which large red abalone shells are the visually dominant midden constituent, are primarily a Middle Holocene phenomenon, especially on Santa Cruz Island (Glassow 1993b, 1997a; Glassow et al. 1994; see also Braje et al. 2009). As noted earlier, large red abalone shells dating to the Terminal Pleistocene are the dominant shellfish taxa present at several loci at SMI-678 (Cardwell Bluffs) on San Miguel, but these are small and low-density middens. In shell middens dating between 10,200 and 8000 years ago, however, red abalone shells are rare or absent—a faunal change that may be related to fluctuations in sea surface temperature (see Glassow et al. 1994; Kennett 2005). Erlandson, Rick, Estes et al. (2005) and Braje et al. (2009) have also linked the appearance of substantial red abalone middens to human effects on the nearshore ecosystem, suggesting that significant numbers of large abalones could only exist if sea otters were rare in local waters. Further evidence for an early human impact on nearshore Channel Island ecosystems may be found in a decline in the average size of California mussels on San Miguel Island (Erlandson, Rick et al. 2008). Early anthropogenic impacts on Channel Island ecosystems may also have occurred on land, especially following a human introduction of dogs and foxes to the islands, which may have occurred 7000 or more years ago (Rick, Erlandson, Vellanoweth, Braje et al. 2009; Rick, Walker et al. 2008). Finally, Jones et al. (2008) documented a protracted prehistoric extinction of the flightless scoter (*Chendytes lawi*) along the California Coast, a process that may have begun with the disruption of *Chendytes* breeding colonies on the Northern Channel Islands during the Terminal Pleistocene (Rick, Erlandson, et al. 2008). Such evidence for early anthropogenic effects on island ecosystems represents a precursor for more substantial impacts later in the Holocene and during the historic period.

EARLIER MIDDLE HOLOCENE, 7000-5000 BP

The period between 7000 and 5000 BP, termed here the earlier middle Holocene, is a time during which populations living on the northern Channel Islands were responding to significant environmental changes and establishing a foundation for the development of more complex forms of cultural systems that characterize the rest of prehistory. At present, there is no evidence that the two smallest islands in the Park—Santa Barbara and Anacapa Islands—were inhabited

during this time interval; consequently, this section concerns the archaeology on the three significantly larger islands: Santa Cruz, Santa Rosa, and San Miguel islands. Interestingly, cultural systems during this period have characteristics that link them to those of the early Holocene as well as those of later middle Holocene, and for this reason this 2,000-year time-span may be seen as transitional.

To understand the course of cultural development during this period, it is helpful to divide it into three intervals: 7000-6300 BP, 6300-5300 BP, and 5300-5000 BP. The middle interval governs how these divisions are defined; it is based on radiocarbon dating of a distinctive series of sites on western Santa Cruz Island, sites that contain unusually large quantities of red abalone shells within their deposits, which for convenience are called red abalone middens (Glassow 1993b; Glassow et al. 2008). As discussed in the previous section, red abalone middens also occur on Santa Rosa and San Miguel Islands—indeed, they are more prevalent and their chronology is more complex on these islands.

Although the interval between 7000 and 5000 BP may be characterized as one of transition from earlier to later forms of cultural systems, most aspects of cultural development appear subtle in comparison to changes that occurred later in time, particularly after roughly 3,000 years ago. Subsistence on marine resources remained largely focused on intertidal shellfish, with minimal attention to fish and sea mammals, mobility remained a prominent characteristic of settlement systems, and technology remained largely unchanged. Yet there is some evidence of increased complexity in all these realms, even though much of it is circumstantial.

7000-6300 BP

Prehistory during this time interval is still poorly understood. In his list of middle Holocene sites for which radiocarbon dates exist, Kennett (2005:130-133) includes only eight sites (and as many radiocarbon dates) on the northern Channel Islands. Furthermore, only a small sample, of the size of a column sample, has been obtained from any site of this age, and in every instance data pertaining specifically to deposits of this time interval have been described only in general terms, if at all. Available data do, however, provide some general information about subsistence but essentially nothing about other aspects of culture. Sites known to have deposits dating to this age include Daisy Cave (SMI-261) on San Miguel. This site contains deposits dating between 6900 and 6600 BP (as well as deposits dating both earlier and later in time) (Erlandson, Kennett, Ingram, Guthrie 1996; see also discussion in the previous section).

On Santa Rosa, SRI-192 contains deposits dating to about 6650 BP. Close to the eastern end of the island, this site contains evidence of the utilization of estuarine shellfish living in the nearby Abalone Rocks Estuary (Rick, Kennett, and Erlandson 2005b). During the 1950s and 60s, Orr (1968) may also have encountered deposits within the 7000-6300 time interval, but the broad counting errors of the radiocarbon dates he obtained make this uncertain. The mouth of Arlington Canyon may have been another locus of occupation during this time interval, although no radiocarbon dates yet indicate this. Nonetheless, dates from SRI-4 and SRI-5 fall on either side of this interval, and some of the substantial deposits still undated at one or both sites may date within this interval (see Kennett 2005:134). Kennett (2005:130-131) reports radiocarbon dates from two other Santa Rosa Island sites that fall within this interval (SRI-462 and 628).

On Santa Cruz, SCRI-549, overlooking Christy Beach, contains deposits directly underlying a red abalone midden. These underlying deposits date to 6800 and 6400 BP and contain abundant mussel shells, but red abalone shells are less prevalent (Glassow 2005b). Near the northwestern extreme of Santa Cruz Island is another site, SCRI-277, with deposits falling near this range of time, the two radiocarbon dates ranging between 6900 and 6500 BP. Interestingly, these deposits contain not only an abundance of mussel shells but also an unusually large quantity of cormorant bones (Glassow 2005b). Finally, three sites on the eastern end of Santa Cruz are associated with dates within this time interval: SCRI-406 (6600 BP), SCRI-610 (6850 BP), and SCRI-614 (6970 BP) (Perry 2003:156). Data reported for SCRI-406 indicate that mussel was a dominant contributor to the diet but that sea mammal and fish also were consumed (Perry 2003:160).

Despite the minimal amount of information available, it is reasonable to conclude that cultural systems of this period were essentially the same as those that prevailed through the early Holocene. Population on the Channel Islands appears to have been very low, perhaps only a few hundred people on each of the larger islands, and intervals of adverse environmental conditions may have resulted in population being even lower at times during the early Holocene (Glassow et al. 1988).

The available data imply that the small populations on each of the islands were highly mobile. No known site dating to this time period contains substantial deposits indicating that it served as a residential base that was the focal point of a settlement system. Shellfish, particularly California mussels, appear to have been the principal food resource, at least while people occupied coastal sites. The presence of a few sites in the interior of the island, however, imply that plant foods may have been seasonally important, but even at these sites shellfish remains are relatively abundant, indicating the importance of this food resource wherever people resided on the islands.

Aside from shellfish, faunal remains reveal that fishing and sea mammal hunting were undertaken, as they were during most or all of the early Holocene, although their contributions to the diet appear to have been relatively small. The taxa represented by identified fish remains indicates that most fishing apparently was from shore rather than from boats, using a bone gorge attached to a line and perhaps a spear of some sort. At the Punta Arena site on Santa Cruz Island (SCRI-109), for instance, fish remains from strata dating within this bracket of time (and earlier) are dominated by sheephead remains and lack bones of taxa that could be caught only from boats (Glassow et al. 2008). Information concerning utilization of plant foods does not yet exist, but the existence of a few sites in the interior imply that plant foods were acquired. No milling implements are attributed to this time period. Digging-stick weights may occur during this period (and may be earlier as well), but reference to their occurrence during this time period are general, and no specific dated contexts are reported (Kennett 2005:126-127; Orr 1968:128).

6300-5300 BP

Sites of this time period on the northern Channel Islands where abalones were available in the intertidal or shallow subtidal zone have deposits containing significant quantities of red abalone shells. The abundance of red abalone shells is significant because site deposits dating earlier and later in time typically have few or no red abalone shells, and if abalone shells are present, black abalone (*Haliotis cracherodii*) is the dominant species. This temporal pattern is strongest on Santa Cruz Island, and most date after 6000 BP (Glassow 1993b). On Santa Rosa and San Miguel Islands sites dating to other time periods may also contain abundant red abalone shells.

On Santa Cruz Island, all but one of these sites are in the western sector of the island, the exception being at Punta Arena on the south coast. Fourteen of these sites have been radiocarbon dated, and several more are known to exist. Nearly all visible red abalone middens probably have been identified on the island. On Santa Rosa and San Miguel the distribution of red abalone middens is not so restricted to a particular sector of the island. As well, the number of red abalone middens is substantially larger on San Miguel Island compared to the other two, although many may not date to the 6300-5300 BP time interval.

Other shellfish taxa are represented in red abalone middens. On Santa Cruz, mussel shells uniformly dominate the shellfish assemblages, and shells of black and pink abalone, as well as wavy top (*Lithopoma undosum*), also may be relatively abundant (Glassow et al. 2008; Glassow 2005b). Indeed, at Punta Arena, both mussel and black abalone are more abundant with respect to shell weight than red abalone (Glassow et al. 2008; Sharp 2000a, 2000b), red abalone shell typically being less than 5% of the total shellfish weight (Glassow 2005:26). Many other species also occur in minor quantities. On Santa Rosa and San Miguel, red abalone is proportionately more abundant, although mussel may still be the most prevalent taxon present. For instance, at SMI-481 and at SMI-557, both on San Miguel, red abalone is more abundant than mussel (Vellanoweth et al. 2006; Braje and Erlandson 2007:480). This also appears to be the case at many other red abalone middens on San Miguel where red abalone shells form pavements on wind-deflated surfaces. On Santa Rosa, however, mussel is two to six times more abundant by weight than red abalone.

Red abalone middens tend to be relatively small in area. On Santa Cruz, most appear to be less than 20 m in diameter, and similar small sizes appear to prevail on the other two islands. Midden deposits containing red abalone shells at these sites generally are less than 30 cm thick. A few red abalone middens are substantially larger, both in area and depth of deposits. El Montón (SCRI-333), located near the western extreme of Santa Cruz, appears to have red abalone midden deposits covering an area approximately 100 m in diameter and as much as 1.5 m deep (Wilcoxon 1993). A site of similar area and depth, the Punta Arena site (SCRI-109), is located on the south coast of this island (Glassow 2002b, Glassow et al. 2008). Santa Rosa and San Miguel also may have a few sites with similarly substantial deposits. Kennett (2005:130-133) identifies two sites on Santa Rosa as "secondary villages," indicating that they are significantly larger than the typical small sites.

Most red abalone middens are buried, or once were buried, under eolian or alluvial deposits, or midden deposits dating later in time. This pattern is most pronounced on Santa Cruz, largely because wind deflation has not removed overlying deposits, as has been the case on parts of Santa Rosa and on most of San Miguel. Most documented red abalone middens on Santa Cruz Island have been exposed on gully, arroyo, or seacliff walls, and a few are in deflated areas. Most likely many red abalone middens have gone undetected during systematic archaeological survey.

The number of sites on the three larger northern Channel Islands dating between 6300 and 5300 BP implies that population density may have risen during this period. Kennett (2005:130-133) lists 21 sites with deposits dating within this time interval (a total of 25 radiocarbon dates), and since Kennett's list was compiled several more sites have been dated to this time interval (e.g., SMI-481, mentioned above, and SCRI-796 (Ballantyne 2006)). Nonetheless, an inference of population growth should be treated with caution, as these sites have attracted the attention of archaeologists because of their distinctive characteristics. In fact, on Santa Cruz, Glassow has focused much of his research on red abalone middens since the 1980s. However, if population did grow during this time interval, it appears to have remained very low in comparison to later time periods. The small volume of deposits at most sites of this time interval supports this conclusion.

Faunal remains from red abalone middens imply that shellfish were a dominant food resource. Nonetheless, bones of fish, sea mammals, and marine birds are present, indicating that the diet included a variety of marine foods (Braje and Erlandson 2007; Braje, Kennett, Erlandson, and Culleton 2007; Glassow et al. 2008; Rick, Robbins, and Ferguson 2006; Vellanoweth et al. 2006). Although data are limited because of small amounts of excavation undertaken at relatively few red abalone middens, the diversity of fish taxa fish caught was limited, and pinnipeds and birds appear to have been only occasionally acquired. However, the two significantly larger red abalone middens on Santa Cruz contain relatively higher concentrations of fish and sea mammal remains. The Punta Arena site is noteworthy in that dolphin bones are particularly abundant, and it is apparent that dolphins were dietarily more important than shellfish. Fishing also was relatively more important to occupants of the Punta Arena site than to occupants of the small red abalone midden sites (Glassow 2005a; Glassow et al. 2008). Data from El Montón is limited, but auger sampling undertaken in 2003 revealed that fish and sea mammal bone is significantly denser in this red abalone midden than is typically the case. Sites on Santa Rosa and San Miguel with significantly larger proportions of faunal remains other than shells have not been reported, but it seems likely that they exist.

Very little information about utilization of plant foods is available. Analysis of ethnobotanical remains collected from the Punta Arena site indicates that some sort of corm or bulb was collected, but it could not be identified taxonomically (Glassow et al. 2008). The most likely plant represented by these remains is blue dicks, which today occurs in grasslands on the islands. A digging-stick weight from deposits dating to the 6300-5300 BP time period at the Punta Arena site is indicative of collecting bulbs or corms. Two digging-stick weights, a pestle, and a mortar fragment from a red abalone midden at SCRI-549 also are indicative of plant food acquisition and processing (Glassow 2005b:29; Glassow et al. 2008). The importance of plant foods to the diet remains uncertain, however.

The distinction between the two larger red abalone middens and the smaller ones on Santa Cruz indicates some degree of complexity within settlement systems. The significantly larger volumes of deposits at the two larger sites implies longer episodes of occupation, and the greater abundance of fish, sea mammal, and bird bones implies a more diverse diet. These two sites were focal points within one or more discrete settlement systems. In his consideration of middle Holocene settlement systems Kennett (2005:129) has proposed that people living on the northern Channel Islands at this time practiced logistical food procurement in that they acquired food at various locations and brought it back to central bases. He defines four types of settlement: primary villages, secondary villages, logistical encampments, and interior residences. He indicates that primary and secondary villages served as central bases in coastal settings, and some but not all interior residences apparently did also. Logistical encampments, according to Kennett, were locations where resources were obtained, perhaps processed to some extent, and then brought back to a primary or secondary village. He indicates that logistical encampments generally were located near the coast, but some sites classified as interior residences also may have been logistical encampments. Kennett (2005:132) classifies El Montón as a primary village and the Punta Arena site as a possible secondary village. In addition, he classifies a site on Santa Rosa Island (SRI-109) as a logistical encampment, and oxygen isotope data derived from mussel-shell calcite indicates occupation only during warmer months of the year, that is, during summer and fall (Kennett 2005:152).

Several characteristics of red abalone middens and their geographic contexts are not completely in accord with Kennett's proposed settlement system model. First, no red abalone midden, including the few relatively large ones, is known to contain remains of dwellings, although the small scale of investigation at any red abalone midden is not conducive to discovering such remains. Second, El Montón and the Punta Arena site are at either end of the distribution of red abalone middens on Santa Cruz Island and consequently are not centrally positioned to serve as central bases. Third, a few red abalone middens are set back 1 to 2 km from the coast (notably SCRI-425 and SCRI-796), indicating that shellfish were transported a significant distance from where they were collected to a small site rather than to a larger one that Kennett would classify as a village. Finally, a red abalone midden with typical small, shallow deposits, SCRI-549, has yielded artifacts associated with plant food acquisition and processing for consumption, typical of relatively long-term occupation.

The available data indicate that settlement systems of this time period probably were more complex than implied by Kennett's model. Although his model accounts for the contrast between such sites as El Montón and the Punta Arena site on Santa Cruz Island, on the one hand, and the more numerous small, shallow midden deposits on the other, alternative models also could fit these data. For instance, it is possible that all red abalone middens were residential bases and that few or none were logistical encampments as defined by Kennett. The variation between the many small red abalone middens and the two much larger sites may be largely the result of differences in the productivity of nearby marine habitats. Both El Montón and the Punta Arena site are adjacent to highly productive intertidal zones and nearshore waters, and occupation of these sites may have been more frequent and for longer durations than at other red abalone midden sites. Another alternative entails seasonal variation in settlement systems. Winter residence may have been for longer time intervals at locations with productive marine

resources, whereas summer residence may have been for shorter intervals at locations where both marine and terrestrial resources were available. In addition to these alternatives, it is possible that the nature of settlement systems varied beween the islands.

The nature of interior settlement during this time period is still poorly known. On Santa Cruz, a site (SCRI-36) on a ridge at the northern margin of the Coches Prietos watershed is associated with a radiocarbon date falling within the 6300-5300 BP range (Peterson 1994). Three additional sites—SBA-610, 681, and 691—are located in the eastern sector of the island (Perry 2003:159; Glassow et al. 2008:72). The deposits at these sites contain few or no red abalone shells.

Mentioned earlier were two red abalone middens on Santa Cruz located between 1 and 2 km from the coast. These are within easy walking distance of coastal resources, and one might argue that they are not true interior sites. Kennett (2005:130-131) lists five sites in the interior of Santa Rosa with radiocarbon dates within the interval. He classified these as interior residences due to the presence of more substantial deposits than is typical of red abalone middens on the coast. He also lists one on San Miguel that is set back from the coast but close enough to be designated a coastal site (2005:133). It is significant that the interior sites on Santa Rosa apparently have more substantial deposits than most coastal red abalone middens, implying that resources in the interior of the island were of interest to the island occupants. Indeed, interior residential sites probably are more abundant than current data indicate. Mentioned above were red abalone middens that yielded digging-stick weights, a pestle, and a mortar fragment, types of artifacts presumably associated with use of plant food resources.

Knowledge of technology in use during the 6300-5300 BP time interval comes mainly from excavation at the Punta Arena site. In some respects it is a continuation of that which existed during the early Holocene. Bone gorges used for fishing have been collected from deposits of this age (Glassow et al. 2008), and it is likely that baited gorges attached to a line was a major means of catching fish. Nets may also have been used, but remains of them have not been found at sites of this age. Mentioned above were the digging-stick weights collected from Punta Arena site and SCRI-549. They also occurred as mortuary goods at a cemetery excavated in 1932 at El Montón, associated with burials that probably date to this time interval (Hollimon 1990:242-249; King 1990:270-275). Although by no means certain, this artifact may have made its first appearance during this time period. Mortars and pestles also apparently began to be used during this time period, as they were on the mainland (Glassow 1996c; Harrison and Harrison 1966), but the only reasonably well documented island context, the finds of a pestle and mortar fragment, is at SCRI-549.

Projectile points occur very rarely in site deposits of this time period, and no particular type is distinctive, in contrast to the case on the mainland, where a side-notched dart point form was in use (Glassow 1997a). Their rarity indicates that hunting with projectiles was not common on the islands, at least not with projectiles tipped with stone points.

Tar-covered stones also occur during this time period, as documented by finds at the Punta Arena site (Glassow et al. 2008). These may be the earliest occurrence on the Channel Islands (and possibly the mainland too). Ethnographic descriptions imply that these stones were used to

coat the insides of basketry bottles with tar. However, no remains of basketry bottles date to this period to verify this use.

A variety of blunt- or sharp-pointed bone artifacts were collected from the Punta Arena site (Glassow et al. 2008), but the functions of these artifacts is unclear. Some may have been parts of compound artifacts, and others may have served as hairpins. Although some are made of bones of locally available animals (including dogs), others are of deer, implying import of either bone material or finished artifacts from the mainland.

Social life during this time period has left few clues. The small size of many red abalone middens implies that family groups of perhaps no more than 10 people traveled independently for at least some parts of the year and most likely were economically independent as well. Yet the cemetery at El Montón, the only one known on the Channel Islands dating to this time period, implies aggregation into larger social units, perhaps annually. As well, the diversity of ornaments of shell and bone associated with the dead at this cemetery is greater than at cemeteries dating earlier in time (Glassow 2004b), indicating that social complexity had increased even though social organization probably remained the egalitarian form typical of hunter-gatherers that lived in low population densities. Glassow (2004b:21) proposed that this greater complexity may have been the result of a greater use of watercraft, and perhaps the development of a more sophisticated form of watercraft, as indicated by the focus on dolphin hunting of the occupants of the Punta Arena site. The cross-channel commerce implied by the presence of deer bone artifacts also may be related to more intensive watercraft use.

The prevalence of red abalone shells in middens of this time period has stimulated investigation into the possibility that cooler water temperatures prevailed during this time period, which allowed red abalone to be more abundant in intertidal and shallow subtidal waters. This proposal is based on red abalone's preference for water temperatures cooler than those prevailing around the northern Channel Islands today (Glassow 1993b). The proposal gained initial support from an oxygen-isotope analysis of mussel shells from the red abalone midden at El Montón (Glassow et al. 1994). More recently, a sea water temperature record based on oxygen isotope analysis of fossil foraminifera has become available (Kennett 2005:68). This record spans the Holocene and shows that water temperature indeed was cooler during the 6300-5300 BP interval, although it was becoming warmer during its latter part. Significantly, water temperatures were significantly warmer on the average before and after this interval.

However, an explanation for the collection of red abalones during this time period is more complicated than simply a response to greater availability resulting from cooler water temperatures. One complicating factor is that water temperature, although cooler, was still warm enough for warmer-water shellfish taxa such as wavy top to be available (Sharp 2000a). Furthermore, the water temperature record indicates that other periods later in time were characterized by water temperatures as cool or cooler, yet red abalones were not a noticeable focus of shellfish collecting. One factor that may have influenced the availability of red abalone is the variable presence of sea otters (*Enhydra lutris*). As Erlandson, Rick, Estes et al. (2005:15) have argued, abalones within intertidal or shallow subtidal waters would not have been abundant if sea otters were present. No sea otter bones are in the collections from the Punta Arena site (Glassow et al. 2008), an indication that sea otters may not have been present in the waters

around the northern Channel Islands during the 6300-5300 BP time interval. The relatively frequent occurrence of sea otter bones in deposits after approximately 5000 BP implies that sea otters suppressed red abalone populations in shallow waters, thus accounting for the rarity in sites during later periods of prehistory. Another factor that probably influenced the abundance of red abalone shells in middens dating to the period between 6300 and 5300 BP is low human population density, which facilitated sustainable yields of red abalone.

Another issue relating to abalone collecting is the extent to which people were diving in subtidal waters to collect them. Although some red abalones may have been available in the intertidal zone, the abundance that occurs in some red abalone middens hints at the possibility of diving in subtidal waters, or at least wading into shallow subtidal waters. The prevalence of wavy top in the deposits at the Punta Arena site is another indication that diving was taking place. This is a shellfish that lives subtidally and could be obtained only by diving or when wavy tops were washed ashore by strong wave activity related to storms. Significantly, Rick, Robbins, and Ferguson (2006) propose that occupants of a site on Santa Rosa (SRI-191) collected red and black abalones in waters at lower temperatures than was the case with California mussels, as indicated by oxygen isotope analysis. This pattern is expectable if the abalones were collected from a substrate surface in waters deeper than where mussels were collected.

In summary, the 6300-5300 BP period has been one of particular interest among archaeologists working on the northern Channel Islands, in large part because of the distinctiveness of the sites. However, it may also be the case that sites dating to this time period are more prevalent than immediately before or after, resulting in a greater chance of encountering deposits of this age. Although shellfish collecting continued to be an important subsistence activity, fishing and sea mammal hunting were intensified, at least at some locations, and the increased intersite variation in midden volume and proportions of different categories of subsistence remains indicates that settlement systems had become more complex, although their nature still is poorly understood. As well, there is circumstantial evidence that social organization had become more complex.

5300-5000 BP

The brief period of time immediately following 5300 BP appears to be one of significant shifts in settlement and possibly also population decline. Settlement shifts on Santa Cruz Island are indicated by the lack of immediately later deposits resting on top of red abalone middens. As mentioned, most are buried under sterile deposits, and at the Punta Arena site midden deposits about 2700 years younger rest on top of the red abalone midden. A possible exception is at El Montón, where radiocarbon dates and mortuary data hint at occupation within the 5300-5000 time period (Breschini et al. 1996:70). However, even at this site there is a distinct stratigraphic break between the red abalone midden and the midden deposits overlying it. Such evidence of settlement shifts on the other northern Channel Islands is not as clear. Braje, Kennett, Erlandson, and Culleton (2007) report that a red abalone midden on Santa Rosa (SRI-147) is bounded by earlier and later midden deposits, but the number of radiocarbon dates is insufficient for determining how much earlier and later these deposits are.

Kennett's (2005:130-133) list of middle Holocene sites includes seven falling within the 5300-5000 BP interval. One of these, pertaining to deposits at the Punta Arena site, appears to be spurious (Glassow et al. 2008), and another date, with an intercept of 5227 BP, pertains to a red abalone midden on Santa Cruz (SCRI-427) and undoubtedly pertains to the 6300-5300 BP time interval. The remaining five sites are on Santa Rosa, and interestingly these also have intercepts falling between 5300 and 5200 BP, which implies that they too may relate to this earlier time interval.

Too few data exist to say much about cultural change at the onset, let alone within, the 5300-5000 BP time interval. One obvious change, however, at least on Santa Cruz Island, is that red abalone ceased being a focus of shellfish collection. Although a shift in settlement is apparent in that red abalone middens no longer were occupied, changes in the nature of settlement systems are not apparent.

It is possible that settlement systems did not change significantly beginning around 5300 BP and that the abandonment of red abalone middens is largely the result of population decline. This hypothesis is made plausible in light of the climatic shift reflected in the significant warming of sea water temperatures. Although the warming trend began during the previous period, waters became significantly and persistently warmer and remained so until about 3800 BP (Kennett 2005:68). Significantly warmer waters generally would have a negative impact on marine productivity, and if so human populations on the islands would have been negatively impacted. At present, however, no data exist, or are apparent, that would inform on adaptive responses to warmer sea water temperatures.

MIDDLE TO LATE HOLOCENE, 5000-1000 BP

The time interval from 5000 to 1000 BP spans the Middle to Late Holocene as well as the Middle to Late Periods on all of the northern Channel Islands, denoting an important transition in any chronology for the region. On the northern Channel Islands, 58 known sites have components dating to between 5000 and 3000 BP and 38 known sites to between 3000 and 1000 BP, providing a sufficient basis for comparison (see Kennett 2005 and Rick, Erlandson, Vellanoweth, and Braje 2005a for comprehensive lists of radiocarbon dates). This 4000-year-long time interval is not easily divided into meaningful segments, as was the case with the preceding periods. In part this is due to the complexity of change during this time interval. Shifts in population size, technology, settlement, and social organization occurred during this period, but these shifts do not appear to coincide in time. As well, until very recently this time interval has not seen as intensive attention among archaeologists working on the Channel Islands as periods dating both earlier and later in time. As more information is acquired about cultural change during this period, periods of abrupt cultural change may be identified, justifying temporal divisions.

Throughout the northern Channel Islands, changes in technology, subsistence, and settlement from the Middle to Late Holocene reflect an increasingly maritime orientation related to intensified fishing and regional exchange (Arnold 1992, 1995, 1996a and b; 2001b and c; Erlandson 2001; Erlandson and Jones 2002; Glassow, Gamble et al. 2007; Kennett 2005; Munns

and Arnold 2002; Rick, Erlandson, Vellanoweth, and Braje 2005). The transition from the Middle to Late Holocene around 3500 BP follows by about 2000 years the adoption of mortars and pestles, includes the transition to circular shell fishhooks around 2500 BP, but precedes the introduction of the plank canoe and bow-and-arrow around 1500 BP (Arnold 1995; Glassow 1996c; Erlandson, Kennett, et al. 1997; Gamble 2002). In addition to technological innovations, faunal and floral data from coastal sites document major subsistence changes as people broadened their diet breadth to emphasize a diverse array of both marine and terrestrial habitats and species (Glassow 1996c, 1997a; Erlandson 1997; Kennett 1998, 2005; Vellanoweth et al. 2002; Erlandson and Rick 2002b; Perry 2003, 2004, 2005; Perry and Hoppa n.d.; Glassow, Gamble et al. 2007; Rick 2007a; Rick, Erlandson, Vellanoweth, and Braje 2005). Mainland and island populations appear to have diversified their technologies and subsistence practices to emphasize fish, sea mammals, and pulpy plant foods such as acorns (from various species of oaks, *Quercus* spp.), islay (the fruit and seeds of island cherry, *Prunus lyonii*), and roots (tubers, corms, and bulbs) as lower-ranked, higher-cost species (due to processing costs, specialized technologies, etc.) were increasingly included in the diet (Glassow 1996c, 1997a; Timbrook 1993).

Technological innovations during this time interval, including contracting-stem points, notched stone sinkers or net weights, and circular shell fishhooks, relate in various ways to transformed hunting, fishing, competition, and violence in the Santa Barbara Channel (Erlandson 1997; Glassow 1997a; Erlandson and Jones 2002; Glassow, Gamble et al. 2007; Kennett 2005; Rick, Erlandson, Vellanoweth, and Braje 2005; Rick 2007a; Perry and Jazwa 2010). Various new items of technology supported a maritime-oriented economy in which intensified fishing and trade underwrote coastal sedentism and specialization (Arnold and Bernard 2005; Arnold 1995, 2001b and c; Colten 2001; Erlandson and Rick 2002b; Harrington 1978; Kennett 1998, 2005; Munns and Arnold 2002; Perry 2003; Pletka 2001a). Notched stone sinkers or net weights around 4000-3000 BP, circular shell fishhooks around 2500 BP, and plank canoes around 1500 BP provided opportunities to diversify marine resource use in contrast to the overwhelming emphasis on shellfish that characterizes the Early and Middle Holocene, with some notable exceptions (Glassow 1993b, 1996c; Erlandson 1997; Glassow, Gamble et al. 2007; Kennett 2005; Perry 2003, 2004, 2005; Rick 2007a; Vellanoweth et al. 2002). In contrast, Late Holocene subsistence appears to be much broader as fishing efforts were expanded (e.g., kelp bed and mid-channel fishing) and intensified (e.g., nearshore netting) to varying degrees throughout the region (Colten 2001; Pletka 2001a; Erlandson and Rick 2002b; Glassow 1993b, 2002b; Glassow et al. 2008; Kennett 2005; Rick, Erlandson, Vellanoweth, and Braje 2005).

Although not much is known about ground stone production during the Middle Holocene, there is strong evidence of mortar and pestle manufacture on San Miguel Island during the Late Holocene (Conlee 2000; Kennett and Conlee 2002; Walker and Snethkamp 1984). Mortars and pestles are common at sites on the island, most of which appear to have been manufactured locally at SMI-503 and 504. As described by Conlee (2000:378) "the mortars and pestles were generally manufactured from a pink and gray rhyolite porphyry…small boulders were expediently used as preforms for mortars." Sixteen other sites have evidence of mortar and pestle manufacture, indicating its importance in the local economy (Conlee 2000:383). The oldest dates associated with these sites, 2653-2370 BP, are from the basal deposits of SMI-503, indicating that the industry arose at the beginning of the Late Holocene; it also appears to have

peaked prior to the Late Period (Conlee 2000). The scale of production indicates this site complex was connected to a regional exchange network, which is also demonstrated by the recovery of obsidian, among other items, from the mainland (Conlee 2000:383; Rick et al. 2001; Walker and Snethkamp 1984).

Based on evidence obtained on all three of the permanently inhabited northern islands, Santa Cruz, Santa Rosa, and San Miguel, marine resources became increasingly important during the period encompassing the transition from the Middle to Late Holocene. Glassow (1993b, 2005a), Kennett (1998, 2005), Vellanoweth et al. (2002), Perry (2003), Rick (2004 a and b, 2007a), and others have documented significant increases in fishing and steady declines in shellfish contributions to the diet after about 3000 BP, with some exceptions. The most comprehensive data concerning shifts in marine resource utilization during the transition from the Middle to Late Holocene is presented by Glassow (1993b) with respect to Santa Cruz Island and by Kennett (1998, 2005) regarding Santa Rosa and Santa Cruz Islands, partly based on data from trans-Holocene sites on San Miguel Island such as SMI-87, SMI-261, and SMI-481 (Erlandson, Rick, and Peterson 2005b; Glassow 2002a, 2005a; Glassow, Gamble et al. 2007; Perry 2003; Rick 2004a and b, 2007a; Rick et al. 2001; Rick, Erlandson, Vellanoweth, and Braje 2005; Vellanoweth et al. 2002). Island deposits dating between 5000 and 2500 BP are dominated by shellfish, which represents between 70% and 96% of the protein yield, while fish contribute between 1% and 30%. In contrast, for those dating after 2500 BP, shellfish represent between 9% and 70% (primarily under 45%) of the protein yield and fish between 18% and 80% (Glassow 1993b:79; Perry 2003, 2004, 2005). Kennett (1998:277, 327; 2005:189-192) has identified comparable proportions (i.e., intensified fishing) in his analysis of faunal assemblages from the three larger northern islands, which came from 15 sites with deposits dating between 4000 and 3000 BP, bounding the Middle to Late Holocene transition, and 20 Late Holocene sites. Erlandson, Rick, and Peterson (2005b) and Vellanoweth et al. (2002, 2006) have documented similar patterns at Otter Cave on San Miguel Island, although they stress that there is considerable intra- and inter-island variability with respect to the particular contributions of shellfish, fish, and sea mammals.

In contrast to the abundant data on marine subsistence, more limited evidence for local plant exploitation includes indirect indicators such as 1) changing ground stone frequencies (Delaney-Rivera 2001; Hollimon 1990) and 2) oxygen isotopic analysis of mollusk shell carbonates to infer seasonality (Kennett 2005; Rick, Robbins and Ferguson 2006), as well as direct indicators including 3) the identification of bedrock mortars (Perry, unpublished field notes) and 4) macrobotanical analyses (Martin and Popper 2001; Glassow et al. 2008). Stone bowl mortars along with pestles and digging-stick weights are common at residential bases and with burials dating to the Middle Holocene, as well as at stone bowl mortar manufacturing sites mentioned earlier. These highlight the potential significance of local plant procurement and processing (Hollimon 1990; Glassow 1996c; Conlee 2000; Delaney-Rivera 2001; Kennett and Conlee 2002; Perry 2003; Rick 2007a; Schneider and Osborne 1996; Walker and Snethkamp 1984). Digging-stick weights were likely used to harvest corms and bulbs, such as blue dicks and wild onions, in grassland and coastal sage scrub habitats, given that they were attached to sticks for weight and provided leverage in digging (Timbrook 1993; Glassow 1996c; Martin and Popper 2001).

Although islanders continued to procure and consume locally available plant foods into the Late Holocene on Santa Cruz Island (after 2500 BP), archaeological and ethnographic evidence indicates that more labor-intensive ones (e.g., acorns) were increasingly ignored, or perhaps were already overtaxed (Conlee 2000; Hollimon 1990; Timbrook 1993). Delaney-Rivera (2001:181) detected a 21% decline in ground stone from Middle (2500-800 BP) to Late period (650-200 BP) deposits at five sites (SCRI-191, SCRI-192, SCRI-240, SCRI-330, and SCRI-474) dispersed along the coastline, which is particularly significant given the presumed context of stable or increased population density (Glassow 1999b). In addition to ground stone recovered from habitation sites, the decline in the importance of local plant foods is also supported by burial-associated items from eight cemeteries on Santa Cruz Island (Hollimon 1990). Interestingly, while the frequency of bowl mortars, pestles, and digging-stick weights in burials declined, fishhooks and bifaces increased significantly during the Middle period (after 2500 BP), reflecting long-term changes in resource priorities and values (Hollimon 1990:158; see Perry 2003:48). Limited plant exploitation on Santa Cruz Island is also anecdotally supported by ethnographic informants who refer to the 1) preparation of blue dicks in roasting pits; and 2) comparatively limited investment in acquisition of other island plants (such as acorns). Instead, islanders apparently began to invest their time in fishing and manufacturing shell beads and other products for export to obtain mainland resources (such as acorns and seeds) (Timbrook 1993:52). At the same time, ground stone usage and average artifact size appears to have increased slightly on the mainland, which agrees with other evidence linking intensified plant harvesting on the mainland with plant exportation (e.g., whole acorns) to the Channel Islands (Delaney-Rivera 2001).

Regarding settlement patterns, Orr (1968) was the first to discuss specifically the spatial distribution of Middle Holocene sites on any of the Channel Islands within the Park, referring to deposits on Santa Rosa Island dating between 6000 and 4000 BP in interior and/or elevated locales as part of the "Highlander Phase" (see Kennett 2005:140). Survey of Jolla Vieja Canyon on the south side of the island by York (1996) as well as in Arlington Canyon and Canada Verde on the north side by Kennett (1998, 2005) confirmed this pattern. Kennett (1998, 2005:145) and Clifford (2001) first identified these trends on eastern Santa Cruz Island. Sites on the coast and in the interior of Santa Cruz Island support these findings, reflecting seasonal foraging activities of shellfish gathering, marine mammal hunting, and presumably plant harvesting (Glassow 1993b; Perry 2003, 2004, 2005; Peterson 1994). This dispersed pattern of settlement and subsistence is an inter-island phenomenon, with particular variations depending on differences in temperature, precipitation, topography, and resource availability. At present, 58 sites on the northern Channel Islands are known to have components dating to between 5000 and 3000 BP, including two on Anacapa, three on Santa Barbara, seven on San Miguel, 13 on Santa Rosa, and 33 on Santa Cruz Island (Glassow 1993b, 1999b; Glassow, Gamble et al. 2007; Kennett 2005; Perry 2003; Perry and Hoppa n.d.; Perry and Jazwa 2010; Rick 2007a; Rick, Erlandson, Vellanoweth, and Braje 2005). The period from 3000 to 1000 BP is represented by three on Anacapa, three on Santa Barbara, eight on San Miguel, 13 on Santa Rosa, and 12 on Santa Cruz, for a total of 39.

Middle Holocene patterns of settlement and subsistence appear to be similar throughout the northern Channel Islands, characterized by seasonal foraging of marine and terrestrial resources, with some recurring central places (Glassow 2002a, 2005a and b; Glassow, Gamble et al. 2007,

Glassow et al. 2008; Kennett 2005; Perry 2003, 2004, 2005; Perry and Jazwa 2010; Rick 2004a, 2004b, 2007a; Rick et al. 2001; Rick, Erlandson, Vellanoweth, and Braje 2005; Vellanoweth et al. 2002). Islanders appear to have occupied seasonal residential bases in coastal and interior locales, from which they targeted plants such as blue dicks bulbs, large shellfish such as abalone and wavy top, and sea mammals in haul-outs and rookeries (Kennett 2005; Perry 2003; Perry and Jazwa 2010). The pattern of red abalone exploitation during an earlier segment of the Middle Holocene (Glassow 1993a, 1997a, 2002b, 2005a; Glassow, Gamble et al. 2007; Glassow et al. 2008; Kennett 2005; Perry 2003; Perry and Hoppa n.d.; Rick, Robbins, and Ferguson 2006; Sharp 2000b) does not persist after 5300 BP. Nonetheless, some emphasis on red abalone exploitation did continue into the Late Holocene on San Miguel Island, probably related to their intertidal or shallow subtidal occurrence there (Rick 2004a, 2004b, 2007a; Rick, Erlandson, Vellanoweth, and Braje 2005).

The interior-coastal foraging of the Middle Holocene contrasts significantly with maritime-oriented collector-based activities in the Late Holocene, especially after 1500 BP. Survey and testing data from canyons on Santa Rosa (Arlington Canyon, Canada Verde, and Jolla Vieja) and on Santa Cruz (Coches Prietos, Scorpion Canyon, Smugglers Canyon, San Pedro Canyon, La Cañada del Aguaje, and the Central Valley) document this shift (Glassow 1993b; Kennett 1998, 2005; Peterson 1994; Perry 2003, 2004, 2005, 2007b; Perry and Hoppa n.d.; Perry and Jazwa 2010). Middle Holocene residential bases are dispersed throughout the landscape, reflecting the relative importance of local terrestrial habitats and resources. In contrast, the few Late Holocene sites found in the interiors of Santa Rosa and Santa Cruz Islands tend to be fairly ephemeral, possibly reflecting collector-based forays from coastal villages.

Another aspect of settlement pattern change is increased sedentism, a pattern seen throughout the southern California Bight (King 1990; Erlandson 1997; Glassow 1997a; Erlandson and Rick 2002). On the Channel Islands, increased sedentism is associated with the intensified marine-oriented economy discussed earlier, as larger settlements were established directly on the coast to access increasingly maritime opportunities (Gamble and King 1997; Kennett 1998, 2005; Munns and Arnold 2002; Gamble and Russell 2002; Kennett and Conlee 2002; Perry 2003, 2004, 2005). Evidence for coastal sedentism on the islands, starting during the Middle Holocene, has come from SCRI-240 and SCRI-333 on Santa Cruz Island and SMI-481 on San Miguel Island (Rick 2004a and b, 2007a; Wilcoxon 1993; Glassow 2005a; Glassow, Gamble et al. 2007). The shift from dispersed to coast-based residence also has been documented on eastern Santa Cruz, where the movement from upland locales to coastal villages seems to occur after 2500 BP (Perry 2003, 2004, 2005). Gamble and Russell (2002:107) summarize King's (1990) assessment of changes in settlement from 5500 to 2600 BP, which he interprets as trending toward "a greater emphasis on boats and ocean resources, increased regional organization and greater populations, and less emphasis on defensive locations (in upland locales) by 600 BC [2600 BP]." Whereas previously people inhabited upland locales that offered a variety of terrestrial resources and visibility, after this time permanent villages were established directly on the coast (Arnold 1987; King 1990; Clifford 2001; Kennett and Clifford 2004b; Kennett 2005).

Associated changes in social interaction and ideology are reflected in substantial evidence for status differentiation and ritual behavior, including ceremonial enclosures and formal

cemeteries, at coastal sites on the islands and mainland (Lambert and Walker 1991; Lambert 1994; Erlandson and Rick 2002). Erlandson and Rick (2002b:180) suggest that resource diversification, sedentism, and cultural elaboration between 5000 and 1000 BP corresponded with slightly increased population densities on the northern islands, although substantial population growth probably did not occur until after 1500 BP (Glassow 1999b). As coastal settlements became increasingly permanent and densely occupied, territorial circumscription in the context of population-resource imbalances (e.g., resulting from the Medieval Climatic Anomaly) likely contributed to further resource intensification, exchange, and status differentiation, as well as increased competition and violence (Walker and Lambert 1989; King 1990; Lambert and Walker 1991; Lambert 1994; Walker 1996; Erlandson 1997; Jones and Kennett 1999; Jones et al. 1999; Kennett and Kennett 2000; Erlandson and Rick 2002b; Munns and Arnold 2002).

Fluctuating environmental conditions, which were increasingly marine-favorable after 3800 BP, and increased population densities are factors commonly cited as stimulating changes in technology, subsistence, and settlement from the Middle to Late Holocene in the Santa Barbara Channel region (Arnold 1992; Arnold and Tissot 1993; Arnold, Colten, and Pletka 1997; Raab and Larson 1997; Glassow 1993a and b, 2002a, 2005a; Glassow et al. 1988; Glassow, Gamble et al. 2007; Glassow et al. 2008; Jones et al. 1999; Jones and Kennett 1999; Kennett and Kennett 2000; Yatsko 2000; Johnson 2000a; Vellanoweth and Grenda 2002; Perry 2003; Kennett 2005). Synthesizing existing paleoenvironmental data for the California Bight, Kennett (2005) describes periods of cooler sea surface temperatures (SSTs) and arid conditions alternating with warm and wet intervals, cooler waters being associated with higher marine productivity due to nutrient upwelling. One of these periods falls between 4500 and 3300 BP, based on the intersection of a dry interval between 5200 and 3250 BP that peaked around 4800 BP, and cool but fluctuating SSTs between 4000 and 2300 BP (Kennett 2005:68, 70). Based on current paleoenvironmental reconstructions, oak woodlands and other plant resources were distributed extensively between 4500 and 700 BP, when the "warmest and most climatically variable intervals during the Holocene occurred" (Kennett 1998:245; see also Kennett 2005; Kennett and Kennett 2000). Prior to this period there was a warm-water interval between 5900 and 3800 BP, which suggests that terrestrial productivity was relatively high in the Middle Holocene. Circumstances changed between 3800 and 2800 BP with higher marine productivity, establishing environmental conditions conducive to the introduction of circular shell fishhooks and other maritime technologies of the Late Holocene (Kennett 2005:67).

During the Middle Holocene interval of presumably wetter conditions, peripheral islands such as Anacapa and Santa Barbara Islands would also have been habitable on a seasonal basis because of increased freshwater availability, plant productivity, and an abundance of birds and bird eggs during nesting seasons. Mortars and pestles, which are abundant on Middle Holocene sites on Santa Rosa, and San Miguel, and particularly Santa Cruz, also occur in shell middens on Anacapa and Santa Barbara Islands. These implements would have been suitable for processing plants and shellfish, among other resources (see Glassow 1996c). Collectively, the artifact assemblages on all of these islands suggest that people were using boats during the Middle Holocene to transport exchange items between different islands and the mainland, as well as for episodic activities such as egg gathering, bird hunting, and marine mammal hunting.

Initiation of Occupation on Anacapa and Santa Barbara Islands

The two smaller islands in the Park, Anacapa and Santa Barbara Islands, are known to have occupation near the beginning of the 5000-1000 BP time interval. Available radiocarbon dates pertaining to sites on these islands imply that occupation was not earlier than 5000 BP (Rick 2006; Rozaire 1978a). However, it is possible that earlier deposits have not yet been discovered and dated, and it is also possible that lands containing earlier sites have been lost to sea level rise and seacliff retreat. Of the 27 sites that have been documented on Anacapa Island, most are small and shallow, which is similar to the majority of sites on Santa Cruz Island, especially on the East End, except in exceptionally resource-rich areas (McKusick 1959; Rick 2006; Rozaire 1978a) (Figure 46). Regardless, it seems that Anacapa was being occupied seasonally during the Middle Holocene, perhaps as an extension of seasonal foraging rounds on Santa Cruz Island.

Most of the locations on Anacapa Island appear to have been used on a short-term basis, possibly representing "stopover points" that may have been occupied during journeys between the islands and mainland (Rick 2006). Seeking shelter from bad weather conditions, obtaining fresh water from low-lying seeps, asphaltum globules washed onto beaches, and fishing may have motivated these voyagers to visit the island. Also, inhabitants of Santa Cruz Island, especially of its eastern end due to proximity, and/or mainlanders may have utilized Anacapa Island for seasonally abundant resources. Territorial rights may have pertained to Anacapa Island, perhaps by people living in the eastern sector of Santa Cruz simply given the proximity. The substantial amounts of chert presumably transported to Anacapa from eastern Santa Cruz supports this possibility.

One resource that may have been especially attractive on Anacapa is eggs of marine birds. During a visit by Perry in the spring 2007, the island landscape was dotted with birds and their nests, most of which contained three eggs. The nests are simply and hastily constructed, exposed, and sitting right on the ground with no protection. Based on the extent of these nests, an estimate of 9000 eggs being available during one season is not unreasonable. Eggs could have been gathered and prepared quickly with no specialized tools or experience. Furthermore, it would be have been difficult if not impossible to overexploit this resource, if the contemporary populations are meaningful at all, much unlike smaller bird populations elsewhere (e.g., albatross on San Clemente Island).

Meaningful differences in site placement exist between the Middle and Late Holocene on Anacapa Island. Middle Holocene sites are dispersed throughout the landscape, including on the highest point of East Anacapa. In contrast, Late Holocene sites tend to be situated primarily near the waterline; along with fishhooks and microliths present in their deposits, they suggest boat expeditions from Santa Cruz Island or elsewhere to fish, hunt birds, collect eggs, and/or take shelter during rough seas. Multi-component sites are located in rockshelters and near landing areas such as Indian or Freshwater Cave and Le Dreau Cove on West and Middle Anacapa Islands, respectively (McKusick 1959).

Seven sites on Santa Barbara Island date between 4000 and 1000 BP, and none earlier than 4000 BP is known (Erlandson et al. 1992). As is the case with Anacapa Island sites, they are most comparable to small shell scatters and light middens associated with chert quarries on

eastern Santa Cruz (Perry 2003; Perry and Jazwa 2010). Interestingly, black abalone is the single most important species among the shellfish remains at Santa Barbara Island sites, comprising about 66% of the edible meat; owl limpet is second at 23%, followed by other minor taxa (Rick and Erlandson 2001:301). Whereas both intertidal and subtidal shellfish are represented in midden deposits dating to the Middle Holocene, subtidal species appear to have dropped out of the subsistence round sometime after 3000 BP.

Larger Contexts of Occupation during the 5000-1000 BP Interval

In concluding this treatment of the period between 5000 and 1000 BP, it is worth emphasizing that Santa Cruz, Santa Rosa, and Santa Barbara Islands appear to share commonalities in subsistence and residential mobility during the Middle Holocene, as well as the decline of subtidal shellfish exploitation during the Late Holocene. Sites such as in Smugglers Canyon and Coches Prietos Canyon on Santa Cruz Island and Jolla Vieja on Santa Rosa Island reflect logistically forays from central places, namely coastal villages. Santa Barbara Island may have been visited in the Late Holocene for some the same reasons, such as a 'stop-over' during inter-island voyaging, but also for the seasonal targeting of birds and/or sea mammals (Erlandson et al. 1992; Rick 2001; Rick and Erlandson 2001).

It is also important to recognize that the occupation of more peripheral and/or marginal islands by 5000 BP exemplifies significant regional trends during the Middle Holocene, including high residential mobility and a broad spectrum diet. The warmer and wetter climate of part of this time frame, compared to the Late Holocene, likely resulted in more favorable circumstances, including greater terrestrial productivity and freshwater access. Locally available plant foods, in combination with a diversity of marine resources, appear to have been targeted even on the most remote of islands. People were able to move between more resource-rich and resource-limited areas in the context of lower population densities, which stands in sharp contrast to increased coastal sedentism and circumscription during the Late Holocene. Evident in this pattern is the importance of watercraft during the Middle Holocene, which facilitated visits to other islands including those that required traversing long distances. Importantly, the technological developments and changing subsistence of the Middle Holocene appears to have provided the basis for the subsequent shift to increasingly maritime-oriented activities.

LATE HOLOCENE AFTER 1000 BP

The period beginning around 1000 BP is one of significant cultural change in the Santa Barbara Channel as a whole, and not surprisingly it is a period for which a great deal more information exists than for any earlier period. Cultural change is particularly obvious in economic, sociopolitical, and subsistence systems, and a few technological innovations also are apparent. Significantly, much of the current understanding of regional cultural development during the post-1000 BP period is a result of research on the Channel Islands, and indeed the island populations played a key role in the changes that occurred.

A major reason why the prehistory of the post-1000 BP period is much better known than preceding periods is because of the well-documented environmental changes that appear to have

stimulated cultural change. The Medieval Climatic Anomaly (or Medieval Warming) spans the period from approximately 1200 to 600 BP, and shortly thereafter the Little Ice Age occurred. A number of archaeologists either working on the Channel Islands or with interest in Santa Barbara Channel prehistory have argued that cultural responses to unstable and generally unfavorable environmental conditions of this period ultimately resulted in the development of the complex sociopolitical and economic systems that were in place at the time of Spanish exploration and colonization. Other obvious reasons for the comparatively substantial knowledge of post-1000 BP prehistory are the better preservation of and accessibility to the archaeological resources pertaining to this period and the abundance of distinctive time-marker cultural remains on site surfaces that facilitate identification of sites, particularly those dating after 700 BP.

The contemporary interest in the post-1000 BP period may be said to have begun with Arnold's study of the microblade manufacturing industry on Santa Cruz Island (Arnold 1987). Produced in substantial quantities, the ends of microblades were modified to form tips (bits) of drills used to perforate pieces of shell in the course of bead manufacture. Arnold identified two phases in the development of this industry and linked these phases to a significant change in the economic relationships between islanders and mainlanders. Later, as a result of her investigation of a series of terminal Middle Period and Late Period sites on Santa Cruz Island, Arnold (1992b:142) proposed a modification of King's widely used chronology, inserting a period only about 150 years long between the Middle and Late periods that she initially called the Middle to Late period transition (Arnold 1991:956) and more recently has been called simply the Transitional period (Arnold 2001a:23; Munns and Arnold 2002). The designation Middle-Late Transition is used here in order to avoid confusion with other periods of transition recognized in California (Bennyhoff and Hughes 1987:149; King 1990:93-98). With respect to King's (1974, 1990:28, 40) chronological scheme, the Middle-Late Transition encompasses subphase L1a of the Late period.

1000-800 BP: Development Prior to the Middle-Late Transition

The period beginning around 1000 BP falls at the end of the Middle Period in King's chronological scheme and encompasses a subphase he designates M5c (1990:38-39). King defined this subphase on the basis of beads and ornaments found with burials from two sites on Santa Cruz Island (SCRI-474 and either SCRI-191 or SCRI-257) and two sites on the mainland coast. King indicates that two types of beads are distinctive of this period: split-punched *Olivella* shell beads and very small-diameter disc beads of *Olivella* and *Mytilus* shell. In her study of the Santa Cruz Island microlithic industry, Arnold (1987) found that the trapezoidal form of chert microblade began to be manufactured at the beginning of this period or perhaps about 100 years earlier. Indeed, the presence of these microblades and drill tips made from them, in the absence of microblades with dorsal retouch, may be taken as an indicator of occupation during the 1000-800 time period. This period has not received as much attention as the two periods following 800 BP, in part because excavated samples are not as large and in part because researchers have been attracted more to the cultural changes between the Middle-Late Transition and the Late period.

Kennett (2005:61-63) lists 20 sites on the islands associated with radiocarbon dates falling within this interval of time that have yielded trapezoidal microblades, but most are represented

by very small samples. Arnold, however, has obtained relatively large samples from SCRI-93, 191, and 474. Another large collection dating to the 1000-800 BP period came from SCRI-240, obtained by Spaulding in 1974. Arnold (1987) studied evidence of the microblade production industry in this collection for her dissertation, and she and her students included parts of this collection along with the collections from the aforementioned sites in their consideration of cultural change from 1100 BP into the historic period. Comparably large samples have not been obtained from any site on the other islands.

By the beginning of this period subsistence practices resembled those that prevailed later during prehistory. However, fishing was not yet as important as it became later in time, and some emphasis was still placed on sea mammal hunting and shellfish collecting. Nonetheless, Colten's study of faunal assemblages from the SCRI-191, 474, and 240 reveals that fishing was providing the bulk of the meat to the diet during this period, but shellfish remained an important contributor (Colten 2001:202-203). Meat from marine mammals appears not to have been as important as either fish or shellfish. In his studies of fish remains from sites investigated by Arnold and her colleagues, Pletka (2001b:237) found that fish species that had a more southerly distribution or preferred relatively warmer waters were more common during this period than during later periods. (It should be noted that Colten and Pletka apparently include some data from deposits dating somewhat earlier than the period under consideration.)

From 1000 BP to the end of prehistory, island populations were "collectors" in Binford's (1980) sense of the term, and most or all of their residential bases appear to have been located at or very near the coast. Nonetheless, camps were occupied in the interior of the islands for acquisition of interior resources. On Santa Cruz, some of these camps were quarries, where chert was extracted from bedrock, cores were produced, and microblades were struck off. Arnold (1987) recorded a number of such quarry sites located on the southwestern flank of El Montañon, and she investigated one of these (SCRI-93).

Various lines of evidence indicate that populations on the islands, and on the mainland as well, began to experience variety of stresses during this period, a situation that appears to have worsened during the following Middle-Late Transition. Lambert's (1994, see also Lambert and Walker 1991:970-971) analysis of human skeletal remains from Santa Barbara Channel sites revealed that violent conflict peaked during the Middle period (2500-800 BP) and that projectile injuries, specifically, peaked during the late Middle period (1500-800 BP). She also found that health conditions were poorest during the late Middle period. The manner in which she aggregated her data does not allow the 1000-800 BP (Middle period phase M5c) data to be segregated, but there is no reason to believe that conditions during this interval were any different from those of the rest of the late Middle period.

Other lines of evidence also indicate that island populations during the 1000-800 BP period were experiencing stress (Arnold 1992b, 1997). These relate to changes in the regional economic system but are still poorly understood. As mentioned earlier, microblades and microblade drill tips began to be manufactured at or just before the beginning of this period. Their origin apparently is related to an increase in shell bead manufacture or at least a decrease in the amount of labor per bead. As well, their manufacture is clear evidence of intervillage exchange, as the microblades in the form of drills are found at many sites beyond the locality on

eastern Santa Cruz Island where they were produced, generally at or near where the chert was quarried. Also mentioned earlier were changes in shell bead manufacture: the production of very small disc beads and split-punched beads. The contrast between these two bead types with respect to labor devoted to manufacture is dramatic. The split-punched beads entailed very little labor to manufacture whereas the small disc beads required a great deal. Although an explanation for this significant difference in labor investment has not been proposed, at least it may be concluded that the economic system during the 1000-800 BP period became more complex.

Changes in subsistence, an increase in violence, a decline in health, and changes in the economic system related to shell bead production all may be responses to adverse climatic conditions, particularly droughts, occurring at the onset of the Medieval Climatic Anomaly, as pointed out by Raab and Larson (1997). However, a clear understanding of the nature of cultural systems during the 1000-800 BP period and how cultural changes related to particular environmental conditions during the Medieval Climatic Anomaly will require greater control over chronology and more specific information about environmental change (Gamble 2005).

800-650 BP: The Middle-Late Transition

The Middle-Late Transition as defined by Arnold spans a period between about 800 and 650 BP. Arnold defined this period as one during which economic and political systems underwent dramatic transformation into those with the essential characteristics of the Chumash at the beginning of Spanish colonization in the late 18th century (Arnold 1992a; see discussion below concerning the post 650 BP period for an alternative viewpoint). She proposed that this transformation was stimulated by environmental changes that disrupted subsistence, particularly dependence on marine resources. Raab and Larson (1997:351) point out that the Middle-Late Transition is that portion of the Medieval Climatic Anomaly during which apparently the severest climatic and environmental conditions prevailed. Because the Middle-Late Transition is only 150 years long, it is difficult to isolate and date deposits pertaining specifically to it. Nonetheless, Arnold (2001a:41) discovered and studied deposits that appear to fall within this interval of time at SCRI-191. She also identified a small volume of Middle-Late Transition deposits at SCRI-474. On San Miguel Island, Rick (2007a:75-91) investigated deposits of this age at SMI-468.

Many aspects of Arnold's arguments regarding cultural changes that occurred during the Middle-Late Transition are based on comparison between the periods preceding and following the transition. Nonetheless, deposits of this age at SCRI-191 yielded evidence that the period is aptly named. Arnold and Graesch (2001:78-79) found that bead-making detritus, and consequently bead-making activity, expanded significantly during this period. Also, during this period the form of microblade, used for bead drills, began to change from the trapezoidal to the triangular-with-dorsal-retouch form (Preziosi 2001:157-160). Fishing practices also appear to have shifted during this period. On the basis of his analysis of fish remains, Pletka (2001b:237) reports that fishing during this period placed greater emphasis than before on waters farther offshore than before or after. On San Miguel Island, Rick's (2007a:91) investigation of Middle-Late Transition deposits at SMI-468 revealed that use of marine resources increased from the

preceding period. However, such an increase is not apparent in the data obtained by Arnold and her colleagues.

Arnold (1992b:134, 2001c:292) also identified a disruption in settlement during the Middle-Late Transition. A number of sites have occupation either up to 800 BP or after 650 BP but no apparent occupation between these dates. The one site with well-documented occupation during the Middle-Late Transition, SCRI-191, is located adjacent to one of the most reliable sources of fresh water on the island. Kennett (2005:174-175) noted similar gaps in occupation between 800 and 650 BP on Santa Rosa and San Miguel Islands.

The nature of the environmental events that triggered cultural change occurring during the Middle-Late Transition has been a subject of debate. Based on an oxygen isotope-based sea-surface temperature record for the Santa Barbara Channel as well other sources of paleoenvironmental information, Kennett and Kennett (2000:391) have argued that it was significant drought and generally unstable climatic conditions during a period of unusually cool water temperatures that led to the increased socio-economic complexity manifest after 650 BP (see also Kennett 2005:215), an argument similar to one posited earlier by Raab and Larson (1997). However, Arnold (1992a:69-70) argued that sea-surface temperature was warm during the transition, originally basing her argument on a record that since has been shown to be problematic. She and a colleague later found that growth patterns of black abalone shells from deposits dating during the Middle-Late Transition also indicated unusually warm waters (Arnold and Tissot 1993). In addition, data derived from fish remains also imply that waters during the Transition were warmer than before or after (Colten 2001:213-214; Pletka 2001b:237), although the patterns seen in the fish data perhaps can be explained in other ways. Regardless of exactly what environmental perturbations occurred during the Middle-Late Transition, it seems certain that they are implicated in the cultural changes that occurred.

Intriguing evidence of aridity, albeit circumstantial, during the Middle-Late Transition comes from macrobotanical remains acquired during Arnold's investigations on Santa Cruz Island. The deposits of this age at SCRI-191 contained an unusual abundance of prickly pear seeds, the prickly pear cactus presumably being more prevalent, or more frequently a food product, during periods of aridity. As well, the Middle-Late Transition deposits lacked remains of bulrush, which were present in deposits dating both earlier and later (Martin and Popper 2001:258). The absence of this wet-loving plant may imply a reduction in marshland habitats. Importantly, however, Rick notes that freshwater sources near SMI-468, a site with Middle-Late Period deposits on San Miguel Island, are diminutive in comparison to those elsewhere on the island, implying that drought appears not to have had a significant impact on settlement location. As a consequence, he emphasizes that responses to adverse climatic events of this period varied geographically (Rick 2007:91).

Aside from deposits at sites in the western sector of the island investigated by Arnold, SCRI-240 (the Prisoners Harbor site and the historic-period Chumash village of Xaxas) is associated with a radiocarbon date falling within the time of the Middle-Late Transition (Kennett 2005:164). Arnold's (1987:191-200) stratigraphic analysis of microblades and microblade cores from this site showing a transition from the trapezoidal to the triangular-with-dorsal-retouch types also is strong evidence that strata pertaining to this period probably are present. With only

one radiocarbon date indicative of Middle-Late Transition occupation, however, analyses of other categories of cultural remains from SCRI-240 also have focused on trends that span a time interval beginning before and ending after the Middle-Late Transition (e.g., Colten 2001:216). Kennett (2005:164, see also Rick 2007a:90) lists eight other Channel Islands sites with radiocarbon dates falling within the period of the Middle-Late Transition. However, the inherent resolution of radiocarbon dates means that a large number of dates is necessary to be confident that deposits date to this 150-year interval. Of the sites on Kennett's list, Arnold (2001a:43-44) determined that SCRI-474 clearly has deposits dating to this time interval, although the data from them was not as important to her analyses as those from SCRI-191. SMI-468, on San Miguel Island, also is confidently dated to the Middle-Late Transition (Rick 2007a:75-91).

Perry (2003:205, 209-212) reports that two sites in the eastern sector of Santa Cruz, SCRI-506 and 647, are associated with radiocarbon dates that possibly indicate occupation during the Middle-Late Transition (neither being on Kennett's list). However, radiocarbon dates are too few and samples too small to be confident that Middle-Late Transition deposits actually are present. As a consequence of the dearth of data from deposits clearly dating to the Middle-Late Transition, as well as the short length of the period, the seemingly relatively rapid cultural changes that occurred must continue to be defined based mainly on a comparison of cultural systems as they were immediately prior to 800 BP and immediately after 650 BP.

650 BP to the Protohistoric Period: Consolidation of Chumash Lifeways

Not surprisingly, a great deal of archaeological information has accumulated over the last several decades concerning the latest prehistoric period of regional prehistory. Significant excavation of post-650 BP deposits has taken place at a number of mainland and island sites. Many scholars (e.g., Arnold 2001c:287; Ricka 2007:146) have pointed out that by 650 BP essentially all aspects of the Chumash sociopolitical, economic, and subsistence systems had come into place. Nonetheless, some changes during this period have been identified, particularly with regard to styles of shell beads and ornaments, which allowed King (1990:28) to divide the interval between 650 BP and the beginning of European colonization (AD 1782) into two phases and four subphases of his Late Period, based on changes in size and shape of some bead types and on an expansion in the diversity of bead types. Significantly, most of the data King used to define phases and subphases of the Late Period were from mortuary collections derived from Santa Cruz and Santa Rosa Island sites (King 1990:39-44, 237-266).

Subsistence practices during the period following 650 BP continue to show a strong maritime orientation. The most noteworthy change in subsistence at the beginning of this period is a relatively substantial increase in the importance of fishing, a change that appears to have begun during the Middle-Late Transition. Data compiled by Colten (2001:203) reveal that the meat-weight contribution of fish to the diet appears to have increased from approximately 43% to 62%, with proportionate decreases in the contribution of shellfish and marine mammals. Furthermore, he found that rockfish and surfperch were the principal categories of fish caught and that the proportion of rockfish increased after 650 BP relative to surfperches (Colten 2001:207). The greater emphasis on rockfish may indicate more fishing from boats near kelp beds as opposed to shore fishing, presumably with nets. Rick (2007a:139-141) found a similar shift to rockfish on San Miguel Island. Another important development beginning about 650 BP

is a greater emphasis on deep-water and open ocean fishing, particularly the capture of swordfish, a trend seen on Santa Cruz Island (Pletka 2001:238) but not on San Miguel Island (Rick 2007:141). Despite the increased importance of fishing, pinnipeds and shellfish continued to be utilized.

As was the case for the preceding two periods, patterns of plant food utilization remain poorly known, although some macrobotanical data do exist. Macrobotanical remains recovered from site deposits excavated by Arnold indicate that a variety of plants were utilized, and some undoubtedly were imported from the mainland (Martin and Popper 2001). Interestingly, acorns were not well represented among the plant remains, nor were the pits of island cherry, perhaps reflecting the fact that the sites investigated were not near habitats were these resources would have been abundant. However, Arnold (2001c:293) proposes that acorns were imported from the mainland in milled form, thus accounting for the lack of acorn parts among macrobotanical remains. The small-scale nature of excavation prevailing in Channel Islands archaeology generally has precluded acquisition of macrobotanical remains, and as a consequence little may be said about plant utilization during the post-650 BP period, despite the prospect that these remains are relatively abundant at many sites.

An interesting aspect of subsistence is evidence of feasting discovered at SCRI-240. Dating to the historic period, the evidence consists of a concentration of faunal remains—most visibly black abalone shells—that clearly represent one episode of deposition that contrasts markedly from the faunal remains in deposits above or below. Noah (2005, chapter 9) found that the composition of the collection of faunal remains, as well as associated artifacts relating to food preparation and serving, are indicative of a feasting event, probably of the sort that took place in the context of ethnohistorically and ethnographically documented Chumash "fiestas."

Although ethnohistoric and ethnographic information has allowed researchers to determine the location and name of most Island Chumash villages during the period of missionization (Johnson 2001:54), it is clear that a larger number of radiocarbon-dated sites fall within the period between 650 BP and the time of initial contact with Spanish explorers. Some of these are close to mission-period villages (e.g., SCRI-191 is adjacent to SCRI-236, attributed to the village of Ch'oloshush), but others are more distant (e.g., SCRI-195 is nearly a kilometer from SCRI-328, attributed to the village of L'akayamu). Kennett (2005:165-167) lists 44 sites with radiocarbon dates falling within this period, more than twice the number of named Chumash villages. In some cases, villages probably comprised more than one recorded site, being instead a cluster of closely spaced sites at a locality (SCRI-328, 329 and 330, all attributed to L'akayamu, is an obvious example). In other cases, the location of a village may have shifted, or two or more villages amalgamated into one. Some of the smaller sites on Kennett's list probably were seasonal camps rather than villages.

Some research also has focused on remains of houses within a village, which at habitation sites of this age are manifest as distinct circular depressions. Arnold and her colleagues were interested in documenting status ranking among household groups to see how this feature of social organization, documented through ethnohistory and ethnography, was manifest archaeologically. Although larger house size would be expected to be indicative of a higher-status household, as ethnohistoric and ethnographic evidence implies, Arnold (2001c:290) found

no evidence as a result of her and her colleagues' investigation of Santa Cruz Island houses that size was associated with status rank.

Two studies, by Noah and Graesch, addressed the issue of status distinctions between houses through study of associated artifacts and faunal remains. In her analysis of faunal remains obtained from deposits associated with specific houses within a series of Santa Cruz Island sites occupied after 650 BP, Noah (2005) found distinctions in the consumption of fauna attributable to status differences between houses at one site (SCRI-192) but not between houses at three others (SCRI-236 and SCRI-328/330). She also studied the faunal remains from the deposits associated with a house at SCRI-240 at Prisoners Harbor. She did not find definitive evidence that this house was an elite household, which Arnold (2001a:51) had proposed on the basis of redwood being used for house poles, but Noah was unable to compare the faunal remains from this house with any other at this site. It is possible that redwood was not as rare and costly a building material as Arnold presumes. Rick (2007b:259) found that redwood for house construction did not appear to be significantly restricted at SRI-2, the village of Niaqla. Moreover, in his analysis of collections and field records resulting from Orr's excavation at this site in the 1940s–1960s, Rick did not find obvious evidence of status differences between households, but Orr's relatively crude excavation techniques may have resulted in many items indicative of status differences not being collected.

Graesch (2004) investigated bead-making at 31 houses at three historic-period villages located in the western sector of Santa Cruz Island: L'akayamu (SCRI-328/330), Ch'oloshush (SCRI-236), and Shawa (SCRI-192). Although his investigation concerned the socio-economic context of bead-making during the historic period, the general nature of the variability he discovered undoubtedly was much the same during the late prehistoric period. Graesch concluded that occupants of the houses he studied placed varying emphasis on bead-making and that occupants of the three villages focused to some extent on making particular types of beads, apparently taking advantage of the kinds of shells that were most prevalent near each of the villages. He found no clear evidence of status ranking in that none of the 31 houses he investigated appeared to be occupied by an elite family. However, he found support for Arnold's proposal that the house with redwood-pole construction at the village of Xaxas (SCRI-240) was occupied by an elite family. He also discovered that the houses at Shawa on the south coast of the island contained more prestige goods than at any of the other houses at the other two villages, implying that occupants of this village may have enjoyed higher status (2004:166). Indeed, he suspects that not every village had elite families in residence (2004:166). Graesch also was able to reach a more general conclusion, regarding the articulation between the elite and nonelite households. His data indicate that bead-making specialists were not attached to elite individuals; instead, he concluded that the economic system entailed "an interdependent form of labor relations between elites and nonelite specialists" (2004:168).

Mentioned earlier was Arnold's argument that significant changes in the regional economic system occurred during the Middle-Late Transition. By 650 BP, according to her analysis, there was a much greater emphasis on cross-channel exchange and the use of shell bead money. This economic exchange system was essentially that of the Chumash at the time of European exploration and colonization. King (1971) describes the nature of the exchange relationship between the Chumash living on the islands and those living along the mainland coast, basing his

reconstruction on a variety of ethnohistorical and ethnographic information as well as scanty archaeological information available to him circa 1970.

Definitive archaeological evidence of this new economic system came from Arnold's study of the microblade manufacturing industry (Arnold 1987). Specifically she identified a change in the form and manufacturing procedure of microblades that became apparent by 650 BP. Arnold's research demonstrated that microblades with a trapezoidal cross-section were replaced by ones with a triangular cross-section. In order to achieve the new form, more core preparation was necessary. Earlier, Arnold (1987) designated this new form the triangular prepared microblade, but more recently she and her colleagues have used the descriptor, triangular with dorsal retouch, to refer to these microblades, in recognition of the presence of truncated retouch flake scars on one or both facets of the dorsal side of the microblades (Arnold, Preziosi et al. 2001:116). Arnold (1987:231) has argued that this new form, which was more labor-intensive to produce, resulted in a sturdier microblade that facilitated increased bead production.

Consistent with this argument, Arnold demonstrated through her later research that bead production had intensified by 650 BP. She found that *Olivella* shell waste from bead-making and microblades both increased in density within habitation deposits by a few orders of magnitude. In contrast, she also found that the density of bead blanks and beads-in-production remained relatively stable through the period before and after 650 BP, implying that bead-making had become more efficient (Arnold 1992b; see also Arnold and Graesch 2001). An aspect of the intensified bead-making was the introduction of the *Olivella* cup bead made from the callus portion of the shell. Although data are limited, it appears that production of this distinctive bead type began during the Middle-Late Transition (Arnold and Graesch 2001:82), but it remained an important bead type during the period prior to European contact. *Olivella* wall beads continued to be the predominant type manufactured, but cup beads also were produced in considerable quantities as well. It is the cup bead that apparently served as the most important money bead at the initiation of Spanish exploration of California (King 1990:62).

Arnold (1992b, 2001c) argues that the increased production of shell beads is related to significant political and economic changes occurring during the Middle-Late Transition but becoming manifest beginning about 650 BP. According to her, village chiefs emerged as elite individuals who coordinated bead production and economic exchange between villages within Chumash territory, particularly between Channel Islands villages and coastal mainland villages. She proposes that the institutionalized hereditary leadership documented ethnohistorically and ethnographically was in place at the beginning of this period and had developed during the Middle-Late Transition. She contrasts this type of leadership with a less stable form that prevailed prior to the Middle-Late Transition.

Gamble et al. (2001; see also Glassow, Gamble et al. 2007:210-211) have questioned whether the change to the form of hereditary leadership that prevailed after 650 BP was as dramatic as Arnold conceived. In their analysis of mortuary practices and human skeletal characteristics seen in a cemetery dating to the period immediately prior to the Middle-Late Transition, Gamble et al. found evidence indicative of strong leadership and associated high status that appears to be hereditary. In addition, Gamble (2005) questions whether climatic perturbations adversely affecting food resource productivity played a role in cultural changes

occurring at the time of the Middle-Late Transition. Compared to Arnold and her colleagues, she sees cultural change as a relatively more gradual process that was not necessarily stimulated by environmental change.

A note should be added about occupation during the post-650 BP period on Santa Barbara Island. (Occupation in the island between 1000 and ~650 BP interval is not documented.) This small island is in the southern group of Channel Islands, and although most likely not occupied by ancestral Chumash, it is possible that people living on the northern Channel Islands did visit Santa Barbara Island on their way to the larger southern Channel Islands. This possibility is suggested by the fact that Santa Barbara Island is visible on clear days from high elevations on Santa Cruz Island. Erlandson et al. (1992:89) report radiocarbon dates from two sites, SBI-12 and SBI-16, falling within this period or slightly before. SBI-12 was the subject of a small excavation in the 1980s, and Rick and Erlandson (2001) analyzed the collections from this work. As part of their research they obtained an additional radiocarbon date for the site (Rick and Erlandson 2001:299). They propose that the site was occupied during the Middle-Late Transition (Rick and Erlandson 2001:300), but it seems more likely that it was occupied immediately after this period. In addition, they present evidence that the site was occupied for a brief period of time, probably as a temporary camp. They suggest that occupation took place after storms, when fresh water would have been available, or that the site's inhabitants brought fresh water to the island. Their analysis demonstrates that the site occupants collected shellfish, fished, and hunted marine mammals (Rick and Erlandson 2001). This diversity of subsistence activities suggests multiple short-term occupations of the site.

In conclusion, cultural development occurring during the period between 1000 BP and the time of European colonization of the Santa Barbara Channel region has been the subject of a great deal of discussion over the last decade regarding the nature of environmental changes that impacted Channel inhabitants and the nature of cultural responses to environmental changes (see particularly Arnold 1997; Arnold, Colten, and Pletka 1997; Arnold 2001c; Gamble 2005; Gamble et al. 2001; Raab and Bradford 1997; Raab and Larson 1997; Raab et al. 1995). The overview of this period just presented gives some of the flavor of the differences in how both environmental and cultural data have been interpreted, but it does not dwell on the details of the varying interpretations of the available data. Despite these differences of opinion, a wide variety of evidence does indicate that important changes did occur during the Middle-Late Transition that resulted in a type of cultural system prevailing after 650 BP that differed in many respects from that prevailing prior to this date (or prior to the Middle-Late Transition). Before differences of opinion regarding the nature and magnitude the cultural change can be resolved, however, it is apparent that more diverse and detailed environmental and archaeological information will be needed. Because of the prospect of exceptional chronological resolution, clearly the archaeology of the Channel Islands will play a key role in this endeavor.

The End of Prehistory

Prehistory ends with the first encounters between the Island Chumash and European explorers of the California coast and Channel Islands. So far as is known, Island Chumash culture remained relatively unchanged after the initial European contacts of the 16th century until Spanish missions began to be established in mainland Chumash territory in 1782. By 1822, all

Island Chumash villages apparently were abandoned (Johnson 1982:75). Archeological research has yet to focus on this period of time, partly because its brevity resulted in small volumes of archaeological deposits, but especially because of difficulties in dating cultural changes within a period lasting only a few hundred years. The following chapter provides information about the Island Chumash at the beginning of significant European contact in 1782, when the first Spanish settlements, Mission San Buenaventura and the Santa Barbara Presidio, were established.

HISTORY

After removal of the Chumash from their villages, the Channel Islands shared some similar activities and events. Primarily, they were locations for occasional fishing and harvesting of marine resources (particularly abalone and seal), uses that persisted well into the 20th century. Agricultural development was eventually introduced on all the islands but was most successful on Santa Cruz and Santa Rosa, where evidence of these early ranches are important parts of the historic landscape. Most of the islands saw installation of navigation devices beginning the early 20th century, and use by the military before and during WWII. The origins of the Park extend back to the establishment of Channel Islands National Monument in 1938, which encompassed only Santa Barbara and Anacapa Islands. With the establishment of the Park in 1980, the other islands were incorporated. Today's Park also includes cooperative agreements with several inholdings. Because Livingston (2006) provides a comprehensive history of the Park, the discussion below is brief and draws heavily on his report. Each island is discussed in turn, emphasizing topics of particular relevance to historic-period archaeological sites.

SANTA BARBARA ISLAND

This mile-square island with a cliff-like perimeter was not attractive to historic-period settlers, although some clearly arrived: goats were observed on the island in 1840, and a U.S. Coast Survey crew in 1871 noted a corral and cabin on the northwest point. Santa Barbara Island was occasionally occupied by fisherman and seal hunters who constructed small shacks along the beach and cliffs. The island was first leased in 1909 to J.G. Howland, who provided a sub-lease to C.B. Linton for exclusive rights to develop an abalone pearl industry. Howland's lease expired and was not renewed; he apparently did not erect any structures on the island during his tenure.

In 1914, Santa Barbara Island was leased to Alvin Hyder, and under his family's occupation the historic population reached its height: 15 people including 6 children. Alvin and his brother Clarence built homes for their two families near the top of the stairs from the landing. A house for their brother Cleve and his family was soon added as well as a large barn, a stable, workman's cabin, water cisterns, and a slide-rail conveyance to transport supplies to and from the landing. Water was always in short supply, for both people and animals and a series of dams and concrete ditches caught seasonal rainwater. The Hyders stocked the island with sheep and kept the usual barnyard animals. They also experimented with stocking the island with rabbits. When the Hyders left the island in 1922, it remained unoccupied. Later plans to develop Santa Barbara Island as a resort never materialized.

Due to the growth of the Port of Los Angeles, navigation around Santa Barbara Island became more important. In 1928 the first unmanned light was constructed on the northeast part of the island, and in 1934 another light tower went up on the southwest exposure. The southern light facility burned in an island fire in 1959, and the northern tower was replaced with a modern steel tower in 1979. The Navy erected a 90-foot range-finder tower in 1936, likely removed when the Army Signal Corps installed radar on the island in 1942.

In that year, a coastal lookout station was constructed, which included a radio antenna and tower, a steel rail tramway from the dock to the quarters, two barracks buildings, and a kitchen. The barracks were located on the old Hyder ranch site, their construction removing the last of these buildings. Radar equipment was also installed in 1942 as Santa Barbara Island became a Pacific Coast Aircraft Warning Radar Station. The facility was closed in 1945, and the remaining buildings were so vandalized that only the Coast Guard shack and tower remained operable in 1953. In the early 1960s, the Navy Ordnance Test Station at China Lake installed a photo tracking station on the island consisting of two Quonset huts, cement pads for camera stations, and an improved road between the two stations. They also improved the tram from the landing and installed a water system. These facilities were inherited by the Park, which, in 1991, removed most of the former military installations and constructed its ranger station/visitor center on the site of the Quonset huts.

ANACAPA ISLAND

The rugged chain of islets collectively called Anacapa Island were only sparsely inhabited during the prehistoric period. The first recorded historic visitation was by the U.S. Coast Survey team in 1853, although notes from this excursion that mention seeing an old house clearly identify at least occasional use in historic times. The islands were reserved for lighthouse purposes in 1854, a dedication confirmed by the Department of the Interior in 1901. Some later 19th-century use was recorded: seal hunters visited the island, rendering seal oil in large copper kettles on the shore, and Chinese fisherman and abalone hunters were noted as being present during the late 1800s.

Sheep raising began in the 1890s after a man named Mills sold his lease to E.E. Elliot in 1885. Elliot developed a ranch headquarters in the middle of the island but eventually abandoned the operation. In 1907 a ranching lease was issued to H. Bay Webster for running stock and he periodically lived on the island with his wife and two sons. As all leases required that no permanent structures be erected, and that all improvements be removed at the end of the lease, the Webster family lived in several small shacks on the same site developed by Elliot, spending summers and several winters there. In 1917 Webster's lease was awarded to Ira Eaton of Santa Barbara, who also owned the Pelican Bay Camp on Santa Cruz Island, and who reportedly needed a place to store illegal liquor. In 1927 Eaton's lease was not renewed.

In 1932, the middle and western Anacapas were leased to C. Fay Chaffee who apparently, with a partner, planned to develop the island as bird-hunting enterprise. Various individuals squatted around the islands during Chaffee's tenure and in 1937 his lease was not renewed. The

following year the island came under the jurisdiction of the National Park Service. Long time resident Raymond "Frenchy" LeDreau was hired as a sort of caretaker of the island, kept on for his intelligent interest in the land and colorful personality. He was allowed to reside in his much-visited cabin for 28 years, finally removed at age 80 after a serious accident. When the Park cleaned up Frenchy's cove in the 1960s to encourage visitation, "…about 1.5 tons of debris and 1,000 pounds of cans and bottles were punctured and hauled out to sea about a mile and dumped" (Livingston 2006:814). The most derelict of the four cabins at the cove was dismantled and used to repair the other three.

In 1911 a light tower had been installed on east Anacapa, and this location was removed from future leases. A light station was constructed 1932 following several dramatic wrecks. The new installation included the lighthouse itself, a powerhouse, oil house, fog signal building, four lighthouse keepers' dwellings, tank house, and general service building. This was the last new lighthouse to be built on the west coast of the Unites States. The facility was darkened during WWII and adapted as a coastal lookout station. In the 1960s, Anacapa was used briefly as range for missiles fired from Pt. Mugu. Automation of the light and fog signal reduced the Coast Guard's need for the extensive facility, and in 1970 many of the buildings were leased to the National Park Service. The only changes to historic structures on Anacapa have been the removal of three houses and various utility structures and alterations to the lower landing dock (Livingston 2006:815).

SANTA CRUZ ISLAND

Santa Cruz is the largest and most ecologically diverse of the Channel Islands, and it held the largest Chumash population at the time of European contact. The last of the island's native population was taken to mainland missions in the 1820s (see Chapter 3), and in 1839 the land was granted to the largely absentee owner Andrés Castillero (finally confirmed in 1869). His agent, Dr. James Shaw, established a ranch headquarters on the island in the 1850s, and began stocking the land with cattle, horses, and sheep. Castillero sold the island to William Barron in 1857, although Shaw remained as manager and reportedly was given the funds needed to develop a model sheep ranch.

In 1869, Barron's ranch was purchased by the Santa Cruz Island Company (SCIC), owned by a group of San Francisco investors including several members of a French savings bank. The ranch was managed by J.B. Joyaux who expanded the sheep operations. By 1880, Justinian Caire had obtained all the shares of the SCIC and he and his wife, Albina, developed the island into a legendary "old world" estate. Caire established satellite ranch stations and diversified his crops and livestock to fit specific island locations. Sheep, dairy cows, cattle, poultry, horses, pigs and hogs, grain feed, grapes, and wine were all part of ranch production.

Justinian died in 1897 and his heirs entered into litigation that eventually "divided both the family and the island" (Livingston 2006:556). Settlement in 1918 partitioned the island into shares for descendants of Albina and the six children, resulting in the eastern end of the island being eventually consolidated and operated separately by the Gherini descendents. The larger part of the island was sold to Los Angeles businessman Edwin Stanton in 1937.

The Gherini family developed their ranch for sheep raising as the National Trading Company, abandoning the diversified economy of the Caire approach. Residing in San Francisco the family spent summers at the ranch, which was maintained by a resident manager. In 1979, the sheep operation was leased out to former employees, and in 1984 the lease was transferred by the Gherinis to Island Adventures. This arrangement lasted until 1997, when the National Park Service concluded its purchase of these east-end lands.

Edwin Stanton and his son, Dr. Carey Stanton, modernized operations on the larger, western portion of the island by focusing on cattle and improving facilities. After Edwin's death, family dissent arose between Dr. Stanton and his nephew, which prompted Dr. Stanton to arrange the sale and life tenure on the island with The Nature Conservancy in 1978 in order to pay his nephew for his shares in the island company. With Dr. Stanton's death in 1987, his estate was left to the Santa Cruz Island Foundation, which continues research and restoration work on the Island. The island's isthmus was transferred by The Nature Conservancy to the Park in 2000.

SANTA ROSA ISLAND

Santa Rosa was occupied by Chumash until 1825, when they were all removed to the missions, and then for about twenty years with periodic camps of otter hunters. After some legal discussions about the grant, Santa Rosa was conferred to José António Carrillo and Carlos Carrillo in 1843, who promptly sold it to Carlos's married daughters. Their husbands, Alpheus B. Thompson and John C. Jones, stocked the island with cattle and sheep and developed a ranch run by resident vaqueros at a place later known as "Rancho Viejo," located between East and Skunk points. A lawsuit ended their partnership and, beginning in 1858, title to the land began to be acquired by T. Wallace More and his family. By 1870 the Mores assumed full title, changed the livestock operation to just sheep ranching, and moved the ranch headquarters to Beecher's Bay. Alexander P. More assumed sole ownership in 1881, leasing it to his brother Lawrence who maintained five men in residence to manage the operation, with some 40 sheepshearers brought in twice a year.

During the Mores' tenure, the south side of the island is known to have attracted Chinese abalone harvesters, and three camps have been identified there to date. As late as 1911 and 1913, Vail & Vickers issued permits to Chinese to establish camps for abalone harvest on the south side of the island (Livingston 2006:292-294).

Following Alexander More's death in 1893, the estate was sold in probate, and most (7/8ths) of the island became part of the Vail & Vickers Ranch (1901-1998). This family-run operation lasted nearly a century and involved four generations of descendents, with the Vail family operating the ranch and the Vickers serving as silent partners. Livestock was changed from sheep to cattle and the island developed as a successful stocker ranch, where young cattle were brought from the mainland for about 18 months of grazing and then transported back for sale. The Vails used the old More buildings and facilities, adding additional modern structures when needed.

Military uses of the island began during WWII but intensified with development of the U.S. Air Force early-warning radar base on the south side of the island (1951-1963). The operations centered near Johnson's Lee eventually supported 300 servicemen and 30 civilians. The Navy also developed radio facilities to support its Air Missile Test Center. With abandonment of the military facilities, the Vails received ownership of all abandoned military property, which they put to use throughout the ranch.

In 1986 the government purchase of Santa Rosa was finalized, granting the Vails continued grazing (in five-year increment agreements) and exclusive use of 7.6 acres, including the ranch headquarters. Some 935 acres were assigned to Park use. By 1998, the remaining cattle were removed, and ranching ceased. The Park removed the buildings of the Air Force base at Johnson's Lee in 1991-1992, retaining one structure for Park use, and rehabilitated the landscape.

SAN MIGUEL ISLAND

Although there is ample evidence for the prehistoric occupation of San Miguel Island, the first recorded historic-period occupants are an enigmatic person named Bruce, followed by George Nidever and his sons, who initiated sheep ranching in 1853 through a lease from the U.S. government. A part-time resident of the Island, Nidever sold his lease to the Mills brothers in 1870, and sheep raising was intensified under their Pacific Wool Growing Company. In the 1880s, Howard Mills constructed a new two-storey frame ranch up an adjacent gully from the Nidever Adobe. Half of the Mills lease was sold to William Waters in 1887, who subsequently ran sheep operations on the island for thirty years. Waters resided on the island only periodically, as the operations were run by resident managers and their families, and sheep shearers were brought in for seasonal wool harvests. In 1906, Waters, with his manager Russell, constructed a new ranch headquarters about 1500 feet southeast of the old Mills one, up a small drainage from Cuyler Harbor. During this time campsites are noted along the coast for both abalone collection (primarily by Chinese) and for seal harvesting, activities which continued into the early 20th century.

Waters died in 1917 and the island's lease was taken by Robert Brooks and J.R. Moore who continued sheep operations for another 30 years, Brooks particularly enjoying periodic stays on the island. In 1929 Brooks hired Herbert Lester to replace the retiring Russell and manage the ranch. The residence of this colorful family is well documented. After Lester's death in 1942, other managers continued the ranching operation until 1948 at which time the Navy took over the island as a practice ground and removed the sheep in evacuations of 1948 and 1950. Remaining sheep were finally exterminated in the mid 1960s, and the last feral burros were removed in 1977.

In addition to sheep ranching, San Miguel had supported activities in communications and navigation. The first lighthouse was constructed on Richardson's Rock in 1912, followed by a light on Point Bennett in 1923. These were discontinued in 1942, replaced by an unwatched light at Crook Point in 1943 that operated until 1953. First used as a radio communications outpost by the U.S. Marines for two weeks in the winter of 1933, the island soon after was taken

over by the Navy in 1934. Under this administration, San Miguel was developed as a coastal lookout station during WWII. In 1948 Robert Brooks's grazing lease was revoked and San Miguel's use as a bombing target by both the Army and Navy was initiated, activity that continued through the 1980s.

Arrangements to transfer the island's management to the National Park Service (NPS) was promoted as early as 1957, and their active involvement in island resources was initiated in the 1960s. A camp for a resident ranger was established in 1978, and in 1980 the island was included within Channel Islands National Park. Although the ultimate jurisdiction over the island is retained by the Department of the Navy, a series of agreements were developed between the Navy and the National Park Service beginning in the 1960s. Currently the Park oversees management of the island's cultural and natural resources.

CHAPTER 3

CHUMASH ISLANDERS AT EUROPEAN CONTACT

Introduction

Besides brief comments by early explorers, direct ethnohistoric observations pertaining to the Chumash islanders are few and far between. There exist only sporadic references to islanders by missionaries in correspondence and reports from the late eighteenth and early nineteenth centuries (Johnson 1982a). The real treasure trove of information pertaining to Island Chumash social and political organization comes from indirect evidence that resides in the registers of baptisms, marriages and burials compiled by the Franciscan missionaries. Most of what can be reconstructed regarding Island Chumash society at the time of European contact comes from analyses of these data and from later ethnographic accounts compiled by J. P. Harrington from elderly consultants early in the twentieth century. Ethnohistoric studies over the past thirty years have improved our understanding of Island society based on these sources (Harrington 1978, 1986; Hudson et al. 1977; Johnson 1982a, 1993, 2000a, 2001; Johnson and McLendon 2002; McLendon and Johnson 1999; Pfeiffer 1977).

The end of continuous Chumash occupation of the Northern Channel Islands came two decades shy of three centuries following first contact with Europeans. Studies of the Protohistoric Period (1542 – 1768) necessarily must rely upon archaeological investigations for information about island lifeways, whereas the Mission Period (1769 – 1822) benefits from the existence of a variety of documentary evidence that can supplement archaeological research. Ethnohistorical, ethnographic, and linguistic records, while somewhat more limited for island populations than for their mainland counterparts, nonetheless have provided numerous insights into Island Chumash society and its prehistory. Especially important ethnohistoric sources are the mission registers, which contain island *rancheria* names, geographic clues regarding village locations, personal names, kinship relationships, and the chronological context of Chumash islanders' incorporation into mission populations. Analyses of these data contribute to archaeological understanding of settlement patterns, demographic changes, economic exchange, sociopolitical relations, and ceremonial practices.

Over the past thirty-five years, the state of our knowledge has advanced considerably regarding the nature of Island Chumash society during the Protohistoric and Mission periods based on both ethnohistorical and archaeological studies. In addition new research questions have been raised regarding settlement patterns, cultural landscapes, economic organization, and changes that occurred following the coming of Europeans. These topics continue to be debated and drive current research.

Culture History from Initial Contact through the Last Aboriginal Occupation

Cabrillo's Voyage

The earliest European encounter with the native inhabitants of the Channel Islands took place during the Spanish exploration of the California coast by Juan Rodríguez Cabrillo in 1542-43. In sailing northward from San Diego Bay, Cabrillo visited Santa Catalina and San Clemente islands, which he named for two of his ships, *San Salvador* and *Victoria*. He then crossed back to the mainland, moving up the coast to a large Ventureño Chumash ranchería that was named "Pueblo de las Canoas" because of the many plank canoes seen there. This ranchería was probably the large coastal town of *Muwu* at Mugu Lagoon, although both *Humaliwo* (Malibu) and *Shisholop* (Ventura) have been suggested as alternative locations. Cabrillo then crossed over to the Northern Channel Islands on October 13, 1542 for the Spaniards' first encounter with the Chumash islanders. As the historian Harry Kelsey has noted,

> The main narrative of the expedition is almost hopelessly confusing and repetitious at this point, having been derived from several sources, each account somewhat different than the other. The seeming contradictions are probably due to the fact that the various islands and the towns on the mainland were visited on different days by various vessels in the expedition. As a result, what purports to be a list of village names in the narrative for 15 October is really a composite of several lists, with a good deal of repetition. The same holds true for a second list of that date, as well as the list dated 1 November, one following comments made for 3 January 1543, and one dated 12 January. For more than a century historians have disputed the exact locations of these places [Kelsey 1986:147-148].

The original logs kept by members of Cabrillo's expedition have been lost to posterity; however, a composite account copied from at least five different journals was prepared by Fr. Andrés de Urdaneta under orders of the viceroy following the return of the ships to the port of Navidad on the west coast of Mexico. Lacking familiarity with California geography, Urdaneta managed to confuse the various lists of Chumash and Gabrielino placenames recorded by various chroniclers (Kelsey 1986:169-170). For example the Chumash name *Limu* (Santa Cruz Island) appears to have been confounded with the Gabrielino (Tongva) name *Pimu* (Santa Catalina Island). As Kroeber pointed out, two separate lists of village names are given for *Limu*, one of which likely refers to rancherías on Santa Catalina Island (Kroeber 1925:555). Careful textual analysis of the original Urdaneta manuscript (Kelsey 1986:169-170) and J. P. Harrington's linguistic analysis of rancherías named in the narrative (Harrington 1924; King 1975) have cleared up some of the confusion surrounding the sequence of the expedition's movements along the Santa Barbara Channel (Kelsey 1986:147-153).

Cabrillo returned to the Channel Islands towards the end of November after a brief exploration of the California coast north. He appears to have stopped at Cuyler Harbor, San Miguel Island to repair the ship's launch. The traditional assessment of most historians and anthropologists has been that the entire expedition then wintered at this spot; however, Harry Kelsey, author of the most definitive biography of Cabrillo, has argued convincingly that Santa Catalina Island was actually the place where the expedition appears to have made their stopover

until mid-January. During this period, Cabrillo fell and suffered broken limb bones during a fight with the island's inhabitants, eventually dying from his injuries. Testimony later recorded from two of Cabrillo's men stated that the island where he was buried was *La Capitana*, thus connecting it with Santa Catalina; because that island had been named *San Salvador* after his *Capitana* (flagship) (Kelsey 1986:157-159; Pourade 1962:22; Wagner 1929:72). The debate as to where Cabrillo died and was buried has been further complicated by the discovery of a lichen-covered slab of sandstone collected in 1900 near Skunk Point on Santa Rosa Island. When this artifact was cleaned in the 1950s, it was noted to contain an inscribed cross and the initials "JR," as well as an incised anthropomorphic petroglyph presumably added by the native islanders. Because Cabrillo was known as Juan Rodríguez by his contemporaries, the initials "JR" suggested to some that this artifact may have been his gravestone (Heizer 1972). If it is, then it had likely been carried from his original gravesite on either Santa Catalina or San Miguel islands.

After Cabrillo's death and burial, the expedition resumed its voyage of exploration, reaching northern California by the end of February before returning to the Santa Barbara Channel region. While stopping at San Miguel Island, two youths were taken on board to be brought back to Mexico and trained as interpreters in case a return voyage was contemplated. The expedition arrived back at the port of Navidad on April 14, 1543 nine months after embarkation (Kelsey 1986:161).

Protohistoric Contacts after Cabrillo

Some have speculated that Francis Drake may have had contact with Chumash islanders in 1579, and it is certain that the Channel Islands were sometimes sighted by Manila Galleons passing by during their return from the Philippines to ports on the west coast of Mexico (Johnson 1982a:16-18; Wagner 1929:114-117, 1937:411, 447). Despite the potential for there to have been sixteenth century encounters with Europeans after Cabrillo, there is no documentation for any actual contacts until 1595. Following the loss of his ship in a storm at Drake's Bay, Sebastián Rodríguez Cermeño and his crew traveled southward along the California coast in the ship's launch. The Spaniards spent three days passing by the Northern Channel Islands and traded with some Chumash fishermen for fishes and a small seal while anchored off of the southeast side of Santa Rosa Island (Wagner 1929:162).

Following Cabrillo's voyage, the most extensive record of Protohistoric contact with Chumash islanders comes from Sebastián Vizcaíno's visit in December 1602. After spending the last four days of November on Santa Catalina Island, Vizcaíno's two ships entered the Santa Barbara Channel (named by him on St. Barbara's Day, December 4), where they made contact with the native inhabitants of Santa Cruz Island who came out to meet the Spaniards in their plank canoes. Two principal diaries document these encounters, one by Vizcaíno and the other by the missionary Fr. Antonio de Ascención (Bolton 1963:83-90; Wagner 1929:235-239). A rough sketch map of the Channel Islands resulted from the voyage. This map refers to Santa Cruz Island as *isla de gente barbada*, documenting that it was the custom of at least some Chumash men not to remove their facial hair (Hayes 2007:20; Mathes 1968:93; Wagner 1929:238).

The journals kept during Vizcaíno's visit indicate that perhaps only six days were spent around the Northern Channel Islands, and contact with Island Chumash was relatively limited because heavy seas prevented the ships from approaching too close to shore. It is evident that trading took place, and it is interesting that the Santa Cruz islanders had received advance word from the Gabrielino inhabitants of Santa Catalina Island that Spaniards were on their way before the latter arrived. Fr. Ascención's diary records that the Spaniards were surprised to discover that fragments of China silk were in possession of the Island Gabrielino residents of Isthmus Cove. The Spaniards surmised that these to came from a shipwreck, but had to depart before they could be shown its location. Rather than coming from a wreck, these pieces of silk most likely came from trade with Cermeño's crew eight years earlier, as A. K. Brown has suggested (2001:16). The alternative possibility that the silk came from a galleon wreck seemed plausible thirty years ago, when a putative sixteenth century galleon wreck was reported in deep water off of Santa Catalina Island (Johnson 1982a:20-21; Walker and Hudson 1993:21); however, this find has not been substantiated archaeologically nor has alleged documentary evidence been produced.

Although the Channel Islands were sometimes seen from a distance, no further direct contacts between Chumash islanders and Europeans appear to have taken place for the next 166 years after Vizcaíno's exploration. The only brief sightings that have been documented were those by a Spanish exploring expedition which found itself between two of the islands at dawn in 1606 and a French merchant ship that described what appears to have been San Nicolas Island in 1709 (Brown 2001:24-26). In neither case, does there appear to have been interaction with island inhabitants. Some have suggested that the Manila galleons would have been major sources of contagions introduced to California Indian populations, which then could have spread to Chumash peoples (e.g., Erlandson et al. 2001:14-15; Walker and Hudson 1993:21); however, it is the considered opinion of most historians who have considered the question that contacts with any indigenous groups were few and far between. Although Manila galleons continued to make an annual east-to-west crossing of the Pacific Ocean north of the equator, they appear largely to have avoided direct landfalls on the California coast, heading south to Acapulco once signs of the mainland were observed. The Spaniards believed that contact with cold winds in the northern latitudes invited scurvy, so ships were instructed to avoid sailing north of 36 or 37 degrees latitude (Brown 2001:24-25, 28-29; Wagner 1937:94, 114, 139).

Impacts of Protohistoric Contacts

From the forgoing review of known protohistoric encounters with Europeans, it would seem that impacts on indigenous island societies were slight, resulting only in exchanges of native foods for objects of European manufacture. One historian has suggested that Vizcaíno's descriptions of "white or blond" youths on Santa Catalina Island implies that Cabrillo's men had contributed a genetic component to the native population when they wintered on the island sixty years earlier (Kelsey 1985:497). Beyond a few trade goods and perhaps some miscegenation, the most popular hypothesis pertaining to protohistoric impacts is that disease epidemics followed early Spanish contacts and led to a dramatic demographic decline on the Channel Islands. In particular, this possibility has been championed by Erlandson and colleagues (Erlandson and Bartoy 1995, 1996; Erlandson, Rick, Kennett, and Walker 2001). It has even been suggested that

reconstructions of California Indian societies based on late eighteenth and early nineteenth century ethnohistoric documents are inherently flawed because protohistoric pandemics had drastically reduced populations in the centuries preceding the first Spanish land expedition in 1769 (Preston 1996, 2002). Because the protohistoric pandemic hypothesis has gained a certain degree of acceptance among archaeologists working in California, it is worthwhile critically examining the evidence offered in its support.

The most thorough review and analysis of contacts between European seafarers and California Indians during the Protohistoric Period is by Lightfoot and Simmons (1998). These authors consider five maritime expeditions that interacted with native peoples on California coast, three of which (Cabrillo, Cermeño, and Vizcaíno) visited the Channel Islands. They point out that given the relatively small size of the Spanish crews, diseases such as influenza, smallpox, and measles would have already exceeded their incubation periods, having worked their way through the available on-board human carriers long before the ships had reached Alta California from ports in Mexico. The most likely source for disease transmission would have been from venereal diseases carried by crew members who may have had sexual contact with native women. Cabrillo's men especially were present among the Channel Islands long enough for such relations to occur. Although some bioarchaeological evidence of venereal syphilis exists from a cemetery on Santa Rosa Island (CA-SRI-2B), it is unclear whether the two individuals with indications of this disease date to the Protohistoric Period or to the subsequent Mission Period when syphilis was known to have been more prevalent (Rick 2004a:273-274, 2007b:249; Walker et al. 2005:297-299). To date, no other Chumash burials have been identified with clear evidence of venereal disease; which casts some doubt on the hypothesis that syphilis had a major impact on native populations prior to the Mission Period.

The authors who propose that protohistoric pandemics decimated island populations rely primarily upon numbers of radiocarbon-dated components of excavated archaeological sites in their analysis. Based on a sample of 215 calibrated radiocarbon dates distributed in 100-year intervals, these authors note that there is a marked decline in the number of dated components following Cabrillo's visit in 1542 (Erlandson, Rick, Kennett, and Walker 2001). Although the authors admit that their sample may not be representative, they fail to mention what is perhaps a major source of bias in their results. Most archaeologists tend to conserve funds by dating only those occupation layers for which there are no obvious time-sensitive artifacts. This is especially true when glass trade beads or other objects of European manufacture are present, but it is also the case for distinctive Olivella bead types dating to the Protohistoric and Mission periods. As a result, it is unlikely that an index based on radiocarbon-dated components would accurately represent the number of excavated components dating to the most recent periods of site occupations.

In view of the extant evidence, it is clear that demographic impacts on Island Chumash populations during the Protohistoric Period have not been demonstrated. Even if epidemics followed the visits of Cabrillo or Vizcaíno, populations have a tendency to rebound, as has been demonstrated in epidemiological studies among indigenous South American groups (Black 1975:517). Although, the likelihood of major demographic impacts from diseases spread by early voyages has been questioned, analysis of mission burial records for the Chumash region does indicate that occasional disease epidemics would spread northward from colonized portions

of Mexico prior to the actual settlement of Baja California. For example, a measles epidemic appears to have spread northward from Baja California at the very end of the Protohistoric Period. A "notch" in the Chumash population pyramid, as reconstructed from mission records, indicates that the age cohort born in the decade of the 1760s had fewer than expected survivors. The fact that the population pyramid was otherwise like what would be expected from an indigenous population and that there had been population recovery after this measles epidemic argues against the hypothesis that there were long lasting demographic impacts to Chumash populations prior to the Mission Period (Johnson 2000b; Walker and Johnson 1994).

Historic Chumash Rancherías

Chester King's 1975 map of Island Chumash rancherías and attempt to correlate these with native towns mentioned in the surviving account of Cabrillo's 1542-43 expedition has been revised by subsequent ethnohistoric investigations and archaeological evidence from previously untested sites. King's map was an improvement over earlier attempts by Kroeber (1925: Pl. 48), Brown (1967), and Orr (1968) to assign ranchería names to particular localities around the islands. Further refinements and adjustments were suggested by Johnson (1982) based on a survey of ethnohistoric and ethnographic sources. As archaeological data mounted from continued reconnaissance and test excavations, it became clear that revisions were necessary. Certain island sites that had been correlated with ethnohistoric villages lacked evidence of Historic contact materials, whereas others were identified that had not been known to have been occupied during Mission times (Arnold 1990; Kennett 1998). Additional adjustments and correlations have occurred as both ethnohistoric and archaeological research has proceeded (Johnson 1993, 1999a; Kennett 2005:93-104; Kennett et al. 2000; Rick 2004a, 2004b).

Figure 3.1 represents a consensus map of the locations of most island rancherías mentioned in mission records (originally included in Johnson 1999a). Despite the general acceptance of this map's correlations between ethnohistoric placenames and particular archaeological sites, in actuality some identifications are much less certain than others, justifying a critical review of ethnohistoric sources and current knowledge of the archaeological record. Two primary sources form the foundation upon which archaeological correlations must be based: (1) ranchería names and locations assembled by Juan Esteban Pico in 1884 (McLendon and Johnson 1999: Appendix IV) and (2) mission register data. Mission registers not only contain the names of island rancherías, they also provide data on intervillage kinship relationships from which relative geographic positions can be inferred (Johnson 1993, 1999a).

Pico's Lists of Island Rancherías, 1884-1889

Pico's lists of rancherías on each island are critical for reconstructing settlement geography, because he was very specific about the locations of the first ranchería he named for the two largest islands and then described the relative position of other rancherías as he moved counterclockwise around the islands. Juan Esteban Pico (1841-1901) was a member of San Buenaventura's Chumash community and well educated. He may have had a special interest in the islands, because his father had been born there, as had the parents of his first wife (Johnson 1999c:197-201, 203-207). Pico had a strong interest in preserving the knowledge of his native

language and cultural heritage. He worked closely with Henry Henshaw, who visited San Buenaventura in November 1884 to collect information on native languages (Heizer 1955). Pico drew up his list of island rancherías at Henshaw's request, apparently having interviewed the elderly Martina *Leqte* (1815-1884), who had been born on Santa Cruz Island before moving with her family to Mission Santa Bárbara as a small child (Johnson 1999c:188).

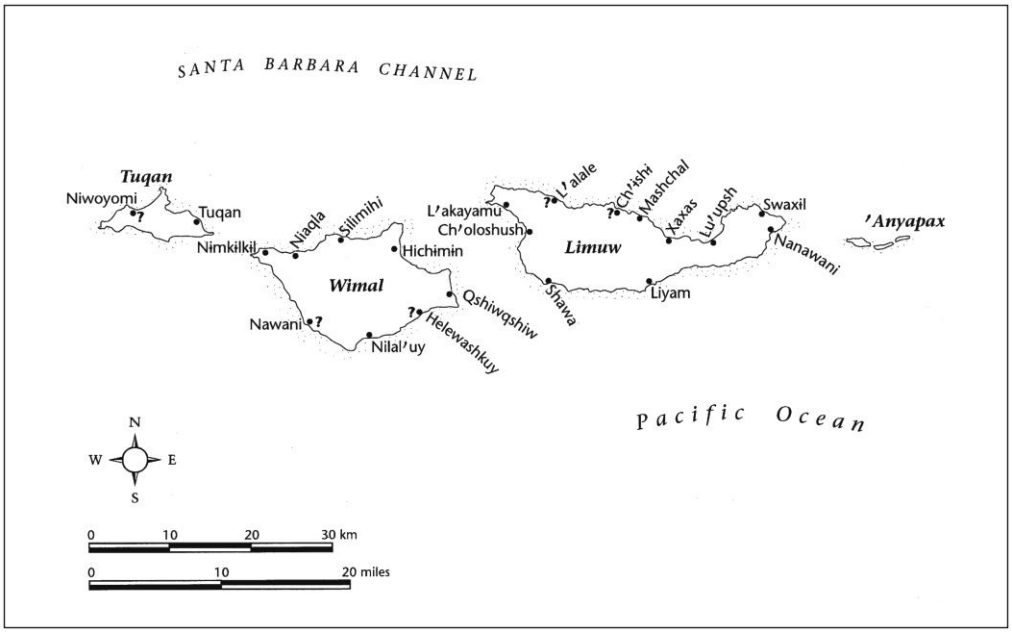

Figure 3.1. Locations of island rancherías

There is a high degree of correlation between island ranchería names mentioned in the Pico-Henshaw list and those recorded in mission registers, although each source includes names that do not appear in the other. For example, Pico lists twelve names for Santa Cruz Island, ten of which certainly match those that appear in mission records. An eleventh name in Pico's list, *Ch'ɨshɨ*, has been doubtfully correlated with "Tonsteche," where three baptisms were recorded in 1814 (Johnson 1999b:58). The remaining ranchería name, *Nimatlala* was identified with "El rancho grande," indicating the vicinity of the main ranch in Santa Cruz Island's Central Valley. Pico's list for Santa Rosa Island includes only seven ranchería names, all of which correlate with names found in mission records. In addition, the mission records contain the names of two other rancherías, *Helewashkuy* ("Elehuascui") and *Xonashup* ("Jonachup"). While the mission records indicate the presence of two rancherías on San Miguel Island, Pico only lists *Tuqan*, which was the designation for the island as a whole, as well as the name of its principal town (Johnson 1999a:54-56).

Preceding Henshaw's visit, Pico had taken it upon himself to write his own account of his native language. Between January 1884 and 1889, he prepared two drafts that contain vocabulary and grammatical information pertaining to the Ventureño Chumash language, which he called "*idioma de los naturales oriundos de Mizkanakan*." Following Pico's death in 1901, these manuscripts passed into the hands of his friend Juan Menéndez, who was later interviewed by J. P. Harrington. Carobeth Tucker Harrington, purchased these two manuscripts on her

husband's behalf in 1917, and they exist today among Harrington's papers at the National Anthropological Archives (Pico 1884, 1889). Translations have been prepared of both documents in anticipation of future publication. Pico included placename lists in both manuscripts, similar to that which he had provided Henshaw; however, there are some interesting differences with regard to island rancherías that bear mentioning (Table 3.1).

In general it appears that Pico's list given to Henshaw in November 1884 was the most carefully compiled and likely to have been the most accurate, although the native name for Anacapa Island was omitted. Pico's January 1884 list was presumably the basis for that later given to Henshaw; however, in the earlier list Pico had only written down specific locations for the first three ranchería names on Santa Cruz Island ("Jajas, El Puerto;" "Nimatlala, El rancho grande;" and "Maschhal, Ranchería que esta al oeste"). The November list provided to Henshaw is much more detailed and specific about locations of all other island rancherías. Although the list contained in the manuscript dated "1889" is presumably later, it is not as complete or accurate as either of the 1884 lists: "Jajas" and "Mashchhal" were omitted entirely, a number of other rancherías on Santa Cruz Island were out of geographic order, and "Nawani" was mislocated from Santa Rosa Island to Santa Cruz Island (in this respect continuing an error contained in the January 1884 manuscript). The mistakes in this later manuscript seem odd, since Pico presumably had the earlier manuscript at hand to inform his later draft. Further comparative textual analysis will be required to determine if other sections of the two manuscripts exhibit similar discrepancies.

Although Pico appears to have been remarkably talented as a linguist in representing his native language, he was inconsistent in the way he spelled names from list to list (Table 3.1). Most of the differences between Pico's three lists have to do with slight differences in orthography used to represent the ranchería names. Pico used "w," "ū," or "u" for *w*. He used "y" and "i" interchangeably when they appeared at the end of a name. He differentiated between the *k* and *q* phonemes (a contrast not found in English), but the way Pico used these in spelling Chumash names is reversed from the way contemporary linguists write Chumash placenames. For example *Qshiwqshiw* was written as "Kshiukshiu," and *Niaqla* was written as "Niakla;" whereas *Tuqan* was written as "Tukan," and *Nɨmkɨlkɨl* was written as "Nimqɛlqɛl" or "Nimqhɛlqhɛl." Sometimes Pico would use a "c" for the *k* sound, as in "L,acayamu." Glottal stops were represented by commas, but sometimes were added or moved around within the placenames appearing in his different lists (e.g., "L,acayamu" vs. "L,acayam,u" and "L, alale" vs. "Lal,ale"). In contrast to these inconsistencies, Pico was constant in using the Greek letter "ɛ" for the vowel represented by the barred i (*ɨ*). In the map appearing in Figure 3.1, Pico's spellings were mostly used as a basis for determining the best way to represent island ranchería names; however, only Pico's list provided to Henshaw was consulted. Ultimately additional linguistic expertise will be required to sort out which forms of the names Pico gave in his different lists were likely to be closest to original Chumash versions.

The most likely sources for Pico's information regarding ranchería locations were Martina *Leqte*, mentioned above, and perhaps Baltazar *Sulupiyautset* (1812-1881), who were both residing in Ventura in the early 1880s (Johnson 1994). Both were very young children (each about four years old) when their families left the island for Mission Santa Bárbara, in 1819 and 1816 respectively (Johnson 1999c:188, 194). Neither was likely to have had direct

Table 3.1. Island placenames as reported in Juan Esteban Pico's various lists

Chumash Placename	November 1884 Spanish	November 1884 Chumash	January 1884	1889
Santa Cruz Island	Isla de Santa Cruz			
Michumash	La isla toda	Mich humash	Mich humas	1. Mich humash
Xaxas	El puerto principal	Jajas	Jajas	n.g.
Nimatlala	El rancho grande	Nimatlala	Nimatlala	12. Nimatlala
Mashchal	En direccion al oeste	Mashch hal	Maschhal	n.g.
Ch'ɨshɨ	Mas al oeste	Ch,hɛsɛ	Ch,hɛsɛ	2. Ch hɛsɛ
L'alale	Punta del diablo	L,alale	L,alale	3. Lal,ale
L'akayamu	Mas al oeste	L,acayamu	L,acayam,u	10. L,acayam,u
Ch'oloshush	En direccion al sudoeste	Ch,oloshush	Ch,olos˜us˜	4. Ch,olo shush
Shawa	En direccion al este	Shawa	S˜aūa	5. Shawa
Liyam	En direccion al este	Liyam	Liyam	6. Liyam
Nanawani	Mas al este	Nanawany	Naūani	7. Nawani, 9. Nanawani
Swaxɨl	A la punta del este	Suajɛl	Suajɛl	8. S,wajɛl
Lu'upsh	En direccion al norte	Lu upsh	Lu,ups˜	11. Lu,upsh
Santa Rosa Island	Isla de Santa Rosa			
Wimal	Toda la isla	Wimal	Ūima	1. Wima
Qshiwqshiw	Rancho viejo	Kshiu kshiu	Ks˜iuks˜iu	2. Kshiukshiu
Hichɨmɨn	El puerto	Hichɛmɛn	Hichɛmɛn	3.Hichemɛn
Silimihi	En direccion al oeste	Silimihi	Silimihi	4. Silimihi
Niaqla	Mas al oeste	Niakla	Niakla	5. Niakla
Nɨmkɨlkɨl	Mas al oeste	Nɛmqɛlqɛl	Nɛmqhɛlqhɛl	6. Nɛmqhɛlqhɛl
Nawani	En direccion al sur	Nawany	Naūani	n.g.
Nilal'uy	Mas al sur	Nilal,hui	Nilalhuy	7. Nilalhuy
Other Islands				
Tuqan	San Miguel	Tukan	Tukan	Tukan
Kinkin	San Clemente	Qinqin	Qinqin	Quinqin
Xalashat	San Nicolas	Jalashat	Jalas˜at	Jalashat
Siwot	Santa Barbara	Siwot	Siūot	Siwot
Huya	Santa Catalina	Huya	Huya	Huya
'Anyapax	[Anacapa]	n.g.	Anyapaj	Anyapaj

Sources: A facsimile of Pico's November 1884 list appears in McLendon and Johnson 1999: Appendix IV. The other two lists are from Pico (1884:173, 1889:84-85).

knowledge about where most island rancherías had been located. Considering this, we must conclude that the information collected by Pico, remarkable as it is, was for the most part third-

hand at best. It is not a slight against Pico's effort to preserve this information for posterity to suggest that the specificity of the geographic positions as one moved around the island may be a bit misleading. It is certainly conceivable that some mistakes crept into the list Pico provided to Henshaw, just as errors are apparent in the manuscript versions of his lists.

As mentioned above, mission register data generally support the island ranchería names and locations as they appear in the Pico-Henshaw list. Intervillage marriages, tabulated from unions listed in the *libros de casamientos* that were "*renovaron*" (renewed) when a couple joined the missions, accord well with geographic proximities as represented by Pico (Johnson 1982a:121-124, 1993:34). Comforting though this observation may be, marriage patterns alone cannot demonstrate with full certainty that all rancherías were positioned entirely accurately by Pico. Although native marriages generally reflect the sizes of the two intermarrying populations and are inversely proportional to the distance between them, the sample size for the islands is not large enough to use intervillage marriages as a predictor for ranchería locations. One must consider also that there were likely marriage prohibitions against marrying close relatives, so that two small rancherías adjacent to one another might have lower than expected intermarriage because of kin relatedness.

Only two other ethnographic sources independently augment the Pico-Henshaw list with regard to specific rancherías. One of these is the observations of Léon de Cessac, who conducted archaeological fieldwork on Santa Cruz Island in 1877. Cessac mentions that after he left the island, he arranged to for two elderly Indians who had been born on the island to examine artifacts he had excavated (Heizer 1951). Undoubtedly these two individuals were Martina and Baltazar, also Pico's likely sources, who were interviewed independently by Cessac's colleague Alphonse Pinart in order to obtain a vocabulary of the Island Chumash language (Heizer 1952). Unfortunately, Cessac's original notes mostly have been lost to posterity; however, an original catalog of his collection preserved at the Musée de l'Homme in Paris specifically equates Prisoner's Harbor with the "Ranch[erí]a de Jhajas," corroborating Pico's identification of "Jajas" (*Xaxas*) with the principal port of the island. Martina had been born at this ranchería, according to her baptismal entry, thus its identification is secure. Regrettably Cessac did not record any other ranchería names.

John Harrington's research pertaining to island placenames was relatively weak, having been conducted some 35 years after Cessac's visit and nearly 30 years after Pico compiled his first two lists. Harrington had only a single consultant who knew anything at all about island placenames. This was Fernando Librado *Kitsepawit* (1839-1915), whose parents had both been born on Santa Cruz Island prior to emigrating with their families to Mission San Buenaventura in 1814 and 1816 (Johnson 1982b, 1999c:213-216). Librado himself had worked on both Santa Cruz and Santa Rosa islands as a sheep shearer, so he knew something of island geography, if not where particular rancherías had been located. Being orphaned as a youth, Librado had grown up speaking Ventureño Chumash as his first language; but he had learned something of the Island Chumash language as well and was able to assist Harrington to a certain extent in etymologizing the placenames recorded by Pico. The one island placename that Librado seems to have placed accurately was *Swaxɨl*, which he identified as Scorpion Anchorage. This was where his mother had been born, so we must presume that he was likely to have been correct with regard to this ranchería location (Johnson 1982a:127-130).

In sum, the Pico-Henshaw list serves as the basis for all current attempts to map island placenames. Mission register data are not precise with regard to ranchería locations on the islands and thus do not provide the surety that the Pico-Henshaw list is entirely accurate. Except for identifying the locations of *Xaxas* and *Swaxɨl*, neither Cessac nor Harrington succeeded in obtaining data that correlated specific placenames with particular sites. It is important to keep in mind the inherent limitations of relying upon what amounts to a single ethnographic source as we review the data regarding specific ranchería names identified with particular archaeological sites on each island.

Archaeological Verification of Historically Occupied Rancherías

Santa Cruz Island

In 1805, Fr. Estevan Tapis wrote to José Joaquín Arrillaga, the Spanish governor of California, regarding his proposal to place a mission near the ranchería of "Cajatsa" (*Xaxas*) on the island of "Limu" (Santa Cruz Island). This letter mentions that ten rancherías existed on this island in 1805 (Johnson 1982a:61-63). At least this number may be accounted for in the mission registers with the possibility that an eleventh ranchería – "Tonsteche", at which three baptisms took place in 1814 – might also have been on Santa Cruz Island (Johnson 1999a:58). The Pico-Henshaw list contains the names of twelve ranchería names, one of which (*Ch'ɨshɨ*) conceivably may have been the aforementioned "Tonsteche," assuming that the "-steche" segment of this name was the Spanish missionary's attempt to write *Ch'ɨshɨ*. This leaves *Nimatlala* as the only placename that is ethnographically attested with no clear correlate in the mission records.

Table 3.2 lists ethnographic placenames recorded for Santa Cruz Island and 25 archaeological sites that have been suggested as having been occupied or used by Chumash Indians during Protohistoric and/or Historic times. A number of these sites are located in close proximity to one another and represent site complexes, which their investigators have suggested represent multiple loci for a particular ethnohistoric settlement. Not all of the sites in each complex have been tested adequately to determine if Mission Period artifacts are present. Two placenames, *Ch'ɨshɨ* and *L'alale*, have not been correlated certainly with midden deposit known to contain artifacts from the Mission Period;. This situation is partly the result of a relative lack of systematic survey and testing on the north coast west of Prisoners Harbor (with the exception of the Twin Harbors watershed). Also, quarrying activities at one location (Fry's Harbor) may have resulted in the destruction of an archaeological midden that Fernando Librado mentioned to J. P. Harrington as a possible location for Pico's *L'alale.* Another site with visible house depressions, SCRI-436, has been proposed as *L'alale*; however, it has not been adequately sampled to determine if its occupation overlapped European contact. Johnson's assertion that Chester King had found glass beads at a small, unrecorded midden inland from Diablo Point was subsequently corrected by King (personal communication). King had noted the presence of full-lipped beads at the site, rather than certain evidence of Historic contact (Johnson 1982a:133-134).

While most of the site or site complexes that appear in Table 3.2 represent ethnohistoric rancherías, there are more locations yielding evidence of Mission Period occupation than there

are placenames. The case of *Nimatlala* was mentioned above as not appearing in the mission records, but being located approximately where Pico had identified it. This raises the question as to what kind of settlement it may have been. The lack of its ethnohistoric attestation suggests that *Nimatlala* was different than the named sociopolitical groups from which people were identified at the time they went to the missions. Nimatlala was perhaps a seasonal encampment or may have been subsidiary to one of the larger rancherías, perhaps *Xaxas* (Sutton 2008a, 2008b, 2009). The character of the midden at the mouth of Willows canyon also is enigmatic. Because of early reports of Historic items there, Johnson (1982a:139) correlated the site with ethnohistoric *Shawa*, but subsequent extensive documentation of a site with Mission Period occupation at SCRI-192 by Arnold (1990, 2001a) and Graesch (2004) make it seem likely that *Shawa* was at Morse Point. The Willows site requires further testing to determine if it might have been a temporary camp during the Historic Period. The identification of SCRI-440 at Cueva Escondida as a temporary camp for fishing and sea bird hunting seems clear, because it would only have been approachable by canoe and was unlikely to have been occupied year around (Johnson and West 2008; Johnson, West, and Deal 2010).

Table 3.2. Santa Cruz Island sites known to possess artifacts from the Mission Period

Chumash Placename	**Site No.**	**General Location**	**Certainty of Identification or Site Type**	**Recent Archaeological References**
Santa Cruz Island				
Xaxas	SCRI-240	Prisoners Harbor	Definite	Arnold 1994, 2001a:48-52; Graesch 2000, 2001, 2004; Noah 2005
Nimatlala	SCRI-324, -384	Central Valley	Very Likely	Sutton 2008a, 2008b, 2009
Mashchal	SCRI-434, -435	Orizaba Cove	Very Likely	Johnson, 1987 site records
Ch'ɨshɨ	Unidentified	Platt's Harbor vicinity	Uncertain	Johnson 1999a:58
L'alale	SCRI-436	Diablo Point vicinity	Uncertain	Johnson 1999a:59
L'akayamu	SCRI-328–330	Forney's Cove	Likely	Arnold 1990, 2001a:46-48; Graesch 2004
Ch'oloshush	SCRI-236	Christy	Likely	Arnold 1990, Graesch 2004
Shawa	SCRI-192	Morse Point	Likely	Arnold 1990, 2001a:44-48; Graesch 2004
Liyam	SCRI-1	Coches Prietos	Very Likely	Peterson 1994
Nanawani	SCRI-504, -506	Smugglers Cove	Very Likely	Kennett et al. 2000
Swaxɨl	SCRI-423, -507	Scorpion Anchorage	Definite	Kennett et al. 2000
Lu'upsh	SCRI-306, -392, -416, -420–422	Chinese Harbor	Very Likely	Arnold 1987:179-186, 1990; Dietler 2003
Unknown	SCRI-496	Willows	Temporary Camp?	Coleman and Wise 1995:189-190
Unknown	SCRI-711	San Pedro Point	Shrine	Johnson, 1994 site visit
Unknown	SCRI-440	NW Coast	Temporary Camp	Johnson and West 2008; Johnson, West, & Deal 2010

SCRI-711, recorded primarily as a prehistoric shell midden, exhibits a discrete locus consisting of a small scatter of glass trade beads and needle-drilled Olivella disc beads on a

prominent point overlooking the ocean. This feature conforms precisely to ethnohistoric descriptions regarding how Chumash shrines were positioned along the coast:

> All rancherías alike, without exception, plant a stake about a vara and a quarter high in the clearest and most elevated spot, and on top of it they place a bunch of feathers . . . . On the coast they try to place it where it can be seen from out at sea when they go fishing, for the prayers of all these gentiles are addressed to the One they hold as Author, so that He will give them the seeds, fish, and other foodstuffs they need for their sustenance [José Longinos Martínez 1790, in Simpson 1961:53].

Other possible Chumash shrines, represented by rock platform features on high ridgelines of Santa Cruz Island, have been described in detail by Perry (2007a), having been first reported by Hudson and Underhay (1978:70). Unfortunately, no associated beads or other Historic artifacts have been discovered at these sites that would substantiate their use during the Mission Period. Ethnohistoric and ethnographic data regarding shrines indicate that beads were left as offerings, and archaeological discoveries on the mainland affirm this association (Geiger and Meighan 1976:48-49, 58; Haley and Wilcoxon 1999; Horne 1981; Hudson and Blackburn 1986:84-90; Hudson et al. 1977:62-63; Kirkish 1992). The absence of beads at the ridgetop rock features suggests that if these do represent shrines, their use was somehow different in function than those that served as depositories for offerings.

Santa Rosa Island

In contrast to both Santa Cruz and San Miguel islands, Santa Rosa Island has not yielded more sites than there are documented placenames (Table 3.3). The most recent attempt to correlate archaeological sites with ethnographic/ethnohistoric rancherías is that by Kennett (2005:97-103). Clear evidence of Mission Period occupation has only been recovered from five locations: SRI-97 at Rancho Viejo Creek, SRI-60 at Bechers Bay, SRI-40 and SRI-502 at Cañada Verde, SRI-2 at Skull Gulch, and SRI-62 at Johnson's Lee. These locations are presumed to have been the rancherías of *Qshiwqshiw*, *Hich*ɨ*m*ɨ*n*, *Silimihi*, *Niaqla*, and *Nilal'uy* respectively (Johnson 1999a; Kennett 2005; Rick 2003, 2007b). Site identifications proposed by Kennett for three other rancherías (*N*ɨ*mk*ɨ*lk*ɨ*l*, *Nawani*, and *Helewashkuy*) have not be verified through the recovery of Mission Period artifacts, which casts an element of doubt regarding whether some of the other placename correlations are accurate. A ninth ranchería name, *Xonashup* ("Jonachup") is attested in the records from La Purísima and is presumably associated with Santa Rosa Island; however, no clues as to its geographic location currently exist.

The most thoroughly reported excavations at a Historic Period site on Santa Rosa Island are those undertaken by Orr (1968) and Rick (2003, 2004a, 2007b) at SRI-2, which has long been assumed to be the ranchería of *Niaqla*. However, this identification of SRI-2 as *Niaqla* has always presented something of a puzzle because the 20-25 house depressions visible at the site would suggest a fairly sizable population in contrast to a rather meager ten baptisms from this ranchería in the mission registers (Johnson 1999b:253). Orr (1968) had suggested that SRI-2 had been abandoned prior to the Mission Period; however, almost all of the houses tested so far, around half the total, contain evidence of occupation during the Historic and Protohistoric

Periods (Rick 2007b:259). The number of houses, assuming most were occupied contemporaneously, would imply a population of at least 80 people, based on an average of four persons per house. The disparity between the house count and baptisms has been interpreted as resulting from a ranchería whose population was in decline from introduced diseases (Johnson 1999a:64); however, it is conceivable that SRI-2 does not represent *Niaqla* at all, but rather its larger neighbor, *N̶imk̶ilk̶il*, which was represented by 51 baptisms in the mission records (Johnson 1999a:53). SRI-15 at Abalone Point has been suggested to have been the site of *N̶imk̶ilk̶il* (Johnson 1982:153); but recent excavations by Kennett at SRI-15 did not yield any evidence of Historic occupation (1998, 2005:101).

Table 3.3. Santa Rosa and San Miguel Island sites known to date to the Protohistoric or Historic Periods

Chumash Placename	Site Nos.	General Location	Certainty of Identification or Site Type	Recent Archaeological References
Santa Rosa Island				
Qshiwqshiw	SRI-85, -87	Rancho Viejo Creek	Very Likely	Kennett 1998:217, 2005:98-99; Coleman and Wise 190-191
Hich̶im̶in	SRI-60	Bechers Bay	Very Likely	Kennett 1998, 2005:98
Silimihi	SRI-40, -502	Cañada Verde	Very Likely	Kennett 2005:99-100
Niaqla	SRI-2	Skull Gulch	Possible	Rick 2003, 2007b
N̶imk̶ilk̶il	SRI-15	Abalone Point	Uncertain	Kennett 2005:101
Nawani	SRI-97, -98	China Point	Uncertain	Kennett 2005:101-102
Nilal'uy	SRI-62	Johnson's Lee	Likely	Kennett 2005:102-103
Helewashkuy	SRI-436	San Agustine Canyon	Uncertain	Kennett 2005:103
Xonashup	Unidentified		Unknown	
San Miguel Island				
Tuqan	SMI-162, -163, -159	Cuyler Harbor, East	Very Likely	Kennett 2005: 104; Rick 2007a:96-114
Niwoyomi	SMI-470	Otter Harbor	Possible	Kennett 2005:104; Rick 2007a:114-121
Unknown	SMI-536	Cuyler Harbor, West	Temporary Camp	Rick 2007a:122-123
Unknown	SMI-602	Point Bennett	Residential	Kennett and Conlee 2002; Rick 2007a:121-122
Unknown	SMI-516	SW Coast	Temporary Camp	Rick 2007a:123

Pursuing this conjecture further, if *N̶imk̶ilk̶il* was at SRI-2, then the question becomes where a rather small ranchería of *Niaqla* may have been located along the coast between *Silimihi* and *N̶imk̶ilk̶il*. One possibility is that during the Mission Period there could have been a settlement at Arlington Canyon, which contains a dependable year-round source of water from nearby springs. Substantial midden deposits dating to the Late Period exist at SRI-5 and SRI-6 on either side of

the canyon mouth; however, recent fieldwork at these sites and others in their vicinity has concentrated on characterizing Paleocoastal and Early Holocene deposits, so later occupations have yet to be studied (Erlandson et al. 1999; Johnson et al. 2007; Kennett 1998, 2005:114-116, 126-128). Our lack of certainty with regard to Chumash presence at sites near the west end and southern shore of Santa Rosa Island during the Historic Period points to the need for further investigations.

San Miguel Island

A comprehensive review of what is currently known about Protohistoric and Historic occupation on San Miguel Island has recently been published by Rick (2007a:93-125). Rick, following Kennett (2005:104), convincingly argues that the site complex represented by SMI-163 and its neighbors SMI-162 and SMI-159 were the likely location of the principal ranchería on the island, *Tuqan*, a name that was also applied to the island as a whole. Rick further notes that he found two chipped-wall disk beads at another site, SMI-536, at the west end of Cuyler Harbor, a type usually diagnostic to the Mission Period, if drilled with metal needles (however, the hole-size is not reported in his study). Erlandson and Bartoy (1995:167) earlier reported that this shell midden appears to be the source of a date previously obtained by Hubbs that pointed to occupation during the early Protohistoric Period. Rick concluded that SRI-536 may have been a residential outlier of the ranchería of *Tuqan* at SRI-163, if not a separate village. He suggested that further research would be required to determine more precisely the temporal range of the Late Period component at this site.

A second ranchería on San Miguel Island, *Niwoyomi*, is represented by a single family in the records of Mission La Purísima (Johnson 1999b:66). Kennett (2005) and Rick (2007a:116) have proposed that *Niwoyomi* might have been correlated with SMI-470, a midden with evidence of Historic Period occupation at Otter Harbor. While this is certainly a possibility, there is no reason to rule out either the aforementioned SMI-536 at the west end of Cuyler Harbor or SMI-602, a residential site near Point Bennett radiocarbon-dated to the Historic Period (Kennett and Conlee 2002; Rick 2007a:121-122) as other possible locations for *Niwoyomi*. The situation at San Miguel, with a number of sites that appear to be contemporaneous, implies that *Tuqan*, as the overarching sociopolitical group on the island, likely had subsidiary settlements, some seasonally occupied, that were scattered about the island in order to exploit particular resources at different locations.

Population Estimates

The Chumash islanders were recruited to five missions. The largest number were drawn to Mission San Buenaventura (440), followed by Santa Bárbara (367), Santa Inés (235), La Purísima (213), and San Fernando (15). Thus, the total number of people baptized from the Northern Channel Islands comes to 1,270, probably far less than lived on the islands prior to the founding of the missions (Table 3.4). Certainly introduced European diseases claimed many lives over the span of the forty years between the founding of Mission San Buenaventura in 1782 and the removal of the last islanders in 1822 (Johnson 1999b). In 1805 the missionary president Fr. Estevan Tapis wrote that there were approximately the same number of people living on the

Channel Islands as the total number who assembled at Mission Santa Bárbara on feast days, implying a population of about 1,800 islanders in that year. A devastating epidemic of measles that swept through California the following year led to the loss of more than 200 adults on the islands according to a later report by the same missionary (Johnson 1982a:62-63). Using a formula derived from mathematical demography and applying a rate of decline based on estimates reported for the mainland Chumash produces an estimate of 3,253 people on the Northern Channel Islands in 1782 (Johnson 1982a:109-114).

Recently a GIS database has been assembled by Randall Milliken and the author of this study to derive an empirically derived population estimate for California Indian groups that incorporates mission register baptismal counts. An adult mortality factor of one percent loss per year is used to adjust for pre-mission populations (Milliken 2006:21). The results of this analysis yield the surprising conclusion that the Northern Channel Islands possessed the highest population density in all of aboriginal California (although population aggregations were higher at some localities on the mainland), with totals of 17.4 people per km^2 (45 people per square mile) on eastern Santa Cruz Island, 8.9 per km^2 (23 per square mile) on central Santa Cruz Island, and 8.1 per km^2 (21 per square mile) on eastern Santa Rosa Island. Although estimated densities for the remaining portions of the islands were much less (2.4 to 2.5 people per km^2), the generally high numbers testify to the tremendous productivity of the islands' marine environment. Using their formula derived from island baptismal counts, Milliken and Johnson calculate a total population of 3,199 people, nearly matching the 3,252 figure that was obtained using Tapis's 1805 estimate of 1,800 people in a formula derived from mathematical demography (Johnson 1982a:114). These independent calculations, producing almost identical results, give us confidence that the Island Chumash population numbered in the neighborhood of 3,200 individuals at the dawn of the colonial era.

Marriage and Family Patterns

The study of Island Chumash social organization and intercommunity interaction has been advanced through analysis of mission register data. Reconstructed genealogies have revealed that the native inhabitants of the Northern Channel Islands, like their mainland counterparts, practiced matrilocal post-marital residence, a pattern that continued even after the Mission Period (Johnson 2001; Pfeiffer 1977). A good example of this predominant pattern is provided by the genealogy of Fernando Librado *Kitsepawit*, whose parents both had been born on Santa Cruz Island. In each case, Librado's parents and their siblings had been born in their mother's natal ranchería, whereas their fathers had come from rancherías elsewhere on the island (Johnson 1982b, 1999c:213-216). The discovery that Island Chumash families were matrilocal has implications for archaeological research. Adjacent house depressions present at many of the sites on the islands may likely have been occupied by families whose women were related matrilineally, which would suggest socioeconomic cooperation among women in these residences and shared crafts passed from mothers to daughters. The antiquity of matrilocal post-marital residence potentially could be investigated if ancient mitochondrial DNA analysis was

Table 3.4. Chumash baptisms from islands

Mission[1]

VILLAGE	MLP	MSI	MSB	MBV	MSF	TOTAL
SANTA CRUZ ISLAND						
Xaxas			107	22		129
Mashchal			68	1		69
Ch'ɨshɨ			2			2
L'alale	2		2	1		5
L'akayamu	1	4	31	14		50
Ch'oloshush	5	3	18	2		28
Shawa			3	6		9
Liyam		1	26	84	6	117
Nanawani			1	60		61
Swaxɨl			25	180		205
Lu'upsh			2	61		63
Subtotal	(8)	(8)	(285)	(431)	(6)	(738)
SANTA ROSA ISLAND						
Qshiwqshiw	31	53	30	5		119
Hichɨmɨn	5	61	5			71
Silimihi	49	4				53
Niaqla	7	1	2			10
Nɨmkɨlkɨl	39	8	4			51
Nawani	1		1			2
Nilal'uy	36	8	2	2		48
Helewashkuy	1	9	27			37
Guima[2]			2	1	4	7
Subtotal	(169)	(144)	(73)	(8)	(4)	(398)
SAN MIGUEL ISLAND						
Tuqan	29		5			34
Niwoyomi	3					3
Subtotal	(32)	0	(5)	0	0	(37)
UNLOCATED	4	83	4	1	5	97
Total	213	235	367	440	15	1,270

[1]MLP=Mission La Purísima, MSI=Mission Santa Inés, MSB=Mission Santa Bárbara, MVB=Mission San Buenaventura, MSF=Mission San Fernando
[2]Native Name for Santa Rosa Island

undertaken. If matrilocal residence was the prevailing practice in prehistory, one would expect that adult females would be less diverse in mtDNA lineages represented, whereas greater variability would be present among male mtDNA sequences in a given community. At least two

surviving mtDNA lineages are known to exist among Chumash descendants from the Channel Islands, only one of which has been tested (Johnson and Lorenz 2006:39-41, 58 n.3).

Social networks are another aspect of island society that has been investigated using mission register research. This analysis is based upon a tabulation of inter-ranchería marriages of couples that were wed in native society prior to migration to the missions (Johnson 1982a:122, 1993). Such unions were documented as *renovaron* 'renewed' by the missionaries who composed the marriage registers. Analysis of the matrix of inter-community marriages revealed that *Liyam* was the most important ranchería in all of the Northern Channel Islands in terms of all three measures of social network centrality, suggesting its importance in terms of communication activity, efficiency, and control (Johnson 1993:33-36). This finding suggests that it is no accident that *Liyam* was reported ethnographically to have been the residence of the paramount chief of Santa Cruz Island during the Mission Period (Hudson et al. 1977:14; Johnson 1982a:117).

Sociopolitical Organization

Fernando Librado provided the most extensive information about Island Chumash sociopolitical organization during his work with J. P. Harrington. He reported that only the four largest rancherías on Santa Cruz Island had individuals who held chiefly rank (Hudson et al. 1977:14). This information is supported by ethnohistoric information from the mission registers that identify only four men from Santa Cruz Island who were *capitanes* 'chiefs' – one each from the four largest rancherías (*Liyam*, *Mashchal*,*Swaxɨl*, and *Xaxas*). The last island chief to be baptized was José Crespín Camuluyatset (*Kamuliyatset*), who was described as the *capitán* of *Liyam*. Librado indicated that the chief of this ranchería was the *paqwot* 'big chief' of all of Santa Cruz Island. A reconstruction of *Kamuliyatset*'s family relationships shows that unlike the majority of islanders, he had resided patrilocally, a pattern that was also characteristic of Chumash chiefs' families on the mainland who likewise frequently deviated from the predominant practice of matrilocal post-marital residence (Johnson 1982a:117; 1988:170-174; 2001:64-65).

Geographic analysis of population distribution suggests that the islands were divided into two natural units: Santa Cruz Island and Santa Rosa–San Miguel islands together. Each of these natural units had centrally located settlements that were most accessible to its inhabitants. The rancherías that were most geographically central within their respective subregions were *Xaxas* on Santa Cruz Island and *Qshiwqshiw* on Santa Rosa Island, each of which could be independently documented by ethnohistoric evidence as having been important political centers (Johnson 1993:27-33). Cluster analysis of island marriages further supported the sociopolitical division between the Santa Cruz and Santa Rosa-San Miguel subregions (Johnson 1993:36-37). Including mainland rancherías in the analysis led to the observation that the mainland coastal towns with the most politically important chiefs were also those that were in the best geographic position to control cross-channel trade (Johnson 1988:281-288, 2000a).

Conclusion

This assessment of ethnographic and ethnohistoric sources on the Channel Islands reveals that much remains to be learned. The hypothesis of Protohistoric pandemics that decimated the islands seems unlikely based on the review conducted here, but careful dating of individual island households, like that conducted by Arnold (2001a) and her students and by Rick (2004a, 2007a, 2007b) will determine the number of dwellings that were inhabited contemporaneously and provide insights into population trends during Protohistoric times. Data regarding island ranchería locations are not as robust as could be desired, and archaeologists should keep in mind that the currently accepted map of island ranchería locations (Figure 3.1) may require revision as further testing takes place at the sites proposed to have been occupied during the Historic Period.

As increased fieldwork has taken place, we are gaining a much greater appreciation that island settlement patterns are more complex than simply one major site representing a basic sociopolitical group. The fact that Historically-occupied sites not documented in mission records have been found on both Santa Cruz and San Miguel islands indicates that larger sociopolitical groups possessed subsidiary settlements. Some of these were undoubtedly seasonal or temporary encampments, but others may have been occupied year around and were not usually differentiated in mission records because the inhabitants were identified with the larger group to which they belonged.

CHAPTER 4
PREHISTORIC ARCHAEOLOGICAL RESOURCES ON SANTA BARBARA ISLAND

Status of Resource Inventories

Santa Barbara Island (Figure 4.1) has experienced much less attention by archaeologists than the other islands within the Park, in part because of its small size but also because of its remote location and much lower public visitation intensity. In the past, the island had been the subject of two apparent total-area surveys (see Glassow 1977 for a description of the first). The second of these, Roziare's in 1964, was the first genuinely thorough survey, and it resulted in the location of 15 sites (Rozaire 1978b). In 1977, Greenwood expanded the results of Rozaire's (Greenwood 1978). She prepared site records for 19 sites, including a bedrock mortar, and no new sites have been formally recorded since. It is Greenwood's site records that are currently on file at the Central Coast Information Center. Although the survey procedures used by Rozaire are only generally described, it may be assumed that they were relatively intensive.

There is reason to believe that the distribution of archaeological deposits on the island are more complex than is implied by the 19 formally recorded sites. Bright, for instance, noted the presence of surface manifestations not apparently associated with deposits that would be conventionally recorded as sites (Glassow 1977:38). Moreover, in her journal Sethkamp (1986) noted that some sites recorded by Greenwood were not easily relocated, in part because of thick vegetation, and both Rozaire (1978b:4) and Greenwood (1978:10) mention the difficulty of identifying sites, particularly in the vicinity of Webster Point, because of the dense cover of ice plant. Indeed, the high concentration of small sites in the Webster Point vicinity implies that even smaller sites may exist there. Morris undertook a resurvey of the Webster Point vicinity in 1986 (Snethkamp 1986); however, there is no extant record of the results of this survey. UTM coordinates obtained from a GPS receiver have not been obtained for any of the island's sites.

Greenwood (1978:10) indicated that erosion is severely affecting six sites and that access by visitors endangers others. She noted that two sites are disappearing rapidly and that much of the erosion appears unstoppable. In her assessment, some of the sites with the highest apparent potential to yield information important to understanding the island's prehistory will soon be lost. Rick (2001:68) also emphasized the effects of erosion, from both wind and water, and he noted that argilliturbation is affecting some of the island's sites. He suggests that a better understanding of the taphonomic processes affecting the sites would enhance their management.

Erlandson and Rick have undertaken analysis of samples of midden deposits that Snethkamp obtained in 1986 from CA-SBI-2 and CA-SBI-12 (Rick 2001; Rick and Erlandson 2001; Rick, Erlandson and Horton 2009), and Erlandson et al. (1992) obtained radiocarbon dates for six sites on the island (SBI-1, 2, 3, 9, 12, 16) based on shells from existing collections. In addition, Rick and Erlandson (2001) reported radiocarbon dates from a seventh site (SBI-19). The radiocarbon dates from SBI-19 indicate that the island was occupied at least by 4000 BP, and SBI-1 and 2 are associated with dates only a few hundred years younger (Rick, Erlandson, and Horton 2009).

The remaining dates are scattered through the remainder of prehistory, with SBI-12 and 16 dating within the last 800 years. The radiocarbon dates demonstrate that Santa Barbara Island has a relatively long prehistory and that changes in the use of the island over time is undoubtedly worth investigating.

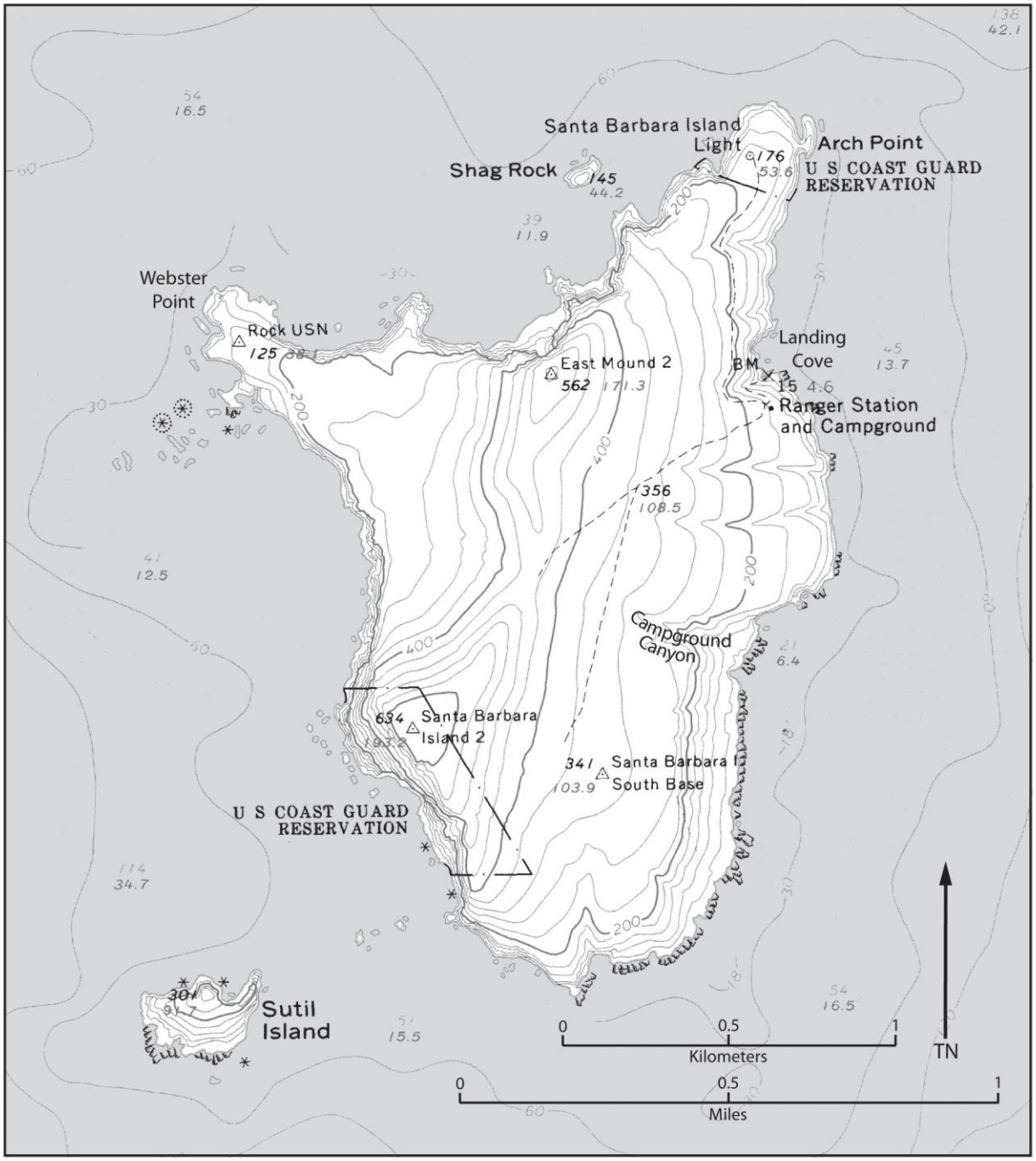

Figure 4.1. Santa Barbara Island showing locations mentioned in this chapter.

An interesting feature of the midden constituents at sites for which samples have been analyzed is the variable presence of mussel, which Rick, Erlandson, and Horton (2009:118) attribute to variation in the strength of wave surge in the vicinity of the sites. They also note that the variety of shellfish taxa represented varies between sites (Rick, Erlandson, and Horton 2009:118). Analysis of midden constituents at various sites also indicates that fishing and sea mammal hunting was practiced, although the data are still too few to indicate the variable importance of these pursuits through time.

Project Descriptions

Only three archaeological projects have occurred on Santa Barbara Island since 1975, these being described below. In addition, Rozaire (1978b) issued a report on his work in the 1960s, and his fieldwork is briefly described in the 1977 overview (Glassow 1977:34-37). The 1986 fieldwork carried out by Snethkamp and Morris is the most extensive since 1975, but few records of the investigation survive. Analysis of collections obtained by Snethkamp have been the subject of several papers by Erlandson, Rick, and their colleagues (Erlandson et al. 1992; Rick 2001; Rick and Erlandson 2001; Rick, Erlandson, and Horton 2009).

Project name (or basic description)
Re-recording of sites on Santa Barbara Island

Principal investigator
Roberta S. Greenwood (assisted by Vance G. Benté)

Institutional sponsor
Greenwood and Associates

Dates of fieldwork
15-18 October 1977

Published and unpublished mss. (in style of *American Antiquity* text citation)
Greenwood 1978

Geographic location(s) of fieldwork
Those parts of the island where sites previously had been recorded

Site nos. or locations from which data were collected
SBI-1 to 19

Theoretical and empirical goals of research
As stated by Greenwood, the goal was "to evaluate conditions of known archaeological sites" on the island. Another goal was to prepare more thorough site records of the sites, compile a map of the island showing locations of the sites, evaluate the sites with respect to National Register criteria, and make recommendations for enhancing preservation of the sites.

Types of data collected (collections, site records forms, field records)

Site record forms were filled out for each site, including 3 new sites. No collection was made.

Person-days and crew size

Two people worked for 4 days, for a total of 8 person-days.

Field procedures (and laboratory procedures as applicable)

Visits to all previously recorded sites but no formal intensive survey to locate new ones; preparation of new site record forms using a 4-page form similar to the OHP forms now currently in use. An oak stake with a brass cap was emplaced at each site.

Location and nature of the archaeological collections and associated documentation

Site records and Greenwood's report are housed at the Central Coast Information Center, Department of Anthropology, University of California, Santa Barbara. The Park assigned accession number 286 to the collections made during the project, and they are housed at the Department of Anthropology, Santa Barbara Museum of Natural History.

Significant descriptive and theoretical conclusions of the research

Greenwood and Benté found that a site previously recorded by Rozaire in 1964 could not be located. They recorded three new sites and prepared thorough site records for previously recorded sites. They also assessed the condition of the sites, many of which have been affected by erosion and land development.

14. Potential of collections and data for future research

The site records can serve as a basis for future research and cultural resources management.

Project name (or basic description)

1986 survey and test excavations on Santa Barbara Island

Principal investigator

Pandora E. Snethkamp and Don P. Morris

Institutional sponsor

Center for Archaeological Studies, Department of Anthropology, University of California, Santa Barbara, and Channel Islands National Park

Dates of fieldwork

4-13 September 1986

Published and unpublished mss. (in style of *American Antiquity* text citation)

Erlandson et al. 1992; Rick 2001; Rick and Erlandson 2001; Rick, Erlandson, and Horton 2009

Geographic location(s) of fieldwork

Various sites and locations throughout the island

Site nos. or locations from which data were collected

Test excavation at SBI-1, 2, 12, and 16 and intensive survey in the Webster Point vicinity

Theoretical and empirical goals of research

No documents exist stating the research goals, but it is apparent that a main goal was to collect data that would allow the significance of the archaeological resources to be evaluated. Another goal was to determine the location of certain sites recorded by Charles Rozaire during his survey of the island in 1964 (based on updated and revised site records prepared by Greenwood and Benté in 1977).

Types of data collected (collections, site records forms, field records)

Collections from excavation include residues caught by eighth-inch screens. No site records are known to have been produced as a result of survey.

Person-days and crew size

Excavation efforts included:

SBI-1: 2 people for 1 day, for a total of 2 person-days
SBI-2: 3 people for 3 days, for a total of 9 person-days
SBI-3: undocumented
SBI-9: undocumented
SBI-12: 2 people for 2 days and 3 people for 2 days, for a total of 10 person-days
SBI-16: 3 people for 2 days, for a total of 6 person-days

Survey in the Webster Point vicinity by 3 to 6 people lasted at least 4 days; it may have lasted as many as 9 days.

Field procedures (and laboratory procedures as applicable)

Excavation was in 0.5x1.0 m units, one per site, excavated in levels of varying thickness due to stratigraphic changes in the deposits. Excavated deposits were sifted through eighth-inch mesh screens, and all deposits were water-screened. At least some of the water-screening took place on the island using sea water.

Survey apparently was intensive within grids of unknown size.

Location and nature of the archaeological collections and associated documentation

Field documentation is incomplete; only Snethkamp's incomplete personal journal is extant. Apparently participants also kept field notes (mentioned in Snethkamp's journal), but none exists within the accession records associated with the project. Collections and associated records are housed by the Repository for Archaeological and Ethnographic Collections, Department of Anthropology, University of California, Santa Barbara.

Significant descriptive and theoretical conclusions of the research

Snethkamp and Morris's collections have been partly processed by Rick, Erlandson, and their colleagues, and they have obtained radiocarbon dates pertaining to all of the sites tested by

Snethkamp and Morris. Their research demonstrates that the island was inhabited for at least 4,000 years. They also found evidence supporting the hypothesis that the island was inhabited intermittently for short periods of time.

Potential of collections and data for future research

Not all collections made by Snethkamp and Morris have been processed, and additional information about use of the island's resources and the place of the site in inter-island mobility patterns may be obtained through further work with the collections.

Project name (or basic description)

Reconnaissance on Santa Barbara Island

Principal investigator

Torben C. Rick

Institutional sponsor

Department of Anthropology, University of Oregon

Dates of fieldwork

21-22 May 2001

Published and unpublished mss.:

Rick 2001

Geographic location(s) of fieldwork

Eastern 1/3 of island due to pelican closure of rest of island.

Site nos. or locations from which data were collected

Sites visits were made to SBI-2, -12, -14, -16, and -19.

Theoretical and empirical goals of research

Rick's brief visit to the island was prompted by his reanalysis of materials excavated by Snethkamp and Morris. Rick visited SBI-2, 12, and 16 excavated by Snethkamp and radiocarbon dated by Erlandson et al. (1992). Rick also visited SBI-14 and 19 to evaluate the sites and collect radiocarbon samples. None was identified at SBI-14 and one shell was collected from SBI-19.

Types of data collected (collections, site records forms, field records)

Brief field notes, photographs, and radiocarbon sample from SBI-19.

Person-days and crew size

1 person worked for 2 days; a total of 2 person-days.

Field procedures (and laboratory procedures as applicable)

A radiocarbon sample was taken from a small probe at SBI-19. Other sites were not excavated or disturbed.

Location and nature of the archaeological collections and associated documentation

None. The radiocarbon sample was destroyed during analysis. Field records are in the possession of Rick.

Significant descriptive and theoretical conclusions of the research

Rick demonstrated that SBI-19 is the oldest directly dated site on the island, at ca. 4260-4060 cal BP.

Potential of collections and data for future research

None

CHAPTER 5
PREHISTORIC ARCHAEOLOGICAL RESOURCES ON ANACAPA ISLAND

Status of Resource Inventories

Compared to the other Northern Channel Islands, Anacapa Island (Figure 5.1) has seen limited archaeological research. Over the last 33 years, a modest number of projects has been conducted on the island's terrestrial cultural resources, with much of this research performed in the late 1970s (e.g., Greenwood 1978), or more recently within the last five years (e.g., Rick 2005). This limited research greatly hinders our understanding of Anacapa Island's prehistoric cultural resources, as well as the place of Anacapa in broader Santa Barbara Channel cultural developments. This dearth of data includes basic chronological information, with ^{14}C dates available from only nine of the island's 26 sites, making even basic comparisons with the other islands and mainland difficult (see Rick 2005; Wolff, Rick, Robbins et al. 2007). Recent work at four sites on East Anacapa by teams from the Department of Anthropology, Southern Methodist University, is helping to fill the gap in understanding of Anacapa's prehistoric archaeological record.

All of Anacapa Island has been surveyed for cultural resources, some portions of the island more than once (Greenwood 1978; Rozaire 1978c; McKusick 1959). Only four sites are found on East Anacapa, with 12 sites on Middle Anacapa, and 10 on West Anacapa (Greenwood 1978). The sites are fairly evenly distributed across the island, but their presence and abundance is largely dictated by the steep sea cliffs and limited access to the coast. The densest concentrations of sites occur at Frenchy's Cove on West Anacapa and at Shepherd's Landing on Middle Anacapa. Both areas are arguably the most accessible parts of Anacapa. In addition, two areas have seen substantial historical settlement that has greatly compromised the integrity of archaeological sites.

Rozaire performed some of the first systematic survey for archaeological resources on Anacapa Island, with details of these projects summarized in his report (Rozaire 1978c) and discussed in Glassow's (1977) overview. Shortly after Glassow's (1977) overview, Greenwood (1978) completed a report on the results of her 1977-1978 survey of East, Middle, and West Anacapa. This survey, attempted to locate all of the sites previously recorded by Rozaire and other researchers on the island and to record any previously undocumented sites. Greenwood's (1978) is by far the most systematic survey of Anacapa Island, and arguably the largest project to be performed on the island since 1975.

Greenwood (1978) recorded 26 archaeological sites on the island and two isolated artifacts. The sites are numbered ANI-1 through 27, with ANI-20 not currently assigned to a site. Detailed site records were completed, and a report describing potential disturbances and threats to all of the sites was also provided. Twenty-four sites were the same ones recorded by Rozaire (1978c) or McKusick (1959), with one of Rozaire's (Site J) and three of McKusick's not relocated, although McKusick's sites may be in a group of sites renumbered by Greenwood (1978:45).

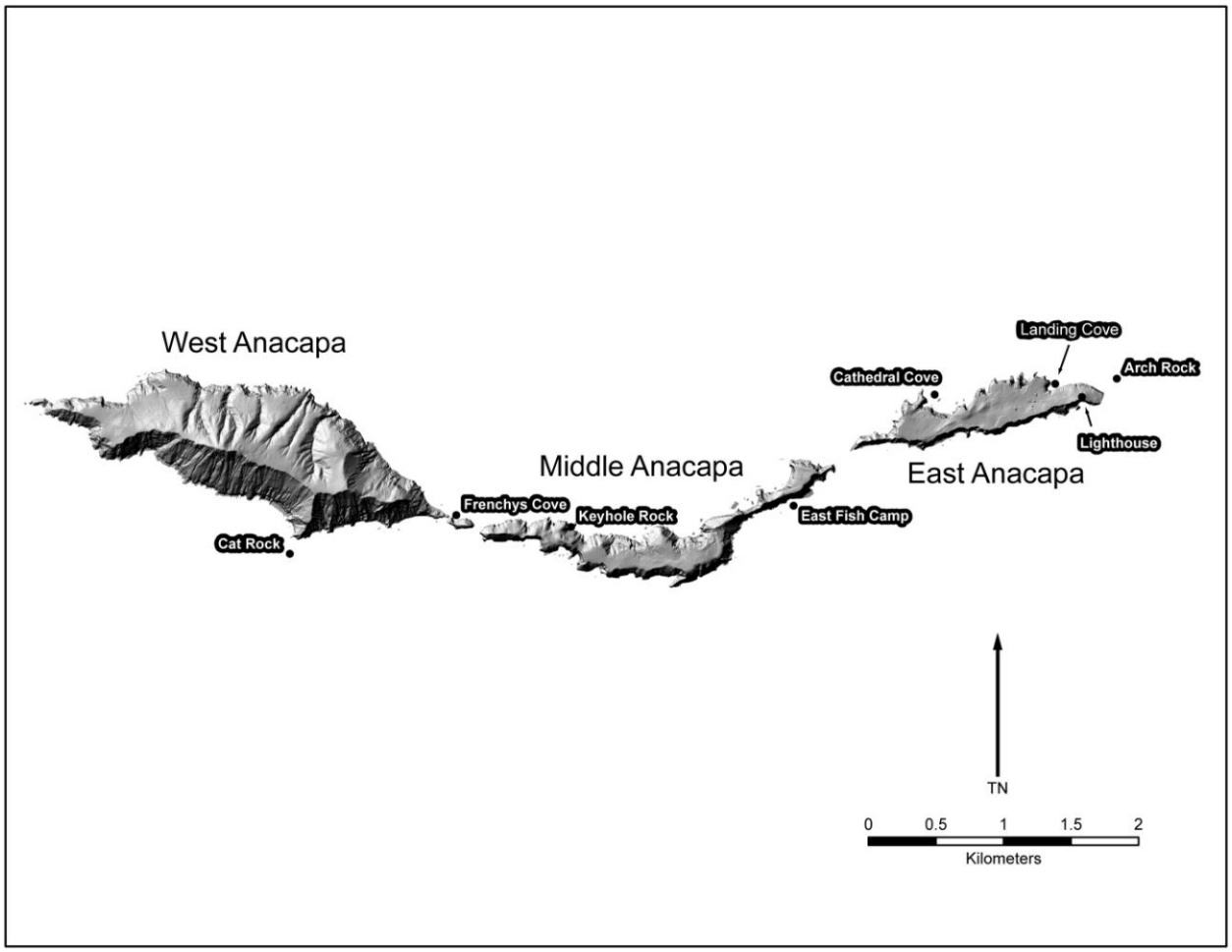

Figure 5.1. Anacapa Island showing locations mentioned in this chapter.

Of the sites recorded by Greenwood, 24 are Native American shell middens and two are lithic scatters. These are mostly open-air sites, but five cave or rockshelter sites are known, with four on West Anacapa and one on Middle. In addition to these prehistoric sites, Greenwood also noted substantial historic deposits (in addition to a prehistoric shell midden) at ANI-21. No named Chumash villages or other sites are known to exist on Anacapa Island. Anacapa is derived from *'Anyapax*, however, a Chumash word likely meaning deception or mirage. This makes Anacapa the only Channel Island that maintains a Chumash name.

In addition to the formal archaeological projects described above and noted in the project descriptions, a few reports or publications focused on the results of projects outlined in Glassow's (1977) overview have appeared since 1975. This includes the final report of Rozaire's (1978c) 1958-1965 research, a brief report of the faunal remains derived from Rozaire's project (Walker et al. 1978), and a publication on the microlithic technology recovered during this work (Rozaire 1993).

As noted above, Greenwood's site records and maps are the most thorough and up-to-date for Anacapa. Copies of Greenwood's 26 site records are available at Channel Islands National Park. The South Central Coastal Information Center at California State University, Fullerton

maintains copies of McKusick's site records for ANI-1 to ANI-24 from 1958 and copies of Greenwood's (1978) records from ANI-1 to ANI-19 and ANI-21 to ANI-27.

Project Descriptions

Unfortunately, archaeological research on Anacapa Island has been limited since 1975. The most detailed survey on the island remains Greenwood's (1978) study, and the site records derived from this project are generally quite thorough, even though they are about 30 years old. Formal research projects on the island after Greenwood's work have been limited to studies led by Rick and students from Southern Methodist University during the last five years. Rick (2005) revisited some of the sites recorded by Greenwood (1978), McKusick (1959), and Rozaire (1978c), obtaining and reporting the first detailed ^{14}C sequence for the island and noting that human occupation extends back at least 5,200 years. In 2006, Rick initiated a cooperative agreement with Channel Islands National Park to work at ANI-2 and other sites on East Anacapa Island. The excavation of ANI-2 was completed in 2007, and laboratory analysis is ongoing, with preliminary results reported in Reeder and Rick (2008) and Wolff, Rick, Robbins et al. (2007). This project should ultimately enhance understanding of the nature of human subsistence and land use on East Anacapa.

Project name (or basic description)
Survey of Anacapa Island

Principal investigator
Roberta S. Greenwood

Institutional sponsor
Greenwood and Associates under contract with the National Park Service

Dates of fieldwork
October 27-29, 1977, December 7, 1977, and July 11-13, 1978

Published and unpublished mss.
Greenwood 1978

Geographic location(s) of fieldwork
East, Middle, and West Anacapa Island

Site nos. or locations from data were collected
ANI-1 through ANI-27, including two isolates. Site number ANI-20 remains unassigned, and several previously numbered sites by McKusick or Rozaire were not relocated, but the numbers were reassigned. These sites probably exist but are now renumbered (see Greenwood 1978:45 for description of all site number correlations).

Theoretical and empirical goals of research

To locate previously recorded cultural resources, provide condition assessments of those resources, map the sites, and acquire information to address the criteria for nomination to the National Register of Historic Places.

Types of data collected (collections, site record forms, field forms)

Archaeological site records, location maps, site maps, and a report summarizing condition and management recommendations for the sites.

Person-days and crew size

1-3 people on various segments of project. Total of 19 person-days.

Field procedures (and laboratory procedures as applicable)

Coverage of all of Anacapa Island visiting previously recorded sites, noting/recording the presence of archaeological isolates, as well as two previously unrecorded sites.

Location and nature of archaeological collections and associated documentation

The two-volume report, site base maps, and site records are on file at Channel Islands National Park (CINP) in Ventura, CA and the South Central Coastal Information Center, California State University, Fullerton. Sixteen artifacts were collected from the site surface and are housed at the Western Archaeological and Conservation Center, Tucson, Arizona (Catalog #s 1388-1403). The Park has assigned accession number 286 to this collection. A catalog in Greenwood (1978:50) also provides brief descriptions of these artifacts. Photographs resulting from the fieldwork have not been located.

Significant descriptive and theoretical conclusions of the research

This project determined that there were at least 26 (ANI-1 through 27, excluding ANI-20) archaeological sites on all three segments of Anacapa Island (one of Rozaire's original sites [ANI-20] could not be relocated by Greenwood but retains its original site number). These sites include a new site on a the eastern terrace of Middle Anacapa that was not previously known and another new site also on Middle Anacapa. The other sites had been previously recorded.

Potential of collections and data for future research

These site records provide the basis for future archaeological research and archaeological resource management. All of the site locations recorded by Greenwood that Rick (see below) visited are thorough and provide good location information. Most if not all of the management recommendations are still applicable today and need to be implemented to help preserve the island's cultural resources. The photos taken during this project are also an important source of information for understanding how the island's landscape and cultural resources have changed during the last few decades.

Project name (or basic description)

Collection of ^{14}C samples from East and West Anacapa sites

Principal investigator

Torben Rick

Institutional sponsor

Department of Anthropology, Southern Methodist University

Dates of fieldwork

February 19, 2004 (West Anacapa) and December 21, 2004 (East Anacapa)

Published and unpublished mss.

Rick 2006

Geographic location(s) of fieldwork

East Anacapa Island and Frenchy's Cove, West Anacapa

Site nos. or locations from data were collected

^{14}C Samples were collected from ANI-1, 2, and 4 on East Anacapa and from ANI-5 and 6 on West Anacapa

Theoretical and empirical goals of research

This project was focused on building a radiocarbon chronology for Anacapa Island. Prior to this work no ^{14}C dates for Anacapa had been published. Moreover, only three dates on charcoal had ever been obtained, all of these coming from Rozaire's work at ANI-8.

Types of data collected (collections, site record forms, field forms)

Brief notes on the condition of the archaeological sites were obtained during this work. Marine shells were obtained *in situ* from the site deposits for ^{14}C dating.

Person-days and crew size

Two researchers (T. Rick and K. Minas) worked for two days, for a total of 4 person days.

Field procedures (and laboratory procedures as applicable)

Probes were excavated into the site deposits, with ^{14}C samples taken *in situ*. Samples from Rozaire's excavations at ANI-6 and ANI-8 housed at the Natural History Museum of Los Angeles were also dated during this study. All ^{14}C dates were run by the National Ocean Sciences AMS (NOSAMS) Facility at the Woods Hole Oceanographic Institution following standard AMS dating procedures.

Location and nature of archaeological collections and associated documentation

Some of the ^{14}C samples were destroyed during analysis, but field notes and remaining shell fragments are housed at the Department of Anthropology, Southern Methodist University.

Significant descriptive and theoretical conclusions of the research

Established first radiocarbon date sequence for Anacapa Island, revealing that human occupation extended back over 5000 years, with many of the sites on East Anacapa dating to the early part of the Late Holocene. A few sites on West Anacapa have Late period occupations.

Potential of collections and data for future research

All radiocarbon samples collected during this project have already been analyzed, but some shell samples remain.

Project name (or basic description)

Excavations at ANI-2

Principal investigator

Torben C. Rick

Institutional sponsor

Department of Anthropology, Southern Methodist University

Dates of fieldwork

May 29, 2006 to June 4, 2006

Published and unpublished mss.

Reeder and Rick 2008

Geographic location(s) of fieldwork

East Anacapa

Site nos. or locations from data were collected

ANI-2

Theoretical and empirical goals of research

This project was designed to generate data on the prehistoric human occupation of Anacapa Island, especially the steep and rugged East Anacapa. Excavation at ANI-2 were carried out to help determine if Anacapa Island was occupied seasonally or all year, used on a permanent or semi-permanent basis, or used primarily as a stopover when traveling between the mainland to other islands. Finally, the excavations were designed to mitigate some of the effects of the island hiking trail that bisects the site. All of the research was deigned to provide management information for protection and preservation of this important site.

Types of data collected (collections, site record forms, field forms)

Site excavation included shellfish and vertebrate faunal remains and artifacts from ANI-2. All of these materials are still being analyzed at SMU. Field notes on the excavations, site maps, and photographs were also obtained.

Person-days and crew size

4 people worked for 7 days, totaling 28 person days.

Field procedures (and laboratory procedures as applicable)

In the eastern section of ANI-2, a 1 x 1 m unit was excavated following arbitrary 10 cm levels with all residuals screened over 1/8-inch mesh. A 25 x 25 cm column sample was also obtained adjacent to the unit, with 1/16-inch residuals retained, and smaller bulk soil samples were also collected. Shellfish for radiocarbon dating were taken *in situ* from the sidewalls and the strata profile was also drawn.

Location and nature of archaeological collections and associated documentation

All materials are currently housed at the Department of Anthropology, Southern Methodist University.

Significant descriptive and theoretical conclusions of the research

This project has determined that most of the occupations of East Anacapa appear to have been relatively brief visits, with some sites (e.g., ANI-2) appearing to have been reoccupied several times. Shellfish dominate the midden constituents at these sites, with some fairly large fish samples at ANI-2. Expedient chipped stone tools and bone gorges were common at ANI-2, and beads and other ornaments are rare.

Potential of collections and data for future research

Final analysis of the vertebrate and invertebrate faunal remains and artifacts from ANI-2 should be important for understanding the nature of Anacapa Island settlement and subsistence systems, as well as its relationship with the other islands. Stable isotope analysis and continued zooarchaeological analysis will all provide important information on East Anacapa.

Project name (or basic description)

^{14}C sample collection on Middle and West Anacapa

Principal investigator

Torben C. Rick

Institutional sponsor

Department of Anthropology, Southern Methodist University

Dates of fieldwork

October 6-8, 2006

Published and unpublished mss.

None

Geographic location(s) of fieldwork

Middle Anacapa and Freshwater Cave, West Anacapa

Site nos. or locations from data were collected

^{14}C Samples were collected from ANI-9, 15, 21, 22, 23, 24, and 25 on Middle Anacapa and from ANI-18 (Freshwater Cave) on West Anacapa

Theoretical and empirical goals of research

This project was focused on obtaining additional radiocarbon dates for Anacapa Island sites to build on Rick's 2004 work. Prior to this work, no ^{14}C dates had been obtained for Middle Anacapa and only ANI-5, 6, and 8 had been dated on West Anacapa.

Types of data collected (collections, site record forms, field forms)

Brief notes on the condition of the archaeological sites were obtained during this work. Marine shells were obtained *in situ* from the site deposits for ^{14}C dating.

Person-days and crew size

2 researchers (Rick and Minas) worked for 3 days, equalling 6 person days.

Field procedures (and laboratory procedures as applicable)

^{14}C probes were excavated in the site deposits with ^{14}C samples taken *in situ*, or obtained from eroding exposures. All ^{14}C dates were run by the National Ocean Sciences AMS (NOSAMS) Facility at the Woods Hole Oceanographic Institution following standard AMS dating procedures. Two conventional ^{14}C dates were also run by Beta Analytic Inc.

Location and nature of archaeological collections and associated documentation

Some of the ^{14}C samples were destroyed during analysis, but field notes and shell fragments are housed at the Department of Anthropology, Southern Methodist University. Only two of the eight samples collected have yet to be dated.

Significant descriptive and theoretical conclusions of the research

Provided dates for two sites (ANI-18 and -22), including the first site to be dated on Middle Anacapa (ANI-22). Both sites are historical in age, with needle drilled *Olivella* beads also found at ANI-18. These are the first clear indications of an historic Chumash occupation of Anacapa Island.

Potential of collections and data for future research

The eight samples collected by Rick should all be dated to help further refine the chronology of Anacapa Island.

Project name (or basic description)

Continuing excavation at sites on East Anacapa Island

Principal investigator

Torben C. Rick

Institutional sponsor

Department of Anthropology, Southern Methodist University

Dates of fieldwork

July 3-10, 2007

Published and unpublished mss.

Wolff, Rick, Robbins et al. 2007

Geographic location(s) of fieldwork

East Anacapa

Site nos. or locations from data were collected

ANI-1, 2, 3, and 4

Theoretical and empirical goals of research

This project was designed to generate data on the prehistoric human occupations of Anacapa Island, especially the steep and rugged East Anacapa. Excavation at ANI-2 and bulk sampling and/or mapping at ANI-1, 3, and 4 were carried out to help determine if East Anacapa Island was occupied seasonally or all year, used on a permanent or semi-permanent basis, or used primarily as a stopover when traveling between the mainland to other islands. Finally, excavations at ANI-2 were designed to mitigate some of the effects of the island hiking trail that bisects the site. All of the research was deigned to provide management information for protection and preservation of these four sites.

Types of data collected (collections, site record forms, field forms)

Site excavation included shellfish and vertebrate faunal remains and artifacts from ANI-2, 3, and 4. All of these materials are still being analyzed at SMU. Field notes on the excavations, site maps, and photographs were also obtained.

Person-days and crew size

4 people worked for 8 days, equaling a total of 32 person days.

Field procedures (and laboratory procedures as applicable)

In the western section of ANI-2, a 1 x 1 m unit was excavated following arbitrary 10 cm levels with all residuals screened over 1/8-inch mesh. Two 25 x 25 cm column samples were also obtained adjacent to the two units, with 1/16-inch residuals retained, and smaller bulk soil samples also collected. Shellfish for radiocarbon dating were taken *in situ* from the sidewalls, and soil profiles were drawn. Along with the 2006 field season, this makes a total of two 1 x 1 m units and two column samples excavated by SMU at ANI-2. Two 5-liter bulk samples were obtained from the sea cliff at ANI-3 with all 1/16-inch residuals collected. A 1 x 0.5 m unit was excavated at ANI-4 with all 1/8-inch residuals retained. Bulk soil samples were also obtained from this unit. ANI-1 through ANI-4 were mapped with a Topcon total station. Laboratory analysis is ongoing, but follows standard Channel Island field methods, with all artifacts and faunal remains from 1/8-inch mesh and larger being analyzed.

Location and nature of archaeological collections and associated documentation

All materials are currently housed at the Department of Anthropology, Southern Methodist University.

Significant descriptive and theoretical conclusions of the research

This project has determined that most of the occupation of East Anacapa appears to have been relatively brief visits, with some sites (e.g., ANI-2) appearing to have been reoccupied several times. Shellfish dominate the midden constituents at these sites, with some fairly large fish samples at ANI-2. Expedient chipped stone tools and bone gorges were common at ANI-2, but beads and other ornaments are very rare on East Anacapa. Dates from all four sites suggest that East Anacapa was occupied primarily between about 3300 and 2700 cal BP with no occupation currently known before or after that time period.

Potential of collections and data for future research

Final analysis of the vertebrate and invertebrate faunal remains and artifacts from ANI-2, 3, and 4 should be important for understanding the nature of Anacapa Island settlement and subsistence systems, as well as Anacapa's relationship with the other islands. Stable isotope analysis and continued zooarchaeological analysis will all provide important information about East Anacapa prehistoric occupation.

CHAPTER 6
PREHISTORIC ARCHAEOLOGICAL RESOURCES ON SANTA CRUZ ISLAND

Status of Resource Inventories

Since data were compiled for the 1977 *An Archaeological Overview of the Northern Channel Islands, California* (Glassow 1977), there has been a significant expansion of the number of formally recorded archaeological resources on the Santa Cruz Island. At that time, circa 1976, 382 sites were formally recorded, and as of March 2009 the number was 801. Similarly, in 1976 33.65 km^2 of land had been subject to intensive systematic survey, and by March 2009 the amount was 51.37 km^2. Based on data available in 1976, Glassow (1977:129) estimated that 10% of the island's area had been surveyed; as of March 2009 surveyed land stood at 20.6% (Figure 6.1). Based on the percent of land surveyed and the number of recorded sites, Glassow (1977:130) estimated that the total number of sites on the island was around 3000. Using the same approach, but based on currently available data, the estimated number of sites on the island would be over 3800 sites. The difference between this estimate and the 1977 estimate is primarily due to differences in how surveyed areas were defined. Recording of many of the surveyed areas since 1977 was only of the land surface actually covered by walking transects (see discussion below), whereas the surveys undertaken prior to 1976 were of complete watersheds, including lands with slopes great enough not to contain sites and therefore not considered during survey. As a result, the actual number of sites on the island probably is closer to the 1977 estimate.

The expansion of the cultural resources inventory since 1976 is a result of projects undertaken for a variety of purposes. On The Nature Conservancy Property, much of the expansion of the inventory is a result of research undertaken by Jeanne Arnold, Michael Glassow, and their graduate students, as well as archaeological field courses they taught. Beginning in the 1990s, surveys of Park lands east of El Montañon by Kennett and Perry and their students, as well as Park personnel, have resulted in a large number of recorded sites, and their density is now comparable to other areas of the island where extensive survey has taken place. However, none of the survey projects anywhere on the island was on the scale of that undertaken during 1973-1974 under Glassow's direction. This earlier survey entailed several weeks' effort by a crew of eight (Glassow 1977:126-130), whereas most subsequent surveys were over periods of one to several days, often with smaller crews.

An important and ongoing issue with regard to the inventory of cultural resources on Santa Cruz has been the location of Chumash villages that were occupied at the time that San Buenaventura and Santa Barbara Missions were established (1782 and 1786, respectively). As indicated by Johnson in Chapter 3, Pico gave relatively specific geographic locations for three of the villages, and the locations of the rest were given simply as directions from other villages.

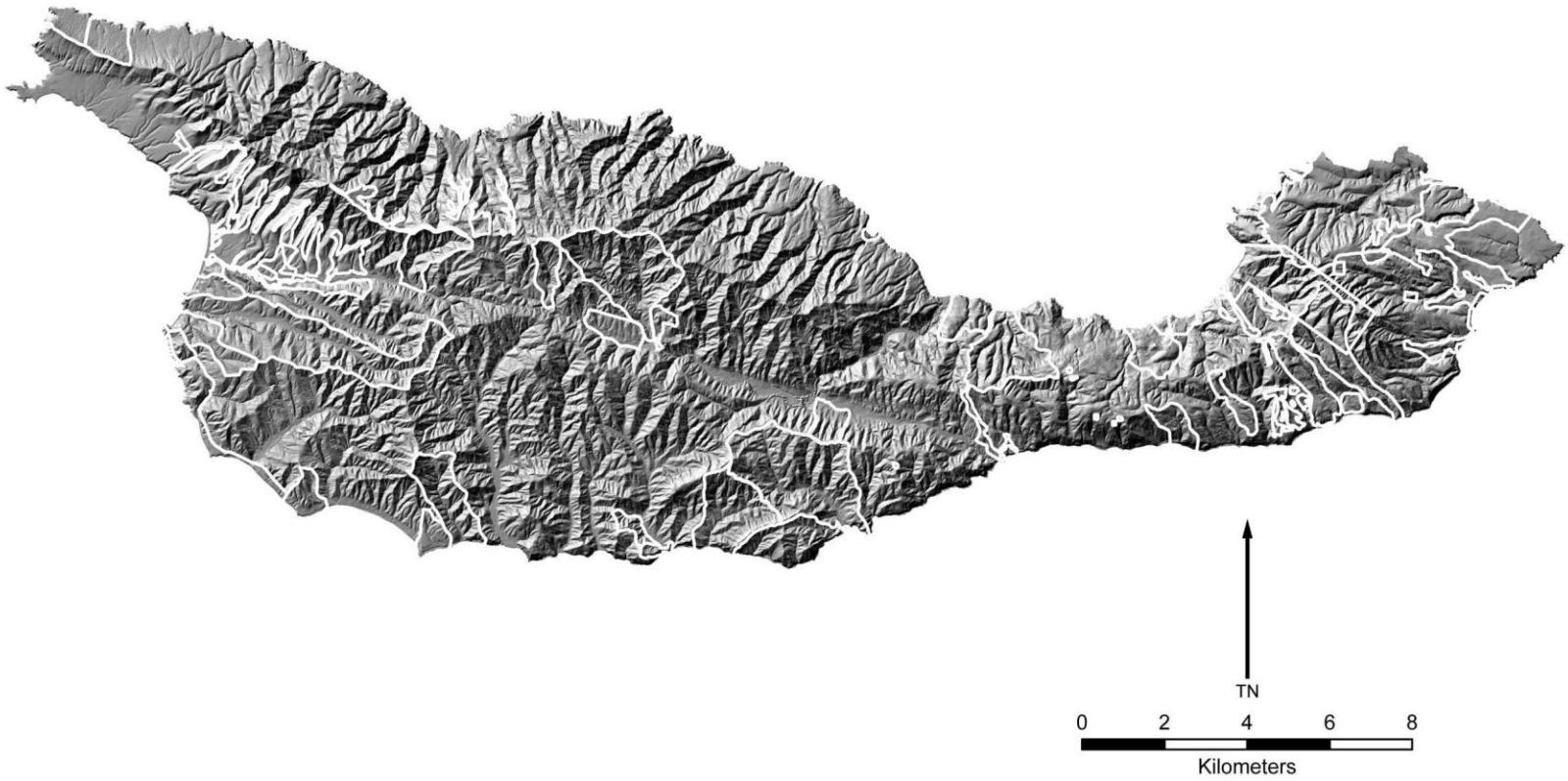

Figure 6.1. Santa Cruz Island showing areas intensively surveyed, outlined in white. Information derived from the Park's GIS, which does not include recently surveyed areas near the western extreme of the island.

Thus, establishing the locations of these named villages had to be based on identification of archaeological sites that yielded evidence of occupation during the historic period (e.g., needle-

drilled *Olivella* disc beads or glass trade beads) and correlation of these locations with the geographic information provided by Pico. Complicating matters was the lack of mention in mission registers of neophytes from two of the villages identified on the Pico list. In the early 1980s Johnson (1982) tackled the task of correlating names of Chumash villages on Pico's list with specific archaeological sites, taking into consideration the information about sites that had accumulated by the time he began his research. He was able to correlate nine archaeological sites (or clusters of sites) with evidence of historic period occupation with village names on Pico's list (see Chapter 3).

Arnold (1990) has suggested a revision to Johnson's village locations. She proposed that the village of Swaxil was not located at Scorpion Anchorage, as Johnson had thought, but instead was at Smugglers Cove (CA-SCRI-504), and that the village of Nanawani, which Johnson had placed at Smugglers Cove, was instead a short distance to the south, at Smugglers Point (CA-SCRI-506). Her argument was based on finding historic-period material at sites at both Smugglers Cove and Smugglers Point, as well as finding no evidence of historic-period material at a site at Scorpion Anchorage (CA-SCRI-423). Later, Kennett et al. (2000; see also Kennett 2005:97) did find historic-period artifacts at this site, indicating that it could indeed be the location of Swaxil.

In Chapter 3 Johnson notes that two village names, L'alale and Ch'ishi, have not yet been associated with specific archaeological sites. Both apparently were located on the north coast of the island, and as Johnson noted, the lack of correlation with archaeological sites probably is due to the minimal attention given by archaeologists to this region. In addition to the need for more intensive investigation along the north coast, it is possible that more intensive investigation in the vicinity of sites already correlated with village names may reveal that the structure of historic communities was more complicated than is currently understood.

Four wrecks of boats and ships and one wreck of a military plane are known to be submerged in waters around Santa Cruz Island within either the Park or the Channel Islands National Marine Sanctuary. These are described in Chapter 10. No extensive and systematic survey for submerged resources has taken place at any location around the island, and some wrecks known from historic records to be present have not yet been located. All located wrecks are the result of either checking locations where historical documents indicate a wreck occurred or fortuitous finds by divers. No submerged prehistoric cultural resources have been located in waters around Santa Cruz.

Types and Distribution of Archaeological Surveys Associated with Site Recording

As discussed in the 1977 *Overview*, survey taking place prior to the early 1970s was informal, with an emphasis on relatively large sites with dense midden deposits. The surveys in 1973 and 1974, under the direction of Michael Glassow, entailed intensive systematic survey procedures, the survey areas being defined as watersheds. Since the time of the 1977 *Overview*,

areas of intensive systematic survey have not been defined on the basis of watersheds. Instead, their definition has been based on specific research objectives or has been simply an expansion of general knowledge of site distributions and variability in the context of training undergraduate students in survey and site recording procedures.

Three surveys were of a series of specific locations where sites were known to exist and from which artifacts donated to the Santa Barbara Museum of Natural History or UCSB had come. One of these took place in 1977 under the direction of Travis Hudson of the museum, and another took place in 1987 under the direction of John Johnson, also of the museum. Both entailed sites in widely dispersed locations and both resulted in recording of sites that had not yet been documented. Glassow undertook a similar survey of the Platts Harbor vicinity, which resulted in recording of two sites.

Glassow has been undertaking surveys in an attempt to locate and record sites with red abalone middens. The first of these, taking place in 1984, entailed survey of seacliff exposures and gully walls along the edge of the marine terrace between Forney's Cove and Black Point and the northern margin of the marine terrace where drainages enter the foothills below the North Ridge. This was not strictly an intensive systematic survey, however, as the focus was on erosional exposures where buried red abalone middens were suspected to be visible. The survey resulted in recording of several sites with red abalone middens (Glassow 1993b). In 1994 and 1995, with the help of his field class students, he surveyed the seacliff overlooking Christy Beach north of the mouth of Cañada Christy, the walls of gullies and ravines bisecting the seacliff, and the walls of Cañada Christy west of the Christy Ranch Airfield. Again, the objective of this survey was to locate and record sites with buried red abalone middens, and several more were recorded along with other kinds of buried middens.

Glassow also was interested in locating red abalone middens, or sites without red abalone shell concentrations contemporary with them, in the interior of the island, under the assumption that the people who created red abalone middens at or near the coast would also have occupied sites in the island's interior to obtain terrestrial resources, particularly plant foods. He undertook two surveys with this objective in mind, both with undergraduate students in his field classes. One of these, in 1995-1997, involved survey of north-south-trending ridgetops overlooking the northern margin of the Cañada Christy valley from a point not far east of the Christy Ranch Airfield to the vicinity of Black Point Canyon. The second, in 1998, involved several ridges descending southward from the North Ridge in the general vicinity of Lagunitas Secas.

In another research-focused survey, Glassow and his colleague Oliver Chadwick (professor in UCSB Geography and Environmental Studies departments) surveyed the arroyo walls along the lower half of Pozo Canyon. This project occurred intermittently between 2001 and 2006. Glassow had been aware of buried lenses of shells on this canyon's arroyo walls since the 1960s, and the availability of grant funding at UCSB for interdisciplinary research provided the opportunity for Glassow and Chadwick's collaborative research. They discovered 18 locations where one or more archaeological strata were visible on the arroyo walls. These were not formally recorded as archaeological sites, but records exist of their locations and characteristics (Glassow et al. 2009). Glassow and Chadwick also looked for buried middens in Cañada de los

Sauces and Cañada Christy, which resulted in the discovery and recording of a site in a tributary of the latter (CA-SCRI-796, Ballantyne 2006).

Glassow undertook four other surveys principally for the purpose of training undergraduate student in survey and site recording procedures while adding to the inventory of recorded sites on the island. One of these, in 1990-1992, took place in the lower Willows watershed. Another, which began in 2004 and is ongoing, is a survey of the marine terrace lands between Black Point and Forney's Cove. This survey is of an area with the highest density of large shell middens anywhere on the island, and survey results not only will provide a basis for research in the indefinite future but also will highlight the importance of this area for protection from any form of future development. The remaining two surveys took place on a series of ridges in the isthmus area of the island, including portions of three ridges not far west of El Montañon, a portion of the Loma Pelona area, and a ridge above Valley Anchorage.

During 1981-1982, Jeanne Arnold (1987) carried out survey and site recording on Santa Cruz Island in connection with her dissertation research, her activities being focused in the China Harbor and El Montañon localities. In 1988 and 1989, however, she and project coworkers conducted surveys and site recording in coastal areas in connection with a large-scale project funded by the National Science Foundation. As she indicated in a volume presenting the results of that project, the areas she surveyed "were among the few large coastal tracts on the island that had not been systematically surveyed. These areas had the potential to support heretofore unknown large communities possibly involved in bead-making crafts or other activities dating within the Middle to Historic sequence" (2001a:35). Her surveys took place in coastal lands adjacent to China Harbor, the Prisoners Harbor vicinity, the Valley Anchorage vicinity, the mouth of Pozo Canyon, the Christy Beach vicinity, highlands south of Christy Beach, the southwest coast between Near Point and Alegría Canyon, the coastal area of western China Harbor, the ridge running through Los Pinos del Sur, and a locality west of Sandstone Point.

Arnold also conducted survey and site recording in connection with summer field schools she taught. The first of these was in 1988, and the rest took place from 1990 to 1993. These surveys took place in the Los Pinos del Sur vicinity of the island's isthmus region, the upper Central Valley, Pelican Bay, inland from Christy Beach, and at two localities in Cañada Christy between 1 and 2.5 km inland from the Christy Ranch buildings. These surveys were not directly related to Arnold's research concerning the development of social and economic complexity; instead, they had the objective of expanding the inventory of recorded sites on the island in the context of providing training to students.

During 1985-1987, Robert Peterson carried out investigation of sites in the Coches Prietos watershed in connection with his doctoral dissertation research (never completed, Peterson 1994). This watershed had been previously surveyed in 1967 and 1973 (Glassow 1977:124-130). In the course of his fieldwork, Peterson visited a number of the recorded sites, and in doing so he encountered two unrecorded sites that had been missed in the previous two surveys. Peterson's site recording and Arnold's survey and site recording several years earlier both had the purpose of generating information relevant to doctoral dissertation research.

Several surveys, or other types of archaeological projects, have been undertaken for strictly cultural resource management purposes. Because the Nature Conservancy does not have a program of expanding the inventory of documented cultural resources as does the Park, in 2003 Park archaeologists surveyed corridors of land on both Park and The Nature Conservancy property prior to the construction of fences in anticipation of the pig eradication program. Also associated with the pig eradication program was a 2002 survey by a Park archaeologist of a small plot of land near the Main Ranch Airfield for construction of hunting dog kennels. On Park lands, three small surveys were undertaken by cultural resources management firms, at Scorpion Anchorage in 1983 before the Park assumed ownership of eastern Santa Cruz, and in the Mount Pleasant vicinity in 1992 and 1997. Between 1995 and 2003 an archaeologist with a cultural resources management firm also monitored the soil sampling related to closure of commercial research facilities at Valley Anchorage.

In 2001, shortly after the Park took over ownership of the isthmus area of the island, Park personnel undertook surveys and small-scale testing related to the development of a hiking trail from Prisoners Harbor to Scorpion Canyon. In addition to surveying the whole length of the proposed trail, testing was undertaken at two sites not far west of El Montañon, one near where a campground was proposed and another along the trail.

Park lands east of El Montañon have witnessed relatively intensive survey as well as some small-scale testing beginning in the late 1990s. From the Park's perspective, these projects aided in developing the inventory of archaeological resources on their property, but they also generated data for two doctoral dissertations and a master's thesis. In 1997, Douglas Kennett undertook the first of these, focusing his attention in the Scorpion Canyon watershed as an aspect of his dissertation research. A large proportion of the watershed area was surveyed, and 14 sites were recorded, including an unusually large chert quarry site. Kennett's survey was undertaken as part of a larger project that had the objective of elucidating the behavioral ecology and evolutionary history of people living on the Channel Islands (1998, 2005). Soon after he completed his dissertation, he and students working with him also surveyed lands elsewhere on eastern Santa Cruz, including a survey just west of El Montañon.

In 2001-2002, Jennifer Perry also carried out survey and limited testing at sites along ridges south of Scorpion Canyon, and after completion of her dissertation she and her students have been expanding this work, part of which was focused on the chert quarry sites at various locations on eastern Santa Cruz. Her research has been concerned with the various factors that influenced the distribution and character of prehistoric sites east of El Montañon as well as impacts of environmental and technological change over time, particularly during the middle and late Holocene. An important aspect of her inventory-related investigations has been identification and a formal assessment of quarry sites within and east of El Montañon (Perry and Jazwa 2010).

Beyond the formal surveys and site-recording projects that have taken place, individual sites have been located and recorded for a variety of purposes, most of which are not documented.

Evaluation of Post-1976 Inventory Activities

In general, surveys undertaken since 1976 have been of the intensive systematic type initiated during Glassow's 1973-74 survey. However, the definition of survey areas has varied considerably, few being defined on the basis of watersheds as were those in 1973-74. Because the objectives of the surveys have varied widely, the location and size and shape of surveyed lands display no clear pattern, and the total surveyed land coverage cannot be said to be a representative sample of the whole island.

Simply because surveys have been of the systematic intensive type does not mean that no sites have been missed. For instance, Peterson found two additional sites in the Coches Prietos watershed that the 1967 and 1973 surveys had missed (see discussion above), apparently because daily episodes of survey inadvertently skipped surveying along a small tributary. Small sites, some no more than a few meters in diameter, also are likely to have been missed if survey teams did not come close enough to them during walking transects. As well, thick grassland cover is likely to have obscured even relatively large sites, and if surveyors were not sufficiently assiduous in removing divots of grass at regular intervals through such ground cover, sites could have been missed. Even moderate grass cover may obscure flake scatters lacking shellfish remains. These were very visible in areas of the island where sheep grazing was intensive before their removal in the 1980s, but such sites now are practically invisible because of obscuring grass cover.

Although survey coverage has increased substantially since 1976, significant gaps in coverage of the island's area remain. Most obvious are the lands between Sierra Blanca and the Willows watershed and nearly all of the land between Twin Harbors and Del Mar Cove, that is, much of the north segment of the island between Prisoners Harbor and the western extreme of the island. However, individual sites have been recorded in these areas, but the numbers are relatively small. Difficulty of access is a major reason for lack of attention to these two areas, more so with regard to the northern area than the southern; in addition, research interests that have developed over the last 30 years happen not to have involved work in these areas.

Also largely neglected in the course of survey and site recording since 1976 (and before) are historic sites. The reason for this neglect is the fact that researchers have been prehistoric archaeologists focused exclusively on prehistoric sites and Chumash village locations. Nonetheless, as Costello demonstrates in Chapters 2 and 9, there is substantial potential for historic archaeological research on the island focusing on the ranching, fishing, military and other activities that spanned the period from the 1850s to 1987.

The quality of information on site records has improved over time. For the 1973-74 surveys a specialized record form was used that facilitated input into a database that by current standards is quite primitive—the SELGEM data management system promulgated at that time by the Smithsonian Institution. Data field entries were relatively restricted and tied in part to the research objectives of the survey. Shortly after the 1973-74 project, a more elaborate form was used, and eventually the form promulgated by the California Office of Historic Preservation came into use.

Plotting of the locations of sites on topographic maps generally has been at a relatively high standard of accuracy, and locations of sites recorded decades ago usually are relocated with little difficulty. Nonetheless, missplotted sites have been identified. For instance, the location of CA-SCRI-324, recorded in 1973, recently was found to be about 300 m west of where it was originally plotted, apparently the result of surveyors having become confused by similar adjacent landforms. Use of GPS receivers to record UTM coordinates became conventional in the 1990s, and such problems generally will be avoided in the future. However, no effort yet has been made to record the boundaries of a site in the field with a GPS receiver and then to transfer the digital information directly into a GIS database. Although the locations of sites are reasonably accurate, their plotted perimeters on USGS maps may not be.

Another improvement in some of the surveys, particularly those taking place since ca. 1990, is plotting on maps only the area of land actually covered by pedestrian survey. In earlier surveys, steep slopes within a tract of land were included in the area plotted as having been subjected to intensive systematic survey even though surveyors never actually walked across the slope surfaces. In the early 1990s, Glassow began plotting just the areas surveyed in his and his students' surveys, but not every other researcher has followed suit.

A shortcoming of the surveys carried out as student training exercises, specifically those Glassow has supervised, is that more sites are located than there was time available to record, given that the survey and site recording activities had been carried out sequentially over the course of two days. Consequently, many of the plotted survey areas contain more sites than the number that was formally recorded. Nonetheless, Glassow's field reports on file at the Central Coast Information Center include maps showing the locations of all sites encountered within the areas surveyed.

Summary

The inventory of recorded sites on Santa Cruz has grown substantially since 1976, and the motivation for survey and site recording has been tied principally to research objectives and student training. Nonetheless, large tracts of land on the property remain uninvestigated, and the current sample of recorded sites cannot be said to be representative of all the variation in site types and environmental contexts that may exist. In general, the quality of site recording has remained high, although earlier records generally are more cursory than later records. Inclusion of GPS-generated UTM coordinates since the 1990s has increased the confidence in the location of recorded sites. Similarly, the care taken in plotting the areas actually covered by intensive systematic survey has improved.

Although some questions remain regarding locations of Chumash villages mentioned in ethnohistorical and ethnographic literature, most are now relatively confidently tied to specific archaeological sites. Particularly noteworthy is the discovery of a cluster of two (perhaps three) historic-period sites in the Central Valley, which may together be one of the two previously unidentified villages mentioned in the ethnographic literature but not ethnohistoric documents.

Project Descriptions

The following synoptic project descriptions cover the period from 1976 to the present. They include all documented archaeological projects since the 1977 archaeological overview was prepared (Glassow 1977). The period covered by the 1977 overview ended during 1976, and two additional projects occurring during that year are included here. For purposes of this listing, a project is a discrete program of fieldwork within a distinct geographic area of the island and with a specified research or resource management objective. In some circumstances a program of fieldwork may consist of two or more episodes extending over a period of two or more years. Some of the projects actually were part of a larger research program, this being particularly the case with some of the descriptions of Jeanne Arnold's projects. However, if the projects were distinct in space and time, and/or if each had a specific data collection objective, they were given separate descriptions. As a consequence, the approach to defining projects was one of "splitting" rather than "lumping," which seems to make most sense with regard to the objectives of archaeological resource management.

Excluded from the definition of a project are instances in which an individual site was recorded outside of the scope of a defined project. Over the years, for instance, researchers have recorded sites when they were encountered, but the recording was done simply to document the site and its location; no specific research or management objective was in mind. Similarly, a small surface collection may have been made at a recorded site outside the context of a defined field project. Although such collections are housed at a collections repository, no attempt was made to inventory these for the purpose of defining projects. There are a few exceptions, however; a few instances of surface collection are defined as projects if the items collected were particularly distinctive or significant.

The information available for the projects is variable, in large part because the documentation of a project varies from relatively brief field notes or generalized information in a publication to formal field journals containing day-by-day accounts of fieldwork. In a few instances, supplemental information about a project was solicited from project directors. Also, some information about a project was gleaned from site records filed at the Central Coast Information Center—for instance, the dates of a project and the number of people involved.

The following project descriptions are organized by the initial date of the fieldwork, from earliest to latest. Locations of projects generally refer to placenames indicated on Figures 6.2 and 6.3.

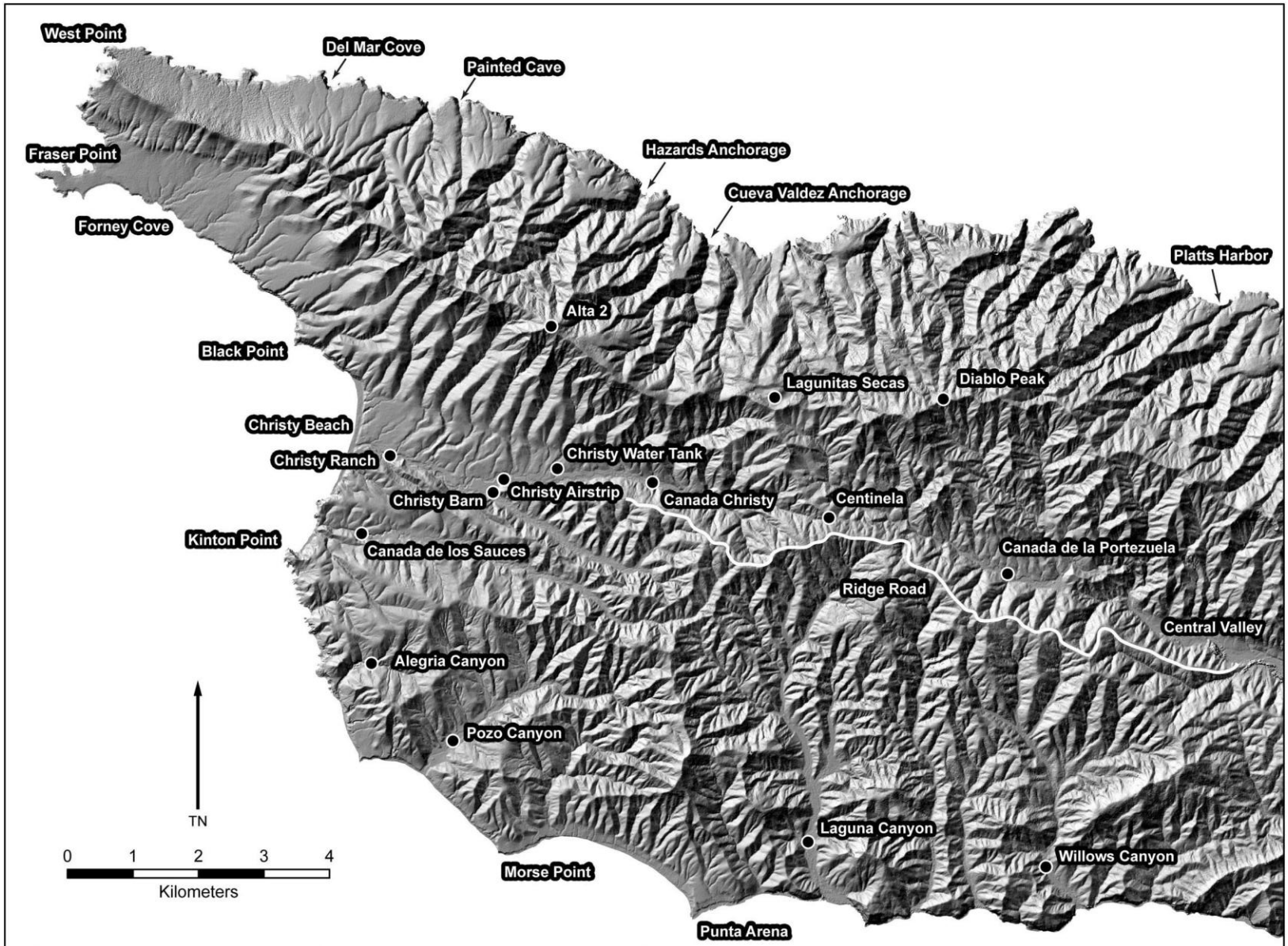

Figure 6.2. Santa Cruz Island showing locations mentioned in this chapter.

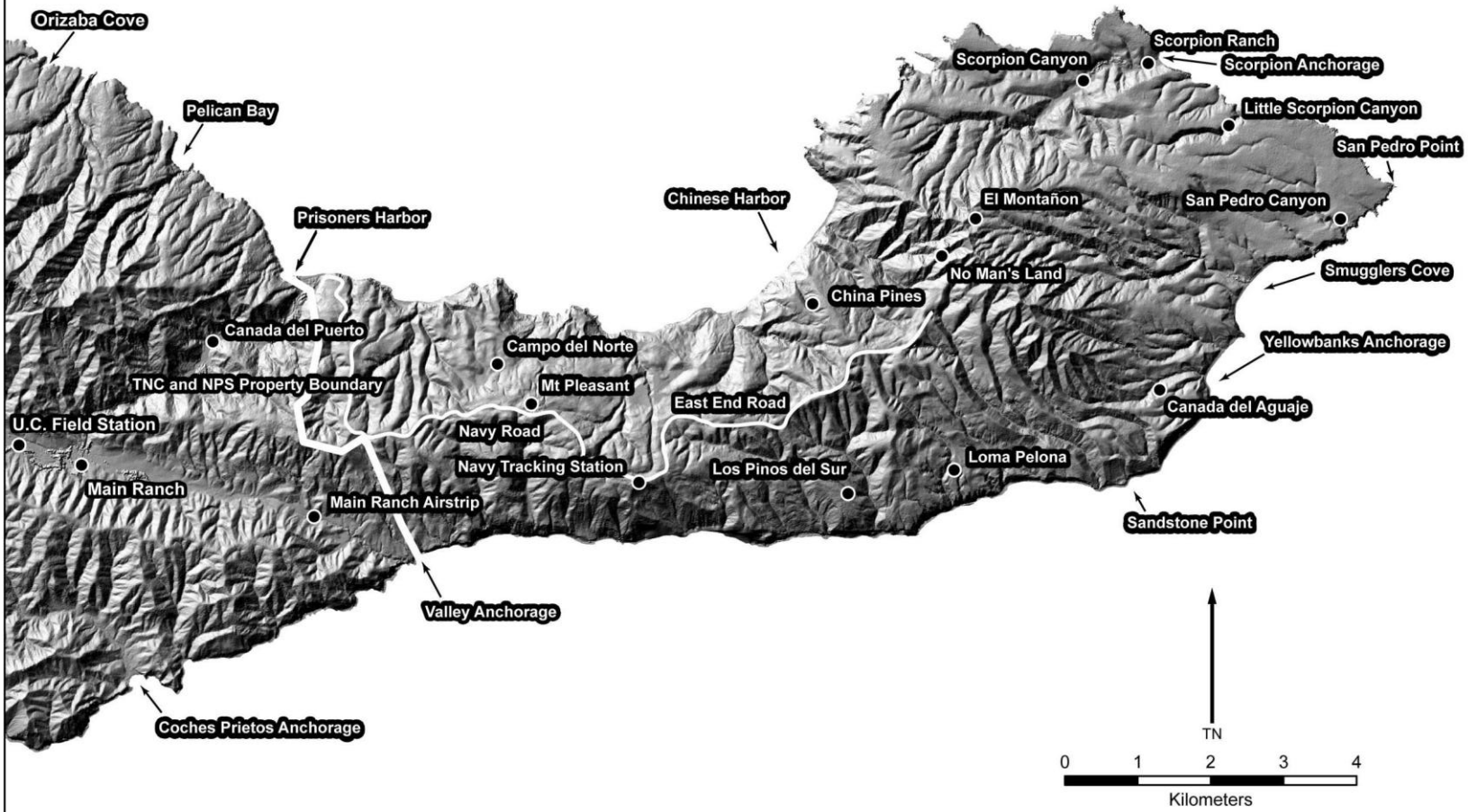

Figure 6.3. The eastern half of Santa Cruz Island showing locations mentioned in this chapter.

Project name (or basic description)
Test pit excavation at CA-SCRI-240

Principal investigator
Michael Glassow and Albert Spaulding

Institutional sponsor
Department of Anthropology, UCSB

Dates of fieldwork
21-24 June and 12-16 July 1976

Published and unpublished mss.
Glassow 1976

Geographic location(s) of fieldwork
Prisoners Harbor

Site nos. or locations from which data were collected
CA-SCRI-240

Theoretical and empirical goals of research
The objective was to reach the base of the site deposits in a test unit, given that Spaulding's 1974 excavation had not done so.

Types of data collected (collections, site records forms, field records)
Collections from the test unit and a column sample and the field journal.

Person-days and crew size
A crew of seven worked for 2.5 days during the first period. Five of the crew were directly involved with the excavation, resulting in an expenditure of 12.5 person-days. A crew of five worked 1.5 days and a crew of three worked one day during the second period, resulting in an expenditure of 10.5 person-days. A total of 23 person-days was expended altogether.

Field procedures (and laboratory procedures as applicable)
Located at the base of Spaulding's southern trench, the unit was 1x1m in size, and the column sample was 25x25 cm in size. The unit was excavated in a mixture of stratigraphic and natural levels to a depth of 180 cm below the base of Spaulding's 1974 excavation. Unit deposits were water-screened through ¼-inch mesh screen, and the column sample was collected as a sequence of bulk samples of deposits. The excavation included deposits below the water table, requiring a sump hole next to the unit from which water was continually pumped out.

Location and nature of the archaeological collections and associated documentation

Collections are housed at the Repository for Archaeological and Ethnographic Collections, Department of Anthropology, UCSB. The journal is on file at the Central Coast Information Center.

Significant descriptive and theoretical conclusions of the research

The project established the maximum depth of deposits at the site and resulted in a small sample of cultural material, mainly faunal remains from these lowermost deposits. As well, material for radiocarbon dating the lowermost deposits was obtained.

Potential of collections and data for future research

The small sample size limits the research value, although the collections do provide some insight into subsistence activities of the earliest inhabitants of the site. The mesh size was too coarse to obtain a representative sample of the smaller remains that may be present in the deposits.

Project name (or basic description)

Site recording at Platts Harbor

Principal investigator

Michael A. Glassow

Institutional sponsor

Department of Anthropology, UCSB

Dates of fieldwork

13 July 1976

Published and unpublished mss.

Glassow 1976

Geographic location(s) of fieldwork

Platts Harbor, north coast of Santa Cruz Island

Site nos. or locations from which data were collected

CA-SCRI-381 and 382

Theoretical and empirical goals of research

To locate and record the site from which a human cranium had been obtained by a recreational boater and then given to the Department of Anthropology, UCSB. Also, to expose and document the burial from which the skull came.

Types of data collected (collections, site records forms, field records)

Displaced human bones eroding down a slope were collected, a photograph of a partial burial from which the cranium may have come, and two completed site record forms

Person-days and crew size
A crew of three devoted about a half day to the investigation, equaling 1.5 person-days.

Field procedures (and laboratory procedures as applicable)
Surface collection and cursory exposure of a partial burial.

Location and nature of the archaeological collections and associated documentation
Collections are housed at the Repository for Archaeological and Ethnographic Collections, Department of Anthropology, UCSB. The journal is on file at the Central Coast Information Center.

Significant descriptive and theoretical conclusions of the research
Recognition that there are at least two cemeteries at Platts Harbor sites that are subject to erosion and that several sites overlook Platts Harbor, only two of which were recorded.

Potential of collections and data for future research
Sites that served as residential bases exist at Platts Harbor and can yield important information. The human skeletal collection is of displaced bones and consequently has relatively low research value.

Project name (or basic description)
Reconnaissance of late prehistoric sites, particularly those that may have evidence of occupation during Spanish colonization

Principal investigator
Steven Craig and Chester King (Phillip Walker also participated)

Institutional sponsor
Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork
Late March 1977

Published and unpublished mss.
None

Geographic location(s) of fieldwork
Central Valley near UC field station, Christy Ranch vicinity, Forney's Cove vicinity

Site nos. or locations from which data were collected
CA-SCRI-194, 195, 236, 324, 328, 329, 330, 331, and 384

Theoretical and empirical goals of research
The main goal was to document the surface features of sites that may correlate with historically documented Chumash villages.

Types of data collected (collections, site records forms, field records)
Site record forms for CA-SCRI-384, sketch maps of site surface features, including house depressions, surface collections of distinctive and time-sensitive artifacts, particularly beads and bead-making artifacts.

Person-days and crew size
Unknown. At least three people worked for at least two days.

Field procedures (and laboratory procedures as applicable)
Surface observation.

Location and nature of the archaeological collections and associated documentation
Surface collections and field records are housed in the UCSB Repository for Archaeological and Ethnographic Collections under accession 222.

Significant descriptive and theoretical conclusions of the research
They verified historic-period occupation at several sites and recorded a previously unidentified historic-period site in the Central Valley (CA-SCRI-384).

Potential of collections and data for future research
The collections may supplement those from future larger-scale excavation of the sites represented by surface collections.

Project name (or basic description)
Recording of sites from which donated collections originated

Principal investigator
Travis Hudson

Institutional sponsor
Santa Barbara Museum of Natural History

Dates of fieldwork
29-30 March 1977

Published and unpublished mss.
Reference to CA-SCRI-385, interpreted as a shrine, in Hudson and Underhay 1978; an apparent wooden paddle is the subject of Timbrook 1980.

Geographic location(s) of fieldwork
South of Christy Ranch, west end of island, inland from Painted Cave, and Laguna Canyon

Site nos. or locations from which data were collected
CA-SCRI-383, 385-387

Theoretical and empirical goals of research
Documentation of the provenience of artifacts donated or loaned to the Santa Barbara Museum of Natural History by Dr. Carey Stanton and to investigate site features of interest.

Types of data collected (collections, site records forms, field records)
Completed site record forms, field notes including photographs, donated or loaned artifacts

Person-days and crew size
Five people for five days, equaling a total of 10 person-days

Field procedures (and laboratory procedures as applicable)
Pedestrian reconnaissance

Location and nature of the archaeological collections and associated documentation
Santa Barbara Museum of Natural History, accessions B1143 and B1203

Significant descriptive and theoretical conclusions of the research
Documentation of site origin of distinctive artifacts.

Potential of collections and data for future research
Artifacts lack intrasite provenience but may be of aid in dating site occupations

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Project name (or basic description)
Test excavation at CA-SCRI-195 and CA-SCRI-333

Principal investigator
Larry Wilcoxon

Institutional sponsor
UCSB Department of Anthropology

Dates of fieldwork
1980 to approximately 1985 (field notes unavailable to determine specific dates)

Published and unpublished mss.
Wilcoxon 1993; Glassow et al. 1994

Geographic location(s) of fieldwork
West end near Forney's Cove and the UCSB trailer camp

Site nos. or locations from which data were collected
CA-SCRI-195 and CA-SCRI-333

Theoretical and empirical goals of research

Doctoral dissertation research focused on community structure

Types of data collected (collections, site records forms, field records)
All material caught by eighth-inch-mesh screens from test unit excavation, field notes, site maps

Person-days and crew size
Unknown. Many episodes of fieldwork by crews of several individuals, probably around 100 person-days at each site

Field procedures (and laboratory procedures as applicable)
Both arbitrary-level and stratigraphic excavation at each site; most of the collections remain unprocessed

Location and nature of the archaeological collections and associated documentation
The bulk of the collections are housed by the UCSB Repository for Archaeological and Ethnographic Collections; parts of the collections still in Wilcoxon's possession. Field records are also still in Wilcoxon's possession, although a copy of the SCRI-333 site map and unit profile drawings are housed at the UCSB Repository for Archaeological and Ethnographic Collections.

Significant descriptive and theoretical conclusions of the research
The discovery of a red abalone midden underlying later deposits at CA-SCRI-333 and its subsequent radiocarbon dating stimulated Glassow's research into the prehistoric contexts of red abalone middens on the island. Wilcoxon never completed his dissertation research.

Potential of collections and data for future research
Considerable research potential exists for the unprocessed collections, given the systematic field procedures used to obtain them.

Project name (or basic description)
Investigation of quarry and microblade production sites in the China Harbor and El Montañon localities

Principal investigator
Jeanne E. Arnold

Institutional sponsor
Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork
12 September to 11 December 1981

Published and unpublished mss.
Arnold 1983, 1987; Dietler 2003

Geographic location(s) of fieldwork

Southwestern flank of El Montañon and the China Harbor coastline

Site nos. or locations from which data were collected

Survey resulted in recording sites CA-SCRI-392 through 422. Excavations at CA-SCRI-93 and 306, surface collections from sites included in the survey areas along the southwestern flank of El Montañon and along the China Harbor coastline.

Theoretical and empirical goals of research

To document locations of chert quarrying for microblade manufacture, to understand the temporal and spatial context of change in microblade manufacturing technology, to understand change in the economic context of microblade manufacturing.

Types of data collected (collections, site records forms, field records)

Completed site record forms, surface and excavated collections, collections from unit excavations, field notes.

Person-days and crew size

Crews ranged in size between three and six people and typically were four to five people. Approximately 365 person-days were devoted to the research.

Field procedures (and laboratory procedures as applicable)

Systematic survey of habitable areas within survey areas. At CA-SCRI-93, systematic surface collection of discrete areas using a stratified sampling design, excavation of six 0.5x1.0 m units, the locations of which were selected using a stratified random sampling design. Units varied between 20 and 40 cm deep. At CA-SCRI-306, a stratified random sampling design was used to select locations of four 0.5x1.0 m excavation units. Units varied between 35 and 90 cm deep, three being between 80 and 90 cm deep. (NOTE: in 1985 Arnold undertook additional excavation at this site.)

Location and nature of the archaeological collections and associated documentation

Collections and records are housed under accession 299 in the Repository for Archaeological and Ethnographic Collections of the Department of Anthropology, University of California, Santa Barbara.

Significant descriptive and theoretical conclusions of the research

Elucidation of the nature and development of the microblade industry on the Channel Islands and changes in the regional economic system between the Middle and Late Periods.

Potential of collections and data for future research

Collections are relevant to further studies of the microblade industry and other activities taking place at the sites from which excavation collections were obtained.

Project name (or basic description)

Archaeological survey at Scorpion Anchorage for a proposed abalone mariculture farm

Principal investigator
Larry R. Wilcoxon

Institutional sponsor
Aquatech International

Dates of fieldwork
4 November 1982

Published and unpublished mss.
Wilcoxon 1983

Geographic location(s) of fieldwork
Along the road between the Scorpion Anchorage pier and the ranch buildings and on a hill slope above this locality

Site nos. or locations from which data were collected
CA-SCRI-423

Theoretical and empirical goals of research
To determine whether archaeological resources would be affected by the construction of commercial abalone mariculture facilities

Types of data collected (collections, site records forms, field records)
One site was recorded.

Person-days and crew size
A crew of two worked for approximately one day, for a total of two person-days.

Field procedures (and laboratory procedures as applicable)
Systematic intensive survey of lands within the project area with walking transects at six-meter intervals

Location and nature of the archaeological collections and associated documentation
CA-SCRI-423 was recorded; no surface collections were made.

Significant descriptive and theoretical conclusions of the research
At this time, no archaeological investigation had occurred on eastern Santa Cruz Island since the early 20th century. This was the first site to be recorded on this segment of the island in the latter half of the century.

Potential of collections and data for future research
Although disturbed, the site has the potential to yield information about prehistoric occupation in the Scorpion Anchorage vicinity.

Project name (or basic description)
Field Trip to Western Santa Cruz Island to Find and Record Red Abalone Middens

Principal investigator
Michael A. Glassow

Institutional sponsor
Department of Anthropology, UCSB

Dates of fieldwork
11-18 May 1984

Published and unpublished mss.
Glassow 1984; Glassow 1993b

Geographic location(s) of fieldwork
Coastline and adjacent marine terrace from Black Point vicinity to Forneys Cove

Site nos. or locations from which data were collected
CA-SCRI-424-430

Theoretical and empirical goals of research
To locate and record sites containing abundant red abalone shells within midden deposits

Types of data collected (collections, site records forms, field records)
Site records for red abalone sites encountered

Person-days and crew size
One person (Glassow) performed a survey to locate sites with red abalone middens over the course of two half-days and one full day, for a total of two person-days. Site recording and sample collection entailed three people over the course of 1.5 days, equaling a total of 4.5 person-days.

Field procedures (and laboratory procedures as applicable)
Pedestrian survey along the coast and at mouths of canyons where they entered the coastal plain. Site recording entailed visiting sites with red abalone middens located during the survey or during earlier informal reconnaissance. Aluminum stakes were placed near the center of each site recorded to serve as a datum. Sketch maps were made with a forester compass and 100-m tape. Abalone shells to serve as samples for radiocarbon dates were collected from erosion exposures.

Location and nature of the archaeological collections and associated documentation
No formal collections retained. Shell samples were for radiocarbon dating.

Significant descriptive and theoretical conclusions of the research
This project was the beginning of Glassow's research concerning the prehistoric context of red abalone middens.

Potential of collections and data for future research
No collections made. Sites have been and continue to be important to research concerning red abalone middens.

Project name (or basic description)
Investigation of sites in the Coches Prietos watershed

Principal investigator
Robert R. Peterson

Institutional sponsor
Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork
Intermittently from May 1985 through fall 1987

Published and unpublished mss.
Peterson 1994

Geographic location(s) of fieldwork
Locations throughout the Coches Prietos Watershed

Site nos. or locations from which data were collected
CA-SCRI-1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 13, 15, 16, 17, 18, 20, 22, 24, 26, 27, 28, 32, 36, temp. designations RP-2, RP-3

Theoretical and empirical goals of research
To understand the dynamics of subsistence and settlement change during the transition from the Middle to Late Periods

Types of data collected (collections, site records forms, field records)
Extent and depths of middens at sites investigated, samples of midden constituents including remains of shellfish, mammals and fish

Person-days and crew size
Crews ranged from one to five people. Peterson (personal communication) estimates less than 50 person-days of fieldwork and 60-70 in laboratory processing.

Field procedures (and laboratory procedures as applicable)
Most sites were tested with a 10-cm diameter bucket auger. All soil from each 20-cm depth increment was collected and floated, with the heavy fraction being caught by 1/16" mesh

screen. Volumes were recorded before processing. During laboratory processing, the heavy fraction was separated into size categories by sifting through 1/4", 1/8", and 1/16" mesh screens. All 1/4" material, 100 ml of the 1/8", and 10 ml of the 1/16" material was sorted. Excavation units were field screened through 1/8" mesh and all material caught by the screen was retained, washed, and sorted. 25x25 cm column samples were collected from the wall of each unit and were processed in the same way as the auger samples.

Location and nature of the archaeological collections and associated documentation

Collections and associated documentation currently are in the possession of Robert Peterson.

Significant descriptive and theoretical conclusions of the research

Analysis of collections has not been completed. However, discovery of Late Period microblade drills at interior residential bases implies significant interior occupation during the Late Period, at least seasonally, as well as bead manufacturing at interior sites. Also demonstrated in Peterson's analysis are differences in diet between the coastal and interior sites within the watershed.

Potential of collections and data for future research

The collections have potential for addressing research issues concerning subsistence and settlement change during the Middle and Late periods.

Project name (or basic description)

1985 test excavation at CA-SCRI-496

Principal investigator

Jeanne E. Arnold

Institutional sponsor

Department of Anthropology, University of Northern Iowa

Dates of fieldwork

A portion of the time from 31 May to 1 July 1985

Published and unpublished mss.

None

Geographic location(s) of fieldwork

Mouth of Willows Canyon overlooking beach

Site nos. or locations from which data were collected

CA-SCRI-496 (Berkeley no. SCRI-B-122)

Theoretical and empirical goals of research

To obtain of samples of materials pertaining to the Middle and Late periods for investigation of the development of Chumash craft production and exchange. Also to provide training to students in field techniques.

Types of data collected (collections, site records forms, field records)
Midden constituents and field records

Person-days and crew size
A crew of ten worked for approximately 10 days, equaling an estimated total of 100 person-days.

Field procedures (and laboratory procedures as applicable)
Excavation of two 1x1 m units, with all material caught by eighth-inch mesh screens retained for analysis; units reached depths of 60 and 96 cm. Collections are partly processed and cataloged.

Location and nature of the archaeological collections and associated documentation
A small collection and a partial catalog are housed at the Repository for Archaeological and Ethnographic Collections at UCSB, under accession no. 350. Bulk midden samples are housed at the Fowler Museum at UCLA under accession no. 889. Field records are kept by Jeanne Arnold at UCLA.

Significant descriptive and theoretical conclusions of the research
No analysis of the collections has been undertaken.

Potential of collections and data for future research
The collections have the potential to yield information about one of the larger coastal village sites on Santa Cruz Island and its place within island subsistence-settlement systems.

Project name (or basic description)
1985 and 1988 investigation of two houses at CA-SCRI-306

Principal investigator
Jeanne E. Arnold

Institutional sponsor
Department of Anthropology, University of Northern Iowa

Dates of fieldwork
Portions of the times from 31 May to 1 July 1985 and 27 May to 27 June 1988

Published and unpublished mss.
Dietler 2003; Arnold 2001a

Geographic location(s) of fieldwork

Near the western margin of China Harbor

Site nos. or locations from which data were collected
CA-SCRI-306

Theoretical and empirical goals of research
To obtain samples from two houses to study inter-household variability.

Types of data collected (collections, site records forms, field records)
Midden constituents, including substantial quantities of chert cores and microblades.

Person-days and crew size
In 1985 a crew of ten worked for approximately 22 days, equaling an estimated total of 220 person-days. In 1988 a crew of ten worked for 19 days, equaling a total of 190 person-days.

Field procedures (and laboratory procedures as applicable)
In 1985, excavation of a row of four contiguous 1x1 m units within House 1 (designated Trench A), with all material caught by eighth-inch mesh screens retained for analysis. Units varied in depth between 30 and 35 cm. In 1988, excavation of two rows of four units each, those comprising Trench A reaching depths of 15 cm and those comprising Trench B reaching unknown depths; the latter trench was within House 3.

Location and nature of the archaeological collections and associated documentation
Portions of the collections are housed at the Repository for Archaeological and Ethnographic Collections at UCSB under accession 350, and the bulk soil samples, the flaked stone pertaining to the microblade industry at the site, and beads are at the Fowler Museum at UCLA. Field records are kept by Jeanne Arnold at UCLA.

Significant descriptive and theoretical conclusions of the research
Dietler concluded that microblade production by the three household groups was essentially comparable, and consequently, they were operating independently of each other.

Potential of collections and data for future research
The collections have the potential to elucidate household variability at the Chumash village of Lu'upsh, as well as further information about the post-AD 1200 microblade industry on the island.

Project name (or basic description)
Documentation of sites at which illegal looting had taken place

Principal investigator
John Johnson

Institutional sponsor
Santa Barbara Museum of Natural History

Dates of fieldwork

21-24 August and 7-9 November 1987. The looted collections were made between spring 1984 and summer 1986.

Published and unpublished mss.

Timbrook and Johnson 1988; Davenport et al. 1993

Geographic location(s) of fieldwork

No Man's Land, Orizaba Cove, Cueva Valdez, Prisoner's Harbor, Cueva Escondida, Hazards Anchorage, Pelican Bay

Site nos. or locations from which data were collected

CA-SCRI-431 through 446 (Artifacts in collection acquired from the looter came from additional sites, but these were the only sites recorded during this project.

Theoretical and empirical goals of research

Documentation of sites from which looted artifact came and recording of any sites not yet recorded. The ethnographically documented Chumash village of Maschal was identified.

Types of data collected (collections, site records forms, field records)

Completed site record forms, notes on where looting activity took place, surface collections of artifacts

Person-days and crew size

August trip: 2-4 people, November trip: 6 people; for a total of 26 person-days.

Field procedures (and laboratory procedures as applicable)

The individual who looted the collections accompanied Johnson and provided information on location of his looting activity.

Location and nature of the archaeological collections and associated documentation

All collections and field records are housed at the Santa Barbara Museum of Natural History. The looted collections that were confiscated by the Santa Barbara County Sheriff are accessioned under B3150. Collections made during site visits are accessioned under B3429. Field records include maps on which Johnson plotted the locations at which artifacts were found according to the looter, notes derived from Johnson's interviews with the looter and various documents confiscated from the looter. The looted collections were donated to the museum, and the cooperation of the looter was part of a court settlement in which charges would not be pressed if the looter showed museum personnel where the looting had taken place and helped to prepare the collections for curation.

Significant descriptive and theoretical conclusions of the research

The looted collections have been associated with the sites from which they came, thus enhancing their research value, and the Chumash village of Maschal may have been located. A Chumash harpoon foreshaft is an especially unique artifact collected during the site visits.

Potential of collections and data for future research
Dates of occupation may be able to be determined from looted artifacts pertaining to specific sites.

Project name (or basic description)
Los Pinos del Sur survey

Principal investigator
Jeanne E. Arnold

Institutional sponsor
UCLA Department of Anthropology

Dates of fieldwork
31 May and 1, 11, 25 June 1988

Published and unpublished mss.
Arnold 1993b; 2001a:34-36

Geographic location(s) of fieldwork
Top of ridge comprising Los Pinos del Sur locality.

Site nos. or locations from which data were collected
CA-SCRI-447-451

Theoretical and empirical goals of research
Documentation of sites with evidence of occupation during the Middle and Late periods; assessment of their research potential; training of students in survey and site recording procedures.

Types of data collected (collections, site records forms, field records)
Site record forms for recorded sites

Person-days and crew size
Crews of 5 to 10 worked for four days, equaling a total of 33 person-days.

Field procedures (and laboratory procedures as applicable)
Intensive systematic survey of all lands up to a 30° slope within the survey area. A maximum of 10 m was maintained between surveyors, sometimes narrowing to as little as 3 m. Grasses were cleared at 10 m or shorter intervals to inspect ground surfaces covered with grasses.

Location and nature of the archaeological collections and associated documentation
Field records are kept by Jeanne Arnold at UCLA.

Significant descriptive and theoretical conclusions of the research
Documentation of sites in this sector of the island

Potential of collections and data for future research
The sites have the potential to yield information about settlement systems and use of marine and terrestrial food resources.

Project name (or basic description)
Initial testing at seven sites on western and southwestern Santa Cruz Island

Principal investigator
Jeanne E. Arnold

Institutional sponsor
Institute of Archaeology, UCLA

Dates of fieldwork
9 September to 12 December 1988

Published and unpublished mss.
Arnold 2001a; Arnold and Graesch 2004, Munns and Arnold 2002

Geographic location(s) of fieldwork
Morse Point, mouth of Pozo Canyon, vicinity of Cañada Christy mouth, and Blue Gum (Forney's) Cove

Site nos. or locations from which data were collected
CA-SCRI-191, 192, 236, 257, 330, 474, and 475

Theoretical and empirical goals of research
Investigation of the last 1200 to 1500 years of Chumash occupation on Santa Cruz Island because it is possibly during this time when organizational features linked to socio-political and economic complexity first emerge. Arnold wished to understand complex causal relationships that may have lead to this emergence including the origins of ascribed status, specialized occupations, subsistence change, key technological changes, and environmental changes. The 1988 fieldwork was the first phase of a larger-scale project.

Types of data collected (collections, site records forms, field records)
Samples of midden constituents, topographic data for maps

Person-days and crew size
A crew of 5 to 6 worked for 75 days, equaling a total of approximately 335 person-days (days devoted to survey are excluded).

Field procedures (and laboratory procedures as applicable)

A 10 cm diameter bucket auger was used to acquire midden samples at all sites. In addition, at CA-SCRI-192, midden samples were collected from three sections of the profile of deposits at the seacliff in the location of house depression no. 4, from the surface to the base of the deposits. All deposits were sifted through eighth-inch screens, and all material caught by the screens was retained, except for four samples at CA-SCRI-474. Number of auger samples per site and depth ranges are as follows:

Site	No. samples	Depth range
CA-SCRI-191	5	90-169 cm
CA-SCRI-192	8	49-198 cm
CA-SCRI-236	8	100-284 cm
CA-SCRI-257	6	38-275 cm
CA-SCRI-330	6	45-271 cm
CA-SCRI-474	12	55-284 cm
CA-SCRI-475	4	100-126 cm

Location and nature of the archaeological collections and associated documentation

Collections, field records, and laboratory records are housed at the Fowler Museum under accession numbers 881, 882, 883, 884, and 889.

Significant descriptive and theoretical conclusions of the research

This phase of research allowed Arnold to determine which sites were appropriate for further investigation in light of her research goals.

Potential of collections and data for future research

The collections can serve as a basis for expanded research at the sites tested beyond that accomplished later by Arnold. They have the potential to provide general data relating to subsistence-settlement systems, and in some instances flaked stone tool technology.

Project name (or basic description)

Survey of Pozo Canyon mouth

Principal investigator

Jeanne E. Arnold

Institutional sponsor

UCLA Department of Anthropology

Dates of fieldwork

9 September and 12 December 1988

Published and unpublished mss.

Arnold 1993b; 2001a:34-36

Geographic location(s) of fieldwork
Coastal lands on either side of the mouth of Pozo Canyon

Site nos. or locations from which data were collected
CA-SCRI-474 and 475

Theoretical and empirical goals of research
Documentation of coastal and near-coastal sites with evidence of occupation during the Middle and Late periods; assessment of their research potential; training of students in survey and site recording procedures.

Types of data collected (collections, site records forms, field records)
Documentation of coastal and near-coastal sites with evidence of occupation during the Middle and Late periods; assessment of their research potential; training of students in survey and site recording procedures.

Person-days and crew size
A crew of five and a crew of six each worked for a day, equaling 11 person-days.

Field procedures (and laboratory procedures as applicable)
Intensive systematic survey of all lands up to a 30° slope within the survey area. A maximum of 10 m was maintained between surveyors. Grasses were cleared at 10 m or shorter intervals to inspect ground surfaces covered with grasses.

Location and nature of the archaeological collections and associated documentation
Field records are kept by Jeanne Arnold at UCLA.

Significant descriptive and theoretical conclusions of the research
Documentation of sites along this section of the island's coast.

Potential of collections and data for future research
The sites have the potential to yield information about settlement systems and the utilization of marine resources in this sector of the island.

Project name (or basic description)
Survey of lower section of watershed east of Prisoners Harbor

Principal investigator
Jeanne E. Arnold

Institutional sponsor
UCLA Department of Anthropology

Dates of fieldwork
11-12 September and 6-8 and 12-13 October 1988

Published and unpublished mss.
Arnold 1993b; 2001a:34-36

Geographic location(s) of fieldwork
Lower half of the next coastal watershed east of Cañada del Puerto (Prisoners Harbor)

Site nos. or locations from which data were collected
CA-SCRI-452-454 and 464-473

Theoretical and empirical goals of research
Documentation of coastal and near-coastal sites with evidence of occupation during the Middle and Late periods; assessment of their research potential; training of students in survey and site recording procedures.

Types of data collected (collections, site records forms, field records)
Documentation of coastal and near-coastal sites with evidence of occupation during the Middle and Late periods; assessment of their research potential; training of students in survey and site recording procedures.

Person-days and crew size
Crews of six to seven people worked for a total of seven days, equaling 43 person-days.

Field procedures (and laboratory procedures as applicable)
Intensive systematic survey of all lands up to a 30° slope within the survey area. A maximum of 10 m was maintained between surveyors. Grasses were cleared at 10 m or shorter intervals to inspect ground surfaces covered with grasses.

Location and nature of the archaeological collections and associated documentation
Field records are kept by Jeanne Arnold at UCLA.

Significant descriptive and theoretical conclusions of the research
Documentation of sites along this section of the island's coast.

Potential of collections and data for future research
The sites have the potential to yield information about settlement systems and the utilization of marine resources in this sector of the island.

Project name (or basic description)
Survey of coastal lands overlooking southern Christy Beach

Principal investigator
Jeanne E. Arnold

Institutional sponsor

UCLA Department of Anthropology

Dates of fieldwork
22 September and 1-2 October 1988, 19-20 April 1989

Published and unpublished mss.
Arnold 1993b; 2001a:34-36

Geographic location(s) of fieldwork
Coastal lands overlooking Christy Beach between the mouth of Cañada Christy southward to the margin of the Cañada de los Sauces watershed, inland to a maximum of 150 m from the bluff edge.

Site nos. or locations from which data were collected
CA-SCRI-461-463 and 480-482

Theoretical and empirical goals of research
Documentation of coastal and near-coastal sites with evidence of occupation during the Middle and Late periods; assessment of their research potential; training of students in survey and site recording procedures.

Types of data collected (collections, site records forms, field records)
Site record forms for recorded sites.

Person-days and crew size
In 1988 crew of six worked for three days, equaling an estimated 18 person-days, and in 1989 a crew of two worked for two days, equaling an estimated eight person-days.

Field procedures (and laboratory procedures as applicable)
Intensive systematic survey of all lands up to a 30° slope within the survey area. A maximum of 10 m was maintained between surveyors. Grasses were cleared at 10 m or shorter intervals to inspect ground surfaces covered with grasses.

Location and nature of the archaeological collections and associated documentation
Field records are kept by Jeanne Arnold at UCLA.

Significant descriptive and theoretical conclusions of the research
Documentation of sites along this section of the island's coast.

Potential of collections and data for future research
The sites have the potential to yield information about settlement systems and the utilization of marine resources in this sector of the island.

Project name (or basic description)
West China Harbor survey

Principal investigator
Jeanne E. Arnold

Institutional sponsor
UCLA Department of Anthropology

Dates of fieldwork
14-17 September and 8 December 1988

Published and unpublished mss.
Arnold 1993b; 2001a:34-36

Geographic location(s) of fieldwork
Northern flank of isthmus from the vicinity of CA-SCRI-306 to the next major canyon to the west

Site nos. or locations from which data were collected
CA-SCRI-455-460, 476-478

Theoretical and empirical goals of research
Documentation of coastal and near-coastal sites with evidence of occupation during the Middle and Late periods; assessment of their research potential; training of students in survey and site recording procedures.

Types of data collected (collections, site records forms, field records)
Site record forms for recorded sites; several surface finds, including five projectile points and a digging-stick weight.

Person-days and crew size
A crew of 6 worked for four days, equaling an estimated total of 24 person-days.

Field procedures (and laboratory procedures as applicable)
Intensive systematic survey of land between the coast and the ridge crest of the isthmus, including all lands up to a 30° slope. A maximum of 10 m was maintained between surveyors. Grasses were cleared at 10 m or shorter intervals to inspect ground surfaces covered with grasses.

Location and nature of the archaeological collections and associated documentation
Field records are kept by Jeanne Arnold at UCLA.

Significant descriptive and theoretical conclusions of the research
Documentation of sites along this section of the island's coast.

Potential of collections and data for future research

The sites have the potential to yield information about settlement systems and the utilization of marine resources in this sector of the island.

Project name (or basic description)
Further testing of sites on southern, western, and southwestern Santa Cruz Island

Principal investigator
Jeanne E. Arnold

Institutional sponsor
Fowler Museum, UCLA

Dates of fieldwork
10 April to 25 June and 31 July to 6 November 1989

Published and unpublished mss.
Arnold 2001a; Arnold and Graesch 2004, Munns and Arnold 2002

Geographic location(s) of fieldwork
Morse Point, mouth of Pozo Canyon, vicinity of Cañada Christy mouth, Blue Gum (Forney's) Cove, and Valley Anchorage

Site nos. or locations from which data were collected
CA-SCRI-191, 192, 257, 330, 474, and 495

Theoretical and empirical goals of research
Investigation of the last 1200 to 1500 years of Chumash occupation on Santa Cruz Island because it is possibly during this time when organizational features linked to socio-political and economic complexity first emerge. Arnold wished to understand complex causal relationships that may have lead to this emergence including the origins of ascribed status, specialized occupations, subsistence change, key technological changes, and environmental changes. This second phase of fieldwork focused on sites that yielded evidence of Late period, terminal Middle period, and/or Middle-Late transition deposits and were not significantly disturbed.

Types of data collected (collections, site records forms, field records)
Samples of midden constituents, field records, laboratory records.

Person-days and crew size
A crew of four to six worked for 173 days, equaling a total of approximately 860 person-days (days devoted to survey are excluded).

Field procedures (and laboratory procedures as applicable)
Excavation entailed testing with a bucket auger at one site and excavation of 1x1 m units at five sites.

Site	Unit type	No. units	Depth range
CA-SCRI-191	1x1 m	4	65-125 cm
CA-SCRI-192	1x1 m	2	120-125 cm
CA-SCRI-257	1x1 m	2	25 cm
CA-SCRI-330	1x1 m	2	152-158 cm
CA-SCRI-474	1x1 m	2	75-80 cm
CA-SCRI-495	Auger	3	97-100 cm

Location and nature of the archaeological collections and associated documentation

Collections, field records, and laboratory records are housed at the Fowler Museum under accession numbers 881, 882, 883, 884, and 889.

Significant descriptive and theoretical conclusions of the research

Fundamentally, Arnold demonstrated significant changes over the time of the Middle-Late Transition in subsistence and economic systems. She expanded the evidence of the shift in microblade and shell-bead production during the Transition. She and her students also were able to demonstrate intrasite and intersite variation in subsistence and bead production activities. Many specific research conclusions are presented in Arnold's article in Jones (1992b) and in her edited volume (2001a, b, c).

Potential of collections and data for future research

The collections have the potential for additional studies of change in subsistence and economic systems. Noteworthy aspects of the collections aside from faunal remains are flaked stone and shell waste related to shell-bead production and the shell beads themselves.

Project name (or basic description)

Survey west of Sandstone Point

Principal investigator

Jeanne E. Arnold

Institutional sponsor

UCLA Department of Anthropology

Dates of fieldwork

15 April 1989

Published and unpublished mss.

Arnold 1993b; 2001a:34-36

Geographic location(s) of fieldwork

Relatively flat terrace lands adjacent to the coast, 1.2 km west of Sandstone Point

Site nos. or locations from which data were collected

CA-SCRI-479

Theoretical and empirical goals of research

Documentation of coastal and near-coastal sites with evidence of occupation during the Middle and Late periods; assessment of their research potential; training of students in survey and site recording procedures

Types of data collected (collections, site records forms, field records)

One site record form filled out.

Person-days and crew size

A crew of four worked for apparently one day, equaling a total of four person-days.

Field procedures (and laboratory procedures as applicable)

Intensive systematic survey, including all lands up to a 30° slope. A maximum of 10 m was maintained between surveyors. Grasses were cleared at 10 m or shorter intervals to inspect ground surfaces covered with grasses.

Location and nature of the archaeological collections and associated documentation

Field records are kept by Jeanne Arnold at UCLA.

Significant descriptive and theoretical conclusions of the research

Documentation of a site along this section of the island's coast

Potential of collections and data for future research

The site has the potential to yield information about settlement systems and the utilization of marine resources in this sector of the island.

Project name (or basic description)

Survey along southeastern coast between Near Point and Alegría Canyon

Principal investigator

Jeanne Arnold

Institutional sponsor

Department of Anthropology, University of California, Los Angeles

Dates of fieldwork

Intermittently: 22, 26, 27 April and 10 May 1989

Published and unpublished mss.

Arnold 1993b; 2001a:34-36

Geographic location(s) of fieldwork

Coastal plain northwest of CA-SCRI-474 (at mouth of Pozo Canyon) and Alegría Canyon. Some accessible lands northwest of Alegría Canyon near the coast also were included.

Site nos. or locations from which data were collected
CA-SCRI-483 through 493

Theoretical and empirical goals of research
Documentation of coastal and near-coastal sites with evidence of occupation during the Middle and Late periods; assessment of their research potential; training of students in survey and site recording procedures.

Types of data collected (collections, site records forms, field records)
Site record forms for recorded sites, 21 artifacts collected from surfaces of four of the sites

Person-days and crew size
Crews of three to five worked for four days, equaling an estimated total of 16 person-days.

Field procedures (and laboratory procedures as applicable)
Intensive systematic survey of the coastal plain between CA-SCRI-474 and the vicinity of the Alegría Canyon mouth, including all lands up to a 30° slope. A maximum of 10 m was maintained between surveyors. Grasses were cleared at 10 m or shorter intervals to inspect ground surfaces covered with grasses.

Location and nature of the archaeological collections and associated documentation
Surface collections are housed at the UCLA Fowler Museum. Field records are kept by Jeanne Arnold at UCLA.

Significant descriptive and theoretical conclusions of the research
Documentation of sites along this section of the island's coast. One of the sites, CA-SCRI-493, clearly dates to the terminal Middle period, as indicated by the presence of trapezoidal microblades and cores.

Potential of collections and data for future research
The sites have the potential to yield information about settlement systems and the utilization of marine resources in this sector of the island.

Project name (or basic description)
Survey and site recording in the lower Willows Canyon watershed

Principal investigator
Michael A. Glassow

Institutional sponsor
Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork
13 May 1990 and 9 May 1992

Published and unpublished mss.
Glassow 1992 (field journal pertaining to the 1992 survey; no field journal was produced for the 1990 survey)

Geographic location(s) of fieldwork
Willows Canyon and ridges on either side within approximately 1.5 km of the coast

Site nos. or locations from which data were collected
CA-SCRI-496-503, 532-535

Theoretical and empirical goals of research
Training of field class students in techniques of survey and site recording; no explicit research goals

Types of data collected (collections, site records forms, field records)
Site record forms

Person-days and crew size
During 1990, a crew of nine devoted one day to the work, for a total of nine person-days. During 1992, a crew of ten devoted one day to the work, for a total of ten person-days.

Field procedures (and laboratory procedures as applicable)
Systematic intensive survey of all terrain less than about 15 degrees slope.

Location and nature of the archaeological collections and associated documentation
The 1992 field journal is on file at the Central Coast Information Center, Department of Anthropology, UCSB.

Significant descriptive and theoretical conclusions of the research
In the limited area covered by the two surveys, it appeared that a cluster of sites occurs near the coast and that density farther inland is much lower.

Potential of collections and data for future research
Data from the sites have the potential of informing on the nature of settlement systems during the periods they were occupied.

Project name (or basic description)
Smugglers Cove vicinity survey

Principal investigator
Jeanne E. Arnold

Institutional sponsor
UCLA Department of Anthropology

Dates of fieldwork
16-18 June 1990

Published and unpublished mss.
Arnold 1990:118-120; 2001a:34-36

Geographic location(s) of fieldwork
Lands adjacent to Smugglers Cove and Scorpion Anchorage and lands near the southern margin of the watershed that includes Smugglers Canyon

Site nos. or locations from which data were collected
CA-SCRI-504-509

Theoretical and empirical goals of research
The principal goal of the survey was to determine the locations of historically documented Chumash villages on the east end of the island.

Types of data collected (collections, site records forms, field records)
Site record forms for recorded sites

Person-days and crew size
A crew of three worked for three days, equaling a total of nine person-days.

Field procedures (and laboratory procedures as applicable)
Intensive survey of lands adjacent to the coast where sites were not yet recorded and a reconnaissance inland from Smugglers Cove.

Location and nature of the archaeological collections and associated documentation
Field records are kept by Jeanne Arnold at UCLA.

Significant descriptive and theoretical conclusions of the research
Arnold found no evidence of occupation at Scorpion Anchorage but did verify locations of two protohistoric/historic sites at Smugglers Cove and Smugglers Point (originally documented by Ronald Olson in 1927-1928), which she proposed were the locations of the two named east-end Chumash villages, *Swaxil* and *Nanawani*. Data obtained subsequently by Kennett and colleagues at Scorpion Anchorage sites indicate that *Swaxil* probably was located there, consistent with ethnographic data (Kennett et al. 2000).

Potential of collections and data for future research
The sites have the potential to yield information about settlement systems and the utilization of marine resources in this sector of the island. The two historic-period village sites can yield information about the Chumash during the protohistoric and historic periods.

Project name (or basic description)
Cañada de la Portezuela survey

Principal investigator
Jeanne E. Arnold

Institutional sponsor
UCLA Department of Anthropology

Dates of fieldwork
24, 25, 29 July, 13 August 1990; 19, 20, and 22 July 1991

Published and unpublished mss.
Arnold 1993b; 2001a:34-36

Geographic location(s) of fieldwork
Eastern end of Cañada de la Portezuela, north of streambed

Site nos. or locations from which data were collected
CA-SCRI-510-515, 518-525

Theoretical and empirical goals of research
Documentation of sites with evidence of occupation during the Middle and Late periods; assessment of their research potential; training of students in survey and site recording procedures.

Types of data collected (collections, site records forms, field records)
Site record forms for recorded sites

Person-days and crew size
A crew of 10 to 11 worked for seven days, equaling a total of approximately 74 person-days. (The crew consisted of field school students.)

Field procedures (and laboratory procedures as applicable)
Intensive systematic survey of all lands up to a 30° slope within the survey area. A maximum of 10 m was maintained between surveyors. Grasses were cleared at 10 m or shorter intervals to inspect ground surfaces covered with grasses.

Location and nature of the archaeological collections and associated documentation
Field records are kept by Jeanne Arnold at UCLA.

Significant descriptive and theoretical conclusions of the research
Documentation of sites in an interior area of the island

Potential of collections and data for future research

The sites have the potential to yield information about settlement systems and use of terrestrial food resources in the interior of the island.

Project name (or basic description)
Pelican Bay survey

Principal investigator
Jeanne E. Arnold

Institutional sponsor
UCLA Department of Anthropology

Dates of fieldwork
28 July 1990

Published and unpublished mss.
Arnold 2001a:34-36

Geographic location(s) of fieldwork
Lands overlooking central and eastern portion of Pelican Bay

Site nos. or locations from which data were collected
CA-SCRI-516 and 517

Theoretical and empirical goals of research
Documentation of coastal and near-coastal sites with evidence of occupation during the Middle and Late periods; assessment of their research potential; training of students in survey and site recording procedures.

Types of data collected (collections, site records forms, field records)
Site record forms for recorded sites

Person-days and crew size
A crew of 11 spent an a few hours recording the two sites, equaling an estimated 3-5 person-days.

Field procedures (and laboratory procedures as applicable)
Apparently no formal survey undertaken, only recording of two sites within the cluster at Pelican Bay.

Location and nature of the archaeological collections and associated documentation
Field records are kept by Jeanne Arnold at UCLA.

Significant descriptive and theoretical conclusions of the research
Documentation of sites along this section of the island's coast

Potential of collections and data for future research

The sites have the potential to yield information about settlement systems and the utilization of marine resources in this sector of the island.

Project name (or basic description)

Excavation of a house floor at CA-SCRI-240

Principal investigator

Jeanne E. Arnold

Institutional sponsor

Department of Anthropology, UCLA

Dates of fieldwork

Summers of 1991 to 1997

Published and unpublished mss.

Arnold 1997, 2001a

Geographic location(s) of fieldwork

Mouth of Cañada del Puerto, or Prisoners Harbor

Site nos. or locations from which data were collected

CA-SCRI-240

Theoretical and empirical goals of research

Determine the construction details of a Chumash house and the kinds of activities that occurred within it. Relate the findings to those from other Santa Cruz Island sites to understand complex causal relationships that may have lead to this emergence including the origins of ascribed status, specialized occupations, subsistence change, key technological changes, and environmental changes. As the excavation was in the context of an archaeological field school, another goal was to instruct students in field methods and techniques.

Types of data collected (collections, site records forms, field records)

Collections of midden constituents, field and laboratory records.

Person-days and crew size

A crew of 10 to 11 worked for approximately 25 days each summer, equaling approximately 260 person-days each summer, or a total of 1820 person-days.

Field procedures (and laboratory procedures as applicable)

Excavation of mostly contiguous 1x1 m units were excavated to expose a significant portion of the house, the perimeter of which is defined by a series of redwood posts. Levels were 5

cm thick, and units reached depths between 55 and 65 cm. All excavated deposits were sifted through eighth-inch screens, and all material caught by the screens was retained for laboratory processing. Column samples and other types of specialized samples (e.g., for flotation) also collected. Generally two units were excavated each year.

Location and nature of the archaeological collections and associated documentation

Collections and field and laboratory records are housed at the Fowler Museum under accession no. 880.

Significant descriptive and theoretical conclusions of the research

Presence of historic artifacts revealed that the house dated to the historic period. Arnold hypothesized that the house was occupied by an elite family, based on the use of redwood in house construction. A layer of abalone shells and swordfish bones in the deposits above the house floor may be indicative of a feasting event.

Potential of collections and data for future research

The collections have the potential to inform on household activities during the historic period prior to site abandonment, the nature of interaction between the island Chumash and the Spanish colonists, the role of this Chumash village as a center of economic activity on the island, and historic period subsistence.

Project name (or basic description)

Cañada Christy survey

Principal investigator

Jeanne E. Arnold

Institutional sponsor

UCLA Department of Anthropology

Dates of fieldwork

21, 24, 30 July 1992

Published and unpublished mss.

Arnold 1993b; 2001a:34-36

Geographic location(s) of fieldwork

Two noncontiguous areas north of the road, one northwest of the Christy airstrip and one in the Christy water tank vicinity

Site nos. or locations from which data were collected

CA-SCRI-536-540

Theoretical and empirical goals of research

Documentation of sites with evidence of occupation during the Middle and Late periods; assessment of their research potential; training of students in survey and site recording procedures.

Types of data collected (collections, site records forms, field records)
Site record forms for recorded sites

Person-days and crew size
A crew of 10 to 11 worked for three days, equaling a total of 32 person-days.

Field procedures (and laboratory procedures as applicable)
Intensive systematic survey of all lands up to a 30° slope within the survey area. A maximum of 10 m was maintained between surveyors. Grasses were cleared at 10 m or shorter intervals to inspect ground surfaces covered with grasses.

Location and nature of the archaeological collections and associated documentation
Field records are kept by Jeanne Arnold at UCLA.

Significant descriptive and theoretical conclusions of the research
Documentation of sites in this sector of the island

Potential of collections and data for future research
The sites have the potential to yield information about settlement systems and use of terrestrial food resources.

Project name (or basic description)
Survey of three crests of peaks

Principal investigator
Robert Sheets

Institutional sponsor
SAIC (environmental assessment firm)

Dates of fieldwork
10 December 1992

Published and unpublished mss.
Sheets 1992

Geographic location(s) of fieldwork
Diablo Peak, Mount Pleasant, and Peak 1450 located approximately 200 m SSE of Mount Pleasant.

Site nos. or locations from which data were collected

No new sites were recorded, although an "isolate" of a dozen glass trade beads was discovered on Mount Pleasant. A record form for this isolate is not known to exist in the Central Coast Information Center.

Theoretical and empirical goals of research

To determine whether cultural resources were present in locations where antenna facilities were proposed for construction or existed

Types of data collected (collections, site records forms, field records)

Apparently no collections were made. Report on file at the Central Coast Information Center, and no other field documentation is known to exist.

Person-days and crew size

One person worked for one day, equaling one person-day.

Field procedures (and laboratory procedures as applicable)

Intensive survey with transects at 5 m intervals. Areas of survey were 45x150 m on Diablo Peak area, 50x60 m area on Mount Pleasant, and 45x50 m area on Peak 1450.

Location and nature of the archaeological collections and associated documentation

Apparently no collections were made.

Significant descriptive and theoretical conclusions of the research

The cluster of trade beads may be a Chumash shrine site dating to the historic period.

Potential of collections and data for future research

More detailed examination of the location of the bead isolate may verify whether this was a Chumash shrine site.

Project name (or basic description)

Buried Midden Survey in the Vicinity of Christy Ranch

Principal investigator

Michael A. Glassow

Institutional sponsor

Department of Anthropology, UCSB (Anth 181 field class exercise)

Dates of fieldwork

17 April 1994 (only one day)

Published and unpublished mss.

Glassow 1994

Geographic location(s) of fieldwork

Along seacliff and ravines north of Christy Ranch and along lower Cañada Christy

Site nos. or locations from which data were collected

CA-SCRI-546-554

Theoretical and empirical goals of research

To document locations of red abalone middens buried by alluvial deposits and exposed along the seacliff overlooking Christy Beach, the sides of ravines bisecting the coastal plain above Christy Beach, and the arroyo walls of the lower reaches of Cañada Christy.

Types of data collected (collections, site records forms, field records)

Site record forms were filled out. A whale bone abalone pry was collected from CA-SCRI-547.

Person-days and crew size

Sixteen people, including 14 students, a teaching assistant, and an instructor worked for one day, equaling a total of 16 person-days.

Field procedures (and laboratory procedures as applicable)

Survey focused only on erosion exposures along the seacliff, ravine walls, and arroyo walls. Sites were recorded once encountered.

Location and nature of the archaeological collections and associated documentation

Field journal is on file at the Central Coast Information Center, Department of Anthropology, UCSB. The abalone pry is housed in the Repository for Archaeological and Ethnographic Collections under Accession number 561 (catalog number 1).

Significant descriptive and theoretical conclusions of the research

The survey demonstrated the existence of a concentration of red abalone middens in the vicinity of Christy Ranch.

Potential of collections and data for future research

Many of the sites contain intact deposits that would yield information important to understanding the prehistoric context of red abalone middens.

Project name (or basic description)

San Pedro Point reconnaissance

Principal investigator

John R. Johnson

Institutional sponsor

Santa Barbara Museum of Natural History

Dates of fieldwork

August 3, 1994

Published and unpublished mss.
None

Geographic location(s) of fieldwork
Eastern end of Santa Cruz Island at San Pedro Point

Site nos. or locations from which data were collected
CA-SCRI-711

Theoretical and empirical goals of research
A casual visit with no archaeological objective until beads indicative of a former historic Chumash shrine were encountered.

Types of data collected (collections, site records forms, field records)
Surface collection of 37 *Olivella* wall disc beads, two glass beads, and one *Haliotis* ornament. Several photographs were taken of location where the beads were collected.

Person-days and crew size
Four persons were included in the site visit. Probably two person-days, including hiking time.

Field procedures (and laboratory procedures as applicable)
The beads were noticed during a casual visit to San Pedro Point with Tom Gherini, John Gherini, and another individual. Johnson noticed that the CA-SCRI-711 midden appeared to be of an earlier age than the beads, which were of types commonly used during the Mission Period. Their distribution was restricted to a very specific locus on the site, conforming to expectations for items left at a shrine.

Location and nature of the archaeological collections and associated documentation
Department of Anthropology, Santa Barbara Museum of Natural History

Significant descriptive and theoretical conclusions of the research
The presence of glass trade beads indicates use of the shrine during Mission times. Most of the Olivella disc beads had small-diameter holes, indicating that they had been drilled with metal needles. A few had rough-chipped peripheries. An eighteenth century ethnohistoric account mentions that shrine poles decorated with feathers were erected at prominent points along the coast so they could be seen when canoemen were at sea. Offerings, such as beads, would be left at these shrines. San Pedro Point, being the eastern end of the island would fit the description of where such shrines were located.

Potential of collections and data for future research
The identification of this location as a Chumash shrine contributes to our understanding of ceremonial behavior of the native peoples of Santa Cruz Island during the Late Period and continuing into Historic times.

Project name (or basic description)
Mapping and excavations at CA-SCRI-434 and 436

Principal investigator
Ann Munns

Institutional sponsor
Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork
2-5 and 14-22 September 1994, 24-26 June 1995; 24-26 July 1995, 3-6 November 1995, 18 May 1997

Published and unpublished mss.
Munns 1997

Geographic location(s) of fieldwork
Just east of Orizaba Cove and just east of Cueva Valdez

Site nos. or locations from which data were collected
CA-SCRI-434 and 436

Theoretical and empirical goals of research
For her dissertation research, Munns was studying shell bead production activities, including characterization of the presence and intensity of evidence for shell artifact craft production and analysis of its variability relative to environmental and cultural variables.

Types of data collected (collections, site records forms, field records)
Collections; site record update information; field notes

Person-days and crew size
Crew sizes varied between 3 and 9 people per trip, for a total of 83.5 person-days (including 27 person-days with UCLA field school for mapping instruction).

Field procedures (and laboratory procedures as applicable)
Site boundaries, topography, and excavation locations were mapped using total station. Excavation unit types included augers (10 cm diameter) excavated in 10- or 20-centimeter levels; shallow excavation units (1 meter square) excavated in 5-centimeter levels; and a 25x25 cm column sample. At CA-SCRI-434, six auger samples were excavated to 60-115 cm below survey, with an average of 91 cm; as well, two units were excavated to 2.5 or 7.5 cm below surface. At CA-SCRI-436, 10 auger samples were excavated to 73-143 cm below surface, with an average depth of 102 cm; as well, a column sample was excavated to 155 cm below surface on the eroded bank of a gully. Some 1/16-inch field residues were collected. Laboratory processing included some 1/8-inch screen residues sorted in 100-gram batches to

assess minimum necessary 1/8-inch sample size requirements to reliably characterize relative proportions of faunal constituents.

Location and nature of the archaeological collections and associated documentation

The collection and associated documentation are currently in the PI's possession, but eventually will be submitted to the Repository for Archaeological and Ethnographic Collections, Department of Anthropology, University of California, Santa Barbara.

Significant descriptive and theoretical conclusions of the research

The analysis and reporting of this project are in progress. Although some have suspected that CA-SCRI-436 at Cueva Valdez is a historically occupied Chumash village, Munns has yet to find evidence of historic occupation.

Potential of collections and data for future research

The two sites retain considerable potential to inform on aspects of Late period adaptation and sociopolitical organization. The collections are valuable for understanding recent Chumash prehistory, subsistence, and craft production. Completion of the analysis of these materials would assist in characterizing site constituents, activities represented, and time period(s) of occupation.

Project name (or basic description)

Field class surveys and site recording along ridges rising northward from the Christy Ranch vicinity to the main northern mountain ridge of the island, as well as two other localities west and south of Christy Ranch

Principal investigator

Michael A. Glassow

Institutional sponsor

Department of Anthropology, UCSB (Anthropology 181 and 194P field classes)

Dates of fieldwork

13-14 May 1995, 11-12 May 1996, 24-25 May 1997

Published and unpublished mss.

Glassow 1995, 1996b; Glassow et al. 1997

Geographic location(s) of fieldwork

The three areas surveyed were 1) ridges rising northward to the main northern ridge of the island from northwest of the Christy Barn on the east to the Black Point vicinity on the west, 2) the arroyo walls of Cañada Christy from the Christy Ranch buildings to the coast, and 3) a tract of land somewhat south of Kinton Point, between the Cañada de los Sauces watershed and a tract of land that Jeanne Arnold and her students had surveyed earlier.

Site nos. or locations from which data were collected

CA-SCRI-565-578, 579-594, 595-605

Theoretical and empirical goals of research

To discover additional red abalone midden sites (dating about 6000 cal BP), particularly along interior ridges given that a few sites of this age elsewhere on the island are of this antiquity; also to complete the survey of the arroyo walls of lower Cañada Christy to determine whether other buried red abalone middens were present; also to determine whether near-coastal red abalone middens existed in a tract of land directly south of the Cañada de los Sauces watershed.

Types of data collected (collections, site records forms, field records)

Site record forms were filled out for some but not all the sites discovered; those sites not recorded are plotted on maps accompanying the field journals cited above. Obvious artifacts, particularly those that are time-diagnostic, also were collected from site surfaces.

Person-days and crew size

In 1995 a crew of 14 worked for two days, equaling 28 person-days. In 1996 a crew of 22 worked for two days, equaling 42 person-days (two person-days devoted to CA-SCRI-571 auger sampling—see separate project description). In 1997 a crew of 16 worked for two days, equaling 32 person-days. Total person days: 104.

Field procedures (and laboratory procedures as applicable)

Intensive systematic survey followed by recording sites on standard forms. On the ridges survey covered lands less than about 15 degrees slope.

Location and nature of the archaeological collections and associated documentation

The field journals are on file at the Central Coast Information Center, Department of Anthropology, UCSB. Surface collections are housed by the Repository for Archaeological and Ethnographic Collections, UCSB, under accession 589.

Significant descriptive and theoretical conclusions of the research

Sites are present on each of the ridges surveyed, and a few contain some red abalone shells, but not in the abundance seen at coastal red abalone middens. Neither the lower portion of Cañada Christy nor the tract of land south of Cañada de los Sauces appears to contain red abalone middens. This project led to the discovery of the first bedrock mortar at a Santa Cruz Island site.

Potential of collections and data for future research

Many of the ridge-top sites contain substantial deposits and would contribute information about settlements systems during the time periods they were occupied.

Project name (or basic description)

Geophysical surveys at CA-SCRI-192 and 240 (undertaken in the context of Arnold's NSF-funded fieldwork)

Principal investigator
Jeanne E. Arnold, Elizabeth L. Ambos, and Daniel O. Larson

Institutional sponsor
Department of Anthropology, UCLA

Dates of fieldwork
September 1995 (presumably 1-2 days at each site)

Published and unpublished mss.
Arnold, Ambos, and Larson1997

Geographic location(s) of fieldwork
Morse Point and mouth of Cañada del Puerto (Prisoners Harbor)

Site nos. or locations from which data were collected
CA-SCRI-192 and 240

Theoretical and empirical goals of research
To determine whether ground-penetrating radar and cesium-vapor magnetometry are able to detect prehistoric house floors. This investigation was part of Arnold's investigation of

Types of data collected (collections, site records forms, field records)
Geophysical data processed with specialized software

Person-days and crew size
A crew of several people, including members of Arnold's field crew

Field procedures (and laboratory procedures as applicable)
Surveys at CA-SCRI-192 were within two 20x20 m areas (SW corners located at 0N-20E and 10S-20W with respect to Arnold's grid layout at this site). Surveys at CA-SCRI-240 were within a 8x14 m grid (SW corner located 23.95 m at 262° from datum) and a 7x9 m grid at CA-SCRI-240 SW corner located 10.65 m at 255° from datum). The long axis of both grids at CA-SCRI-240 were oriented N-S.

Location and nature of the archaeological collections and associated documentation
Geophysical data files presumably in possession of Ambos and Larson. Field records produced by Arnold are housed at the UCLA Fowler Museum.

Significant descriptive and theoretical conclusions of the research
Both ground-penetrating radar and cesium-vapor magnetometry have potential for locating house floors and other distinct features in shell midden deposits.

Potential of collections and data for future research
Potential of the geophysical data files acquired is unknown, but the findings may be used in future research focused on exposure of house floors at the two sites investigated.

Project name (or basic description)
Augering and surface collection at historic Chumash village sites

Principal investigator
Jeanne E. Arnold

Institutional sponsor
Department of Anthropology, UCLA

Dates of fieldwork
5-25 September 1995, 26 August – 16 September and 30 September – 15 October 1996

Published and unpublished mss.
Arnold 2001a, Arnold and Graesch 2004, Graesch 2000, 2001, 2004, Noah 2005

Geographic location(s) of fieldwork
Village sites located to the north of the mouth of Cañada Christy, at Morse Point, and at Blue Gum Cove (Forney's Cove)

Site nos. or locations from which data were collected
CA-SCRI-192, 236, 240, 328, 329, and 330

Theoretical and empirical goals of research
Investigate differences between household activities relating to status distinction and craft specialization. The work accomplished during the 1995 season and a portion of the 1996 season was the first phase of a new project building on the one completed in the 1980s.

Types of data collected (collections, site records forms, field records)
Samples of midden constituents from auger samples and surface collection units, topographic data for site maps.

Person-days and crew size
During 1995, a crew of 10 worked for 11 days, equaling a total of approximately 110 person-days. During 1996 only a portion of the season was devoted to this phase of work: A crew of 11 worked for an estimated 3 days, equaling a total of approximately 33 person-days.

Field procedures (and laboratory procedures as applicable)
Collection of midden samples with a 10 cm diameter bucket auger. Surface sampling entailed placing a pair of 1x2 m units on a N-S axis with one within a house depression and the other immediately outside. All grass and duff collected along with 0.5 cm of underlying soil. Both sampling types entailed all excavated deposits being sifted through eighth-inch mesh screen and all material caught by the screens being retained for laboratory processing.

CA-SCRI-192: Houses 1, 5, 7, and 8 each were tested with two auger samples and two surface collection units Houses 2, 4, and 6 each were tested with two auger samples and one surface collection unit.

CA-SCRI-236: Houses 1, 2, 4, 5, 7, and 9 each were tested with two auger samples and two surface collection units, with a third auger sample being obtained from House 5. Houses 11 and 13 were tested with one auger sample and two surface collection units, and House 12 was tested with two auger samples only.

CA-SCRI-240: Two auger samples, 50 and 60 cm deep, were obtained areas with no surface indications of houses.

CA-SCRI-328: Houses 1, 2, 4, 6, 7, 10, and 11 were tested with one auger sample and two surface collections units. Houses 3 and 5 were tested with two auger samples and two surface collection units.

CA-SCRI-329: House 1 was tested with one surface collection unit within the house.

CA-SCRI-330: Houses 3 and 4 were tested with two auger samples and two surface collections units. Houses 1, 2, and 5, were tested with one auger sample and two surface collection units. House 7 was tested with one auger sample and one surface collection unit.

Location and nature of the archaeological collections and associated documentation

Collections of midden constituents, bulk shell samples, field and laboratory records, and maps are housed at the Fowler Museum under accession no. 885.

Significant descriptive and theoretical conclusions of the research

Analysis is still ongoing. On the basis of data from the surface collection units and data collected in the second phase of fieldwork, Graesch concluded that his analysis of household data suggests that although the elites owned plank canoes allowing them to control distribution of products, the non-elite households retained autonomy over their labor and craft production.

Potential of collections and data for future research

The collections have the potential to inform on the goals of the project indicated above. They also can contribute information about subsistence and settlement during the protohistoric and historic periods.

Project name (or basic description)

Survey and monitoring at CA-SCRI-495 in locations where naval research facility buildings once stood

Principal investigator

Mary Maki during all years except 2003, when an unknown person served as monitor

Institutional sponsor

Conejo Archaeological Consultants, in conjunction with Fugro West, ENSR, MAR, Inc., and the Naval Surface Warfare Center

Dates of fieldwork

27-30 November 1995, 1 April 1997, 20 July 1999, 19 July 2001, 12 August 2002, also apparently a day in 2003

Published and unpublished mss.

Maki 1996, 1999, 2000, 2001a, 2001b, 2002
(No report is known to exist for the 2003 monitoring.)

Geographic location(s) of fieldwork

Valley Anchorage vicinity

Site nos. or locations from which data were collected

CA-SCRI-495

Theoretical and empirical goals of research

The California Regional Water Quality Board required a 5-year soil sample monitoring program (1999-2003) to determine effects of diesel contamination that occurred during facility dismantling at Valley Anchorage. Archaeological monitoring was done each year entailing collection the soil samples for analysis of contaminants. The objective was to assess bioremediation of the contaminants.

Types of data collected (collections, site records forms, field records)

Soil samples collected by a 3-inch diameter auger, a 3-inch diameter probing device and a backhoe

Person-days and crew size

In 1995, 3 people worked for three days, for a total of nine person-days; in 1997, 1999, 2000, and 2002, one person worked for one day, for a total of four person-days. In 2003 apparently one person worked for one day, for a total of one person-day.

Field procedures (and laboratory procedures as applicable)

A phase 1 survey was undertaken prior to dismantling research facility buildings, and after dismantling, monitoring of the locations where a diesel spill occurred. Also undertaken was monitoring of soil sampling to assess soil contamination by chemicals entering the soil when the research facility was functioning. Monitoring at the diesel spill entailed excavation of 51 hand auger holes, 20 geoprobes with a truck-mounted rig, and three backhoe trenches. Depths ranged between 40 and 120 cm below surface. Augering apparently was done in 2003, but no record was located of this work.

Location and nature of the archaeological collections and associated documentation

The Phase 1 report and five letter reports are on file at the Central Coast Information Center, Department of Anthropology, University of California, Santa Barbara.

Significant descriptive and theoretical conclusions of the research
No archaeological samples were collected.

Potential of collections and data for future research
CA-SCRI-495 is a large site with extensive deposits, and considerable research potential remains.

Project name (or basic description)
Auger sampling at CA-SCRI-571

Principal investigator
Michael A. Glassow

Institutional sponsor
Department of Anthropology, UCSB

Dates of fieldwork
11 May 1996

Published and unpublished mss.
Glassow 1996b

Geographic location(s) of fieldwork
On a ridge north of Cañada Christy and northeast of Christy Ranch, at an elevation of 337 m.

Site nos. or locations from which data were collected
CA-SCRI-571

Theoretical and empirical goals of research
To determine whether significant quantities of red abalone shells are present, given the occurrence of red abalone shell fragments on the surface in one sector of the site.

Types of data collected (collections, site records forms, field records)
Midden constituents, field notes.

Person-days and crew size
A crew of four worked for half a day, equaling a total of two person-days.

Field procedures (and laboratory procedures as applicable)
A 10-cm diameter bucket auger was used to collection nine samples of midden deposits. Their locations were distributed in a cross pattern with the N-S and E-W axes bisecting each other near the center of the site. Deposits from the auger holes were sifted through eighth-inch mesh screens, and all material caught by the screens was retained for laboratory

processing. Three of the samples encountered sterile deposits directly below surface, and the remainder encountered midden between 25 and 58 cm deep.

Location and nature of the archaeological collections and associated documentation

The collections and field and laboratory records are housed in the Repository for Archaeological and Ethnographic Collections at UCSB under accession no. 610.

Significant descriptive and theoretical conclusions of the research

Significant quantities of red abalone shell were not discovered. A radiocarbon date indicates that the site was occupied about 4300 BP.

Potential of collections and data for future research

Although the collections are small, they are able to provide information on subsistence and settlement in this sector of the island.

Project name (or basic description)

Subsurface excavation of houses at two Chumash village sites

Principal investigator

Jeanne E. Arnold (Anthony Graesch served as field director.)

Institutional sponsor

Department of Anthropology, UCLA

Dates of fieldwork

26 August – 16 September and 30 September – 15 October 1996, and 14 July – 9 August 1997

Published and unpublished mss.

Arnold 2001a, Arnold and Graesch 2004, Graesch 2001, 2004, Noah 2005

Geographic location(s) of fieldwork

Village sites located to the north of the mouth of Cañada Christy and at Morse Point

Site nos. or locations from which data were collected

CA-SCRI-192 and 236

Theoretical and empirical goals of research

Investigate differences between household activities relating to status distinction and craft specialization. The work accomplished during the 1996 and 1997 seasons was the second phase of a new project building on the one completed in the 1980s.

Types of data collected (collections, site records forms, field records)

Samples of midden constituents from auger samples and surface collection units, topographic data for site maps.

Person-days and crew size

During 1996, a crew of 11 worked for an estimated 34 days, equaling a total of approximately 374 person-days. During 1997, a crew of approximately 8-9 worked for 27 days, equaling a total of approximately 225 person-days.

Field procedures (and laboratory procedures as applicable)

Excavation of a contiguous series of 1x1 m units within a portion of each house depression investigated. At CA-SCRI-192, seven units were placed within House 4 and excavated to depths between 15 and 20 cm, and seven units were placed in House 8 and excavated to depths between 5 and 32 cm. At CA-SCRI-236, seven units were placed within House 5 and excavated to depths between 18.5 and 25 cm, and nine units were placed in House 9 and excavated to depths between 5 and 15 cm. All excavated deposits were sifted through eighth-inch mesh screens, and all material caught by the screens was retained for laboratory analysis. Occasional bulk soil samples or column samples were acquired for flotation.

Location and nature of the archaeological collections and associated documentation

Collections and associated field records are housed at the Fowler Museum at UCLA under accession nos. 886, and 887.

Significant descriptive and theoretical conclusions of the research

Much of the data from the houses was the basis for Graesch's MA thesis. Graesch concluded that his analysis of household data suggests that although the elites owned plank canoes allowing them to control distribution of products, the non-elite households retained autonomy over their labor and craft production.

Potential of collections and data for future research

The collections have the potential to inform on the goals of the project indicated above. They also can contribute information about subsistence and settlement during the protohistoric and historic periods.

Project name (or basic description)

Survey and test excavation in the Scorpion Canyon watershed

Principal investigator

Douglas Kennett

Institutional sponsor

Department of Anthropology, University of California, Santa Barbara, California State University, Long Beach, and Channel Islands National Park

Dates of fieldwork

Multiple intervals during 1997

Published and unpublished mss.

Kennett 1998, 2005; Clifford 2001

Geographic location(s) of fieldwork

Scorpion Canyon watershed, including canyon bottom and uplands to the ridges bounding the watershed

Site nos. or locations from which data were collected

Sites recorded include CA-SCRI-608-615, 627-631, and 639. Test excavation took place at CA-SCRI-608 and 610, and a radiocarbon sample was obtained from an erosional exposure at CA-SCRI-615.

Theoretical and empirical goals of research

This project produced some of the data Kennett used in his dissertation research. Documentation of sites within the watershed in order "to explore the evolutionary history and behavioral ecology of island occupants," and more generally "to gain a broder insight into the cultural developments…." This project also aided the Park in the development of its cultural resources inventory.

Types of data collected (collections, site records forms, field records)

Completed site record forms, surface collections, samples of midden constituents from test excavation.

Person-days and crew size

A crew of six people devoted 24 days to survey, equaling a total of 144 person-days. A crew of six people devoted 16 days to excavation, equaling a total of 96 person-days.

Field procedures (and laboratory procedures as applicable)

Two test units 50x50 m in size were excavated at CA-SCRI-608, and one unit of this size was excavated at CA-SCRI-610. At CA-SCRI-608, the units reached depths of 70 and 80 cm; at CA-SCRI-610 the unit at Locus A (ridgeline midden) reached a depth of 19 cm. At Locus B (the quarry) collection was made within four surface collection units, consisting of 1 m diameter circles. Only a sample for radiocarbon dating was collected from an erosional exposure at CA-SCRI-615.

Location and nature of the archaeological collections and associated documentation

Collections and field notes and maps currently are under the care of Douglas Kennett at the University of Oregon. Midden constituents from Unit 1 at CA-SCRI-608 are reported by Clifford (2001, Appendix I, pg. 152).

Significant descriptive and theoretical conclusions of the research

The data from the sites contributed to Kennett's dissertation, which considered change in settlement patterns through time from the viewpoint of behavioral ecology. Site CA-SCRI-610 undoubtedly is the largest chert quarry site on the Channel Islands, and Kennett established that it apparently had been used from about 7000 BP into the Late period.

Potential of collections and data for future research

Kennett used only a few of the data concerning midden constituents in the excavated samples in his dissertation research, so the collections could contribute data to research concerned with use of marine resources by site inhabitants. The sites generally have the potential to contribute information about subsistence and settlement within the Scorpion Canyon watershed. CA-SCRI-610 is a very large quarry site, with the potential to yield information about quarrying activity and flaked stone tool production.

Project name (or basic description)
Blue Site Restoration Project survey

Principal investigator
Robert J. Wlodarski

Institutional sponsor
Rincon Consultants

Dates of fieldwork
14 May 1997

Published and unpublished mss.
Wlordarski 1997

Geographic location(s) of fieldwork
The Blue Site is a former building complex located south-southeast of Mt. Pleasant, approximately 150 m south of the Navy Road.

Site nos. or locations from which data were collected
No cultural resources discovered.

Theoretical and empirical goals of research
To determine the presence of cultural resources within the area of the Blue Site Restoration Project

Types of data collected (collections, site records forms, field records)
No cultural resources were encountered and collections were made. Wlodarsky's report is on file at Channel Islands National Park and at the Central Coast Information Center. No other documentation is known to exist.

Person-days and crew size
One person worked for seven hours, equaling a total of approximately one person-day.

Field procedures (and laboratory procedures as applicable)
Intensive survey with intervals between transects never exceeding 5 m

Location and nature of the archaeological collections and associated documentation

No collections were made.

Significant descriptive and theoretical conclusions of the research
No cultural resources were discovered within the project area.

Potential of collections and data for future research
Not applicable

Project name (or basic description)
Auger sampling at CA-SCRI-601 and 604

Principal investigator
Michael A. Glassow (augering supervised by Peter F. Paige)

Institutional sponsor
Department of Anthropology, UCSB

Dates of fieldwork
25 May 1997

Published and unpublished mss.
Glassow et al. 1997

Geographic location(s) of fieldwork
A knoll approximately 100 m east of the eastern margin of Lagunitas Secas

Site nos. or locations from which data were collected
CA-SCRI-601 and 604

Theoretical and empirical goals of research
To determine the depth of deposits and to obtain shell samples for radiocarbon dating in an effort to identify interior sites that may be coeval with red abalone middens on the coast.

Types of data collected (collections, site records forms, field records)
A site record form, samples of midden constituents, sketch map slowing location of auger holes with respect to the site datum.

Person-days and crew size
A crew of three worked for a day, equaling a total of three person-days.

Field procedures (and laboratory procedures as applicable)
A 10-cm diameter bucket auger was used to collect samples of midden deposits. At CA-SCRI-601, the four auger holes, ranging between 15 and 44 cm deep, were placed 5 m from datum to form a cross, two of them being oriented with the ridgeline. At CA-SCRI-604, the five auger holes, ranging in depth between 40 and 60 cm deep, were oriented on N-S and E-

W axes that bisected each other at the site datum near the center of the site. All deposits were sifted through eighth-inch mesh screens, and all material caught by the screens was retained for laboratory processing.

Location and nature of the archaeological collections and associated documentation

The collections and associated field and laboratory documentation are housed in the Repository for Archaeological and Ethnographic Collections at UCSB. Samples from CA-SCRI-601 are still unprocessed. Those from CA-SCRI-604 are processed and cataloged under accession number 610.

Significant descriptive and theoretical conclusions of the research

Significant quantities of red abalone shell were not discovered. A radiocarbon date pertaining to CA-SCRI-604 indicates occupation at about 3200 BP.

Potential of collections and data for future research

Although the collections are small, they are able to provide information on subsistence and settlement in this sector of the island.

Project name (or basic description)

Survey and site recording in the Lagunitas Secas vicinity

Principal investigator

Michael A. Glassow

Institutional sponsor

Department of Anthropology, UCSB (Anthropology 181 field class)

Dates of fieldwork

25 May 1997 and 15-17 May 1998 (A reconnaissance taking place 13-15 September 1996 established the feasibility of the May 1998 fieldwork.)

Published and unpublished mss.

Glassow 1996a, 1998a; Glassow et al. 1997

Geographic location(s) of fieldwork

Upper portions of ridges descending to the northward to the north coast of the island in the general vicinity of Lagunitas Secas. In addition, two sites located during a 1996 reconnaissance, in an area to the west of Lagunitas Secas and to the north of peak Alta 2, also were recorded.

Site nos. or locations from which data were collected

CA-SCRI-618-623 and 596 and 597

Theoretical and empirical goals of research

To locate ridgetop sites that may be coeval with red abalone middens located in the western sector of the island

Types of data collected (collections, site records forms, field records)
Site record forms were filled out for some but not all sites identified during survey; those not recorded are plotted on the map attached to the above-cited field journal.

Person-days and crew size
The 1998 survey entailed 19 people composing the crew worked for two days, equaling 38 person-days. The 1997 site recording entailed a crew of four working for a day, equaling a total of four person-days.

Field procedures (and laboratory procedures as applicable)
Intensive systematic survey of lands less than about 15 degrees slope

Location and nature of the archaeological collections and associated documentation
Field journals are on file at the Central Coast Information Center, Department of Anthropology, UCSB.

Significant descriptive and theoretical conclusions of the research
Large and small sites occur at relatively high elevations on the island, including one with bedrock mortars.

Potential of collections and data for future research
The sites in the Lagunitas Secas vicinity may provide information about the prehistoric use of interior resources.

Project name (or basic description)
Red Abalone Midden Project

Principal investigator
Michael Glassow

Institutional sponsor
UCSB Department of Anthropology

Dates of fieldwork
22 July - 3 August, 20-23 September 1997, 3-6 August 1998, 26-31 August 1999

Published and unpublished mss.
Field journals: Glassow 1997a, 1997b, 1998b, 1999a; publications: Glassow 2002b, 2004b, 2005b, 2005c; Glassow et al. 2008

Geographic location(s) of fieldwork
Punta Arena, Christy Ranch vicinity, west end of island

Site nos. or locations from which data were collected

CA-SCRI-109, 277, 427, 428, 429, 549, 571

Theoretical and empirical goals of research

To ascertain the time interval during which red abalone middens occur, to identify temporal and spatial variation in ecological adaptation during this time interval, to identify cultural changes leading to the period preceding the red abalone middens, particularly with regard to resource intensification

Types of data collected (collections, site records forms, field records)

Collections of cultural remains through excavation, soils data, topographic maps of sites

Person-days and crew size

CA-SCRI-109 excavation and mapping: crew of 6, 78 person-days; soils studies: crew of 3, 3 person-days; pollen sample collection: crew of 4, 1.5 person-days

CA-SCRI-427 excavation and mapping: crew of 2, 4 person-days

CA-SCRI-428 collection of radiocarbon sample: crew of 1, 0.1 person day

CA-SCRI-429 excavation and mapping: crew of 2, 2 person-days; CA-SCRI-549 excavation and mapping: crew of 2-5, 9 person-days

CA-SCRI-277 mapping: crew of 4, 3 person-days

CA-SCRI-571 mapping: crew of 4, 3 person-days

Field procedures (and laboratory procedures as applicable)

CA-SCRI-109: two units were excavated along gully walls and two column samples collected. Soil samples later were collected to determine preservation of pollen. Surface collection also made.

CA-SCRI-427: one unit was excavated after creating a vertical face near the sloping site margin.

CA-SCRI-428: two shells were collected from the seacliff exposure of the midden.

CA-SCRI-429: two small units were excavated

CA-SCRI-549: two column samples were collected from gully faces near the seacliff, one being discontinuous due to sterile mudflow deposits intervening between midden strata. Surface collection also made.

Mapping at all sites was with a total station.

All excavated samples were sifted through eighth-inch mesh screen; all material caught by the screens was brought to UCSB for processing. Column samples were collected as bulk samples and floated at UCSB.

Location and nature of the archaeological collections and associated documentation

Collections and field and lab records are housed at the UCSB Repository for Archaeological and Ethnographic Collections under accession no. 609.

Significant descriptive and theoretical conclusions of the research

Red abalone middens on Santa Cruz Island all appear to date between 6300 and 5300 cal BP; diverse shellfish taxa and marine fauna were obtained by CA-SCRI-109 occupants of this time period, notably dolphins; occupants who created small red abalone middens obtained significantly lower diversity of marine fauna; utilization of marine resources intensified after 6300 cal BP but did not intensify significantly during the next 1,000 years; lower water temperatures probably were a major determinant of the prevalence of red abalone shells in the middens, but other factors such as low population density probably also played a role.

Potential of collections and data for future research

Although shells from the units have been discarded, the remaining collection retain considerable research potential because they were obtained using modern recovery techniques.

Project name (or basic description)

Survey of Eastern Santa Cruz Island chert quarries

Principal investigator

Torben Rick

Institutional sponsor

University of Oregon

Dates of fieldwork

August 1998

Published and unpublished mss.

None

Geographic location(s) of fieldwork

Inland area from the southern margin of Scorpion Canyon toward the Yellowbanks locality.

Site nos. or locations from which data were collected

CA-SCRI-632-638

Theoretical and empirical goals of research

Documentation of chert quarry sites on the east end of Santa Cruz Island. This project aided the Park in the development of its cultural resources inventory.

Types of data collected (collections, site records forms, field records)
Site records were generated for the seven sites discovered.

Person-days and crew size
Three people worked two days, equaling a total of six person-days (estimated).

Field procedures (and laboratory procedures as applicable)
A reconnaissance focused on location of chert quarries.

Location and nature of the archaeological collections and associated documentation
Completed site record forms for sites located; field notes apparently are in possession of Douglas Kennett.

Significant descriptive and theoretical conclusions of the research
Documentation of the location of additional chert quarry sites and two lithic scatters.

Potential of collections and data for future research
The sites have the potential to yield information about chert quarrying activity and flaked stone tool production on eastern Santa Cruz Island.

Project name (or basic description)
Survey of two localities of the "isthmus" area of the island

Principal investigator
Michael Glassow

Institutional sponsor
Department of Anthropology, University of California, Santa Barbara (Anthropology 181 field class

Dates of fieldwork
13-14 May 2000

Published and unpublished mss.
Glassow 2000

Geographic location(s) of fieldwork
A ridge descending to the Valley Anchorage vicinity just west of the current boundary fence between Channel Islands National Park and The Nature Conservancy properties, as well as two ridges descending to the north coast directly west of No Man's Land and El Montañon, a portion of a ridge extending southward toward Loma Pelona, and a small ridge extending into the China Pines locality.

Site nos. or locations from which data were collected
CA-SCRI-640-654

Theoretical and empirical goals of research
To document sites located on Channel Islands National Park property in light of their incorporation into the Park's cultural resource management program

Types of data collected (collections, site records forms, field records)
Standard site record forms were filled out for 15 of the 25 sites encountered. Not enough time was available to record all of the sites.

Person-days and crew size
A crew composed of 19 people worked for two days; however, one of the crew was present for only one of the days. The total person-days equals 37.

Field procedures (and laboratory procedures as applicable)
Intensive pedestrian survey of ridges, excluding areas greater than about 15 degrees slope

Location and nature of the archaeological collections and associated documentation
Field journal on file at the Central Coast Information Center, Department of Anthropology, UCSB.

Significant descriptive and theoretical conclusions of the research
Some sites appear to have been intensively occupied residential bases, whereas others are the commonly occurring small shell middens occurring in the island's interior. The survey results also contributed to the Park's consideration of cultural resources that could be impacted by development of a public trail from Prisoners Harbor to Scorpion Anchorage.

Potential of collections and data for future research
All sites have the potential to yield information useful in understanding settlement systems during the periods of occupation represented by their deposits.

Project name (or basic description)
Survey of uplands within the Scorpion Canyon watershed

Principal investigator
Robert Clifford (supervised by Douglas Kennett)

Institutional sponsor
California State University, Long Beach

Dates of fieldwork
Intermittently between 22-23 and 27-30 November 2000

Published and unpublished mss.

Clifford 2001; Kennett and Clifford 2004a, 2004b

Geographic location(s) of fieldwork

Upland area of the Scorpion Canyon watershed—an expansion of survey and testing undertaken by Douglas Kennett

Site nos. or locations from which data were collected

39 sites recorded: CA-SCRI-655-693

Theoretical and empirical goals of research

Expansion of the survey begun by Kennett as part of his dissertation research, apparently completing the survey of the whole Scorpion Ranch watershed. The specific objective was to document site distributions in relation to variation in watershed size, fresh water availability, and other environmental factors. Clifford was interested in evaluating an evolutionary ecological model to explain upland settlement and to expand knowledge of settlement change through time. This project also aided the Park in the development of its cultural resources inventory and development of preservation measures.

Types of data collected (collections, site records forms, field records)

Completed site record forms. Occasional surface collections also made.

Person-days and crew size

Based on dates on site record forms, three people worked for six days, equaling 18 person-days.

Field procedures (and laboratory procedures as applicable)

Intensive systematic survey and recording of all sites discovered.

Location and nature of the archaeological collections and associated documentation

Collections currently are housed with Douglas Kennett at the Department of Anthropology, University of Oregon.

Significant descriptive and theoretical conclusions of the research

Clifford demonstrated that most sites in the interior area that he surveyed dated to the middle Holocene, a pattern emerging in other parts of the island as well. He proposed that the interior site locations were in areas where plant foods could be collected and that the site occupation signaled temporary claims on a collecting territory.

Potential of collections and data for future research

Problem have been encountered during revisits to some of the sites Clifford recorded. Some site records have vague location descriptions, inaccurate UTM coordinates, incomplete or inaccurate site sketch maps, inaccurate recording of vegetation, and errors in identification of shellfish remains. At least one site he recorded (CA-SCRI-689) had been previously recorded (CA-SCRI-406).

Project name (or basic description)
Survey and testing of sites south of the Scorpion Canyon watershed

Principal investigator
Jennifer E. Perry

Institutional sponsor
Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork
Intermittently February 2001 through July 2002. Excavation fieldwork took place 27-28 June, 14-15 July, 9-14 September, 2-4 November, and 8-9 December 2001; 1-3 and 15-17 February and 1-3 March 2002.

Published and unpublished mss.
Perry 2003, 2004, 2005

Geographic location(s) of fieldwork
Survey was of tracts of land south of the Scorpion Canyon watershed, including Little Scorpion Canyon and lands to the south of the drainage, the upper portion of San Pedro Canyon including lands to the north, parts of the Smugglers Canyon watershed, and the lower segment of the Cañada del Aguaje watershed. Test excavation took place at nine sites within these areas.

Site nos. or locations from which data were collected
Perry recorded 30 sites and visited some previously recorded sites. Her test excavations took place at CA-SCRI-406, 698, 699, 706, 741, 746, 747, 751, and 752.

Theoretical and empirical goals of research
Perry's goals were to expand knowledge of site distributions on the eastern end of the island, particularly during the middle and late Holocene, assess the influence of fresh water availability on site distribution, evaluate models of settlement and subsistence change proposed by earlier investigators, and explore the relationship between patterns of chert exploitation and settlement, subsistence, technology, and environmental fluctuation.

Types of data collected (collections, site records forms, field records)
Site records forms for recorded sites, samples of midden constituents at tested sites, shells for radiocarbon dating, topographic data for maps.

Person-days and crew size
Excavation crews varied between two and six, equaling a total of 81 person-days.

Field procedures (and laboratory procedures as applicable)
Intensive systematic survey with walking intervals of 10 m except where vegetation was dense, where it was 5 m instead. Intensive site surface survey was at 3 m intervals to locate

and collect time-sensitive artifacts, with ground clearance if necessary using a hand pick or trowel. The location of each artifact found was recorded with a total station. Testing nine sites was with a 10-cm diameter bucket auger, with two to 18 augers per site, the auger holes in most cases being distributed along the two axes of the site area at 5 to 20 m intervals. All deposits in each 10 cm depth interval was collected and brought to UCSB for processing. Testing at two sites entailed collection of 25x25 cm column samples from erosional exposures. Maximum depths reached at each site ranged between 40 and 160 cm.

Location and nature of the archaeological collections and associated documentation

Collections and field notes are housed at Pomona College.

Significant descriptive and theoretical conclusions of the research

Perry verified that settlement shifted from an emphasis on interior locations during the middle Holocene to an emphasis on the coast during the late Holocene, reflecting a shift from seasonal foraging of terrestrial and marine resources in the Middle Holocene to intensive fishing, coastal sedentism, and increased circumscription by the latter part of the Late Holocene.

Potential of collections and data for future research

All sites investigated still have substantial intact deposits. The collections are useful for further research regarding subsistence and settlement, and the artifacts are relevant to technological studies.

Project name (or basic description)

Geoarchaeological investigation of CA-SCRI-796

Principal investigator

Kate Ballantyne (under supervision of Michael Glassow)

Institutional sponsor

Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork

Intermittently during 2001, 2002, and 2003, six episodes of fieldwork altogether. Excavation occurred 13-18 July 2002.

Published and unpublished mss.

Ballantyne 2006

Geographic location(s) of fieldwork

The site is located in a northern tributary of Cañada Christy near its confluence with Cañada Christy. The confluence is 1.8 km inland from the coast.

Site nos. or locations from which data were collected

CA-SCRI-796

Theoretical and empirical goals of research

To document and understand the alluvial contexts of buried midden deposits at the site

Types of data collected (collections, site records forms, field records)

Samples of constituents were collected from each of the buried middens. Profile drawings were made of sediments above and/or below the archaeological deposits.

Person-days and crew size

Crews varied from two to five in size, for an estimated total of 40 person-days.

Field procedures (and laboratory procedures as applicable)

Midden deposits at the base of one of the profiles were excavated within a 1x1 m unit, and the deposits at the other, at the level of the stream floodplain, were excavated within a 0.5x1 m unit. Midden samples also were collected from the profile above the 1x1 m unit. All midden deposits were sifted through 1/8" mesh screens and all material caught by the screens was retained for laboratory sorting.

Location and nature of the archaeological collections and associated documentation

The collections are housed by the Repository for Archaeological and Ethnographic Collections at the University of California, Santa Barbara. Accession 694 was assigned to the collection.

Significant descriptive and theoretical conclusions of the research

The lowermost archaeological stratum is a red abalone midden dating to ~5700 cal BP. It is the farthest inland red abalone midden documented so far, and it indicates that the site probably was a residential base to which shellfish were brought and consumed. The buried midden strata generally indicate that alluvial deposits were accumulating in the Cañada Christy watershed during much of the last 5700 years.

Potential of collections and data for future research

Most of the shell collected was not retained after weighing, but all other constituents are in the existing collection, and despite small sample sizes could provide comparative data pertaining to the time periods to which they pertain.

Project name (or basic description)

Survey of El Montañon Trail

Principal investigator

Jennifer E. Perry

Institutional sponsor

Pomona College

Dates of fieldwork

March 2001

Published and unpublished mss.
Goetze 2001

Geographic location(s) of fieldwork
The trail route from the CA-SCRI-393 vicinity west of El Montañon to the existing Scorpion Loop trail east of El Montañon

Site nos. or locations from which data were collected
No additional sites were located and recorded; however, CA-SCRI-93, 393, and 406 were noted to be adjacent to or bisected by the trail.

Theoretical and empirical goals of research
To determine whether proposed public use of the trail would impact archaeological sites. Perry later tested CA-SCRI-406 and the resulting data was included with that used for her dissertation research.

Types of data collected (collections, site records forms, field records)
Aside from ascertaining the location of sites relative to the proposed trail, no data were collected.

Person-days and crew size
A crew of four devoted one day to the survey, equaling a total of four person-days.

Field procedures (and laboratory procedures as applicable)
Intensive survey along the trail route and within varying distances on either side not exceeding 50 meters

Location and nature of the archaeological collections and associated documentation
Aside from the Goetz report on file at Channel Islands National Park, no other documentation is known to exist.

Significant descriptive and theoretical conclusions of the research
Only CA-SCRI-93 would be directly impacted by the trail, although vegetation obscures the more obvious surface remains from public view. The survey led to testing at CA-SCRI-406, the results of which are included in her dissertation.

Potential of collections and data for future research
All sites have the potential to provide information about subsistence and settlement in the locales where they occur. CA-SCRI-93, although already investigated by Arnold (1987), has potential to inform on quarrying activity and production of chert microblades.

Project name (or basic description)
Survey of the proposed Del Norte Trail

Principal investigator
Chris Goetze

Institutional sponsor
Channel Islands National Park

Dates of fieldwork
4-7 and 11 April 2001

Published and unpublished mss.
Goetze 2001

Geographic location(s) of fieldwork
Along the entire length of the proposed trail from Prisoners Harbor to the CA-SCRI-393 vicinity

Site nos. or locations from which data were collected
No sites were formally recorded. The survey team relocated seven sites and identified but did not record six others, one of the latter ultimately being determined to have been recorded previously.

Theoretical and empirical goals of research
To determine the location of archaeological sites to that impacts by public use of the trail could be minimized

Types of data collected (collections, site records forms, field records)
Apparently no formal records kept, aside from the report submitted to Channel Islands National Park

Person-days and crew size
During the 4-7 April trip, four people surveyed for five days, and during the 11 April trip two people surveyed for two days. Total person-days is 24.

Field procedures (and laboratory procedures as applicable)
Intensive survey along the trail corridor

Location and nature of the archaeological collections and associated documentation
Apparently no collections were made.

Significant descriptive and theoretical conclusions of the research
Documentation of the locations of sites on or near the proposed trail provided the basis for designing the trail to minimize impacts to site deposits.

Potential of collections and data for future research

The sites encountered appear to have the potential to yield information about subsistence and settlement in the localities where they occur.

Project name (or basic description)
Survey of the watershed southwest of Montañon Canyon

Principal investigator
Robert Clifford (under supervision of Douglas Kennett)

Institutional sponsor
California State University, Long Beach, Department of Anthropology

Dates of fieldwork
15 June 2001 and 28 February 2002

Published and unpublished mss.
Kennett and Clifford 2004a

Geographic location(s) of fieldwork
The Montañon Canyon watershed (perhaps just the western half) and a smaller watershed immediately to the west. The western margin of the survey area apparently was the western margin of the ridge along which the eastern portion of the Loma Pelona loop road runs.

Site nos. or locations from which data were collected
CA-SCRI-776 and 777

Theoretical and empirical goals of research
Apparently an extension of Clifford's interest in middle Holocene occupation of upland regions of the eastern part of the island.

Types of data collected (collections, site records forms, field records)
Site records forms were filled out; aside from a report prepared for Channel Islands National Park, no other documentation is known.

Person-days and crew size
Apparently a crew of two worked for two days, for a total of four person-days.

Field procedures (and laboratory procedures as applicable)
Unknown, probably systematic intensive survey

Location and nature of the archaeological collections and associated documentation
Apparently no collections were made.

Significant descriptive and theoretical conclusions of the research

Only two sites were found and recorded, implying an unusually low site density that is consistent with findings of Glassow's survey in the neighboring Loma Pelona area.

Potential of collections and data for future research

The two sites may provide insight into why this environmentally marginal area was at least intermittently occupied.

Project name (or basic description)

Testing of sites in the locality of a proposed campground

Principal investigator

Jennifer E. Perry

Institutional sponsor

Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork

19-22 and 23-26 August 2001

Published and unpublished mss.

Perry 2003

Geographic location(s) of fieldwork

A locality just east of China Pines, a few hundred meters north of the East End Road.

Site nos. or locations from which data were collected

CA-SCRI-647 and 649

Theoretical and empirical goals of research

To obtain samples of midden constituents and samples for radiocarbon dating in support of Perry's dissertation research, as well as to assess the sites' significance and determine their extent in light of a proposal to establish a public campground nearby.

Types of data collected (collections, site records forms, field records)

Samples of midden constituents, topographic data for site maps.

Person-days and crew size

Crews of four and five worked for eight days, equaling 36 person-days.

Field procedures (and laboratory procedures as applicable)

Surface collection of diagnostic items at each site. At CA-SCRI-647, 16 auger samples were excavated to a maximum depth of 70 cm, with an average depth less than 60 cm. At CA-SCRI-649, 18 auger samples were excavated to a maximum depth of 65 cm, with an average depth less than 60 cm. Two radiocarbon dates were obtained for each site.

Location and nature of the archaeological collections and associated documentation
Collections are stored at Pomona College.

Significant descriptive and theoretical conclusions of the research
Radiocarbon dates indicate occupation at CA-SCRI-649 around 3400-3700 BP and at CA-SCRI-647 around 1000-900 BP. The latter site was occupied during the Middle-Late Period Transition or immediately before. Collecting and processing plant food resources occurred at both sites, as indicated by fragments of mortars, pestles, and digging-stick weights. Perry concluded that both sites probably were seasonal residential bases.

Potential of collections and data for future research
Both sites have potential to contribute information about subsistence-settlement systems in this sector of the island. CA-SCRI-647 clearly is a residential base, and appears to have the potential to contribute information about use of plant foods.

Project name (or basic description)
Excavation at the Cueva Escondida site

Principal investigator
John Johnson

Institutional sponsor
Santa Barbara Museum of Natural History

Dates of fieldwork
One day in August 2001, 10-11 July 2007, 24 and 28 July 2009

Published and unpublished mss. (in style of *American Antiquity* text citation)
Johnson and West 2008

Geographic location(s) of fieldwork
North coast of the island.

Site nos. or locations from which data were collected
CA-SCRI-440

Theoretical and empirical goals of research
Collection of radiocarbon samples to date discrete midden strata and collection of midden constituents, particularly perishable artifacts before they are eroded into the ocean.

Types of data collected (collections, site records forms, field records)
Samples of midden constituents including faunal remains and artifacts. Field notes including maps and photographs. Collections are accessioned under B4387 and B4495).

Person-days and crew size

2001 trip: 1 person for 1 day, one person-day (in the context of a family vacation.); 2007 trip: 3 people for 2 days, 6 person-days; 2009 trip: 4 people for 1.5 days

Field procedures (and laboratory procedures as applicable)

Excavation of a column sample from an exposed face of midden and a small unit beginning at the intact surface, the latter not completed because of logistical difficulties.

Location and nature of the archaeological collections and associated documentation

Collections include perishable artifacts such as a fire stick, cordage, feathers, and plant material. Also in the collections are faunal remains of shellfish, fish, and cormorants. Pollen samples also were collected.

Significant descriptive and theoretical conclusions of the research

The midden at this site contains an array of perishable artifacts as well as floral and faunal remains that are not preserved in deposits at open sites or even most rock shelters on the island. A series of superimposed hearths were delineated during excavation of a column sample in 2009. Johnson has not concluded his investigation at this site.

Potential of collections and data for future research

A radiocarbon date from the lowermost level of a column excavated in 2007 indicates that periodic occupation of the site dates at least to the Middle-Late Transition. Given that the most recent deposits date to the Contact Period, the collections have the potential to shed light on a variety of aspects of subsistence and technology for more than a millennium prior to and including Mission times.

Project name (or basic description)

Archaeology and Soil Science on Santa Cruz Island

Principal investigator

Michael Glassow and Oliver Chadwick

Institutional sponsor

UCSB Departments of Anthropology and Geography; funded by a UCSB Research Across Disciplines grant.

Dates of fieldwork

Two days in late summer 2001, 19-22 September 2003, 30 July – 2 August 2004, 19 December 2006

Published and unpublished mss.

Ballantyne 2006; Glassow 2001, 2006; Glassow et al. 2009

Geographic location(s) of fieldwork

Cañada Christy, Cañada de los Sauces, and Pozo Canyon (the 2001 reconnaissance included several other locations in the southwestern and western portions of the island)

Site nos. or locations from which data were collected

CA-SCRI-796, consisting of several localities of buried archaeological deposits exposed on stream bank and arroyo walls of a tributary of Cañada Christy

CA-SCRI-554, consisting of buried archaeological deposits along the arroyo wall of Cañada Christy near CA-SCRI-796, as well as a nearby exposure

A series of 40 archaeological strata distributed among 18 localities along the arroyo walls of the canyon, for which sites numbers have not been assigned

Reconnaissance for buried archaeological deposits included all of Cañada Christy from the coast to a point approximately 4 km from the coast, Cañada de los Sauces from the coast to a point approximately 1.5 km upcanyon where the road crosses.

Theoretical and empirical goals of research

To determine patterns of alluvial buildup of the canyon floors through dating of archaeological strata and to assess the importance of canyon-bottom prehistoric occupation and its variation through time

Types of data collected (collections, site records forms, field records)

Records of the locations of buried archaeological strata exposed on arroyo walls, including profile descriptions of alluvial and archaeological strata ; collection of shells from selected sites for radiocarbon dating—sixteen dates obtained for Pozo Canyon archaeological strata; nine dates obtained for the CA-SCRI-796 archaeological strata and three dates from CA-SCRI-554 and a nearby buried archaeological deposit. Archaeological excavation took place at two localities at CA-SCRI-796.

Person-days and crew size

2001 reconnaissance: crew of 3, 6 person-days

2003 reconnaissance: crew of 4, 4 person-days

Cañada Christy excavation: crews of 3-5 during 5 episodes of fieldwork, approximately 40 person-days

Pozo Canyon locality recording and sample collection: a crew of 4 during the two main episodes of fieldwork (2003 and 2004) and a brief visit by a crew of four in 2006, equaling a total of 10 person-days

Field procedures (and laboratory procedures as applicable)

Reconnaissance entailed walking along the base of arroyo walls to locate buried middens and assess potential for further investigation.

Pozo Canyon buried archaeological documentation entailed recording characteristics of each locality on a customized form and collecting shells for radiocarbon dating from six localities.

Excavation at CA-SCRI-796 entailed excavation of two test units and cleaning a section of arroyo wall for detailed recording of stratification of deposits.

Location and nature of the archaeological collections and associated documentation

Field records and collections from CA-SCRI-796 are housed by the UCSB Repository for Archaeological and Ethnographic Collections. Field records pertaining to the Pozo Canyon buried midden documentation are currently kept by Glassow.

Significant descriptive and theoretical conclusions of the research

The lowermost archaeological stratum at CA-SCRI-796, at the level of the current stream course, dates to approximately 5700 cal BP. A date at the level of the current stream course in Pozo Canyon dates to approximately 4800 cal BP. This implies that alluvial and archaeological deposits exposed on arroyo walls of these canyons, and probably other canyons on the island date no earlier than the middle Holocene. The research demonstrates of the potential to establish alluvial chronologies through dating of buried archaeological deposits. The abundance of buried middens exposed along arroyo walls indicates that canyon bottoms on the island probably were important areas for short-term habitation and terrestrial resource acquisition, even though archaeological deposits are not visible on the bottomland surfaces.

Potential of collections and data for future research

More intensive analysis of the collections resulting from Ballantyne's investigation of CA-SCRI-796 would be profitable. Study of the contents of other buried archaeological strata may lead to identifying resources that were acquired from the canyon bottomlands.

Project name (or basic description)

Test excavation at CA-SCRI-393

Principal investigator

Jeanne Arnold and Anthony Graesch

Institutional sponsor

Department of Anthropology, University of California, Los Angeles

Dates of fieldwork

20-21 October 2001

Published and unpublished mss.

Graesch and Arnold 2003

Geographic location(s) of fieldwork

On the ridge linking El Montañon with the isthmus to the west

Site nos. or locations from which data were collected

CA-SCRI-393

Theoretical and empirical goals of research

Assessment of the extent of deposits and the significance of the site in light of a public hiking trail passing by the site

Types of data collected (collections, site records forms, field records)

Collections of sorted midden constituents and field and laboratory records.

Person-days and crew size

A crew of 16 worked for two days, for a total of 32 person-days.

Field procedures (and laboratory procedures as applicable)

Excavation of six shovel test pits and two 10-cm diameter auger tests with all material bagged without screening and brought to UCLA for flotation and sorting. Shovel test pits were excavated to a depths of 20 to 30 cm, and auger tests were to depths of 20 and 40 cm.

Location and nature of the archaeological collections and associated documentation

Collections and records are housed by the Santa Barbara Museum of Natural History for Channel Islands National Park, under Park accession number 302.

Significant descriptive and theoretical conclusions of the research

The extent and diversity of cultural remains at the site implies it was a residential base occupied to utilize ridgetop resources, including chert, and to facilitate movement between the isthmus area and the eastern sector of the island. The investigation revealed that the site has three discrete loci, that the abundant chert knapping waste includes no evidence of microblade manufacture, that three stone alignments probably are of cultural origin, and that relatively abundant mortar fragments imply acquisition and processing of plant foods. The radiocarbon date indicated middle Holocene occupation.

Potential of collections and data for future research

The site should yield abundant evidence of chert knapping activity prior to the development of the microblade production industry. The stone alignments, which may be remains of dwellings, are unique on the island. Their presence implies that there may be potential to investigate household activities.

Project name (or basic description)

Upper Renegade Canyon survey

Principal investigator

Sam Spaulding and Georganna Hawley

Institutional sponsor

Channel Islands National Park

Dates of fieldwork
17 December 2001 and 25 February 2002

Published and unpublished mss.
None

Geographic location(s) of fieldwork
Renegade Canyon complex refers to a canyon and its tributaries east of the Navy tracking station and Los Pinos del Sur. "Renegade Canyon" is an informal name given by park personnel during the period when feral sheep were being rounded up for removal from the island.

Site nos. or locations from which data were collected
Three sites were visited, designated in field notes as sites 5, 6, and 7.

Theoretical and empirical goals of research
To determine whether 12 proposed locations for fox kennels to be used in the captive breeding program contained cultural resources.

Types of data collected (collections, site records forms, field records)
Artifacts were noted, but none was collected.

Person-days and crew size
Apparently two people worked for two days (one day during each year), equaling a total of four person-days.

Field procedures (and laboratory procedures as applicable)
Not described

Location and nature of the archaeological collections and associated documentation
Field notes are on file at Channel Islands National Park.

Significant descriptive and theoretical conclusions of the research
Three sites were discovered, but they were not recorded, or perhaps they were previously recorded.

Potential of collections and data for future research
The sites undoubtedly have potential to yield information about subsistence-settlement systems.

Project name (or basic description)
Site record updating in the Scorpion Canyon watershed

Principal investigator
Mike Kaberline

Institutional sponsor
Channel Islands National Park

Dates of fieldwork
8 May, 4-7 August, 16 September, and 28 December 2002 and 24 January 2003

Published and unpublished mss.
None

Geographic location(s) of fieldwork
Scorpion Canyon watershed

Site nos. or locations from which data were collected
CA-SCRI-610, 614, 630, 639, 657, 659, 683, 691, 692

Theoretical and empirical goals of research
To locate and verify the accuracy of information on site records for previously recorded sites

Types of data collected (collections, site records forms, field records)
Updating information on site record forms, sketch maps of each site, and UTM coordinates recorded with a GPS receiver

Person-days and crew size
One person worked for eight days, equaling a total of eight person-days.

Field procedures (and laboratory procedures as applicable)
Reconnaissance involving visits to previously recorded sites

Location and nature of the archaeological collections and associated documentation
Updated site records are on file at the Central Coast Information Center and Channel Islands National Park.

Significant descriptive and theoretical conclusions of the research
Some information on original site record forms was found to be inaccurate or incomplete.

Potential of collections and data for future research
Not applicable

Project name (or basic description)
Survey and Site Recording in the Loma Pelona and Los Pinos del Sur Areas of Santa Cruz Island, California

Principal investigator
Michael A. Glassow

Institutional sponsor
Department of Anthropology, UCSB (Anthropology 181 field class)

Dates of fieldwork
11-12 May 2002

Published and unpublished mss.
Glassow 2002c

Geographic location(s) of fieldwork
Loma Pelona and Los Pinos del Sur vicinities in the "isthmus" area of the island overlooking the south coast

Site nos. or locations from which data were collected
CA-SCRI-726-728

Theoretical and empirical goals of research
To document locations of sites on Channel Islands National Park property for purposes of their incorporation into the Park's cultural resource management program

Types of data collected (collections, site records forms, field records)
Standard site record forms were filled out for all three sites encountered.

Person-days and crew size
A crew of 25 spent two days in survey and site recording, for a total of 50 person-days.

Field procedures (and laboratory procedures as applicable)
Intensive systematic survey of lands less than about 15 degrees slope

Location and nature of the archaeological collections and associated documentation
Field journal on file at the Central Coast Information Center, Department of Anthropology, UCSB

Significant descriptive and theoretical conclusions of the research
This southern segment of the island's isthmus contains a very low density of sites compared to most other areas of the island, and those sites present are small, with low densities of cultural remains.

Potential of collections and data for future research
Investigation of these sites would provide information about settlement systems on the island at the times these sites were occupied. In particular, insight may be gained into why some parts of the island were minimally inhabited in comparison to other parts.

Project name (or basic description)
Testing of CA-SCRI-82 and 89 and surface collection at CA-SCRI-754

Principal investigator
Jennifer E. Perry

Institutional sponsor
Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork
25-27 and 30 June 2002

Published and unpublished mss.
No formal report was prepared, but a cursory handwritten report was filed with Channel Islands National Park.

Geographic location(s) of fieldwork
CA-SCRI-82 and 89 are about 500 m northeast of Campo del Norte. CA-SCRI-754 is about 500 m southwest of the main part of Los Pinos del Sur.

Site nos. or locations from which data were collected
CA-SCRI-82, 89, and 754 (the latter known as the Midway site).

Theoretical and empirical goals of research
To assess the significance of each site and determine whether use of a proposed campground nearby would affect them

Types of data collected (collections, site records forms, field records)
Seven auger samples from CA-SCRI-82 and five auger samples from CA-SCRI-89. Only a surface collection was acquired from CA-SCRI-754. Maximum depth of deposits encountered at CA-SCRI-82 was 90 cm, but the average depth was less than 50 cm; maximum depth at CA-SCRI-89 was 60 cm. Artifacts collected included two stone mortars (fragments?). Very few surface artifacts were collected from CA-SCRI-754. Maps of each site were made.

Person-days and crew size
A crew of five worked for 1.5 days at each of the auger-tested sites, equaling a total of 15 person-days. A crew of four worked one day at CA-SCRI-754, equaling a total of four person-days.

Field procedures (and laboratory procedures as applicable)
Testing at CA-SCRI-82 and 89 was with a 10 cm diameter bucket auger. All deposits were sifted through eighth-inch mesh screen and all material caught by the screen was retained for laboratory processing.

Location and nature of the archaeological collections and associated documentation
Collections and field records currently are housed at Pomona College.

Significant descriptive and theoretical conclusions of the research
CA-SCRI-82 and 89 contain relatively shallow but nonetheless significant deposits. The development of a campground will not disturb them, and there is little likelihood that campers will disturb the deposits. CA-SCRI-754 is unlikely to be affected by hikers, particularly because few or no artifacts are on its surface.

Potential of collections and data for future research
The sites and the collections from them have potential to yield information about subsistence and settlement in this sector of the island.

Project name (or basic description)
Geophysical survey at western Santa Cruz Island sites

Principal investigator
Daniel Larson and Elizabeth Ambos, with the assistance of Michael Glassow

Institutional sponsor
Department of Anthropology, California State University, Long Beach, and Department of Anthropology, UCSB (supported by CSU Long Beach's NSF-funded Geoscience Diversity Enhancement Program)

Dates of fieldwork
15-19 July 2002 and 7-11 July 2003

Published and unpublished mss.
Glassow 2003 (No separate journal or report exists for the fieldwork in 2002.)

Geographic location(s) of fieldwork
West end of island

Site nos. or locations from which data were collected
CA-SCRI-328,329, 330, and 333. The bulk of the investigation occurred at CA-SCRI-333.

Theoretical and empirical goals of research
To assess the prospect of geophysical survey to locate house floors and other distinctive features within shell midden deposits, and to expose community college students to geoscience research (including geoarchaeology)

Types of data collected (collections, site records forms, field records)
At CA-SCRI-333, ground-penetrating radar and magnetometer instruments were used to collect data from four contiguous 60x60 m grids. Within one of these grids seven auger samples were obtained to determine the source of an anomaly in the geophysical data.

Person-days and crew size

The 2002 crew consisted of 10 people working for two days, equaling 20 person-days. The 2003 crew consisted of 11 people working for two days, equaling 22 person-days.

Field procedures (and laboratory procedures as applicable)

The geophysical survey entailed standard procedures. The auger samples were excavated in 20-cm levels with all deposits sifted through eighth-inch mesh screen and all that was caught by the screens retained. Depths of auger samples ranged between 230 and 280 cm deep. Two radiocarbon dates were obtained from the lowermost levels of one of the column samples.

Location and nature of the archaeological collections and associated documentation

Collections are currently unaccessioned and are housed by the Department of Anthropology, UCSB. The journal associated with the 2003 fieldwork and the radiocarbon dating documents are in the possession of Michael Glassow.

Significant descriptive and theoretical conclusions of the research

The geophysical survey results are equivocal in that they did not discern the house floors associated with surface house depressions. The auger samples verified that the stratigraphic distinction between red abalone midden deposits and overlying later deposits extends westward from Wilcoxon's excavations in the 1980s.

Potential of collections and data for future research

The auger sample collections would be useful to any analysis of data derived from Wilcoxon's collections.

Project name (or basic description)

Survey of a location for dog kennels

Principal investigator

Ray Corbett

Institutional sponsor

Channel Islands National Park

Dates of fieldwork

12 August 2002

Published and unpublished mss.

None

Geographic location(s) of fieldwork

Vicinity of the Main Ranch Airfield

Site nos. or locations from which data were collected
CA-SCRI-775

Theoretical and empirical goals of research
To determine whether archaeological resources are present in a location proposed for construction of kennels for dogs used in the pig eradication project.

Types of data collected (collections, site records forms, field records)
Completion of a site record form

Person-days and crew size
One person worked for one day, equaling one person-day.

Field procedures (and laboratory procedures as applicable)
Intensive survey of alternative locations near the western end of the Main Ranch Airfield

Location and nature of the archaeological collections and associated documentation
Apparently no field records were generated aside from one site record form.

Significant descriptive and theoretical conclusions of the research
Documentation of a site in this locality

Potential of collections and data for future research
Information from the site can contribute to subsistence-settlement studies on the island.

Project name (or basic description)
Survey of proposed fence lines in advance of pig fence construction

Principal investigator
Georganna Hawley, Sam Spaulding, Ray Corbett

Institutional sponsor
Channel Islands National Park and The Nature Conservancy

Dates of fieldwork
May through September 2003 (based on dates on site records submitted to the Central Coast Information Center)

Published and unpublished mss.
None

Geographic location(s) of fieldwork
Various locations throughout the island from the isthmus westward

Site nos. or locations from which data were collected

CA-SCRI-445 (update), CA-SCRI-755-774

Theoretical and empirical goals of research
To document archaeological sites along the routes of pig containment fences so that impacts to them could be avoided to the extent possible. This fieldwork is related to the pig eradication program that is part of the Santa Cruz Island Restoration Project.

Types of data collected (collections, site records forms, field records)
Completed site record forms, surface collections

Person-days and crew size
One to three people per day for an unknown number of days.

Field procedures (and laboratory procedures as applicable)
Survey along proposed fence lines

Location and nature of the archaeological collections and associated documentation
Santa Barbara Museum of Natural History and the Channel Islands National Park headquarters

Significant descriptive and theoretical conclusions of the research
Documentation of sites in various unsurveyed parts of the island

Potential of collections and data for future research
The site data and collections can contribute to subsistence-settlement studies on the island.

Project name (or basic description)
Survey and site recording on the west end marine terrace

Principal investigator
Michael A. Glassow (2006 fieldwork directed by Nathan Craig)

Institutional sponsor
Department of Anthropology, UCSB (Anthropology 181 field classes)

Dates of fieldwork
15-16 May 2004, 13-14 May 2006, 10-11 May 2008

Published and unpublished mss.
Craig 2006; Glassow 2004a, 2008b

Geographic location(s) of fieldwork
Marine terrace lands from Black Point Canyon toward Forney's Cove, south of Fraser Point Road

Site nos. or locations from which data were collected

CA-SCRI-783-795 (in 2004), no site records submitted for work in 2006, nine sites recorded in 2008

Theoretical and empirical goals of research

To document sites within the zone of the island containing the highest density of sites with large volumes of midden deposits, in anticipation of the need to justify excluding this area from public access in the future as a management plan for cultural resources develops

Types of data collected (collections, site records forms, field records)

Standard site record forms were filled out for some but not all of the sites encountered during survey.

Person-days and crew size

In 2004, a crew of 21 worked two days for a total of 42 person-days; in 2006 a crew of 17 worked two days for a total of 34 person-days; in 2008 a crew of 17 worked two days for a total of 34 person-days.

Field procedures (and laboratory procedures as applicable)

Intensive systematic survey. Survey was restricted to the terrace lands and did not include the ravines, some of which contain rock shelters. However, in 2006 a small effort was devoted to investigating one or more of the ravines.

Location and nature of the archaeological collections and associated documentation

Field journals are on file at the Central Coast Information Center, Department of Anthropology, UCSB.

Significant descriptive and theoretical conclusions of the research

The density of sites and the volume of their deposits appears to increase from Black Point Canyon toward Forney's Cove. Many of the larger sites contain house depressions, implying that they were principal residential bases within settlement systems.

Potential of collections and data for future research

The large volumes of deposits at many of the site and the diversity of faunal remains indicates that sites in this zone have the potential to yield considerable information about the island's prehistory.

Project name (or basic description)

Investigation of chert quarries on eastern Santa Cruz Island

Principal investigator

Christopher Jazwa and Jennifer Perry

Institutional sponsor

Department of Anthropology, Pomona College

Dates of fieldwork
24-27 July and 6-13 August 2004

Published and unpublished mss.
Jazwa 2005; Perry and Jazwa 2010

Geographic location(s) of fieldwork
Dispersed location in the El Montañon vicinity and eastern sector of the island

Site nos. or locations from which data were collected
CA-SCRI-93, 394, 395, 408, 409, 412, 414, 415, 417, 419, 610, 611, 627, 628, 629, 630, 632, 633, 634, 637, 638, 693, and 748

Theoretical and empirical goals of research
To acquire standardized information from island quarry sites with the goal of understanding the spatial and temporal patterning in chert exploitation at chert quarries

Types of data collected (collections, site records forms, field records)
Updated information for site records, photographs, and samples of non-artifact chert

Person-days and crew size
A crew of two worked for 11 days, equaling 22 person-days.

Field procedures (and laboratory procedures as applicable)
Site visits to known chert quarry sites. Samples of chert, and shells for radiocarbon dating, were collected from the surface. To collect a shell sample for radiocarbon dating, an auger sample was collected from CA-SCRI-408, which indicated deposits are 50 cm deep in the densest midden deposits of the site.

Location and nature of the archaeological collections and associated documentation
Collections and field notes are housed at Pomona College, although some chert samples are with Jazwa at the University of Rhode Island.

Significant descriptive and theoretical conclusions of the research
Chert quarries are widely dispersed in the eastern sector of the island, and many date to the middle Holocene. However, many quarries have evidence of late Holocene use, indicated by the presence of the earlier form of microblade, the trapezoidal form. Apparently many of the relatively large flakes produced by middle Holocene users of quarries were used in the production of these microblades.

Potential of collections and data for future research
Investigation of these quarry sites would yield information about the nature and chronology of quarrying activity and the production of flakes stone tools, many of which were exported to other parts of the island and to other Channel Islands.

Project name (or basic description)
Recovery of perishable artifacts, a comal fragment, and a swordfish bill from eroding deposits at CA-SCRI-192

Principal investigator
Dustin McKenzie and Terry Joslin

Institutional sponsor
Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork
One day during Fall 2004

Published and unpublished mss.
None

Geographic location(s) of fieldwork
The seacliff edge of CA-SCRI-192, Morse Point

Site nos. or locations from which data were collected
CA-SCRI-192

Theoretical and empirical goals of research
Recovery of distinctive artifacts that were about to fall down the seacliff

Types of data collected (collections, site records forms, field records)
Collected specimens include a swordfish bill, a long segment of braided cordage, and a steatite comal fragment. The collected data are summarized in field notes prepared by McKenzie and Joslin (2004).

Person-days and crew size
Three people spent approximately two hours in the recovery, for a total of somewhat less than a person-day.

Field procedures (and laboratory procedures as applicable)
A trowel was used to expose those portions of the artifacts still within deposits. The locations of the objects were located with respect to the site datum, and UTM coordinates were collected. Depths of finds also were recorded. Additional cordage or a matt or lens of sea grass was visible in the deposit. However, due to the concern that excavating into the seacliff would further destabilize the already eroding deposit, the materials were left in situ.

Location and nature of the archaeological collections and associated documentation
The objects and associated field notes were transferred to Jeanne Arnold at UCLA so that the artifacts could be incorporated with her collections from the site.

Significant descriptive and theoretical conclusions of the research

These finds demonstrate the presence of a variety of distinctive artifacts within the site deposits, as well as the high degree of preservation of relatively perishable artifacts.

Potential of collections and data for future research

The artifacts would have significance when combined with other similar finds during past and future investigation at the site.

Project name (or basic description)

Test excavation at sites in the vicinity of Scorpion Anchorage

Principal investigator

Jennifer Perry

Institutional sponsor

Department of Anthropology, Pomona College

Dates of fieldwork

Investigation at CA-SCRI-693 took place 3-5 March 2005; investigation at CA-SCRI-724 took place 5-10 October 2006.

Published and unpublished mss.

Perry 2007b; Perry and Hoppa n.d.

Geographic location(s) of fieldwork

Between Scorpion and Little Scorpion Canyons

Site nos. or locations from which data were collected

CA-SCRI-693 and 724

Theoretical and empirical goals of research

To expand knowledge of middle Holocene occupation in the eastern sector of the island, particularly with regard to chert exploitation, and assess the significance and condition of sites in areas of relatively intensive public visitation. Perry also is considering data from nearby CA-SCRI-698, acquired in 2002 in the context of her dissertation research.

Types of data collected (collections, site records forms, field records)

Samples of midden constituents; field records

Person-days and crew size

At CA-SCRI-724 a crew of 2-7 people worked for seven days, equaling a total of 21 person-days. At CA-SCRI-693, a crew of seven worked for 2.5 days, equaling a total of 18 person-days.

Field procedures (and laboratory procedures as applicable)

Excavation of 20x20 cm column samples at CA-SCRI-693, one at each site, and two 0.5x1 m units, a one 1x1 m unit, and one 20x20 cm column sample at CA-SCRI-724

Location and nature of the archaeological collections and associated documentation
Collections and field records are housed at Pomona College.

Significant descriptive and theoretical conclusions of the research
CA-SCRI-724 appears to be one of the two largest middle Holocene residential bases on the eastern end of the island, CA-SCRI-608 being the other. Analysis of collections is still ongoing.

Potential of collections and data for future research
All three sites contain substantial intact deposits. Existing collections can contribute to studies of middle Holocene settlement and subsistence, as well as flaked stone production and use, given the chert quarries at or near CA-SCRI-693 and 724.

Project name (or basic description)
Testing of CA-SCRI-627

Principal investigator
Jennifer E. Perry

Institutional sponsor
Department of Anthropology, Pomona College

Dates of fieldwork
Collecting topographic data for a map and updating of the site record and recognition of the shell midden deposit occurred 16-17 April 2005. Auger sampling took place 24-26 March 2006.

Published and unpublished mss.
Perry 2007b

Geographic location(s) of fieldwork
On high land immediately northwest of Scorpion Anchorage

Site nos. or locations from which data were collected
CA-SCRI-627

Theoretical and empirical goals of research
To document the nature and extent of the shell midden for Channel Islands National Park in light of a hiking trail passing over it

Types of data collected (collections, site records forms, field records)
Collections from auger samples and field notes

Person-days and crew size

The 2005 fieldwork entailed a crew of nine working for two days, equaling a total of 14 person-days (crew members were not preoccupied all the time). The 2006 fieldwork entailed a crew of five working for three days, equaling a total of 15 person-days.

Field procedures (and laboratory procedures as applicable)

Ten auger samples with depths below surface not exceeding 50 cm. All material from the auger holes was sifted through eighth-inch mesh screens, and all material caught by the screens was retained. Only the larger than quarter-inch portion of the collections was processed.

Location and nature of the archaeological collections and associated documentation

Collections and field records are housed at Pomona College.

Significant descriptive and theoretical conclusions of the research

Aside from quarrying of chert, microblade production and biface manufacture occurred at the site. Radiocarbon dates indicate middle Holocene occupation, and the presence of a trapezoidal microblade and microblade core indicate terminal Middle period occupation.

Potential of collections and data for future research

The collections have the potential to yield information about chert tool production and subsistence activities. Given that the site was a chert quarry, it has the potential to yield information about quarrying activities during the time intervals of site occupation.

Project name (or basic description)

Test excavation at CA-SCRI-555 and 574

Principal investigator

Michael Glassow

Institutional sponsor

Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork

14-18 July 2005

Published and unpublished mss.

Glassow 2005a

Geographic location(s) of fieldwork

CA-SCRI-555 is located adjacent to the Ridge Road about 800 m east of the turnoff down to Centinela, and CA-SCRI-574 is on a ridge rising up to the main North Ridge of the island, the base of which is just northeast of the eastern in of the Christy Ranch Airfield.

Site nos. or locations from which data were collected

CA-SCRI-555 and 574

Theoretical and empirical goals of research

The immediate research objectives were to obtain small samples to characterize the nature of the midden deposits at each site and samples for radiocarbon dating. The larger objective was to increase the number of dated interior sites to verify whether most were occupied during the latter part of the Middle Holocene.

Types of data collected (collections, site records forms, field records)

One-eighth-inch screened midden samples, total-station data for production of a topographic map of each site, unit record forms, field journal, 35 mm color slides.

Person-days and crew size

A crew of five worked two full days, for a total of 10 person-days.

Field procedures (and laboratory procedures as applicable)

Units at both sites were 20x20 cm in area. Three units were excavated at CA-SCRI-555 in arbitrary 10-cm levels unless a stratigraphic break was observed, their depths reaching 20, 22, and 30 cm. Two units were excavated at CA-574, reaching depths of 40 and 50 cm. All deposits were sifted through 1/8-inch mesh screens, and everything caught by the screens was retained for transport back to the mainland. A total station was used to obtain data for topographic maps.

Location and nature of the archaeological collections and associated documentation

Collections are still being processed in a laboratory at the University of California, Santa Barbara. All documentation is being kept by Glassow in his laboratory, but the journal is on file at the Central Coast Information Center.

Significant descriptive and theoretical conclusions of the research

The one date for CA-SCRI-555 turned out to be significantly older than expected, at about 6400 BP, whereas occupation at CA-SCRI-574 was occupied between about 4500 and 4200 BP, which is slightly older than expected.

Potential of collections and data for future research

The archaeological deposits at both sites are largely intact and therefore can yield information about interior occupation on the island. Additional radiocarbon dates derived from collected shell samples would be necessary to refine the chronological information.

Project name (or basic description)

Search for Late Pleistocene/Early Holocene deposits

Principal investigator

Michael Glassow and Amy Gusick

Institutional sponsor

Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork

21-22 September 2006, 17-18 December 2006, and 27 March 2007

Published and unpublished mss.

Glassow 2006, 2007; Gusick 2006

Geographic location(s) of fieldwork

Ravine edges northwest of Black Point, seacliffs overlooking Christy Beach, a locality overlooking the north coast between Del Mar Cove and West Point, the seacliff overlooking Christy Beach just south of the mouth of Cañada Christy, and the mouth of Alegría Canyon

Site nos. or locations from which data were collected

CA-SCRI-282 and 797, a small rockshelter near CA-SCRI-797, CA-SRI-480, CA-SCRI-485

Theoretical and empirical goals of research

The objective was to locate archaeological deposits that date to periods before about 9000 BP, which Gusick could investigate as a dissertation project, given her interests in the earliest occupation along the Pacific coast and the coastal migration hypothesis.

Types of data collected (collections, site records forms, field records)

Samples for radiocarbon dating; no midden samples were collected from auger samples.

Person-days and crew size

September 2006 fieldwork: 6 people worked 2 days, for a total of 12 person-days
December 2006 fieldwork: 4 people worked 2 days, for a total of 8 person-days
March 2007 fieldwork: 3 people worked for a half day, for a total of 1.5 person-days

Field procedures (and laboratory procedures as applicable)

The September 2006 entailed a visit to a recorded site and reconnaissance; no formal survey or excavation took place. The December 2006 fieldwork entailed collecting 10 cm diameter bucket auger samples from CA-SCRI-282 and 797, completing a site record form for CA-SCRI-797 (Berm Rockshelter), collecting a shell for radiocarbon dating at the base of deposits at CA-SCRI-480 at the seacliff, and collecting a shell sample for radiocarbon dating from the lower stratum at CA-SCRI-485 exposed by erosion. The augering had the specific purpose of obtaining shells large enough for conventional radiocarbon dating from basal deposits; no midden samples were collected. Augering encountered a rock at CA-SCRI-282 at 110 cm and did not reach the base of deposits at CA-SCRI-797. The March 2007 fieldwork entailed completion of the augering at CA-SCRI-797 in order to reach the base of the deposits (at 226 cm) and augering at a small nearby rockshelter, which terminated upon hitting a rock at 40 cm without collection of a sample.

Location and nature of the archaeological collections and associated documentation

Journals are on file at the Central Coast Information Center. The radiocarbon samples having been obtained, samples collected no longer exist.

Significant descriptive and theoretical conclusions of the research

The radiocarbon date for CA-SCRI-282 basal deposits is of late Holocene age, the dates for CA-SCRI-797 and CA-SCRI-485 are of middle Holocene age, and the date for CA-SCRI-480 is of terminal early Holocene age.

Potential of collections and data for future research

Although the sites did not contain evidence of pre-9000 BP deposits, their middens are intact and have the potential to yield information relevant to subsistence-settlement studies.

Project name (or basic description)

Collection of column samples from CA-SCRI-480

Principal investigator

Michael Glassow and Heather Thakar-Hucks

Institutional sponsor

Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork

28 March 2007

Published and unpublished mss.

Glassow, Gusick, and Thakar-Hucks 2007

Geographic location(s) of fieldwork

Bluff overlooking the south side of the mouth of Cañada Christy

Site nos. or locations from which data were collected

CA-SCRI-480

Theoretical and empirical goals of research

Obtain midden samples of deposits containing high concentrations of pismo clam shells, with the objective of determining whether the periods during which large numbers of pismo clams were collected correlate with time intervals when Patricia Masters proposed that sandy beaches were more prevalent than before or after.

Types of data collected (collections, site records forms, field records)

Two column samples were collected. Aside from the journal, a sketch map, and digital photographs in Glassow's possession document the project.

Person-days and crew size

Three people worked one day, for a total of three person-days.

Field procedures (and laboratory procedures as applicable)

One column sample was excavated from surface in a shallow Late period deposit to a depth of 15 cm; the other was excavated from a trimmed seacliff exposure to a depth of 50 cm. Both were excavated with a trowel, and deposits were divided into natural strata. All deposits from each stratum were sifted through a 1/8-inch mesh screen, and everything caught by the screen was bagged for transportation back to the mainland.

Location and nature of the archaeological collections and associated documentation

The collections are undergoing processing, and Thakar-Hucks is analyzing the resulting data for a research paper that is a requirement for advancement to candidacy.

Significant descriptive and theoretical conclusions of the research

None yet

Potential of collections and data for future research

The Late period deposit is limited in area and has been severely affected by erosion and wind deflation. It may relate to the Late period occupation at sites overlooking Christy Beach to the north, and as such would provide data on the nature of Late period settlement at this locality. Deposits dating earlier in time have been affected by seacliff erosion, but substantial amounts apparently still exist.

Project name (or basic description)

Summer field school test excavation at Central Valley sites

Principal investigator

Matthew des Lauriers and Jennifer Perry

Institutional sponsor

California State University, Northridge, and Pomona College

Dates of fieldwork

19-22 and 24-29 June 2007

Published and unpublished mss.

None

Geographic location(s) of fieldwork

Two sites in vicinity of the University of California field station

Site nos. or locations from which data were collected

CA-SCRI-384 and CA-SCRI-801 (the latter had the temporary designation JEP-47 until 2009)

Theoretical and empirical goals of research

To learn more about subsistence and settlement in the interior of the island and to investigate protohistoric/historic occupation of the island.

Types of data collected (collections, site records forms, field records)
Collections of stone, bone, and shell materials from excavation units.

Person-days and crew size
A crew of seven worked for 10 days at the sites, equaling a total of 70 person-days.

Field procedures (and laboratory procedures as applicable)
Eleven 10-cm diameter auger samples, one 20x20 cm column sample, a 1x1 m unit and a 1x1.5 m unit were excavated at CA-SCRI-801. A 0.5x2.0 m trench was excavated at CA-SCRI-384. All items caught by eighth-inch mesh screens was retained.

Location and nature of the archaeological collections and associated documentation
Collections from CA-SCRI-801 are stored at Pomona College. Collections from CA-SCRI-384 are being processed and studied at University of California, Santa Barbara.

Significant descriptive and theoretical conclusions of the research
Evidence of protohistoric/historic occupation was discovered at both sites, although CA-SCRI-801 may also have deposits dating earlier in time. These two sites, as well as CA-SCRI-324, may have formed the ethnographically recorded Chumash village of Nimatlala.

Potential of collections and data for future research
Both sites have considerable potential to produce information about subsistence and settlement in the island's interior during protohistoric-historic times.

Project name (or basic description)
UCSB Extension course in ground-penetrating radar applications

Principal investigator
Steven Koppenjan and Michael Glassow (aided by Lawrence Conyers, Dean Goodman, and Billy Silva)

Institutional sponsor
Extended Learning Services and Department of Anthropology, UCSB

Dates of fieldwork
23 June and 8 August 2007

Published and unpublished mss.
Koppenjan et al. 2008

Geographic location(s) of fieldwork
Sites overlooking Christy Beach

Site nos. or locations from which data were collected
CA-SCRI-236 and 549

Theoretical and empirical goals of research
To assess the utility of ground-penetrating radar to detect house floors with in shell midden deposits and midden deposits buried under alluvium; to demonstrate the collection and analysis of ground-penetrating radar data

Types of data collected (collections, site records forms, field records)
Ground-penetrating radar data and grid maps showing certain topographic features

Person-days and crew size
Three people for one day in June and 12 people for one day in August; total person-days equals 15.

Field procedures (and laboratory procedures as applicable)
A ground-penetrating radar instrument was used to survey two overlapping grids at CA-SCRI-549 and one grid at CA-SCRI-236. A magnetometer also was used during the June fieldwork. As well, five bucket auger samples were excavated at CA-SCRI-549 to investigate anomalies in the ground-penetrating radar data. No samples were collected, and augering stopped if midden was discovered.

Location and nature of the archaeological collections and associated documentation
All data collected are presented in the publication; field copies of grid maps are in possession of Michael Glassow.

Significant descriptive and theoretical conclusions of the research
Ground-penetrating radar had equivocal success in discovering buried middens, but the middens must be less than a half meter below the surface. The technique also is able to detect house floors within depressions, implying that it would detect house floors when depressions are not present. Finally, some anomalies may be a product of variation in the amount of clay and moisture in the soil.

Potential of collections and data for future research
Ground-penetrating radar has some potential to discover buried archaeological phenomena in shell middens, but more experimentation will be necessary to understand the conditions affecting success.

Project name (or basic description)
Collection of radiocarbon samples and a column sample from CA-SCRI-492

Principal investigator
Michael Glassow

Institutional sponsor
Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork
20-21 July 2007

Published and unpublished mss.
Glassow 2007

Geographic location(s) of fieldwork
Collection of samples from site deposits took place only at CA-SCRI-492, southeast of the mouth of Alegría Canyon. CA-SCRI-109 at Punta Arena was visited, but only a sample of sea water was collected.

Site nos. or locations from which data were collected
CA-SCRI-492

Theoretical and empirical goals of research
The immediate objective was to obtain small midden samples to characterize the density of different shell taxa and shell samples for radiocarbon dating. As the deposits at this site have an unusually high density of sea urchin remains, a research objective was to determine when sea urchin was collected and determine whether the time of site occupation correlated with distinct environmental events, such as sea water temperature fluctuation.

Types of data collected (collections, site records forms, field records)
Three black abalone shells were collected from an erosional exposure as radiocarbon samples. Three midden samples 8x15 cm in area and 10 cm thick also were collected from the exposure.

Person-days and crew size
Three people worked for about an hour, for about a third of a person-day.

Field procedures (and laboratory procedures as applicable)
Samples were removed from a nearly vertical erosion exposure using a trowel. These were brought back to the mainland for processing.

Location and nature of the archaeological collections and associated documentation
The collections are still unprocessed and are housed in Glassow's laboratory. Digital photographs are in Glassow's possession. Aside from the journal, no other records exist.

Significant descriptive and theoretical conclusions of the research
None as yet

Potential of collections and data for future research
The site has been significantly affected by erosion along a ravine wall and the seacliff, but substantial deposits remain. The three midden samples have limited research potential, in

part because a stratigraphic distinction bisects one of the sample, which was not recognized until the sample was collected.

Project name (or basic description)
Collection of radiocarbon and midden samples from buried archaeological deposits at CA-SCRI-798

Principal investigator
Michael Glassow and Amy Gusick

Institutional sponsor
Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork
1 March 2008

Published and unpublished mss.
Glassow 2008a

Geographic location(s) of fieldwork
The north wall of a steep-sided ravine bisecting the marine terrace near the north end of Christy Beach. One smaller ravine is directly north of this one before the land rises to the hills beyond.

Site nos. or locations from which data were collected
CA-SCRI-798

Theoretical and empirical goals of research
The immediate objective was to obtain radiocarbon samples to date the buried archaeological deposits visible on the ravine wall, which is an element in Gusick's efforts to locate late Pleistocene/early Holocene deposits in the island that would inform on its earliest occupants.

Types of data collected (collections, site records forms, field records)
Individual shells were collected for radiocarbon dating, and grab samples of midden deposits were collected to characterize the basic characteristics of the deposits.

Person-days and crew size
Four people worked for one day, for a total of four person-days.

Field procedures (and laboratory procedures as applicable)
Two different strata were investigated, one about 3.75 m and the other about 5 m below surface. Because of his training and possession of appropriate gear, Don Morris rappelled down the face of the ravine and collected the samples with a trowel. These were brought to the surface in a bucket. Photographic documentation took place from the opposite side of the ravine.

Location and nature of the archaeological collections and associated documentation

Collections are housed in Glassow's laboratory. Aside from the journal, photographs document the location and collection procedures and are in the possession of Glassow. Radiocarbon date records are in both Glassow's and Gusick's possession.

Significant descriptive and theoretical conclusions of the research

Radiocarbon dating revealed that the lowermost stratum actually represents some sort of slump of a block of deposits, as they date to about 3600 BP. The upper stratum, however, dates to about 8500 BP.

Potential of collections and data for future research

Although the strata are limited in horizontal extent, larger samples could be collected.

Project name (or basic description)

Archaeological survey of Poretezuela and Centinela areas

Principal investigator

Kristina Gill and Terry Jones

Institutional sponsor

Department of Social Sciences, Cal Poly San Luis Obispo

Dates of fieldwork

24-26 May 2008

Published and unpublished mss. (in style of *American Antiquity* text citation)

Gill's field notes in her possession.

Geographic location(s) of fieldwork

A series of five areas in the Portezuela and Centinela localities; the two in Portezuela are adjacent to each other.

Site nos. or locations from which data were collected

SCRI-812, 813, 814, 815, and 816 plus six other sites not yet formally recorded

Theoretical and empirical goals of research

The purpose of this trip was to instruct undergraduate students in archaeological survey methods, site recording, and site mapping and to identify additional sites in the island's interior, particularly sites associated with bedrock mortars. The data collected from the survey will supplement other survey data for Gill's dissertation research.

Types of data collected (collections, site records forms, field records)

Site records for five new sites and plotting of the locations of six additional sites not yet formally recorded; field notes of several students.

Person-days and crew size

22 people (5 staff, 17 students) worked for 3 days, equaling a total of 66 person-days.

Field procedures (and laboratory procedures as applicable)

Students were divided into five teams, each with a survey area designated on a 7.5' topographic map. Any previously recorded sites/previously surveyed areas were shown on the maps provided to each group so as to not to be re-recorded. In more topographically flat areas, students walked transects approximately 10 m apart. In steeper areas, or areas of dense vegetation, more discretion was utilized (i.e., targeting flat areas, bedrock outcrops). Each site encountered was plotted the USGS map, its UTM coordinates were recorded with a GPS receiver, and a brief description was prepared. Time was available to record one site per team.

Location and nature of the archaeological collections and associated documentation

No collections were made. Gill's field notes are still in her possession.

Significant descriptive and theoretical conclusions of the research

During the course of the survey, 11 new sites were located, including two sites associated with bedrock mortars. Although still a rare feature of island sites, the addition of these two occurrences implies that bedrock mortars are more common than presumed previously.

Potential of collections and data for future research

The data from this survey will be used in Gill's dissertation research. The sites have the potential to contribute information about resource use in the interior of the island, particularly plant resources.

Project name (or basic description)

Mapping and auger testing at CA-SCRI-549

Principal investigator

Michael Glassow

Institutional sponsor

Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork

29-31 July 2008, 23-26 August 2009

Published and unpublished mss. (in style of *American Antiquity* text citation)

Glassow 2008c, 2009

Geographic location(s) of fieldwork

Near the edge of the bluff overlook the northern end of Christy Beach

Site nos. or locations from which data were collected

CA-SCRI-549

Theoretical and empirical goals of research

To produce a map of the site and to discover and map the extent of buried red abalone midden deposits. The map and knowledge of the extent of the deposits were necessary for developing a research design for a larger-scale investigation of the site than that which occurred in 1997.

Types of data collected (collections, site records forms, field records)

No collections were made aside from a pestle encountered on the surface in one of the gullies bisecting the seacliff. A map of the site shows locations of 60 auger samples, placed on a 3x3m grid, within the terrace segment bounded by a ravine, canyon, and seacliff. A auger test record form was completed for each auger hole dug. Because the 1997 datum could not be relocted despite an extensive search with a metal detector, a new master datum and secondary datum were established, each marked by a 10-inch spike.

Person-days and crew size

In 2008 six people worked for 1.5 days; in 2009 five people worked for three days. Total person-days is 24.

Field procedures (and laboratory procedures as applicable)

The map was produced by measuring with a 100-m tape. The augering entailed use of a 10-cm diameter bucket auger and a breaker bar for breaking rocks encountered during augering. The 60 holes excavated were terminated once red abalone midden was encountered, generally between 0.8 and 1.2 m in depth below surface.

Location and nature of the archaeological collections and associated documentation

The map and auger test record forms are in Glassow's files at UCSB.

Significant descriptive and theoretical conclusions of the research

The buried red abalone midden deposits were discovered to be patchy. The augering procedure proved to be effective in discovering midden deposits.

Potential of collections and data for future research

Not applicable.

CHAPTER 7
PREHISTORIC ARCHAEOLOGICAL RESOURCES ON SANTA ROSA ISLAND

Status of Resource Inventories

Santa Rosa Island (Figure 7.1) has a remarkable archaeological record, with scores of archaeological sites and one of the longest coastal archaeological sequences in the Americas. With the discovery of the Arlington Springs human remains by Phil Orr in 1959 and the recent redating and other work at the site, this record is now known to extend back some 13,000 calendar years (Johnson et al. 2002; Orr 1962a, 1962b). Beginning about 9500 BP, the number and density of known sites increases, with a continuous record through the Historic period (Erlandson et al. 1999; Kennett 2005; Rick, Kennett, and Erlandson 2005a). Scores of shell middens, ranging from large dense village sites to small ephemeral deposits, numerous lithic scatters, submerged sites, and a variety of historic resources dot the Santa Rosa Island landscape.

Since 1975, a variety of archaeological projects entailed investigation of the island's terrestrial archaeological resources. Many of these have been survey projects, including a complete survey of the island's coastline by Morris (n.d.) and survey of five of the island's canyon systems, and parts of at least three others. Excavation of Santa Rosa Island sites, however, has languished during the last 33 years. The most detailed work was Kennett and Morris' excavation of numerous column samples around the island, with some of these results available in Braje, Kennett, Erlandson, and Culleton (2007), Kennett (1998, 2005), Kennett and Conlee (2002), and Rick, Kennett, and Erlandson (2005b). Many of these samples are in the process of being analyzed by Kennett and his students and will be important sources of data. Other projects include small-scale testing in the heavily studied northwest coast locality (e.g., Arlington Canyon region) and on the island's east coast, with other areas seeing comparatively little research (Erlandson 1994; Erlandson and Rick 1999; Erlandson et al. 1999; Johnson et al. 2002; Rick 2004a, 2007b; Rick, Kennett, and Erlandson 2005b; Rick, Robbins and Ferguson 2006; Wolff, Aland, and Rick 2007; Wolff, Rick and Aland 2007). Despite a relatively steady pace of research over the last 33 years, much of Santa Rosa's archaeological record remains greatly underexplored.

There are 705 recorded archaeological sites on Santa Rosa Island. The vast majority of these are prehistoric shell middens and lithic scatters, with a considerably smaller number of historic sites and submerged cultural resources (see Costello, this volume; Morris, this volume; Morris and Lima 1995). One historic site of particular interest is Nidever Cave (SRI-248) located above a drainage across from the ranch complex near Bechers Bay. This cave site was apparently used by George Nidever as a hideout during skirmishes he had with Aleuts during the 19th century fur trade. This is a very poorly understood time in Channel Island history, and this site has never been excavated. Morris (unpublished field notes) noted that this site is threatened and that vehicles passing along a road above the cave are causing sediments to fall into the cave and bury the archaeological deposits. The current status of the site is unknown, but the overburden of sediments is becoming thicker over time.

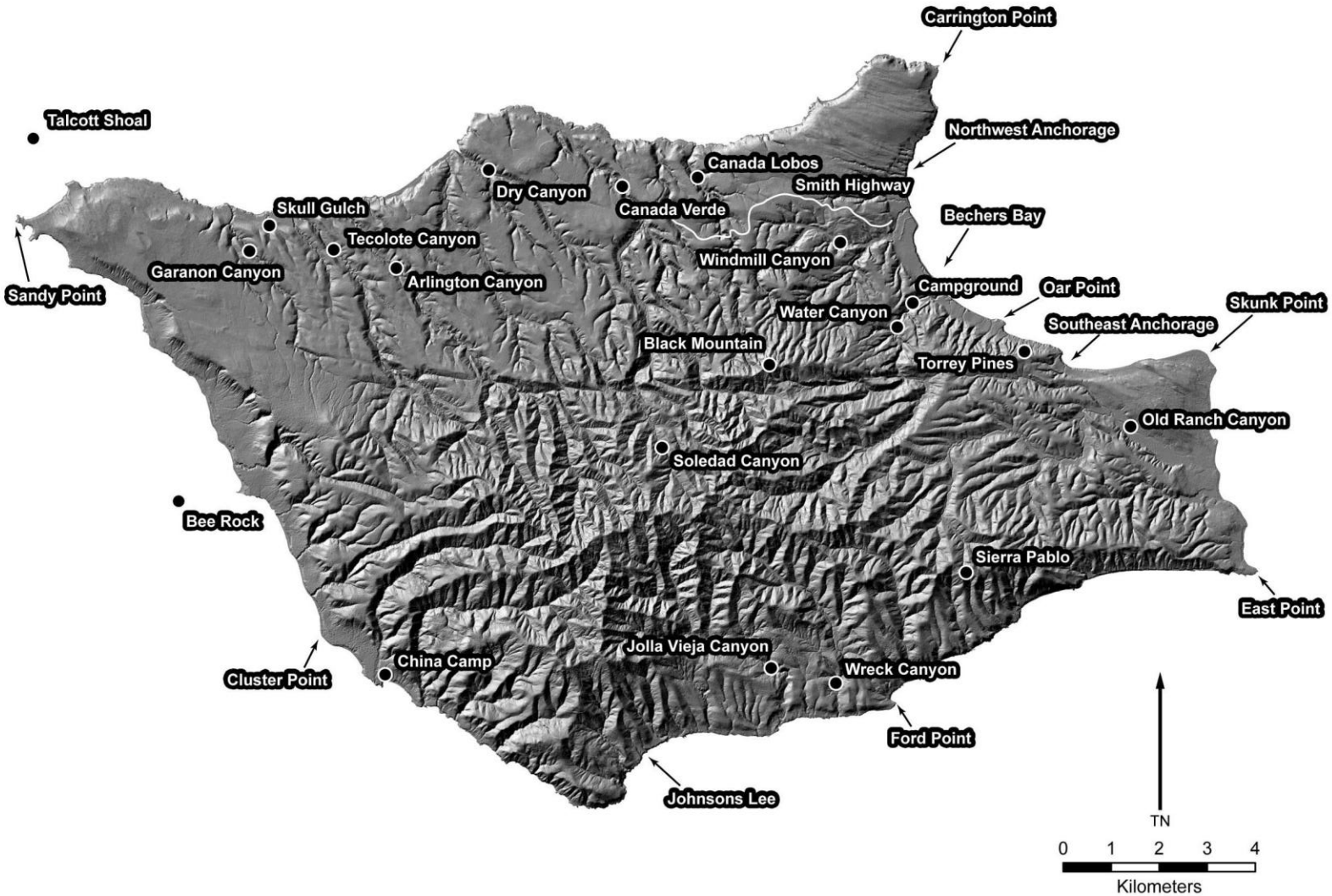

Figure 7.1. Santa Rosa Island showing locations mentioned in this chapter.

Similar to Santa Cruz and San Miguel islands, Santa Rosa also contains a rich record of Historic period Chumash occupation. According to Johnson (Chapter 3; see also 1999b:53) there are eight named Chumash villages on Santa Rosa Island. See Johnson's discussion of these villages and their proposed correlations with archaeological sites in Chapter 3. A ninth village may also have existed on Santa Rosa, but the location is unknown and not correlated with a known archaeological site.

According to Morris (n.d.) approximately 40% of Santa Rosa Island has been surveyed for terrestrial archaeological sites. This is a reasonable estimate, which includes surveys around the entire coastline of the island, and in Canada Verde, Jolla Vieja Canyon, Wreck Canyon, Arlington Canyon, Old Ranch Canyon, parts of Water, Cherry, and Windmill canyons, parts of other canyon watersheds (including Water, Cherry, and Windmill), and a few other localities around the island (Figure 7.2). Given the fact that 705 sites have been recorded, it is likely that some 2000-3000 sites may exist on the island as a whole. Hammersmith-Morris (1993) estimated roughly 1844 sites would be found on the island, about 8 sites per km^2.

In addition to the archaeological projects described above, Glassow et al. (1983) provided detailed descriptions of archaeological research on Santa Rosa Island and the status of collections through the late 1970s and early 1980s. Glassow (1996e) also summarized the history of archaeological research on the island, putting it in a broader research framework. Bentz (1996) prepared a report on overseas Chinese abalone sites on Santa Rosa Island, noting the presence of three sites (SRI-93-47 just west of Johnson's Lee; SRI-91-75 just east of Sandy Point; SRI-96 east of Johnson's Lee) yielding important insight into the abalone fishery on the island and the need for research on this important topic. In addition to these sites, another apparent Chinese abalone deposit is present at SRI-109 at Carrington Point, where it is situated in association with a prehistoric red abalone midden.

The Central Coast Archaeological Information Center at the Department of Anthropology, University of California, Santa Barbara, has copies of 705 site records for Santa Rosa Island, as well as detailed topographic maps with the locations of the archaeological sites. The site records are in various conditions, with the most detailed information available from the Morris (n.d.), Kennett (1996), York (1996), and Rick (2008) surveys done in more recent times. Other site records filled out by Orr and other early researchers generally lack important location (e.g., UTM coordinates) and descriptive details. Kelly Minas, CINP Park Archaeologist, also has visited sites.

Project Descriptions

Since 1975 archaeological research on Santa Rosa Island has proceeded at a fairly steady pace. In the 1980s and 90s, a great deal of emphasis was placed on surveying and inventorying the island's cultural resources. Since this time only one survey has been conducted (Rick's [2008] survey of Old Ranch Canyon), and unfortunately much of the island has not been systematically surveyed. Kennett's column sampling program is easily the most extensive excavation program on the island, with numerous details reported in various publications (e.g.,

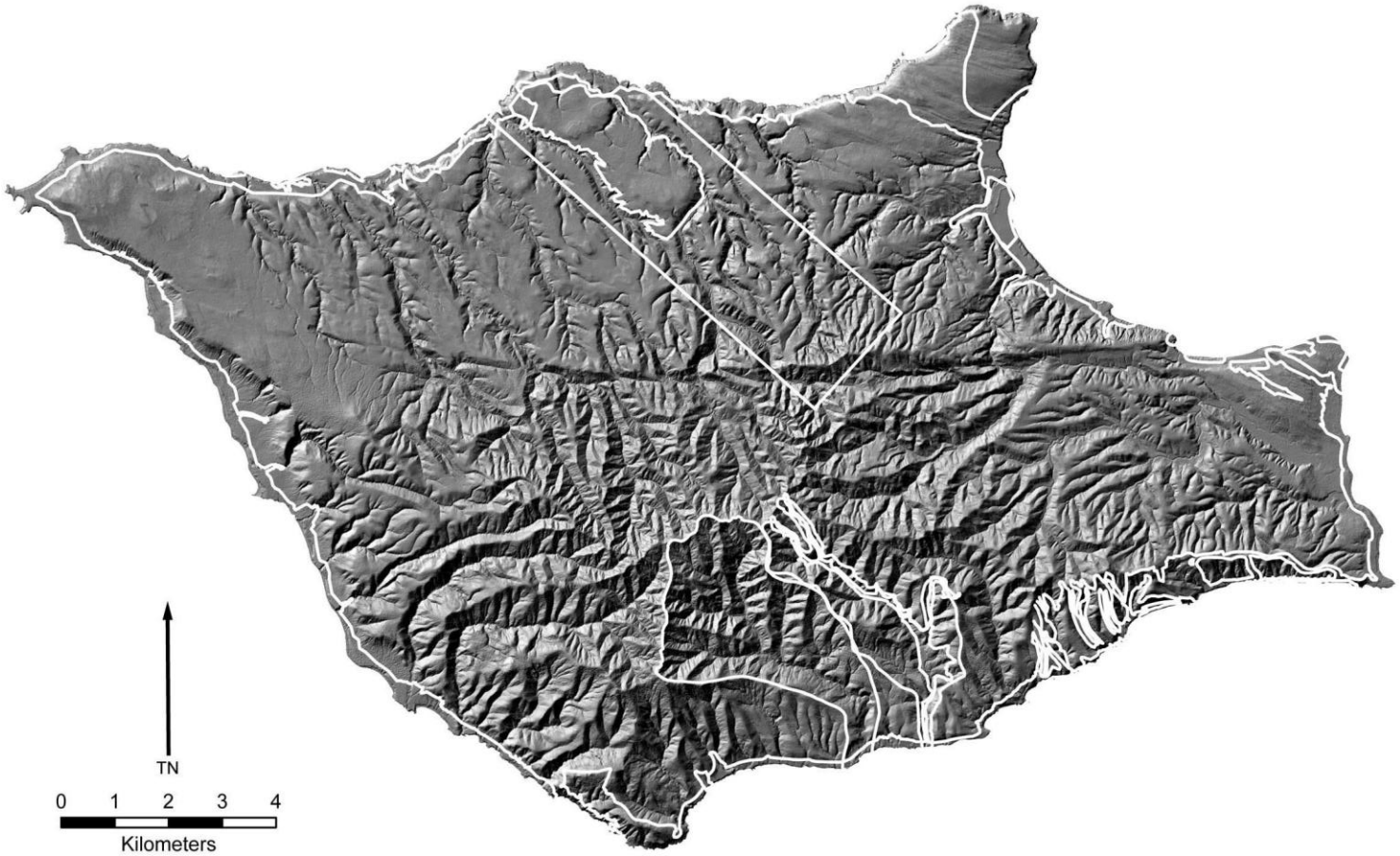

Figure 7.2. Santa Rosa Island showing areas intensively surveyed, outlined in white.

Braje, Kennett, Erlandson and Culleton 2007; Kennett 1998, 2005). However, many of these samples have not been completely analyzed but continue to be studied by Kennett and his students. Munns' work at SRI-77 and 87 is another very important excavation project that has not yet been reported. Rick and Johnson have conducted the most recent research projects on the island, focused on the east coast and Arlington Canyon areas, respectively.

Project name (or basic description)
Excavation of the Woolley Site

Principal investigator
C. Rainer Berger

Institutional sponsor
Departments of Earth and Space Sciences and Anthropology, University of California, Los Angeles

Dates of fieldwork
April 1976

Published and unpublished mss.
Berger 1980; Glassow et al. 1983; Wendorf 1982:157-159

Geographic location(s) of fieldwork
The Woolley Site is approximately 300 meters east of the mouth of Wreck Canyon

Site nos. or locations from which data were collected
The Woolley Site (no site number assigned)

Theoretical and empirical goals of research
Berger's work was designed to document the nature of a "fire area" and its association with mammoth remains and stone tools.

Types of data collected (collections, site records forms, field records)
Maps and profiles, four fragments of pygmy mammoth bone, five supposed stone tools, and three charcoal samples for 14C dating.

Person-days and crew size
Unknown

Field procedures (and laboratory procedures as applicable)
Excavations were done by hand.

Location and nature of the archaeological collections and associated documentation
Location of any collection from this project is unknown. The Fowler Museum at UCLA has no collections from any Santa Rosa Island site.

Significant descriptive and theoretical conclusions of the research

The map and profile drawings that were published proved information on the provenience of the bones and tools and their relation to the fire areas.

Potential of collections and data for future research

Given that this site actually may not be archaeological, whatever collections may still exist have minimal value.

Project name (or basic description)

Reconnaissance of northwestern Santa Rosa Island

Principal investigator

Donald L. Johnson

Institutional sponsor

Department of Geography, University of Illinois, Urbana-Champaign and Santa Barbara Museum of Natural History

Dates of fieldwork

September 13-15, 1978

Published and unpublished mss.

Liu and Coleman 1981

Geographic location(s) of fieldwork

Lower Portions of Arlington and Tecolote Canyons and Canada Verde

Site nos. or locations from which data were collected

None. Work was at fire areas and alluvial deposits.

Theoretical and empirical goals of research

This research was designed to provide complementary information to Johnson's detailed research on soils and geomorphology on San Miguel Island. Johnson also designed the research to expand on Orr's earlier alluvial stratigraphic work and to investigate the geological context of the fire areas.

Types of data collected (collections, site records forms, field records)

Samples of charcoal from fire areas

Person-days and crew size

Number of crew in addition to Johnson is unknown. Two to three days of fieldwork were undertaken.

Field procedures (and laboratory procedures as applicable)

Standard soil collection—essentially grab samples.

Location and nature of the archaeological collections and associated documentation
Johnson has copies of the maps with each sampled location. Glassow has copies of the results of the six radiocarbon dates that were obtained.

Significant descriptive and theoretical conclusions of the research
The research was not strictly archaeological in nature, but investigation of fire areas related indirectly to Orr's contention that the fire areas were of human origin.

Potential of collections and data for future research
No direct archaeological relevance

Project name (or basic description)
Investigation of fire areas and alluvial stratigraphy on northwestern Santa Rosa Island

Principal investigator
Donald L. Johnson, Phillip L. Walker, and Michael A. Glassow

Institutional sponsor
Santa Barbara Museum of Natural History

Dates of fieldwork
August 6-8, 1979

Published and unpublished mss.
Glassow et al. 1983; Johnson, D. L., et al. 1980

Geographic location(s) of fieldwork
Lower Arlington and Tecolote Canyons and canyon mouths elsewhere on the northwest coast. Visits were also made to Johnson's Lee, Canada Verde, and Wreck Canyon.

Site nos. or locations from which data were collected
SRI-3 and SRI-5 were visited. Charcoal samples were collected from geological contexts in Tecolote and Arlington Canyons and fossil mammoth and microfaunal bones were collected in eroded areas at the mouth of Arlington Canyon.

Theoretical and empirical goals of research
Observations were made at various geological, paleontological, and archaeological localities in preparation of writing a grant proposal. Johnson was also interested in collecting charcoal samples from Early Holocene and Pleistocene contexts for radiocarbon dating and wood species identification.

Types of data collected (collections, site records forms, field records)
Field notes and maps of the sampled locations.

Person-days and crew size
3 people worked for 3 days, 9 person days total.

Field procedures (and laboratory procedures as applicable)
Unknown

Location and nature of the archaeological collections and associated documentation
Collections not consumed in radiocarbon dating are in possession of Johnson.

Significant descriptive and theoretical conclusions of the research
The investigators concluded that many, of not most, fire areas were a result of natural fires and not created by humans.

Potential of collections and data for future research
The collections have no apparent archaeological research potential.

Project name (or basic description)
Further excavation at the Woolley Site

Principal investigator
Michael A. Wendorf

Institutional sponsor
Department of Anthropology, University of California, Berkeley

Dates of fieldwork
ca. 1980

Published and unpublished mss. (in style of *American Antiquity* text citation)
Wendorf 1982

Geographic location(s) of fieldwork
Within a gully a short distance to the east of Wreck Canyon

Site nos. or locations from which data were collected
The Woolley Site (no number assigned)

Theoretical and empirical goals of research
To evaluate alternative hypotheses to account for the creation of a fire area. This project was a follow-up of Berger's original work in 1976.

Types of data collected (collections, site records forms, field records)
Bone fragments, apparently all of pygmy mammoth. Charcoal may have been collected as well.

Person-days and crew size
Unknown. A crew of at least one person apparently worked for at least one day.

Field procedures (and laboratory procedures as applicable)
Hand tools were used for excavation; deposits were sifted through a 1/8" screen.

Location and nature of the archaeological collections and associated documentation
Unknown

Significant descriptive and theoretical conclusions of the research
Wendorf concluded that the features of this fire area are consistent with the hypothesis that it was caused by a tree falling over and burning.

Potential of collections and data for future research
If collections still exist, they may be relevant to paleontological studies of pygmy mammoths. They appear not to have archaeological relevance.

Project name (or basic description)
Survey of Wreck Canyon

Principal investigator
Susan Hammersmith Morris

Institutional sponsor
Institute of Archaeology, University of California, Los Angeles

Dates of fieldwork
December 1988, September 1989, and March 1990

Published and unpublished mss.
Hammersmith Morris 1993

Geographic location(s) of fieldwork
Wreck Canyon, Santa Rosa Island

Site nos. or locations from which data were collected
SRI-139, SRI-154, and 32 newly recorded sites.

Theoretical and empirical goals of research
To locate and identify sites in Wreck Canyon that had previously not been recorded and to generate information on the diversity of site types and human settlement strategies on the island.

Types of data collected (collections, site records forms, field records)
Site records, field notes, maps, and photographs.

Person-days and crew size
Unknown. Involved the PI and an unknown number of volunteers.

Field procedures (and laboratory procedures as applicable)
Systematic survey of nearly 1000 acres in 5 meter transects. This included exploring the many rockshelters located within the canyon.

Location and nature of the archaeological collections and associated documentation
Field records are still in the possession of Hammersmith-Morris but will eventually be turned over to the Park. Site records are on file at the Central Coast Archaeological Information Center, University of California, Santa Barbara. No artifacts were collected.

Significant descriptive and theoretical conclusions of the research
This survey located a total of 32 new sites, bringing the Wreck Canyon total to 34 sites. Roughly 79% of these were associated with rockshelters, with only six sites located on the valley floor and one on the marine terrace at the canyon mouth. Three of the shelter sites contained rock art, including petroglyphs and pictographs.

Potential of collections and data for future research
This survey provided important baseline information for future research in Wreck Canyon. Photographs and drawings of the rock art could serve as a basis for further analysis of the rock art in the canyon, particularly in light of the rarity of rock are anywhere else on the northern Channel Islands.

Project name (or basic description)
Survey and reconnaissance of early Santa Rosa Island sites

Principal investigator
Jon M. Erlandson

Institutional sponsor
1989 work: Department of Anthropology, University of California, Santa Barbara, and 1991 work: Department of Anthropology, University of Oregon

Dates of fieldwork
A few days in 1989 and September 5-8, 1991

Published and unpublished mss.
Erlandson 1994; Erlandson and Morris 1992a, 1992b; Morris and Erlandson 1993

Geographic location(s) of fieldwork
Northwest Coast from Arlington Canyon mouth vicinity to Garanon Canyon mouth vicinity, Carrington Point, Skunk Point, and Lobo Canyon

Site nos. or locations from which data were collected

SRI-1, 3, 5, 6, 26, 116, and 666 (91-15).

Theoretical and empirical goals of research

Erlandson and Park Archaeologist Don Morris visited several sites on Santa Rosa Island thought to have great antiquity. Notes on the contents and stratigraphy of these sites were obtained, a small number of artifacts, faunal remains, and radiocarbon samples were also collected.

Types of data collected (collections, site records forms, field records)

Field notes, photographs, radiocarbon samples.

Person-days and crew size

In 1989 two people worked for a few days. In 1991 4 people worked for approximately 4 days, equaling 16 person days.

Field procedures (and laboratory procedures as applicable)

Reconnaissance of sites and localities originally described by Phil C. Orr. Samples were collected from erosion exposures for radiocarbon dating and characterization of midden constituents.

Location and nature of the archaeological collections and associated documentation

Field records for the 1989 investigation currently are missing. Those for the 1991 investigation are on file at the Department of Anthropology, University of Oregon. The collections from SRI-6 are housed at the Department of Anthropology, Santa Barbara Museum of Natural History, under the Park's accession number 381. All of the remaining materials also will ultimately be housed at the Santa Barbara Museum of Natural History.

Significant descriptive and theoretical conclusions of the research

This research helped better define the antiquity of ancient human occupations of Santa Rosa Island, noting at least an Early Holocene occupation. This research challenged the Pleistocene occupations asserted by Orr (1968) and found that many of his chronological and stratigraphic associations were problematic.

Potential of collections and data for future research

The findings of this project could be used to help pave the way for future research at these important early archaeological sites on the island.

Project name (or basic description)

Various surveys in the vicinity of Bechers Bay and Carrington Point

Principal investigator

Don P. Morris

Institutional sponsor

Channel Islands National Park

Dates of fieldwork

March 15, April 21-23, May 3-5, July 9-11, August 21-28, September 1-3 and 7, November 9-13, 1990

Published and unpublished mss.

Personal records kept by Morris (his Day Timer); Dykstra 2005

Geographic location(s) of fieldwork

Carrington Point vicinity, west side of Lobo Canyon, fields north of Bechers Bay, Water Canyon, Wreck Canyon, Skunk Point vicinity and Torrey Pines vicinity

Site nos. or locations from which data were collected

Sites were located but was not formally recorded until later.

Theoretical and empirical goals of research

Systematic survey related to the construction and location of Park facilities and reconnaissance to expand knowledge of the island's archaeological resources.

Types of data collected (collections, site records forms, field records)

Surface collections of artifacts and faunal remains. Some site locations plotted on topographic maps that eventually were recorded during the coastal survey that began in 1991.

Person-days and crew size

Unclear. A minimum of 27 person-days.

Field procedures (and laboratory procedures as applicable)

According to Dykstra the teams walked parallel lines 3-5 m apart to identify cultural remains, but some of the survey was more casual in nature.

Location and nature of the archaeological collections and associated documentation

Collections from 1990 are cataloged under accession numbers CHIS-161-163, 168-170, and 176-177; however, which of the cataloged items is from this survey is unknown. The collections are not housed at the Santa Barbara Museum of Natural History.

Significant descriptive and theoretical conclusions of the research

This project was largely related to cultural resource management issue. The survey resulted in the location of sites in this intensively visited part of Santa Rosa Island.

Potential of collections and data for future research

This series of short surveys appears not to have produced data useful in future research.

Project name (or basic description)

Initiation of a survey of the island's coast

Principal investigator
Andrew Ovenden

Institutional sponsor
Channel Island National Park

Dates of fieldwork
Minimally these days: 26-28 July; 10, 23-27 August; 9, 12, 19, 22, 25 September; 4-7, 18, 21-22 October 1991

Published and unpublished mss.:
Dykstra 2005; Morris n.d.

Geographic location(s) of fieldwork
Coastal areas between Skunk Point and East Point, Skunk Point to Torrey Pine Grove/Water Canyon, Soledad Canyon to Garanon Canyon, Garanon Canyon to Sandy Point and 1 mile southeast of Sandy Point.

Site nos. or locations from which data were collected
SRI-183 through 234

Theoretical and empirical goals of research
To locate previously unrecorded sites at or near the coast and update site records for previously recorded sites along the Santa Rosa Island coast.

Types of data collected (collections, site records forms, field records)
Site records, field notes, site and location maps, black and white and digital photographs, and some 8 mm video of sites. Some surface collection of artifacts and radiocarbon samples were also acquired.

Person-days and crew size
Only Ovenden's name appears on site records. He worked a minimum of 21 days, equaling 21 person-days.

Field procedures (and laboratory procedures as applicable)
Systematic survey of the island's coastline with crews walking lines with people spaced about 10-20 m apart

Location and nature of the archaeological collections and associated documentation
Site records, photographs, video, and notes are at Channel Islands National Park. Site records are also housed at the Central Coast Archaeological Information Center, University of California, Santa Barbara. Surface collections are accessioned by the Park under various numbers between 188 and 236 and are housed at the Department of Anthropology, Santa Barbara Museum of Natural History.

Significant descriptive and theoretical conclusions of the research

Identified numerous archaeological sites along the coastline, including the first Chinese abalone camp identified on the Island (SRI-91-75). This was the first formal survey since Orr's investigations on the island in the 1950s-1960s.

Potential of collections and data for future research

Many of the sites located during the survey appear to have considerable research potential.

Project name (or basic description)

Continuation of the survey of the island's coast

Principal investigator

Don P. Morris

Institutional sponsor

Channel Island National Park

Dates of fieldwork

July 14-16; August 5-7, 9-10, 19-25; September 3-7, 15-21; September 30-October 6, October 14-19; November 1, 12, 1992

Published and unpublished mss.

Dykstra 2005; Morris n.d.

Geographic location(s) of fieldwork

Southwest Coast of Island starting at the ending point of the 1991 survey and working beyond Johnsons Lee. Also some work around Bechers Bay and Water Canyon.

Site nos. or locations from which data were collected

SRI-235-383 (with a few gaps in number for which records do not exist)

Theoretical and empirical goals of research

To locate previously unrecorded sites and update site records for previously recorded sites along the island's coast, mainly for cultural resource management purposes.

Types of data collected (collections, site records forms, field records)

Site records, field notes, site and location maps, black and white and digital photographs, and some 8 mm video of sites. Some surface collection of artifacts and radiocarbon samples were also acquired.

Person-days and crew size

Crews of 1 to 5 people worked for 42 days, equaling approximately 150 person days.

Field procedures (and laboratory procedures as applicable)

Systematic survey of the island's coastline with crews walking lines spaced about 10-20 m apart.

Location and nature of the archaeological collections and associated documentation

Site records, photographs, video, and notes are at Channel Islands National Park? Site records are also housed at the Central Coast Archaeological Information Center, University of California, Santa Barbara. Surface collections are accessioned by the Park under various numbers between 188 and 236 and are housed at the Department of Anthropology, Santa Barbara Museum of Natural History.

Significant descriptive and theoretical conclusions of the research

Identified and recorded numerous archaeological sites along the coastline.

Potential of collections and data for future research

Many of the sites located during the survey have research potential.

Project name (or basic description)

Completion of the survey of the island's coast

Principal investigator

Don P. Morris

Institutional sponsor

Channel Island National Park

Dates of fieldwork

July 15-19, 28-31; September 24, 1993

Published and unpublished mss.

Dykstra 2005; Morris n.d.

Geographic location(s) of fieldwork

Southeast shoreline below the heights of the Sierra Pablo and the northerly slopes of Black Mountain down to Windmill Canyon; also completion of the shoreline survey.

Site nos. or locations from which data were collected

SRI-427-468 and SRI-545. In addition, records for several previously recorded sites were updated.

Theoretical and empirical goals of research

To locate previously unrecorded sites and update site records for previously recorded sites along the coast, mainly for cultural resource management purposes

Types of data collected (collections, site records forms, field records)

Site records, field notes, site and location maps, black and white and digital photographs, and some 8 mm video of sites. Some surface collection of artifacts and radiocarbon samples were also acquired.

Person-days and crew size

4-5 person crews worked for at least 10 days, equaling approximately 45 person days.

Field procedures (and laboratory procedures as applicable)

Systematic survey of the island's coastline with crews walking lines spaced about 10-20 m apart.

Location and nature of the archaeological collections and associated documentation

Site records, photographs, video, and notes are at Channel Islands National Park? Site records are also housed at the Central Coast Archaeological Information Center, University of California, Santa Barbara. Surface collections are accessioned by the Park under various numbers between 188 and 236 and are housed at the Department of Anthropology, Santa Barbara Museum of Natural History.

Significant descriptive and theoretical conclusions of the research

Identification of numerous archaeological sites along the coastline, including the first Chinese abalone camp to be identified (SRI-91-75)

Potential of collections and data for future research

Many of the sites located during the survey have research potential.

Project name (or basic description)

Stratigraphic studies of the Arlington Springs vicinity and other localities on the island

Principal investigator

Thomas K. Rockwell

Institutional sponsor

Department of Geological Sciences, San Diego State University

Dates of fieldwork

1993, 1994, and follow-up projects (see J. Johnsons Arlington Springs research projects below)

Published and unpublished mss.

Colson 1996; Johnson, J., et al. 2002; Morris n.d.

Geographic location(s) of fieldwork

Arlington Canyon, Carrington Point, and lower-level marine terraces elsewhere on the island

Site nos. or locations from which data were collected

SRI-173 and other localities where sites are nearby.

Theoretical and empirical goals of research
To better understand the stratigraphy of the Arlington Springs site (SRI-173) and other Santa Rosa Island localities. Data originally were gathered for a student research project.

Types of data collected (collections, site records forms, field records)
Soil samples, notes, and photographs

Person-days and crew size
2 people worked for an unknown number of days.

Field procedures (and laboratory procedures as applicable)
Observation of stratigraphic exposures, some cleaning of erosion profiles with hand tools, and collection of soil samples from geological and archaeological contexts.

Location and nature of the archaeological collections and associated documentation
Photos, maps, and soil samples are currently housed at the Department of Anthropology, Santa Barbara Museum of Natural History.

Significant descriptive and theoretical conclusions of the research
Work at the Arlington Springs site paved the way for more detailed research by Johnson et al. (see below). Rockwell and colleagues also discovered the Carrington Pygmy Mammoth that became a focal point of later paleontological research.

Potential of collections and data for future research
The SRI-173 and other stratigraphic data have the potential to expand understanding of the alluvial history of the island.

Project name (or basic description)
Survey of Jolla Vieja Canyon

Principal investigator
Andrew York

Institutional sponsor
Dames and Moore

Dates of fieldwork
July 16-17, August 24-29, 1995

Published and unpublished mss.
York 1996

Geographic location(s) of fieldwork

Jolla Vieja Canyon watershed

Site nos. or locations from which data were collected
SRI-126, 130, 131, 147, 385-426

Theoretical and empirical goals of research
To identify archaeological sites in Jolla Vieja Canyon in support of the Park's cultural resources management efforts.

Types of data collected (collections, site records forms, field records)
Site records, photographs, site maps, location maps, 16 artifacts, and two samples for radiocarbon dating.

Person-days and crew size
Crews of 2 to 4 worked for eight days, the usual crew size being two. Person-days equals approximately 16-20.

Field procedures (and laboratory procedures as applicable)
Systematic survey of the 2,368 acre canyon, with crew members spaced 20 m or less apart

Location and nature of the archaeological collections and associated documentation
Site records on file at the Central Coast Archaeological Information Center. Report on file at Channel Islands National Park, Ventura, California. Collections, field notes, and photographs are accessioned by the Park under number 278. They are not housed at the Department of Anthropology, Santa Barbara Museum of Natural History.

Significant descriptive and theoretical conclusions of the research
This survey located 45 archaeological sites, determining that sites in Jolla Vieja Canyon were present on virtually all landforms. The sites were found to range from small lithic scatters, to massive multi-component shell middens such as SRI-147, and rockshelter sites. Two radiocarbon dates were obtained, with one dated to the Late Holocene (SRI-419) and one to the Middle Holocene (SRI-147).

Potential of collections and data for future research
Provided important site location information that can be used to determine sites for future research projects.

Project name (or basic description)
Survey of lower Canada Verde

Principal investigator
Douglas J. Kennett

Institutional sponsor
Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork
September 14-19, 1994; November 9-12, 1995

Published and unpublished mss.
Kennett 1996

Geographic location(s) of fieldwork
Lower Canada Verde Canyon: from Smith Highway to the coast, including canyon bottom lands and ridgetops, and a flat mesa top between Dry Canyon and Canada Verde.

Site nos. or locations from which data were collected
SRI-596-597, 601-625

Theoretical and empirical goals of research
To identify human settlement patterns in Canada Verde and assist the Park in their cultural resource management plan.

Types of data collected (collections, site records forms, field records)
Site records for all sites discovered; field notes are in the possession of Kennett.

Person-days and crew size
A crew of four worked for 10 days; 40 person-days total.

Field procedures (and laboratory procedures as applicable)
Survey of a 6.5 km^2 area. Surveyed at 10 m spacing between crew members, with 10-20 m spacing in the mesa top area

Location and nature of the archaeological collections and associated documentation
Site records are on file at the Central Coast Archaeological Information Center. A copy of the final report is on file with the Park. The Park has assigned accession number 251 to the surface collections from the 1994 work; however, they are not housed at the Department of Anthropology, Santa Barbara Museum of Natural History. Apparently all of the collections are housed at the Department of Anthropology, University of Oregon.

Significant descriptive and theoretical conclusions of the research
The survey located 27 new archaeological sites and 10 isolated artifacts. 9 previously recorded sites were visited.

Potential of collections and data for future research
Identified numerous archaeological sites that are important potential locations for future archaeological research.

Project name (or basic description)
Column Sampling at sites dispersed throughout the island

Principal investigator
Douglas J. Kennett

Institutional sponsor
University of California, Santa Barbara, and California State University, Long Beach

Dates of fieldwork
Intermittently between 1995 and 1999

Published and unpublished mss.
Braje, Kennett, Erlandson, and Culleton 2007; Clifford 2001; Christy 2004; Kennett 1998, 2005; Kennett and Conlee 2002; Kennett and Kennett 2000; Kennett, Kennett, Erlandson, and Cannariato 2007: Kennett, Culleton, Kennett, Erlandson and Cannarito 2007; Erlandson, Rick, Kennett, and Walker 2001; Rick, Kennett, and Erlandson 2005a, 2005b

Geographic location(s) of fieldwork
Throughout the island, with most sites on the coast.

Site nos. or locations from which data were collected
SRI-5, 15, 19, 31, 40, 41, 50, 60, 62, 85, 96, 97 109, 116, 130, 147, 432

Theoretical and empirical goals of research
Kennett, working with Park archaeologist Don Morris, was interested in understanding the nature of human subsistence strategies and ecological changes through time and space on Santa Rosa Island.

Types of data collected (collections, site records forms, field records)
Field notes, maps, photographs, profile drawings, soil samples, artifacts, faunal and floral remains.

Person-days and crew size
An average of two 8 day episodes of fieldwork per year by a crew of 4-6 students or volunteers. Approximately 400 person-days expended.

Field procedures (and laboratory procedures as applicable)
Samples were generally excavated in arbitrary 10 cm levels, with some samples taken following natural stratification. All samples were screened over 1/8-inch mesh or smaller following standard Channel Islands field procedures. Radiocarbon dates from basal and upper deposits were used to establish chronology. A range of other analyses were also performed on select sites (e.g., oxygen isotope seasonality studies).

Location and nature of the archaeological collections and associated documentation
All materials are currently housed at the Department of Anthropology, University of Oregon and will ultimately be transferred to the Santa Barbara Museum of Natural History.

Significant descriptive and theoretical conclusions of the research

Kennett's research is the largest and most systematic sampling program on the island to date. Kennett used a behavioral ecological theoretical approach to identify and explain changes in human adaptations on the northern Channel Islands from the terminal Pleistocene through the Historic period.

Potential of collections and data for future research

More detailed analyses are on-going and these collections continue to provide an invaluable source of information for understanding broader Santa Rosa Island prehistory.

Project name (or basic description)

Survey of upper Canada Verde

Principal investigator

Douglas J. Kennett

Institutional sponsor

Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork

June 19 and 26; August 21, 22, and 26, 1996

Published and unpublished mss.

Kennett 1997

Geographic location(s) of fieldwork

Upper Cañada Verde drainage

Site nos. or locations from which data were collected

SRI-577-580, 582-585, 593-595, 598-600

Theoretical and empirical goals of research

Kennett's work was intended to complete the survey of the Cañada Verde watershed, begun in 1994. Generally, the survey objectives were to identify human settlement patterns in Canada Verde and assist the Park in their cultural resource management plan.

Types of data collected (collections, site records forms, field records)

Site record forms were filled out in the course of the survey.

Person-days and crew size

A crew of 1 to 5 people (usually 2) worked for 5 days, equaling approximately 15 person-days.

Field procedures (and laboratory procedures as applicable)

Systematic survey of the Upper Canada Verde drainage, focusing on areas that were sufficiently flat for human settlement, with survey crew members walking transects at 10-m spacing.

Location and nature of the archaeological collections and associated documentation
Site records are on file at the Central Coast Archaeological Information Center, Department of Anthropology, University of California, Santa Barbara, and at Park headquarters.

Significant descriptive and theoretical conclusions of the research
The survey located 14 previously unrecorded archaeological sites in the upper portion of the canyon watershed.

Potential of collections and data for future research
The site records are relevant to for designing future research within the watershed, and they can serve as a basis for monitoring the condition of these sites through time.

Project name (or basic description)
Excavation at SRI-77 and 87

Principal investigator
Ann Munns

Institutional sponsor
Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork
3-9 October 1995, 17-22 October 1995

Published and unpublished mss.
Munns 1997

Geographic location(s) of fieldwork
Northeast Coast, vicinity of Oar (Oat) Point, and vicinity of west margin of Southeast Anchorage (west margin).

Site nos. or locations from which data were collected
SRI-77 and 87

Theoretical and empirical goals of research
To gather data for her PhD dissertation research, which focused on shell bead production activities, including the presence and intensity of shell artifact craft production, and its variability relative to environmental and cultural variables.

Types of data collected (collections, site records forms, field records)
Collections from excavation, site record update, field notes

Person-days and crew size

Four to five people worked for nearly 13 days, for a total of 57 person days.

Field procedures (and laboratory procedures as applicable)

Site boundaries, topography, and excavation locations were mapped using a total station. Excavation unit types included 10-cm diameter auger holes excavated in 10-cm levels; several shallow 1x1 m units excavated in 5-cm levels; and column samples (one excavated at SRI-77). Some 1/16-inch field residues were collected. Laboratory processing included some 1/8-inch screen residues sorted in 100-gram batches to assess minimum necessary 1/8-inch sample size requirements to reliably characterize relative proportions of faunal constituents.

At SRI-77, 11 auger holes varied in depth between 50 and 278 cm, with an average auger depth of 118 cm (note: 3 augers were aborted at 20 cm below surface or less, and are not included in this count); the one unit had a depth of 15 cm, and column sample had a depth of 155 cm. One column sample (25 x 25 cm), excavated to 155 cm below surface on cliff face.

At SRI-87, two auger holes had depths of 52 and 170 cm below surface and six units were excavated to 5 cm below surface.

Location and nature of the archaeological collections and associated documentation

The archaeological collections, including faunal and artifact remains are currently in Munns's possession but eventually will be housed at the Department of Anthropology, Santa Barbara Museum of Natural History.

Significant descriptive and theoretical conclusions of the research

The analysis and reporting are in progress.

Potential of collections and data for future research

The collections obtained for this study are valuable for understanding recent Chumash prehistory, subsistence, and craft production. Once analysis of the collections is complete, the chronology of site occupation, nature of midden constituents, and information about subsistence and settlement would be available.

Project name (or basic description)

Survey of the Arlington Canyon watershed

Principal investigator

Douglas Kennett

Institutional sponsor

Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork

July 16, 26-28; September 1; November 13-17, 1996

Published and unpublished mss.
Kennett's report to the Park currently is lost, and Kennett does not have a copy either.

Geographic location(s) of fieldwork
Arlington Canyon watershed

Site nos. or locations from which data were collected
SRI-626-665

Theoretical and empirical goals of research
Identify all sites in the watershed in support of the Park's archaeological resources management program

Types of data collected (collections, site records forms, field records)
Completed site records. Although Kennett's report is missing, his field notes may exist.

Person-days and crew size
A crew of 1 to 2 worked for at least 10 days, equaling approximately 15 person-days.

Field procedures (and laboratory procedures as applicable)
Intensive survey; details unknown

Location and nature of the archaeological collections and associated documentation
Collections, field notes, and photographs are in Kennett's possession at the Department of Anthropology, University of Oregon.

Significant descriptive and theoretical conclusions of the research
Archaeological sites are distributed throughout the watershed, similar to the situation found the Cañada Verde and Jolla Vieja watershed surveys.

Potential of collections and data for future research
The information on the site records can serve as a basis for designing research focused on a variety of specific research problems.

Project name (or basic description)
Collection of radiocarbon and midden samples from SRI-1 and 6

Principal investigator
Jon M. Erlandson

Institutional sponsor
Department of Anthropology, University of Oregon

Dates of fieldwork
September 1997

Published and unpublished mss.

Erlandson and Rick 1999; Erlandson, Rick, Vellanoweth, and Kennett 1999

Geographic location(s) of fieldwork
Arlington and Garanon Canyon mouths

Site nos. or locations from which data were collected
SRI-1 and SRI-6

Theoretical and empirical goals of research
To collect archaeological faunal and ^{14}C samples from two of the important early sites originally dated by Phil C. Orr. The data from these samples were designed to help understand the antiquity and lifeways of some of the earliest peoples to occupy the islands.

Types of data collected (collections, site records forms, field records)
Field notes, samples of midden constituents, bulk samples of deposits, shells for radiocarbon dating.

Person-days and crew size
A crew of 5 worked for approximately 4 days, equaling approximately 20 person-days.

Field procedures (and laboratory procedures as applicable)
Excavation of deposits from eroding sea cliff exposures. At SRI-6 the sample had to be accessed using rappelling equipment. Deposits were field screened over 1/8 and 1/16-inch mesh. Bulk soil samples also were collected.

Location and nature of the archaeological collections and associated documentation
These relatively small samples are currently housed at the Department of Anthropology, University of Oregon.

Significant descriptive and theoretical conclusions of the research
Refined the chronology of these two important sites showing that they were definitively occupied prior to 9000 years ago. The faunal samples indicated a subsistence focus on rocky intertidal shellfish, especially California mussel.

Potential of collections and data for future research
Analyzed collections that were retained still have potential to yield data relevant to expanding knowledge of the earliest occupation of the island.

Project name (or basic description)
2000 field work at the Arlington Springs site

Principal investigator
John R. Johnson

Institutional sponsor
Department of Anthropology, Santa Barbara Museum of Natural History

Dates of fieldwork
May 18-20, 2000

Published and unpublished mss.:
Agenbroad 2005; Johnson et al. 2002; Johnson et al. 2007

Geographic location(s) of fieldwork
Arlington Springs Site (SRI-173) and other nearby localities

Site nos. or locations from which data were collected
SRI-173

Theoretical and empirical goals of research
This project was designed to assess the geological, biological, and archaeological context of the human remains found at the Arlington Springs site recovered by Phil Orr in 1959. In particular, the research also focused on dating the human remains.

Types of data collected (collections, site records forms, field records)
Field notes, photographs, soil, floral, faunal, and ^{14}C samples, laser transit and gps map data, geophysical data, and other analytical data

Person-days and crew size
A crew of 5 worked for 2 days, equaling a total of 10 person-days.

Field procedures (and laboratory procedures as applicable)
Field and laboratory techniques included backhoe excavation to remove soil overburden, small-scale test excavations and soil sampling, core sampling, ground penetrating radar, laser transit mapping, AMS ^{14}C dating.

Location and nature of the archaeological collections and associated documentation
All field records and collections are housed at the Department of Anthropology, Santa Barbara Museum of Natural History.

Significant descriptive and theoretical conclusions of the research
This research determined that the Arlington Springs human remains are the oldest in western North America, dating to roughly 13,000 BP. Important geological and other data also provide the context for these important human remains.

Potential of collections and data for future research

Data from the various samples collected are currently being analyzed by Johnson and collaborators. These data are very important for enhancing understanding of the earliest occupation on the Channel Islands.

Project name (or basic description)
2001 continuation of fieldwork at Arlington Springs

Principal investigator
John R. Johnson

Institutional sponsor
Santa Barbara Museum of Natural History

Dates of fieldwork
April 25 to May 9, 2001

Published and unpublished mss.:
Agenbroad et al. 2005; Johnson et al. 2002; Johnson et al. 2007

Geographic location(s) of fieldwork
Arlington Springs Site (SRI-173) and other localities in the Arlington Canyon vicinity

Site nos. or locations from which data were collected
SRI-173, SRI-4, and SRI-160

Theoretical and empirical goals of research
This project was designed to assess the geological, biological, and archaeological context of the Arlington Springs Site and surrounding area. In particular, this research focused on defining the chronology and context of the Arlington Springs human remains recovered by Phil Orr in 1959.

Types of data collected (collections, site records forms, field records)
Field notes, photographs, soil, floral, faunal, and ^{14}C samples, laser transit and GPS map data, geophysical data, and other analytical data were gathered during research.

Person-days and crew size
A crew of 8-13 worked for 15 days, equaling ~168 person-days

Field procedures (and laboratory procedures as applicable)
The diverse array of field and laboratory techniques employed included backhoe excavation to remove soil overburden, small scale test excavations and soil sampling, core sampling, ground penetrating radar and laser transit mapping, AMS ^{14}C dating, and other data collection and analytical techniques. This phase of the project focused on terracing the side of the canyon to expose the geological strata and collecting samples for chronostratigraphic

research. In addition to the work at SRI-173, one excavation unit was excavated at SRI-4 and another at SRI-160 to obtain faunal and floral samples and several ^{14}C dates for each site.

Location and nature of the archaeological collections and associated documentation

All field records and collections are housed at the Department of Anthropology, Santa Barbara Museum of Natural History, or are in the hands of Johnson's collaborators. The collections at the museum were assigned the Park's accession number 318 and the museum's accession numbers B4418 and 4491.

Significant descriptive and theoretical conclusions of the research

This phase of research established in greater detail the stratigraphic position of Arlington Springs Man.

Potential of collections and data for future research

The soil, faunal, and other samples are currently being analyzed by Johnson and his collaborators. The analytical results should enhance understanding of the beginning of Channel Islands prehistory, which will have implications for expansion of human populations into North America.

Project name (or basic description)

Investigations at SRI-2 (Skull Gulch)

Principal investigator

Torben C. Rick

Institutional sponsor

Department of Anthropology, University of Oregon

Dates of fieldwork

July 11 to July 25, 2001 and October 4 to 5, 2002

Published and unpublished mss.:

Rick 2003, 2004a, 2007b

Geographic location(s) of fieldwork

Skull Gulch

Site nos. or locations from which data were collected

SRI-2

Theoretical and empirical goals of research

To understand the chronology, subsistence, and technologies of the Chumash occupants of the site. The small-scale testing, augering, and mapping expanded upon Orr's research at the site in the 1940s, 50s, and 60s.

Types of data collected (collections, site records forms, field records)

Faunal remains, artifacts, ^{14}C samples, and soils samples from the excavation of two units and several auger holes. A laser transit was used to map the site.

Person-days and crew size

A crew of 2 to 4 worked for 17 days, equaling 68 person-days.

Field procedures (and laboratory procedures as applicable)

Excavation of a 1 x 0.5 m unit (Unit 2) near House 3 and a 0.5 x 0.5 m unit (Unit 1) near House 1. All excavated deposits were screened over 1/16-inch mesh. Bulk soils samples were collected and profile were drawn. Auger holes were excavated to determine site boundaries and the nature, extent, and depth of deposits in unexcavated areas. ^{14}C samples were also collected in situ from auger hole sidewalls. A topographic map was of the site as well.

Location and nature of the archaeological collections and associated documentation

Archaeological collections and field notes are temporarily housed in the Department of Anthropology, Southern Methodist University awaiting transfer to the Department of Anthropology, Santa Barbara Museum of Natural History.

Significant descriptive and theoretical conclusions of the research

The research established the extent of the human occupation of this village site. It demonstrating that the occupation during the late prehistoric and historic periods was complex, with most area of the site occupied throughout this time. Information was obtained on the nature of Chumash household organization and subsistence.

Potential of collections and data for future research

The collections may be relevant to other research problems concerned with the late prehistoric and historic occupation of the island.

Project name (or basic description)

Assessment of a selection of recorded sites on the island

Principal investigator

Torben C. Rick and Jon M. Erlandson

Institutional sponsor

Department of Anthropology, University of Oregon

Dates of fieldwork

October 2-9, 2002 and August 27-September 3, 2003

Published and unpublished mss.:

Rick and Erlandson 2004; Rick, Kennett, and Erlandson 2005

Geographic location(s) of fieldwork

Arlington Canyon, Lobo Canyon, Bechers Bay, Skunk Point to East Point, China Camp

Site nos. or locations from which data were collected

SRI-1, 2, 3, 7, 28, 60, 77, 78, 81, 82, 83, 84, 85, 87, 95, 96, 97, 98, 115, 116, 183, 184, 185, 186, 187, 190, 191, 192, 196, 197, 212, 213, 231, 232, 233, 279, 364, 365, 542, 543, 544, 573, 666, and 667

Theoretical and empirical goals of research

To update the status and condition of previously recorded sites on five areas of Santa Rosa Island.

Types of data collected (collections, site records forms, field records)

Information on the condition and status of sites was entered onto condition assessment forms.

Person-days and crew size

A crew of 2-4 people worded for 16 days, equaling a total of 48 person-days.

Field procedures (and laboratory procedures as applicable)

Visited archaeological sites that had previously been recorded to update information on the status and condition of the sites. Information was entered onto National Park Service condition assessment forms.

Location and nature of the archaeological collections and associated documentation

A report, including all of the site assessment forms, is on file at Park headquarters. Digital photos and 35 mm slides of the sites also are housed at Park headquarters.

Significant descriptive and theoretical conclusions of the research

Provided condition assessments of sites in some of the areas on Santa Rosa Island with extremely dense concentrations of sites. Recommendations or site preservation and conservation were made with recommendations for sites to be investigated.

Potential of collections and data for future research

The information on the site assessment forms will largely be valuable for continued monitoring and condition assessments of the sites, but it also could be valuable for designing future research at individual sites.

Project name (or basic description)

Collection of bulk sample and mapping at SRI-191 and SRI-667

Principal investigator

Torben C. Rick

Institutional sponsor

Department of Anthropology, University of Oregon, and Department of Anthropology, Southern Methodist University

Dates of fieldwork

August, 28 to 29 and September 1, 2003, and a few days in July 2005

Published and unpublished mss.

Rick, Robbins, and Ferguson 2006; Wollf, Rick and Aland 2007; Wollf, Aland, and Rick 2007

Geographic location(s) of fieldwork

Skunk Point

Site nos. or locations from which data were collected

SRI-191 and 667

Theoretical and empirical goals of research

This research was conducted while Rick and Erlandson were doing condition assessments of Santa Rosa Island sites. Working with acting Park Archaeologist Georganna Hawley, bulk samples of deposits were excavated at SRI-667 in conjunction with her site stabilization research. Two small units were also excavated at SRI-191, an eroding shell midden on the southeast side of Skunk Point to obtain data from this threatened site.

Types of data collected (collections, site records forms, field records)

Faunal remains, artifacts, and radiocarbon samples from excavations, as well as field notes and site photos.

Person-days and crew size

4-6 people worked approximately 5 days, equaling a total of16 person-days.

Field procedures (and laboratory procedures as applicable)

Three 25-30 liter bulk samples were excavated from three distinct Middle Holocene strata at SRI-667. A 1x0.5 m unit and 0.5x0.5 bulk sample was excavated at SRI-191. All deposits were screened over 1/8 and 1/16-inch mesh. All collections were analyzed at SMU using standard Channel Islands lab methods, with all 1/8-inch faunal remains and artifacts analyzed.

Location and nature of the archaeological collections and associated documentation

All materials are temporarily housed in the Department of Anthropology, Southern Methodist University, awaiting transfer to the Department of Anthropology, Santa Barbara Museum of Natural History.

Significant descriptive and theoretical conclusions of the research

Data pertaining to these two sites provided insight into the nature of human subsistence, environmental conditions, and technology during the Middle Holocene on eastern Santa Rosa

Island. The data from these sites showed relatively diverse marine foraging strategies focused on obtaining shellfish from a variety of habitats.

Potential of collections and data for future research
The collections may have relevance to other research problems.

Project name (or basic description)
Test excavation at CA-SRI-670

Principal investigator
Kelly R. Minas

Institutional sponsor
Channel Islands National Park

Dates of fieldwork
September 2004

Published and unpublished mss. (in style of *American Antiquity* text citation)
The report is in preparation and will be completed in 2010.

Geographic location(s) of fieldwork
The project area is at the Park Service campground adjacent to an unnamed drainage that flows into Water Canyon

Site nos. or locations from which data were collected
SRI-670

Theoretical and empirical goals of research
The purpose of this project was to make an eligibility and effect determination in accordance with Section 106 of the NHPA in advance of a septic system installation at the campground.

Types of data collected (collections, site records forms, field records)
Artifacts of shell, stone, and bone, including specifically shell beads and microblades; faunal remains include shells and bones of fish, sea mamma, and bird. Field notes were taken. A site map and excavation level records were produced. A catalog was created and an analysis of collections was generated by McKenzie and Glassow in 2005.

Person-days and crew size
A crew of 3 spent 6 10-hour days, equaling a total of 22.5 person-days.

Field procedures (and laboratory procedures as applicable)
Test excavation included auguring, hand excavation of two 1/2 x 1 meter units, dry screening through 1/8-inch mesh with all material caught by the screens being retained, and mapping

with a total station. Laboratory analysis included water-screening, sorting, labeling, and cataloging of artifacts, and basic descriptive analysis.

Location and nature of the archaeological collections and associated documentation

The collections were cataloged at the Department of Anthropology, University of California, Santa Barbara, and a brief accompanying report was prepared by Dustin McKenzie and Michael Glassow. These are housed at the Park headquarters. The collections are housed at the Department of Anthropology, Santa Barbara Museum of Natural History under the Park's accession number 374; the museum assigned the accession number B4485.

Project name (or basic description)

2005 continuation of fieldwork at Arlington Springs

Principal investigator

John R. Johnson

Institutional sponsor

Santa Barbara Museum of Natural History

Dates of fieldwork

June 26-July 1, 2005

Published and unpublished mss.:

Agenbroad et al. 2005; Johnson et al. 2002; Johnson et al. 2007

Geographic location(s) of fieldwork

Arlington Springs Site (SRI-173) and other localities in the Arlington Canyon vicinity

Site nos. or locations from which data were collected

SRI-173

Theoretical and empirical goals of research

Continuation of efforts to assess the geological, biological, and archaeological context of the Arlington Springs site.

Types of data collected (collections, site records forms, field records)

Field notes, photographs, soil, floral, faunal, and ^{14}C samples, laser transit and GPS map data, geophysical data, and other analytical data

Person-days and crew size

A crew of 5 worked for 6 days, an expenditure of 30 person-days

Field procedures (and laboratory procedures as applicable)

This phase of the project focused on GPR survey of three 50 X 50m quadrants.

Location and nature of the archaeological collections and associated documentation
Records and collections are housed at the Department of Anthropology, Santa Barbara Museum of Natural History.

Significant descriptive and theoretical conclusions of the research
The GPR survey identified some anomalies that may be buried archaeological features.

Potential of collections and data for future research
The data acquired, which are currently being analyzed by Johnson and collaborators, has the potential to expand knowledge of the earliest occupants of the west coast of North America.

Project name (or basic description)
Survey of Old Ranch Canyon

Principal investigator
Torben C. Rick

Institutional sponsor
Department of Anthropology, Southern Methodist University

Dates of fieldwork
July 25 to August 2, 2005, June 6 to June 20, 2006

Published and unpublished mss.:

Rick 2008

Geographic location(s) of fieldwork
Old Ranch Canyon, Skunk Point, and the Torrey Pine Grove

Site nos. or locations from which data were collected
SRI-61, 76, 77, 81, 82, 85, 89, 90, 91, 92, 93, 155, 190, 191, 192, 196, 209, 210, 666, 667, 671 through SRI-705.

Theoretical and empirical goals of research
To understand the nature of prehistoric human settlement in Old Ranch Canyon and surrounding areas. To document archaeological site status and condition in this fairly heavily visited area of Santa Rosa Island.

Types of data collected (collections, site records forms, field records)
Site records, field notes, digital photos of sites, location maps, radiocarbon samples.

Person-days and crew size
A crew of 4 worked for 24 days, equaling 96 person-days.

Field procedures (and laboratory procedures as applicable)

Systematic pedestrian survey of the canyon bottom and ridgetops in 5 m transects. Radiocarbon samples were collected from eroding deposits at most sites. A very small number of unique artifacts were also collected from the surface.

Location and nature of the archaeological collections and associated documentation

The site records and final project report are on file at the Central Coast Archaeological Information Center, Department of Anthropology, University of California, Santa Barbara and at the Park headquarter. Digital photos are housed at the Park headquarters. Artifacts collected during the survey are temporarily at the Department of Anthropology, Southern Methodist University.

Significant descriptive and theoretical conclusions of the research

This survey identified a total of 35 new sites in Old Ranch Canyon, and revisited 20 previously known sites. 51 radiocarbon dates obtained from 31 sites determined that the canyon had been occupied for at least 8000 years, and possibly much earlier. The site types recorded were very diverse and demonstrated a number of sites with estuarine shell from a nearby estuary.

Potential of collections and data for future research

All the collected radiocarbon samples have been analyzed, but many of the sites recorded during this study remain excellent candidates for future research.

Project name (or basic description)

2006 continuation of fieldwork at the Arlington Springs site

Principal investigator

John R. Johnson

Institutional sponsor

Santa Barbara Museum of Natural History

Dates of fieldwork

July 25-August 4, 2006 and September 19-22, 2006

Published and unpublished mss.:

Agenbroad et al. 2005; Johnson et al. 2002; Johnson et al. 2007

Geographic location(s) of fieldwork

Arlington Springs Site (SRI-173) and other localities in the Arlington Canyon vicinity

Site nos. or locations from which data were collected

SRI-173

Theoretical and empirical goals of research

This phase of the project focused on core sampling, producing ten deep sediment core samples and other sorts of samples for additional sedimentological analysis.

Types of data collected (collections, site records forms, field records)

Field notes, photographs, soil, floral, faunal, and ^{14}C samples, laser transit and gps map data, geophysical data, and other analytical data were gathered during research.

Person-days and crew size

10-12 people, ~120 person days

Field procedures (and laboratory procedures as applicable)

A Giddings rig was used to obtain the sediment cores. Other samples were collected from erosion exposures along the canyon wall.

Location and nature of the archaeological collections and associated documentation

All collections and field records are housed at the Department of Anthropology, Santa Barbara Museum of Natural History, or with Johnson's collaborators. The collections at the museum were assigned the Park's accession number 318 and the museum's accession numbers B4418 and 4491.

Significant descriptive and theoretical conclusions of the research

The analysis of the core samples is not yet complete. It will contribute to understanding the sedimentary history of the site locality.

Potential of collections and data for future research

The samples may provide other sorts of information about the geology and archaeology of the site locality.

Project name (or basic description)

2008 continuation of fieldwork at the Arlington Springs site

Principal investigator

John R. Johnson

Institutional sponsor

Santa Barbara Museum of Natural History

Dates of fieldwork

June 17 to 27, 2008

Published and unpublished mss.:

None pertaining to this phase of the investigation

Geographic location(s) of fieldwork

Arlington Springs Site (SRI-173) and other localities in the vicinity

Site nos. or locations from which data were collected

SRI-173

Theoretical and empirical goals of research

Acquisition of additional information about the contents of the stratigraphic unit from which the human remains were obtained.

Types of data collected (collections, site records forms, field records)

Field notes, photographs, soil samples.

Person-days and crew size

A crew of 15 worked for 11 days, equaling a total of 165 person days

Field procedures (and laboratory procedures as applicable)

This phase of the project focused on excavation in the stratum dated to 13,000 BP where Arlington Man's bones were obtained.

Location and nature of the archaeological collections and associated documentation

Collections and records are housed at the Department of Anthropology, Santa Barbara Museum of Natural History.

Significant descriptive and theoretical conclusions of the research

Analysis of the samples is ongoing.

Potential of collections and data for future research

The samples may provide other sorts of information about the geology and archaeology of the site locality.

CHAPTER 8
PREHISTORIC ARCHAEOLOGICAL RESOURCES ON SAN MIGUEL ISLAND

Status of Resource Inventories

Compared to the other Northern Channel Islands, San Miguel Island (Figure 8.1) has seen a significant amount of archaeological research relative to its size. Over the last 33 years, a number of projects have been conducted on the island's cultural resources, with much of the research in the last two decades sponsored by the University of Oregon (UO). Jon M. Erlandson has spearheaded a number of archaeological investigations, with several of his graduate students at the UO completing master's theses and doctoral dissertations on various aspects of the cultural and natural history of the island. Erlandson and his colleagues continue to conduct research on the island with projects focused on the archaeology of the island, along with historical ecology and human impacts on its marine and terrestrial ecosystems.

Archaeological studies have been conducted on San Miguel since the late 1800s, and much of the island was intensively surveyed for archaeological sites during the 1960s, 1970s, and 1980s (Glassow 1980; Greenwood 1978, 1982; Rozaire 1978c). Earlier surveys and excavations were conducted by antiquarians and archaeologists but resulted primarily in large artifact collections housed in east coast museums, with little or no provenience or contextual information (see Heye 1921; Schumacher 1877). After preliminary surveys by Rogers (1929), Schumacher, and Rozaire (Glassow 1977:214-217), the first systematic archaeological survey conducted on San Miguel using modern pedestrian reconnaissance methods was an island-wide survey for prehistoric archaeological sites by Kritzman and Rozaire beginning in the 1960s (Rozaire 1978c). This survey was of variable thoroughness and recorded a total of 542 sites during field sessions from 1964 to 1966. Rozaire and colleagues documented a dense concentration of sites on the island, ranging in size from lithic scatters to small campsites and large village locations, the latter containing thick accumulations of shell midden refuse. They also excavated several sites on the island, SMI-1, SMI-261 (Daisy Cave), and SMI-525, documenting an occupation of San Miguel spanning at least 3200 years. Unfortunately, Rozaire's excavation strategy often employed arbitrary six-inch levels oriented horizontally, so that some excavation levels crosscut stratigraphic layers, making the exact provenience and context of many of the recovered artifacts and faunal remains difficult to determine. Nonetheless, Rozaire's excavations and Walker et al. (1978) and Walker and Craig's (1979) faunal analyses revealed that fishing and sea mammal hunting were important subsistence activities for prehistoric islanders, along with shellfish collecting. More recent work at SMI-1, SMI-261, and SMI-525 has provided a longer and more complex chronology for these sites, as well as collections recovered with much greater stratigraphic resolution for the latter two (see Erlandson 1991a; Erlandson, Kennett, Ingram, Guthrie et al. 1996; Erlandson, Tveskov et al. 1996; Kennett 2005; Rick et al. 2001).

In 1977 the National Park Service contracted with Greenwood and Associates to relocate a sample of Rozaire and Kritzman's sites and to update site record information. Greenwood's (1978) investigations did not include any new systematic survey of the island (although new sites

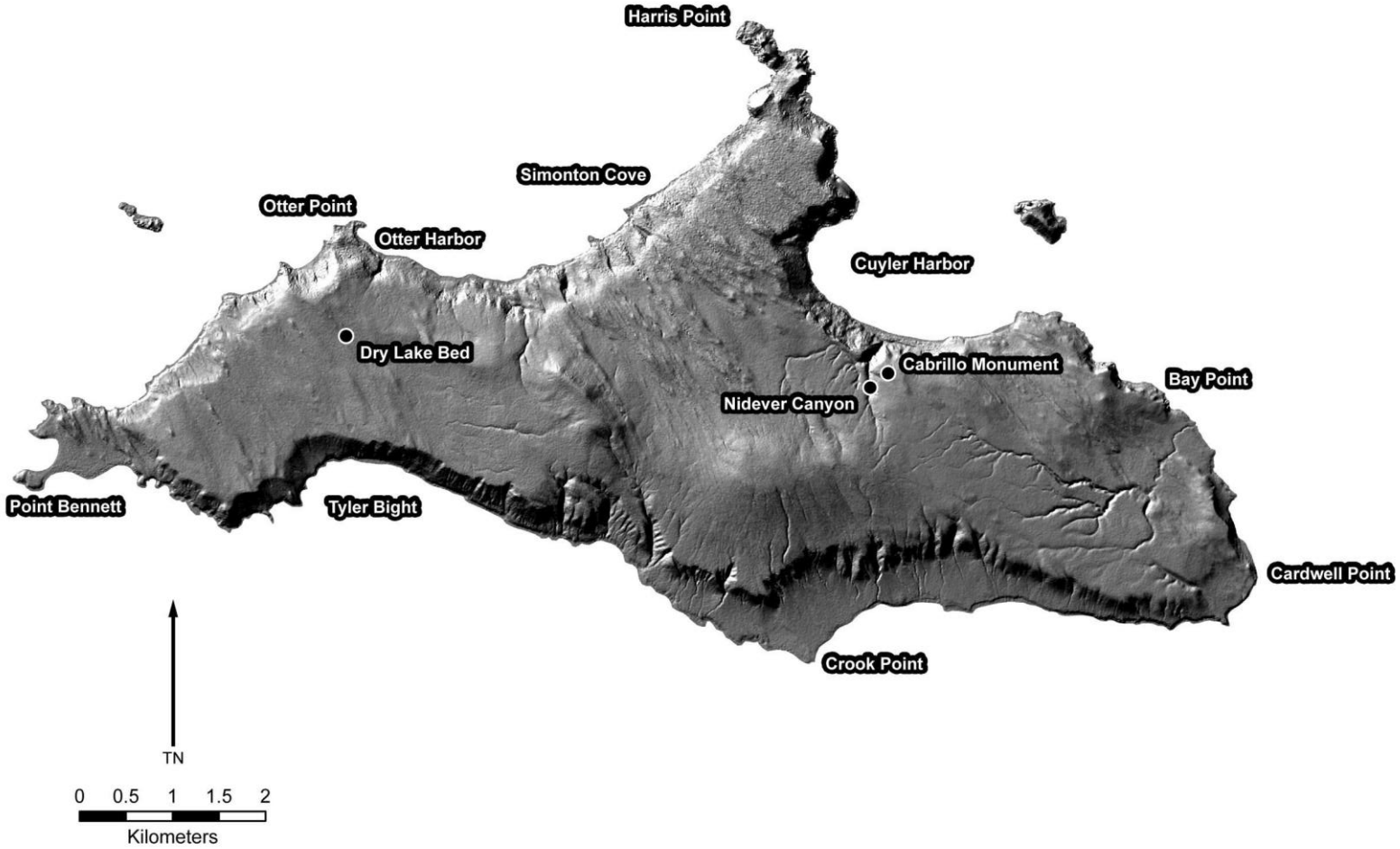

Figure 8.1. San Miguel Island showing locations mentioned in this chapter.

were encountered and recorded), and the focus remained on the assessment of existing site records. Greenwood's (1978) site assessment project rerecorded, mapped, and evaluated 154 of Rozaire and Kritzman's 542 Native American sites—33% of the recorded archaeological sites. Twenty-two new sites were also recorded, eight associated with Native American occupations, five with historic Euro-American occupations, and nine paleontological sites. Greenwood (1978) assigned new archaeological site numbers to SMI-573 to 579, 581, 582, and SMI-584 to 590. Due to changing field conditions or methods, Greenwood's team also combined some clusters of small sites recorded by Rozaire and Kritzman into site complexes covered by a single site number. Subsequent reconnaissance work requires the use of two sets of base maps produced by the studies led by Rozaire and Greenwood.

Greenwood's (1978:2) investigations identified the need for some systematic resurvey of San Miguel Island to better evaluate the existing site record inventory generated by Rozaire (1978c) and Kritzman. To this end, the Park contracted Glassow (1982) and a University of California, Santa Barbara team to conduct a systematic survey project of a small portion of the island. This project also was designed to assess the potential of identifying archaeological sites using remote sensing from aerial photographs, with mixed results. Glassow's (1982) study was designed to assess the thoroughness of earlier reconnaissance work by systematically surveying two quarter mile wide north-south transects on the east end of the island. Glassow (1982) and colleagues identified 22 previously unrecorded archaeological sites (site numbers SMI-550 through 566 and SMI-568 through 572), 15 of which were located on the south coast of the island. These results suggested that large numbers of archaeological sites may have gone undocumented and unrecorded on the south coast of San Miguel Island. The locations of these surveys is shown in Figure 8.2.

In the 1980s and 1990s the focus of research on San Miguel Island turned towards understanding the prehistory of maritime adaptations through excavation, mapping, and surface collections at a variety of sites on the north coast. In 1982, responding to the Park's concerns about the erosion of several large sites, Phillip Walker and Pandora Snethkamp of UCSB studied several sites on the northwest coast of the island, providing a system by which site erosion could be monitored and stabilized, demonstrating the research potential of selected sites and artifacts in both primary and secondary contexts, and making recommendations regarding the treatment and care of human skeletal remains and artifacts on San Miguel Island. From 1985 to 1986, Pandora Snethkamp, Daniel Guthrie, and Don Morris conducted a salvage excavation and mapping project at Daisy Cave (SMI-261) on the northeast coast. Their project was designed to re-document Rozaire's (1978c) stratigraphic profiles, produce a detailed map of the cave, and collect a sample of the faunal remains from their natural strata. Significantly, this work also produced the first ^{14}C dates from Daisy Cave, extending the occupation of the island back to at least 9000 years, and potentially to more than 11,000 years. In the 1990s, Jon Erlandson and a team of UO archaeologists conducted a multi-year excavation and salvage project at Daisy Cave and Cave of the Chimneys (SMI-603) on the northeast coast, confirming the presence of a terminal Pleistocene occupation at Daisy Cave and providing a detailed trans-Holocene record of human occupation at the two sites (Connolly et al. 1995; Erlandson 2007; Erlandson, Kennett, Ingram, Guthrie et al. 1996; Erlandson, Tveskov et al. 1996; Rick et al. 2001; Vellanoweth 2001a, b).

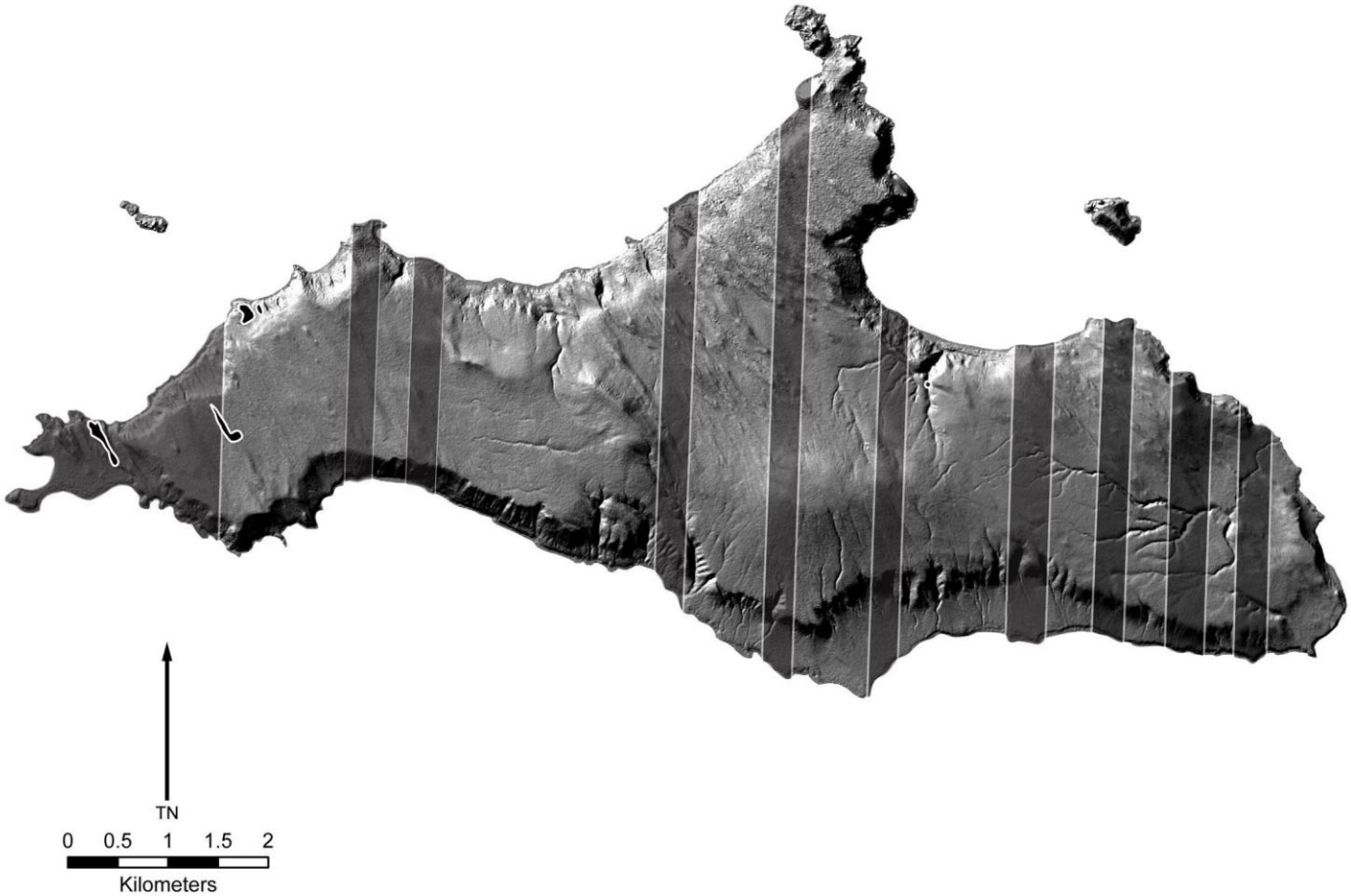

Figure 8.2. San Miguel Island showing areas intensively surveyed. Transects are in medium gray and smaller irregular survey areas are in black.

Also in the 1990s, UCSB doctoral student Douglas Kennett obtained ^{14}C dates and column samples from several shell middens and conducted more extensive excavations at three Late Holocene sites on the west end in and near the modern Pt. Bennett sea mammal rookery (Kennett 1998, 2005; Walker et al. 2002). The Point Bennett excavations were designed to investigate the changing role of sea mammal hunting in the economy of San Miguel Islanders during the Late Holocene. Research was focused on understanding the history of San Miguel's diverse pinniped community, the role island hunters played in shaping this history, and the impact of human predation on pinniped density and distribution from past to present.

In the last eight years a variety of new archaeological survey and excavation projects have been conducted on San Miguel Island. Erlandson and his students at the UO have carried out much of this research. In 2000, Torben Rick began his dissertation fieldwork at a series of Late Holocene sites on north coast of San Miguel (SMI-87, 163, 468, 470, and 481) and Santa Rosa islands. His project provided a detailed overview of changes in human daily activities, emergent complexity, and ecology over the last 3,000 years on San Miguel Island. A site assessment project conducted by Rick and Erlandson demonstrated, among other findings, that a substantial number of sites were unrecorded on the south coast of San Miguel. As a response, Todd Braje and Erlandson began a systematic survey of the south coast of San Miguel Island in 2004, recording 66 new archaeological sites. Braje also excavated a series of five south coast sites for his dissertation work at the UO, investigating subsistence, technological, and ecological change and human impacts on marine ecosystems. Braje and Erlandson also conducted a systematic shoreline survey to locate and record all the historic "Chinese abalone camps" on the island (see Braje and Erlandson 2006b). Currently, Erlandson, Braje, and Rick continue to conduct research projects on the archaeology and historical ecology of San Miguel at a variety of other island sites.

Exciting new research also has been initiated by Erlandson and Braje on terminal Pleistocene and Early Holocene occupations on San Miguel. Braje's work at a ~9500 year old site, SMI-608, on San Miguel's south coast was designed to better understand Early Holocene subsistence, technologies, migration patterns, burial practices, and maritime lifeways on the Northern Channel Islands. Erlandson has begun new research on a series of lithic workshop sites on eastern San Miguel, the Cardwell Bluffs sites. Initial radiocarbon dating and associated lithic technologies suggest that the sites (SMI-678, 679, and 680) date to the terminal Pleistocene (~12,000-11,500 cal BP) and Early Holocene, offering fascinating new insights into the lives the earliest Channel Islanders.

Project Descriptions

Project name (or basic description)
Archaeological Survey on San Miguel Island Channel Islands National Monument California

Principal investigator
Roberta S. Greenwood

Institutional sponsor
Greenwood and Associates

Dates of fieldwork
December 9–19, 1977, January 16, 1978, May 22–25, 1978, and October 30–November 7, 1981

Published and unpublished mss.:
Greenwood 1978; Glassow 1982

Geographic location(s) of fieldwork
Sample of nearly all geographic areas on the island, revisited during Greenwood's fieldwork.

Site nos. or locations from which data were collected
A total of 154 of Rozaire and Kritzman's 1964-1966 sites was rerecorded. Greenwood assigned new archaeological site numbers to SMI-573 to 579, 581, 582, and SMI-584 to 590. A site now known as SMI-603 (Cave of the Chimneys), appears to have been mistakenly recorded as SMI-261 (Daisy Cave), judging from the description of a hole in the roof of the cave, which is not present at Daisy Cave but is characteristic of the nearby SMI-603.

Theoretical and empirical goals of research
Project was undertaken with the goal of relocating a sample of the 542 sites recorded by Rozaire and Kritzman during their island-wide survey from 1964 to 1966. Greenwood relocated a sample of Kritzman's sites, updated and improved the site record information, and recorded any new sites that were encountered during fieldwork.

Types of data collected (collections, site records forms, field records)
Archaeological site records for newly and previously recorded sites, UTM coordinates, location maps, site maps, surface collected diagnostic artifacts and faunal remains, and two reports (one preliminary) summarizing project results.

Person-days and crew size
Not available

Field procedures (and laboratory procedures as applicable)
Greenwood divided the island into quarter-mile wide strips running north-south across the width of the island. A sample of seven strips was chosen, which included a diversity of environmental features on the island. The transects were not systematically surveyed, rather

surveyors were spaced at 20 m intervals in an effort to relocate all previously recorded sites within the corridor. When a known site was relocated, it was rerecorded and mapped, often with more detailed data recorded on the features, artifacts, and faunal remains observed. When a new site was encountered, it was recorded and mapped in a similar fashion.

Location and nature of the archaeological collections and associated documentation

The project reports, site records, and site maps are on file at Park headquarters and at the Central Coast Information Center, Department of Anthropology, University of California, Santa Barbara. The Park assigned accession number 286 to collections obtained during this survey.

Significant descriptive and theoretical conclusions of the research

This survey project rerecorded, mapped, and evaluated 154 of Rozaire and Kritzman's (Rozaire 1978c) 542 prehistoric sites—a total of 33% of the recorded archaeological sites at the time. Twenty-two new sites were also recorded, eight prehistoric, five historic, and nine paleontological.

Potential of collections and data for future research

Greenwood (1982), like Glassow (1982), recommended a full assessment of the site inventory generated by Rozaire and Kritzman and recognized the need to undertake an island-wide resurvey to fully evaluate the existing inventory.

Project name (or basic description)

Archaeological Investigations on Eastern San Miguel Island Channel Islands National Park, California

Principal investigators

Michael A. Glassow and Pandora Snethkamp

Institutional sponsor

University of California, Santa Barbara

Dates of fieldwork

September 20 to September 25, 1981.

Published and unpublished mss.

Glassow 1982

Geographic location(s) of fieldwork

Two quarter-mile wide transects on the east end of San Miguel Island, only the lower terrace on the southern end of the eastern transect and all of the western transect were completed.

Site nos. or locations from which data were collected

Twenty-two previously unrecorded archaeological sites (SMI-550 to 566 and SMI 568 to 572) were documented. Twelve sites (SMI-27, 31, 48, 198, 199, 200, 224, 225, 267, 279, 280, 281) were rerecorded.

Theoretical and empirical goals of research

This project was designed to assess the potential of identifying the locations of archaeological sites on San Miguel Island through remote sensing from aerial photographs, to record new archaeological sites, and to assess and update recorded sites from Kritzman's 1964-66 survey.

Types of data collected (collections, site records forms, field records)

Archaeological site records for newly and previously recorded sites, UTM coordinates, location maps, site maps, site photographs, and a report summarizing project results. A single ^{14}C date was later obtained by Glassow for a large red abalone midden (SMI-557) located on the south coast.

Person-days and crew size

A crew of 4 worked for 7 days, equalling 28 person-days

Field procedures (and laboratory procedures as applicable)

Aerial photographs of survey transects were analyzed for distinctive signatures of archaeological sites without success. Pedestrian survey was conducted within transects, oriented either north-south or east-west based on topographic features, and conducted at 30 meter intervals. Each site was recorded, measured, mapped, and photographed, and an aluminum datum stake with a stamped site number was driven into the ground.

Location and nature of the archaeological collections and associated documentation

The project report, site records, site maps, and photographs are on file at Park headquarters and at the Central Coast Information Center, Department of Anthropology, University of California, Santa Barbara.

Significant descriptive and theoretical conclusions of the research

Glassow identified a number of unrecorded sites on the south coast of San Miguel Island. One reason that these sites may have been overlooked by earlier surveys is that portions of the southern coastal plain were blanketed historically by dune sand deposited after historical overgrazing destabilized the island's extensive dune field. Glassow's results demonstrated the need for continued pedestrian survey of the island, especially areas on the south coast.

Potential of collections and data for future research

Glassow's results suggested that human use of San Miguel's south coast was more extensive than previously thought and offers considerable avenues for future survey, radiocarbon dating, and archaeological investigations of the prehistoric and historic use of the land and seascapes on the south shore of the island. Glassow (1982:60-61) also offers a number of research questions and directions based on his findings.

Project name (or basic description)
Archaeological Investigations on San Miguel Island, Prehistoric Adaptations to the Marine Environment

Principal investigator
Phillip L. Walker and Pandora E. Snethkamp

Institutional sponsor
University of California, Santa Barbara

Dates of fieldwork
Fieldwork completed between August 29 and September 2, 1982 and September 8 and September 26, 1982

Published and unpublished mss.:
Walker and Snethkamp 1984

Geographic location(s) of fieldwork
Western San Miguel Island

Site nos. or locations from which data were collected
SMI-364, 481, 485, 488, 492, 503, 504, 510, 511, 515, 521, and 525

Theoretical and empirical goals of research
Project was designed to provide a basic system by which site erosion can be monitored and stabilized, to demonstrate the research potential of eroding sites and artifacts in both primary and secondary contexts, and to make recommendations regarding the treatment and care of human skeletal remains and artifacts on San Miguel Island.

Types of data collected (collections, site records forms, field records)
Site maps, photographs, soil profiles, a manual for the identification of human skeletal remains on the island, and a report summarizing field and laboratory results and providing management recommendations for the sites. Small (25 x 25 cm wide) column samples were also collected from several sites (see below), and their analysis provided detailed faunal data (especially for shellfish and fish remains) and several ^{14}C dates.

Person-days and crew size
18 field personnel participated at various times over the course of 24 days, equaling 103 person-days

Field procedures (and laboratory procedures as applicable)
A variety of field methods were employed for this project. Faunal transects were conducted at six sites (SMI-481, 485, 488, 492, 504, and 510), identifying all of the human and nonhuman bones within transect areas. Data on the sites surveyed, transect dimensions, number of bones identified, and density of bone at each site were recorded. Human skeletal remains were identified at nine sites (SMI-396, 481, 485, 488, 504, 511, 515, and 525).

Human remains were mapped, photographed, analyzed, and reburied. Two profiles were cleared at SMI-485, 488, 492, 503, 504, 510, and 525, and the soils and cultural stratigraphy were mapped. Column samples were excavated from each site over 1/16-inch mesh. Thirteen column samples were transported to UCSB, and the faunal and artifactual materials were analyzed under the direction of Snethkamp by undergraduate students. a photographic record was produced, and field analysis of mortar and pestle production at SMI-503/504 was also conducted.

Location and nature of the archaeological collections and associated documentation

Collections are stored in the Repository for Archaeological and Ethnographic Collections in the Department of Anthropology at UCSB, under accession no. 348. They consist primarily of faunal remains (shellfish, fish, etc.) from the column samples excavated. The collections may eventually be transferred to the Department of Anthropology, Santa Barbara Museum of Natural History.

Significant descriptive and theoretical conclusions of the research

This project produced a wealth of data on a variety of issues concerning San Miguel Island prehistory, including subsistence, settlement, economic, and health patterns; technological change and craft specialization; site conditions, erosion control methods, and cultural resource management. In addition, this study is one of the few that has systematically documented information from human skeletal remains. This report made significant contributions to the evolution of subsistence patterns and craft specialization, variation in the composition of prehistoric shellfish and sea mammal communities, and the health status and genetic affinities of the island's Native inhabitants.

Potential of collections and data for future research

Walker and Snethkamp's (1984) data and analysis are an important source of information on the prehistory on western San Miguel for future researchers. Continued analysis of their collections is possible with new techniques—isotopic analysis, AMS radiocarbon dating, etc. The photographs taken during this project are an important source of information for understanding the evolution of terrestrial landscapes since the early 1980s under the management of Channel Islands National Park. The management recommendations are still applicable today.

Project name (or basic description)

Daisy Cave (SMI-261) salvage mapping and excavation

Principal investigators

Pandora E. Snethkamp, Daniel A. Guthrie, and Don P. Morris

Institutional sponsor

University of California at Santa Barbara, Claremont College, and the Park

Dates of fieldwork

1985 and 1986

Published and unpublished manuscripts:
Caldwell 1986; Snethkamp 1986

Geographic location(s) of fieldwork
Northeast Coast, Daisy Cave (SMI-261)

Site nos. or locations from which data were collected
Daisy Cave (SMI-261)

Theoretical and empirical goals of research
Project was designed to redocument Charles Rozaire's (1978c) stratigraphic profiles, produce a detailed map of the cave, collect a sample of faunal remains from their natural strata, and obtain a series of ^{14}C dates to document the chronometric age of the archaeological strata at the site.

Types of data collected (collections, site records forms, field records)
A preliminary map of Daisy Cave was produced along with faunal data from two small column samples. Fields notes and photographs were also produced.

Person-days and crew size
Not available

Field procedures (and laboratory procedures as applicable)
The interior and exterior of SMI-261 was mapped in preliminary fashion. Small test pits were excavated inside 'Cave A,' one in the middle chamber and one in the inner chamber. Two small column samples were collected. One column was excavated from Rozaire's (1978c) grid unit H-5, at the base of the cliff face on the slope outside and east of the mouth of SMI-261A. The second column was excavated along the dripline of the rockshelter on the edge of Rozaire's grid D-5 (but within grid unit E-5). Excavations followed natural strata, with material wet-screened in the field before dry screening over 1/16-inch mesh. A cormorant nest was also collected from a ledge in SMI-261A and a red abalone shell from column E-5, stratum G (100 cm) was collected for radiocarbon dating. Several artifacts were also collected while cleaning and documenting the walls of Rozaire's profiles just outside the rockshelter. In the laboratory, midden samples were segregated into ½-inch, ¼-inch, and 1/16-inch fractions. Only preliminary analysis of these materials was completed (see Caldwell 1986) before Snethkamp left UC Santa Barbara. Later, mapping of the site was completed and the column samples were transferred to Jon Erlandson at the University of Oregon, where analysis and dating of the collection was completed prior to the onset of additional field work at Daisy Cave (see below).

Location and nature of the archaeological collections and associated documentation
Some of the ^{14}C samples were destroyed during analysis, but field notes, photographs, and all archaeological materials are temporarily housed in the Department of Anthropology, University of Oregon until completion of the Daisy Cave analysis. The Park has assigned accession number 261 to the collection derived from this project.

Significant descriptive and theoretical conclusions of the research

This project collected the first stratigraphically controlled faunal remains and artifacts and provided the first ^{14}C dates for Daisy Cave, documenting that the site was first occupied by at least 10,000 cal BP and possibly earlier.

Potential of collections and data for future research

A variety of analyses can still be conducted on the excavated materials. Stable isotope analysis and additional radiocarbon dating will provide higher resolution data on the Daisy Cave chronology. Continued analysis on the shellfish, vertebrate, and invertebrate faunal remains and artifacts can produce high-resolution data on the subsistence activities and technologies of early San Miguel Islanders.

Project name (or basic description)

Archaeological Investigations at Daisy Cave (SMI-261)

Principal investigator

Jon M. Erlandson

Institutional sponsor

Department of Anthropology, University of Oregon

Dates of fieldwork

1989, 1992-1994, 1996-1999; 2006, 2007, 2008

Published and unpublished mss.

Connolly et al. 1995; Erlandson 1991b, 1993, 1994, 2005, 2007; Erlandson Braje and Rick 2008; Erlandson, Tvskov, Kennett, and Ingram 1996; Erlandson, Kennett, et al. 1997; Erlandson, Kennett, Ingram et al. 1996; Firestone et al. 2007; Forgeng 1992; Gamble 2002; Jones et al. 2002; Jones et al. 2008; Kennett, Ingram, Erlandson, and Walker 1997; Norris 1997; Rick 1999; Rick and Erlandson 2000; Rick, Erlandson and Vellanoweth 2001, 2003; Rick Vellanoweth, Erlandson, and Kennett 2002; Vellanoweth, Rick, and Erlandson 2002; West and Erlandson 1994

Geographic location(s) of fieldwork

Northeast coast of the island

Site nos. or locations from which data were collected

Daisy Cave (SMI-261)

Theoretical and empirical goals of research

The goals of this research were driven by the continuing erosion of site deposits and the Park's desire to document the antiquity and nature of the cultural deposits being lost. Priorities were to: (1) determine if a shell-bearing terminal Pleistocene soil (Stratum G) at the base of the sequence contained unequivocal artifacts; (2) to recover a more representative

sample of artifacts and ecofacts from the extensive Early Holocene strata (~8600-10,200 cal BP); and better document the age and contents of endangered Middle and Late Holocene components at the site.

Types of data collected (collections, site records forms, field records)

Mapping of the site was completed in 1989. Beginning in 1992 several 50 x 100 cm wide test pits were meticulously excavated in the vicinity of the dripline of the rockshelter outside Cave A. Excavation followed the natural stratification of the deposits, as well as arbitrary levels within thicker strata, with volume controlled by recording the number of liters of sediment in each bucket screened. In 1992, excavated sediments were water-screened (with sea water), with screen residuals dried and returned to the UO for detailed analysis. In subsequent years, dry-screening (1/8-inch and 1/16-inch) was done in the field, with all artifacts and vertebrate remains returned to the UO for further study. To document the stratigraphy of Cave A, Rozaire's test pit the middle chamber of Cave A was re-excavated and a column sample removed from the north wall. Deep soundings were conducted in both areas to document the nature of sediments deposited prior to human occupation, with soil, pollen, and small faunal samples collected from these paleontological strata. Finally, a small deposit of fossil bird bones and land snail shells was collected from the supratidal splash zone below the rockshelter—a paleontological assemblage later ^{14}C dated to >30,000 years ago.

Person-days and crew size

1989: 8 person-days (Erlandson, Morris, Hammersmith)
1992: 30 person-days (Erlandson, S. Cooper, R. Dugger, E. Forgeng)
1993: 20 person-days (Erlandson, L. Chalmers, R. Dugger, D. Kennett)
1994: 32 person-days (Erlandson, S. Byram, T. Connolly, M. Tveskov)
1996: 30 person-days (Erlandson, D. Kennett, O. Mason, D. Morris, M. Tveskov, R. Vellanoweth)
1997: 8 person-days (Erlandson, D. Kennett, D. Morris, T. Rick, R. Vellanoweth)
1998a: 23 person-days (Erlandon, R. Losey, J. Younker, visited by D. L. Johnson & M. Glassow)
1998b: 36 person-days (Erlandson, T. Rick, I. Sawyer, R. Vellanoweth)
1999: 1 person-day (Erlandson, Morris); monitoring only
2008: 4 person-days (Erlandson, C. Billings, T. Garcia, C. Lopez)

Field procedures (and laboratory procedures as applicable)

Careful excavation and processing of the Daisy Cave sediments produced extensive faunal, floral, and artifact assemblages recovered from stratigraphically controlled contexts. A suite of over 50 conventional and AMS ^{14}C dates on charcoal and marine shells help define the site chronology. Pollen samples were also collected from natural stratigraphic layers.

Location and nature of the archaeological collections and associated documentation

The Daisy Cave collections, including Snethkamp's material, are temporarily stored at the Department of Anthropology, University of Oregon, until the analysis is complete. Cataloged under UCSB Accession #514, the collection consists of over 5000 catalog entries.

Two woven items and a small sample of sea grass cordage are on display at the Santa Barbara Museum of Natural History.

Significant descriptive and theoretical conclusions of the research

The work at Daisy Cave, one of the oldest shell middens in the Americas, produced the first definitive evidence for a terminal Pleistocene occupation on the Northern Channel Islands, demonstrated that Paleoindians had boats and seafaring capabilities, produced the most extensive and diverse collection of Paleocoastal artifacts (spire-removed *Olivella* shell beads, bone gorges, sea grass cordage and basketry, a chipped stone crescent and other bifaces, etc.) yet recovered, as well as important evidence for Middle and Late Holocene occupations. The outstanding faunal, floral, and artifactual preservation provides an important trans-Holocene record human adaptation and ecological changes on the Northern Channel Islands. The extraordinary nature of this site and assemblage has led to a National Historic Landmark Nomination that is currently under review.

Potential of collections and data for future research

The Daisy Cave collection has enormous potential for future research on the nature of early maritime lifeways, the development of Chumash society, and ecological changes on San Miguel Island and in its surrounding waters.

Project name (or basic description)

Archaeological Investigations at Cave of the Chimneys (SMI-603)

Principal investigators

Jon M. Erlandson, René L. Vellanoweth, and Douglas J. Kennett

Institutional sponsor

Department of Anthropology, University of Oregon

Dates of fieldwork

Intermittently between 1992 and 1998

Published and unpublished mss.

Kennett 1998, 2005; Kennett, Ingram, Erlandson, and Walker 1997; Rick Erlandson and Vellanoweth 2003; Rick, Vellanoweth, and Erlandson 2005a, 2005b; Vellanoweth 2001a, 2001b; Vellanoweth, Lambright, Erlandson, and Rick 2003; Vellanoweth, Rick and Erlandson 2002

Geographic location(s) of fieldwork

Bay Point area, northeast coast

Site nos. or locations from which data were collected

Cave of the Chimneys (SMI-603)

Theoretical and empirical goals of research

This research project was designed to sample the cultural materials at Cave of the Chimneys, salvage eroding archaeological deposits, fill in the occupational gaps represented at nearby Daisy Cave, and better understand the history of occupation, subsistence activities, and technologies on San Miguel Island through time.

Types of data collected (collections, site records forms, field records)

Collected were shellfish and vertebrate faunal remains and artifacts. Formal, diagnostic shell, bone, stone, and fiber artifacts were collected from eroding exposures. All of these materials are still being analyzed by Vellanoweth at the Department of Anthropology, California State University, Los Angeles.

Person-days and crew size

Information is available only for 1998: Four people worked for nine days, equaling 36 person-days.

Field procedures (and laboratory procedures as applicable)

In 1994, three exploratory probes (20 x 20 cm and less than 50 cm deep) were excavated by Erlandson and Kennett to obtain samples for radiocarbon dating. Charcoal and marine shell samples were dated to 4400 cal BP (Kennett 1998), without reaching the basal deposits. In 1997-1998, Vellanoweth, Erlandson, Kennett, and Rick excavated a 0.5 m x 1.0 m unit under a rock overhang situated along the cave's northeast wall. Hand excavation followed natural stratigraphy and all sediments were screened over 1/8-inch mesh. All screen residuals and four bulk soil samples were collected and transported to the laboratory. All archaeological materials were washed over graduated screens, sorted by major faunal and artifact categories, and quantified. Radiocarbon dating shows that the basal deposits at Cave of the Chimneys date to at least 8400 cal BP.

Location and nature of the archaeological collections and associated documentation

Field notes, photographs, surface collections, and excavated samples are housed at the Department of Anthropology, California State University, Los Angeles.

Significant descriptive and theoretical conclusions of the research

This project has produced valuable information on the subsistence, economic, technological, and social systems of San Miguel Islanders. Excavations produced an assemblage of perishable fiber artifacts, rarely recovered in Channel Island shell middens. The cordage and knots produced from Cave of the Chimneys, and Daisy Cave, offer a unique glimpse into the nature of early island fiber technology. Significantly, Cave of the Chimneys appears to have been occupied during many of times when Daisy Cave does not seem to have been used. The occupational sequence at the two cave sites combined provides a nearly unparalleled record of human lifeways and local ecosystems on San Miguel Island spanning the past 11,500 years.

Potential of collections and data for future research

Archaeological investigations produced a rich assemblage of shell, bone, and stone artifacts and faunal remains. A number of important studies concerning the archaeology of San Miguel Island are still possible with the collected samples. Analyses are on-going and

additional faunal studies of shellfish and fish and sea mammal bone are currently underway. Detailed artifactual analyzes are also being carried out to complement the faunal studies.

Project name (or basic description)
Archaeological Investigations at Point Bennett (SMI-525, 528, and 602)

Principal investigators
Douglas J Kennett, Phillip L. Walker, Robert DeLong

Institutional sponsor
Department of Anthropology, University of California, Santa Barbara

Dates of fieldwork
1993-1998

Published and unpublished mss.
Cruz 2004; Kennett 1998, 2005; Rick, Vellanoweth, Erlandson, and Kennett 2002; Walker et al. 2002

Geographic location(s) of fieldwork
Point Bennett vicinity in the western sector of the island

Site nos. or locations from which data were collected
SMI-525, 528, 602

Theoretical and empirical goals of research
Project was designed to investigate the changing role of sea mammal hunting in the economy of San Miguel Islanders during the Late Holocene. Research was focused on understanding the history of San Miguel's diverse pinniped community, the role island hunters played in shaping this history, and the impact of human predation on pinniped density and distribution from past to present.

Types of data collected (collections, site records forms, field records)
Excavation resulted in collections of shellfish and vertebrate faunal remains and artifacts from the sites. Diagnostic shell, bone, and stone artifacts were collected from eroding exposures. All of these materials are still being analyzed at OU. Field notes on the excavations, site maps, and photographs were also obtained.

Person-days and crew size
Crews of 3-6 people worked for 10-15 days, equaling approximately 48 person-days.

Field procedures (and laboratory procedures as applicable)
Excavation of small bulk or column samples screened over fine (1/16-inch mesh) and larger 2.0 x 1.0 meter units screened over 1/8-inch mesh for bone, artifacts, and diagnostic material.

Location and nature of the archaeological collections and associated documentation

Some shell fragments were destroyed during ^{14}C and isotopic analysis. Some fish bones were destroyed for isotopic analysis for the purpose of trophic-level analysis studies. Field notes, shell fragments, surface collections, and excavated samples are housed at the Department of Anthropology, University of Oregon.

Significant descriptive and theoretical conclusions of the research

Data from this study show that the structure of the San Miguel Island pinniped community underwent significant changes during the past 5000 years. The California sea lions and elephant seals that dominate the modern pinniped community at Point Bennett today are relatively rare in archaeological assemblages from SMI-525, 528, and 602. Rather, prehistoric assemblages are dominated by Guadalupe fur seals, sea otters, and northern fur seals. These results are especially intriguing because Guadalupe fur seals and sea otters are rare or absent in San Miguel Island waters today. In addition, SMI-602 contains a large Late Holocene residential area with house pits, a cemetery, and other evidence of permanent occupation in the middle of the modern Point Bennett breeding ground. These data suggest a complex history of human impacts on local sea mammal populations that may have begun as early as 5000 years ago.

Potential of collections and data for future research

Archaeological investigations produced a rich assemblage of shell, bone, and stone artifacts and faunal remains. A number of important studies on the archaeological and modern history of western San Miguel Island and the Point Bennett area are still possible from the collected samples. New isotopic studies are ongoing, and additional faunal studies of shellfish and fish and sea mammal bone are currently underway. Detailed artifactual analyses are also being carried out to complement the faunal studies. These collections represent some of the best data sources on the economic and social activities of Late Holocene San Miguel Islanders.

Project name (or basic description)

Reconstructing Human Daily Activities, Subsistence, and Historical Ecology of the Late Holocene San Miguel Island, California

Principal investigators

Torben C. Rick and Jon M. Erlandson

Institutional sponsor

University of Oregon, with Park and National Science Foundation support.

Dates of fieldwork

Fieldwork conducted between June 2000 to October 2002, with initial site visits in 1997, 1998, and 1999

Published and unpublished mss.

Braje, Rick, and Erlandson 2008; Erlandson, Rick, Braje et al. 2008; Erlandson, Rick, and Peterson 2005a; Rick 2004a, 2004b, 2007a; Rick, Reeder, and Shaw 2008; Rick Erlandson,

and Vellanoweth 2006; Rick, Erlandson, Vellanoweth, and Braje 2005; Rick, Vellanoweth, Erlandson, and Kennett 2002

Geographic location(s) of fieldwork

Cuyler Harbor and Otter Point localities

Site nos. or locations from which data were collected

Primarily SMI-87, 163, 468, 470, and 481, although ^{14}C dating and ancillary work was also done at other sites.

Theoretical and empirical goals of research

Project was designed to provide a detailed overview of changes in human daily activities, emergent complexity, and ecology over the last 3,000 years on San Miguel Island. This research represents a baseline for understanding long-term cultural developments among the Late Holocene Chumash. The primarily research issues addressed in this study fall under three categories: 1) daily activities and community dynamics; 2) complex hunter-gatherers and emergent complexity; and 3) historical ecology and human impacts on ancient environments.

Types of data collected (collections, site records forms, field records)

Site maps, photographs, and field notes were complied for each site. Surface collections of diagnostic artifacts and faunal remains were conducted when possible. Site excavations included shellfish, vertebrate remains, and artifacts.

Person-days and crew size

Crews of between 3-4 people worked for several days, equaling approximately 20 person-days

Field procedures (and laboratory procedures as applicable)

Nine small test units, primarily 0.5 x 1.0 m and 0.5 x 0.5 m wide, were excavated at SMI-87, 163, 468, 470, and 481. All of the archaeological sediments were screened over a combination of 1/8-inch and 1/16-inch mesh, and volume was estimated using measured buckets. Twenty-two auger holes were excavated at SMI-163 and 468. Auger holes (3-inch diameter) were used to determine the depth of site deposits in unexcavated areas, to identify the location of house floors and other subsurface features, and to establish site boundaries. The sediments from auger holes were screened over 1/8-inch or 1/16-inch mesh. Controlled surface collections for artifacts and/or mammal bones and screening of rodent tailings were conducted at SMI-87, 163, and 481. SMI-163, 468, and 470 were mapped using a laser transit.

Location and nature of the archaeological collections and associated documentation

Some of the ^{14}C samples were destroyed during analysis, but field notes, photographs, and all archaeological materials are housed in the Department of Anthropology, Southern Methodist University. All of these materials are still being analyzed at Southern Methodist University.

Significant descriptive and theoretical conclusions of the research

A recent book by Torben Rick (2007a) documents a number of important conclusions from this research project. Overall, Rick's project demonstrated significant variability in the Late Holocene archaeological record on San Miguel Island, both in the types of faunal exploited and the types of artifacts produced and exchanged. His study also revealed a long history of human impacts on and management of marine ecosystems, which may help in modern management practices of Channel Islands marine and terrestrial ecosystems.

Potential of collections and data for future research

A variety of analyses can still be conducted on the excavated and surface collected materials. Stable isotope analysis and additional radiocarbon dating will provide higher-resolution data on Late Holocene San Miguel Island. Continued analysis on the shellfish, vertebrate, and invertebrate faunal remains and artifacts from all six archaeological sites will be important for understanding the nature of Late Holocene settlement, subsistence, and human impacts on San Miguel Island as well as its relationships with the other Northern Channel Islands.

Project name (or basic description)

Archaeological Site Assessments on San Miguel and Santa Rosa Islands, Channel Islands National Park, California

Principal investigator

Torben C. Rick and Jon M. Erlandson

Institutional sponsor

Department of Anthropology, University of Oregon

Dates of fieldwork

Thirty-two days between May 1, 2002 and September 30, 2003

Published and unpublished mss.

Rick and Erlandson 2004

Geographic location(s) of fieldwork

Point Bennett, Cuyler Harbor, Otter Harbor, Simonton Cove, Bay Point, Harris Point, Tyler Bight, the Dry Lake Bed, and Crook Point

Site nos. or locations from which data were collected

Small ^{14}C samples were collected from eroding exposures at SMI-1, 42, 87, 149 to 154, 159, 160/162, 161 (155, 156, 157, 158), 163, 181, 185 to 193, 232, 234, 261 to 265, 267 to 270, 283, 285, 286, 287, 294, 295, 296, 297, 298, 464, 467 to 481, 485, 486, 520, 521, 522, 534, 535, 536, 545, 575/577, 578, 579, 581, 608 to 611, Cuyler Temp 1, SMI-SC-TEMP-1, SMI-SC-TEMP-3, SMI-SC-TEMP-4, SMI-SC-TEMP-5

Theoretical and empirical goals of research

The goals of this research included 1) targeting multiple portions of the island and obtaining detailed site environmental data; 2) assessing the current integrity of the archaeological

resources and documenting changes that may have occurred since the sites were originally recorded; 3) obtaining necessary information to be entered into the Archaeological Site Management Information System (ASMIS); 4) documenting any disturbances or threats to the archaeological sites; and 5) providing brief recommendations for future research or salvage excavation at the sites.

Types of data collected (collections, site records forms, field records)

Archaeological site assessment forms, archaeological site records for newly recorded sites, location maps, site maps, and a report summarizing condition and management recommendations for the sites.

Person-days and crew size

A crew of 3-4 worked for 32 days, equaling 121 person-days.

Field procedures (and laboratory procedures as applicable)

Each site targeted for assessment was visited and noted the location, setting, and condition of the archaeological resources. UTM coordinates for the sites were obtained. Digital and/or 35 mm slides of each site were obtained, including documentation of site layout and setting, any disturbances and/or threats, as well as unique cultural or natural features. The presence, location, condition, and potential threat to any human remains were noted. New sites discovered during the project were also recorded. Small radiocarbon samples and/or small bulk samples from threatened sites were collected from eroding exposures whenever possible.

Location and nature of the archaeological collections and associated documentation

The project report, site assessment forms, site records, and site maps are on file at Park headquarters. Some of the ^{14}C samples were destroyed during analysis, but field notes, shell fragments, and bulk samples are housed at the Department of Anthropology, Southern Methodist University.

Significant descriptive and theoretical conclusions of the research

A total of 79 archaeological sites was assessed. The most profound threats to the sites are marine and sea cliff erosion, wind deflation/erosion, and rodent burrowing. Investigators made a total of 10 recommendations to mitigate the effects of the documented threats and disturbances (see Rick and Erlandson 2004:7-8).

Potential of collections and data for future research

Additional radiocarbon dates could be submitted from collected samples to help refine the prehistoric chronology of San Miguel Island occupation.

Project name (or basic description)

Paleocoastal Occupation on San Miguel Island, California

Principal investigator

Jon M. Erlandson

Institutional sponsor

Department of Anthropology, University of Oregon

Dates of fieldwork

1999 to 2007

Published and unpublished mss.

Braje and Erlandson 2008; Erlandson 2000; Erlandson and Braje 2007; 2008a, 2008b; Erlandson, Braje, and Rick 2008; Erlandson, Braje, Rick, and Davis 2009; Erlandson, Braje, and Snitker 2008; Erlandson, Moss, and Des Lauriers 2008; Erlandson, Braje, Rick, Davis, and Southon 2008; Erlandson and Rick 2002a; Erlandson, Rick and Batterson 2004; Erlandson, Rick, and Peterson 2005a; Rick, Erlandson and Vellanoweth 2003; Erlandson, Rick, Vellanoweth, and Largaespada 2004

Geographic location(s) of fieldwork

Island-wide, with emphasis on northwest coast, Point Bennett, Simonton Cove, Harris Point, and Cardwell Point areas, especially cave sites, freshwater springs, and lithic sources.

Site nos. or locations from which data were collected

SMI-388NE, 481, 507, 522, 528, 548, 575, 588, 604, 605, 606, 607, 608, 610, 623, 678, 679, 680, 681, 684, 685 and others.

Theoretical and empirical goals of research

Systematic search for Early Holocene and terminal Pleistocene shell middens, focused on high-probability areas that may have drawn Paleocoastal peoples away from now-submerged coastlines. The larger goal was to understand the nature of early maritime settlement and subsistence on San Miguel Island, as well as to evaluate the antiquity of Paleoindian seafaring and the potential contribution of a coastal migration to the peopling of the Americas.

Types of data collected (collections, site records forms, field records)

Locational mapping, radiocarbon dating, site condition assessments, surface collection of diagnostic artifacts, and samples from small-scale excavations at threatened sites.

Person-days and crew size

Crews generally were limited to 4-5 people for a week of field work at a time. Because this work was often intermixed with work on Late and Middle Holocene sites in the same areas, it is impossible to accurately determine the number of person-days represented in this ongoing effort. Significant fieldwork on this project began in 2001 with grant funding from the Foundation for Exploration and Research on Cultural Origins. Additional survey has been accomplished annually since that time, primarily with funding from the University of Oregon, but also with support from the National Science Foundation.

Field procedures (and laboratory procedures as applicable)

This ongoing project has focused primarily on systematic survey of eroding arroyo, sea cliff exposures, and dune exposures where exposures of the Late Pleistocene/Early Holocene "Simonton Soil" were searched from evidence of human occupation. Marine shell samples were collected from numerous small and low density shell middens embedded in (or immediately overlying) this distinctive soil. Where erosion threatened significant site deposits, limited testing has been conducted to document the content and context of endangered site deposits.

Location and nature of the archaeological collections and associated documentation

Department of Anthropology, University of Oregon. They will ultimately be housed at the Santa Barbara Museum of Natural History. The Park has assigned accession number 320 to collections from SMI-605 and accession number 321 to collections from SMI-606.

Significant descriptive and theoretical conclusions of the research

So far, this work has documented over 35 sites dating between about 7500 and 12,000 cal BP, sites that show substantial variation in location, size, density, and contents of Paleocoastal sites. The large number and spatial variability of early sites, despite the fact that large expanses of coastal lowlands have been lost to erosion or submerged by rising seas, suggests that San Miguel was a major focus of Paleocoastal settlement and may have supported a larger human population during the Early Holocene than previously anticipated. Recent work has also helped document important technological evidence for the existence of a Paleocoastal maritime hunting tradition marked by numerous Channel Island Barbed points and chipped stone crescents.

Potential of collections and data for future research

Many of the early sites identified have not yet been excavated, but the sites provide a rich source of future data on early maritime peoples on San Miguel. The sites that have been excavated—SMI-388NE, 522, 528, 575, and 608—have produced small collections that still have great potential for technological and ecological analysis. Study of these collections is ongoing at the University of Oregon.

Project name (or basic description)

Archaeological survey of the island's south coast

Principal investigators

Todd J. Braje and Jon M. Erlandson

Institutional sponsor

Department of Anthropology, University of Oregon

Dates of fieldwork

February 24-30, 2004; July 6-12, 2004; August 4-17; February 13-14, 2005

Published and unpublished mss.

Braje and Erlandson 2005; Braje 2007a; Braje, Erlandson, and Rick 2005

Geographic location(s) of fieldwork

The south coast of the island extending from Point Bennett on the west to Cardwell Point on the east, and including all land located between the ocean and the rim of the southern escarpment.

Site nos. or locations from which data were collected

Small ^{14}C samples were collected from all accessible prehistoric shell midden sites, from SMI-612 to SMI-675.

Theoretical and empirical goals of research

This project was designed to better understand and document the antiquity and nature of human use of south coast land and seascapes. Based on Glassow's (1982) survey results, this project was designed to evaluate the cultural resources on the south coast of the island and to collect radiocarbon samples from previously recorded and unrecorded south coast sites.

Types of data collected (collections, site records forms, field records)

Archaeological site records, GPS locations, a report summarizing the findings, and recommendations for future site management, and *in situ* marine shells from the site deposits for ^{14}C dating.

Person-days and crew size

Feb. 2004: crew of 4 for 28 person-days; July 2004: crew of 4 for 28 person-days; Aug 2004: crew of 2 for 28 person-days; Feb. 2005: crew of 4 for 8 person-days

Field procedures (and laboratory procedures as applicable)

Pedestrian survey focused on the extensive south coast gully systems and the sea cliff exposures as the likely locations of unrecorded sites. In combination with walking every gully and along the sea cliff, the areas between the gullies were surveyed at 10-20 meter intervals. Areas with heavy vegetation cover and thick blankets of historic dune sand were surveyed at 15-20 meter intervals, while denuded areas (areas centered on Crook Point) were surveyed at 10-15 meter intervals. Upon locating unrecorded sites, site record forms were completed, site locations were mapped using GPS technology, each site was photographed, and, wherever possible, organic samples were collected from erosional exposures for radiocarbon (^{14}C) dating.

Location and nature of the archaeological collections and associated documentation

The project report, site records, and site maps are on file at Park headquarters. Some of the ^{14}C samples were destroyed during analysis, but field notes and shell fragments are housed at the Department of Anthropology, University of Oregon.

Significant descriptive and theoretical conclusions of the research

Survey produced 66 newly recorded sites: 51 prehistoric and 15 historic sites. These ranged from small rock shelters to large open sites, and they appear to encompass a range of site types from short-term camps or shellfish processing locations, to seasonal encampments, to

villages with substantial midden deposits and human burials, to historic bomb craters, roads, and abalone processing camps.

Potential of collections and data for future research

Survey results suggest that human use of San Miguel's south coast was more extensive than previously thought and offers considerable avenues for future subsurface investigations at a variety of Early, Middle, and Late Holocene and Historic sites. Additional radiocarbon samples could be submitted to help refine the chronology of south coast archaeological sites.

Project name (or basic description)

The Archaeology and Historical Ecology of the South Coast of San Miguel Island

Principal investigators

Todd J. Braje and Jon M. Erlandson

Institutional sponsor

Department of Anthropology, University of Oregon

Dates of fieldwork

Fieldwork for this project overlapped with the south coast survey project, where days were often split between survey and sampling. February 24-27 2004; July 7-10, 2004; August 16, 2004; February 10-14, 2005; August 26-28, 2005; July 20-23, 2006

Published and unpublished mss.

Braje 2007a; Braje and Erlandson 2006a, 2007, 2008a; Braje, Erlandson, and Rick 2004; Braje Rick, and Erlandson 2008; Erlandson, Braje, Rick, and Peterson 2005; Erlandson, Rick, Braje, Steinberg, and Vellanoweth 2008

Geographic location(s) of fieldwork

South-central coast of San Miguel Island near Crook Point

Site nos. or locations from which data were collected

^{14}C samples were collected and subsurface excavations of small bulk samples and 2.0 x 1.0 m excavation units were conducted at SMI-232, SMI-558, SMI-608, SMI-628, and SMI-657.

Theoretical and empirical goals of research

This project investigated issues of long-term subsistence change, development of new technology, and human impacts on marine ecosystems on the south-central coast of San Miguel Island. These issues are directly related to understanding human-environmental relationships with the ultimate goal of building long-term, trans-Holocene records, which can provide a better measure of a healthy marine environment and aid in developing future conservation protocols.

Types of data collected (collections, site records forms, field records)

Site excavation included collection shellfish and vertebrate faunal remains and artifacts from SMI-232, 558, 608, 628, and 657. Field notes on the excavations, site maps, and photographs were also obtained.

Person-days and crew size

Feb. 2004: a crew of 4 for 16 person-days; July 2004: a crew of 4 for 16 person-days; August 2004: a crew of 2 for 2 person-days; Feb. 2005: a crew of 4 for 20 person-days; August 2005: a crew of 4 for 12 person-days; July 2006: a crew of 4 for 16 person-days

Field procedures (and laboratory procedures as applicable)

Small bulk samples were collected from eroding exposures at each site, screened over 1/16-inch mesh, and the residuals transported to UO for detailed analysis. A 2.0 x 1.0 m test unit was also excavated at each site, screened over 1/8-inch mesh, and bone and artifacts were transported to the UO for detailed analysis. Soil samples were collected from each site along with *in situ* shellfish for radiocarbon dating from the sidewalls. At each site detailed stratigraphic profiles were drawn and photographed.

Location and nature of the archaeological collections and associated documentation

Some of the ^{14}C samples were destroyed during analysis, but field notes, shell fragments, and excavated samples are housed at the Department of Anthropology, University of Oregon.

Significant descriptive and theoretical conclusions of the research

Results of this study indicate that the ancient south coast occupants of San Miguel did impact local marine environments, similar to patterns seen on the north coast and across the other Northern Channel Islands. As populations grew, technologies became more sophisticated and subsistence strategies diversified, leading to local alterations in the marine ecosystem. Compared to the immediate and devastating impacts of historic Euro-American practices, however, they engaged in relatively sustainable strategies focused on the harvest of similar suites of resources over millennia.

Potential of collections and data for future research

Stable isotope analysis and continued zooarchaeological and artifactual analysis on collected samples will all provide important information on the south coast of San Miguel Island over the last 9500 years.

Project name (or basic description)

Historical Ecology and Archaeology of San Miguel Island, California

Principal investigator

Jon M. Erlandson and Todd J. Braje

Institutional sponsor

Department of Anthropology, University of Oregon

Dates of fieldwork

February 27, 2004; July 11, 2004; August 13, 2004; August 26&29 2005; December 4-5 and 9-10, 2007

Published and unpublished mss.

Braje 2007a; Braje and Erlandson 2006a, 2007, 2008a; Braje, Erlandson, and Rick 2007; Braje, Erlandson, and Timbrook 2005; Erlandson and Braje 2007

Geographic location(s) of fieldwork

All areas of the island

Site nos. or locations from which data were collected

SMI-396, 557, 575, 614H

Theoretical and empirical goals of research

Erlandson and Braje continue to conduct archaeological and historical ecological research on San Miguel Island aimed at better understanding patterns of cultural and ecological evolution and human impacts on terrestrial and near shore ecosystems.

Types of data collected (collections, site records forms, field records)

Field notes on excavations, surface collections, and procedures; site maps; photographs; surface collected artifacts; and excavated samples of shellfish and vertebrate faunal remains and artifacts

Person-days and crew size

Feb. 2004: a crew of 4 for 4 person-days; July 2004: a crew of 4 for 4 person-days; August 2004: a crew of 2 for 2 person-days; August 2005: a crew of 3 for 6 person-days; Dec. 2007: a crew of 5 for 16 person-days

Field procedures (and laboratory procedures as applicable)

Continued site monitoring, surface collection of eroding archaeological exposures, collection of small radiocarbon samples for AMS dating, and the excavation of small samples from eroding site exposures screened over fine mesh screens. Detailed faunal analysis of excavated samples and high-resolution radiocarbon dating and isotopic analysis have been the focus of laboratory procedures. This project also focused on recording the undocumented historic occupations and features on San Miguel Island, including Chinese abalone processing camps, the historic US Navy road, and historic bomb craters on the south coast.

Location and nature of the archaeological collections and associated documentation

Some radiocarbon samples were destroyed during analysis, but field notes, photographs, and excavated archaeological materials are currently housed at the Department of Anthropology, University of Oregon (Erlandson), or Department of Anthropology, Humboldt State University (Braje).

Significant descriptive and theoretical conclusions of the research

This project has made numerous contributions concerning the archaeology and historical ecology of San Miguel Island. Research has found that San Miguel was occupied more

extensively and intensively at an earlier time than previously thought. Research has also shown a wider range of Early Holocene and Middle Holocene tools and technologies than previously believed. This project has also made significant strides in documenting and interpreting the variety of historic occupations on San Miguel Island beginning in the mid-1800s through historic military activity of the 20th century. Analysis of faunal remains and artifacts from all sites is underway.

Potential of collections and data for future research

Detailed analysis and continued study will be important for understanding the ancient history of the island and the role humans have played in structuring local terrestrial and marine ecosystems. Stable isotope analysis and continued radiocarbon dating and zooarchaeological analysis will provide key datasets.

CHAPTER 9

HISTORIC ARCHAEOLOGICAL RESOURCES

There are remarkably few formally recorded historical archaeological resources within the CINP: a total of 52 (Table 9.1). This is due to the emphasis by archaeologists on the complex and fascinating record of the islands' prehistoric occupation, which stretches back as many as 13,000 years. Consequently, this chapter necessarily has a different format than the preceeding ones in that it includes an inventory of locations where historic buildings and various other sorts of facilities are known to have existed on the basis of historic records and visual observation. The large number of historic resources included in this inventory is an indication of the considerable potential for historic archaeology within the Park.

Those historic-period sites for which official record forms have been filled out and filed with the California Office of Historic Preservation's Information Center system are identified below as "recorded." This information was obtained from the Channel Islands National Park offices in Ventura, the Central Coastal Information Center and the South Central Coastal Information Center of the California Office of Historic Preservation, and the Channel Islands data base of the National Park Service (site designations have CHIS- prefix). Information on historic sites also came from interviews with Ann Huston and Don Morris (Channel Islands National Park), Michael Glassow (University of California, Santa Barbara), and John Johnson (Santa Barbara Museum of Natural History). The complete list of recorded sites is presented in Appendix 1. Also useful for identifying potential locations of historical archaeological remains are National Register of Historic Places archaeological district evaluations on several of the islands, published maps with place names, and various histories and summaries (such as Glassow 2007).

The prospects for historic-period archaeological resources may be gained from summary histories of the islands that provide information on prior occupants and activities. Most useful in this regard is the comprehensive draft study of the historic resources within the Park submitted by Dewey S. Livingston (2006), along with cultural landscape inventories of Santa Rosa Island (2002b) and Santa Cruz Island by the National Park Service (2002a, 2003, and 2004). Livingston provides an invaluable historic overview for each of the islands, and the historic names used in this report to reference specific sites follow his designations. His narratives, and the Park studies, often mention locations that could qualify as historical archaeological resources but which have not yet been recorded or, in many cases, even located. These potential sites have been identified below by type, and sometimes specifically by name.

Livingston addresses the National Register of Historic Places eligibility of the islands' built-environment resources, particularly assessing the significance of existing buildings, and of landscape features such as roads, fences, and water systems. These types of landscape features are often studied by archaeologists as well as historians, and one road has been formally recorded on San Miguel Island. Although these types of landscape features are listed in Table 9.1 and itemized in Appendix 1 if they have been recorded, they are not discussed further in this report as Livingston has already adequately addressed them. Livingston addresses some archaeological

resources in his island discussions, and this information has been incorporated into the discussions below.

Table 9.1. Recorded Historic-Period sites in Channel Islands National Park

Type	San Miguel	Santa Rosa	Santa Cruz	Anacapa	Santa Barbara	Total
Ranch Headquarters	6		1	1	1	9
Habitation	0	2	0	0	0	2
Marine harvest	16	9	0	0	0	25
Military and Navigation	3	1	0	0	0	4
Refuse deposits	3					3
Oil Exploration	0	1	0	0	0	1
Survey marker	1	0	0	0	0	1
Historic marker	1	0	0	0	0	1
Airplane crash	1	0	0	0	0	1
Grave	1	0	0	0	0	1
Ship Salvage	0	1	0	0		1
Road	1	0	0	0	0	1
Shipwreck	0	4	0	0	0	4
Shore Debris	0	1	0	0	0	1
Total	**30**	**7**	**1**	**1**	**1**	**52**
Prehistoric Only	1	5	2	0	0	8

HISTORIC PERIOD RESOURCES BY ISLAND

The following inventory of historic-period resources—both recorded and unrecorded—is presented by each of the CINP's islands (addressed from west to east). The category types are as follows:

Ranch Headquarters: This designation describes the primary complex of ranch facilities which typically include the residence of the manager/owner as well as a bunkhouse for workers, kitchen, barn, sheds, stable, blacksmith shop, water system, and corrals.

Habitation: These sites are primarily residence locations, containing a house or "shack" and perhaps a few outbuildings. They can be long-term or seasonal.

Marine Harvest: Because of the abundance and distinctive qualities of these types of sites, they have been separated from the "habitation" sites mentioned above. They include abalone processing locations of both Chinese and Anglo work crews as well as seal harvesting and rendering sites. Locations are often sequentially occupied by these groups.

Military and Navigation: These sites relate to the use of the offshore islands as locations for lighthouses, radio, and radar facilities, WWII Coastal Lookout stations, and missile range and tracking stations.

Refuse Deposits: These secondary deposits consist of substantial concentrations of artifacts most often somewhat removed from their place of use. They are typically associated with somewhat permanent residences such as ranch headquarters.

Other recorded sites itemized in Table 9.1 are rare or unique, or are types that are not considered here (shipwrecks and roads). Eight recorded sites identified with a "/H," indicating a prehistoric site with a historic componen, were determined not to warrant this designation. In some cases the reference to a "historic named Chumash village site" appears to have been the source of the historic association, while in others it was the isolated presence of one or two artifacts. These sites are identified in Appendix 1.

Santa Barbara Island Historical Archaeological Resources

There is only one recorded historic-period site on Santa Barbara Island, although others that are documented or undocumented undoubtedly exist.

Ranch Headquarters Sites. This is the only recorded historic site.

- *Hyder Ranch (4-SBI-18)*. The first Hyder ranch building was constructed above the landing in 1915. It was built of salvaged lumber, it had two rooms for Alvin's and Clarence's families. Brother Cleve added a one-room cabin in 1918. Also a barn was constructed, the skid rails reaching to the landing. Another shack was added for laborer Paul Wills. Two large concrete cisterns held the community's water. All but two of the shacks were removed when the Hyders left. In 1936 the Navy destroyed one and rebuilt the other as a temporary barracks. In 1942 the barracks for the Coastal Lookout Station were constructed at this location.

Marine Harvesting. None is recorded, although there may be site locations along the shore.

Habitation Sites. None is recorded. Unrecorded resources include:

Various shoreline fishing cabins, including a trying-pot for seal oil, are mentioned in historic records.

H. Bay Webster, also involved in Anacapa Island, built a shack near Webster point in 1896.

The Hyders also built a cabin here during their tenure.

A fisherman's shack located near the landing in around 1900, was said to have been built by "Chinese lobster trappers."

When the Hyders arrived in 1916, a small house was reported to be present on the north side of the current landing location.

Military and Navigation Sites. None is recorded. Unrecorded resources include:

Various towers for radio and radar.

Coastal Lookout Station built in 1942: landing dock, tram/hoist, water tanks. Most of the facility was abandoned by 1953, including two barracks buildings, a kitchen, generator buildings, and a garage at Hyder Ranch site (see above).

Navy Photo Tracking Station included three cement camera pads, water tanks, improved railway, and an improved road. Two Quonset huts were constructed at the Hyder Ranch site. These facilities were passed to the NPS.

Other Resources. None is recorded.

Coast Survey marker set in 1871 consists of a granite block with "U.S.C.S." carved on its surface. This has not been relocated.

Anacapa Island Historical Archaeological Resources

The only recorded historic-period site is an occupation site at Shepherds Landing, Middle Anacapa Island.

Ranch Headquarters Sites.

- Elliott/Webster Ranch Headquarters (CA-ANI-21), on Middle Anacapa Island, appears to be the location of the Elliot Sheep Camp (1885), Webster Ranch headquarters (1907-1917), and perhaps later facilities by the rumrunner Eaton. The site record documents a brick cistern, which may be the "old cistern" recorded by Webster, along with historic refuse in a gully up from the beach; at the shore are concrete foundations. The historic resources overlie a large prehistoric midden.

Marine Harvesting. None is recorded. Unrecorded resources include:

References have been found to Chinese and American abalone hunters and to seal hunters rendering oil on the beaches.

Habitation Sites. None is recorded. In the 1930s, several individuals were known to live on the island, although their sites have not been located.

Charles Johnson, called the "mayor" of Anacapa, who lived on the island some five years.

Two men with resort cabins at Frenchy's Cove (evicted in 1938), later occupied by Raymond "Frenchy" LeDreau.

Military and Navigation Sites. None is recorded. Unrecorded resources include:

A light tower was established on East Anacapa in 1911 and in 1932 a lighthouse, fog signal building, and light station were constructed.

Santa Cruz Island Historical Archaeological Resources

Only one historic-period site has been recorded on Santa Cruz Island, and the only two prehistoric sites that included historic designations were determined not to qualify for this designation (having only one historic artifact isolate each). The historic occupation of the island, however, has been extensively researched in documents and through oral and personal histories. As part of the NRHP evaluation of the island, Caire-Gherini Ranch Historic District and Rancho Del Norte Historic District were defined for the resources on NPS land (east end and central isthmus; NPS 2002b, 2003), and both are components of the Santa Cruz Island Ranching District, which includes all NPS property on the island (NPS 2004). These studies provide excellent summaries of the island's history and potential archaeological sites.

Ranch Headquarters Sites. The large size of Santa Cruz Island required development of several ranch "departments" with their own facilities; these locations were complex enough to qualify as "headquarters sites." In 1922, in addition to the Main Ranch, Christy, Scorpion, and Prisoner's Harbor were still operating with resident staff.

- *Scorpion Ranch* (CA-SCI-0423/H. Buildings first shown here on 1859 Coast Survey map, occupied by "Mondran;" also appearing on the 1875 Forney map. One of Caire's key ranch stations, it was described as a "busy and well-equipped colony" in 1885 (Livingston 2006:466). Subsequent accounts and maps depict numerous facilities including residences and storehouses, a bake oven, blacksmith shop, wells, a dairy, and nearby barns. Following division of the island in 1925, the facility was headquarters to the Gherini family, who made few additions or improvements until the 1980s. The potential for archaeological remains is demonstrated by Don Morris's 1998 excavation of the foundations of the 1876 adobe residence and ca. 1885 addition (Morris 1998, 2002). Unrecorded Resources include:

  Main Ranch. Established in 1850s with houses, outbuildings, and corrals, it was fully developed under Caire ownership. The extensive number of buildings are well documented in Livingston 2006.

Christy Ranch. Also known as West Ranch, it was present in the 1860s and developed as an important sub-station under Caire. The old adobe was present by 1869, with a larger residence added by 1890, along with a storehouse, blacksmith shop, carpenter shop, stables, tack room, storage shed, and hay barn, as well as various corrals, gardens and fields. By 1918 there were additionally a shearing shed, wood shed, meat storeroom, milk room, wine room, bunkhouses, and chicken houses. Christy Ranch was still occupied full-time into the 1920s. During the 1960s it was leased by a hunting club who flew members in to an airstrip built nearby.

Prisoner's Harbor. The site of the adobe building of 1857-1873 was expanded into a ranch headquarters under Caire, who also built a brick-faced warehouse and rail line out to the pier. For a time, it was the residence of schooner captain Charles Burtis with wife and son. The map of 1934 shows its largest extent (Livingston 2006:737-746).

Marine Harvesting. None has been formally recorded. Unrecorded resources include a variety of camps:

There were certainly Chinese abalone camps on Santa Cruz Island, as at the other islands along the southern California coast. "Campo China" in China Harbor may indicate such a historic use for this location.

There is also recorded evidence of "Americans" being involved in abalone harvesting, setting up camps on the shore and cleaning and processing the meat for sale. In 1911, the Santa Cruz Island Company also leased exclusive fishing rights to a Japanese firm. Their abalone camp at Pelican Bay was reportedly well equipped and the gatherers used diving equipment (Livingston 2006:279-181).

A number of fishing camps also existed. In the early 20th century, commercial fishermen were recorded as being dropped on remote island beaches in season, supplied by a parent company. Wooden cabins were built where men would spend weeks, months, or years fishing (Livingston 2006:577). Sometimes these folks would obtain permits from the island owners, but mostly they were allowed to reside unmolested. Fisherman Dutch Schultz lived on the island for some twenty years (Livingston 2006:578). From 1927 to the 1940s, the Gherini family contracted fishing rights to a Santa Barbara company who supplied and tended various solitary camps along the coast.

Habitation Sites. None has been recorded. Unrecorded resources include:

A house on the West End, located between Christy Ranch and West Point, is shown on 1859 Coast Survey Map, identified as occupied by "John".

An 1874 article on the SCIC describes: "buildings and improvements of all sorts located at five different points of the island" (Livingston 2006:426).

Caire developed nine satellite ranch sites; the largest and most enduring—Christy, Prisoners Harbor, and Scorpion—are discussed above. Others which are also reported to have had dwellings are discussed below:

Smugglers Ranch. House and facilities were constructed by 1885 and a new larger two-story home of adobe and stone built in 1890. Eventually the site supported three houses, a bakery, barn, blacksmith shop, "wine cave," sheds, water system, fields, and an orchard. By 1909, the location was largely abandoned.

China Ranch. The location appears on a map of 1886 and a house is shown at the site in 1890.

Campo Punta West. Caire established a small complex of buildings at West Point, on Forney's Cove; the buildings were gone by 1919.

Rancho Nuevo. Constructed out of lumber from Campo Punta West in 1919, it included a two story house, stable, chicken house, and barn. It was reputed to be in disrepair by 1937.

Portezuela Ranch. Located west of Main Ranch in the Central Valley, by 1885 it contained a house, kitchen, and stables. By 1890, the complex had been enlarged by a new house (of adobe and stone), three barns for hay, and a wood shed. The station was still occasionally used into the 1920s.

Rancho Sur. A small facility east of the Main Ranch, it contained a barracks, kitchen, dining room, storeroom, stable, and lavatories. Established in 1891, it was abandoned by 1937.

There are many accounts of illegal camping throughout the 20th century, and many of the camping episodes undoubtedly left tangible remains.

Pelican Bay Camp. A resort camp permitted by the Caire family and operated from 1913-1937 by the Eatons. At its height there were some 15 buildings at the site.

Rancho del Norte—1952 ranch station developed by Stanton.

Military and Navigation. None has been recorded. Unrecorded resources include:

Naval air Missile Test Center observation station, constructed 1950.

WWII Coastal Lookout camp along slope of Mt. Pleasant, includes leveled pads, a concrete floor, and other abandoned artifacts.

A WWII facility at Forney's Cove on the west end of the island.

Oil Exploration. None has been recorded. Oil exploration began on Santa Cruz in the 1920s; exploration and leases were maintained through the 1980s. Unrecorded resources include:

In the 1950s a facility at Forney's Cove supported up to 30 workers for a year-long exploration venture.

Santa Cruz Island Exploration Co. drilled in the hills above Scorpion and Smuggler's ranches in the 1960s. These facilities included harbor piers, buildings, and roads to the drill sites.

An oil exploration site apparently exists on a ridge overlooking Pozo Canyon, next to the road entering the canyon.

Other Resources.

A 60-foot deep mine seeking gold-bearing quartz is reported in the 1874 Forney notes (Livingston 2006:432):

Kiln (brick and lime) at Prisoner's Harbor.

Kiln near Main Ranch.

Kiln near Scorpion Ranch

Kiln near Smugglers Cove

Extensive rock retaining walls and check dams built by Caire's ranch workers in creeks and drainages for flood and erosion control (Livingston 2006:535).

Quarry at Fry's Harbor (1926-1930).

Outlying barns (*sacateras*), such as those noted by Livingston (2006:715-717).

Site of 1949 bomber crash.

Santa Rosa Island Historical Archaeological Resources

Nineteen historic-period sites have been recorded on Santa Rosa Island, nine of which are marine harvest sites. Unrecorded sites include those discussed in Livingston's 2002 study of the island's history, many of which were determined to be contributing elements of the historic district.

Ranch Headquarters Sites. None of the ranch headquarters sites has been formally recorded as archaeological resources. Existing and former residence buildings, outhouses, mess hall, and out-buildings may all be associated with potentially important archaeological deposits. Unrecorded sites include:

- *Old Ranch (Rancho Viejo)*. This was established 1844 by Thompson and Jones; it consists of a wood plank structure, located inland between Skunk and East Points. It is possibly still present on the 1873 Forney map. A good summary of its physical description is found in King (1983:112-113); its location is unknown.

- *Thompson Ranch*. This was established 1855 by Dixie Thompson, presumably near Southwest Anchorage.

- *Main Ranch*. This was established in 1870 by More owners at Becher's Bay. The Mores spent part time on the island and part in San Francisco. By 1873, the Upper House, wharf, barn, and water system were established. In 1874 J. Ross Brown described storehouses, barns, boarding houses for employees, and a wharf. The 1876 drought triggered installation of an impressive tallow processing area with large kettles for rendering. The ranch is described in 1910 as a "village" made up of "great storing-barns and shearing-rooms, stables, pens, sheds, dining-rooms and houses for the Indian and Mexican shearers." A sheep dip is also part of the complex (2006:170). The main ranch house (Upper House) burned in 1969, and the cottage became the Vail residence (Livingston 2006:185).

Marine Harvesting. Nine "Abalone Processing Camps" have been recorded and many more are likely present on the island, particularly in the vicinity of China Camp, reportedly named for the presence of Chinese. In 1911 and 1913, Vail made agreements with Chinese to use the area for marine harvesting, indication that these activities continued well into the twentieth century.

Habitation Sites. Two habitation sites are recorded.

- *Nidever's Cave* (CA-SRI-0248). Reportedly George Nidever camped here in the 1830s on his various expeditions to the island to hunt otters and seals. He often stayed weeks, sometimes accompanied by an individual described in the accounts as a by a "Kanaka Indian." The cave also was the home of Santiago Quintero reportedly for some 30 years in the late 1800s (NPS 2002a:Part 3b p.28). Currently the Smith Highway passes over the top of the cave (Livingston 2006:174).

- *Inscription Cave* (CA-SRI-0256). This cave is near Main Ranch at Bechers Bay, across the creek; it may have had use in prehistoric times. It was used as a Coast Survey camp in 1875-76 and was occupied by sheep shearers according to a 1910 account.

Unrecorded Habitation Sites included are the following:

"house and corral on west end of Island" in Cañada Soledad (Livingston 2006:163) depicted on Forney map of 1872. A shack was described in this vicinity in the 1920s, but it may have been associated with cattle ranching.

Three "traps". These were developed for gathering cattle including cabins for cowboys:
Arlington Trap at Arlington Canyon;
Wreck Trap at Ford Point; and

House Trap near the ranch headquarters

Small cabins were located with corral complexes at the line camps at
Lepe;
China Camp;
Green Canyon;
Black Mountain; and
Water Canyon.

Cañada Soledad House and corral, depicted on the 1873 Forney map in the vicinity of upper Cañada Soledad near the Smith Highway (Livingston 2006:388).

Orr's Camp. This group of informal buildings was constructed by Phil C. Orr, an archaeologist at the Santa Barbara Museum of Natural History, and his colleagues as a base camp for Orr's archaeological investigations on the island. It is located in a gully on the island's northwest coast (NPS 2002a:Part 3b:63). Although last used somewhat less than 50 years ago, its construction apparently dates to the late 1940s or 1950s.

Military and Navigation Sites. Only one military installation has been recorded, although there were a number of facilities on the island.

- *1943 Radar Station* (CA-SRI-0481) on the south flank of Soledad Mountain: radar unit, buried concrete operations bunker, generator house, concrete radio room, water tank. Livingston evaluated this as a potential contributing element to a NRHP "Coastal Defenses" theme (Livingston 2006:265, 349).

Unrecorded Military and Navigation Sites. The descriptions of these facilities in Livingston's 2006 report (pp. 264-285) are somewhat hard to follow, lacking maps showing their exact locations. The reader is referred to that source if the following summary is confusing or erroneous.

1925 Lighthouse and shack at Johnson's Lee (King 1983:121), no longer standing.

South Point Lighthouse, a two-room prefabricated installation was erected by the Coast Guard in 1937 and abandoned in 1987 (NPS 2002a:Part 2B:28).

1943 camp at Bechers Bay, including barracks, storage buildings, and pit latrine. It is no longer standing.

1943 Dry Lake Camp (Scott's Camp) for a radar station, near the center of the island (Livingston 2006:265). The facility housed about 75 men in 16 wood frame buildings including barracks, mess hall, kitchen, bathhouse, motor repair building, and a generator building. Louis Scott took up residence here during late 1940s, installed a crew, and did some oil prospecting and other contract jobs (Livingston 2006:271). The site was also reused during oil exploration in late 1940s. Livingston evaluated this as a potential

contributing element to a NRHP "Coastal Defenses" theme (Livingston 2006:265, 349-351); foundations and remnants only.

WWII Radar Stations on Soledad Mountain and two miles north of South Point.

1942 Navy Coast Lookout Station. Its location is unknown. It likely had wooden lookout tower, temporary barracks, and mess for the small crew.

1950-1963 Air Force Base at Johnson's Lee including five two-story barracks, dining hall, training and recreation buildings, offices, warehouses, maintenance facilities, dispensary, and a concrete pier at the harbor. The site was rehabilitated in 1991-1992, with one building retained for NPS use.

1951 communications station.

Oil Exploration Sites. The oil exploration site "Pemberton Camp" has been recorded (CA-SRI-0269/H) as part of a prehistoric site. Other unrecorded locations of "oil wells"—largely exploration sites—are noted on island maps and include the Standard Oil well and the Signal Oil well (Livingston 2006:355).

Other Unrecorded Resources. Included are:

- Survey points established by Greenwell (1860) and Forney (1872)
- Fences. Included are the 19th century board-and-wire fences that divided the island into four grazing areas. These areas were further divided into a total of eight pastures. The 1860 William Greenwell map additionally shows locations of corrals, likely built by Thompson et al. These fences are included in the 2004 NRHP nomination form for the island's ranching resources.
- South Point Light, 1925-1986. The light and adjacent building are still extant.
- School House at Bechers Bay (King 1983:119).

San Miguel Island Historical Archaeological Resources

A total of 30 historic-period sites has been recorded on San Miguel Island, more than half of all of those recorded within the Park.

Ranch Headquarters Sites. The three recorded ranch headquarters habitation sites are recommended as NRHP-eligible by Livingston (2006:130).

- *Nidever Adobe (SMI-546).* This adobe building was occupied periodically from 1853 until 1870 by sheep-raiser George Nidever and his sons, who were based in Santa Barbara. After the grazing lease was sold to the Millses in 1870, the ranch headquarters was moved to the

south where a new frame house was constructed (SMI-582, see below). The adobe may have been used for a time as a secondary facility. The adobe remains were first mapped by Charles Rozaire in 1963, at which time the east and southern walls were still visible; the others had eroded into the adjacent stream bed. A site record was completed in 1977 as part of the NRHP assessment. Livingston mistakenly gives the site number as SMI-548 (2006:117).

- *Mills/Waters Ranch Headquarters (SMI-582).* The new ranch headquarters established by the Mills brothers (Pacific Wool Growing Company) after 1870 when they purchased the grazing lease from Nidever. They apparently only occasionally visited, and the frame house was presumably occupied by managers. After purchasing the island's lease in 1887, William G. Waters utilized this headquarters, occupied primarily by resident ranch managers, until a new complex was constructed in 1906 at SMI-543. The site appears on an 1895 map and the complex reportedly additionally included a cistern, wind vane, wool house, various out buildings, fence line, fruit trees, and flagstaff. The stone cistern, exposed by gully erosion, has long marked the site (Livingston 2006:64, 117-118). Recent excavation confirmed the location of the ranch complex (Costello and Thorpe 2009). The site is not identified in Archaeological Sites Management Information System (ASMIS) data base.

- *Russell/Lester Ranch Headquarters (SMI-543).* Constructed in about 1906 by Waters with his manager Russell, the facility burned to the ground in a 1967 fire. It is referred to as "the Ranch House." Herbert Lester and his family lived here for 13 years, working for leaseholder Robert Brooks. Remains include concrete foundations, water tank, cistern, two collapsed chimneys, root cellar, exotic plantings, and abundant artifacts and debris. Adjacent remains of the Navy complex overlie some of ranch site (Livingston 2006:118). The site is not identified in ASMIS data base.

- *Ranch Windmill / NPS Ranger Station (P-42-035707, SMI-707H).* A windmill was built in this ravine by 1906 to pump water to the new ranch house (SMI-543), although it was likely present earlier, serving the Barns and Sheds area (SMI-702). The NPS Ranger Station was also located here from the 1970s to 1997 (Costello and Thorpe 2009).

- *Ranch Barns and Sheds (SMI-702).* The large complex of ranch barns, sheds, and corrals served to store feed and equipment, house the blacksmith shop, and serve as the periodic sheep-shearing headquarters. It was likely constructed by Waters prior to building his nearby 1906 ranch house and later improved and expanded. The facility was abandoned in 1948 (Costello and Thorpe 2009).

- *Mills Ranch Corral (SMI-706).* The original corral area for the Mills Ranch is located about 300 feet down the ravine (north) of the headquarters site(SMI-582). Measuring about 30 by 75 feet, the structure is marked by remnant posts and has been cut by an erosion channel (Costello and Thorpe 2009).

Marine Harvesting / Abalone Processing Sites. Sixteen sites of marine harvesting have been recorded, the majority of which have been associated with Chinese abalone processing. Uncrecorded sites include:

Hunters and fishermen are recorded as camping on the island throughout its history. Analysis of artifacts from an abalone camp near Pt. Bennett (SMI-614) determined that it had been reoccupied in 1930s-40s, apparently by non-Chinese.

Reference is made to a shell-processing camp by Japanese near Point Bennett.

Livingston (2006:123) describes a site he calls "Rock Retaining Wall on North Shore" where there is a rock retaining wall 3-5 feet high and 20 feet long. He suggests it was a fishing shack and perhaps a Chinese abalone processing camp. This site may be already recorded, but this could be determined.

Habitation Sites. No habitation sites have been recorded on San Miguel Island. Unrecorded sites are associated with:

Accounts of illegal visitation between 1950s-1980s, particularly illegal pothunting, with arrival by planes and boats.

The 1964 case of Kimberly, Rozar, and Vreeland, who established a camp for their "San Miguel Land and Cattle Company" and filed a grant deed (thrown out by the courts).

Residence of "Bruce," first recorded sheepherder. It is possibly on same location as Nidever Adobe. This site is unlikely to be found, or correctly identified, if it is near the other occupation sites due to an expected minimal artifact assemblage.

Military and Navigation. Three military-related sites have been recorded: a refuse pile of military food cans (CA-SMI-493/H) present on a prehistoric site; a weather station with military and ranch attributes (CA-SMI-574/H); and a cluster of three bomb craters (CA-SMI-664H). Evidence of the Navy's occupation adjacent to the Russel/Lester Ranch House (SMI-543) have recently been included within this site boundary (Costello and Thorpe 2009). Livingston (2006:84), does not think any of these resources have adequate integrity for a NRHP nomination, although Hammond Field is suggested as a structure that may contribute (2006:130). Unrecorded sites include:

Reference to a military site, perhaps the helipad, adjacent to the Nidever Adobe (SMI-582)

Near Tyler bight a site with abundant architectural artifacts. It may represent a two-week camp of eight Marines present in 1933, or the site may belong to 1966 Pacific Missile Range operations (Livingston 2006:125).

Ruins of Coastal Lookout Station (1942) on San Miguel peak.

Navy range poles.

Navigation Sites:

The first lighthouse on Richardson's Rock in 1912-1942.
Light on Point Bennett in 1923-1942.
Unwatched light at Crook Point in 1943-1953.

Refuse Deposits. Three locations of secondary refuse have recently been recorded near the Russel/Lester Ranch headquarters: SMI-703, SMI-704, and SMI-705. Dating to the period between ca. 1920 and 1950, they are likely associated with this occupation (Costello and Thorpe 2009).

Other Resources. Miscellaneous other resources include:

- *Roads*. CA-SMI-662 – Historic Navy Road, the only road recorded in the CINP. Roads were addressed for each island by Livingston in his study (2006).

- *Survey markers* established by Greenwell (1850s), Forney (1871), and Tittman (1876). Over 24 benchmarks are depicted on the 1943 USGS quadrangle map.

- *Fencing systems, corrals, and other ranch features*. Livingston (2006:130) recommends that many of these (1920-1950) may contribute to a National Register district, but that they should be recorded and left to deteriorate.

- *Hammond Field* (1930s) Old ranch airstrip. Livingston (2006:130) regarded this as a potential contributing member of a district.

Unrecognized Historic Archaeological Resources on the Park's Islands

The listing above captures essentially all of the possible historic archaeological resources within the Park, largely because it includes relatively broad categories. Without concerted efforts of historic archaeologists, however, the inclusiveness of this listing cannot be known. In particular, undocumented activities occurring during the Spanish and Mexican periods may have left remains on some of the islands. Also worth emphasizing are the variety of refuse deposits associated with all sorts of habitations, including trash pits and dumps (including privy pits) and litter around existing and former habitation buildings. These are excellent sources of information about daily life among the islands' inhabitants.

PROJECT DESCRIPTIONS

Only four projects within the Park that explicitly focused on historic archaeological resources are known to have occurred. Two of these focused on excavation at the locations of individual structures, one entailed a more general assessment of structures and other nearby historic resources, and one involved a survey to locate Chinese abalone processing sites.

Although very few, these project demonstrate the potential to learn about aspects of Park history that cannot be elucidated through documentary research.

Project name (or basic description)
Excavation of the remains of the "underhouse" at Scorpion Ranch

Principal investigator
Don P. Morris

Institutional sponsor
Channel Islands National Park

Dates of fieldwork
March 1998

Published and unpublished mss. (in style of *American Antiquity* text citation)
Morris 1998, 2002

Geographic location(s) of fieldwork
South of the existing two-storey stone masonry building at Scorpion Ranch

Site nos. or locations from which data were collected
SCI-0423/H, Scorpion Ranch

Theoretical and empirical goals of research
Heavy rains in December 1997 had displaced a frame bunkhouse from its foundations. Prior to returning it to its former location, Morris conducted archaeological studies of the remains of an earlier structure (constructed ca. 1876 and ca. 1885 additions) underneath this location.

Types of data collected (collections, site records forms, field records)
Map of building foundations and associated features. Artifacts of bone, shells, metal, and glass.

Person-days and crew size
Morris and usually one other crew member worked for 21 days. Various short-term specialists occasionally provided expertise. Approximately 40 person-days were expended on the excavation.

Field procedures (and laboratory procedures as applicable)
Trenches were excavated to expose the foundation and lower wall remains and then area excavation to expose floors in the northern segment of the structure. Artifacts had not been analyzed at the time of the report.

Location and nature of the archaeological collections and associated documentation
Collections are housed at the Department of Anthropology, Santa Barbara Museum of Natural History, and field records are housed at Channel Islands National Park headquarters.

The artifact collection is relatively small; it includes bones of butchered animals (probably sheep), black abalone shells, a percussion cap for a muzzle-loading firearm, a button, cloth fragments, an apparent porcelain picture frame, and a few small glass bottle fragments. The Park has assigned accession number 267 to this collection.

Significant descriptive and theoretical conclusions of the research

Research documented the location and architectural characteristics of two prior structures on this location: the ca. 1876 ranch residence and its ca. 1885 addition. Also documented is rapid erosion in the past and deposition of alluvium on the ranch site.

Potential of collections and data for future research

The shell and bone recovered may provide information on the dietary habits of island residents and details of the sheep herd's physical characteristics. Morris (personal communication) pointed out that the existing wood-frame bunkhouse actually dates earlier than 1918, the date mentioned in his report and publication. Consequently the flood that destroyed the earlier structure he investigated would have occurred earlier as well.

Project name (or basic description)

Excavation of trenches at the "Leaning Shed" (aka Blacksmith's Shop)

Principal investigator

Sam Spaulding (with guidance from Don P. Morris)

Institutional sponsor

Channel Islands National Park

Dates of fieldwork

May 1998

Published and unpublished mss. (in style of *American Antiquity* text citation)

Spaulding 2002

Geographic location(s) of fieldwork

Scorpion Ranch building complex

Site nos. or locations from which data were collected

No formal designation

Theoretical and empirical goals of research

Excavation of trenches around parts of the interior and exterior surfaces of the walls in anticipation of stabilization of the structure.

Types of data collected (collections, site records forms, field records)

A variety of historic artifacts, including glass bottles and bottle fragments, a fragment of lumber. Evidence of earlier use as a blacksmith shop also were encountered.

Person-days and crew size
One person worked for several days.

Field procedures (and laboratory procedures as applicable)
Shallow excavation with shovel, trowel, and whisk broom

Location and nature of the archaeological collections and associated documentation
The collections currently are housed at Park headquarters, and field records are housed at the Channel Islands National Park headquarters. The Park assigned accession number 269 to this collection.

Significant descriptive and theoretical conclusions of the research
Discovery that the location of the "Leaning Shed" was apparently the original location of the Scorpion Ranch blacksmith shop.

Potential of collections and data for future research
The collections can contribute to understanding life at Scorpion Ranch during the late 19th and early 20th centuries.

Project name (or basic description)
Survey to locate historic black abalone processing sites and excavation of CA-SMI-558

Principal investigator
Todd J. Braje

Institutional sponsor
Department of Anthropology, University of Oregon

Dates of fieldwork
Survey and excavation intermittently from summer 2003 into 2005

Published and unpublished mss. (in style of *American Antiquity* text citation)
Braje 2007a

Geographic location(s) of fieldwork
Survey apparently included the whole coast of the island. Excavation at SMI-558 included a 100-liter bulk sample from a seacliff exposure and a 1x2 m unit within deposits 20-25 cm thick

Site nos. or locations from which data were collected
19 sites plus revisit to two recorded in 1980s (553 and 558)

Theoretical and empirical goals of research

To understand historic abalone collecting within a historical ecology context and to document the sites in the context of the Park's cultural resource management program.

Types of data collected (collections, site records forms, field records)
Site records were prepared. From SMI-558 bulk matrix samples and midden constituents were collected.

Person-days and crew size
Unknown

Field procedures (and laboratory procedures as applicable)
Intensive pedestrian survey of the coastline, including seacliff exposures and supratidal localities

Location and nature of the archaeological collections and associated documentation
Collections and field documentation currently are at the Department of Anthropology, University of Oregon

Significant descriptive and theoretical conclusions of the research
A substantial number of historic abalone processing sites are on the island, particularly along the south coast, many probably dating prior to 1880. SMI-558 probably was occupied by Chinese between 1850 and the mid-1860s.

Potential of collections and data for future research
The collections and survey data can contribute to understanding the growth of the abalone industry on the Channel Islands.

Project name (or basic description)
Study of Historic Archaeological Resources on San Miguel Island

Principal investigator
Julia G. Costello, Foothill Resources, Ltd.

Institutional sponsor
Channel Islands National Park

Dates of fieldwork
24-31 March 2009

Published and unpublished mss. (in style of *American Antiquity* text citation)
Costello and Thorpe 2009

Geographic location(s) of fieldwork
South of Cuyler Harbor, encompassing historic ranch locations

Site nos. or locations from which data were collected

Table 9.2. Sites from which data were collected

Site #	Name	Study Activities	Site Recording
P-42-040644	Windmill/NPS Ranger Station	*Site map and feature identification*	*Update (P, ASR)*
SMI-543	Russell/Lester Ranch	Site map and feature identification	Update (P, ASR)
SMI-544	*Cabrillo Monument*	observations	Update (P)
Site #	**Name**	**Study Activities**	**Site Recording**
SMI-546	Nidever Adobe	Excavated profiles of wall and floor strata; site map; floral samples	Update (P, ASR)
SMI-545	Lester Grave	Not visited	none
SMI-582	Mills/Waters Ranch	Excavated profile of site section, cistern recording, site map	Update (P, ASR)
FRL-1*	Ranch Barns/Sheds	Recording; site map and feature identification	New (P, ASR)
FRL-2*	Refuse Dump near Cabrillo Monument	Recording; selected artifact descriptions	New (P)
FRL-3*	Ranger Station Refuse Dump	Recording; selected artifact descriptions; NRHP evaluation	New (P)
FRL-4*	Refuse Dump in Ranch Gully	Recording; selected artifact descriptions	New (P)
FRL-5*	Mills Ranch Corral	Recording; site map	New (P)

* forms submitted to Information Center; official numbers pending

Theoretical and empirical goals of research

Update prior site records for the Island's historical resources; clean exposed erosion profiles at the Nidever (SMI-546) and Mills/Waters (SMI-582) sites to obtain site data; record additional historic resources in the vicinity; make management recommendations for resources.

Types of data collected (collections, site records forms, field records)

Site record forms were filled out for each site as noted under item 7 above. A small collection was recovered from the Nidever Adobe (SMI-546), including adobe brick and

wood samples. A fragment of a bowl mortar and several other artifacts were recovered from the Mills/Waters Ranch house (SMI-582).

Person-days and crew size

Crew sized varied between 3 and 5 persons. Total person days equals 32.

Field procedures (and laboratory procedures as applicable)

Relocating known historic resources; establishing site boundaries using metal detectors and visible remains; dating of artifact deposits; cutting back exposed profiles on two sites, mapping stratigraphy, recovering excavated artifacts and samples for analysis; GPS points obtained for all sites.

Location and nature of the archaeological collections and associated documentation

Channel Islands National Park

Significant descriptive and theoretical conclusions of the research

Previously recorded historic-period sites need updates, site boundaries added, and GPS points taken; numerous known historic-period sites remain unrecorded and unevaluated.

Potential of collections and data for future research

Unanalyzed samples of adobe brick from Nidever Adobe can be subjected to future pollen and macrofloral studies.

Appendix 9.1. Recorded Historic-Period Sites

ASMIS #	Park	State # CA-	Historic remains	Site Type
	Santa Barbara	"4-SBI-18"	Hyder Ranch remains, 1973 site record describes an historic concrete cistern, rock wall, and earthen berm	Ranch headquarters
	Anacapa	“4-AnI-21”	Elliot/Webster sheep ranch headquarters; brick cistern and historic refuse along gully; concrete footings at Shepherds Landing	Ranch headquarters
CHIS 01325	San Miguel	SMI-0582H	Mills/Waters ranch headquarters; location marked by stone cistern	Ranch headquarters
CHIS 00947.000	San Miguel	SMI-195/H	rock cairn	Survey marker
	San Miguel	SMI-459	1943 B-24 crash site	Airplane crash site
CHIS 01244.000	San Miguel	SMI-470/H	isolate historic artifact: wooden crate	(Prehistoric only)
CHIS 01267.000	San Miguel	SMI-493/H	military food cans	Military
	San Miguel	SMI-543	Russell/Lester Ranch headquarters (1906); structure remains, artifacts; burned 1967	Ranch headquarters
CHIS 01006.000	San Miguel	SMI-545/H	Lester grave site; 1942	Graves
	San Miguel	SMI-546)	Nidever Adobe (1850s-1870s); adobe remains, stone foundations	Ranch headquarters
	San Miguel	SMI-553	Abalone Processing Camp (from Braje & Erlandson 2006:23)	Marine Harvesting
	San Miguel	SMI-544	Cabrillo Monument; erected 1937	Historic Marker
	San Miguel	SMI-558	Abalone Processing Camp (from Braje & Erlandson 2006:23)	Marine Harvesting
CHIS 01318.000	San Miguel	SMI-574/H	Weather Station, Military, Ranch	Military
CHIS 01401.000	San Miguel	SMI-613H	Abalone Processing Camp	Marine Harvesting
	San Miguel	SMI-614H	Abalone and seal hunting base camp, 19th C - 1940s (from Braje & Erlandson 2006:23)	Marine Harvesting

ASMIS #	Park	State # CA-	Historic remains	Site Type
CHIS 01423.000	San Miguel	SMI-639H	Abalone Processing Camp	Marine Harvesting
CHIS 01436.000	San Miguel	SMI-654H	Abalone Processing Camp	Marine Harvesting
CHIS 01437.000	San Miguel	SMI-655H	Abalone Processing Camp	Marine Harvesting
CHIS 01438.000	San Miguel	SMI-656H	Abalone Processing Camp	Marine Harvesting
CHIS 01441.000	San Miguel	SMI-659H	Abalone Processing Camp	Marine Harvesting
CHIS 01387.000	San Miguel	SMI-662H	Historic Navy Road	Road
CHIS 01388.000	San Miguel	SMI-663H	Abalone Processing Camp	Marine Harvesting
CHIS 01389.000	San Miguel	SMI-664H	3 bomb craters	Military
CHIS 01391.000	San Miguel	SMI-666H	Abalone Processing Camp	Marine Harvesting
CHIS 01392.000	San Miguel	SMI-667H	Abalone Processing Camp	Marine Harvesting
CHIS 01393.000	San Miguel	SMI-668H	Abalone Processing Camp	Marine Harvesting
CHIS 01395.000	San Miguel	SMI-670H	Abalone Processing Camp	Marine Harvesting
	San Miguel	SMI-676H	Abalone Processing Camp (from Braje & Erlandson 2006:23)	Marine Harvesting
	San Miguel	SMI-690	Abalone Processing Camp (from Braje & Erlandson 2006:23)	Marine Harvesting
	San Miguel	SMI-707H	Ranch water-pump windmill; NPS Ranger station 1970s - 1997.	Ranch headquarters
	San Miguel	SMI-702	Ranch barns and sheds	Ranch headquarters
	San Miguel	SMI-703	Refuse dump near Cabrillo Monument	Refuse dump
	San Miguel	SMI-704	Refuse dump near Ranger Station	Refuse dump

ASMIS #	Park	State # CA-	Historic remains	Site Type
	San Miguel	SMI-705	Refuse dump in Ranch gully	Refuse dump
	San Miguel	SMI-706	Mills Ranch corral	Ranch headquarters
CHIS 00249.000	Santa Cruz	SCI-0423/H	Scorpion Canyon: A. 1930s fishing shacks, Chinese CBGS; B. basalt cave with door and wooden shed; C. 2-story adobe; D. pepper tree grove	Ranch headquarters
CHIS 01345.000	Santa Cruz	SCI-505/H	prehistoric only	(Prehistoric only)
CHIS 01358.000	Santa Cruz	SCI-615/H	prehistoric only	(Prehistoric only)
CHIS 00561.000	Santa Rosa	SRI-0025/H	Prehistoric site with cattle and pig disturbances	(Prehistoric only)
CHIS 00562.000	Santa Rosa	SRI-0028/H	prehistoric only	(Prehistoric only)
CHIS 00565.000	Santa Rosa	SRI-0031/H	possible Chinese abalone processing component	Marine Harvesting
CHIS 00614.000	Santa Rosa	SRI-0062/H	road cuts through PH site	(Prehistoric only)
CHIS 00649.000	Santa Rosa	SRI-0097/H	Prehistoric site with cattle and pig disturbances, pothunting	(Prehistoric only)
CHIS 00684.000	Santa Rosa	SRI-0132/H	Salvage of donkey engine and gally stove from 1897 shipwreck "Crown of England"	Salvage
CHIS 00707.000	Santa Rosa	SRI-0155/H	one historic isolate: sheep shears	(Prehistoric only)
CHIS 00056.000	Santa Rosa	SRI-0238/H	salvaged shipwreck wood, black abalone shells	Marine Harvesting
CHIS 00059.000	Santa Rosa	SRI-0241/H	salvaged shipwreck wood, black abalone shells, coal	Marine Harvesting
CHIS 00066.000	Santa Rosa	SRI-0248	Nidever's Cave. rockshelter with bracing posts and front wall; Santiago Quintero occupied for some 30 years in early 20th century	Habitation

ASMIS #	Park	State # CA-	Historic remains	Site Type
CHIS 00074.000	Santa Rosa	SRI-0256	cave with inscriptions near Main Ranch; possible sheepherders' residence	Habitation
CHIS 00075.000	Santa Rosa	SRI-0257	shipwreck remains near pier	Shipwreck
CHIS 00087.000	Santa Rosa	SRI-0269/H	Pemberton camp: structural lumber, bottles, drill-rig, metal bed, electrical, 55-gal steel drums	Oil exploration
CHIS 00256.000	Santa Rosa	SRI-0353	stone walls, circular (4 m diam) and linear (1-2m). Black abalone. Wooden posts	Marine Harvesting
CHIS 00176.000	Santa Rosa	SRI-0359/H	large pile of black abalone	Marine Harvesting
CHIS 00183.000	Santa Rosa	SRI-0366	wreck of C-2-type cargo freighter "Chicksaw," WWII	Shipwreck
CHIS 00184.000	Santa Rosa	SRI-0367	shipwreck remains: "Goldenhorn"	Shipwreck
CHIS 00185.000	Santa Rosa	SRI-0368	shipwreck remains	Shipwreck
CHIS 00332.00	Santa Rosa	SRI-0471	black abalone shells, Chinese brown-glazed stoneware, rock pile	Marine Harvesting
CHIS 00333.000	Santa Rosa	SRI-0472/H	Black abalone shell pile; modern metal canisters upslope	Marine Harvesting
CHIS 00334.000	Santa Rosa	SRI-0473	collapsed wooden structure, stovepipe, wire nails, black abalone	Marine Harvesting
CHIS 00342.000	Santa Rosa	SRI-0481	WWII bunker and artillery emplacement	Military, WWII bunker
CHIS 00420.000	Santa Rosa	SRI-0559/H	wood planking, pile of black abalone shell, iron rods	Marine Harvesting
CHIS 00427.000	Santa Rosa	SRI-0566/H	Large modern timbers, boat in gully	Shore Debris

CHAPTER 10
SUBMERGED ARCHAEOLOGICAL RESOURCES IN CHANNEL ISLANDS NATIONAL PARK

Status of Resource Inventories

"There are no wrecks in the vicinity of Anacapa Island," wrote the Superintendent of Channel Islands National Monument in response to a sport diver's inquiry in 1969. Today, just around Anacapa Island, the *Winfield Scott* is listed on the National Register, three other submerged wrecks (one a World War II era airplane) are documented, while a fourth is located and not yet definitely identified. A minimum of 11 additional vessels have wrecked near Anacapa, not counting an indeterminate number of aircraft, so research should continue. Altogether, throughout Channel Islands National Park (CHIS), the physical remains of 20 wrecks are identified to varying degrees, while historical documents suggest as many as 80 additional vessels await discovery.

Sport divers worked the submerged resource first, including occasional finds of prehistoric artifacts, from the very earliest days. Sport divers located and dove on *Winfield Scott*, as well as other wrecks, beginning in the early 1960s. Initial NPS work focused on the *Winfield Scott*. Following the initial NPS discovery in 1981 by Dan and Barbara Lenihan of the Submerged Cultural Resources Unit (SCRU), James Delgado, NPS Historian, began research on the vessel, ultimately resulting in a successful nomination to the National Register of Historic Places in 1987. SCRU produced a basic map of the wreck scatter in 1983 (Murphy, personal communication). Subsequent progress relied primarily upon local knowledge, particularly Peter Howorth, a highly experienced abalone diver with a real concern for preservation. In 1985, Channel Islands National Marine Sanctuary contracted with Howorth and Travis Hudson, Curator of Anthropology at the Santa Barbara Museum of Natural History, for a report on known and potential underwater resources within the park and sanctuary. This document discussed the probability of submerged prehistoric sites, citing known examples along coastal California and elsewhere (see Hudson 1977), as well as setting down Howorth's considerable and detailed information on wrecks within the park and sanctuary. The knowledge of Howorth and Hudson was a refreshing counterpoint to the popular literature, most of which was inaccurate and inconsistent.

With the addition of a permanent archaeologist to the park staff in 1985 (Don Morris) and the vital assistance of Howorth, study of the submerged resource began. From the beginning it was obvious that the NPS knew a lot less than numerous proficient, albeit unethical divers, about wrecks in the park. Supported by knowledgeable boat captains and a vigorous park diving program, early work attempted to find wrecks, identify them, describe the physical remains, and provide protection. A parallel outreach program involved contacting the California Wreck Divers (CWD) and attempting to communicate to them the significance of the wrecks in Park and Sanctuary waters. Two presentations were made at CWD meetings and the Park archaeologist participated in a CWD diving trip. This outreach ended when NPS undercover agents documented a CWD dive trip that extensively and deliberately vandalized and removed

artifacts from *Winfield Scott* and *Goldenhorn.* Prosecution resulted in significant fines (more than $120,000) levied against the perpetrators and the sure knowledge that wrecks within the Park and Sanctuary attracted vandalism and thievery.

The most effective strategy for finding wrecks proved to be relatively small-scale, conventional underwater surveys for short periods of time, focused on specific locations. Through time, these surveys were preceded by more and more thorough historic research. This strategy developed after early attempts at larger-scale trips proved unsatisfactory. To some extent this is a reflection of the importance of weather and sea conditions in travel and study around the islands. Short trips utilize more effectively the frequently brief weather windows that open access to many wrecks.

It eventually became clear that much shipwreck material lay concealed, not underwater, but beneath the shifting sand of numerous beaches. Roughly half of the known wreck assemblage within the park is located on beaches, in some cases well above the high tide line. Both specific surveys of beaches for exposed material and inventory surveys on Santa Rosa Island in 1991 through 1994 added to the terrestrial portion of the submerged resource inventory. This terrestrial survey also located the remains of Chinese abalone fishing camps, intimately related with salvage of remains of *Goldenhorn.* Delgado prepared a National Register nomination for *Goldenhorn* in 1988, but more work is required for the nomination to proceed. Repeated visits to prominent wrecks began a *de facto* monitoring program.

With the support and help of the NPS Submerged Resources Center (SRC—formerly SCRU), a volume summarizing work to date appeared in 1996 entitled Channel Islands National Park and Channel Islands National Maritime Sanctuary Submerged Cultural Resources Assessment (Morris and Lima 1996). This became an important date, because in 1997 the NPS assumed control of East Santa Cruz Island, focusing cultural resource management efforts in that area. These efforts involved another significant, high-stakes court battle over vandalism of cultural resources and diverted efforts away from submerged resources.

The formation of Coastal Maritime Archaeological Resources (CMAR) around 1990 augmented the park diving capability and brought valuable maritime historical expertise to the program. CMAR is a coalition of volunteer maritime historians, many of whom are highly capable divers, who participate in the park's maritime research efforts at all levels. Of increasingly valuable assistance has been the developing cultural resource capability of the Channel Islands National Marine Sanctuary (CINMS) and their public outreach program, closely allied with the Santa Barbara Maritime Museum.

Going beyond the bare bones of the initial program, detailed and meticulous analysis by Matthew Russell of SRC, who studied and compared three beached shipwrecks, and by Deborah Marx of the *Winfield Scott*, have taken research on the submerged resource beyond mere description.

In 1985, aside from the contentious early radiocarbon dates produced by Phil Orr (1968) from Arlington Canyon, there was very little evidence for human occupation of the Channel Islands during terminal Pleistocene and Early Holocene times. Early dates came from Daisy

Cave (Erlandson, Kennett, Ingram, Guthrie et al. 1996) and renewed work at the Arlington Canyon locality (Johnson et al. 2002). It became more and more likely that people had reached the islands during times of significantly lowered sea levels; hence, the possibility of early Holocene submerged sites (provided they had escaped destruction during inundation) became more and more reasonable. Only token efforts have been made to locate such sites, because of the costs and complexities involved. The potential search area for submerged terrestrial sites is huge, consisting of Park and Sanctuary waters to a depth of approximately 120 meters, or very roughly, about 60 fathoms—essentially 370,000 submerged acres. The sole prehistoric object located to date by the NPS is a small stone bowl, found off the eastern shore of Santa Rosa Island in very shallow water, but this at least was the first artifact recovered from an underwater context which had first been viewed by a professional archaeologist prior to its removal.

Parallel to the question of submerged archaeological resources is the possibility of submerged paleontological material, specifically the likelihood that pygmy mammoth fossils (*Mammuthus exilis)* remain throughout sunken Santarosae. Curiously enough, Terminal Pleistocene/Early Holocene archaeological sites roughly co-occur with the distribution of pygmy mammoth fossil localities on the emerged island—abundant on San Miguel and Santa Rosa, less common on Santa Cruz. As numerous recoveries from the North Sea indicate (Agenbroad, personal communication), mammoth bones survive submergence handily. A search for submerged archaeological sites may find submerged fossils as well.

In recent years, work in submerged resources has focused upon monitoring the "Big Four" wreck scatters within the Park (*Winfield Scott, Cuba, Aggi,* and *Goldenhorn*), and improving the existing maps of these wreck scatters, including location of peripheral remains. Cultural resource management efforts have increased within the Channel Islands National Marine Sanctuary, and, in conjunction with the Santa Barbara Maritime Museum, the agencies are developing an increasingly effective public program.

Table 10.1. Identified wrecks

Vessel Name	Official Number	Type	Island	Year	Gross Tonnage	Comments
Aggi	102136	cargo (grain)	SRI	1915	1898	
Barbee		rum runner	ANI			under investigation
Billcona	251907	tug	SCI	1952	71	tentative
Broadbill	215227	fishing	SRI	1966	34	
Chickasaw	241993	cargo (general)	SRI	1962	6131	
Comet	126379	lumber schooner	SMI	1911	429	
Crown of England	99115	cargo (coal)	SRI	1894	2574	
Cuba	215771	cargo & passengers	SMI	1923	3168.8	
Dante Alighieri II	236704	fishing	SBI	1938	97	
Del Rio	234477	fishing	ANI	1952	110	
Dora Bluhm	157091	lumber schooner	SRI	1910	330.44	
Englyn		pleasure	SCI	1974		
Equator	257143	fishing	ANI	1949	238	
Goldenhorn	36279	cargo (coal)	SRI	1892	1914.78	
Grumman Avenger (plane)		dive bomber	ANI	1940s		
Grumman Guardian (plane)		anti submarine	SCI	1954		
J M Colman	76717	lumber schooner	SMI	1905	463	
Jane L Stanford	77070	derelict	SRI	1929	970	
Peacock	MSC198	under salvagfe	SCI	1980	370	
Santa Cruz	116559	general cargo	SCI	1960	45	
W.T. & B. Co. No. 60	166821	derelict	SRI	1931	738	
Winfield Scott		passenger	ANI	1853	1291	

Types of Submerged Cultural Resources

The archaeological remains of 20 historic shipwrecks and two airplanes have been identified within Channel Islands National Park and Channel Islands National Marine Sanctuary (Table 10.1), while historical research indicates that more than 80 additional vessels have come to grief within the Park. Their material remains have not yet been identified. The historical research that is the basis for these statements is less than exhaustive, and additional work will probably yield records of still more wrecks within the Park and Sanctuary. There is every likelihood that submerged prehistoric archaeological sites exist with the Park and Sanctuary, but no definite artifacts have yet been found. The present submerged resources program emphasizes monitoring of the four most prominent and significant wrecks known in the Park and Sanctuary.

While lurid popular descriptions of the maritime perils of the northern islands refer to "hundreds" of shipwrecks, work to date suggests that perhaps somewhat more than 100 vessels came to grief within the Park. Although a sizeable number, this is a relatively small quantity compared to such truly hazardous areas as the Golden Gate, farther north, or many areas of the English Channel. This relatively small number of wrecks speaks for the generally calm conditions within the Southern California Bight.

The typical situation of wrecks in the Park and Sanctuary involves some combination of limited visibility (fog or darkness), adverse winds, occasional storms, and human frailty. Corresponding to the increasing volume of traffic through time, most of these wrecks pertain to oceanic commerce or the sealing/hunting pursuits of the nineteenth and twentieth centuries. The lack of Spanish-era vessels may reflect the lack of work with foreign archives rather than their true absence.

All of the Park's island waters have a number of wrecks, with a slight concentration associated with San Miguel, situated at the foggy western entrance to the busy shipping lanes of the Santa Barbara Channel, and a smaller number associated with Santa Barbara Island, visited primarily by fishing boats and small craft. Two military aircraft occur in the inventory, and the number of undiscovered planes that may lie within the Park and Sanctuary is open to question.

Morris and Lima (1996) summarize and discuss vessels by size and type. Vessels range in size from *Pectan,* 7,318 gross tons, 471 feet, to numerous smaller craft, typically recreational or commercial fishing vessels of lesser size. Most of the undiscovered craft are relatively small, although some large ships remain unlocated. Most of the wreck assemblage lies in relatively shallow water, 70 feet deep or less, while records show only a very few should be found at depths of more than 200 feet.

While many wrecks are truly submerged, lying below intertidal waters, quite a few are not. Of those known and identified, about one-third are submerged, one-third are beached, and one-third are "smeared" across both zones as a result of both cultural and natural processes. Since the mean high tide line demarks the boundary between state and federal ownership of embedded resources in much of the park, many of these resources lie within the terrestrial domain of Channel Islands National Park, and some may vary in ownership from time to time.

Consider the case of *Comet.* From 1985 to 1999, the buried bow and anchor were clearly above mean high tide, with water never reaching the anchor. The beach was sprouting vegetation and beginning to stabilize. In 1999, sands shifted, the wreckage uncovered, and the investigating archaeologists became keenly aware that every high tide invaded the wreckage. Was the bow fragment within the Sanctuary and state lands at that time? It is not too hard to imagine this being a crucial point in a future court case. Resources that shift jurisdiction with the vagaries of beach erosion clearly present a complex management challenge.

Many wreck scatters contain what might be described as a "heavy fraction" (sinking) and a "light fraction" (floating onto the beach). *J M Colman* is a well-documented example. In some

cases, like *Dora Bluhm*, the light fraction has been identified, but the heavy fraction has not yet been found (Russell 2004).

Submerged Resources Project Descriptions

This section summarizes projects that investigated submerged resources within CHIS and CINMS. They are arranged by wreck and then by time. The more extensively investigated wrecks are discussed first. The one investigation that might be described as an underwater survey for submerged prehistoric resources is listed at the end.

Project name (or basic description)
Initial investigations, *Winfield Scott*

Principal investigator
Daniel Lenihan, James Delgado

Institutional sponsor
National Park Service

Dates of fieldwork
Initial National Park Service location dive by Dan Lenihan (SCRU), 1981; early assessment dives in January 1982;05/02 to 05/07/1983 for initial mapping

Published and unpublished mss.
Delgado 1982; Haller and Kelly 1987; Morris and Lima l996

Geographic location(s) of fieldwork
Middle Anacapa Island

Site nos. or locations from which data were collected
No site number been assigned.

Theoretical and empirical goals of research
Locate and describe submerged remains; conducted as a training workshop

Types of data collected (collections, site record forms, field records)
To-scale map

Person-days and crew size
Unknown; estimated to be approximately 25 person days

Field procedures (and laboratory procedures as applicable)
Photography and tape measurements of large pieces of wreckage

Location and nature of the archaeological collections and associated documentation

No collections were derived from this specific project; most of the material in the Channel Islands Museum collection was donated by private individuals, including a gold coin allegedly recovered from the wreck by an individual prosecuted in the 1987 case. The coin donated and present in the collection is almost certainly not the coin recovered from the wreck. The Park has assigned the accession numbers 055, 056, 060, 101, 152, and 175 to these items from the *Winfield Scott*. Field notes are housed at SRC, Santa Fe, New Mexico.

Significant descriptive and theoretical conclusions of the research

The project objective was identification and description of extant wreckage. The assemblage was deemed worthy of nomination to the National Register of Historic Places. Delgado prepared a successful nomination that was accepted in 1987.

Related historical research

James Delgado interviewed several wreck divers with artifact collections from the vessel and assembled the narrative of the wreck event and details of the construction and voyages of the *Winfield Scott.*

Project name (or basic description)

Winfield Scott map revisions

Principal investigator

Don Morris

Institutional sponsor

National Park Service

Dates of fieldwork

06/24/1988; 06/30/1988, 08/11/1988

Published and unpublished mss.

None

Geographic location(s) of fieldwork

Middle Anacapa Island

Site nos. or locations from which data were collected

No site number has been assigned.

Theoretical and empirical goals of research

Update of 1983 map for presentation in court

Types of data collected (collections, site record forms, field records)

Remeasuring major wreckage components; documenting specific instances of vandalism

Person-days and crew size
Four people; approximately eight person-days

Field procedures (and laboratory procedures as applicable)
Remeasuring prominent components, particularly the shaft support and vandalized artifacts, usually sawn off bronze fastenings.

Location and nature of the archaeological collections and associated documentation
No collections made. The case involved was litigated over a long period of time. Notes may remain with Department of Justice attorneys.

Significant descriptive and theoretical conclusions of the research
Highly pragmatic objective of presenting a more accurate and updated site map in an extremely significant court proceeding.

Project name (or basic description)
Winfield Scott remapping

Principal investigator
Don Morris

Institutional sponsor
National Park Service

Dates of fieldwork
06/11/1990 to 06/15/1990

Published and unpublished mss.
Morris and Lima 1996

Geographic location(s) of fieldwork
Winfield Scott site

Site nos. or locations from which data were collected
No site number has been assigned.

Theoretical and empirical goals of research
Remap the site to reflect changes since the 1983 mapping and to record newly discovered material.

Types of data collected (collections, site record forms, field records)
Photographs, videotape, and a trilateration map

Person-days and crew size
10 divers; approximately 40 person days

Field procedures (and laboratory procedures as applicable)
Comprehensive mapping from an arbitrary base line

Location and nature of the archaeological collections and associated documentation
No collections made; field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
Relatively detailed description and map of largest hull fragment.

Related historical research
None

Project name (or basic description)
Winfield Scott thesis study

Principal investigator
Deborah Marx

Institutional sponsor
East Carolina University

Dates of fieldwork
07/06 –07/12/ 2000

Published and unpublished mss.
Marx 2002

Geographic location(s) of fieldwork
Middle Anacapa Island

Site nos. or locations from which data were collected
No site number has been assigned.

Theoretical and empirical goals of research
Expand existing documentation of the wreck scatter, and provide authoritative identification of material remaining on the seabed. Determine the effect of various salvage efforts (salvage project in 1894, World War II work, postwar treasure diving) on the wreck Develop an integrated historical and archaeological study of the vessel's role in maritime commerce on both coasts.

Types of data collected (collections, site record forms, field records)
Photographs, descriptive notes, and a site map

Person-days and crew size

4-person crew for a total 28 person days

Field procedures (and laboratory procedures as applicable)
Trilateration, with site mapping tied to terrestrial benchmarks via transit work

Location and nature of the archaeological collections and associated documentation
No collections made. Notes and records remain with Marx.

Significant descriptive and theoretical conclusions of the research
Definitely the best descriptive effort and a highly successful integration of historical and archaeological materials.

Related historical research
Extensive and detailed work in primary sources results in most detailed accounting of the career of *Winfield Scott*, the wreck event, survivors' experiences, and post wreck transformations. Marx also visited the Winchester Adobe, Santa Barbara, recording material incorporated into that dwelling which came from *Winfield Scott.*

Project name (or basic description)
Cuba discovery (NPS)

Principal investigator
Don Morris

Institutional sponsor
National Park Service

Dates of fieldwork
05/071989

Published and unpublished mss.
Howorth and Hudson 1985; Haller and Kelly 1987; Morris and Lima 1996

Geographic location(s) of fieldwork
Point Bennett, San Miguel Island

Site nos. or locations from which data were collected
No site number has been assigned.

Theoretical and empirical goals of research
Find the wreck scatter on the basis of historical photographs

Types of data collected (collections, site record forms, field records)
General videotape of the wreckage

Person-days and crew size
Two divers for a total of one person day

Field procedures (and laboratory procedures as applicable)
Minimal due to limited time and an adverse weather forecast—quickly document the existence of the wreckage

Location and nature of the archaeological collections and associated documentation
No collections made; field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
Cuba is a compact wreck scatter with significant research potential, as well as great interest for sport divers.

Related historical research
Finding the wreckage required only one dive since photographs taken from the deck of the grounded *Cuba* showed several exposed rocks, locating the wreck scatter precisely within the foul area west of Point Bennett.

Project name (or basic description)
Cuba mapping

Principal investigator
Don Morris

Institutional sponsor
National Park Service, CMAR, SRC

Dates of fieldwork
10/17 to 10/19/1989

Published and unpublished mss.
Howorth and Hudson 1985; Haller and Kelly 1987; Morris and Lima 1996

Geographic location(s) of fieldwork
Point Bennett, San Miguel Island

Site nos. or locations from which data were collected
No site number has been assigned.

Theoretical and empirical goals of research
Location, description and inventory of the material remaining at the site.

Types of data collected (collections, site record forms, field records)
Map and videotape; still photography

Person-days and crew size
Ten people for 35 person days

Field procedures (and laboratory procedures as applicable)
Mapping and photography

Location and nature of the archaeological collections and associated documentation
Various artifacts from this wreck are almost certainly held by various private individuals. Washbasins identical to those seen within the wreck scatter remain within the ruins of the Lester Ranch House, above Cuyler Harbor. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
The major elements of the vessel remain in place within the wreck scatter, although brass objects appear to be scarce.

Related historical research
Original construction records may exist for this vessel in German archives. Eaton (1980:229-233) provides a vivid account of the salvage of the vessel. Lester (1974:36) and Roberti (2008) report the continued service of the ship's safe on the island.

Project name (or basic description)
Goldenhorn location

Principal investigator
Don Morris

Institutional sponsor
National Park Service

Dates of fieldwork
08/09/85

Published and unpublished mss.
Haller and Kelly 1987; Howorth and Hudson 1985; Morris and Lima 1996

Geographic location(s) of fieldwork
Goldenhorn wreck scatter off the southwest coast of Santa Rosa Island

Site nos. or locations from which data were collected
No site number has been assigned.

Theoretical and empirical goals of research
Locate this major wreck and begin its description and analysis.

Types of data collected (collections, site record forms, field records)
Photographs and video footage

Person-days and crew size
A crew of six for one day; approximately six person days

Field procedures (and laboratory procedures as applicable)
Observation; videotape and still photography

Location and nature of the archaeological collections and associated documentation
No collections were made. Field notes are in the CHIS Archives

Significant descriptive and theoretical conclusions of the research
The location of the wreck was shown to Park personnel.

Related historical research
Haller and Kelly 1987; Morris and Lima 1996

Project name (or basic description)
Goldenhorn mapping

Principal investigator
Don Morris

Institutional sponsor
National Park Service

Dates of fieldwork
08/13 to 08/15/1985; 08/21/85

Published and unpublished mss.
Morris and Lima 1996

Geographic location(s) of fieldwork
Goldenhorn wreck scatter

Site nos. or locations from which data were collected
No site number has been assigned.

Theoretical and empirical goals of research
Document the extent and nature of the remaining wreckage.

Types of data collected (collections, site record forms, field records)
Trilaterated map, videotape, color slide photographs

Person-days and crew size
20 person crew; 80 person days

Field procedures (and laboratory procedures as applicable)
Photography and videotape; measured map. Smaller, less expensive projects replaced this type of large-scale project, involving a chartered dive boat. It did not help that this same dive boat served as the platform for organized pillage of this wreck two years later.

Location and nature of the archaeological collections and associated documentation
No collections made. Field notes are in the CHIS Archives and SRC

Significant descriptive and theoretical conclusions of the research
The project described the wreck scatter and its principal components, producing a relatively accurate map and an assessment of the condition of the wreck.

Related historical research
Howorth and Hudson 1985, Haller and Kelly 1987. James Delgado located the Cost Book, a detailed accounting record of material and items incorporated in the vessel. This document is filed at the CHIS Archives.

Project name (or basic description)
Goldenhorn, terrestrial components

Principal investigator
Don Morris

Institutional sponsor
National Park Service

Dates of fieldwork
August, September 1992 (SRI-238 and 241) and 25 June 1994, 30 June to 3 July 1995 (SRI-84-01)

Published and unpublished mss.
Morris and Lima 1996

Geographic location(s) of fieldwork
Southwest coast of Santa Rosa Island

Site nos. or locations from which data were collected
SRI-238, SRI 241, and SRI-94-01

Theoretical and empirical goals of research
Type I inventory survey of archaeological resources threatened by coastal erosion with particular interest in recently located Chinese abalone fishing camps.

Types of data collected (collections, site record forms, field records)

Photography and sketch maps of located sites, together with GPS coordinates. There was occasional collection of diagnostic artifacts and radiocarbon samples for dating.

Person-days and crew size

A crew of five recorded for four days—20 person days

Field procedures (and laboratory procedures as applicable)

Sites were encountered and boundaries were determined, followed by artifact collection, photography and mapping, typically by pacing and measuring of small-scale features. Data were entered on the standard California site form in use at that time.

SRI-238 contained a scattering of coal and timbers and planks in an arrangement that suggested the existence of a temporary structure. This lay directly upon a prehistoric horizon.

SRI-241 contained two large piles of wave worn coal, as well as a pile of stacked lumber and hatch covers, evidently derived from the wreck of *Goldenhorn*, all placed directly on a prehistoric site.

At SRI-94-01 a team uncovered planks exposed in the west bank of Mud Tank Wash, determining that the planks were indeed hatch covers and appeared to have been positioned in such a manner as to provide a wooden tent platform. No culturally diagnostic artifacts were located, although it seems likely that the inhabitants of this site were Chinese abalone fishermen.

Location and nature of the archaeological collections and associated documentation

Samples of coal were taken, along with wood samples from the stockpiles at SRI-241. These are curated at CHIS, and the field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research

This was the first recording of material on land derived from Goldenhorn, and suggested that abalone fishermen salvaged material from the wreck as it drifted ashore. They would have used the coal to process abalone, as well as for cooking.

Related historical research

Newspaper accounts mention Chinese crews being taken to Santa Rosa Island within six weeks of the wreck of *Goldenhorn*. There is abundant archaeological and historical evidence for the presence of Chinese along the stretch of coast between China Camp and Sandy Point.

Project name (or basic description)

Aggi location

Principal investigator

Don Morris

Institutional sponsor
National Park Service

Dates of fieldwork
08/08/85

Published and unpublished mss
Howorth and Hudson 1985; Haller and Kelly 1987; Morris and Lima l996; Fouts 1989

Geographic location(s) of fieldwork
Talcott Shoal, Santa Rosa Island

Site nos. or locations from which data were collected
No site number has been assigned.

Theoretical and empirical goals of research
Location, description and resource inventory. Peter Howorth led a Park Service team to the wreck scatter that was pinpointed with a magnetometer.

Types of data collected (collections, site record forms, field records)
Map, detailed drawing of individual pieces of wreckage, and photographs and videos were taken over course of dives over several years. No artifact collection.

Person-days and crew size
Crew of eight divers; approximately 56 person days

Field procedures (and laboratory procedures as applicable)
Tape and compass mapping, videotape and still photography

Location and nature of the archaeological collections and associated documentation
No collections made. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
The wreck scatter was located and an attempt was made to determine its extent.

Related historical research
Copies of primary sources concerning the *Aggi* are held in the CHIS Archives. There has been no research in foreign archives or any successful search for construction records.

Project name (or basic description)
Aggi reconnaissance and mapping

Principal investigator
Don Morris

Institutional sponsor
National Park Service, CMAR

Dates of fieldwork
08/21 to 08/22/85; 30 Oct to 2 Nov 89

Published and unpublished mss.
Fouts 1989; Howorth and Hudson 1985; Haller and Kelly 1987; Morris and Lima l996

Geographic location(s) of fieldwork
Talcott Shoal, Santa Rosa Island

Site nos. or locations from which data were collected
Aggi wreck scatter, Talcott shoal; an archaeological site (SRI-200) on an adjacent beach contains an historic fire hearth that might represent a survivors' camp. No site number has been assigned to the wreck scatter.

Theoretical and empirical goals of research
Location, description and resource inventory

Types of data collected (collections, site record forms, field records)
No collections made; map, detailed drawing of individual pieces of wreckage, and photographs and videos were taken over course of dives over several years.

Person-days and crew size
Crew of typically eight divers, approximately 56 person days

Field procedures (and laboratory procedures as applicable)
Tape and compass mapping, videotape and still photography

Location and nature of the archaeological collections and associated documentation
An anchor from *Aggi* is on display at the Santa Barbara Historical Society. The compass and bell from the wreck are held at a small museum in Goleta. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
The wreck scatter was located, identified, and described. There is considerable potential for further work.

Related historical research
Copies of primary sources concerning *Aggi* are held in the CHIS Archives. There has been no research in foreign archives nor any successful search for construction records.

Project name (or basic description)

Comet identification

Principal investigator
Don Morris

Institutional sponsor
National Park Service

Dates of fieldwork
Peter Howorth led Morris to San Miguel Island and to the Simonton Cove anchor in February 1985. Reed McCluskey, San Miguel Island Ranger, photographed wreckage associated with this anchor that had uncovered in 1984. Subsequent visits over the next several years monitored the location, watching for exposure of the material.

Published and unpublished mss.
Howorth and Hudson 1985; Haller and Kelly 1987; Morris and Lima 1996; Russell 2004

Geographic location(s) of fieldwork
Simonton Cove, San Miguel Island

Site nos. or locations from which data were collected
No site numbers were assigned.

Theoretical and empirical goals of research
The principal initial goal was to identify the vessel represented by the existing wreck scatter. Historic photographs curated at the Santa Barbara Museum of Natural History linked the wreckage to *Comet* about two years later.

Types of data collected (collections, site record forms, field records)
Photography and sketch maps

Person-days and crew size
Approximately four person days in intermittent visits over a period of several years

Field procedures (and laboratory procedures as applicable)
Measured sketches, photography

Location and nature of the archaeological collections and associated documentation
No collections made. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
McCluskey's photographs demonstrated that significant wreckage occurred with the anchor. Its true nature remained unknown for several years.

Related historical research

Archival work by Morris and Robert Schwemmer. Identification of the wreckage as *Comet* was by means of photographs filed at the Santa Barbara Museum of Natural History.

Project name (or basic description)
Comet anchor recording

Principal investigator
Matthew Russell

Institutional sponsor
National Park Service, East Carolina University, CMAR

Dates of fieldwork
10/19 to 10/23/1993

Published and unpublished mss.
Morris and Lima 1996; Russell 1996; Russell 2004; Russell 2005

Geographic location(s) of fieldwork
Simonton Cove, San Miguel Island

Site nos. or locations from which data were collected
No site number has been assigned.

Theoretical and empirical goals of research
Excavate and study the wreckage associated with the partially exposed *Comet* anchor.

Types of data collected (collections, site record forms, field records)
Photographs and a measured drawing; magnetometer survey of a 20 meter by 40 meter area

Person-days and crew size
Five-person crew for four days—approximately 20 person days

Field procedures (and laboratory procedures as applicable)
Magnetometer survey, photography, and measured drawing

Location and nature of the archaeological collections and associated documentation
No collections made. Field notes are at the SRC, Santa Fe, NM.

Significant descriptive and theoretical conclusions of the research
The magnetometer survey indicated additional wreckage associated with the anchor. The anchor is probably the stream anchor of the vessel. Dry beach sand is difficult to excavate by hand beyond a shallow depth, given limited time.

Related historical research

The work accomplished is summarized in publications cited above.

Project Name (or basic description)
Comet bow fragment documentation

Principal investigator
Matthew Russell

Institutional sponsor
National Park Service

Dates of fieldwork
05/18/ to 05/23/1999

Published and unpublished mss.
Russell 2004, 2005

Geographic location(s) of fieldwork
Simonton Cove, San Miguel Island

Site nos. or locations from which data were collected
No site numbers assigned

Theoretical and empirical goals of research
Locate, measure, and describe the finally exposed wreckage known to be associated with the Simonton Cove anchor.

Types of data collected (collections, site record forms, field records)
Carefully measured drawings and photographs

Person-days and crew size
Five-person crew for six days—approximately 30 person days

Field procedures (and laboratory procedures as applicable)
Comprehensive photography and detailed mapping. Hand-dug trenches that increased the extent of exposed wreckage supplemented the natural uncovering of the wreckage.

Location and nature of the archaeological collections and associated documentation
Three loose fastening were collected, together with wood samples for species identification, from key points on the bow. Field notes are at the SCR, Santa Fe, NM.

Significant descriptive and theoretical conclusions of the research
The anchor marked the location of the deeply buried, but surprisingly intact, bow of the *Comet*. The 1984 photographs gave the impression that the wreck scatter was more broken up that proved to be the case. Exposure of the wreckage was sufficient to allow detailed

description of this portion of a19th century lumber schooner. In the course of investigation, it became clear that while deep beach burial is a stable and generally preserving environment, each uncovering event degrades the material. This exposed fragment represents only a small portion of the vessel.

Related historical research

Matthew Russell conducted comprehensive research on *Comet* in the course of his master's thesis fieldwork in 1993. His 2005 publication represents his fullest development of this work.

Project name (or basic description)

Dora Bluhm preliminary investigation

Principal investigator

Don Morris

Institutional sponsor

National Park Service

Dates of fieldwork

05/06/89, 08/24/1989,09/14/1989: surveys near Bee Rock; Shore remains: 07/16/88, 07/06/94 and 07/16/94

Published and unpublished mss.

Howorth and Hudson 1985; Haller and Kelly 1987; Morris and Lima 1996; Russell 1996, 2004, 2005

Geographic location(s) of fieldwork

Bee Rock, Santa Rosa Island (submerged material), and Cluster Point, Santa Rosa Island

Site nos. or locations from which data were collected

Cluster Point, Santa Rosa Island, was the focus of terrestrial work, while diving concentrated on the Bee Rocks. Despite reports of wreckage in the vicinity, nothing was located during the Bee Rock dives.

Theoretical and empirical goals of research

Understand the origin of various timbers and ship fragments concentrated at Cluster Point, Santa Rosa Island. Awareness of Cluster Point as the focal point for wreckage occurred gradually as several trips were made to this locality after the purchase of Santa Rosa Island in 1986. The concentration of wreckage at Cluster Point is not typical of the usual Santa Rosa Island beach.

Types of data collected (collections, site record forms, field records)

Photography and mapping of shore material

Person-days and crew size

Bee Rock saw a total nine dives by two person dive teams in 1988 and 1989. Two separate magnetometer surveys covered this area in 1985 and 1989. Approximately 20 person days are represented.

Field procedures (and laboratory procedures as applicable)

Mapping and sketching; tagging of studied material

Location and nature of the archaeological collections and associated documentation

No collections made. Field note are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research

While fragments of obviously modern vessels were encountered at Cluster Point, much of the wreckage seemed to relate to a large, relatively old wooden vessel. A massive wooden and iron piece of steering gear was the most diagnostic piece located. A mast band from a wooden sailing vessel was noted at China Camp, in use as a fireplace ring. A long hawse pipe was noted in intertidal rocks near China Camp. By default, the wreckage was hypothesized to be of the *Dora Bluhm.*

Related historical research

Howorth and Hudson 1985; Haller and Kelly 1987; Morris and Lima 1996

Project Name (or basic description)

Dora Bluhm analysis

Principal investigator

Matthew Russell

Institutional sponsor

National Park Service, East Carolina University

Dates of fieldwork

11/02/ - 11/07/1993

Published and unpublished mss.

Russell 1996, 2004, 2005

Geographic location(s) of fieldwork

Cluster Point, Santa Rosa Island

Site nos. or locations from which data were collected

No site number has been assigned to this location; some of the material occurs within the boundaries of SRI-96, a predominantly prehistoric site.

Theoretical and empirical goals of research

Determine and demonstrate the analytical value of scattered shipwreck remains

Types of data collected (collections, site record forms, field records)
Careful description and mapping of wooden vessel fragments consistent with the historical records of *Dora Bluhm*

Person-days and crew size
A crew of five for six days—approximately 30 person days

Field procedures (and laboratory procedures as applicable)
Photography and theodolite controlled mapping; detailed drawings of prominent components

Location and nature of the archaeological collections and associated documentation
No collections made. Field notes are at the SRC, Santa Fe, NM.

Significant descriptive and theoretical conclusions of the research
"…the Cluster Point site includes several fragments that are likely associated with the Hall-built schooner [*Dora Bluhm*]. These include portions of the keelsons, centerboard trunk, deck planking and upper deck stern structure" (Russell 2005:97). Eleven fragments could not be conclusively associated with the vessel. Despite scattering, careful study of archaeological material, combined with historical records, can yield useful information.

Related historical research
Russell conducted extensive historical research into West Coast schooner construction and the lumber trade.

Project name (or basic description)
J M Colman preliminary investigations

Principal investigator
Don Morris

Institutional sponsor
National Park Service

Dates of fieldwork
10/15/89

Published and unpublished mss.
Howorth and Hudson 1985; Haller and Kelly 1987; Morris and Lima 1996; Russell 1996, 2004, 2005

Geographic location(s) of fieldwork
Point Bennett, San Miguel Island

Site nos. or locations from which data were collected
No site number assigned. *J M Colman* wreck site

Theoretical and empirical goals of research
Document intertidal wreckage

Types of data collected (collections, site record forms, field records)
Photographs and a site map

Person-days and crew size
Crew of six for one day; approximately two person days

Field procedures (and laboratory procedures as applicable)
The areas exposed at low tide were scanned for artifacts that were then photographed and measured.

Location and nature of the archaeological collections and associated documentation
No collections made. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
A donkey engine boiler was identified, along with several pieces of winches and anchor gear; remains seemed consistent with a single vessel.

Related historical research
Peter Howorth had pointed out some of this material to Morris in 1985, and had indicated that it might be the *J M Colman*. This mapping took advantage of a low afternoon tide before beginning to map *Cuba* the next day.

Project name (or basic description)
J M Colman Investigations

Principal investigator
Matthew Russell

Institutional sponsor
National Park Service, East Carolina University

Dates of fieldwork
11/02 –011/07/1993

Published and unpublished mss.
Russell 1996, 2004

Geographic location(s) of fieldwork
Point Bennett, San Miguel Island

Site nos. or locations from which data were collected
No site number was assigned to this site

Theoretical and empirical goals of research
Comprehensively document wreckage at this location. Demonstrate the interpretive potential of scattered, disassociated wreck fragments

Types of data collected (collections, site record forms, field records)
Photographs, a theodolite controlled map, and measured drawings

Person-days and crew size
Crew of six for five days—30 person days

Field procedures (and laboratory procedures as applicable)
Wood samples were taken from timbers judged relevant to the wreck scatter.

Location and nature of the archaeological collections and associated documentation
Wood samples were collected. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
Careful measurement and description established the *J M Colman* as the likely source for the majority of the wreckage, including one massive timber well up on the beach.

Related historical research
Howorth and Hudson 1985, Haller and Kelly 1987, Morris and Lima 1996; Russell 1996, Russell 2004, Russell 2005

Project name (or basic description)
Jane L Stanford peripheral investigations

Principal investigator
Don Morris

Institutional sponsor
National Park Service

Dates of fieldwork
05/24/1988 and 08/16/1990

Published and unpublished mss.
Howorth and Hudson 1985; Morris and Lima 1996

Geographic location(s) of fieldwork
Vicinity of Skunk Point, Santa Rosa Island

Site nos. or locations from which data were collected
No site number assigned.

Theoretical and empirical goals of research
Locate outlying portions of the *Jane L Stanford*'s wreck scatter. One attempt was made with divers; the other attempt employed a remotely operated submersible vehicle with a video camera.

Types of data collected (collections, site record forms, field records)
Videotape—not retained

Person-days and crew size
Two divers for one person day

Field procedures (and laboratory procedures as applicable)
Nothing was encountered that was worthy of recording.

Location and nature of the archaeological collections and associated documentation
No collections made. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
Mo discernible material encountered immediately offshore from the beached remains of the *Jane L Stanford*; much of the terrestrial wreck scatter is shielded by beach sand.

Related historical research
This work was prompted by historical accounts of the "boiler on the demolished vessel being blown twenty feet in the air" by explosive charges that shattered the hull of this vessel. It was thought that heavy fragments of the ship might lie immediately offshore from the prominent scatter on the north side of Skunk Point, Santa Rosa Island.

Project name (or basic description)
Jane L Stanford mapping

Principal investigator
Don Morris

Institutional sponsor
National Park Service

Dates of fieldwork
11/9/90 to 11/13/90

Published and unpublished mss.
Morris and Lima 1996

Geographic location(s) of fieldwork
Skunk Point, Santa Rosa Island

Site nos. or locations from which data were collected
No site number has been assigned.

Theoretical and empirical goals of research
Map the exposed hull fragments of this vessel exposed at Skunk Point, Santa Rosa Island

Types of data collected (collections, site record forms, field records)
To-scale map and photographs as well as a physical description of he fragments

Person-days and crew size
A crew of four for two days—eight person days

Field procedures (and laboratory procedures as applicable)
Map was produced with a tape and compass

Location and nature of the archaeological collections and associated documentation
A stray fastening, found some distance from the main wreck scatter, has been cataloged into the CHIS museum collections. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
This project collected information on fastening sizes employed in the wreckage, wood species, as well as basic measurements of this very large vessel.

Related historical research
Morris and Lima 1996

Project name (or basic description)
Dante Alighieri II discovery

Principal investigator
Don Morris

Institutional sponsor
National Park Service

Dates of fieldwork
10/2 - 4/1994—initial location and description

Published and unpublished mss.
Morris and Lima 1996

Geographic location(s) of fieldwork
Santa Barbara Island

Site nos. or locations from which data were collected
No site number was assigned.

Theoretical and empirical goals of research
Location and description of wreck scatter described in historic documents

Types of data collected (collections, site record forms, field records)
Photographs

Person-days and crew size
A crew of four for three days—12 person days

Field procedures (and laboratory procedures as applicable)
Only rudimentary measurement and photography has been accomplished, due to difficult surf conditions.

Location and nature of the archaeological collections and associated documentation
No collections made. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
The wreck site was located, verifying the historical record, and at least partially described. The wreck scatter could be most easily accessed at either an extreme high tide or an extreme low tide. There is a modern wreck overlying *Dante Alighieri II* at almost exactly the same spot. No accurate GPS coordinates have yet been taken at this wreck scatter. The location is easily identified from the information in the Coast Guard log.

Related historical research
Newspaper accounts detailed the extensive involvement of the Coast Guard in this rather involved rescue operation. Inquiry to the Coast Guard turned up the information contained in the logbook of *Aurora*, the rescuing vessel.

Project name (or basic description)
Del Rio identification

Principal investigator
Don Morris

Institutional sponsor
National Park Service

Dates of fieldwork
12 May 1994 and 19 Oct 1994

Published and unpublished mss.
Morris and Lima 1996

Geographic location(s) of fieldwork
Frenchy's Cove, West Anacapa Island

Site nos. or locations from which data were collected
No site number has been assigned.

Theoretical and empirical goals of research
Identify obvious large engine block ashore at Frenchy's Cove, Anacapa Island

Types of data collected (collections, site record forms, field records)
To-scale sketch of engine block and photographs

Person-days and crew size
Two persons for a total of three person days

Field procedures (and laboratory procedures as applicable)
Sketching and photography of massive engine block partially exposed in beach sand.

Location and nature of the archaeological collections and associated documentation
No collections made. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
The site was identified. Additional material, apparently *Del Rio*, was located within Frenchys Cove just offshore from the engine block during the work in October.

Related historical research
Archival work by Robert Schwemmer has been instrumental in identification of this material. For many years, available documentation indicated that this vessel sank well offshore in Sanctuary waters. Schwemmer located Coast Guard records that stated that the burning vessel had drifted ashore at Frenchy's Cove, Anacapa Island.

Project name (or basic description)
Crown of England Data Recording

Principal investigator
Don Morris

Institutional sponsor
National Park Service

Dates of fieldwork

2 April 1986—initial NPS visit; 23 May 1988; July 1991

Published and unpublished mss.
Morris and Lima 1996

Geographic location(s) of fieldwork
Ford Point, Santa Rosa Island

Site nos. or locations from which data were collected
SRI-132. This site contains a prehistoric component underlying the salvage camp for *Crown of England.*

Theoretical and empirical goals of research
Locate, describe and record historic material associated with the wreck and salvage of *Crown of England* at this location, especially the prominent donkey engine. Offshore work discovered a large anchor and chain.

Types of data collected (collections, site record forms, field records)
Photography of prominent material (cast iron oven, donkey engine boiler, and various iron beams)

Person-days and crew size
Crew size of approximately three; perhaps three person days

Field procedures (and laboratory procedures as applicable)
Photography and sketch map

Location and nature of the archaeological collections and associated documentation
A fire brick, labeled "Glenboig" accords with the attribution of this wreckage to *Crown of England*, built near Glasgow, Scotland. Glenboig is a Glasgow suburb. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
The historic material, here associated with a prehistoric site, was recorded during the Santa Rosa Island Coastal Survey in 1993.

Related historical research
Both Lima and Schwemmer have searched assiduously for a photograph of this vessel. None has been located to date.

Project name (or basic description)
Ella G identification

Principal investigator
Don Morris

Institutional sponsor
National Park Service

Dates of fieldwork
August 1992

Published and unpublished mss.
Morris and Lima 1996

Geographic location(s) of fieldwork
Bechers Bay pier, Santa Rosa Island

Site nos. or locations from which data were collected
No site number has been assigned.

Theoretical and empirical goals of research
Describe and identify occasional materials exposed in the surf just south of the Bechers Bay pier.

Types of data collected (collections, site record forms, field records)
Critical measurements and photography

Person-days and crew size
One person day

Field procedures (and laboratory procedures as applicable)
Minimal measuring and description of partially exposed hull fragment within the surf line. Relatively light construction suggests a smaller vessel.

Location and nature of the archaeological collections and associated documentation
No collections made. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
Morris and Lima (1996) discuss a hull fragment near the pier is discussed in terms of *Ella G*, an early sealing vessel lost in Bechers Bay. Definitive identification is lacking, however. A detached fragment directly beneath the pier (in fact pierced by the first set of pier pilings) contains a drive shaft. Its presence suggests another vessel (*Bluefin*?) may be involved.

Related historical research
This wreck scatter is discussed in terms of the two wrecks that may have come to rest in this locality. There is a distinct possibility that another vessel entirely may be represented. One omission has been the failure to ask the Vail family and other ranch sources about this material. They just might know.

Project name (or basic description)
Broadbill investigations

Principal investigator
Don Morris

Institutional sponsor
National Park Service and CMAR

Dates of fieldwork
07/10/1994

Published and unpublished mss.
Howorth and Hudson 1985; Morris and Lima 1996

Geographic location(s) of fieldwork
Just east of Orr's Camp, Santa Rosa Island

Site nos. or locations from which data were collected
No site number assigned

Theoretical and empirical goals of research
Locate, document, and describe remaining wreck scatter on the beach

Types of data collected (collections, site record forms, field records)
Drawings, photographs

Person-days and crew size
A crew of 3 for one day—3 person days

Field procedures (and laboratory procedures as applicable)
To-scale drawing and photographs

Location and nature of the archaeological collections and associated documentation
No collections made. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
Peter Howorth led Morris to this material on 02/15/85 and identified it as *Broadbill.* Howorth was an active fisherman at the time of the wreck (1966). There is an unidentified wreck with twin diesel engines about two hundred yards east of the *Broadbill* wreck scatter. The fishing vessel *Pleiades* wrecked just 50 yards to the west of *Broadbill* in 1992.

Related historical research
Newspaper accounts of the wreck event are the only records known. Given the military origin of this vessel, additional information probably exists within Navy archives.

Project name (or basic description)
George E Billings investigation

Principal investigator
Don Morris

Institutional sponsor
National Park Service

Dates of fieldwork
Summer 1995

Published and unpublished mss.
Morris and Lima 1996

Geographic location(s) of fieldwork
Middle Anacapa Island

Site nos. or locations from which data were collected
No site number has been assigned.

Theoretical and empirical goals of research
Identify location of newspaper photograph showing George E Billings burning off north shore of Middle Anacapa Island, near the usual landing for this island. As of 2000, no material had been located.

Types of data collected (collections, site record forms, field records)
No collections made

Person-days and crew size
Two teams of two divers made exploratory dives—one person day.

Field procedures (and laboratory procedures as applicable)
Just observation. No records made.

Location and nature of the archaeological collections and associated documentation
No collections made

Significant descriptive and theoretical conclusions of the research
The photograph of the burning vessel is conclusive, but either the wreckage has not yet been identified at this location, or the burning hulk may have drifted slightly. This location is west of *Winfield Scott.* Possible wreckage sightings close to this vessel's wreckage might be remnants of *George E Billings*.

Related historical research

None aside from use of the newspaper photograph

Project name (or basic description)
Yankee Blade investigation

Principal investigator
Don Morris

Institutional sponsor
National Park Service

Dates of fieldwork
Summer 1991

Published and unpublished mss.
Morris and Lima 1996

Geographic location(s) of fieldwork
SRI-91-75

Site nos. or locations from which data were collected
SRI-91-75

Theoretical and empirical goals of research
Vessel-related artifacts were encountered in a Chinese abalone fishing camp along the southwest coast of Santa Rosa Island close to Sandy Point. The historic material capped a prehistoric occupation.

Types of data collected (collections, site record forms, field records)
Artifact collection

Person-days and crew size
Two person crew for a total of one person day

Field procedures (and laboratory procedures as applicable)
Walking survey and surface collection of significant artifacts

Location and nature of the archaeological collections and associated documentation
National Park Service Museum collection. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
Identification of the collected material as pertaining to Yankee Blade is plausible but not satisfactorily demonstrated.

Related historical research

Accounts of the wreckage of *Yankee Blade*, a Gold Rush era side wheel steamer, clearly state that components of this vessel reached Santa Rosa Island. While it perfectly possible that this material could represent *Yankee Blade*, it is equally plausible that it derived from any of several wrecked vessels with copper sheathed hulls. Morris and Lima note three instances of wreckage drifting across the Santa Barbara Channel from wreck sites to the north.

Project name (or basic description)
Grumman Guardian investigation

Principal investigator
Don Morris

Institutional sponsor
National Park Serive

Dates of fieldwork
08/10/85. Peter Howorth, the initial discoverer of this material, led the NPS team to this plane. Subsequent visits were made periodically to describe the wreckage and monitor conditions.

Published and unpublished mss.
Morris and Lima 1996

Geographic location(s) of fieldwork
South side of Santa Cruz Island

Site nos. or locations from which data were collected
No site number assigned.

Theoretical and empirical goals of research
Location and description of material reported by Peter Howorth. Subsequent historical research uncovered the specifics of the plane crash.

Types of data collected (collections, site record forms, field records)
Video and film photography was taken on the initial visit, along with basic measurements (wingspan and length). Initial location coordinates are not accurate.

Person-days and crew size
The first two visits utilized two teams of two divers each, for a total of approximately two person days.

Field procedures (and laboratory procedures as applicable)
No samples or artifacts were collected.

Location and nature of the archaeological collections and associated documentation

None exist in museum or Park collections. Material from this plane may be in the hands of private collectors, as pieces of the plane (gauges from the instrument panel) have disappeared over the years. Anchoring activities have also damaged the wreck scatter. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research

The wrecked plane has been definitively linked to basic records of the plane wreck, which, as suspected from the condition of the remains, was a relatively planned ditching, or controlled dead stick landing, rather than an out of control crash.

Related historical research

While basic historical information has been acquired, no attempt has been made to study material that might be retained in military archives, nor has an attempt been made to collect oral histories from any survivors or witnesses to the crash landing. These could be very rewarding projects.

Project name (or basic description)

Grumman Avenger location

Principal investigator

Don Morris

Institutional sponsor

National Park Service

Dates of fieldwork

8/2/1995

Published and unpublished mss.

Morris & Lima 1996

Geographic location(s) of fieldwork

West Anacapa Island

Site nos. or locations from which data were collected

No site number has been assigned.

Theoretical and Empirical Goals of Research:

Location and description of a wreck known to several veteran divers in the Santa Barbara Channel

Types of data collected (collections, site record forms, field records)

Videotape and photography

Person-days and crew size

A crew of six for three days—approximately 18 person days

Field procedures (and laboratory procedures as applicable)
Photography and occasional isolated measurements. This plane lies at a depth of 120 feet, limiting bottom time for divers using compressed air.

Location and nature of the archaeological collections and associated documentation
No collections made. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
Location of the wreckage, identification of the plane, and basic description of the material remaining.

Related historical research
This plane was well known within the wreck diving community prior to the NPS "discovery," which was aided by anonymous tips. Definitive historical research has not been done. Military archives surely contain detailed records of the circumstances of this mishap. No newspaper accounts have been noted, not surprising since this plane evidently crashed during World War II. Patrick Smith, CMAR, has reportedly uncovered historical material related to this plane.

Project name (or basic description)
Santa Cruz identification

Principal investigator
Don Morris

Institutional sponsor
National Park Service

Dates of fieldwork
18 Aug 91

Published and unpublished mss.
Morris and Lima 1996

Geographic location(s) of fieldwork
Prisoners Harbor, Santa Cruz Island

Site nos. or locations from which data were collected
No site number has been assigned.

Theoretical and empirical goals of research
Locate and initially describe the wreck scatter.

Types of data collected (collections, site record forms, field records)
Some photographs (not particularly clear) and a basic map were obtained.

Person-days and crew size
Six dives by three divers—one person day

Field procedures (and laboratory procedures as applicable)
Tape and compass were used to produce the map.

Location and nature of the archaeological collections and associated documentation
No material is in the CHIS collections. Several spars attributed to this vessel are stored on Santa Cruz Island under the ownership of the Santa Cruz Island Foundation. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
Prior historical research led the team to the wreck scatter almost immediately. Additional wreckage has either been salvaged or lies buried beneath the silty bottom of Prisoners Harbor.

Related historical research
Morris and Lima 1996

Project name (or basic description)
Kate and Anna identification and documentation

Principal investigator
Patrick Smith, Henry Silka, and Don Morris, co-investigators

Institutional sponsor
National Park Service

Dates of fieldwork
01/08/2003 to 01/12/2003

Published and unpublished mss.
Morris and Lima 1996

Geographic location(s) of fieldwork
San Miguel Island, Cuyler Harbor

Site nos. or locations from which data were collected
No site number has been assigned.

Theoretical and empirical goals of research

Description, identification, and documentation of spontaneously exposed material on the beach very near the start of the trail to the ranger station

Types of data collected (collections, site record forms, field records)
Photography and measured drawing, along with samples of metal hull sheathing, wood, and fastenings, and a fragment of caulking

Person-days and crew size
Crew of three—12 person days

Field procedures (and laboratory procedures as applicable)
Mapping, sketching, and photography

Location and nature of the archaeological collections and associated documentation
Items collected for further analysis including a sheathing fragment, fastenings and samples of caulking, and wood. These reside in the Channel Islands National Park museum collection. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
Recorded details of unknown wreck; location of remains and some unusual characteristics (use of unshaped, naturally curved timbers) suggest that the vessel is *Kate and Anna*. However, this wreckage could easily refer to any of five vessels recorded in Morris and Lima 1996 (*NB, Isabella, Liberty, Santa Rosa*, and *Kate and Ann).*

Related historical research
The historical record reveals extensive rebuilding of this vessel and a change in propulsion from steam to sail. Robert Schwemmer has obtained contemporary photographs of the wrecked vessel on the beach at Cuyler. These photos indicate that a recent landslide now covers the spot where the hull of *Kate and Anna* came to rest. The bow fragment lies about 150 yards east of this location. While this wreckage may relate to *Kate and Anna*, it conceivably could pertain to at least four other vessels that have wrecked within Cuyler Harbor. A careful survey of this area could prove very fruitful.

Project name (or basic description)
Location of prehistoric and historic remains

Principal investigator
Don Morris

Institutional sponsor
National Park Service

Dates of fieldwork
10/18/95

Published and unpublished mss.
Morris 1995

Geographic location(s) of fieldwork
Offshore from Oat Point, Santa Rosa Island

Site nos. or locations from which data were collected
No site number was assigned.

Theoretical and empirical goals of research
Exploration of likely area for possible submerged materials, both historic and prehistoric

Types of data collected (collections, site record forms, field records)
Location data on stone bowl submerged at a depth of 14 feet

Person-days and crew size
Six divers for a total of one person day

Field procedures (and laboratory procedures as applicable)
Locations were taken with a Loran unit, which proved to be distorted.

Location and nature of the archaeological collections and associated documentation
The bowl, with accompanying report, is housed at the Santa Barbara Museum of Natural History. Field notes are in the CHIS Archives.

Significant descriptive and theoretical conclusions of the research
Despite extensive search, this bowl was not associated with anything that appeared to be archaeological—a classic isolated artifact. Immediately adjacent to archaeological site SRI-87, this artifact may have come from that large and extensive site. This may be first instance in which a submerged artifact and its context were examined by a professional archaeologist before its removal.

Related historical research
None

Project name (or basic description)
Side-scan sonar and scuba survey off San Miguel Island

Principal investigator
Jack Watts

Institutional sponsor
Oxford University and the Department of Anthropology, University of Oregon

Dates of fieldwork

September 2008, October 2009

Published and unpublished mss. (in style of *American Antiquity* text citation)

None yet.

Geographic location(s) of fieldwork

The side-scan sonar survey was conducted in the waters between San Miguel and Santa Rosa Islands and off the western point of San Miguel. Scuba survey was conducted off Daisy Cave, Willow Canyon, Cardwell Point, and Wyckoff Ledge.

Site nos. or locations from which data were collected

No sites were recorded.

Theoretical and empirical goals of research

The project entailed identification of submerged targets and scuba survey. Specific targets of interest were chert outcrops that may have been a quarry source for Late Pleistocene/Early Holocene groups living on the islands. A possible worked chert cobble was found in the target area, but was left in place without further analysis.

Types of data collected (collections, site records forms, field records)

Bathymetric, photographic, and video information was collected. Potential lithic artifacts were left *in situ*.

Person-days and crew size

Eight person-days were expended, with a crew of four for the sonar survey. The scuba survey lasted three days with five researchers and a boat crew of five.

Field procedures (and laboratory procedures as applicable)

A 30 ft boat was used to undertake the survey. A side-scan sonar tow-fish tethered to a long cable was dragged behind the vessel to collect images within specific locales around San Miguel Island. The side-scan swath was 100 m, and transects were run northeast to southwest. The sonar data were collected from the nearshore submerged landscape, to a maximum of approximately 130 ft depth. The Scuba survey was conducted from the R/V Shearwater in locations predicted to be of potentially high value through GIS analysis of the sonar survey.

Location and nature of the archaeological collections and associated documentation

The digital sonar data, still photographs, and video are in the possession of Jack Watts.

Significant descriptive and theoretical conclusions of the research

The side-scan sonar was valuable in narrowing the scuba search area. Scuba survey information revaled that the areas off Daisy Cave, Willow Canyon, and Wyckoff Ledge were likely poor candidates for future scuba work due to topological or environmental problems. The area off Cardwell Bluffs, however, is a high-value target for further scuba work, provided lithic samples can be taken to a laboratory and analyzed properly. Subsequent GIS

analysis has extended the high-value target areas for survey to the northeast and southeast waters off Santa Rosa Island.

Related historical research
None

Project name (or basic description)
Endeavour Underwater Survey

Principal investigator
John R. Johnson

Institutional sponsor
Santa Barbara Museum of Natural History

Dates of fieldwork
26-27 July 2009

Published and unpublished mss. (in style of *American Antiquity* text citation)
None

Geographic location(s) of fieldwork
Northwest coast of Santa Rosa Island.

Site nos. or locations from which data were collected
The survey was conducted in the vicinity of the mouth of Arlington Canyon with transects beginning off the shoreline at Soledad Canyon and extending westward to Garañon Canyon, covering roughly a 3.4 km x 6.0 km area.

Theoretical and empirical goals of research
Side-scan sonar mapping of submerged portions of Late Pleistocene Santarosae Island. The resulting topographic map will help to place the Arlington Springs Site in its larger geomorphological context. Ancient watercourses and rock outcrops that were detected during the survey can be targeted for subsequent underwater investigations.

Types of data collected (collections, site records forms, field records)
Side-scan sonar data

Person-days and crew size
Six people were actively engaged in the survey over a two-day period, but setting up the equipment, testing it, and travel to and from Santa Barbara to the islands comprised another four days.

Field procedures (and laboratory procedures as applicable)

A 70-foot former Army T-boat, *The Endeavour* (William Urschel, owner/captain), was used to undertake the survey. A side scan sonar tow fish tethered to a long cable was dragged behind the vessel to collect a continuous image of the ocean floor. A total of 20 overlapping transects, each 200 m wide, were made off the island, mostly from parallel paths running northwest-southeast perpendicular to the shore, beginning outside the area of densest kelp near shore extending to about 180 feet in water depth (the approximate shoreline 13,000 years ago).

Location and nature of the archaeological collections and associated documentation

The digital data were saved on a hard drive and copied to computers at the Santa Barbara Museum of Natural History.

Significant descriptive and theoretical conclusions of the research

The sonar transect data will be stitched together to make a map of submerged terrain that was part of the Santarosae land mass towards the end of the Pleistocene. The resulting topographic map will help to place the Arlington Springs Site in its larger geomorphological context. Ancient watercourses and rock outcrops that were detected during the survey can be targeted for subsequent underwater investigations.

Related historical research

Not relevant

Research in Progress: The 2007 wreck cruise investigated a newly "discovered" wreck that is thought to be *Barbee*, a 1930s rumrunner. There is very little, if any, specific information about this vessel and the circumstances of the wreck.

CHAPTER 11

ARCHAEOLOGICAL RESOURCE MANAGEMENT ISSUES

Each island within the Park contains cultural resources with characteristics that are not found or are rare on the other islands. With regard to prehistory within the Park, this variation reflects divergent ecological adaptations of the islands' inhabitants and different courses of cultural development, even though what happened during the course of prehistory on each of the islands has much in common with the others. With regard to the historic period, this variation is mainly due to the varying environmental constraints on ranching activities, the cultural backgrounds of the ranchers and their workforces, and the manner in which ranching articulated with the economy at large. The discussion below begins with sections devoted to issues concerning prehistoric cultural resources on each of the Park's islands in turn. These sections are followed by a consideration of issues surrounding historic archaeological resources within the Park as a whole and then by a consideration of issues related to cultural resources submerged in the waters surrounding all of the Park's islands. Finally, all the issues brought up in each of these sections are integrated and summarized as a series of Park-wide issues, which serve as a basis for recommendations presented in the next chapter.

PREHISTORIC RESOURCES ON SANTA BARBARA ISLAND

As the most remote island within the Park, Santa Barbara Island experiences much less public visitation than the more popular islands such as Anacapa and Santa Cruz. Archaeologists also have seldom undertaken field research on the island, the last episode occurring in 1986. Greenwood's 1977 survey of the entire island is the most recent attempt to inventory the island's sites (Greenwood 1978). Ten of the 19 sites she recorded are in the Webster Point vicinity, that is, in the western sector of the island. The others are more dispersed, although three occur in the eastern sector near the landing, ranger station, and campground. None occurs in the interior of the island.

The actual number of sites in the Webster Point vicinity is questionable. A dense vegetative cover, particularly introduced ice plant, obscures the ground surface in this area and has frustrated survey efforts. More sites may exist in this area, but to find them would require clearance of the vegetation to discern them, and their probable small size would require the survey to be at close walking intervals.

As discussed in Chapter 4, erosion is affecting a large proportion of the sites on the island. Public visitation, although not as intense as on some of the other islands, also is affecting sites near the ranger station and campground. A Park intern carried out a condition assessment of the island's sites in 2007, visiting all but four sites, and the assessment forms are filed at Park headquarters. The intern assessed the overall condition of the sites as fair to good, implying that some of the effects of erosion and visitation witnessed in the 1970s and 1980s have diminished somewhat. Nonetheless, there is no question that the potential for archeological investigation to acquire information about the island's prehistory is being increasingly compromised. Because a

large proportion of the island's sites are being affected to varying degrees, and because the total number of sites is small, the decline in research potential of the sites is a serious issue.

A related issue concerns assessment of the significance of the prehistoric sites. Because knowledge of the island's prehistory is still very limited, despite the recent analyses of existing collections discussed in Chapter 4, the significance of the island's archaeological resources is still poorly defined. Knowing that the island was occupied for at least 4,000 years and that taxa represented by shellfish remains vary among the sites implies that the island's archaeological resources have a great deal of significance in that their study is likely to contribute to understanding variability in prehistoric human adaptations to marine environments, particularly in situations where terrestrial food resources were severely limited.

PREHISTORIC RESOURCES ON ANACAPA ISLAND

Anacapa is one of the most heavily visited islands within the Park. Its short distance to the mainland results in numerous boats to the island throughout the year, with most of this visitation to East and to a smaller extent West Anacapa. This heavy public visitation stands in contrast to the relatively limited archaeological research that has been conducted on the island. Surprisingly, it is only within the last five years or so that archaeologists have begun to do basic ^{14}C dating on the island. Detailed research is greatly needed on Anacapa Island to provide information on the nature of Channel Islands settlement and subsistence systems, given that its sites were occupied by people living on Santa Cruz Island or by by boat crews traveling from the mainland to any of the other three northern Channel Islands. Understanding these articulations with occupation of the other Channel Islands would relate to defining more explicitly the significance of the island's cultural resources, as well as generating information that can be disseminated to the public about the unique Anacapa Island cultural history.

As Greenwood (1978) noted, many of Anacapa's archaeological sites have been severely damaged by historical activities and to a smaller extent public visitation. Sites in some of the most favorable locations (i.e., Shepherd's Landing on Middle, Frenchy's Cove on West Anacapa, and throughout East Anacapa) have been the most heavily affected by historic land use. Similar to Greenwood's (1978) evaluation, Rick (2006) noted that ANI-5 and -6 at Frenchy's Cove were badly eroding and appear to have been heavily disturbed by the historical buildings that were once located in the area. Wolff, Rick, Robbins et al. (2007) recently evaluated the disturbance processes affecting all of the sites on East Anacapa (i.e., ANI-1 to -4). These four sites all contain historical debris (e.g., bricks and gun casings) mixed into the prehistoric deposits. At ANI-2, burrows from the introduced European hare also were found in the two units excavated there in 2006 and 2007 (Wolff, Rick, Robbins et al. 2007). Similarly, Sandefur (in Rozaire 1978c) noted hare and sheep bones in the deposits at ANI-8 on West Anacapa. During the brief ^{14}C sampling of sites on Middle Ancapa, Rick and Minas also noted that these same processes are at work at these sites, with the complex of sites (ANI-21, -22, and -24) at Shepherd's Landing being heavily disturbed by the former historical settlement present at that location.

Anacapa is home to scores of breeding sea gulls and brown pelicans. Theses birds are also having a pronounced effect on the archaeology of Anacapa. Gulls and gull chicks nest on sites, die on sites, and introduce non-cultural faunal and other materials that can be commingled with prehistoric remains in the archaeological deposits. This was apparent at all the sites on East Anacapa (Wolff, Rick, Robbins et al. 2007), with Rick also noting a few chicken bones embedded in the deposits at ANI-1 in 2004. Brown pelicans nest on West and Middle Anacapa. In the course of their visit during the non-breeding season to Middle Anacapa, Rick and Minas were astounded by the extensive nature of the pelican nests there. They were extremely dense in the vicinity of Shepherd's Landing, with these birds also having the potential to introduce non-cultural constituents into the sites. As these bird populations continue to increase, their impacts on Anacapa's cultural resources will also expand.

Since many of the island's archaeological sites are located on or near sea cliffs, marine erosion remains a problem for some of the sites, including a cave complex at ANI-18, where some of the deposits are scoured by wave action at very high tides.

Although we are just beginning to understand the nature of Anacapa Island's archaeological record, it is clear that the island has been occupied for over 5000 years, with substantial occupations occurring throughout much of the Late Holocene (see Rick 2006). Ongoing analysis of the recent excavations at ANI-2 should prove important for understanding the nature of Anacapa's settlement and subsistence strategies. While many of Anacapa's sites appear to be relatively small and shallow, some of them contain more substantial deposits indicative of more sustained occupation. Both Glassow (1977) and Greenwood (1978) suggested the possibility of more sustained occupation on Anacapa than was previously recognized. The sites in the Shepherd's Landing (Middle Anacapa) and Frenchy's Cove (West Anacapa) vicinities remain the best candidates for more prolonged occupations, but further testing and analysis are needed to document this pattern. Unfortunately, the heavy historical disturbances in these areas may make this a difficult endeavor. ANI-2 on East Anacapa is also a fairly large and dense site. Based on preliminary observations, Reeder and Rick (2008) suggested that the site may contain repeated occupations over a 500-1000-year period, perhaps seasonally for subsistence activities (e.g., fishing).

PREHISTORIC RESOURCES ON SANTA CRUZ ISLAND

Three characteristics of its cultural resources set Santa Cruz Island apart from the rest of the islands. First, Santa Cruz contains prehistoric sites that vary in size to a much greater extent than on the other islands. Specifically, some habitation sites are among the largest in California (see Arnold 2001a:47). Second, because Santa Cruz is a much larger island than the others, with greater topographic relief and a significant east-west expanse, the sites on the island, both on the coast and in the interior, exist in a greater variety of environmental circumstances. Third, many sites, including some relatively small ones, exhibit house depressions on their surfaces. Such sites occur on the other larger Channel Islands, but the number, and perhaps also the proportion, is larger on Santa Cruz. Many of the sites on Santa Cruz exhibiting distinctive characteristics are especially significant with respect to National Register of Historic Places criteria and will require in some instances special attention in cultural resource management programs.

As discussed in Chapter 6 with regard to the status of cultural resource inventories on Santa Cruz Island, intensive survey coverage on the island is geographically irregular; there are large areas where no survey has taken place. Much of the northern flank of the northern mountain range (including the adjacent north coast) and much of the south-central sector of the island lack any intensive survey. Only spot surveys have occurred in these areas, resulting in very few recorded sites. Moreover, not all of the intensively surveyed areas, particularly east of El Montañon, have been formally documented. Also discussed earlier was variation in the quality of the site records and the amount of detail they contain. In general, site records prepared prior to ca. 1985 lack the detail that is now standard and conforms to guidelines established by the California Office of Historic Preservation. As well, most lack UTM coordinates. The brevity of these records makes the relocation of some of the sites difficult.

Erosion has affected many sites on Santa Cruz Island, although in relative terms erosion is not as significant a factor as on the other two larger islands within the Park. Much of this erosion is the result of overgrazing, particularly by sheep, during the historic period (Brumbaugh 1983; Perroy 2009). Gullying, sheetwash, watercourse entrenchment and lateral expansion of arroyos, and wind deflation resulting from devegetation, have all affected archaeological deposits throughout the island. Seacliff erosion due to the natural action of surf and weathering of bedrock exposed on seacliff faces also has affected many coastal sites. Indeed, it is clear that some of the coastal sites are nearly gone, with only a small portion of their landward deposits remaining (e.g, CA-SCRI-429, tested in 1997).

Much of the non-coastal erosion continues to occur, particularly in the southwestern sector of the island, where the character of bedrocks and soils is especially conducive to gullying and sheetwash. The extent of some of the erosion is difficult to assess. Many narrower ridgetops, for instance lack topsoil, although its former presence occasionally is attested in small patches where it is preserved. Small ridgetop sites with low-density deposits may have been completely lost as a result of the sheetwash that removed the topsoil. In other instances, the revegetation of areas once actively eroding, occurring since removal of sheep over much of the island in the 1980s, has obscured the extent of erosion and the amount of damage it may have caused to prehistoric sites. Deposition of alluvium eroded from higher elevations has occurred along many canyon-bottom flatlands throughout the island (Brumbaugh 1983; Perroy 2009) and has covered an unknown number of sites. Some of these may be seen in profile near the top of arroyo banks, where they are capped by historic alluvium (e.g., in Pozo Canyon [Glassow et al. 2009]).

The extent of erosion usually is mentioned on site record forms, but no formal assessment of the extent to which erosion has affected sites on the island has been made, and aside from limited efforts on the Park property, no remediation programs to reduce or eliminate ongoing erosion to sites have been implemented.

Some sites have been directly affected by livestock and feral pigs. Cattle trampling has affected sites adjacent to water troughs and within or adjacent to corrals, and sheep are known to have congregated and bedded in rock shelters and trampled their archaeological deposits. In both instances, their feces may have contaminated the organic content of prehistoric deposits. Given that both forms of livestock have been absent for 20 years on most of the island, the

damage they have caused is now difficult to assess, although information in site records gives some indication.

Feral pigs were a major threat to archaeological sites before their removal was completed in 2007. They have been disturbing sites since their introduction to the island 150 years ago, but the damage they were causing became much more apparent after the removal of sheep and cattle. During the last few years before the pig eradication was completed, Perry (2008) carried out a study of pig damage to archaeological sites for the Park, and the discussion here borrows from her report. Perry estimated that 85 percent of the sites she visited over the course of five years were damaged by pigs. Her observations were mainly in the east end and isthmus areas of the island, but this estimate probably is applicable to the island as a whole. Pigs have dug holes close to a meter deep at many sites, particularly those on which fennel grows (e.g., SCRI-526, about a kilometer east of Christy Ranch), and their rooting to depths from 10 to 30 cm is widespread on surfaces of sites within grasslands. As have sheep, pigs also have congregated and bedded in rock shelters and have contributed to the damage of their archaeological deposits. To protect two of the historic Chumash village sites and a prehistoric habitation site at which pigs were becoming active—SCRI-192 (*Shawa*), SCRI-240 (*Xaxas*), and SCRI-494—in 2000 the Park constructed fences around their perimeters to prevent pig entry.

Although the pigs were eradicated from the island in 2007, the most recent damage they caused to sites is still visible. As time passes, however, the disturbance will become increasingly less visible and consequently more difficult to assess. The degree of pig damage is highly variable—some sites within grasslands have been extensively affected by pig rooting over most of their surface whereas others have not been affected at all. A curious example of the latter are many of the large midden sites near the western extreme of the island, where pig rooting is extensive within the surrounding grasslands but not within the site areas, apparently because of differences in grassland vegetation on sites as opposed to off. In any regard, with the removal of livestock and feral pigs, the damage they caused to archaeological resources has been abated, and at some sites the resulting revegetation has slowed or stopped erosion of deposits.

A byproduct of livestock removal and feral pig eradication is increased difficulty in locating sites during survey. Revegetation has obscured the surfaces of many sites, and conventional pedestrian survey procedures would be insufficient for locating sites consisting of small, low-density scatters of shell fragments or flakes. For instance, some ridge-top sites recorded in the 1970s within areas intensively grazed by sheep are no longer visible due to grass cover. Even some sites with dense midden deposits covered by thick grasslands are now invisible. In recent years, their presence could be discerned in spots where pigs have rooted, but soon this advantage will be lost as the pig rooting areas revegetate.

Over the last several years, particularly after eradication of the feral pig population on the island, small-scale burrowing has been noted at several archaeological sites. The burrows clearly are not the product of gophers or ground squirrels in that they lack substantial tailings near the burrow opening, and the density of burrows is much lower than where these animals are active on the mainland. However, the size of some of the burrow openings is similar to those produced by gophers and ground squirrels. In some instances the burrow opening appears enlarged, as if a

fox had attempted to pursue whatever animal entered the burrow. In any regard, the burrowing is adversely affecting archaeological deposits, probably to a depth no more than 30 cm.

Current land-use activities on the island generally have little effect on archaeological resources. Construction of buildings and roads damaged some sites when they were originally constructed many decades ago, but little new construction has happened since, and maintenance activities generally have caused no new damage. Of course, the Park must conform to the National Historic Preservation Act and other federal laws when considering any development project that may affect archaeological resources on that part of the island owned by the federal government. For planned development on the rest of the island, The Nature Conservancy typically contacts the Park's cultural resources staff to perform survey and assessment of the potential adverse impacts, but the arrangement for this service is informal. One sort of maintenance activity that does have continuing potential to disturb sites is road maintenance. Some roads have been cut through prehistoric sites and continual grading may in some instances remove site deposits or exacerbate their erosion.

Public visitation to the island has resulted, and continues to result, in both unintentional and intentional damage to archaeological sites. Some of the established and maintained trails used by the public pass over or adjacent to sites, and trail maintenance and use is negatively impacting some sites. An example is the trail between Prisoners Harbor and Pelican Bay, which bisects several unrecorded sites, and another example is the Scorpion Loop Trail, which passes over two archaeological sites, SCRI-701 and 748. Informal public trails also bisect sites, one being SCRI-693. Not only do these trails provide opportunities for the public to pick up artifacts as they become exposed, in some situations erosion occurs along the trails.

Purposeful looting at archaeological sites is a continuing problem that is difficult to address due to the inability to patrol the coastline and monitor sufficiently closely the activities of visitors. Recreational boaters come onshore with or without a landing permit, and the extent of this sort of activity is large enough that well established trails radiate out from some of the popular coves and anchorages around the island (e.g., Orizaba). Such visitors may only casually collect artifacts they see on site surfaces, but some are purposeful looters who have excavated into archaeological deposits. An example of the latter is the looting in the mid-1980s documented by Johnson (see project descriptions in Chapter 6). Even coastal areas with no easy access are vulnerable to casual collecting and looting. For instance, Glassow is aware of a human burial looted in the 1980s from SCRI-109, at Punta Arena on the south coast. Around the same time a complete sandstone metate was taken from the site surface. This looting occurred despite the absence of good spots for boat landing near this site. With population growth in southern California and expanding knowledge of the opportunity to visit Channel Islands National Park, the potential for casual collecting and looting inevitably will increase.

PREHISTORIC RESOURCES ON SANTA ROSA ISLAND

Santa Rosa Island contains an extraordinary prehistoric and historic archaeological record, including over 705 recorded archaeological sites. Many of the archaeological site records are in good condition and contain detailed locational information, site descriptions, itemization of

contents, and maps and photographs. Still, some of the site records recorded by Orr in the 1940s to 1960s remain less detailed, with generally inadequate descriptive or location information. Updating some of these records should be a priority for future management projects. All of the archaeological collections from past work appear to be in good condition and are properly housed at appropriate curation facilities, or are housed with the original PI and are being prepared for curation. The excavated collections continue to provide important archaeological data and research. Kennett's collections, in particular, represent the largest assemblage of materials with perhaps the greatest future potential.

Although research has progressed at a steady pace, there are still several significant gaps in our understanding of Santa Rosa prehistory and management issues. With regard to site inventory, only about 40% of the island has been surveyed. The largest gaps in survey coverage appear to be along the southwest coast (e.g., Bee Canyon, Acapulco Canyon, and other areas not along the immediate coastline) and in the island interior. With regard to excavation, there are a number of spatial and temporal gaps in the record. The most heavily excavated area is the northwest coast near Arlington Canyon. Here, Johnson, Stafford, Ajie, and Morris (2002) and Erlandson (1994; Erlandson and Rick 1999; Erlandson et al. 1999) have published on the earliest human occupants of the region. Rick (2004a, 2007b) focused on the Late Holocene village occupation of this area, while Lambert (1993, 1994), Walker (1986; Walker and Erlandson 1986), and Goldberg (1993) have analyzed human skeletal remains in the locality excavated by Orr to investigate issue of human health, diet, and violence. The reporting of excavation projects elsewhere on the island, although somewhat sporadic, includes Braje, Kennett, Erlandson, and Culleton's (2007) report on Jolla Vieja and Rick et al. (2005b, 2006) and Wolff et al.'s (2007) reports on the northeast coast.

Rick and Erlandson (2004; see also Rick, Erlandson, and Vellanoweth 2006) provided a variety of suggestions and recommendations on the management of Santa Rosa Island sites during their site assessment work at various places on the island's coastline. A number of disturbance and taphonomic processes impact the Santa Rosa and broader Channel Island records. Although considerably less pronounced than on the mainland, historical activities (i.e., road grading and use and building construction, as well as the activities of former (e.g., cattle) and extant (e.g., deer and elk) introduced herbivores continue to cause erosion of island sites. Coastal erosion remains the greatest threat to sites along the coast and is actively destroying parts of the record annually. Continued radiocarbon dating and sampling of these eroding exposures remains the best strategy for gathering information before it is lost (Erlandson and Moss 1999). Burrows, perhaps of Native deer mice or other animals, have also been observed in a few Santa Rosa Island middens. Future work should be done to determine the animals responsible for digging these burrows and the extent of such burrowing (see Rick, Erlandson, and Vellanoweth 2006). Ultimately, monitoring, ^{14}C dating, and salvage excavation of eroding deposits remain the best strategies for combating theses disturbance processes.

The research projects discussed in Chapter 7 demonstrate that Santa Rosa Island has seen a fair amount of research in recent years. Still, a number of important research issues need to be addressed in greater detail. The Arlington Springs skeletal remains and shell middens in the Arlington area demonstrate that Santa Rosa Island contains a lengthy archaeological record, spanning some 13,000 calendar years. Despite projects by Erlandson (1994), Erlandson and

Rick (1999), Erlandson et al. (1999), and Johnson et al. (2002), we are still just beginning to understand this earliest occupation, and considerably more research is needed to help better document this important early record of coastal peoples. This is equally true for research on Middle and Late Holocene peoples on Santa Rosa that in many ways lag far behind analyses of the early record. Detailed studies of island settlement, subsistence, and technology should also be a priority for future research on Santa Rosa and the other Channel Islands.

PREHISTORIC RESOURCES ON SAN MIGUEL ISLAND

San Miguel Island is the least visited of the Northern Channel Islands due to its remote location and maritime climate. Visitors on San Miguel also have limited access to areas outside the campground, even when accompanied by a park official. While public visitation is of limited concern compared with some of the more heavily visited islands such as Anacapa and Santa Cruz, San Miguel's isolation makes it an occasional target for looting by boaters, fishermen, and other visitors who can access remote locations of the island with little or no oversight. Large archaeological sites are especially visible eroding from dune faces on the north coast, where evidence of pot-hunting (make-shift hand screens, looter holes, footprints, etc.) has been found.

The greatest threats to archaeological sites on San Miguel Island continue to be marine, wind, and fluvial erosion. San Miguel is the most maritime of all the islands in Channel Islands National Park and is exposed to strong northwesterly winds, heavy wave action, and powerful storms. The extensive sand dunes of San Miguel are extremely vulnerable to wind erosion, which has already damaged most of the dune sites on the island. However, the revegetation of the island is gradually stabilizing many of these dunes. Nonetheless, erosion processes have a cumulative effect on archaeological sites and result in the loss of enormous quantities of archaeological artifacts and ecofacts every year. While these processes may appear to be natural, much of the site erosion occurring today on San Miguel has been caused or exacerbated by human impacts associated with overgrazing and global warming (sea level rise).

San Miguel Island is home to tens of thousands of seals and sea lions that visit, breed, and haul out on rocky outcrops and sandy beaches along the island shoreline every year. Since the passing of the Marine Mammal Protection Act of 1972, pinniped populations in the North Pacific have made a dramatic recovery, and San Miguel now has one of the largest rookeries in the world, centered on the west end at Pt. Bennett. As pinniped populations have grown to sizes probably not seen for the last 10,000 years or more, so have their effect on archaeological sites. The effects of seals and sea lions hauling out on sites can result in the rapid loss or displacement of archaeological material, a process that is actually occurring along Pt. Bennett, Otter Point, and Crook Point (Rick, Erlandson, Braje, Estes et al. 2008).

While the archaeological record on the Channel Islands is often cited for its stratigraphic integrity, San Miguel Island cultural resources are threatened by a number of native and introduced animals that burrow, dig, and disturb archaeological deposits. Most of this burrowing is limited in depth, but the highly organic, well-drained anthropogenic soils of island shell middens seem to attract these activities. Rick et al. (2006:577) identified insects (beetles, bees, and crickets), native island deer mice (*Peromyscus maniculatus*; Schoenherr et al. 1999), and

introduced black rats as animals that burrow and bioturbate shell middens on San Miguel Island. The burrowing habits of island deer mice and black rats are particularly destructive and poorly understood. Rick at al. (2006:577) observed "4-cm diameter hole(s) to a depth of about 25 cm" in vertical midden exposures at sea cliffs and arroyo cuts on San Miguel. We have observed similar disturbances at a number of sites on the island, and the frequency of their occurrence may have increased during the island fox captive breeding program. A number of biologists are currently studying island deer mice and black rats and may help determine the scale and intensity of their burrowing habits and a course of action to mitigate their damage to island cultural resources.

Finally, many of San Miguel Island's archaeological sites have been severely damaged by historic activities such as ranching, sheep grazing, and military activity. While the effects of the ranching industry and associated sheep overgrazing have been recognized, little attention has been paid to the damages caused by historic military activity to archaeological sites. Bomb craters on the south central coast, range poles on the north and south coasts, and the Navy roads transecting the island have damaged important archaeological sites and a mitigation plan to address these impacts is needed. One of these Navy roads appears to have been cut directly through a large and extremely important Paleoindian site (CA-SMI-678) near Cardwell Point.

ETHNOHISTORIC RESOURCES ON THE NORTHERN CHANNEL ISLANDS

Several ethnohistoric studies should be undertaken to clarify our current understanding of Island Chumash settlement patterns and sociopolitical organization during the Historic Period. Probably the most important need is to conduct field surveys and limited test excavations to determine which archaeological sites were occupied into Mission times. On each island, we have a good idea regarding the locations of particular named settlements, but some remain to be identified with certainty on both Santa Cruz and Santa Rosa islands. On San Miguel Island, some sites proposed to have been occupied during Mission times have yet to be adequately tested. Some of the unresolved problems are:

- The locations of the rancherías of *Ch'ɨshɨ* and *L'alale* need to be determined on the north coast of Santa Cruz Island west of Orizaba Cove.

- Additional evidence needs to be sought regarding a possible Historic Period occupation at SCRI-496 at Willows Anchorage on Santa Cruz Island.

- The largest, most politically important ranchería on Santa Rosa Island appears to have been *Qshiwqshiw*, but the only identified site (SRI-87) that has clear evidence of Historic Period occupation appears to be too small to represent the entire ranchería. Other nearby sites need to be sampled to determine if *Qshiwqshiw* was represented by more than one residential area occupied contemporaneously.

- On Santa Rosa Island's north coast, there still remains uncertainty, because at least one ranchería is likely to have existed there that has not yet been identified. Limited testing should be conducted at sites in the vicinities of Abalone Point and Arlington Canyon to

determine which location may have been the ranchería of *N*ɨ*mk*ɨ*lk*ɨ*l* and whether the past consensus regarding the correlation of *Niaqla* with SRI-2 is justified.

- Similarly the southern coast of Santa Rosa Island needs further attention. Although candidate sites for *Nawani* and *Helewashkuy* have been suggested by Kennett (2005:101-103), none of these thus far has yielded evidence of Historic occupation.

- More Historic Period residential sites exist on San Miguel Island than are attested by ranchería names recorded in mission records. However, adequate field investigations and artifact descriptions have only been reported for two of these sites (SMI-163 and SMI-470). Further work will be necessary to confirm Historic occupation at the others.

The excellent preservation of house features on many island sites offer a unique opportunity to correlate ethnohistoric evidence for ranchería populations with numbers of houses in an effort to gain insight into the nature of these communities at the beginning of and during the Historic Period. This effort will become possible once greater certainty has been achieved pertaining to Island Chumash settlement geography (see above) and contemporaneity of island households has been established. Systematic determinations of the periods of occupation for individual houses will be required, such as has been initiated at SRI-2, SMI-163, and SMI-470 (Rick 2007a, 2007b) and by the researchers involved in the Santa Cruz Island Project directed by Arnold (Arnold 2001a; Graesch 2001, 2004). Comparisons of house counts with number of baptisms will yield insights into the effects of disease epidemics on the island populations and may be used to estimate ranchería populations for prehistoric sites where house features exist.

Besides the principal residential sites, other site types appear to date to Historic times. Research pertaining to these logistical camps, temporary or short-lived residential localities, and special use areas will help to understand more fully the lifeways of the Chumash islanders during the Mission Period. For this reason, these sites are as significant as the principal residential sites. Some of the questions to be investigated include:

- The nature of use and season of occupation of sites such as *Nimatlala* and Cueva Escondida on Santa Cruz Island, which have certain evidence of use during the Mission Period, needs to be determined to gain a fuller appreciation of the nature of settlement patterns and the seasonal round.

- SCRI-711 at San Pedro Point has been identified as a shrine used during the Mission Period and suggests that other such locations remain to be identified on the islands.

- A particular site type represented by rock platform features on Santa Cruz Island has been discussed by Perry (2007a) as having been shrines. These sites should be investigated further to determine their use and whether they date to the Protohistoric or Historic periods.

Studies pertaining to intervillage marriages and sociopolitical interaction on the northern Channel Islands have relied upon data tabulated from mission marriage registers (Johnson 1982a, 1993). A larger sample of marriages can be obtained by tabulating relationships revealed by reconstructed kinship diagrams using evidence derived from records of baptisms, burials, and the

padrones (census books). The necessary data has already been collected and kinship diagrams for many rancherías reconstructed, but this effort remains incomplete at this time. Greater insights regarding marriage patterns, social networks, and sociopolitical organization will be possible once the kinship diagrams are completed and analyzed for publication.

HISTORIC ARCHAEOLOGICAL RESOURCES ON ALL ISLANDS

Historic archaeological resources within the Park have received much less attention than prehistoric archaeological resources. None of the archaeologists who have been undertaking long-term research on the islands over the last 30 years is a historic archaeologist. Nonetheless, the Park's cultural resources staff has recorded some of the historic archaeological sites within the Park, and prehistoric archaeologists working on San Miguel have made efforts to inventory all of the historic abalone processing sites. Despite these efforts, many remain undiscovered, and many that are known, often because of mention in historic documents, have not been recorded. Despite the lack of attention, the Park's historic archaeological resources have considerable potential to expand knowledge of the history on each of the islands within the Park.

A significant issue that arose during the course of research for this overview and assessment is that existing lists of inventory records for historic archaeological sites are inconsistent and not comparable. Formally recorded resources exist in two databases: the National Park Service (NPS) and the State of California. References to historic sites also exist in reports of projects conducted on the Channel Islands. The NPS list is the Archaeological Sites Management Information System (ASMIS), housed by the NPS in their Oakland office. This database was reported to include information present in the State of California's list, the California Historical Resources Information System (CHRIS). In compiling a list of historic archeological sites, several searches were made of the NPS list, the most successful of which used the "Time Period" field, searching for the entry "historic." Problems were found in two particular instances:

- Some prehistoric sites were identified as having a historic component if only one or two historic artifacts were noted. In these cases the historic remains can be considered "isolates" and do not identify a component.

- The "historic" attribution was occasionally used when a site was described as a possible "historic" [ethnographic] Chumash village in the site description.

A comparison between the ASMIS and CHRIS lists revealed that not all CHRIS site records have been entered into the ASMIS data base. Some omissions were site records prepared after 2005 that had not yet been entered into ASMIS. In other cases, sites recorded in the 1970s as part of overview studies had not been entered into the database.

In addition, historic site records at the Central Coast Information Center and the South Central Coastal Information Center are incomplete. Record forms for the sites recorded during the 1970s were often not present in the files, although trinomials had been assigned. On a more particular scale, the AH4 designation on site records (privies / dumps / trash scatters) has been

used for any appearance of historic artifacts, no matter how few. The usefulness of this code to identify potentially significant features is diminished by this broad interpretation.

Many historical archaeological deposits were overlooked when the Park considered the eligibility of existing buildings for inclusion in the National Register of Historic Places (NRHP). The first assessment of NHRP eligibility of the Channel Islands took place in 1978, with submittal of the "San Miguel Island Archaeological District" by the NPS (Kelly et al. 1978). Historic-period archaeological resources were evaluated by Roberta Greenwood, who identified the Nidever adobe ruins and the remains of the Russell [Lester] ranch house as being potentially eligible for their research potential (Criterion D); the Waters ranch house was unknown but presumed to be eligible if located. Subsequent historic-period resource evaluations prominently include the overview history of the Channel Islands by Dewey Livingston (2006). Landscape ranching districts have also been identified on Santa Rosa Island (NPS 2002) and Santa Cruz Island (NPS 2002b, 2003, 2004).

These NPS overview studies evaluated existing buildings and landscape features, although mention was sometimes made of the likely importance of specific historic-period archaeological sites, such as the ranch headquarters. Most often overlooked, however, were potential archaeological deposits associated with building ruins determined to be "non-contributing" to proposed NRHP districts. Many of these former habitation sites may qualify under Criterion D, as they contain associated domestic refuse. Historic-period sites previously evaluated under landscape district criteria should be reevaluated for their significance as archaeological sites.

Archeologists working on the Park's islands have largely neglected to record historic archaeological sites in favor of prehistoric sites. Although previous survey focused on recording historic archaeological sites will particularly benefit documentation of marine harvesting along the coast—the Chinese abalone processing camps as the prime example—the locations of many of the historic archaeological sites on the islands are already known, but they are simply not recorded. Management of these sites would benefit greatly from their being incorporated into the cultural resource data base. Simply by being assigned a number and appearing on maps and data bases increases the likelihood that these historic sites will not inadvertently be neglected or impacted by future projects.

This applies not only to outlying resources but also to ranch headquarters dominated by extant dwellings and visible historic remains. Where these facilities have some antiquity, and underwent a series of building episodes over their periods of use, past locations of structures and activities may be as important the extant facilities. It is also likely that artifact deposits associated with early residents may be present and may have the potential to yield significant information.

Resources that may not be eligible for NRHP listing should not be neglected. The locations and characteristics of sites such as old survey points, corrals, and WWII bunkers all are important contributors to understanding the history of the Park's islands. Recording these sorts of historical resources is important for assessing potential impacts, as elements of the evolving cultural landscape, and as a management tool for simply knowing what is out there and where it is located.

Documentary research on historic archaeological sites is beneficial for both pre-field research to alert archaeologists undertaking surveys to the location of historic sites and follow-up entailing more detailed study of identified resources. The eventual NRHP evaluation of a historic archaeological site often includes an assessment of "what can this site tell us that the documentary record cannot," and we must know what the documents say in order to answer this.

Historic archaeological sites may be grouped into several site types, each of which contributes in a distinctive way to explicating the Park's history and developing an understanding of cultural processes at play in the past. Although documentation of historical archaeological resources necessarily focuses on spatially discrete sites, it is important to remember that they articulate with one another in various ways to form historic landscapes. Indeed much of the significance of historic sites lies in their landscape contexts. The site types are as follows:

Ranch Headquarters: For several of the islands, their ranch headquarters served as the heart of historic-period occupations. Ranch sites can be seen as complex systems, where the facility's headquarters contains a cluster of activity areas that supported the broader enterprise: houses, bunkhouses, barns, sheds, blacksmithing, livestock pens, and storehouses. For headquarters with long periods of use, it is important to reconstruct detailed base maps of various time periods in order to identify specific features and their historic associations. This research is basic to locating potentially significant domestic deposits, for identifying ranch landscapes and various activity areas, and for public interpretation.

Other ranch-related features may be scattered around the island landscape, and these should be associated with specific a headquarters' landscapes. These outlying sites and features may include fences, water systems (troughs, wells, reservoirs), corral areas, and roads, as well as line camps (see Habitations, below). This thematic ranch landscape approach is nicely addressed in Livingston's study (2006).

Marine Harvesting Camps: These sites date from about 1850 until the 1940s. Located on or near beaches, they typically consist of domestic refuse and structural remains, and in the case of abalone harvesters, piles of abalone shells. Sites of Chinese abalone harvesting have recently received attention from archaeologists on all of the Channel Islands. The large number of these sites recorded on San Miguel is likely due to the interest and efforts of archaeologist Todd Braje, not to their unusual numbers there, and should encourage others to look for these sites on other islands (Braje and Erlandson: 2005, 2006b). Chinese occupation sites are conveniently marked by distinctive Chinese ceramics, a useful cultural marker for archaeologists. A paper by historian Linda Bentz on the Chinese abalone collectors of Santa Rosa Island provides an excellent context for the entire CINP study area (Bentz 1996). These entrepreneurs were active as early as the 1870s and leases are recorded as late as 1913.

However, the histories provided by Livingston and other island accounts point out that non-Chinese also set up abalone-harvesting camps on the islands during the 1ate 1800s and early 1900s. Japanese fishermen are also noted on Santa Cruz Island, and seal hunting and otter-harvesting camps were established by Euro-Americans during 1870s-1880s. All beach-side

camps, therefore, are not necessarily those of Chinese abalone harvesters. Some of the Chinese camps were also reoccupied by later groups of people, as was determined through analysis of artifacts from the large site at Point Bennett (CA-SMI-614H) where remains of the Chinese camp were mixed with artifacts from the 1930s-1940s (Costello and Thorpe 2009). In recording these sites, it is important to distinguish time periods and address the possibility of sequential use.

Habitation: Various isolated habitation sites are mentioned in historic accounts of the islands and include squatters shacks, ranching line cabins, smuggler's camps, and recreational camps. Some of these may be identifiable through the presence of domestic artifacts and structural remains. Others may not be visible at all. The quantity of artifacts present will relate to length of occupation, time period of occupation, activities taking place, and number of people present on the site. A line cabin occupied seasonally for 30 years may hold the same quantity of artifacts as a two-year camp. It will be the age, types, and date ranges of the artifacts that will distinguish the two.

Military and Navigation Facilities: WWII sites have now come of age: older than 50 years, they are now eligible for NRHP listing and must be evaluated. These sites are often well documented on historic maps.

Oil Exploration Facilities: Many of these sites will also have reached the 50-year requirement for NRHP listing. As with military sites, it is recommended that oil exploration sites be recorded so the islands' data bases are complete, and that domestic refuse, where present, be evaluated for its information potential.

Miscellaneous Historic Sites: There are a myriad of other types of cultural resources present on the islands that likely warrant recording. These include survey markers, airstrips, graves, airplane crash sites, roads and trails. While it is unlikely that many of these are eligible, they constitute a record of the islands' histories that would not be difficult to record. And the history, locations, and functions of these resources may soon disappear and be forgotten. It is particularly recommended that historic and modern road and trail systems be recorded to keep track of evolving history of transportation routes on the island and to record what disturbances have taken place on the landscape. It is also axiomatic that habitations are located adjacent to roads and trails, and that reconstructing the old road systems of a region will lead you to the dwellings.

In conclusion, the interpretive potential of historic archaeological sites is an important consideration. Remains of historic sites are often much more visible and easier for a visitor to understand than prehistoric sites and therefore are more susceptible to interpretation. Also, many historic sites—especially more recent ones—are well documented and physically strong (WWII bunkers, airplane runways, for example) and therefore can withstand increased visitation. On San Miguel Island, Livingston (2006:130) identified several sites which, while not qualifying for the NRHP, he recommended for protection and interpretation: the Cabrillo Monument, the Lester graves, and the wreckage of the B-24 bomber. Other similar sites are likely present on the other islands.

SUBMERGED SITES IN WATERS SURROUNDING ALL ISLANDS

Cultural resource management issues pertaining to submerged archaeological sites parallel many of those pertaining to terrestrial sites, the most obvious example being the incomplete nature of the submerged site inventory. Underwater survey of Park waters surrounding the islands is still far from complete. Most survey has been focused on locations where wrecks were known or suspected to exist, but many such locations still have not been surveyed, or have not been surveyed thoroughly. Moreover, wrecks may exist at locations where historically documented shipwrecks are not suspected. A related issue is that archival research to document wrecks known to have occurred around the islands is still incomplete. Results of this research would serve as an effective guide for further underwater survey.

Surprisingly, none of the wrecks investigated by Park personnel and volunteers has been assigned a California state trinomial designation. The only submerged sites around the islands that have trinomials are isolated finds of large prehistoric artifacts such as stone mortars, these being recorded by Travis Hudson of the Santa Barbara Museum of Natural History in 1974-1975 on the basis of information obtained from divers. One of these sites is off Anacapa, three are off Santa Cruz, and two are off San Miguel (one of the later likely being in National Marine Sanctuary waters). Despite the lack of trinomial designations, the Park does maintain records of the location and nature of investigated wrecks.

Wrecks are continually being looted by sports divers, many of whom do not realize that doing so is illegal. The magnitude of looting is difficult to ascertain, but it is widely known to be occurring. As well, wrecks are deteriorating as a result of the natural actions of waves, shifting sand, and chemical alteration. The processes of wreck degradation due to human and natural causes are not well understood.

The prospect of submerged prehistoric sites is only now being addressed, but only on a very limited basis. The submerged finds of prehistoric artifacts documented in 1974-1975 imply that many other such artifacts may exist. Most of these artifacts appear to date within the last 5000 years, and most probably are the result of coastal erosion, which generally results in the complete destruction of prehistoric site deposits. In other words, these artifacts, although providing indication of where sites existed, are not associated with intact archaeological deposits. Nonetheless, some intact prehistoric sites may exist where inundation resulting from sea level rise through the late Pleistocene and Holocene epochs took place in relatively quiet water or where landforms being submerged protected site deposits from wave action.

Addressing issues related to the Park's submerged archaeological resources is difficult. The Park's cultural resources staff has expertise mainly in terrestrial resources; an archaeologist with a background in underwater archaeology ideally should be on staff. Moreover, proper management of the Park's submerged archaeological resources requires a considerable investment of time and effort, well beyond the capacity of the Park's current budget.

PARKWIDE MANAGEMENT ISSUES

Issues concerning the management of archaeological resources within the Park as a whole may be divided into three categories. The first concerns the identification and documentation of archaeological resources within the Park; the second concerns the condition assessment and preservation of the resources; and the third concerns management of collections obtained from archaeological sites and various databases, including site records, maps showing locations of sites and surveys, and fieldwork records. The bulk of the island-specific issues discussed above relate to the first category; these are summarized and augmented here. Fewer island-specific issues concern the second and third categories, although these are equally as important.

Identification and Documentation of Archaeological Resources

Lack of Intensive Survey within Large Areas of Land: Ideally each island within the Park should be intensively surveyed in its entirety for both prehistoric and historic archaeological sites; however, this objective cannot be reached in the near future on the larger islands because of their size and ruggedness and lack of sufficient financial resources. Only the two small islands, Anacapa and Santa Barbara, have been surveyed in their entirety, although questions remain regarding the intensiveness of survey coverage. On the larger islands, substantial tracts of land have seen no intensive survey at all, making the survey coverage relatively uneven. Included in unsurveyed lands are some coastal localities frequently visited by recreational boaters, who come ashore and occasionally disturb archaeological deposits.

Substandard Site Records: Archaeological site records on file at the Central Coast Information Center and the South Central Coastal Information Center vary in quality, particularly those dating before the California Office of Historic Preservation began promulgating a standard form in the 1980s. Many forms contain very cursory information that provides little idea of the nature of the site or its location, and many lack associated sketch maps. As a result, some sites recorded before the mid-1980s cannot be relocated, particularly if they were not accurately plotted on USGS maps at the time of recording.

A related problem is the lack of UTM coordinates on site records dating prior to the mid-1990s, when consumer GPS receivers became widely available. Even if UTM coordinates were recorded on the site record forms, they were sometimes calculated inaccurately if derived from USGS maps rather than a GPS receiver. Once GPS receivers began to be used, the particular datum set in the receiver may have been the NAD83 datum rather than the NAD27 CONUS datum, which is the one used on USGS maps and by all of Information Centers within the California Historical Resources Information System. The number of sites that are inaccurately plotted or cannot be relocated because of missing or spurious information on site record forms is unknown, but the percentage may be as high as 5 to 10 percent.

Another problem with a few site records, specifically some of those allegedly pertaining to historic sites, is that they may not pertain to actual locations where Euro-American activities took place. Instead, they are prehistoric sites that have yielded a few historic artifacts or are sites occupied by Chumash people during the historic period. Moreover, the attribute codes elicited

on the Office of Historic Preservation's Primary Record form are not always indicated, and if an attribute code is given, it may be incorrect. Consequently, searching site record databases for particular kinds of sites (e.g., prehistoric vs. historic sites) is not useful.

Over the last few decades, the Park has maintained a program of resurvey and site record updating, and many of the earlier records for sites federally owned property within the Park have been updated using the form promulgated by the Office of Historic Preservation. Some updating of site record forms has also taken place on The Nature Conservancy property on Santa Cruz Island, although efforts of this sort are much more limited. Despite these efforts, many site records remain substandard.

Diminishment of the Visibility of Archaeological Sites and the Visibility of Damage to Them: Removal of livestock and feral pigs has resulted in reduced erosion and increased vegetation cover. As a result, sites are not as visible. This is particularly the case in grasslands, where sites often could be identified because pig rooting exposed midden deposits, but it is also the case where other forms of vegetation, such as ice plant and lemonade berry, have covered large areas of land. With the elimination of feral pigs and the disappearance of upturned soil from their rooting, these sites are increasingly difficult to identify. In addition, as areas of exposed soil resulting from wind erosion exacerbated by former livestock grazing become covered with vegetation, sites consisting of just flake scatters will become practically impossible to identify. In general, archaeological survey is becoming increasingly difficult, requiring the use of hand picks to turn up a divot of soil and greater effort to walk through chaparral-covered lands. Intensive pedestrian survey, consequently, necessarily is becoming slower, and survey results are becoming less reliable.

Difference Between the Park and the Central Coast Information Center in the Required Reference Datum for Recording UTM Coordinates on Site Records: Beginning in 2010, the National Park Service began requiring UTM coordinates recorded for locations of cultural resources on Park property be referenced to the NAD83 rather than the NAD27 CONUS datum. Considering that the Central Coast Information Center requires that UTM coordinates be referenced to the latter datum, issues will arise not only in recording UTM coordinates on site record forms but also for sharing of GIS information between the Park and the Information Center.

Lack of Knowledge Regarding the Overall Structure of Individual Sites: Archaeologists over the past 35 years have emphasized the collection of very small samples from archaeological sites, generally in the form of one or a few column samples or excavation of a few units no larger than 1x1 m in area. Even the research carried out by Arnold and her students (Arnold 2001a), which has entailed more extensive excavation at certain sites, was of a comparatively small scale and was not sufficient for discovering some of the larger-scale characteristics of the structure of site deposits. Likewise, although Rick (2007b) focused on community structure at a SRI-2 on Santa Rosa Island, based on collections acquired by Orr prior to the mid-1960s, the nature of the data collected by Orr placed significant limitations on his analysis of spatial structure. In general, the potential for sites within the Park to contribute to a variety of realms of archaeological theory concerned with spatial patterning of features and midden constituents within sites in order to understand community structure remains largely unknown. Nonetheless,

the contributions made by Arnold and Rick, despite their limited scope, demonstrate the prospects of community structure studies at many sites within the Park. It should also be noted that from a resources management perspective, the ability of a site to contribute to understanding community structure is an important realm of significance. Not every site can be expected to yield spatial information important to defining community structure, but as yet no criteria exist for assessing which sites may or may not. Geophysical survey, using ground-penetrating radar, magnetometry, or other such technology, may have some applicability to discovering patterns in the distribution of site features, and a few pilot studies to assess this potential have been carried out (Arnold, Ambos, and Larson 1997; Koppenjan et al. 2008). However, these studies have yielded variable results, and the potential of geophysical survey for this purpose will require additional experimentation. Of course, larger-scale excavation also could begin to address this issue if archaeologists working within the Park were to develop appropriate research foci.

Identification of Sites or Groups of Sites with Special Significance: Nearly all sites within the Park have significance with respect to National Register criteria, even most that have lost some of their integrity through construction of buildings and facilities. Nonetheless, some sites have special significance because of their potential to contribute information about specific periods of prehistory of great interest or because of special features they contain. Specifically, sites occupied during certain time periods have special significance because their investigation would elucidate the nature of change during crucial junctures in cultural evolution. Distinctive features of sites that enhance their significance include house depressions, the presence of bedrock mortars, or refuse associated with craft production. Such features would allow specific cultural activities to be studied in unusual detail. Some sites with special significance may be identified with relative ease because of the abundance or obtrusiveness of surface evidence, examples being sites with obvious house depressions and sites with abundant items on their surfaces indicative of quarrying, microblade production, or bead-making. However, most sites contain relatively subtle evidence indicating their significance.

Chapter 2 provides many of the contexts for defining sites with special significance, and the categories listed below include the most obvious.

- Sites known to date prior to 9000 BP are still very rare and are likely to remain so; all of them—because there are so few—are important in providing evidence of the nature of and change in cultural systems during these early times.

- Sites dating between 6300 and 5300 BP, many of which contain unusual quantities of red abalone shells, appear to occur during a period when subsistence and social systems became somewhat more complex than earlier, and when island population sizes may have been somewhat larger than before or immediately after.

- Sites dating around 2500 BP have evidence of an increase in the kinds, and perhaps also the quantities, of beads being manufactured, and sedentism also appears to have increased as focal residential became more important. These changes appear to signal development of more complex economic and socio-political systems.

- Sites that exhibit evidence of an unusually high rate of accumulation of deposits over the course of hundreds or a few thousands of years, implying their importance as focal residential bases over long periods of time, are important because of the unusually abundant subsistence remains they contain and because of the prospect of distinguishing relatively short periods of occupation. They also allow geographic factors to be controlled while studying the course of cultural change.

- Sites dating to the Middle-Late Period Transition (800-650 BP) and within the few hundred years prior (back to about 1000 BP) are important because of they were occupied during a period when Santa Barbara Channel populations were undergoing intervals of subsistence stress and were involved in significant economic and social changes that are still not well understood.

- Chert quarry sites are concentrated on eastern Santa Cruz Island but also occur elsewhere on the Channel Islands. Quarrying likely took place during all periods of prehistory, and the knapping activities that occurred at quarry sites clearly varied over time, with biface and flake production apparently predominating during earlier periods of prehistory and microblade production predominating at some quarries after about 1000 BP. Investigation of quarry sites is still very limited, however, and much still can be learned about chert tool production.

- Sites including bedrock mortars obviously are indicative of some sort of food processing, although investigation of these sites is only just beginning. It is possible that such sites may have been occupied during a specific interval of time, and if so, their investigation would shed light on the nature of subsistence-settlement systems during this time interval.

- Sites with evidence of specialization in the manufacture of particular kinds of artifacts can yield information about technological and economic exchange systems. Examples of industries known to occur at some Channel Islands sites are mortar manufacturing, microblade production, and bead-making.

- Sites correlated with named Chumash rancherías or that otherwise have evidence of Chumash occupation during the historic period. These sites can yield information about the structure of ranchería communities and settlement patterns and are of particular concern to modern-day Chumash people.

- Sites with house depressions or other evidence of structural remains. Such sites allow the investigation of household activities, perhaps also ritual activities, and community organization, which generally is not possible at sites lacking such features.

- Sites with cemeteries or isolated burials of any age are of concern to contemporary Chumash people, and the human remains and associated grave goods are the purview of state and federal laws.

- Sites with deposits containing anomalously high or low quantities of faunal or floral remains pertaining to specific taxa can provide insight into food acquisition patterns, ecological

relationships between humans and the resources they exploited, and changing environmental circumstances.

- Sites associated with the early historic sea-mammal hunting, fishing, and shellfish harvesting, particularly those dating prior to 1900.

- Sites associated with ranching activities of the last half of the 19th and the first half of the 20th centuries, particularly those dating prior to ca. 1880, can yield evidence of the initiation and early development of ranching on the islands during a period that is not well documented in extant archives.

Although this list captures many of the sites that archaeologists working in the Santa Barbara Channel region recognize as having special significance, it certainly is not exhaustive, and as knowledge of prehistory of the Park lands increases, the list surely could be expanded.

Minimal Consideration of Cultural Landscapes: Archaeologists working on the Park's islands have focused their research mainly on individual sites and have not yet made serious use of a landscape approach, which has become prominent in archaeological research over the last 20 years (e.g., Rossignol and Wandsnider 1992; Bruno and Thomas 2008). It is true, nonetheless, that archaeologists often have given attention to a site's context within a natural landscape. With regard to the prehistoric occupants of the islands, a cultural landscape includes all of the locations that a social unit used for subsistence and social purposes over the course of years or decades, and to a large extent a cultural landscape is coincident with its settlement system. Cultural landscapes are more readily identifiable during the historic period as a result of the availability of documentary archives that describe activities taking place at different locations on the islands. From a cultural resources management perspective, cultural landscapes are an important context for defining the significance of sites and the grouping of sites and their surrounding natural environments into management units (Birnbaum 1994).

Ambiguous Locations and Documentation of Many Ethnohistoric Chumash Rancherías: Many of the locations of Chumash rancherías on Santa Cruz and Santa Rosa Islands mentioned in mission records and the ethnographic literature are still not firmly tied to specific archaeological sites, and some of the sites that are tied to specific village names are not adequately documented. As well, the place within settlement systems of relatively small archaeological sites with evidence of occupation by Chumash during the Historic Period has not been established. Finally, information about regional structure of social and political relations between villages still could be enhanced through further ethnohistoric research.

Minimal Consideration of Historic Archaeological Sites: All archaeologists engaged in long-term research within the Park have focused on prehistoric sites, and only in a few instances have historic sites been considered. Historic sites include the remains of buildings and facilities associated with ranching and oil exploration. Also included are World War II-era remains and relatively ephemeral remains of buildings and facilities associated with fishing and abalone collecting during the late 19th and early 20th centuries. Many historic archaeological sites have not yet been formally recorded, even though their locations are indicated in historic documents within archives.

Inadequate Identification of Historic Archaeological Sites and Features within Cultural Landscape Inventories: Although archaeological sites and features are included in the established National Register Districts (Anacapa Light Station, Santa Cruz Island Ranching District, Santa Rosa Island Ranching District), relatively more subtle ones are not, particularly if they are not near visible historic resources. Examples are remains of older construction and various nearby features such as trash deposits an privies. Archaeological investigation would be necessary to identify these. Expanding an understanding of island history depends on knowledge that can be gained from such historic archaeological sites.

Lack of Consideration of Historic Resources that Recently Became More than 50 Years Old: Various military oil exploration facilities are now at least 50 years old or are about to become so. These facilities are associated with significant historic events on the islands and deserve to be considered for inclusion on the National Register of Historic Places.

Incomplete Survey Coverage of Intertidal Zones within the Park for Remains of Shipwrecks: Survey coverage of intertidal zones around the islands within the Park is still limited. The years ahead may be an ideal time for beach and intertidal survey. The removal of exotic grazers from the islands and the subsequent rebound of vegetation are diminishing the sand supply for beaches within the park. With less sand, beaches will shrink, exposing whatever lies beneath the present surface. Late winter and early spring are ideal times to perform these surveys, although access to some beaches may be restricted because of seasonally sensitive natural resources. Aerial photography might be a valuable supplement in some of these situations. Metal detectors and ground penetrating radar could also effectively supplement visual search in selected locations. Areas of particular interest might be:

- Cuyler Harbor, with its assemblage of late nineteenth century small vessels (*Surprise, NB, Kate and Anna, Liberty*, and *Santa Rosa)* plus more recent vessels offers several possibilities in a fairly small area.

- The portion of the south coast of Santa Cruz Island where *Wampas* is stated to have been driven ashore. Additional historical research might indicate whether *Wampas* was salvaged after its wreck.

- The southwest side of Santa Rosa Island. The chances of finding additional *Dora Bluhm* and *Goldenhorn* material alone make this area attractive.

Beach survey offers low expense, low technology projects, which covers terrain indisputably under the control of the NPS containing many potential finds. Beaches that are inaccessible because of topography or pinnipeds presence can be scanned from afar with binoculars. In some cases magnetometers or ground penetrating radar might usefully supplement traditional searches.

Incomplete Survey Coverage of Coastal Waters Around the Islands within the Park: Survey coverage of the island's coastal waters is still relatively limited, yet a number of shipwrecks are

known to have occurred in these waters, and their approximate locations are known. Some of the more interesting ones include:

- *W T & Co No 3* (the "*Pandora*" movie set from the 1939 version of "Mutiny on the Bounty"). Somewhere in Adams Cove, San Miguel Island, lies MGM's version of this British warship (Morris & Lima 1996). Associated with a landmark Oscar-winning movie, this sunken movie set presents a unique object of study. One might speculate that entertainment industry funds could be enlisted to aid in financing the search.

- *Watson A West*. Why has this very large wreck remain undetected for so long? Why has no material washed up on the adjacent island beaches? There have been stories from local fishermen, but nothing tangible has turned up.

- *Mary*, the longest serving vessel wrecked at the islands (1891-1968) lies in very deep water south of the Gull Island light. The circumstances of the sinking suggest that the wreck would be relatively intact. Searching for this vessel will provide experience in deep-water search in a virtually unknown area of the Sanctuary.

- There are persistent stories about sightings of wreckage near the known wreck scatter of *Winfield Scott*. This could be more of the hull of this vessel, or perhaps remnants of *George E Billings*, photographed burning just east of the Winfield Scott wreck scatter.

Undoubtedly the most significant wreckage that could be recovered within the Park and Sanctuary would be even a small portion of a prehistoric *tomol*, the watercraft used by the Chumash coast-dwellers at the beginning of European colonization. One might rest within a terrestrial sand dune, or deeply submerged within the Sanctuary. The tomol is probably the most significant and unique vessel that has operated within Park and Sanctuary waters, but information derived from authentic prehistoric or historic specimens is minimal (Gamble 2002).

Minimal Documentary Research in Support of Submerged Site Survey: Virtually every underwater survey project could benefit from additional archival research. Foreign language archives remain unexamined, which probably explains the lack of knowledge of Spanish or Mexican era shipwrecks within the Park and Sanctuary. In addition, military archives should contain very useful information about many of the vessels in the wreck assemblage, such as *Peacock* or *Del Rio*, which began or served in the military. The historical research summarized in Morris and Lima 1996 is a rudimentary start.

Unrealized Prospects for Submerged Prehistoric Sites: Erlandson's continuing discoveries of Terminal Pleistocene/Early Holocene sites on San Miguel increase the likelihood of submerged sites nearby of equivalent age. High-resolution bathymetry now allows rather careful modeling of prospective site locations. An expanded site base and more comprehensive information about the nature of the early occupation of the islands will provide valuable insight into the nature of the early occupation of the North American continent, an important and fundamental question long debated by archaeologists.

Monitoring of Excavation Projects by Chumash People: It is conventional throughout California that any prehistoric archaeological investigation entailing any sort of excavation be monitored by a Chumash representative. This is common for any such project on the federal property within the Park, although it is not conventional on The Nature Conservancy property. However, archaeologists working in academic contexts may at times encounter difficulty recruiting a Chumash monitor for several reasons. First, a Chumash monitor may not be available at the time that fieldwork is planned, which may be of short duration and may have to occur within specific intervals of time because of academic obligations and scheduling constraints on the use of island facilities. Second, funding may not be available to pay a Chumash monitor, although funds generally can cover their transportation, room, and board. Many Chumash monitors, however, expect a salary or stipend above these costs. Third, monitors may not be accustomed to the primitive and communal living conditions on the islands. Fourth, not all Chumash monitors are in sufficient physical shape for hiking to some locations where an excavation is to take place because of the location's remoteness and ruggedness of terrain.

Public Interpretation: At present, the public has little awareness of the rich prehistory and early history of Park. Although several popular books concern the history of particular islands within the Park, and a few may provide a brief overview of knowledge gained from archaeology, no popular book or other form of media covers the details of what has been learned from archaeological research over the past several decades. Archaeologists traditionally have been hesitant to popularize the archaeology of the Park's islands because of the possibility that it may stimulate looting. Nonetheless, a greater public awareness of the Park's prehistory undoubtedly would inspire most members of the public to respect archaeological resources, promote their preservation, and support cultural resource management programs.

Condition Assessment and Preservation of Archaeological Resources

Ongoing Adverse Impacts to Archaeological Sites: The preservation of archaeological sites resulting from minimal land development and the lack of burrowing animals justifiably have been touted as important feature of the Park's archaeological resources. However, archaeologists working on all of the islands within the Park have recognized that a variety of natural and human-caused factors are adversely affecting archaeological sites.

Erosion related to wave action against seacliffs and the action of water runoff from rainfall is a widespread problem. Seacliff erosion, of course, cannot be controlled, but it is affecting some of the Park's most valuable cultural resources, specifically coastal sites that date to the earliest and least known periods of prehistoric occupation on the islands, let alone sites of more recent age. With global warming and consequent acceleration of sea-level rise, the rate coastal erosion is increasing, and the rate of destruction of prehistoric (and some historic) sites also is increasing. Of course coastal erosion is a natural process that has been occurring long before acceleration of sea-level rise began to be apparent, but as Erlandson (2008:168-169) points out, it is increasingly the result of anthropogenic factors.

Erosion resulting from degradation of watersheds through livestock overgrazing during the late 19th and early 20th centuries has abated since the removal of livestock on the various islands,

but it is still active in many localities and continues to remove archaeological site deposits. Over the years the Park has taken measures to stop erosion occurring at selected sites, but the character of erosion at some sites makes it nearly impossible to control, even if substantial funding were available to do so.

Infrastructure development and maintenance projects within the Park is at a very small scale overall compared to land development on the mainland. Measures are in place within the Park to avoid or minimize adverse impacts to archaeological resources. However, The Nature Conservancy currently has no program of documentation and treatment of its archaeological resource base within the lands it owns on Santa Cruz Island, given its focus on the island's natural resources. The Nature Conservancy is cognizant of its responsibility to protect cultural resources and has solicited help from the Park's cultural resources management staff when land-development activities are planned. However, this relationship is informal, and some of the Conservancy's management activities on Santa Cruz Island may inadvertently affect archaeological resources. As a private landowner in Santa Barbara County, The Nature Conservancy presumably must conform to the California Environmental Quality Act, let alone what their obligations may be with regard to federal laws such as the Archaeological Resources Protection Act.

It is also the case that, compared to the Park, The Nature Conservancy has perceived no obligation to sponsor expansion of the inventory of archaeological sites within the context of Section 110 of the National Historic Preservation Act. Consequently, many aspects of cultural resource management on Conservancy property has largely been the responsibility of the archaeologists undertaking fieldwork.

One aspect of infrastructure maintenance not normally considered to impact archaeological sites is road grading. Some roads were cut through archaeological sites a number of decades ago, and the continual grading to maintain them may affect archaeological deposits exposed in road cuts. The extent to which this occurs currently is unknown.

Looting and surface collecting of artifacts by the public undoubtedly is increasing as a result of increasing public visitation to the islands, although the magnitude of the problem is unknown. Some hiking trails pass over or are adjacent to prehistoric sites, and some of the largest habitation sites on the islands overlook harbors and anchorages that are popular destinations of recreational boaters. Many go ashore, legally or illegally, and visit archaeological sites, and some established trails maintained by the Park or The Nature Conservancy pass over or very close to obvious prehistoric sites. During the course of fieldwork, archaeologists working on the island occasionally have encountered looter's holes in sites near where boaters anchor. The dispersed and occasional nature of looting and illegal surface collecting makes it difficult to control.

Looting also takes place at sites of submerged shipwrecks, although the magnitude of the problem is unknown. Visiting shipwrecks is popular among sports divers, and some do not realize, or care, that removing parts of shipwrecks is illegal and diminishes their value as cultural resources.

The activities of animals also may adversely affect archaeological sites. Before removal of livestock and feral pigs, it was these sorts of animals that were damaging archaeological sites—feral pigs in particular. Now that these animals have been removed or eradicated, only certain naturally occurring animals are affecting sites. On western San Miguel Island, hauled-out pinnipeds are disturbing and contaminating sites within the range of their movement. On Santa Cruz and Santa Rosa, and perhaps also on some of the other islands, unidentified animals, perhaps deer mice, are digging holes in site deposits. These burrows appear to be relatively shallow, but the cumulative effect of burrowing over long periods of time obviously could seriously compromise the upper 20 or 30 cm of site deposits. The activities of these unidentified animals appear to have become more apparent (on Santa Cruz Island, at least) since the removal of feral pigs. On Anacapa Island, nesting and roosting marine birds are contaminating archaeological deposits with bones, shells, and their fecal material. Whether sites on other islands are being affected by nesting and roosting birds is unknown.

Adverse Impacts of Past Activities on Archaeological Sites: Comparatively little is known about the adverse impacts of past land-use activities that have taken place on the islands within the Park during historic times. Construction of ranching and military facilities, in particular, have damaged a number of archaeological sites. In addition, US Navy bombing practice on San Miguel Island has resulted in craters within some archaeological sites.

Management of Archaeological Collections and Databases

Unprocessed or Partly Processed Collections: Some archaeological collections from prehistoric sites, particularly some dating before 1990, have seen little or no processing since they were acquired through fieldwork. Some of these collections are still in the bags in which they were placed in the field, whereas others have undergone some processing, although they may or may not be associated with a collections catalog. The project descriptions presented in Chapters 4 through 8 give some sense of the magnitude of this issue, but a compilation of the specific condition of each unprocessed or partly processed collection would require considerable effort. Importantly, these collections have the potential to yield a substantial amount of information about prehistory within the Park. A related problem is that most catalogs of collections obtained prior to 20 years ago are hand-written, which greatly limits their utility for future research. Ideally a catalog should be digital, in either spreadsheet or relational database format.

Use of the the National Park Service's Interior Collections Management System (ICMS): Although Park collections housed by the Santa Barbara Museum of Natural History are cataloged using the ICMS format, many of those still in the hands of researchers or housed at other repositories, such as the UCSB Department of Anthropology's Repository of Archaeological and Ethnographic Collections, are not. A formal protocol for ensuring that all Park collections are cataloged using ICMS does not yet exist.

Disposition of Archaeological Collections in Diverse Locations: The Santa Barbara Museum of Natural History's Department of Anthropology is the official repository of archaeological collections derived from sites on property owned by the Park. Most collections from sites on The Nature Conservancy Property are housed by the Repository for Archaeological and

Ethnographic Collections within the Department of Anthropology, University of California, Santa Barbara, or the Fowler Museum, University of California, Los Angeles. A number of collections, however, are housed in the laboratories of the archaeologists who acquired them, and many of these are still undergoing analysis. There is no established standard for how long an archaeologist may keep a collection, although 10 years is a discipline-wide informal convention (see, for example, the Register of Professional Archaeologists' Standards of Research Performance, section 6.3). All archaeologists working within the Park recognize that collections ultimately should be submitted to an appropriate repository. So long as a collection is properly housed in an archaeologist's laboratory and is accessible for research purposes, there is no pressing need for it to be submitted. Nonetheless, if an archaeologist has no intention of deriving further data from a collection, it should be properly prepared and submitted to a repository.

Lack of Concordance Between Site Record Databases: Over the years, the Park and the Central Coast Information Center have made efforts to ensure that the two sets of records of sites and archaeological projects are consistent. A Park intern undertook the last effort of this sort several years ago. However, there is no established protocol for sharing information on a consistent basis, and as a result the two sets again are inconsistent. A related problem is inconsistency between the NPS's Archaeological Sites Management Information System database and the databases within the record files of the Central Coast Information Center and the South Central Coastal Information Center. The discrepancy appears to be a result of a lack of a procedure for regularly updating the NPS database against those of the Information Centers.

Lack of Standards for Project Documentation: There are no established conventions for documenting archaeological projects. Although archaeologists working on the various islands within the Park generally keep excellent records of their fieldwork, they vary in detail and often do not contain certain information relevant to management of archaeological resources. Moreover, fieldwork documentation frequently is not readily available at Park headquarters, the Central Coast Information Center, or a local collections repository, often because the collections and documentation are still held by the project director.

Division of State Record-Keeping Between Two Different Information Centers: Currently, the state-sponsored housing of records of sites and projects is the responsibility of two different Information Centers. The Central Coast Information Center at the Department of Anthropology, University of California, Santa Barbara, houses records for Santa Barbara, Santa Cruz, Santa Rosa and San Miguel Islands (all in Santa Barbara County), whereas the South Central Coastal Information Center at the Department of Anthropology, California State University, Fullerton, houses the records for Anacapa Island (in Ventura County). As a result, investigators interested in records pertaining to archaeological resources on Anacapa Island and one or more of the other islands in the park must contact (or go to) two different information centers. As well, the Central Coast Information Center has been contacted by investigators who mistakenly had assumed that it housed Anacapa Island's records.

Lack of a Complete Listing of Radiocarbon Dates Pertaining to Archaeological Resources Within the Park: Although individual researchers or institutions have maintained databases consisting of radiocarbon date information, there is no Park-wide database consisting of radiocarbon date information.

CHAPTER 12
RECOMMENDATIONS

The recommendations presented below are based on the Parkwide resource management issues identified at the end of the previous chapter. They are presented in roughly the same order and within the same three categories. Most of the recommendations pertain to archaeological resources under direct and complete control of the Park, but some also pertain, at least in part, to archaeological resources on The Nature Conservancy's Santa Cruz Island property, sites on San Miguel Island administered by the Park but owned by the US Navy, and submerged resources now falling under the jurisdiction of the California State Lands Commission. It is important to recognize that some recommendations would be relatively easy to implement, whereas others would not, mainly because of the lack of funding. Similarly, some recommendations can be quickly implemented, whereas others would require considerable planning and consultation, sometimes with the participation of multiple parties. In general, the recommendations are meant to set out ideals for improving both cultural resource management and archaeological research within the Park.

None of the recommendations below concern research issues not associated with management of archaeological resources, although many do have direct bearing on research problems beyond this realm. Only in recommendations considering management of significant sites do research issues prevailing in archaeology today have relevance. In Chapter 11 a variety of site types were identified as having special significance because they relate to research issues being addressed by archaeologists currently working in the Park. However, these research issues represent a relatively narrow range in comparison to those of concern to archaeology world-wide. Two broad research themes that are beginning to emerge in the archaeology being undertaken within the Park are the subjects of explicit recommendations (these being discussed in Chapter 11): definition of cultural landscapes and explication of community structure. Together, these two characterize a significant segment of world-wide archaeological research today, and both have clear potential to be addressed through investigation of archaeological sites within Park.

Identification and Documentation of Archaeological Resources

1. *The Park's program of systematic intensive survey and recording of prehistoric and historic sites should continue.* This effort would include survey of both unsurveyed and previously surveyed areas, as well as update and/or expansion of earlier site records. The Primary Record and the Archaeological Site Record forms promulgated by the California Office of Historic Preservation should be used and completely filled out, and records should include both photographs showing the site in its geographic context and UTM coordinates obtained with a GPS receiver.

2. *When possible, priority for survey should be in tracts of land where little previous survey has taken place.* Although priorities for survey and site recording always must be lands where adverse impacts to archaeological resources may occur, whether in the context of

land-use planning or as a result of anticipated dangers to the resources, attention also should be given to tracts of land where there is little current information about the nature of archaeological sites and their distribution.

3. *In designing a survey, cultural resources managers and archaeologists undertaking survey should recognize the increasing difficulty of locating sites in areas of dense grasslands*. Hand picks should be regularly used in such situations, and reporting of survey procedures should include mention of areas where ground surface visibility is minimal and the kinds of survey procedures used to compensate for this. The reduced reliability of survey results in areas of dense grasslands should be recognized if land development projects are proposed.

4. *One or more historical archaeologists should be recruited and funded to survey areas of historic activity that have not yet received attention.* Recording of historic archaeological sites should not be left for prehistoric archaeologists to undertake, although some prehistoric archaeologists currently working on the islands do have competence in certain types of historic archaeological resources. Ideally, a relationship with a historic archaeologist at an academic institution or museum should be developed so as to benefit from student participation in survey and site recording efforts. If such an individual or individuals cannot be recruited, then a consulting historic archaeologist should be contracted.

5. *Sites in danger of being destroyed through erosion should be recorded if they have not, and their significance with respect to National Register criteria should be ascertained.* Given that some sites suffering from continuing erosion are among the most significant within the Park, measures should be taken to identify where they are, and assessments should be made of their significance. Many sites that are witnessing significant loss of deposits through erosion are along seacliffs and stream courses, and others are in areas of active wind deflation, and such topographic situations should be the subject of survey and assessment of the impact of erosion. The need for locating and evaluating sites subject to coastal erosion is especially great, as this form of erosion is accelerating. Once sites have been identified, their significance could be assessed through radiocarbon dating, scrutiny of erosional exposures of deposits, and in some cases small-scale test excavation.

6. *All actively used roads within the Park should be surveyed to identify sites that are being increasingly impacted through road maintenance activities.* Some segments of road networks on the islands have been surveyed, although assessment of the impact to sites from road maintenance may not have occurred. The significance of sites undergoing damage from road maintenance needs to be determined, and if significant, measures must be developed to eliminate disturbance or mitigate its impacts.

7. *Survey should take place in locations where public visitation is most intensive, if these areas have not already been surveyed, to identify the presence of significant archaeological sites.* Once sites in areas of intense visitation are identified, any adverse impacts to them should be ascertained. Adverse impacts may be erosion resulting from well-used paths through sites or digging into deposits to acquire artifacts. Where impacts are occurring the significance of the sites should be assessed.

8. *When sites are revisited, updated site records should be prepared, particularly if existing site records do not meet current standards.* When revisits occur, the current version of the state form should be used to record missing or inaccurate information on the earlier record (or records). Any change in the condition of the site should also be noted.

9. *Because the Central Coast Information Center references UTM coordinates to NAD27 CONUS whereas the Park is now referencing them to NAD83, the coordinates should be recorded with reference to both datums*. In other words, two sets of UTM coordinates should be recorded on site record forms, each referenced to one of the two datums. (Online computer programs provide a means of converting from one to the other if this is not done in the field.)

10. *Efforts should continue to be made to identify sites that have special significance in understanding prehistory or to the Chumash people so that they may be given priority for protection or mitigation of adverse impacts.* Although sites being impacted by various destructive agents generally have highest priority for protective measures or mitigation of adverse impacts, some sites falling into this category may have special significance and consequently should receive top priority for action. However, long-term management of archaeological resources within the Park would benefit from knowledge of those sites with special significance. Consequently, survey and site testing programs should continue so that these sites can be identified. An inventory of such sites should be established as a management tool.

11. *An emphasis on radiocarbon dating to establish the chronology of a site's prehistoric occupation should continue*. The significance of a prehistoric site depends in large part on the time interval or intervals during which it was occupied. Given that some sites were reoccupied many times during the course of prehistory, large numbers of radiocarbon dates sometimes are necessary to define periods of occupation. Acquiring samples of shell or charcoal for radiocarbon dating often requires just small-scale excavation, often less than a cubic meter of excavated deposits.

12. *Archaeologists and cultural resource managers should consider the potential to understand the spatial aspects of community structure as a realm of site significance, and as a means to deepen understanding of cultural development*. Further experimentation to establish the potential of geophysical survey for identification of such features as floors, hearths, baking pits should be encouraged. As well, archaeologists working on Park lands also should consider adopting research foci entailing larger-scale excavation aimed at understanding community structure.

13. *Archaeologists and cultural resource managers alike should be encouraged to consider the cultural landscape contexts of archaeological resources*. In particular, arguments of site significance should consider cultural landscape perspectives. Although archaeologists often have given attention to the natural contexts of the individual sites they have investigated, their research would benefit from a more explicit consideration of both natural and cultural landscape contexts.

14. *Archaeological survey and as necessary limited test excavation should take place to ascertain the locations of Chumash rancherías identified in ethnohistorical and ethnographic literature but not yet tied to specific sites*. Such surveys are needed within specific sectors of Santa Cruz and Santa Rosa Islands. The presence of European artifacts such as glass beads, as well as certain types of shell beads would be key to identifying these sites. Often these objects may be found during careful surface inspection, but shallow test excavations would be necessary if obscuring vegetation or natural deposition is present.

15. *Detailed topographic maps should be made of each Chumash ranchería for which such maps do not exist, and these maps should be archived at Park headquarters and at the Central Coast Information Center*. The mapping is necessary for adequately documenting these especially significant sites. Related to this effort, it should be recognized that the number of sites associated with some of the identified rancherías may be incomplete. It is already known that some rancherías, such as *L'akayamu* on western Santa Cruz Island, are associated with a site cluster, and this may be the case elsewhere. Careful survey and possibly limited test excavation should be undertaken in the vicinity of essentially all identified Chumash rancherías in order to ensure that the total community is identified.

16. *Archaeological investigation should take place at sites with evidence of occupation during the Historic Period but not linked to a named ranchería*. The objective of such investigation would be to verify the Historic Period occupation and to determine how these sites articulated with the rancherías within a settlement system. Not only are these sites are significant to understanding Chumash lifeways, they also are of concern to contemporary Chumash people.

17. *Further ethnohistorical research should be undertaken in order to enhance understanding of the regional organization of the Island Chumash*. Rancherías were linked to each other socially, politically, and economically, and the place of each ranchería within a network of relationships is an aspect of each ranchería's signficance. This research would require additional analysis of existing databases derived from mission records.

18. *Prehistoric archaeologists should be encouraged to complete site record forms for historic sites during their surveys*. Prehistoric archaeologists should be made aware of the kinds of historic archaeological resources they could encounter, perhaps through a training session with a historic archaeologist. Development of a short, several-page guide to identifying and recording historic sites would be another useful measure. At a minimum prehistoric archaeologists should be encouraged to fill out at least a Primary Record form for historic archaeological sites.

19. *Archaeologists working within areas where historic development is known to have taken place should consult historical documents to become aware of potential subsurface historic features that may be encountered*. Prehistoric sites occur in many areas known to have been developed during historic times, and investigation of these sites may inadvertently disturb historic archaeological resources unless the archaeologist is aware of their potential presence. Consequently, prehistoric archaeologists should make an effort to ascertain whether historic resources may be present during project planning.

20. *In carrying out survey and formal recording of historic sites, first priority should be given to locations of known historic sites*. Many historic sites are referenced in the historic literature and archives. Focusing on these would not require extensive foot survey, although relocating known sites under the new, dense ground cover main in some instances be difficult. This would be an excellent project for an academic-based historical archaeologist with students.

21. *Survey and site recording of historic sites also should give some priority to historic and modern road and trail systems to document the evolving history of transportation routes on the island and to record resulting disturbances to the landscape*. Focusing on historic roads and trails also will lead to discovery of adjacent features, such as habitations. It is also axiomatic that habitations are located adjacent to roads and trails, and that reconstructing the old road systems of a region will lead you to the dwellings.

22. *Remains of military and oil exploration facilities should be recorded*. In addition to recording these facilities as historic archaeological sites, those more than 50 years old should be evaluated for inclusion on the National Register of Historic Places. Associated deposits of domestic refuse should be included during recording and determination of eligibility.

23. *Underwater survey to locate shipwreck remains exposed on beaches and within the intertidal zone should be continued.* This sort of survey ideally should be done during the winter, when beaches are depleted of much of their sand. Years when El Niño weather conditions are prevailing would be most ideal.

24. *Underwater survey to locate submerged shipwreck scatters that remain undetected should be continued.* Underwater surveys to locate shipwrecks have covered only small amounts of the seafloor within the Park, and a number of shipwrecks documented to have occurred remain undetected.

25. *Projects designed to discover submerged prehistoric sites should be encouraged and implemented in coordination with the Channel Islands National Marine Sanctuary.* Such investigation most likely would involve remote sensing and seafloor mapping technology as a first step in determining areas where prehistoric sites may be preserved. Sharing of costs among agencies and perhaps with interested private individuals can support what will be a relatively expensive exploration.

26. *The* Chickasaw *shipwreck should be investigated*. Large and obvious, its three major sections are now submerged near South Point, Santa Rosa Island. One approach was made to the vessel around 1995, and the divers (including Morris) got the distinct impression that they were approaching a rusty pile of razor blades and the effort was abandoned. Salvagers have conducted permitted operations on this vessel, so a safe approach appears possible. At least some elementary documentation should occur.

27. *A relationship with volunteer diving organizations should be supported and sustained.* The strength of vigorous volunteer organizations lies in their disparate strengths and knowledge. The Park should encourage volunteers to present at professional meetings and support their travel to these events. It should provide financial support to CMAR for dive physicals and, for proven members, their attendance at professional meetings.

28. *A more sophisticated approach to Chumash monitoring of archaeological excavation is needed.* The Park's cultural resources staff and archaeologists carrying out research in the Park should meet to discuss ways in which Chumash monitoring concerns can be effectively accommodated with the realities of archaeological fieldwork on the islands. Alternatives to conventional monitoring by a most likely descendant that could be considered are site visits by groups of Chumash people; participation in fieldwork or labwork by Chumash people, perhaps in the context of educational programs; presentations at the Chumash reservation or at another venue of project results; and preparation of reports written to be understood and appreciated by a nonacademic audience.

29. *The Park cultural resources staff and archaeologists working on Park lands should meet to discuss how to increase public awareness of the value of archaeological resources and the need to protect them and to expose them to the knowledge gained through archaeological investigation.* The Park cultural resources staff and archaeologists undertaking research in the Park should recognize that public support of cultural resources programs on the islands depends on public appreciation of the resources, which is most effectively enhanced through education and dissemination of research results in a form attractive to the public. One possibility is to select and develop certain prehistoric and historic sites for public education and access, that is, sites with features to which the public can easily relate with regard to the value of archaeological resources and the manner in which archaeologists can learn details about past human behavior.

Condition Assessment and Preservation of Archaeological Resources

30. *Efforts should continue to assess damage to archaeological sites resulting from public trails, both formal and informal, that pass over them, and measures should be taken to move the trails offsite or otherwise eliminate the damage occurring to these sites*. In some cases, the rerouting of a trail is possible, but in other cases a trail may not be moved, such as the one that passes along a ridge through No Man's Land west of El Montañon on eastern Santa Cruz Island. Creative measures will have to be developed to eliminate adverse impacts to sites in such situations.

31. *Programs to eliminate or mitigate the impacts of public visitation to significant sites should be developed and implemented.* Although prevention of adverse impacts to archaeological sites through public visitation may be difficult, some cost-effective measures such as rerouting of paths and capping sites with sterile alluvium may be possible. One measure would be to recruit the services of the existing volunteer interpreters, who could be trained to be archaeological site stewards. Such a program could be modeled after the Society for

California Archaeology's California Archaeological Site Steward Program (www.cassp.org).

32. *Data recovery should take place at significant sites that are being irretrievably lost through erosion*. Once the significance of sites being lost through erosion has been ascertained, priorities should be established for funding data recovery before the sites are lost forever. The Park's cultural resources staff, working with academic archaeologists, may be able to pursue funding from sources beyond those allocated annually to the Park for cultural resource management.

33. *Measures should be taken to prevent or mitigate ongoing damage to archaeological sites by animal activities, including pinnipeds and nesting and roosting birds.* Some investigation of sites being adversely affected by pinniped activities next to the San Miguel Island rookeries has already taken place, but substantial deposits still undergoing damage remain uninvestigated. If the damage cannot be prevented through fencing or similar measures, then a data recovery project to mitigate the damage should be implemented. As well, measures to prevent or mitigate contamination of sites by the contents of bird feces and various bird activities should be explored and implemented.

34. *The animal or animals that have been burrowing into prehistoric site deposits on Santa Cruz Santa Rosa, and San Miguel Islands should be identified, and if possible measures should be taken to eliminate this source of damage to archaeological sites.* Identification of the animal doing the digging would require the help of biologists. If the species of animal is native to the islands, most likely little can be done to prevent the burrowing, but this cannot be concluded until the animal has been identified.

35. *The existing program to abate erosion of site deposits where feasible should be continued*. Although the extent to which erosion is affecting archaeological sites is far beyond the capacity of the Park to control, erosion affecting sites with special significance should be stopped if possible.

36. *An assessment of damage to archaeological sites by past ranching and military activities should be made*. All locations where construction of ranching, military, and oil exploration facilities (including roads) took place should be examined to determine whether archaeological sites are present, and, if so, the extent of any damage to site deposits that may have occurred should be assessed. Also, the extent of cratering at archaeological sites on San Miguel Island, resulting from past US Navy bombing practice, should be assessed. As a property still owned by the Navy, it may be their responsibility to initiate and fund such a study.

37. *The Park and The Nature Conservancy should formalize their relationship with regard to protection of archaeological resources on The Nature Conservancy lands on Santa Cruz Island*. The Park's cultural resource staff is in the best position to advise The Nature Conservancy staff on the island of their responsibilities under federal law. Officials in Santa Barbara County government could provide advice to The Nature Conservancy with regard to their responsibilities with respect to the California Environmental Quality Act.

38. *Cultural resource managers and archaeologists evaluating the significance of historic sites within the Park should recognize that some historic archaeological sites may be significant with respect to National Register of Historic Places criteria only because they have the potential to yield information important to understanding history of one of the islands.* There should be no minimization of the importance of criterion D for establishing the significance of historic sites at this local level.

39. *Programs and relationships with law enforcement officers should be developed to enhance monitoring of shipwrecks with the purpose of preventing looting.* Because submerged resources are particularly susceptible to looting, resource managers should coordinate and work closely with park rangers to provide the data that they need to safeguard submerged resources. Carefully acquired monitoring data is particularly useful in documenting pre-existing conditions prior to damage by looters. The shorter the interval between documentation and damage, the more convincing is the case that prosecutors can present in court.

Management of Archaeological Collections and Databases

40. *The condition of all the Park's archaeological collections and associated documentation should be assessed, and funds should be made available for upgrading their condition to meet current curatorial standards for storage.* Given that some collections and associated documentation were generated before modern curation standards were developed, and before adequate funding for preparing collections for curation was provided, some collections and associated documentation housed at different repositories are not properly prepared for long-term storage, and in some cases their research value cannot be fully realized.

41. *All Park collections housed at various repositories should be identified, and if they are not cataloged into ICMS (or in some cases not even into the institution's database), funds should be sought to accomplish this*. Funds for cataloging, as well as to address the previous recommendation, may come from sources beyond the Park and the federal government and may require that the repository staff participate in preparing grant proposals.

42. *In the future, all archaeological collections derived from Park lands should be cataloged so as to be easily entered into the National Park Service's ICMS and the Santa Barbara Museum of Natural History's collections datbase*. An appropriate cataloging template needs to be developed for this purpose and provided to any archaeologist who generates a collection at the outset of a project.

43. *A determination should be made of which collections from Park property have not yet been submitted to the Santa Barbara Museum of Natural History and when they will be submitted.* A collection should not have to be submitted if it is still being used for research and teaching.

44. *The Park's cultural resources staff and the staff of the Central Coast Information Center should meet to determine how to share regularly information about archaeological resources.* The objective of such a meeting would be to establish procedures for updating each other's files as new information is received. This effort may require some amount of regularization of digital database formats, given that most information generated today is in digital form.

45. *Once the Park's and the Information Centers' site record databases are concordant, the an effort should be made to ensure that its site record database is consistent with the Archaeological Sites Management Information System (ASMIS).* Ideally, a protocol should be established so that the ASMIS database is regularly updated on the basis of the Park's or the Information Centers' site record databases. Efforts to maintain consistency between the two databases will be facilitated when the ASMIS database become web-based sometime during 2010.

46. *The Park's cultural resources staff and the staff of the Central Coast Information Center should consider approaching the CHRIS Coordinator in the California Office of Historic Preservation to determine whether Anacapa Island's cultural resources files can be transferred to the Central Coast Information Center.*

47. *A protoco should be developed for inventorying and filing information pertaining to field projects occurring on Park property*. Currently, it is very difficult to retrieve records pertaining to individual field projects, which is one of the reasons why project descriptions presented in Chapters 4 through 10 vary in quality and completeness. The Park cultural resources staff may wish to consult with both researchers and museum scientists in designing and implementing the protocol.

48. *The Park's cultural resources staff and archaeologists doing research within the Park should agree to a set of standards for documenting fieldwork and filing the documentation at Park headquarters and the Central Coast Information Center.* For pedestrian surveys (regardless of whether sites are located and recorded), the information minimally should include:

    - A field report that specifies a) the dates during which the survey took place, b) the location of the survey with reference to geographic placenames, c) the number of crew members involved and variation in the number over the duration of the survey, d) crew experience level, e) amount of time devoted to survey (in days or hours), f) number of sites encountered and temporary designations given to each, and g) difficulties encountered during survey and in locating sites.

    - A map showing the specific lands covered by pedestrian survey, based on a relevant section of a USGS map. The outlined areas of survey on this map should be only those areas actually covered on foot and should exclude lands such as steep slopes that were not actually covered.

- Another map showing the locations of sites and their temporary designations. This map may be combined with the map showing areas surveyed.

For excavation projects, the information minimally should include:

- A field report that specifies a) the trinomial assigned to the site, b) geographic location of the site, c) objectives of the excavation, d) the dates during which the excavation took place, e) amount of time devoted to excavation (in days or hours) f) methods and techniques of excavation, including sampling design and the size, number and depths of each unit, tools used, and screening procedures, f) the number of crew members involved and any variation through the course of excavation, g) crew experience level, h) problems encountered during excavation, i) general nature of the finds, j) and location where collections processing and data analysis is to take place.

- A site map to scale showing the locations and designations of the units.

Field reports for surveys and excavations should be filed with both the Park and the relevant Information Center within three months after the end of fieldwork. They should be in digital format prepared using conventional software. The reports may take the form of a field journal so long as all the information specified above is included.

49. *Site record forms should be prepared for the submerged sites currently inventoried by the Park, and these should be submitted to the relevant Information Center so that California trinomial designations may be assigned to them.*

50. *Archives should continue to be searched to document shipwrecks that occurred within Park waters.* The most economical approach to underwater survey to locate submerged shipwrecks would be first to undertake research into archives that have not yet been tapped for information about the occurrence and location of shipwrecks around the Park's islands. Survey then could focus on the localities where shipwrecks are known to exist.

51. *Sensitivity maps showing the locations of historic development on each of the islands should be prepared*. Such maps not only would aid prehistoric archaeologists in their project planning (see previous recommenation) but also would aid Park and TNC personnel in their management activities.

52. *A database consisting of all radiocarbon dates pertaining to the Park's cultural resources should be generated, and a procedure for regularly updating it should be instituted.* Archaeologists working within the Park have maintained their own listings of radiocarbon dates related to their research, and in 1994 the Santa Barbara Museum of Natural History developed a database of radiocarbon date information pertaining to their collections (Schaefffer 2004). Ideally, the database should contain all information pertaining to the dates, including full provenience information pertaining to the samples submitted for dating. One of the archaeologists actively working within the Park may wish to take on the task of generating and updating the database and making it available to Park personnel and other researchers.

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APPENDIX 1
PROJECT DESCRIPTIONS FROM THE 1977 OVERVIEW

Note: literature cited in the project descriptions are included in the bibliography above.

SANTA BARBARA ISLAND PROJECTS

Project Name: Archaeological Reconnaissance of Santa Barbara Island, carried out as part of UCLA Archaeological Survey's Channel Islands Research Project.

Principal Investigator: B. K. Swartz, Jr.

Institutional Sponsor: UCLA Archaeological Survey

Dates of Fieldwork: August 8 to 15, 1958

Published and Unpublished Mss.: Swartz and Sutton 1958, Swartz 1960. Swartz 1960 is an abstraction of Swartz and Sutton 1958.

Location of Fieldwork: Their reconnaissance involved "as thorough a survey of the island as possible." Their excavation was restricted to SBaI-1.

Theoretical and Empirical Goals of Research: Determination of whether Santa Barbara Island was occupied prehistorically. Beyond this, the objective was to determine the nature and extent of occupation.

Types of Data Collected: They recorded the location of one archaeological site and made a collection of cultural items from a test excavation at this site.

Site Nos. or Locations from which Data Were Collected: SBaI-1

Person-Days and Crew Size: A crew of two (Swartz and Sutton) spent two days in their survey of the island for a total of four person-days. Presumably the rest of the time, about five days, was spent in excavation, for a total of about 20 person-days in excavation.

Data Collection Procedures: Swartz and Sutton report that their survey on the island was thorough; however, they failed to locate more than one of the sites now known to exist on the island. They claim that the ice plant (Mesembryanthemum) covered much of the ground surface of the island, making observation difficult. But since the ice plant does not cover the whole island's surface, and certainly not the surface of every known site, the quality of their survey may be questioned.

Their excavation at SBaI-1 consisted of three 5 x 5-ft. pits aligned on a north-south axis and apparently spaced five feet apart. These pits were labeled nos. 1, 3, and 5. Pit 1 was excavated to a 24-inch depth while pits 3 and 5 were excavated to an l8-inch depth. They apparently

excavated each pit in 6-inch depth intervals, and presumably all deposit was screened.

Significant Descriptive and Theoretical Conclusions of the Research of the Research: Swartz concludes that the island "was inhabited, but only temporarily or by periodic visits, perhaps for quarrying manufacturing materials" (Swartz 1960:9). Swartz and Sutton "believe that Santa Barbara Island does not offer abundant archaeological materials" (Swartz and Sutton 1958:4). The former conclusion was based on the abundant lithic debris found on the surface of the site and the fact that there is an abundance of cryptocrystalline rock on the island (Swartz 1960:9).

Nature of the Archaeological Collections: The collection from the excavation at SBaI-l is accessioned under no. 199 in the anthropological collections of the UCLA department of anthropology. The collection consists of 43 catalog entries, and one 4 x 5" black-and-white negative (neg. no. 1735) is associated with the collection. The accession records include a statement, presumably by Swartz, mentioning that "only a representative sample is cataloged. Specimens from pit 5 were discarded." This statement implies that some of the material collected, possibly including some of that from pits 1 and 3 as well as 5, were discarded. What is meant by a "representative sample" is not clear, and therefore the collection should probably be treated as nonrepresentative. The extant collection consists primarily of quartzite and basalt flakes, however some unmodified bone and shell is also included. A bone abalone pry and a worked bone tube fragment are the most distinctive artifacts. The collection is stored by the department of anthropology under good conditions, and it is accessible for research purposes.

Project Name: Unknown. The work involved a surface reconnaissance of Santa Barbara Island.

Principal Investigator: Paul J. Schumacher

Institutional Sponsor: National Park Service

Dates of Fieldwork: Late summer 1958

Published and Unpublished Mss.: A letter from Schumacher to the UCLA Archaeological Survey describing his work is on file at the UCLA Archaeological Survey.

Location of Fieldwork: The reconnaissance apparently involved a thorough coverage of the whole island.

Theoretical and Empirical Goals of Research: The goal was apparently an inventory of the archaeological sites on the island and descriptions of their locations. Any information on the site records beyond locational information was apparently added by subsequent workers.

Types of Data Collected: Schumacher recorded the location of four archaeological sites. Site records contain scanty information.

Site Nos. or Locations from which Data Were Collected: SBaI-2 through 5.

Person-Days and Crew Size: Unknown

Data Collection Procedures: Unknown. The work at least involved surface reconnaissance.

Significant Descriptive and Theoretical Conclusions of the Research of the Research: The survey demonstrated more archaeological resources on the island than reported by B. K. Swartz in 1958.

Nature of the Archaeological Collections: Apparently no collections were made.

Project Name: Unknown. A surface reconnaissance of Santa Barbara Island

Principal Investigator: J. Nichols?

Institutional Sponsor: UCLA Archaeological Survey? However, there is no record of this project in the Archaeological Survey Annual Report.

Dates of Fieldwork: October 1961

Published and Unpublished Mss.: None. The only reference to this work is in the UCLA Archaeological Survey site records for Santa Barbara Island and the UCLA department of anthropology accession records under accession no. 312.

Location of Fieldwork: The reconnaissance apparently covered most or all of the island.

Theoretical and Empirical Goals of Research: The goal was apparently to reassess the island's archaeological resources, building upon the data base of known site locations.

Types of Data Collected: Surface collections of artifacts were obtained from SBaI-2, 4, 5, and 6, and the location of one new site, SBaI-6 was recorded. The site record for SBaI-6 is the most comprehensively filled out of the records for the island's sites on file at the Archaeological Survey.

Person-Days and Crew Size: Unknown. The initials of one other person besides J. Nichols appear on the site record for SBaI-6, indicating that the crew may have consisted on only two people. There is no indication of the length of their stay.

Data Collection Procedures: Unknown. The work presumably involved surface reconnaissance and casual surface collection of artifacts and faunal remains.

Significant Descriptive and Theoretical Conclusions of the Research of the Research: Record of one more site on the island.

Nature of the Archaeological Collections: The surface collection consists of 33 catalog entries,

including mortar and pestle fragments, other ground stone objects, flake tools, and a "fragment of a boat effigy." Ground stone artifacts, the most numerous, are largely of sandstone and basalt (?). Flake tools are of chalcedony or chert. Steatite is also represented. Unmodified shell and mammal bone is alsopresent in the collection. All items in the collection are provenienced by site number only. The collection is housed under accession no. 312 in the UCLA department of anthropology. The conditions under which the collections are stored is good, and they are accessible for study.

Project Name: 7th Dorado Expedition, Western Spelelogical Institute

Principal Investigator: Phil C. Orr, at least so far as the archaeological observations are concerned.

Institutional Sponsor: Western Speleological Institute, Santa Barbara Museum of Natural History.

Dates of Fieldwork: February 13-16, 1964

Published and Unpublished Mss.: Orr(?) 1964; an unpublished journal of the expedition with mention of having seen an archaeological site. Orr 1964 is an essay on Orr's views (mainly critical) on the quality of management by the National Park Service of Santa Barbara Island.

Location of Fieldwork: The expedition apparently ranged over much of the island's area. No specific mention is made of portions of island subjected to archaeological observation beyond the location of the one archaeological site mentioned in the journal.

Theoretical and Empirical Goals of Research: The expedition's purpose was the "scientific observation of Santa Barbara Island." Archaeological observation of any sort was apparently a minor and casual interest of the expedition.

Types of Data Collected: Description of the location of one archaeological site: "on a steep hillside 900 yards SSW from landing, at elevation of ca. 150-200 ft."

Site Nos. or Locations from which Data Were Collected: The site described cannot be correlated with any known site.

Person-Days and Crew Size: Does not apply.

Data Collection Procedures: Casual observation of the land surface. **Significant Descriptive and Theoretical Conclusions of the Research of the Research**: The opinion is expressed in the journal that the island prehistorically was probably a stopping-off point for voyagers on their way to San Nicolas Island.

Nature of the Archaeological Collections: Apparently no collections were made; none were found in the collections of the Santa Barbara Museum of Natural History.

Project Name: Survey of Santa Barbara Island

Principal Investigator: Charles E. Rozaire

Institutional Sponsor: Los Angeles County Museum and Cabrillo Historical Association.

Dates of Fieldwork: May 5 and 6, 1964

Published and Unpublished Mss.: Apparently no report was written. Site records, fieldnotes, and photographs are on file with Rozaire at the Los Angeles County Museum. (These were not available for this overview because of construction at the museum.)

Location of Fieldwork: Complete area of the island

Theoretical and Empirical Goals of Research: Rozaire's objective was a thorough survey of the island with the intent of checking the locations of sites recorded earlier and locating any other sites not previously reported. ***Types of Data Collected***: Rozaire located 15 archaeological sites on the island. Only two of these were in the exact spots where sites had previously been reported. Three other sites located by Rozaire were within about 100 yards of previously reported sites, while the rest were apparently never located in previous surveys. Rozaire filled out the conventional UC site records for each of the 15 sites, and he plotted their locations on a contour map of the island.

Site Nos. or Locations from which Data Were Collected: Rozaire assigned his own numbers to all of the 15 sites he located and recorded. These are designated R-l through R-15. See the map of the island for the correlations between Rozaire's site numbers and the numbers used by the UCLA Archaeological Survey.

Person-Days and Crew Size: Rozaire was accompanied by a crew of two experienced persons. They spent in the order of six person-days to complete the survey.

Data Collection Procedures: The survey was done on foot. There is no indication of how the ground was covered in the course of doing the survey.

Significant Descriptive and Theoretical Conclusions of the Research of the Research: Rozaire was able to demonstrate quite conclusively that all previous surveys were inadequate and that prehistoric utilization of the island was considerably more intensive than previously believed. Rozaire produced thorough descriptions of each site (in terms of the UC site record form), which had not been done for all of the previously reported sites.

Nature of the Archaeological Collections: Rozaire apparently made no collections in the course of the survey.

Project Name: Excavations at Rozaire's Site R-9 on Santa Barbara Island

Principal Investigator: Charles E. Rozaire

Institutional Sponsor: Los Angeles County Museum

Dates of Fieldwork: June 3-5, 1964

Published and Unpublished Mss.: Apparently no report was written. Fieldnotes, photographs, and collections are housed at the Los Angeles County Museum. (The collections were not available for observation because of construction at the museum.)

Location of Fieldwork: Rozaire's site R-9, near the northwestern corner of the island.

Types of Data Collected: Rozaire and his crew collected from their excavations all artifacts, flakes, bone, and apparently all shell. Provenience information was also kept.

Site Nos. or Locations from which Data Were Collected: Rozaire's site no. R-9.

Person-Days and Crew Size: Rozaire was accompanied by a crew of three experienced persons, and they spent three full days in their excavations, making a total of about 9 person-days of fieldwork.

Data Collection Procedures: Six 5 x 5-ft. square test pits were placed in different portions of the site (no site map was available for the overview). Pits were dug in 6-inch levels, and all deposit was screened through quarter-inch (?) mesh screen. This site was selected for testing because of the relatively large number of artifacts on its surface. All pits were taken down to sterile deposit, the average depth being about 12 inches. One of the pits was taken down to 20 inches to verify the depth of the archaeological deposit.

Significant Descriptive and Theoretical Conclusions of the Research of the Research: In comparison to Swartz's excavation at SBaI-l Rozaire was able to demonstrate that at least one site on the island does contain a comparatively wide variety of different classes of artifacts and faunal remains. He has not yet written an analytical report, however.

Nature of the Archaeological Collections: The collection contains an estimated 50 artifacts and perhaps 100 each of flakes and faunal remains. Artifacts include: fishhook fragments, fishhook blank, projectile point fragments, bone awl tips, and mortar and pestle fragments. Mortar and pestle fragments are probably the most abundant classes of artifacts in the collection. Flakes were of chert, milky quartz, and basalt. Faunal remains include bones of fish, sea mammals, and birds, and shells of black abalone, owl limpet, and others. Shell was sparse in the deposit.

Project Name: Archaeological Survey of Santa Barbara Island

Principal Investigator: Marcia Bright (deceased)

Institutional Sponsor: UCLA Archaeological Survey

Dates of Fieldwork: May 21-22, 1966

Published and Unpublished Mss.: Bright 1966

Location of Fieldwork: All of the island except the "southwest area"

Theoretical and Empirical Goals of Research: Resurvey of the island with the intent of checking the locations of the known sites and the discovery of any other archaeological resources.

Types of Data Collected: Bright relocated sites SBaI-l and 3 and made notes on their condition at the time of her observation. She also discovered some isolated finds whose locations were recorded on a map of the island, labelled "A" through "F", described, and apparently not collected.

Site Nos. or Locations from which Data Were Collected: SBaI-l and 3 and 6 other localities where isolated finds were made.

Person-Days and Crew Size: There was at least one other person with Bright. The minimum number of person-days would probably be two and the maximum would probably be five or six.

Data Collection Procedures: Unknown beyond that the reconnaissance was undoubtedly exclusively on foot.

Significant Descriptive and Theoretical Conclusions of the Research of the Research: Bright verified the presence of at least one other site beyond SBaI-l. She also reported that a number of surface manifestations not closely associated with obvious midden deposits exist on the island. She noted that SBaI-3 appears to have been tested by someone in the past. SBaI-3, in her opinion, has the deepest midden seen on the island (approx. 12 inches) and contains a "heavy concentration of shell, some chipped basalt," and a light tan soil.

Nature of the Archaeological Collections: Bright apparently made no surface collections.

ANACAPA ISLAND PROJECTS

Project Name: de Cessac Expedition to the Channel Islands

Principal Investigator: L. de Cessac

Institutional Sponsor: The French Ministere de 1'Instruction pub1ique

Dates of Fieldwork: Sometime within the years 1877-79

Published and Unpublished Mss.: Only brief accounts of the expedition were written by Hamy and de Cessac, both of which have been republished by Heizer. There was never any comprehensive report of the expedition, and most of the original records kept by de Cessac are apparently lost.

Location of Fieldwork: Somewhere on Anacapa Island

Theoretical and Empirical Goals of Research: de Cessac and his sponsors were primarily interested in exploration and discovery of unique archaeological resources. Their collecting seems to have been partly oriented toward producing exhibitable museum specimens.

Types of Data Collected: Collections were made of artifacts and human skulls from burials. De Cessac probably emphasized the collection of unique and complete artifacts. He apparently did not keep accurate provenience records as to where on the Santa Barbara Channel his materials came from. If so, these records are apparently lost.

Site Nos. or Locations from which Data Were Collected: De Cassac visited one or more of the Anacapa islets, and he apparently undertook some limited excavation at at least one site, however he does not mention the islet or islets from which he collected. He insinuates that he collected all of his items from one "little village."

Person-Days and Crew Size: Apparently a very short time was spent on Anacapa—probably no more than a few days. Crew size is unknown.

Data Collection Procedures: De Cessac provides no information on the nature of his excavations. He was apparently interested in cemetery excavation, and he undoubtedly exercised little or no provenience control—in other words, his excavations probably conformed to the norms of the day, being rather haphazard.

Significant Descriptive and Theoretical Conclusions of the Research of the Research: De Cessac demonstrated that aboriginal occupation did take place on the island. He was apparently the first investigator to demonstrate this.

Nature of the Archaeological Collections: De Cessac mentions collecting "two skulls and a basin," the latter probably being a mortar. There is no knowledge as to whether these items are still curated by the Musee de L'Homme in Paris.

Project Name: Unknown. Yate's expedition to the Channel Islands

Principal Investigator: L. G. Yates

Institutional Sponsor: Unknown. He may have sponsored his own work.

Dates of Fieldwork: 1880's(?)

Published and Unpublished Mss.: Yates 1890:46-47. Yates alludes to his visit to Anacapa Island in his article.

Location of Fieldwork: Somewhere on Middle Anacapa. He may also have made his collections in a shelter site on west Anacapa, but this is very uncertain.

Theoretical and Empirical Goals of Research: Yates was primarily interested in exploration and discovery of unique archaeological resources. He was also interested, if not more so, in many different aspects of natural history, and the bulk of his collecting appears to have been in terms of these other interests.

Types of Data Collected: A small collection of artifacts was made.

Site Nos. or Locations from which Data Were Collected: Yates visited at least one site on Anacapa Island. He mentions in his article a cave referred to him as Freshwater or Indian Cave, however, it is not obvious that this was even on Anacapa Island, since he was speaking of caves on the other Channel Islands in the same context. Notes associated with items in his artifact collection indicate that he visited at least one open site on Middle Anacapa.

Person-Days and Crew Size: He makes no mention at all of how much time he spent on Anacapa Island, and it is not evident that he was working with a crew.

Data Collection Procedures: He does not mention at all how he obtained his collection.

Significant Descriptive and Theoretical Conclusions of the Research of the Research: None

Nature of the Archaeological Collections: The Yates collection from Anacapa Island, curated by the Santa Barbara Museum of Natural History, contains the following: A yucca-leaf(?) plaited sandal, a shist stone disk from the top of Middle Anacapa, and a doughnut stone from "middle of Anacapa" are the only items specifically attributed to Yates. Also in the collection, but not as certainly attributed to Yates' collecting, are the following: 2 seagrass 3-strand braided rope fragments, about 25 bladelets that are either blanks or tipped, misc. shell and stone beads, 1 fishhook fragment, 1 complete fishhook. This collection is accessible and available for study.

I personally question the attribution of the plaited sandal to Anacapa Island. It strongly resembles plaited sandals from the American Southwest.

Project Name: Unknown. Rogers' Reconnaissance of the Channel Islands

Principal Investigator: David Banks Rogers

Institutional Sponsor: Santa Barbara Museum of Natural History

Dates of Fieldwork: Sometime in the 1920's

Published and Unpublished Mss.: Rogers 1929:262. No associated fieldnotes could be located at the Santa Barbara Museum of Natural History.

Location of Fieldwork: He may have only landed on West Anacapa, although there is no specific mention of where he visited on the islets in his report.

Theoretical and Empirical Goals of Research: Rogers' reconnaissance was primarily exploratory. He was apparently doing a survey in order to determine where he would spend his time in excavation in a later phase of his work.

Types of Data Collected: Record of the presence of archaeological sites on Anacapa Island.

Site Nos. or Locations from which Data Were Collected: Unknown.

Person-Days and Crew Size: He probably made a very cursory survey on foot.

Significant Descriptive and Theoretical Conclusions of the Research of the Research: Rogers believes that the sites were only temporarily occupied by Canalino populations—that there were no permanent villages on the island. His description of his findings consume only one short paragraph in his book.

Nature of the Archaeological Collections: Rogers apparently made no collections.

Project Name: Channel Islands Biological Survey by the Los Angeles County Museum

Principal Investigator: Richard Van Valkenburgh(?)

Institutional Sponsor: Los Angeles County Museum

Dates of Fieldwork: McKusick, apparently using information supplied by M. Whistler of the Los Angeles County Museum, attributes the survey to the year 1939. However, Comstock (1946:100, 102) mentions archaeological observations on Anacapa having taken place in 1941.

Published and Unpublished Mss.: A cursory report in the form of an unpublished manuscript is on file at the Los Angeles County Museum. McKusick published this manuscript as an appendix to his report (1959). The manuscript is unsigned but was attributed to Van Valkenburgh by Mildred Whissler on the museum staff. It is possible that Whissler was mistaken, since the only archaeologist mentioned by Comstock as having visited Anacapa Island was a person named John Shrader.

Location of Fieldwork: West and Middle Anacapa only.

Theoretical and Empirical Goals of Research: The museum archaeologist's survey was associated with a wide-ranging biological survey. The archaeologist's objective appears to have been the recording of locations of archaeological sites.

Types of Data Collected: Locations of sites on Middle and West Anacapa with brief descriptions of each.

Site Nos. or Locations from which Data Were Collected: McKusick believes that the archaeologist visited and described the following sites recorded by him: AnI-5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 21. These sites are located on West and Middle Anacapa.

Person-Days and Crew Size: No indication is given that any more than the museum archaeologist was involved in the archaeological survey. The amount of time spent in the survey is not given; however, if the expedition is really that mentioned by Comstock, then it is known that the museum party's stay on Anacapa lasted five days.

Data Collection Procedures: A comparatively thorough survey was made on foot, but there is no indication as to how thorough his coverage of the islets was.

Significant Descriptive and Theoretical Conclusions of the Research of the Research: The archaeologist presents brief descriptions of each site located, giving area dimensions and estimated depths of deposits. This report is the first detailed account of the nature of sites on Anacapa Island.

Nature of the Archaeological Collections: The archaeologist collected a number of "unfinished arrowheads" from a site Mc Kusick believes to be AnI-11. The location of this collection is unknown.

Project Name: None. Orr's Survey and Excavation on East Anacapa

Principal Investigator: Phil C. Orr

Institutional Sponsor: Santa Barbara Museum of Natural History

Dates of Fieldwork: March 9-10, 1956.

Published and Unpublished Mss.: Orr wrote no report of his work; however, he filled out site records on file at the Santa Barbara Museum of Natural History, using his numbering system for sites recorded by UCLA as AnI-l through 4. McKusick (1959:77) refers to Orr's work.

Location of Fieldwork: Orr restricted his fieldwork to East Anacapa during this expedition; however, he mentioned in personal communication to McKusick that he visited Fish Camp on West Anacapa at a later date.

Theoretical and Empirical Goals of Research: Apparently Orr wished to make an inventory of the archaeological sites on East Anacapa. Reports to him of archaeological resources on East Anacapa may have provided the inducement to make this survey.

Types of Data Collected: Locations of sites on East Anacapa with brief descriptions of each site.

Site Nos. or Locations from which Data Were Collected: He recorded AnI-1 through 4 on his record forms. He designated the sites 129.2 through 129.4 on his records. No record exists for 129.1, although it is recorded on his small scale map of East Anacapa. He undertook his test excavation at AnI-3 (129.3).

Person-Days and Crew Size: Orr was accompanied by a crew of two. One to 3 person-days were spent in the survey, and two to three person-days were spent in the excavation.

Data Collection Procedures: His survey was apparently on foot, and he probably covered the whole islet. The thoroughness of his survey is unknown. Orr excavated a 5x5-ft. square test pit into AnI-3, however he gives no indication of his collection procedures.

Significant Descriptive and Theoretical Conclusions of the Research of the Research: Orr's survey was fhe first relatively systematic survey of East Anacapa. It is comparable to Van Valkenburg's(?) survey of Middle and West Anacapa.

Nature of the Archaeological Collections: No collections from Anacapa were located at the Santa Barbara Museum of Natural History that pertain to Orr's work. There are about 10 photographs of Orr's work on file at the museum, and one shows a private collection made by one Larry Boylan from Anacapa sites. This collection includes five points made of black or grey chert.

Project Name: Archaeological Reconnaissance on Anacapa Island, carried out as a segment of the UCLA Archaeological Survey's Channel Islands Program.

Principal Investigator: M. B. Mc Kusick

Institutional Sponsor: UCLA Archaeological Survey

Dates of Fieldwork: July 29 - August 1, 1958

Published and Unpublished Mss.: Mc Kusick and Clune 1958, Mc Kusick 1959

Location of Fieldwork: Mc Kusick and Clune apparently spent most of their time on East Anacapa, and West Anacapa was also briefly visited (see Mc Kusick 1959:82).

Theoretical and Empirical Goals of Research: The survey was undertaken as part of a program to obtain basic information on the nature of the archaeological resources on the Channel Islands. The immediate objective of their survey was to record all sites on East Anacapa.

Types of Data Collected: Locations of archaeological sites on East Anacapa, with brief descriptions of each, using the conventional UC site record form.

Site Nos. or Locations from which Data Were Collected: AnI-1 through 4.

Person-Days and Crew Size: The crew consisted of Mc Kusick and Clune. Their manuscript mentions that four days were spent in the survey, but Mc Kusick mentions in his publication that only two days were spent. Therefore, the number of person-days spent in the survey was either four or eight, the former probably being closer to being correct.

Data Collection Procedures: Their foot survey apparently covered the whole islet. They do not mention the manner in which the ground was covered.

Significant Descriptive and Theoretical Conclusions of the Research of the Research: Mc Kusick's report is the first published survey since the early explorations of Yates, Rogers, and others. It essentially duplicates the unpublished survey of Phil Orr.

Nature of the Archaeological Collections: The surface collections derived from this project were accessioned with those obtained in December 1958. The site records are on file at the UCLA Archaeological Survey, however, the map on which they were originally plotted could not be located by Survey personnel. A copy of the missing map was made by C. Rozaire and is on file at the Los Angeles County Museum.

Project Name: Anacapa Expedition, carried out as a segment of the UCLA Archaeological Survey's Channel Islands Program.

Principal Investigator: M. B. Mc Kusick (C. Rozaire directed the excavation at AnI-8)

Institutional Sponsor: UCLA Archaeological Survey

Dates of Fieldwork: December 19-22, 1958

Published and Unpublished Mss.: McKusick 1958, McKusick 1959, Rozaire 1959, Swartz 1960.

Location of Fieldwork: Survey of Middle and West Anacapa, excavation at AnI-8 at LeDreau Cove on West Anacapa.

Theoretical and Empirical Goals of Research: The survey was undertaken as part of a program to obtain basic information on the nature of the archaeological resources on the Channel Islands. McKusick's collection and analysis of midden samples had the purpose of seriating sites on a time scale. The excavation at AnI-8 apparently had the purpose of collecting a stratigraphic sample of material in order to help in the construction of a chronology for the island.

Types of Data Collected: McKusick recorded minimum information on the sites located during his survey on the conventional UC archaeological site record forms, and he plotted the locations of the sites on a very small scale map. In addition he collected from the surfaces of sites on

Middle Anacapa shallow midden samples. Rozaire collected artifacts and faunal remains from the excavations at AnI-8.

Site Nos. or Locations from which Data Were Collected: AnI-5 through 21

Person-Days and Crew Size: McKusick spent three days alone surveying Middle and West Anacapa. He mentions spending only a half day surveying West Anacapa west of LeDreau Cove. Rozaire and a crew of three spent three days in the excavation at AnI-8, making a total of 12 person-days.

Data Collection Procedures: In the Middle Anacapa survey, McKusick apparently covered the whole area of the island (although Rozaire's subsequent surveys indicate that this is probably not so). McKusick's midden sample collection from sites on Middle Anacapa involved obtaining one 96 cu. in. sample of midden per site by scraping up the midden from the surfaces of the sites. Samples were screened in the field through quarter-inch-mesh screen, with all residues retained for analysis. Four samples instead of one were collected from a cut bank at AnI-6. The excavation at AnI-8 involved a 6 by 18 ft. trench with an estimated average depth of three feet, making a total of about 324 cu. ft. of excavated deposits. About one-sixth of the total deposit was excavated. No clear indication of provenience controls kept in the course of excavation beyond that the deposit was excavated in 6-inch levels, and all deposit was screened through one-half-inch mesh screen. The burial encountered in the excavation is plotted on a map of the excavation, but no depth is given. The depth of a fire hearth feature is given, but its horizontal location is not indicated on the map of the excavation.

Significant Descriptive and Theoretical Conclusions of the Research of the Research: McKusick attempted to construct a chronology based on a seriation of the abalone-mussel ratios of the midden samples taken from sites on Middle Anacapa. This is the only known example of such an endeavor. The excavation at AnI-8 revealed the presence of an apparently late or Canalino occupation, as indicated by the presence of chert bladelets and cores and a burial in a flexed position. The stratigraphic change in the abundance of different species of shellfish at AnI-8 appears to reflect some sort of change in subsistence or settlement pattern.

Nature of the Archaeological Collections: The Collection obtained from the surfaces of the sites on all three islets (apparently including that obtained from McKusick and Clune during their summer 1958 survey on East Anacapa) are housed by the UCLA department of anthropology under accession number 206. The collection is accessible for study. The surface collections from AnI-2, 3, 5, 6, 11, and 19 consist of flake tools, cores, bladelets, fishhooks, a bone barb, tarring pebbles, knives, points, and a sandstone bowl. The collection from AnI-8 consists of 30 items altogether and includes principally chipped stone items: scrapers, knives, multi face cores, choppers, 1 bladelet (microblade) core, 1 bladelet, and 1 complete and 1 incomplete burial.

Project Name: Rozaire's 1961 "Cursory Survey"

Principal Investigator: Charles Rozaire

Institutional Sponsor: Sierra Club

Dates of Fieldwork: June 24-25th, 1961

Published and Unpublished Mss.: Rozaire 1961

Location of Fieldwork: Rozaire surveyed the central portion of Middle Anacapa and a small portion of the top of West Anacapa.

Theoretical and Empirical Goals of Research: Rozaire was a member of a Sierra Club expedition, and his activities were governed by the club's activities. Since it was convenient for him to do so, he recorded any sites that he encountered.

Types of Data Collected: Rozaire filled out thoroughly the conventional UC site record form for each site he encountered. These included sketch maps of the site locations.

Site Nos. or Locations from which Data Were Collected: Rozaire recorded one site on West Anacapa, which he gave the temporary designation of Site "A". The location of Rozaire's site does not appear to correlate with the location of any site recorded by Mc Kusick, however, from the description Rozaire suspects that his site correlates with AnI-ll, which he feels was mismapped by Mc Kusick. Rozaire recorded four sites on Middle Anacapa, none of which appear to correlate with sites recorded by Mc Kusick. The UCLA Archaeological Survey, to whom Rozaire gave copies of his site records, eventually assigned the numbers AnI-22, 23, and 24 to three of Rozaire's four sites on Middle Anacapa.

Person-Days and Crew Size: Rozaire spent the better part of one day in the Middle Anacapa survey and only a few hours in the West Anacapa survey. While he was accompanied by members of the Sierra Club, he worked alone.

Data Collection Procedures: Rozaire carried out a casual foot survey with no intention of making a thorough survey of either Middle or West Anacapa. Nevertheless, the area covered on Middle Anacapa was apparently covered thoroughly.

Significant Descriptive and Theoretical Conclusions of the Research of the Research: Rozaire was able to demonstrate the serious shortcomings in Mc Kusick's 1958 surveys of Anacapa Island.

Nature of the Archaeological Collections: Apparently no collection was made.

Project Name: Rozaire's 1962 "Archaeological Site Survey of Anacapa Island."

Principal Investigator: Charles Rozaire

Institutional Sponsor: Nevada State Museum

Dates of Fieldwork: May 26-30, 1962

Published and Unpublished Mss.: Rozaire 1962

Location of Fieldwork: West and Middle Anacapa, excluding the inaccessible eastern extreme of Middle Anacapa.

Theoretical and Empirical Goals of Research: Rozaire wished to obtain accurate records of sites on West and Middle Anacapa, and he wished to assess the nature of the archaeological record on these islets.

Types of Data Collected: Rozaire thoroughly filled out UC site record forms for six sites on Middle Anacapa beyond the four recorded by him in 1961. He labelled these E through J. He also similarly filled out records for AnI-5 and AnI-6 at Le Dreau Cove on West Anacapa. In addition, he put in a small test pit into AnI"-6, collecting a number of artifacts (mostly bladelets) and a sample of fish and sea mammal bone. Rozaire failed to locate any more sites on West Anacapa beyond the sites at Le Dreau Cove and the one he recorded in 1961 west of the cove.

Site Nos. or Locations from which Data Were Collected: Rozaire recorded sites on Middle Anacapa labelled by him as "E" through "J". He also re-recorded AnI-5 and 6 on West Anacapa.

Person-Days and Crew Size: Rozaire was accompanied by one other co-worker. They spent one day on West Anacapa and one day on East Anacapa in their survey. They spent a portion of one day in testing the AnI-6 deposit.

Data Collection Procedures: Rozaire believes that he made a thorough foot survey of West and Middle Anacapa, excluding the inaccessible eastern extreme of Middle Anacapa. However, he gives no indication of how the ground was covered. The test pit dug into AnI-6 was 30x40 inches and was dug to the base of the deposit at about two feet below surface. He gives no indication of vertical controls, if any, and he does not say whether the deposit was screened.

Significant Descriptive and Theoretical Conclusions of the Research of the Research: Rozaire attempted to reconcile his survey with that of Me Kusick. He concludes that there are errors in the numbering of sites on Me Kusick's published map and that site locations were not even plotted with rough accuracy on the small-scale map used by Mc Kusick. The errors on the published map of site locations on West Anacapa are as follows: "12 should be 14, 14 should be 12, 8 should be 5, 5 should be 6, and 6 should be 8." He suspects that the one site he recorded west of Le Dreau Cove may be AnI-11, but this is far from certain since there is considerable spatial descrepancy between Rozaire's site location and Mc Kusick's. Concerning Mc Kusick's locations of sites on Middle Anacapa, Rozaire believes that possibly only AnI-17 is plotted by Mc Kusick where it should be.

Nature of the Archaeological Collections: The collection from AnI-6 is apparently housed at the Los Angeles County Museum, although it is presently inaccessible due to construction. Rozaire obtained from the test pit over 200 bladelets, a bladelet core, five bone barbs, and a shell fishhook blank. From the surface of the same site bladelets, tarred pebbles, awl tips, a fishhook

shank, olivella disc beads, a steatite bead, and a willow-leaf point were collected.

Project Name: Unknown. Survey by K. Johnson

Principal Investigator: Keith Johnson

Institutional Sponsor: UCLA Archaeological Survey

Dates of Fieldwork: August 18-19, 1962

Published and Unpublished Mss.: None. The project is only mentioned in the UCLA Archaeological Survey Annual Report, 1962-63, p. xiii.

Location of Fieldwork: West Anacapa

Theoretical and Empirical Goals of Research: Unknown

Types of Data Collected: Unknown

Site Nos. or Locations from which Data Were Collected: Unknown

Person-day and Crew Size: No crew is mentioned, but the reference in the Archaeological Survey Annual Report indicates that four person-days were spent in the project.

Data Collection Procedures: Unknown

Significant Descriptive and Theoretical Conclusions of the Research of the Research: None

Nature of the Archaeological Collections: A search through the UCLA department of anthropology collection accession records failed to reveal any collection derived from this project.

Project Name: Unknown

Principal Investigator: Charles Rozaire

Insitutional Sponsor: Nevada State Museum

Dates of Fieldwork: July 4-7, 1963

Published and Unpublished Mss.: Rozaire does not have a report of his work undertaken in this project. Maps, photographs, and other records are on file with him at the Los Angeles County Museum.

Location of Fieldwork: Excavation was undertaken at AnI-8 on West Anacapa, and Rozaire performed a complete survey of East Anacapa as well. This was also apparently the time when he located three more sites on West Anacapa and one more site on Middle Anacapa, although he does not specifically remember this.

Theoretical and Empirical Goals of the Research: Rozaire wished to obtain a complete sample from AnI-8 since this site was so vulnerable to looting by visitors to the National Monument. (A burial had been reported eroding out of this site a short time earlier.). He also wished to complete his survey of Anacapa in the course of this project.

Types of Data Collected: Rozaire thoroughly filled out UC site record forms for the East Anacapa sites (and apparently also for the three new West Anacapa and the one new East Anacapa sites). They also collected cultural materials from the excavation at AnI-8, which included one burial missing its cranium.

Site Nos. or Locations from which Data Were Collected: The excavation took place at AnI-8. Rozaire re-recorded AnI-l through 4 on East Anacapa, and he apparently also recorded his site "K" on Middle Anacapa and his sites "B" and "C" on West Anacapa.

Person-Days and Crew Size: One other person accompanied Rozaire in his survey. While the survey was going on, a crew of four experienced excavators carried out the excavation at AnI-8. Therefore, around 6 to 8 person-days were spent in survey and about 12 to 16 person-days were spent in the excavation.

Data Collection Procedures: Rozaire appears to have undertook a thorough foot survey of East Anacapa, however there is no information available on the manner in which he covered the ground. There is also no information on the nature of his excavations at AnI-8 since Rozaire did not have access to his fieldnotes at the time of my inquiries. Presumably the data collection techniques resembled those of the 1958 excavation at AnI-8.

Significant Descriptive and Theoretical Conclusions of the Research of the Research: Rozaire completed his survey of Anacapa Island in the course of this project. Since analysis of the collection from AnI-8 has not yet been undertaken, no other conclusions are presently available.

Nature of the Archaeological Collections: I did not have access to these collections due to construction at the Los Angeles County Museum. Presumably they are similar to the earlier collections from this site.

Project Name: Unknown. Excavations at AnI-2 in 1970

Principal Investigator: Clement W. Meighan

Institutional Sponsor: UCLA department of anthropology

Dates of Fieldwork: Sometime in 1970.

Published and Unpublished Mss.: No account of this project is known to exist. Reference to the work having been undertaken was found in the UCLA department of anthropology collection accession records under accession no. 571.

Location of Fieldwork: Site AnI-2 on East Anacapa.

Theoretical and Empirical Goals of Research: Unknown.

Types of Data Collected: A collection of artifacts and faunal remains from an excavation.

Site Nos. or Locations from which Data Were Collected: AnI-2

Person-Days and Crew Size: Unknown

Data Collection Procedures: Apparently one test pit was dug to about 18 inches below surface. A surface collection was also made.

Significant Descriptive and Theoretical Conclusions of the Research of the Research: Apparently none.

Nature of the Archaeological Collections: A collection of 16 artifacts and 26 faunal fragments are housed by the UCLA department of anthropology under under accession no. 571. The artifacts include chert and quartzite utilized flakes, a chert reamer, a sandstone pestle fragment, a quartzite chopper, a chert core, and a quartzite biface. The faunal remains are mostly seal bones. The collection is accessible for study.

SANTA CRUZ ISLAND PROJECTS

Project Name: Schumacher's Excavations on Santa Cruz Island
(see also Table2)

Principal Investigator: Paul Schumacher

Institutional Sponsor: Smithsonian Institution

Dates of Fieldwork: May 9 - June 12, 1875

Published and Unpublished Mss.: Schumacher 1877. No journal or fieldnotes could be located at the Smithsonian Institution.

Location of Fieldwork: Seven coastal sites scattered around island-see Table 2 for details.

Theoretical and Empirical Goals of Research: Generally to obtain an artifact collection from a

region for which very little was known archaeologically.

Types of Data Collected: Artifact collections, primarily associated with cemeteries. Schumacher also drew sketch maps of the site locations.

TABLE 2: Schumacher's Excavations on Santa Cruz Island in 1875

Geographic Location	UCSB or UCB #	# of days excavation	Types of Data Collected	Page #	Comments
Between Orizaba and West Twin Harbor	UCB-158	7	2 cemeteries, yielding 225 skeletons. Graves in one cemetery marked by whale bone and had wood shorings of graves	40-41	He mislocated Tinkers Cove on his map of the island at the location of Pelican Harbor
Coches Prietos Shell-mound	UCSB-1 UCB-131	2	140 skeletons, fishhooks, wood board, canoe planks, perforated stones, points drills	41-42	
Prisoners Harbor Shellmount	UCSB-240 UCB-147	ca. 2	40 skeletons, fishhooks, and few other tools	42	
Willows Anchorage Mound	UCB-122	?	100 skeletons, fishhooks, bone "fish-spears"	42	Schumacher says he excavated at Alamos however, his map of the site is obviously that at Willows
Smugglers Cove, north side of creek mouth	UCB-138	?	fishhooks and fishhook blankes, borers, points	42-43	200 skeletons from the 2 sites combined
Smugglers Cove, southern point of cove	UCB-135	?	Whalebone grave markers, wooden "sword"	43	
Near Forney's Cove	UCSB-328? UCB-14?	?	burials in 3 house depressions	43-44	

Data Collection Procedures: Schumacher appears to have carried on very casual excavations with no provenience controls to speak of. In fact, artifacts in the collection at the Smithsonian Institution are not even provenienced to the site from which they came.

Significant Descriptive and Theoretical Conclusions of the Research: Schumacher's excavations are the first recorded for the island, and his report is the first publication on the subject of the island's archaeology.

Nature of the Archaeological Collections: the collection contains primarily complete artifacts. Since Schumacher was on the island only some 60 years after abandonment of some of the sites he excavated, preservation of perishables-particularly wood—was still relatively good, and the collection contains several wood objects, including hafted knives. Also in the collection are ground and chipped stone artifacts, and worked bone and shell artifacts. The only locational information associated with the collection is the fact that they came from Santa Cruz Island. The collection is accessible at the Smithsonian Institution, although some of the objects are either missing or have been exchanged.

Project Name: The French Scientific Expedition to California

Principal Investigator: Leon de Cessac

Institutional Sponsor: The French Ministere de L'Instruction publique

Dates of Fieldwork: 1877

Published and Unpublished Mss.: Heizer (ed) 1951, Heizer and Kelley 1961,1962, Reichlen and Heizer 1964.

Location of Fieldwork: No specific information is given in the very short accounts of the expedition. He apparently excavated in some of the sites in which Schumacher had a few years before, but "without success." He does explicitly mention collecting at "flint quarries" in the interior of the island near which were "workshops." These are almost certainly in the interior of the eastern sector of the island.

Theoretical and Empirical Goals of Research: Apparently simply the acquisition of artifact collections. However, the brief reports of the expedition also mention that botanical and marine faunal collections were made and that a geological relief map was prepared.

Types of Data Collected: Not yet completely known. Heizer and Kelley report the presence of burins (bladelet cores) and bladelets in the collection.

Site Nos. or Locations from which Data Were Collected: Unknown.

Person-Days and Crew Size: de Cessac spent four months on the island, however much of this time was spent in natural history investigations. The presence of any crew is unknown.

Data Collection Procedures: Unknown. Probably very casual excavation and surface collection.

Significant Descriptive and Theoretical Conclusions of the Research: de Cessac was apparently the first to collect bladelets and bladelet cores from Santa Cruz Island.

Nature of the Archaeological Collections: The collection from the Channel Islands is still largely uncataloged. It is only known at present that the collection contains bladelets and bladelet cores or burins. They are presently curated by the Musee de L'Homme in Paris, France.

Project Name: Outhwaite's Survey

Principal Investigator: Leonard Outhwaite (this person is undoubtedly the "Mr. Hebblewaite" referred to in Rogers 1929:261).

Institutional Sponsor: University of California, Berkeley.

Dates of Fieldwork: 1916

Published and Unpublished Mss.: Mentioned in Kroeber 1925:922. A blueprint map of the island showing Outhwaite's site locations and numbers is on file at the U.C. Berkeley Archaeological Research Facility.

Location of Fieldwork: Primarily on the island's coastline, although a few sites in the interior were also recorded.

Theoretical and Empirical Goals of Research: Apparently the sole objective was to record the locations of the larger sites on the island.

Types of Data Collected: 86 sites are located on the map, and an artifact collection consisting of 34 catalog entries attributed to the Outhwaite survey by the Lowie Museum. Rogers claims that Outhwaite carried out extensive excavations at Prisoners Harbor, but this appears doubtful considering the size of the collection.

Site Nos. or Locations from which Data Were Collected: The original 86 sites recorded by Outhwaite have been renumbered by personnel at U.C. Berkeley. The blueprint map has Outhwaite's, Olson's, and a third set of numbers for the sites.

Person-Days and Crew Size: Unknown

Data Collection Procedures: Apparently a foot survey was made of the coastal zone and portions of the Central Valley.

Significant Descriptive and Theoretical Conclusions of the Research: Outhwaite's was the first large-scale survey of the island. He demonstrated that the density of sites on the island is rather high.

Nature of the Archaeological Collections: The artifacts attributed to Outhwaite appear to be casual surface finds—mainly stone artifacts. Records pertaining to the project are filed under accession numbers 100JR and 583 in the U.C. Berkeley Lowie Museum; however, most of the records are missing. The collections are also housed at the Lowie Museum.

Project Name: Rogers' First Reconnaissance of Santa Cruz Island

Principal Investigator: David Banks Rogers

Institutional Sponsor: Santa Barbara Museum of Natural History

Dates of Fieldwork: March 27-30, 1927

Published and Unpublished Mss.: Rogers 1929 and his fieldnotes on file at the museum.

Location of Fieldwork: North side of the island, including specific visits to sites at Stanton Ranch, Prisoners and Pelican Harbor, the Twin Harbors and Orizaba region, and Chinese Harbor.

Theoretical and Empirical Goals of Research: Rogers was apparently prospecting for sites to excavate in the summer of that year.

Types of Data Collected: Commentaries on site characteristics and locations. No map of site locations was found at the museum, although a small-scale map is published in Rogers 1929.

Site Nos. or Locations from which Data Were Collected: Unknown

Person-Days and Crew Size: About two days of survey. (Part of the period was spent in excavating test pits at Prisoners Harbor-see Table 3).

Data Collection Procedures: A boat was used to gain access to various spots along the coast. The survey itself was on foot. No rigorous attempt was made to observe and record all the sites in any particular region.

Significant Descriptive and Theoretical Conclusions of the Research: None

Nature of the Archaeological Collections: It is not evident that Rogers made collections.

Project Name: Rogers' Second Reconnaissance of Santa Cruz Island

Principal Investigator: Davis Banks Rogers

Institutional Sponsor: Santa Barbara Museum of Natural History

Dates of Fieldwork: June 15-17, 1927

Published and Unpublished Mss.: Rogers 1929, and his fieldnotes on file at the museum.

Location of Fieldwork: Along north coast of the island from Ladies Harbor to "slightly west of the center of the northern shore" and the Forneys Cove vicinity.

Theoretical and Empirical Goals of Research: Rogers was apparently prospecting for sites to excavate later in the summer.

Types of Data Collected: His fieldnotes consist of narrative descriptions of sites. Some surface artifacts apparently were collected.

Site Nos. or Locations from which Data Were Collected: Unknown. Rogers apparently did not plot site locations on maps.

Person-Days and Crew Size: No more than three people including Rogers surveyed for slightly

more than one day on the north coast and only a few hours at Forneys Cove.

Table 3: Rogers' Excavations on Santa Cruz Island in 1927.

Site Location	SBMNH Site No.	UCSB and/or UCB Site No.	Pages in Rogers 1929	Dates of Excavation	Est. labor Days	No. Catalog Cards.	Extent of Excavation
Ridge east of east canyon at Cueva Valdez	130.157	UCB-185	285-291	July 6-10	12		3 cemeteries; excavations primarily on 1 of 5 terraces.
East of Cueva Valdez ca. 1/2 mile.	above?	UCB-184	291-293	July 18	3	19	Site disturbed by slumping. Excavations in disturbed cemetery.
100 yards northeast of above site, called: "Arch Rock West."	above?		293-295	July 14-18	12		Cemetery and "ceremonial platform" excavated.
1 mile east of Cueva Valdez, north or larger mound.	130.158?	UCB-183?	295-298	July 11-12	5		Cemetery excavation, "temescal" encountered.
1 mile east of Cueva Valdez, south or smaller mound.	130.158?	UCB-183?	298-299	July 12-14	6		Extensive cemetery excavation, containing mostly "females and children."
2 small sites northeast of previous site.			300			90	Rogers may have been confused in book. His map does not show these. Field notes do not correlate.
1/4 mile east (actually overlooking) of Arch Rock, Site "A" or Crescent-shaped site.	130.158	UCSB-307 UCB-181?	300-301	July 23-29 Rogers absent	18		Large-scale excavation, with area exposures, of cemetery.
Smaller site just north-east of above, site "C."	130.158	UCSB-314	301				Several test pits.
							continued
East side of eastern inlet of Ladies Harbor, called "Babies."	130.170	UCB-178	302	July 19-23	12	2	Large-scale excavation of cemetery.
200 yds behind beach in canyon behind Dicks Harbor.	131.165	UCB-173?	303-304	Aug. 14-16	4	4	Several test pits.
1/3 mile southeast of Dicks on hill 600 ft. alt.		UCB-171?	304				
West side of stream at Coches Prietos.	130.125	UCSB-UCB-131	309	May 14-21 Rogers present.	36	99	"Rather extensive trenching," Few burials.
Rock shelter northwest of above.	130.125	UCSB-	309-310				Test excavations.
Main mound on east side of stream at Coches.	130.125	UCB-131 UCSB-1	310-313	May 21-28 Rogers Absent.			Large-scale excavations with area exposures and test trenches cemetery; some historic material.
Willows Anchorage.	130.159	UCB-122	313-316	May 30-June 9		30	Excavations directed by Olson. See Olson's projects.
Beach at Christies, next to creek & cliff.	130.156	UCB-83 UCSB-191	318-320	June 9-July 5 Rogers Absent		443	Excavations directed by Olson. See Olson's projects.
Beach at Christies, north of above.	130.156	UCB-81 UCSB-257	320				
Beach at Christies, on brink of cliff.	130.156	UCB-82 UCSB-236	320				
Prisoners Harbor mound	130.1	UCR-147	306-7	March 28-29	4	2	Ca. 3 text pits on each side of present wash.

Data Collection Procedures: Access to points along the coast were gained from a boat. The actual survey was on foot. No effort was made to systematically cover particular regions on the island.

Significant Descriptive and Theoretical Conclusions of the Research: None

Nature of the Archaeological Collections: No collections definitely associated with this survey were located at the Santa Barbara Museum of Natural History.

Project Name: Rogers' Third Reconnaissance of Santa Cruz Island

Principal Investigator: David Banks Rogers

Institutional Sponsor: Santa Barbara Museum of Natural History

Dates of Fieldwork: August 13-16, 1927

Published and Unpublished Mss.: Rogers 1929 and his fieldnotes on file at the museum.

Location of Fieldwork: Visits were made to Gull Rock, Morse Point, Punta Arena, Coches Prietos, Smugglers Cove, San Pedro Point, and Scorpion Anchorage.

Theoretical and Empirical Goals of Research: Rogers was apparently prospecting for sites to excavate. Since he indicates that he thought he located all of the sites on the island, it would seem that his objective was also a complete survey of the island.

Types of Data Collected: Commentary on the surface characteristics of sites and their locations. Little or no surface collections made.

Person-Days and Crew Size: Portions of four days. (Parts of l4th-6th were spent in excavating at Dicks Harbor—see Table 3).

Data Collection Procedures: Access to points along the coast was made from a boat. The survey itself was on foot. It involved only a casual survey of any one area of the island.

Significant Descriptive and Theoretical Conclusions of the Research: None

Nature of the Archaeological Collections: No collection housed at the Santa Barbara Museum of Natural History could be definitely associated with this survey.

Project Name: Rogers' Excavations on Santa Cruz Island (see also Table 3).

Principal Investigator: David Banks Rogers

Institutional Sponsor: Santa Barbara Museum of Natural History

Dates of Fieldwork: March 28-29, May 14-August 16, 1927 with a few gaps (see Table 3).

Published and Unpublished Mss.: Rogers 1929 and fieldnotes on file at the museum.

Location of Fieldwork: 19 coastal sites scattered around the island, five of which were excavated with Olson of the University of California, Berkeley.

Theoretical and Empirical Goals of Research: Apparently Rogers wished to obtain a range of variation in artifacts from the island. He appears not to have been specifically interested in establishing a chronology.

Types of Data Collected: He collected primarily artifacts associated with burials and normally retained only the crania from the human skeletons. A small collection of photographs is associated with Rogers' excavations and reconnaissances. His handwritten fieldnotes contain only verbal descriptions of his excavations with very few rough sketches.

Person-Days and Crew Size: Rogers worked with two or three hired crew members whom he would frequently leave for a week at a time to carry out excavations with no direct field supervision. Two of the crew were, in Olson's words (Olson personal communication), "sewer diggers" from Santa Barbara. The other was apparently a student. (See Table 3 for length of excavation time at each site.)

Data Collection Procedures: Rogers does not give adequate descriptions of his excavation techniques. His excavation units varied from test pits presumably about five feet in length to broad area exposures more than ten feet on a side. He would occassionally screen deposits, but according to Olson (personal communication) this was seldom, if at all at some sites. Rogers normally restricted most of his excavations to areas of sites yielding burials.

Many of the objects in the collections are catalogued with information recorded on burial number or burial location or pit designation. With some difficulty it would be possible to ascertain those artifacts associated with specific burials, although the quantities of beads and ornaments found in the cemetery areas, but not recorded as pertaining to a specific burial, leads one to believe that careful attention was not always devoted in the field to recording all burial associations. Since no maps of excavations or burial plots were made (excepting a crude sketch map of the large Arch Rock cemetery) the locations of burials in relation to one another or to the area of the site is unknown.

Significant Descriptive and Theoretical Conclusions of the Research: Rogers' book contains only general descriptions of his excavations, with mention made of unique or spectacular finds. Nevertheless, some idea of the nature of the archaeological record on the island may be obtained from his book. It is the second publication on the island's archaeology.

Nature of the Archaeological Collections: There is a definite emphasis on larger and more complete artifacts in the collection. Artifacts include large quantities of shell beads and

ornaments and smaller collections of chipped and ground stone artifacts, bone artifacts, fiber and wood artifacts, and asphaltum objects. (See Table 3 for the number of catalog cards per site. Each catalog card pertains to one of several dozen objects.) Very few postcrania1 bones exist in the skeletal collection. The collection is easily accessible at the Santa Barbara Museum of Natural History. Portions of the collections obtained with Olson are at the Lowie Museum.

Project Name: Olson's Excavations on Santa Cruz Island (see also Table 4)

Principal Investigator: Ronald L. Olson (faculty director was A. L. Kroeber)

Institutional Sponsor: U. C. Berkeley Department of Anthropology

Dates of Fieldwork: May 29 to beginning of August, 1927, and July 9 August 4, 1928

Published and Unpublished Mss.: Olson 1930, Hoover 1971, McKern 1960, and handwritten fie1dnotes on file at the Lowie Museum at the University of California, Berkeley.

Location of Fieldwork: 16 coastal sites scattered around is1and—see Table 4 for listing.

Theoretical and Empirical Goals of Research: Olson appeared to be concerned with determining the nature of variation in the contents of sites and establishing a prehistoric chronology for the island.

Types of Data Collected: Olson concentrated on cemetery areas and recorded burial position and location and artifacts in terms of burial numbers. He also made stratigraphic excavations and recorded artifacts according to depth. Stratigraphic drawings of trench sidewalls were made. Some faunal remains were collected, but they have apprently been discarded by the Lowie Museum some years ago. Comparatively few postcranial human bones were collected in comparison to the number of crania. A small photographic collection accompanies the field records. Olson made several excursions to other parts of the island to locate and record sites. He located 120 sites additional to the 86 located previously by Outhwaite. The locations were plotted on a copy of Outhwaite's map.

Data Collection Procedures: Olson normally started an excavation at a site with a long strata-trench through the center of the site. Portions of the deposit were quarter-inch screened, but in terms of the number of labor days spent to excavate a given volume of deposit, comparatively minimal screening was done. This phase of excavation was followed or replaced by the excavation of a series of test pits. Once a cemetery was located, excavations normally consisted of a cluster of pits of varying shapes (usually rectangular) and sizes separated from one another by balks. Burials were apparently cleared with small hand tools, and screening was used, at least selectively, when beads and ornaments were encountered.

Significant Descriptive and Theoretical Conclusions of the Research: Olson's preliminary report includes general descriptions of the sites, brief descriptions of some artifact classes, a seriation of sites based on artifact frequencies, and a description of broad changes in material culture. Olson was the first person to establish a chronology for the prehistory of the island.

Hoover's dissertation is a more detailed presentation of the data and his analysis includes a more refined chronological analysis.

Nature of the Archaeological Collections: See Table 4 for details. Olson's collections are generally better provenienced than Rogers'. Burial associations may be ascertained, and to varying degrees of precision the provenience of burials and artifacts within the area and depth of each site may be ascertained. The collections are stored at the Lowie Museum at U.C. Berkeley, however, the location of portions of those collections obtained in 1927 when Olson and Rogers were working together are stored at the Santa Barbara Museum of Natural History. Hoover (1971) presents maps of Olson's excavations showing unit numbers and in some cases burial locations. These were not located for me by personnel at the U.C. Berkeley Archaeological Research Facility.

Project Name: Welcome-Moodie Expedition

Principal Investigator: Richard VanValkenburgh (D. B. Rogers was probably VanValkenburgh's overseer, but he was not in the field with him.)

Institutional Sponsor: Santa Barbara Museum of Natural History

Dates of Fieldwork: September 1932

Published and Unpublished Mss.: Robinson n.d.; Sutton, R. 1932

Location of Fieldwork: Large site at Forney's Cove called “El Monton” by VanValkenburgh

Theoretical and Empirical Goals of Research: Beyond the collection of artifacts, research goals are unknown.

Types of Data Collected: Artifact collection associated with 130 burials. Field notes include a list of 13 of the burials indicating age, depth, position, orientation bone condition, type of grave marker, type of soil matrix, and artifact associations. A map of the site shows location of excavation pits. There is also a topographic plan of two associated burials and their accompaniments. There is no correlation in the museum catalog between burial number and artifact. About 130 photographs are associated with the collection.

Site Nos. or Locations from which Data Were Collected: In the Santa Barbara Museum of Natural History records,this site is designated 130.155, and in the University of California, Berkeley, Archaeological Research Facility Records it is designated SCrI-3.

Person-Days and Crew Size: One month with a crew of four plus VanValkenburgh—150 person days.

Table 4: OLSON'S EXCAVATIONS ON SANTA CRUZ ISLAND IN 1927-28

Olson's Field No.	Berk. Site No.	UCSB Site No.	Locality	Dates of Excavation	Pages in Hoover 1971	Data Collection Procedures	Nature of the Collection
1	131	1 and 3	Coches Prietos mound	May 29-June 1, 1927	186-197	34 pits of varying sizes, 27 of which are clustered in center of mound.	11 burials, points and other chipped stone artifacts, ground stone artifacts. 118 catalog cards at Lowie Museum.
2	122	--	Willows anchorage mound	June 4-9, 1927	175-185	16 pits, 5 x 80 ft trench, ca. 3 x 20 ft trench.	3 burials, misc. stone, shell, bone artifacts. 116 catalog cards at Lowie Museum.
3	83	191 and 257	Christis Beach, north side of mouth of Canada Cervada	June 10-29, 1927	108-129	Trench 10.9 ft long and ca. 10 ft wide with several lateral extensions forming area exposures.	201 burials, ground and chipped stone artifacts, shell beads and ornaments, fishhooks, bone artifacts, fiber artifacts. 463 catalog cards at Lowie Museum.
4	81	253	Christis Beach	June 23-25, 1927	100-103	75 ft trench connected to a ca. 30 x 30 ft area exposure at one end.	7 burials, primarily ground stone artifacts, several shell, bone, and fiber artifacts. 22 catalog cards at Lowie Museum.
4W	82	236	Christis Beach	June 27-30, 1927	104-107	5 pits clustered together in 1 portion of site.	14 burials, ground and chipped stone artifacts, bone and shell artifacts, fiber artifacts. 52 catalog cards at Lowie Museum.
5	39	--	Rock shelter 1/3 mile from coast and 1 1/4 mile cast of Forneys Cove	June 8-10, 1927	94-99	6 pits near mouth of shelter and 2 on slope below.	5 burials, primarily ground stone artifacts, few of shell, bone, and fiber. 91 catalog cards at Lowie Museum.
6	3	--	On knoll north of Forneys Cove	July 12-18, 1927	69-93	17 pits clustered in cemetery area.	102 single and multiple burials, stone, bone, shell artifacts. 911 catalog cards at Lowie Museum.
7	162	--	Between Platts and Orizaba Coves.	July 23-25 1927	231-237	8 pits, 6 of which are clustered in area of cemetery.	27 burial, misc. chipped and ground stone artifacts, shell beads and ornaments, misc. shell and bone artifacts. 134 catalog cards at Lowie Museum.
179	154	--	On ridge on west side of West Twin Harbor drainage.	July 1927	223-224	6 pits (no map)	5 burials, few chipped stone artifacts, few ground stone artifacts, shell beads, few bone artifacts. 55 catalog cards at Lowie Museum.
8	159	--	On ridge on west side of Onzaba Cove	July 26-27 1927	225-230	7 pits (no map)	19 burials, points and other chipped stone tools, ground stone artifacts, few shell artifacts, misc. bone and fiber artifacts. 130 catalog cards at Lowie Museum.
180	161	--	Vicinity of West Twin Harbor and Orizaba Cove	July 1927	--		2 catalog cards at Lowie Museum.
9	147	240	Prisoners Harbor Mound	July 31-1927	214-222	3 x 50 ft step-trench to maximum depth of 17 ft, located on top of mound.	No burials, abundant chipped stone artifacts, misc. ground stone artifacts, shell beads, misc. shell and bone artifacts. 339 catalog cards at Lowie Museum.
49	138	--	North side of creek at Smugglers Cove	July 9-1928	198-213	11 pits, 9 of which are clustered to form area exposure in area of cemetery.	69 burials, historic objects, points, and other chipped stone artifacts, quartz crystals, ground stone artifacts, shell beads, ornaments, and fish hooks, misc. shell, bone, and fiber artifacts. 452 catalog cards at Lowie Museum.
192	135	--	On southern extreme of Smugglers Cove	July 13-16 1928	192-197	3 test pits (no map).	22 burials, points and other chipped stone artifacts, ground stone artifacts, shell beads and ornaments, bone artifacts. 88 catalog cards at Lowie Museum.
62	104	192	Johnson's Landing, just east of Morse Point	July 20-22, 1928	171-174	23 test pits, 4 of which were inside house depressions.	No burials, misc. stone, bone, shell, and fiber artifacts. 75 catalog cards at Lowie Museum.
193	103	292	Morse Point	July 23, 1928	169-170	1 test pit to depth of 4 feet.	2 burials, shell beads and ornaments, few bone artifacts. 9 catalog cards at Lowie Museum.
64	100	--	West side of mouth of Paso Creek	July 24-Aug. 4, 1928	130-168	Ca. 50 x 65 ft area exposure in cemetery, 7 test pits scattered in other areas of site, and a 3 x 30 ft trench in midden area.	180 burials, large collection of chipped stone tools and steatite beads and ornaments, ground stone tools, over 15,000 shell beads, over 400 shell ornaments, misc. shell, bone, and fiber artifacts. 1260 catalog cards at Lowie Museum.

Data Collection Procedures: Hand excavation with shovels and small tools. The excavation was restricted to an area where undisturbed burials were located (near where Olson excavated in 1927).

Significant Descriptive and Theoretical Conclusions of the Research: None

Nature of the Archaeological Collections: The fieldnotes list 238 artifacts and an unspecified number of beads and ornaments. Comparatively little of this collection is still curated by the Santa Barbara Museum of Natural History.

Project Name: Edwards' Excavations on Santa Cruz Island

Principal Investigator: H. Arden Edwards

Institutional Sponsor: Southwest Museum (?)

Dates of Fieldwork: ca. July 28, 1933

Published and Unpublished Mss.: Edwards 1956 (this is a transcription of Edwards' journal found in a small notebook housed by the Southwest Museum.)

Location of Fieldwork: In the vicinity of Fry's Harbor.

Theoretical and Empirical Goals of Research: Presumably to collect artifacts for museum collections.

Types of Data Collected: Edwards apparently found very few, if any, artifacts in excavation. Several surface items may have been collected from this and other sites in the vicinity.

Site Nos. or Locations from which Data Were Collected: The UCLA Archaeological Survey designated this site SCrI-2l0. (There are no sites recorded in this area in the U.C. Berkeley Archaeological Research Facility records.) No map of the island showing the location of this site could be located at the UCLA Archaeological Survey, and Edwards may have excavated at more than one site in the vicinity of Fry's Harbor in any regard. He mentions two "flint working sites" three-quarters of mile up from the coast on ridges, in addition to the sites on the coast.

Person-Days and Crew Size: Edwards mentions working with three other people. They may have spent only one day in survey and excavation.

Data Collection Procedures: Edwards says that he "trenched and dug" to a depth of five feet without finding the bottom of the site.
Apparently no records beyond the journal exist.

Significant Descriptive and Theoretical Conclusions of the Research: None

Nature of the Collection: Edwards mentions finding very few artifacts and no burials. What collections that may exist are probably at the Southwest Museum.

Project Name: Orr's Excavations at the Prisoners Harbor Mound

Principal Investigator: Phil C. Orr

Institutional Sponsor: Santa Barbara Museum of Natural History

Dates of Fieldwork: 1950

Published and Unpublished Mss.: Referred to in Orr's unpublished field report of a 1957 trip to Santa Cruz Island. There are also burial record cards pertaining to this excavation. No field notes were located.

Location of Fieldwork: The Prisoners Harbor Mound. The location on the site is unknown, however, it appears that he salvaged two burials out of the erosion bank adjacent to the stream channel.

Theoretical and Empirical Goals of Research: Unknown. Possibly salvage of burials eroding out of a bank.

Types of Data Collected: Artifacts associated with two burials and portions of the skeletons.

Site Nos. or Locations from which Data Were Collected: UCSB-SCrI-24D, designated by UCB Archaeological Research Facility as SCrI-147.

Person-Days and Crew Size: Unknown. Apparently a very small-scale excavation, possibly no more than a few hours.

Data Collection Procedures: Unknown.

Significant Descriptive and Theoretical Conclusions of the Research: None

Nature of the Archaeological Collections: Shell beads and ornaments, bone objects, chipped stone artifacts. Four catalog cards on file at the museum pertain to the collection.

Project Name: Orr's 1959 Reconnaissance of Santa Cruz Island

Principal Investigator: Phil C. Orr

Institutional Sponsor: Santa Barbara Museum of Natural History

Dates of Fieldwork: May 25-29, 1959

Location of Fieldwork: Canada de los Sauces and generally the western end of the island, Canada Laguna, and the Central Valley.

Published and Unpublished Mss.: Five page typewritten field report on file at the museum.

Theoretical and Empirical Goals of Research: A preliminary reconnaissance apparently to obtain some idea of the nature of sites on the island.

Types of Data Collected: One doughnut stone from a midden stratum exposed in an arroyo bank under about 20 feet of alluvium.

Site Nos. or Locations from which Data Were Collected: Orr's site record on file at the museum with the designation "donut" appears to pertain to this site. Several such sites in the vicinity described by Orr, in Canada de los Sauces between grove of cyprus and windmill, were recorded by UCSB. This particular site may be UCSB-SCrI-61.

Person-Days and Crew Size: Orr and botanist Cliff Smith for about four days.

Data Collection Procedures: Casual reconnaissance by jeep and on foot. Apparently no systematic effort was made to cover a particular portion of the island.

Significant Descriptive and Theoretical Conclusions of the Research: Orr reported the presence of deeply buried middens on the island, which he thought were very ancient—perhaps of Pleistocene age. (They probably are not.)

Nature of the Archaeological Collections: Apparently only the doughnut stone was collected.

Project Name: Santa Cruz Island Expedition (Ground Survey)

Principal Investigator: Phil C. Orr

Institutional Sponsor: Santa Barbara Museum of Natural History

Dates of Fieldwork: May 1963, prior to the helicopter survey (see next project).

Published and Unpublished Mss.: typed field report, "Santa Cruz Island Expedition, May 1963," on file at the museum.

Location of Fieldwork: generally on the west end of the island.

Theoretical and Empirical Goals of Research: Orr was apparently planning a large-scale excavation on the island, comparable to his work on Santa Rosa Island. This reconnaissance apparently had the purpose of locating prospective sites for future excavation.

Types of Data Collected: Apparently no collections were made. Orr recorded several sites on

the western extreme of the island, but no map was found at the museum on which these are plotted.

Site Nos. or Locations from which Data Were Collected: No formal numbers were given to the sites. They appear to be in the vicinity of UCSB-SCrI-328.

Person-Days and Crew Size: Orr was accompanied by two non-archaeologists, spending five days on the island.

Data Collection Procedures: A casual survey by jeep and on foot.

Significant Descriptive and Theoretical Conclusions of the Research of the Research: None.

Nature of the Archaeological Collections: Apparently none was collected.

Project Name: Santa Cruz Island Expedition (Helicopter Survey)

Principal Investigator: Phil C. Orr

Institutional Sponsor: Santa Barbara Museum of Natural History.

Dates of Fieldwork: May 24-25, 1963

Published and Unpublished Mss.: "Brief Report to the Trustees on a Helicopter Survey"—a one-page report.

Location of Fieldwork: Orr apparently ranged over much of the island.

Theoretical and Empirical Goals of Research: Orr was apparently looking for prospective sites for future large-scale excavation.

Types of Data Collected: Visual observations and photographs. He claims to have looked at about 200 sites. Landings were made on a few of the sites; apparently no collections were made.

Site Nos. or Locations from which Data Were Collected: Orr did not record any of the sites he visited.

Person-Days and Crew Size: Apparently only Orr and the pilot for a period of two days.

Data Collection Procedures: A casual survey from the air at low altitudes with occasional touch-downs so that a foot reconnaissance could be made.

Significant Descriptive and Theoretical Conclusions of the Research: Orr demonstrated the effectiveness of doing certain kinds of site survey by helicopter, especially over the rugged parts of the island.

Nature of the Archaeological Collections: Apparently no collections were made.

Project Name: Hoover's Field Reconnaissance and Mapping of Olson's Sites

Principal Investigator: Robert Hoover

Institutional Sponsor: U.C. Berkeley Department of Anthropology

Dates of Fieldwork: July 1968

Published and Unpublished Mss.: Hoover 1971. Field records are on file at the U.C. Berkeley Lowie Museum.

Location of Fieldwork: Sites excavated by Olson in 1927-28.

Theoretical and Empirical Goals of Research: The objective of the fieldwork was to check the locations of Olson's excavations, map the sites, and in a few cases obtain samples of material from limited test excavations. Hoover's analysis had the objective of creating a more refined artifact typology and a more sensitive relative dating of the sites than was accomplished by Olson.

Types of Data Collected: Hoover made topographic maps of each site from which Olson obtained collections except those in the vicinity of Orizaba Cove on the north coast, and he obtained surface and test pit collections from some of the sites as listed below:

UCB Site No.	Number of Catalog Entries		Maximum Depth
	Surface	Test Pit	
3	–	pit alpha: 55	ca. 36 in.
83	23	–	
84	1	–	
100	7	pit alpha: 5	12 in.
104	7	–	
147	22	pit alpha: 54	4 in.
		pit beta: 17	96-108 in.
Chinese Harbor	1	(not one of Olson's sites—location unknown)	

Site Nos. or Locations from which Data Were Collected: Sites from which collections were made are listed above. The sites mapped are UCB-SCrI-3, 39, 81, 82, 83, 100, 103, 104, 122, 131, 135, 138, 147, and 162.

Person-Days and Crew Size: Hoover spent two weeks on the island working primarily by himself.

Data Collection Procedures: Hoover was apparently using conventional mapping and test-pitting techniques. His test pit excavations are not described in this dissertation. No maps showing locations of test pits are on file at the Lowie Museum.

Significant Descriptive and Theoretical Conclusions of the Research of Research: Hoover presents Olson's data in considerably more detail than Olson did in his 1930 preliminary report. Hoover's relative chronology for the island has more divisions than Olson's, and Hoover was able to correlate his relative chronology with Orr's chronology for Santa Rosa Island and the chronology for
the adjacent mainland.

Nature of the Archaeological Collections: Misc. stone, bone, and shell artifacts and faunal remains. The collections are housed by the Lowie Museum.

Project Name: Pilot Study to Evaluate the Potential of Palynology on Santa Cruz Island

Principal Investigator: James N. Hill

Dates of Fieldwork: Spring 1967

Published and Unpublished Mss.: Hevly and Hill 1970. Field notes are on file with Hill at the UCLA Department of Anthropology.

Geographic **Location of Fieldwork**: Posa Canyon, Willows Anchorage, Valley Anchorage, and El Camino Viejo—near the U.C. Field Station.

Theoretical and Empirical Goals of Research: Hill casually collected soil samples in order to determine whether fossil pollen was preserved adequately for palynological studies of the paleoclimate and paleobotany of the island.

Types of Data Collected: Plastic bags-full of soil from four archaeological sites.

Site Nos. or Locations from which Data Were Collected:
Unnumbered Posa Canyon site: 4 samples, 2 from midden strata, 2 from sterile strata
UCB-SCrI-122 (Willows):1 sample
UCB-SCrI-132? (Valley Anchorage): 1 sample
UCB-SCrI-126? (El Camino Viejo): 1 sample
(None of the four sites has been numbered by UCSB.)

Person-Days and Crew Size: Hill and assistant. (I was Hill's field assistant.) Two days were spent obtaining the samples, but very little time was spent at any one site.

Data Collection Procedures: The samples were obtained from erosion banks that cut through the site deposits, the surface of the banks being cut back to obtain fresh surfaces. The loci where the samples were extracted were not mapped. The samples were processed by R. Hevly, a

palynologist who has done extensive work with Southwestern archaeologists.

Significant Descriptive and Theoretical Conclusions of the Research: Hevly and Hill demonstrated that fossil pollen is well preserved in Santa Cruz Island middens and may be used for environmental and subsistence reconstructions. They suspect that fossil pollen may also be preserved in southern California middens in general.

Nature of the Archaeological Collections: Besides the soil samples, which were destroyed in the course of analysis, no other collections were made.

Project Name: Pilot Survey of the Coches Prietos Drainage.

Principal Investigator: James N. Hill (Hill did not participate in the fieldwork, however.)

Dates of Fieldwork: Intermittantly during the summer of 1967.

Published and Unpublished Mss.: No report was written based on this fieldwork. Records are on file with Hill at the UCLA Department of Anthropology.

Location of Fieldwork: The complete Coches Prietos Drainage.

Theoretical and Empirical Goals of Research: A complete survey of the Coches Prietos drainage was undertaken with the intent of locating every site in order to gain a preliminary idea of the density of sites on the island, the number of labor days needed to survey a given area, and the amount of time needed to collect and process midden samples from surface deposits. A special form for recording site information was also tried out to determine its effectiveness.

Types of Data Collected: Site records on special "long" forms, site locations plotted on aerial photos and USGS maps, casual and limited surface collections of artifacts, screenings from a 1 x l-meter by 10 cm test square in each site and a midden soil sample from each site were collected.

Site Nos. or Locations from which Data Were Collected: UCSB-SCrI-l through 23. The UCSB survey team relocated in 1973 all of the these sites and retained the numbers assigned in 1967.

Person-Days and Crew Size: A crew of two graduate students for approximately 20 working days.

Data Collection Procedures: A foot survey. All land with slopes less than about 15° plus rock shelters were walked over. The survey failed to locate several sites that were subsequently located by the UCSB team in the 1973 resurvey.

Significant Descriptive and Theoretical Conclusions of the Research: This project was undertaken to produce information relevant to planning a large-scale project for which J. N. Hill was seeking grant funding. (He was ultimately unsuccessful.) The project demonstrated the

presence of a relatively high density of sites-many more than reported by Olson or Rogers for this portion of the island. Moreover, the project revealed that 1 xl-meter sample squares consumed a large proportion of the survey time and generated more data than could be economically processed. As a result, this data collection technique was abandoned when the UCSB team began survey under my direction in 1973.

Nature of the Archaeological Collections: The surface collection of artifacts was retained and is presently housed by the UCSB Department of Anthropology. It consists of only a couple dozen objects.

Project Name: Santa Cruz Island Project—Site Survey

Principal Investigator: Albert C. Spaulding and Michael A. Glassow

Institutional Sponsor: UCSB Department of Anthropology (funded by the National Science Foundation).

Dates of the Fieldwork: July 10 to September 10, 1973; June 28 to August 23, 1974.

Published and Unpublished Mss.: Spaulding and Glassow 1972. Journals and field records are on file at the UCSB Department of Anthropology. (Reports in progress.)

Location of Fieldwork: A stratified random sample of 14 out of 153 drainage areas from 9 strata consists of the following localities:

Arbitrary Drainage No.	Location
1	West Point, northwest corner of Island
2	Directly east of above
26	East Twin Harbor
34	Rancho del Norte, east of Prisoners Harbor
64	South coast of the isthmus
78	Between Willows and Coches
85	Southeast of Sierra Blanca on south coast
90	Morse Point
96	First drainage south of Canada de los Sauces
97	Cañada de los Sauces
112	Canada Cervada at the airstrip
117	North side of upper Canada Cervada
136	Southeast of Mount Diablo
140	South of Mount Diablo
151	Southeast of winery near Stanton Ranch headquarters

In addition, the following areas were surveyed outside the stratified random sample: vicinity of Arch Rock, vicinity of Christi Beach, vicinity of Forneys Cove, Coches Prietos drainage, vicinity

of Punta Arena, vicinity of Stanton Ranch, vicinity of Prisoners Harbor, vicinity of western end of Chinese Harbor, vicinity of chert outcrops in eastern highlands near property boundary.

Theoretical and Empirical Goals of Research: A complete sample of sites was sought from each of the drainages surveyed. The survey's objective was to determine the relationship between spatial variations in subsistence-settlement patterns and variations in the locations of terrestrial and marine resources. In a broader perspective, it was anticipated that the project would provide data relevant to understanding the evolution of marine-adapted cultural systems on the Santa Barbara Channel.

Types of Data Collected: Description of the surface characteristics and environmental context of each site on special ,site record forms, 35mm B &W photographs of each site, one or more cloth bags full of midden soil from directly beneath the surface of each midden-bearing site.

Site Nos. or Locations from which Data Were Collected: Since many of the sites recorded on maps at the U.C. Berkeley Archaeological Research Facility could not be precisely correlated with site locations in the field, and since the UCSB team intended to make finer distinctions in defining individual sites, a new numbering system was established. Numbers assigned to sites were SCrI-l through SCrI-380.

Person-Days and Crew Size: Four two-person teams plus myself carried out the survey in the 1973 season for a total of about 410 person-days. I worked with my wife during portions of the 1974 season for a total of 28 person-days in finishing the survey.

Data Collection Procedures: Sampling design: The island was divided into 153 interior and coastal drainages. These were grouped into nine sampling strata based on vegetation community type, coastline characteristics (including presence or absence of coastline), and drainage size. One to three drainages were selected for complete survey using a random numbers table. Sample Size: The sample included approximately 10 percent of the island's area. Reconnaissance Procedures: All ground that was less than about 15° slope was surveyed by two-person teams walking parallel transects or zig-zag patterns over the ground so as to cover the land at no more than approximately 10-meter intervals. All rocky slopes and cliff faces, except where completely inaccessible, were checked for rock shelters. In areas with thick grass or duff cover, the sod was removed at approximately 10-meter intervals with a hand mattock or geology hammer to search for obscured midden deposits. Once a site had been located, an aluminum stake with the site number stamped on it was driven into the site area's approximate center. Site dimensions from the stake were determined with a sighting compass and by pacing. Intensity of Coverage: It is assumed that over 90 percent of the sites **in** each drainage surveyed were located.

Significant Theoretical and Descriptive Conclusions: While analysis of the data is still in progress, the survey has demonstrated the inadequacy of all previous surveys. Based on the number of sites found and the area of the island covered, the total number of sites on the island is somewhere in the neighborhood of 3000. The diversity of site locations appears to indicate that many kinds of terrestrial resources were exploited in addition to the marine resources.

Nature of the Archaeological Collections: Beyond the midden samples, surface collections

consist of artifacts that might serve as time markers or that stood the danger of being picked up by trespassers. The site records now comprise a SELGEM file. The collections are housed by the UCSB Department of Anthropology.

Project Name: Santa Cruz Island Project—Prisoners Harbor Mound Excavations

Principal Investigator: Albert C. Spaulding and Michael A. G1assow

Institutional Sponsor: UCSB Department of Anthropology (funded by the National Science Foundation).

Dates of Fieldwork: June 24 to August 23, 1973

Published and Unpublished Mss.: Spaulding and G1assow 1972. Field records are on file at the UCSB Department of Anthropology.

Location of Fieldwork: Prisoners Harbor Shellmound

Theoretical and Empirical Goals of Research: The excavation's objective was to obtain a large collection using modern volumetric controls from a stratified site representing a relatively long period of prehistoric occupation so that cultural change—particularly change in subsistence and economy—could be determined.

Types of Data Collected: Artifacts, unmodified bone, chert flakes and cores, soil samples, topographic map of the site, stratigraphic cross-sectional drawings, color and black-and-white photographs.

Site Nos. or Locations from which Data Were Collected: UCSB-ScrI-240 (UCB-SCrI-147)

Person-Days and Crew Size: Spaulding, two graduate student crew chiefs, and seven crew. Forty working days were spent in the excavation making a total of 400 person-days.

Data Collection Procedures: Two strata trenches were excavated, one on the north (seaward) and one on the south (landward) side of the mound. The trenches were 2.5 meters wide, and each was excavated by first taking down in relatively gross stratigraphic units two parallel 0.75 meter-wide trenches separated by a one-meter-wide balk, which was taken down in stratigraphic levels after the strata observed on both sidewalls were mapped. Screening through half-inch and eight-inch meshes was done selectively, more frequently of the balk deposits. The seaward trench was excavated to a maximum depth of 3 meters below surface at the end nearest the center of the mound, with the depth tapering off to surface at a distance of 8 meters from the deep end. The landward trench was excavated to a depth of 5 meters below surface at the end towards the mound's center and was stepped up to the surface at 14 meters from the deep end. The bottom of the mound was not reached in either trench. (The bottom of the site extends below the water table.)

Significant Descriptive and Theoretical Conclusions of the Research: Although analysis is not complete, the excavation revealed that a considerable time depth is represented in the mound and that much of the deposit is still undisturbed in spite of several previous excavations.

Nature of the Archaeological Collections: The collection contains chipped and ground stone, bone and shell artifacts, faunal remains, and midden samples. The majority of the items in the collection are chert flakes and cores and faunal remains. The collection, containing an estimated 5000 catalog entries, is presently being processed and analyzed at the UCSB Department of Anthropology.

Project Name: Santa Cruz Island Project—Column Sampling and Radiocarbon Dating of Coastal Sites

Principal Investigator: Albert C. Spaulding and Michael A. Glassow

Institutional Sponsor: UCSB Department of Anthropology (funded by the National Science Foundation)

Dates of Fieldwork: Several days in the 1973 season and intermittently in the 1974 season, plus September 20 to 23, 1974.

Published and Unpublished Mss.: Spaulding and Glassow 1972. (Reports in progress.) The radiocarbon dates will be published by R. E. Taylor of U. C. Riverside. All field records are on file at the UCSB Department of Anthropology.

Location of Fieldwork: Fourteen coastal or near-coastal sites on the northern, western, and southern coasts of the island. **Theoretical and Empirical Goals of Research**: Column and radiocarbon samples were obtained in order to derive a dated sequence of change in the proportions of different fish species exploited throughout the prehistory of the island. These data are deemed relevant to testing a series of hypotheses having to do with the relationship between population growth and change in subsistence.

Types of Data Collected: Vertical 25 x 25 em. or 30 x 30 em. column samples were obtained from cuts made into eroded cross-sections of site deposits or in a few cases into the sides of excavated test pits.

Site Nos. or Locations from which Data Were Collected:

UCSB Site No.	Location	No. Columns
277	North coast near west end	1
195	Near Forneys Cove	2
236	Christi Beach	2
191	Christi Beach at mouth of Canada Cervada	4
145	Mouth of canyon just south of Canada de los Sauces	2
146	Same as above, next terrace up	2

UCSB Site No.	Location	No. Columns
292	Morse Point	2
192	Morse (Johnson's) Landing	2
109	Punta Arena	2
127	Just east of Punta Arena	1
1	Coches Prietos Anchorage	1
240	Prisoners Harbor Mound (50 x 50 cm column)	1
369	Ridge between the two Twin Harbors Drainages	1
363	Same as above, farther from coast	1

Person-Days and Crew Size: 50 person-days spent altogether.

Data Collection Procedures: The sites selected for column and radiocarbon sampling were coastal sites occurring in nearly all of the drainages selected for survey that occur on the coast. Usually but no always the sites selected had exposed faces of site deposits resulting from some form of erosion. An attempt was made to select a series of sites representing differing coastal environmental situations and appearing to represent relatively long prehistories. The column samples were divided into stratigraphic units which were in turn divided into arbitrary units if *over* about 25 cm thick. Charcoal or shell samples were collected for radiocarbon dating from distinct, comparatively narrow strata. Each stratigraphic unit of the columns was screened one-eighth mesh in the field, and all screenings were bagged. Each column was drawn to scale in order to record stratigraphic divisions and photographed with 35 mm. color slide film.

Significant Descriptive and Theoretical Conclusions of the Research: Analysis is still underway. The radiocarbon dating, being undertaken at the laboratory at U.C. Riverside, is partially complete and indicates a prehistoric sequence starting at least by 4700 B.C.

Nature of the Archaeological Collections: The column samples are being separated into constituents, all of which are being retained for the time being at the UCSB Department of Anthropology. The bone will be permanently curated.

Project Name: Santa Cruz Island Project—Test Excavations in the Late Components of UCSB-SCrI-328

Principal Investigator: Albert C. Spaulding and Michael A. Glassow (This aspect of the project was directed in the field by Stephen H. Horn.)

Institutional Sponsor: UCSB Department of Anthropology (funded by the National Science Foundation).

Dates of Fieldwork: June 24 to August 23, 1974

Published and Unpublished Mss.: Spaulding and Glassow 1972. Horne is basing his doctoral dissertation on this aspect of the research. Field records are on file at the UCSB Department of

Anthropology.

Location of Fieldwork: Site near Forneys Cove. That portion of the site in which glass trade beads were found was the focus of the excavation.

Theoretical and Empirical Goals of Research: Horne is studying the adaptive changes that occurred among the Chumash in the protohistoric-historic period (ca. 1542-1815) as a result of depopulation. His objective was to obtain from the historic components of the site samples of faunal remains that would reflect, among other things, changes in fishing strategies.

Types of Data Collected: Column and control pit samples from which artifacts and faunal remains may be extracted.

Site Nos. or Locations from which Data Were Collected: UCSB-SCrI-328 (this may be UCB-SCrI-13).

Person-Days and Crew Size: The crew ranged from two to four (including Horne) for approximately 30 working days. The total labor days is approximately 75.

Data Collection Procedures: 50-em-wide trenches were excavated to an approximate depth of 50 cm through the margins of house depressions previously determined to be post-contact by the presence of glass beads. Trench locations were selected using a probability sampling design. The trench allowed strata to be defined and undisturbed areas to be located. The column samples and control pits were excavated out from the sides of the trenches in relatively thin levels—5 to 15 em. thick. Deposits of the column and control samples were screened oneeight mesh, and screenings from the column samples were retained for later sorting in the laboratory. Maps were made to the portions of the site excavated and of the excavations themselves.

Significant Descriptive and Theoretical Conclusions of the Research: The collections are still being processed, and the analysis is underway. Horne located one of the historic villages on the island, which is probably one of the named villages on Henshaw's list, although which one is open to question.

Nature of the Collections: All artifacts, flakes, and animal bone are being sorted out from the samples. These will be retained after analysis. However, the large quantities of shell will eventually be discarded. The rest of the collection will be housed by the UCSB Department of Anthropology.

SANTA ROSA ISLAND PROJECTS

Project Name: Bowers' Excavations on Santa Rosa Island

Principal Investigator: Stephen Bowers

Institutional Sponsor: Smithsonian Institution

Dates of Fieldwork: 1877

Published and Unpublished Mss.: Bowers 1878. There may be other records of Bowers' work at the Smithsonian Institution, but this was not verified.

Location of Fieldwork: Locations of excavations on the island are unknown.

Theoretical and Empirical Goals of Research: Bowers was apparently interested in determining what kinds of artifacts sites on the island might yield. Although he had peripheral associations with scientific institutions such as the Smithsonian Institution, Bowers is notorious **in** the history of archaeology of the Santa Barbara Channel as a pothunter who often sold artifacts from the region to collectors.

Types of Data Collected: Artifacts from cemeteries and houses

Site Nos. or Locations from which Data Were Collected: Unknown

Person-Days and Crew Size: Unknown; assisted by L. Yates

Data Collection Procedures: Unknown

Significant Descriptive and Theoretical Conclusions of the Research: None

Nature of the Archaeological Collections: Unknown. It may still exist, at least **in** part, at the Smithsonian Institution.

Project Name: Eisen's Excavations on Santa Rosa Island

Principal Investigator: Gustav Eisen

Institutional Sponsor: Koeniglich-Boehmischen Gesellschaft der Wissenschaften (Royal Bohemian Society of Sciences in Prague)

Dates of Fieldwork: 1873 and/or 1897

Published and Unpublished Mss.: Eisen 1904. The location of any field records associated with this project is unknown.

Location of Fieldwork: At a coastal site on the northwestern shore of the island.

Theoretical and Empirical Goals of Research: Eisen appears to have been interested in obtaining a sample of prehistoric human skeletons from the island.

Types of Data Collected: An unknown number of skeletons from burials located "within a space

of not over twenty feet square." The total number of skeletons probably did not exceed 50. Eisen kept the individual skeletons separated whenever possible. He claims to have found no artifacts associated with the burials. **Site Nos. or Locations from which Data Were Collected**: The location of the site is unknown. Eisen mentions that the site is "about four miles from the harbor facing Santa Cruz. The heap from which the bones were taken was situated about 200 feet from the water or shoreline, and so high on a rocky ledge that the waves at no time could reach the place."

Person-Days and Crew Size: Unknown

Data Collection Procedures: Unknown

Significant Descriptive and Theoretical Conclusions of the Research: None

Nature of the Archaeological Collections: The collection presumably consisted exclusively of human bones. Its present deposition is unknown.

Project Name: Jones' Excavations on Santa Rosa Island

Principal Investigator: Philip Mills Jones

Institutional Sponsor: U. C. Berkeley Department of Anthropology. The project was financed by Mrs. Phoebe A. Hearst.

Dates of Fieldwork: February l8-May 1, 1901 (the ending date is questionable).

Published and Unpublished Mss.: Heizer and Elsasser 1956. All field records and photographs associated with the collection are housed in the U.C. Berkeley Lowie Museum.

Location of Fieldwork: Sites scattered over most sectors of the island.

Theoretical and Empirical Goals of Research: The objective of the excavations appears simply to have been the acquisition of an artifact collection from the island.

Types of Data Collected: Human crania, artifacts from excavations and surface collections, and a few animal bones. The human bones and artifacts are not provenienced to individual burials in the field records or catalog.

Site Nos. or Locations from which Data Were Collected: UCB-SRI-6, 20, 22, 24, 31, 34, 40, 50, 60, 76, 78, 114, 147, 154, and 156. These are the same numbers assigned by Orr to the sites.

Person-Days and Crew Size: Site reconnaissance: about 15 days with one to three people for a total of about 30 person-days; excavation: 38 days with two to three people for a total of about 95 person-days.

Data Collection Procedures: Jones concentrated his efforts in cemetery excavations; he would apparently excavate at a site so long as burials with association continued to be found. Excavation was carried out with shovel and garden trowel. Care was taken in exposing intact burials. The reconnaissance over much of the island's area was done on horseback and on foot. His coverage was not systematic.

Significant Descriptive and Theoretical Conclusions of the Research: Jones demonstrated that there are abundant archaeological resources on the island.

Nature of the Archaeological Collections: Jones' collections consist primarily of obvious artifacts of which a substantial number are shell and bone beads and ornaments. The collections are described and illustrated by Heizer and Elsasser. Crania and a few postcranial bones appear to have come from somewhat over 100 individuals. All of the collections are housed by the U.C. Berkeley Lowie Museum.

Project Name: Rogers' First Reconnaissance of Santa Rosa Island

Principal Investigator: David Banks Rogers

Institutional Sponsor: Santa Barbara Museum of Natural History

Dates of Fieldwork: March 25-26, 1927

Published and Unpublished Mss.: Rogers 1929, fieldnotes on file at the Santa Barbara Museum of Natural History.

Location of Fieldwork: A limited area of the island.

Theoretical and Empirical Goals of Research: Rogers was apparently prospecting for sites to excavate during the forthcoming summer.

Types of Data Collected: Commentary on the surface characteristics of sites. He mentions that he encountered a stone grave marker at one site, which he removed and then exposed a burial through a limited excavation. He did not remove it, and instead refilled his pit and replaced the marker.

Site Nos. or Locations from which Data Were Collected: Unknown

Person-Days and Crew Size: One full day. He was accompanied by two other people.

Data Collection Procedures: Casual reconnaissance on foot.

Nature of the Archaeological Collections: Rogers apparently made no collections.

Project Name: Rogers' Second Reconnaissance of Santa Rosa Island

Principal Investigator: David Banks Rogers

Institutional Sponsor: Santa Barbara Museum of Natural History

Dates of Fieldwork: April 12, 1927

Published and Unpublished Mss.: Rogers 1929, fieldnotes are on file at the Santa Barbara Museum of Natural History.

Location of Fieldwork: Skunk Point and East Point area of the island.

Theoretical and Empirical Goals of Research: Rogers apparently was prospecting for sites to excavate during the forthcoming summer.

Types of Data Collected: Brief commentary on the surface characteristics and locations of sites. However, he did not plot sites on any map on file at the museum, the only record being a small-scale map published in this book. He may also have made surface collections.

Site Nos. or Locations from which Data Were Collected: Unknown

Person-Days and Crew Size: Less than one day was spent in reconnaissance.

Data Collection Procedures: Casual survey on foot.

Significant Descriptive and Theoretical Conclusions of the Research: None

Nature of the Archaeological Collections: No collections from the island housed by the Santa Barbara Museum of Natural History can definitely be associated with this survey.

Project Name: Rogers' Excavations on Santa Rosa Island (see also Table 5)

Principal Investigator: David Banks Rogers

Institutional Sponsor: Santa Barbara Museum of Natural History

Dates of Fieldwork: August 3-28, 1927

Published and Unpublished Mss.: Rogers 1929, fieldnotes on file at the Santa Barbara Museum of Natural History. Reference to Rogers' excavations is also made in Orr 1968.

Location of Fieldwork: Five sites, three of which are on the coast at Beechers Bay and two on the southeast coast (see Table 5).

Theoretical and Empirical Goals of Research: These excavations were part of Rogers' overall investigations on the northern Channel Islands (primarily Santa Cruz and Santa Rosa Islands). Since he made only minimal attempts to establish a chronology for the island, it appears that his objectives in carrying out the excavations were to determine the nature of the archaeological record on the island.

Types of Data Collected: Rogers was primarily interested in cemetery excavations, and he collected the artifacts associated with burials along with human crania and a few postcranial bones.

There are no maps of the sites excavated nor of his excavation units. There are a few photographs associated with the collections at the museum.

Table 5: ROGERS' EXCAVATIONS ON SANTA ROSA ISLAND IN 1927

Site Location	SBMNH No.	Pages in Rogers 1929	Dates of Excavation	Est. Person Days	No. Catalog Cards at SBMNH	Extent of Excavation
South side of mouth of Ranch House Creek	131.60	326	Aug. 3-9 and 11-24. Rogers absent Aug. 11-24.		60	Apparently small-scale excavation; several burials encountered.
North side of mouth of Ranch House Creek	131.60	326 - 328		40		Extensive excavations at 3 cemeteries; bulk of time spent at this site.
1/4 mi. east of mouth of Water Canyon	131.61	329	Aug. 9-11		12	Excavations in cemetery; "numerous skeletons" encountered.
North margin of Johnson's Lee	131.62	331 - 332	Aug. 24-26	9	14	Extensive excavations in cemetery; also encountered house remains in other areas of site.
3/4 mi. east of Johnson's Lee	131.63	332	Aug. 27-28	6	None	Cemetery excavation.

Site Nos. or Locations from which Data Were Collected: See Table 5. These numbers were assigned by Orr and were also adopted by U.C. Berkeley Archaeological Research Facility.

Data Collection Procedures: The excavations did not significantly differ from others undertaken by Rogers. Shovels and smaller hand tools were apparently used, and a small amount of screening was probably done. The excavations were restricted primarily to areas of sites where cemeteries were located.

Significant Descriptive and Theoretical Conclusions of the Research: Rogers demonstrated that the island was occupied at least as intensively as Santa Cruz Island. He also found that the island occupants' culture did not differ significantly from that of the mainland, although he asserts that "village life of the islanders was much less highly organized than was that of the mainland Canalino." He also asserts that there is no significant cultural change represented in what he excavated on the Channel Islands.

Nature of the Archaeological Collections: The collections consist of shell beads and ornaments, bone artifacts, ground and chipped stone artifacts, seagrass matting, human crania, and a few human postcrania1 bones. The collection is catalogued by site, and with some difficulty it may be possible to determine from catalog information which artifacts pertain to at least some of the burials. The collections are housed by the museum.

Project Name: Edwards' Expedition to Santa Rosa Island

Principal Investigator: H. Arden Edwards

Institutional Sponsor: Southwest Museum?

Dates of Fieldwork: Latter part of July, 1933

Published and Unpublished Mss.: Edwards 1956 (this is a transcription of Edwards' short journal found in a small notebook in the Southwest Museum).

Location of Fieldwork: A site at "Green Harbor" (Canada Verde?) and another at "Beechers Harbor" (Beechers Bay).

Theoretical and Empirical Goals of Research: Presumably to collect artifacts for museum collections.

Types of Data Collected: A couple dozen artifacts apparently collected from the surface of the site at Beechers Bay and possibly a large artifact collection from a cemetery excavation at the "Green Harbor" site.

Site Nos. or Locations from which Data Were Collected: The UCLA Archaeologica1 Survey identifies the "Beechers Harbor" site as Orr's site 131.155, which is more specifically located at Skunk Point. The "Green Harbor" site is possibly Orr's site 131.40, at the mouth of Canada Verde.

Person-Days and Crew Size: Edwards mentions working with three other people. The number of days of excavation is unknown—perhaps several.

Data Collection Procedures: Unknown. There appear to be no other records beyond the short journal pertaining to Edwards' work.

Nature of the Archaeological Collections: Unknown. It may no longer exist.

Project Name: Woodward's Excavations in the Skunk Point Area

Principal Investigator: Arthur Woodward

Institutional Sponsor: Los Angeles County Museum

Dates of Fieldwork: November 25- December 14, 1941

Published and Unpublished Mss.: Reference is made to Woodward's excavations in a manuscript by Phil Orr on file at the Santa Barbara Museum of Natural History. A short summary of the expedition is presented by Comstock, 1946.

Location of Fieldwork: Excavation on bluff above sea about three miles east of ranch house at Beechers Bay. Other sites on north side of island were surface collected.

Theoretical and Empirical Goals of Research: The stated objective was "to excavate an Indian site and make further exploratory samplings" in the context of the museum's Channel Island Biological Survey.

Types of Data Collected: Artifacts and perhaps faunal remains from a midden excavation.

Site Nos. or Locations from which Data Were Collected: Designated site 5E.

Person-Days and Crew Size: Crew of two to five (?) for about 17 days.

Data Collection Procedures: No details given.

Significant Descriptive and Theoretical Conclusions of the Research: The summary mentions finding a site with abundant byproducts of bead manufacture. **Nature of the Archaeological Collections**: Unknown. Rozaire did not mention the existence of a collection pertaining to this project at the Los Angeles County Museum in our conversations.

Project Name: Orr's Excavations on Santa Rosa Island

Principal Investigator: Phil C. Orr

Institutional Sponsor: Santa Barbara Museum of Natural History

Dates of Fieldwork: Intermittently during 21 years beginning in 1947 (about 20 expeditions altogether).

Published and Unpublished Mss.: Orr 1968, 1951, 1962a, 1962b, 1964, Orr and Berger 1966, Berger and Orr 1966. In addition, a large number of manuscripts that are either field reports or earlier versions of his publication are on file at the museum, and brief summaries of most of his expeditions are published in the Museum's Museum Talk. His fieldnotes are also on file at the museum.

Location of Fieldwork: Most of Orr's Excavations were centered in the northwestern sector of the island, although limited excavations were undertaken at many other spots on the island.

Through the years he also undertook surveys which eventually ranged over most of the island's area.

Theoretical and Empirical Goals of Research: Orr was attempting to establish a complete chronology for the prehistory of the island as well as to discover the nature of cultural changes through the island's prehistory. One of his particular objectives was to demonstrate that human occupation extended back to ca. 30,000 B.P. and was associated with "fire areas" and the exploitation of dwarf mammoths.

Types of Data Collected: See following list of projects for details. Generally speaking, most of Orr's excavations were in cemetery areas, and the bulk of the artifact collections are burial associations. Orr tended to collect only the crania from the human skeletons in the cemeteries. A large photographic collection is associated with Orr's island work, numbering close to 1000 photographs.

Person-Days and Crew Size: There is generally little information available on the duration of each of Orr's projects on the island, although this could be reconstructed for a few of the projects for which journals exist. Orr apparently worked with a comparatively small crew at all times—no more than several individuals.

Data Collection Procedures: See following list of projects for details. Cemeteries were excavated with hand tools, although occasionally overburden would be removed using a jeep with a blade attached to its front. Orr normally numbered each discrete burial in a cemetery and recorded which artifacts were associated with each burial in his artifact cataloging. Moreover, he usually mapped the locations of burials to scale on graph paper. Individual descriptions of each burial from the larger cemeteries exist in his fieldnotes. However, Orr did not always produce a site map showing the location of his excavations within the area of the site.

Significant Descriptive and Theoretical Conclusions of the Research: Orr argues that the island was occupied by human populations as early as 30,000 years ago based on alleged associations between "fire areas," burned and broken dwarf mammal bones, and stone and bone artifacts. Orr also documented a prehistory less controversial in nature starting ca. 7000 years ago and extending up into the historic period. He divides this prehistory into four periods. Orr's radiocarbon dated sequence is the first for the Channel Islands.

Individual Descriptions of Orr's Projects:

SBMNH Site No.: 131. 1

Geographic Location: "Garanon Point," on the west side of the mouth of Canada Garanon

Pages in Orr 1968: 143-144

Dates of Fieldwork: 1947, 50, and 51.

Types of Data Collected: 224 artifacts associated with one burial.

Data Collection Procedures: Very limited excavation of one burial exposed by wind erosion

Orr's Chronological Placement: Early Dune

SBMNH Site No.: 131.2

Geographic Location: "Skull Gulch," on both si des of an arroyo mouth midway between Canadas Teco1ote and Garanon

Locality within Site: Cemetery "A"

Pages in Orr 1968: 191-196

Dates of Fieldwork: 1948, 1950

Types of Data Collected: 65,646 total artifacts, most of which are shell beads. 40,000 olive11a disc beads were recovered from a 8 x 8-foot plot screened to 1/16 inch. Artifacts associated with 26 burials. A map showing burial locations was found in the fie1dnotes.

Data Collection Procedures: Broad area exposure; overburden removed with shovel; cemetery excavated with trowel and broom; all deposit screened to 1/16 inch, however only the screenings from a 8 x 8-foot plot (130 cu. ft.) were sorted through for artifacts.

Orr's Chronological Placement: Canalino

SBMNH Site No.: 131.2

Locality within Site: Cemetery "B" (Site II)

Pages in Orr 1968: 196-210

Dates of Fieldwork: 1951 and 1952

Types of Data Collected: Two closely adjoining cemeteries: the older cemetery contained 26 burials and one radiocarbon date was obtained. The newer cemetery contained 83 burials and reburials and 17,000 total artifacts, most of which were beads. There is a topographic plan of the whole cemetery published in Orr 1968.

Data Collection Procedures: 8 x 150-foot trench excavated in part with a blade attached to a jeep to a maximum depth of 8 feet. This excavation was expanded by hand to expose both areas of the cemetery.

Orr's Chronological Placement: Cana1ino

SBMNH Site No.: 131.2

Locality within Site: Area of house depressions (Site II)

Pages in Orr 1968: 210-218

Dates of Fieldwork: 1949, 50, and 51

Types of Data Collected: Floor plans of two house floors that were completely excavated (nos. 1 and 3). No.1 yielded 330 artifacts and one radiocarbon date; no. 3 yielded 883 artifacts and another radiocarbon date. Collections are also obtained from several other houses that were tested only. There is a site map of the excavations in the fje1dnotes showing most of the excavation units mentioned in Orr 1968.

Data Collection Procedures: Area excavations to expose two completely excavated house floors. Otherwise test trenches were cut through house depressions.

Orr's Chronological Placement: Canalino

SBMNH Site No.: 131.3

Geographic Location: "Tecolote Point,: a small promontory covered with dune deposits

Locality within Site: Cemetery "A"

Pages in Orr 1968: 115-129

Dates of Fieldwork: 1949, 50, and 51

Types of Data Collected: 79 burials, 374 artifacts, and 7 radiocarbon dates. A map showing burial locations was encountered among the fieldnotes.

Data Collection Procedures: Area exposure of cemetery.

Orr's Chronological Placement: Early Dune

SBMNH Site No.: 131.3

Locality within Site: Midden above Cemetery "A"

Pages in Orr 1968: 131

Dates of Fieldwork: ca. 1950

Types of Data Collected: 23 artifacts

Data Collection Procedures: Midden removed in levels with the blade attached to a jeep. Several test pits also excavated by hand.

Orr's Chronological Placement: Early Dune

SBMNH Site No.: 131.3

Locality within Site: Cemetery B

Pages in Orr 1968: 130

Dates of Fieldwork: ca. 1950

Types of Data Collected: Small number of burials disturbed by the elements, 323 shell artifacts and some bone artifacts.

Data Collection Procedures: 2 x 20-foot trench presumably excavated with hand tools.

Orr's Chronological Placement: Early Dune

SBMNH Site No.: 131.4

Geographic Location: "Arlington Dunes," 350 yards up Arlington Canyon from mouth

Locality within Site: Cemetery A

Pages in Orr 1968: 147

Dates of Fieldwork: 1947 and 1960

Types of Data Collected: Descriptions of two intact and one disturbed burial exposed by the elements.

Data Collection Procedures: No formal excavation, only salvage of exposed burials.

Orr's Chronological Placement: Early Dune

SBMNH Site No.: 131.4

Locality within Site: Cemetery B

Pages in Orr 1968: 146-149

Dates of Fieldwork: ca. 1950

Types of Data Collected: There is no indication of the number of burials observed, however, all were apparently disturbed. 1204 artifacts recovered, 1195 of which are shell. No map of the excavations or the cemetery found in fieldnotes, however an aerial photograph showing locations of cemeteries was located.

Data Collection Procedures: "Limited" excavation

Orr's Chronological Placement: Early Dune

SBMNH Site No.: 131.5

Geographic Location: "Survey Point," just east of Teco1ote Point

Locality within Site: Cemeteries A, B, C, D, and E

Pages in Orr 1968:. 135-143

Dates of Fieldwork: 1947, 48 and 49. Most of the work was done in 1949.

Types of Data Collected: Cemetery A: descriptions of 13 burials; fieldnotes contain a map showing burial locations; 4353 beads and ornaments, 13 bone and 8 stone artifacts associated with burials. Cemetery C: 4 burials. Cemetery 0: disturbed burials with no artifacts. Cemetery E: 1 burial with no artifacts. 75 artifacts came from the surface of the site. The fieldnotes contain a site map showing the locations of the cemeteries.

Data Collection Procedures: Area exposure of Cemetery A using hand tools. The other burials in the other cemeteries were apparently partly exposed by the elements.

Orr's Chronological Placement: Early Dune

SBMNH Site No.: 131.6

Geographic Location: "Arlington Point," on the east side of the mouth of Arlington Canyon.

Pages in Orr 1968: 144-145

Dates of Fieldwork: 1947,48, 51, and 52

Types of Data Collected: One burial, a few surface artifacts, and three radiocarbon dates collected from strata exposed on cliff face.

Data Collection Procedures: No excavation undertaken. The burial was exposed in a rutted trail.

Orr's Chronological Placement: Early Dune

SBMNH Site No.: 131.7

Geographic Location: "Orr's Camp," 1000 yds. west of 131.2

Pages in Orr 1968: 219-220

Dates of Fieldwork: 1948

Types of Data Collected: Only three artifacts collected

Data Collection Procedures: "A Series of 6-inch post holes" and "a few 5-foot test pits"

Orr's Chronological Placement: Late

SBMNH Site No. 131.9A

Geographic Location: "Arlington Cave," in the upper reaches of Arlington Canyon.

Pages in Orr 1968: 220-223

Dates of Fieldwork: 1952

Types of Data Collected: 13 burials and 145 shell, bone and stone artifacts. One radiocarbon date was obtained.

Data Collection Procedures: Area exposure using hand tools and electric hammer where sediments were highly compacted. No map of the site or locations of burials was located in the fieldnotes.

Orr's Chronological Placement: Late

SBMNH Site No.: 131.18

Geographic Location: On terrace between Canada Tecolote and Arlington Canyon, near site 131.66.

Pages in Orr 1968: 181

Dates of Fieldwork: Unknown

Types of Data Collected: No collection; no fieldnotes located.

Data Collection Procedures: "Preliminary excavation of a minor sort"

Orr's Chronological Placement: Highland

SBMNH Site No.: 131.24

Geographic Location: On low knoll near Smith Highway between Soledad Canyon and Canada Verde at 500 feet altitude

Pages in Orr 1968: 180-181

Dates of Fieldwork: November 1948

Types of Data Collected: 9 surface artifacts, 2 burials, and 420 associated shell artifacts. No map of the site or excavations found in the fieldnotes.

Data Collection Procedures: The burials were salvaged from an eroded area where they were exposed by the elements.

Orr's Chronological Placement: Highland

SBMNH Site No.: 131.40 (P.M. Jones' Camp 4, according to Orr)

Geographic Location: "Canada Verde Flats," on a terrace on east side of the mouth of Canada Verde

Pages in Orr 1968: 177-178

Dates of Fieldwork: N/A

Types of Data Collected: Description of the site and commentary on excavations by previous workers.

Data Collection Procedures: Surface observation only; no excavation

Orr's Chronological Placement: Early Dune (7) and Late. Orr follows Kroeber in believing that this site is the named Chumash village of Siliwihi.

SBMNH Site No.: 131.41

Geographic Location: "Canada Verde Dunes," on the west side of the mouth of Canada Verde

Locality within Site: Section I, or Cemetery A

Pages in Orr 1968: 149-171

Dates of Fieldwork: 1948-49 (9 burials removed), November 15–December 10, 1951 (the rest removed).

Types of Data Collected: 152 burials; about 17,000 artifacts of which 16,165 are shell, and of these about 14,000 are *Olivella* beads. A map showing locations of burials is in Orr 1968.

Data Collection Procedures: Area exposure, hand tools used.

Orr's Chronological Placement: Early Dune

SBMNH Site No.: 131.41

Locality within Site: Cemetery "X"

Pages in Orr 1968: 171-176

Dates of Fieldwork: 1961

Types of Data Collected: One burial weathering out of sand dune associated with 340 artifacts and two radiocarbon dates.

Data Collection Procedures: Salvage of only one burial, hand tools used.

Orr's Chronological Placement: Early Dune

SBMNH Site No.: 131.41

Locality within Site: Section II, Cemetery "C"

Pages in Orr 1968: 151, 176, 177

Dates of Fieldwork: 1951

Types of Data Collected: One skull and mandible associated with other skeletal fragments, no artifacts.

Data Collection Procedures: Salvage of the skeletal parts eroding out of a bank.

Orr's Chronological Placement: Late

SBMNH Site No.: 131.43

Geographic Location: "Fox," on a flat-topped ridge between Canada Tecolote and Arlington Canyon

Locality within Site: Midden area

Pages in Orr 1968: 181

Dates of Fieldwork: 1957

Types of Data Collected: "Relatively few artifacts," 4 small hearths

Data Collection Procedures: 8 three 5 x 5-foot pits screened to 1/8 inch; 8-foot transverse trench scraped down in l-inch increments with the blade attached to a jeep, with screening "a t random"; two radiocarbon dates obtained.

Orr's Chronological Placement: Highland

SBMNH Site No.: 131.43

Locality within Site: Cemetery "A", on southeast border of midden area

Pages in Orr 1968: 182-187

Types of Data Collected: 8 burials and 164 associated artifacts. No map of the site or the cemetery was found in the fieldnotes.

Data Collection Procedures: presumably excavation by hand tools.

Orr's Chronological Placement: Highland

SBMNH Site No.: 131.62

Geographic Location: "Johnson's Lee," on the south coast

Pages in Orr 1968: 224-229

Dates of Fieldwork: 1950

Types of Data Collected: 8 burials associated with about 116 artifacts

Data Collection Procedures: trench(es) excavated with hand tools

Orr's Chronological Placement: Late

SBMNH Site No.: 131.66

Geographic Location: between Canada Tecolote and Arlington Canyon on the 5-700-ft terrace

Pages in Orr 1968: 180, 181

Dates of Fieldwork: 1957

Types of Data Collected: One catalog card indicates small collection made.

Data Collection Procedures: Auger samples taken at 20-foot intervals along a baseline through the center of the site.

Orr's Chronological Placement: Highland

SBMNH Site No.: 131.70

Geographic Location: on 5-700-foot-terrace between Canada Tecolote and Arlington Canyon

Pages in Orr 1968: 181

Dates of Fieldwork: unknown

Types of Data Collected: Apparently no collection made

Data Collection Procedures: "preliminary excavations of a minor sort"

Orr's Chronological Placement: Highland

SBMNH Site No.: 131.85

Geographic Location: "Rancho Viejo," 400 yards east of China Point

Pages in Orr 1968: 236

Dates of Fieldwork: Some collection made in 1941, but radiocarbon samples were apparently

collected at a later date.

Types of Data Collected: One radiocarbon date

Data Collection Procedures: No excavation undertaken; the radiocarbon sample was apparently taken from an erosion bank

Orr's Chronological Placement: Late

SBMNH Site No.: 131.97

Geographic Location: "China Point," on east side of creek at China Camp

Pages in Orr 1968: 236

Dates of Fieldwork: Unknown

Types of Data Collected: 5 or 6 burials

Data Collection Procedures: "couple of test trenches" apparently excavated with hand tools

Orr's Chronological Placement: Late. Orr suspects that this is the named Chumash village of Nawani.

SBMNH Site No.: 131.98

Geographic Location: "China Annex," 400 yards east of China Point

Pages in Orr 1968: 236

Dates of Fieldwork: unknown

Types of Data Collected: surface observations only

Data Collection Procedures: No excavation

Orr's Chronological Placement: Late. Orr believes this site was occupied by populations expanding out from 131.97

SBMNH Site No.: 131.147 (apparently refers to a cluster of sites)

Geographic Location: "Canada Jolla Vieja," two miles up the canada from the ocean.

Pages in Orr 1968: 229-324

Dates of Fieldwork: 1950, 51

Types of Data Collected: Surface observations and commentary on Jones' work at sites in the locality. Two catalog cards indicate collections were made.

Data Collection Procedures: No excavation

Orr's Chronological Placement: Late, with strong possibility of very early components

SBMNH Site No.: 131.154 (apparently refers to a cluster of sites)

Geographic Location: "Wreck Canyon," one mile up Wreck Canyon from mouth.

Pages in Orr 1968: 234-235

Dates of Fieldwork: Unknown

Types of Data Collected: Surface observations and commentary on Jones' work at some of the sites in the locality.

Data Collection Procedures: No excavation

Orr's Chronological Placement: Late, with some possibility of earlier components.

SBMNH Site No.: 131.168

Geographic Location: "Mess Cave," facing south coast on slopes of Sierra Lopez at 412 feet altitude.

Pages in Orr 1968: 223-224

Dates of Fieldwork: Unknown

Types of Data Collected: About 50 artifacts of wood, stone, bone, shell, and plant fiber.

Data Collection Procedures: Unspecified. Apparently excavation.

Orr's Chronological Placement: Late. Orr estimates an antiquity of no more than 600 years.

SBMNH Site No.: 131.173

Geographic Location: "Arlington Springs," about 1300 feet up from mouth of Arlington Canyon on west bank.

Pages in Orr 1968: 87-92

Dates of Fieldwork: 1946 and intermittently thereafter.

Types of Data Collected: Uppermost stratum contained cemetery with 16 or 17 disturbed burials; apparently no artifact collection made from the cemetery. One radiocarbon date was obtained from shell midden associated with cemetery. Four human bones were obtained from a stratum about 37 feet below that of the cemetery that have been dated to 7350-11,300 B.P. by means of 7 radiocarbon samples from the stratum in which the bones were reportedly found. No artifacts were found in association.

Data Collection Procedures: The cemetery was exposed in an 8-footwide trench, which was apparently excavated with hand tools. The stratigraphic context of the bones, which were exposed by weathering, was established by making cuts into the side of the arroyo wall. No map of the cemetery was found.

Orr's Chronological Placement: Shell midden dates ca. 2000 B.P. Orr does not place either the cemetery or the deeply buried human bones in any specific time period.

Project Name: Santa Rosa Island Conference

Principal Investigator: Phil C. Orr and Fay-Cooper Cole

Institutional Sponsor: Santa Barbara Museum of Natural History

Dates of Fieldwork: 1960

Published and Unpublished Mss.: Mentioned in Orr 1968:89. A notebook with all correspondence and field notes pertaining to the conference is on file at the Santa Barbara Museum of Natural History.

Location of Fieldwork: No actual fieldwork was done. The conference members viewed the exposure at Arlington Springs.

Theoretical and Empirical Goals of Research: Orr wished to obtain the opinions of various researchers regarding the association between the human bones referred to as "Arlington Han" and Pleistocene deposits.

Types of Data Collected: Each participant provided written opinions that are on file at the museum.

Site Nos. or Locations from which Data Were Collected: The site is known as Arlington

Springs. The museum's number for this site is 131.173.

Person-Days and Crew Size: Twelve archaeologists, geologists, and geographers in addition to Orr.

Significant Descriptive and Theoretical Conclusions of the Research: The opinions of the scientists were mixed. Most were hesitant to accept the association but thought that further work should be done.

Nature of the Archeological Collections: No collection was made in the course of the conference, so far as is known.

SAN MIGUEL ISLAND PROJECTS

Project Name: Dall's Visit to San Miguel Island

Principal Investigator: William H. Dall

Institutional Sponsor: U. S. Coast Survey

Dates of Fieldwork: 1873-1874

Published and Unpublished Mss.: The visit is referred to by Holland (1963:144-145), Schumacher (1877:38), and Heye (1921:35). Field records pertaining to this visit are unknown.

Location of Fieldwork: The areas of the island where collections were made are unknown.

Theoretical and Empirical Goals of Research: Unknown. Dall was apparently one of the early scientific explorers that made archaeological collections simply because nothing was known about the archaeology of the region.

Types of Data Collected: Dall apparently made only surface collections of artifacts. He also acquired a collection obtained by W. G. W. Harford of the Coast Survey in 1872 and 1873. This was also probably a surface collection. Schumacher felt that Dall, among others, had already picked up the "best" artifacts.

Site Nos. or Locations from which Data Were Collected: Unknown.

Person-Days and Crew Size: Unknown

Data Collection Procedures: Casual surface collection.

Significant Descriptive and Theoretical Conclusions of the Research: None

Nature of the Archaeological Collections: The deposition of the collections is unknown.

Project Name: Schumacher's Excavations on San Miguel Island

Principal Investigator: Paul Schumacher

Institutional Sponsor: Smithsonian Institution

Dates of Fieldwork: May 5-9, 1875

Published and Unpublished Mss.: Schumacher 1877. No field records (beyond a packing list) or journal was discovered at the Smithsonian Institution.

Location of Fieldwork: At two or three sites half way between two springs on the west side of Cuyler Harbor and at a third site close by.

Theoretical and Empirical Goals of Research: Schumacher was undertaking research to determine the nature of the archaeology of the Santa Barbara Channel region. (He also undertook excavations on Santa Cruz Island and the mainland.) It also appears that a major objective was to obtain a museum collection of artifacts from this region.

Types of Data Collected: Artifact association with 250 burials from two cemeteries, each apparently occurring in a distinct site. Excavations were also undertaken at a third site that yielded few burials. Schumacher published a small-scale map of the island showing the locations of his excavations.

Site Nos. or Locations from which Data Were Collected: Since Rozaire and Kritzman recorded at least a dozen sites in the vicinity of Schumacher's excavations, no correlation with their numbers may be made without field checking. The U.C. Berkeley Archaeological Research Facility assigned the numbers SMI-27,28, and 29 to Schumacher's sites. These are not mapped, however. **Person-Days and Crew Size**: Four days were spent on the island. Schumacher worked with a crew of three hired men, making a total of 12 person-days.

Data Collection Procedures: Schumacher does not describe his excavation procedures in any detail; he does mention, however, that care was taken when burials were encountered. It is presumed that his excavations were very casual and lacked any kind of provenience controls. Schumacher also undertook a casual survey of the island, but his published map does not indicate the location of sites other than those at which he excavated.

Significant Descriptive and Theoretical Conclusions of the Research: Schumacher was the first person to report **in** publication the presence of archaeological resources on the island.

Nature of the Archaeological Collections: The collection contains primarily complete artifacts which are identified as pertaining to San Miguel Island with no indication of site or burial provenience. The collection includes chipped stone artifacts (presumably ground stone artifacts as well), shell and bone artifacts, and fragments of matting in which burials were wrapped. These

collections are stored at the Smithsonian Institution and are accessible to research. Some of the items of the original collection may have been lost or exchanged, however.

Project Name: The French Scientific Expedition to California

Principal Investigator: Leon de Cessac

Institutional Sponsor: The French Ministere de 1'Instruction pub1ique

Dates of Fieldwork: 1878

Published and Unpublished Mss.: Heizer (ed) 1951, Reich1en and Heizer 1964

Location of Fieldwork: Unknown

Theoretical and Empirical Goals of Research: Apparently simply the acquisition of artifact collection, although de Cessac mentions making a geological map and a natural history collection.

Types of Data Collected: Artifacts and human skeletal remains, probably from cemeteries.

Site Nos. or Locations from which Data Were Collected: Unknown.

Person-Days and Crew Size: Three weeks were spent on the island, although not all this time **in** archaeological investigations. The presence of any crew is unknown.

Data Collection Procedures: Unknown. Probably very casual excavation and surface collection.

Significant Descriptive and Theoretical Conclusions of the Research: The collection from the Channel Islands is still largely uncataloged. De Cessac mentions in his short report finding "chipped flint jasper arrowpoints ... skulls, some skeletons and isolated basins as well as very beautiful ornamants, numerous bone tools and an extremely interesting series of mortars ranging from the first rough draft to the perfect achievement." The collection, at least in part, is housed by the Musee de 1'Homme in Paris, France.

Project Name: Misc. Excavations on San Miguel Island by Yates, Bowers, Dreyfus, and Doran

Principal Investigators: Lorenzo Yates, Stephen Bowers, Louis G. Dreyfus, and E. L. Doran

Institutional Sponsor: Unknown, if any.

Dates of Fieldwork: Various times between 1875 and 1919.

Published and Unpublished Mss.: None. The work of these people is referred to by Holland

(1963) and Rozaire (1965). Yates' work is indicated by the presence of a small collection from the island attributed to him at the Santa Barbara Museum of Natural History.

Location of Fieldwork: Unknown locations on the island.

Theoretical and Empirical Goals of Research: Unknown. Some of this work may have been virtually looting.

Types of Data Collected: Unknown. Presumably artifacts and human bones.

Site Nos. or Locations from which Data Were Collected: Unknown.

Person-Days and Crew Size: Unknown.

Data Collection Procedures: Excavations and presumably also surface collections

Significant Descriptive and Theoretical Conclusions of the Research: None

Nature of the Archaeological Collections: The deposition of the various collections obtained by these various investigators is unknown, other than Yates' collection which is at the Santa Barbara Museum of Natural History.

Project Name: Mrs. Thea Heye Expedition

Principal Investigator: Ralph Glidden

Institutional Sponsor: Museum of the American Indian, Heye Foundation

Dates of Fieldwork: March 16 - October 2, 1919.

Published and Unpublished Mss.: Heye 1921

Location of Fieldwork: 23 sites scattered over most of the island's area.

Theoretical and Empirical Goals of Research: The objective appears to have been to obtain a large museum collection from a relatively unknown region.

Site Nos. or Locations from which Data Were Collected: Correlation with Rozaire and Kritzman's site numbers is impossible without field checking.

Types of Data Collected: Artifacts from cemeteries and possibly also human bones. 343 skeletons were unearthed altogether, ranging from 1 to 160 skeletons per site. A small map showing the locations of the sites on the island is published.

Person-Days and Crew Size: Glidden plus two others—presumab1y about 450-500 person-days

altogether.

Data Collection Procedures: The focus of the excavations was on cemeteries. No detail is given of excavation procedures; presumably they were relatively casual.

Significant Descriptive and Theoretical Conclusions of the Research: Glidden obtained the largest known collection of artifacts from the island. Their work demonstrates that prehistoric occupation on the island was extensive.

Nature of the Archaeological Collections: The number of artifacts in the collection probably is in the thousands. The collection includes ground and chipped stone tools, a wide variety of shell and bone artifacts, various perishable items, and apparently also human ske1etons—at least crania. The amount of provenience information associated with the collection is unknown. Also, the present condition of the collection at the Museum of the American Indian is unknown.

Project Name: Rogers' First Reconnaissance of San Miguel Island

Principal Investigator: David Banks Rogers

Institutional Sponsor: Santa Barbara Museum of Natural History

Dates of Fieldwork: March 24, 1927

Published and Unpublished Mss.: Rogers 1929:262-268. Field notes are on file at the museum.

Location of Fieldwork: Rogers (1929:262) claims to have walked around the whole periphery of the island.

Theoretical and Empirical Goals of Research: Rogers was apparently prospecting for sites to excavate in the forthcoming summer.

Types of Data Collected: Commentary on the surface characteristics and locations of archaeological sites. There is no map of the island showing his site locations on file at the museum. Some surface collections were made.

Site Nos. or Locations from which Data Were Collected: Rogers lumped large groups of sites together, claiming that there were about nine large areas of continuous distributions of surface debris (see published map in his book).

Person-Days and Crew Size: One full day.

Data Collection Procedures: Rogers apparently stayed relatively close to the coast. His survey seems to have been hurried and casual.

Significant Descriptive and Theoretical Conclusions of the Research: Rogers apparently

found this island uninviting with regard to his excavation plans.

Nature of the Archaeological Collections: A surface collection attributed to Rogers exists at the museum. Ten catalog cards pertain to the collection.

Project Name: Rogers' Second Reconnaissance of San Miguel Island

Principal Investigator: David Banks Rogers

Institutional Sponsor: Santa Barbara Museum of Natural History

Dates of Fieldwork: June 16, 1927

Published and Unpublished Mss.: Rogers 1929. Field notes are on file at the museum.

Location of Fieldwork: Along the north shore of the island from Cuyler Harbor east.

Theoretical and Empirical Goals of Research: Rogers was apparently completing the survey he started the previous March.

Types of Data Collected: Commentary on the surface characteristics and locations of sites. Some surface collections were apparently also made.

Site Nos. or Locations from which Data Were Collected: Unknown. See comment on this subject in description of first reconnaissance.

Person-Days and Crew Size: Rogers spent less than one day in the reconnaissance.

Data Collection Procedures: A casual and hurried foot survey.

Significant Descriptive and Theoretical Conclusions of the Research of Research: Rogers was apparently not too enthused over the archaeological resources of the island.

Nature of the Archaeological Collections: A small surface collection exists at the museum.

Project Name: Orr's Survey of San Miguel Island

Principal Investigator: Phil C. Orr

Institutional Sponsor: Santa Barbara Museum of Natural History

Dates of Fieldwork: July 1 and 2, 1950. (Perhaps a few more days were spent on the island in addition to these two.)

Published and Unpublished Mss.: Orr's survey was identified by reference to the site records on file at the museum, copies of which (on U. C. forms) are on file at the U.C. Berkeley Archaeological Research Facility. No other field records of his survey could be located.

Locations of Fieldwork: Orr apparently ranged over most of the island's area.

Theoretical and Empirical Goals of Research: Orr apparently wished to inventory the sites on the island and compare them to those on Santa Rosa Island, where most of his research was being undertaken.

Types of Data Collected: Orr's site record forms contains descriptions of site locations and surface characteristics. Grid locations of the sites are given in terms of the old military grid system (not the UTM system). Surface collections were made. The presence and in some cases the positions of exposed burials are also noted.

Site Nos. or Locations from which Data Were Collected: Orr assigned the numbers 132.1 to 132.26 to the sites he located. The U.C. Berkeley Archaeological Research Facility adopted Orr's numbers (i.e., SMI-l to 26). Correlation with Rozaire and Kritzman's numbers assigned starting in 1964 is largely impossible without field checking. Correlation with Rozaire's and Rozaire and Schumacher's numbers assigned pri or to 1964 is also nearly impossible. The U.C. Berkeley Archaeological Research Facility correlates only the following numbers:

ARF and SBMNH	Rozaire, pre-1964
1	30
4	10
16	27
23	16 to 20

Person-Days and Crew Size: Orr was accompanied by at least two other individuals; they spent at least two days on the island.

Data Collection Procedures: Unknown. Apparently the crew was not on the island long enough to make a thorough survey. The intensity of coverage appears to be very light.

Significant Descriptive and Theoretical Conclusions of the Research: Orr demonstrated that more discrete sites existed on the island than the number mapped by Rogers.

Nature of the Archaeological Collections: Orr collected about 60 objects (20 catalog cards) from the following sites: 132.3, 4, 13, 15, 16, 19, 20, and 24. Objects include stone bowl fragments and shell and bone tools and ornaments. The collection is housed by the museum.

Project Name: Rozaire's Initial Survey of San Miguel Island

Principal Investigator: Charles Rozaire

Institutional Sponsor: Unknown

Dates of Fieldwork: April 17, 1962

Published and Unpublished Mss.: This survey is indicated by the presence of site records filled out by Rozaire on file at the U.C. Berkeley Archaeological Research Facility. (Rozaire did not bring up this survey in my interviews with him.)

Location of Fieldwork: Primarily on the northern promontory of the island.

Theoretical and Empirical Goals of Research: Rozaire apparently wished to inventory the sites on at least a portion of the island in terms of modern criteria for differentiating between sites.

Types of Data Collected: Rozaire filled out standard U.C. site record forms for ten sites. He also mapped their locations, apparently on 7.5' maps.

Site Nos. or Locations from which Data Were Collected: Rozaire numbered his sites SMI- 1 through 10. These are not the same numbers used either by the U.C. Berkeley Archaeological Research Facility or by Rozaire and Kritzman beginning in 1964. Rozaire's SMI-10 is UCB's SMI-10.

Person-Days and Crew Size: Apparently Rozaire worked by himself for one day.

Data Collection Procedures: His survey was undoubtedly on foot. The intensity of coverage is unknown.

Significant Descriptive and Theoretical Conclusions of the Research: This was apparently only a preliminary survey.

Nature of the Archaeological Collections: None made.

Project Name: Investigation of San Miguel Island

Principal Investigator: Paul Schumacher and Charles Rozaire

Institutional Sponsor: National Park Service

Dates of Fieldwork: August 21-27, 1963

Published and Unpublished Mss.: This survey is indicated by the presence of site record forms filled out by Schumacher and Rozaire on file at the U.C. Berkeley Archaeological Research Facility. It is also referenced in the summary of Channel Islands National Monument correspondence compiled by the National Park Service. (Rozaire did not mention this survey in my interviews with him.)

Location of Fieldwork: On the eastern half of the island.

Theoretical and Empirical Goals of Research: Schumacher and Rozaire were continuing the survey started by Rozaire in 1962. Their objective appears to have been a relatively thorough survey of the island.

Types of Data Collected: Rozaire and Schumacher filled out standard U.C. site record forms for each site and plotted their locations on a map—apparently a 7.5' map.

Site Nos. or Locations from which Data Were Collected: Rozaire and Schumacher numbered their sites SMI- 11 through 30. These were not the same numbers used by the U.C. Berkeley Archaeological Research Facility or by Rozaire and Kritzman beginning in 1964. The Berkeley and Rozaire-Schumacher site number concordance is as follows:

Berkeley	Rozaire-Schumacher
1	30
16	27
23	16 - 20
39	13
40	14
41	15
42	21
43	22
44	23
45	24
46	25
47	26
48	28
49	29
50	11
51	12

Person-Days and Crew Size: Apparently only Rozaire and Schumacher for six days for a total of 12 person-days.

Data Collection Procedures: The survey was presumably on foot. The intensity of coverage is unknown.

Significant Descriptive and Theoretical Conclusions of the Research: This was apparently a preliminary survey.

Nature of the Archaeological Collections: None made.

Project Name: Excavations at SMI-l

Principal Investigator: Charles E. Rozaire

Institutional Sponsor: Los Angeles County Museum of Natural History

Dates of Fieldwork: Summer 1964

Published and Unpublished Mss.: Rozaire 1965. All field records are on file with Rozaire at the Los Angeles County Museum of Natural History.

Location of Fieldwork: A site located near the abandoned ranch house in the eastern sector of the island.

Theoretical and Empirical Goals of Research: Rozaire selected this site to excavate since its undisturbed condition and relative depth appeared to enhance the potential that the site would yield information for constructing a chronology for the island. He also mentioned that logistical convenience was a factor.

Types of Data Collected: All artifacts, flakes and faunal remains excluding shell (which was collected in three microanalysis pits).

Site Nos. from which Data Were Collected: SMI-l. This site is the same SMI-l in the U.C. Berkeley Archaeological Research Facility records and the SMI-30 of Schumacher and Rozaire's 1963 survey. In other words, Rozaire abandoned his original designation for the site.

Person-Days and Crew Size: The project lasted four weeks. The crew averaged about 12 in number, making a total of approximately 290 person-days of excavation and related fieldwork.

Data Collection Procedures: A simple random sample of 69 5 x 5-ft. grids out of a total of 1500 in the sampling frame (6.9 percent) were excavated. Three of the grids in the sample were nonrandomly selected for microanalysis; the three pits represented a range in surface densities of midden debris. The grids were excavated in arbitrary six-inch levels, although the microanalysis grids were excavated in three-inch levels. All material collected was provenienced to pit and level. Shovel and trowel were used; all soil passed through quarterinch screens except that from the three microanalysis pits which was screened through eighth-inch screens. **Significant Descriptive and Theoretical Conclusions of the Research**: Rozaire states: "The impression is that the site represents a single, but long term, cultural horizon." The site may represent a terminal Middle Horizon occupation with a time span estimated to be 1500 to 2000 years.

Nature of the Archaeological Collections: Artifacts include ground stone, flaked stone, and bone and shell artifacts. The numer of artifacts in the coll~ction is 617. Unmodified flakes and unmodified bone were also retained and are abundant. The collection is housed by the Los Angeles County Museum of Natural History and is accessible for research. It is described in Rozaire 1965.

Project Name: San Miguel Island Survey (see attached map)

Principal Investigator: Charles E. Rozaire

Institutional Sponsor: Los Angeles County Museum (the project was funded by the National Park Service.)

Dates of Fieldwork: Intermittently between June 1964 and July 1966.

Published and Unpublished Mss.: Rozaire 1965 includes a section coverning the survey of the first 125 sites, Curtis 1965, Kritzman 1964. Daily journal, and site record forms are on file with Rozaire at the Los Angeles County Museum.

Location of Fieldwork: The portion of the survey reported in 1965 was in the vicinity of Cuyler Harbor only; the survey eventually covered the whole island.

Theoretical and Empirical Goals of Research: Rozaire was contracted by the NPS to produce an inventory of sites on the island. Beyond this, Rozaire appears to have been interested in finding sites that would yield chronological information.

Types of Data Collected: Descriptions of the surface characteristics and locations of sites were placed on conventional U.C. site record forms, and locations were plotted on 7.5' USGS maps. There is a collection of photographs associated with the survey. Surface collections were made from most sites.

Site Nos. or Locations from which Data Were Collected: SMI-l through 542. Rozaire and Kritzman abandoned all previous numbering systems, including that started by Rozaire in 1962.

Person-Days and Crew Size: The survey was done primarily by George Kritzman who worked alone about 25 percent of the time (often working 10-12 hour days) and usually with one other person the rest of the time. Eighty days were spent in the survey for a total of approximately 140 person-days altogether.

Data Collection Procedures: The survey was done on foot, and an attempt was made to cover all habitable land on the island. Details on how the ground was covered are not presently available. Toward the end of the survey when those portions of the island most distant from the ranch house were being covered, a Honda motor bike was used to go to and from the survey areas.

Significant Descriptive and Theoretical Conclusions of the Research: The survey demonstrates the relatively high density of sites on the island in terms of modern criteria for site differentiation. It also demonstrates the inadequacies of all previous surveys of this island and also the other islands.

Nature of the Archaeological Collections: The surface collection of artifacts includes usually one to several artifacts per site. Most of the collection consists of ground and chipped stone artifacts. It is housed at the Los Angeles County Museum of Natural History and is accessible for

study.

Project Name: Test Excavations at SMI-525

Principal Investigator: Charles E. Rozaire

Institutional Sponsor: Los Angeles County Museum of Natural History.

Dates of Fieldwork: April 17-21, 1967.

Published and Unpublished Mss.: No publications or reports have been prepared as yet. Field records and photographs are on file with Rozaire at the Los Angeles County Museum. **Location of Fieldwork**: On the north coast at the extreme western end of the island.

Theoretical and Empirical Goals of Research: Being a deep, stratified site (ca. 10 ft. thick deposits) and having a convenient exposure on a cliff edge, it was hoped that a reasonably long sequence could be established from the analysis of the sample obtained.

Types of Data Collected: All artifacts, faunal remains, and flakes, as well as stratigraphic information.

Site Nos. or Locations from which Data Were Collected: SMI-525, in the Rozaire and Kritzman numbering system.

Person-Days and Crew Size: Rozaire and two crew for a total of about 12 person-days.

Data Collection Procedures: The selection of the site depended on its realtive depth and convenience of its exposure. Two adjacent 5 x 5-ft. pits placed along the cliff edge were excavated to the maximum depth of the deposit. The levels varied in volume because of the irregular side of the cliff. Material was segregated according to pit and arbitrary six-inch levels. The deposit was excavated with shovel and trowel and all deposit was screened through quarter-inch screen. **Significant Descriptive and Theoretical Conclusions of the Research**: The excavation demonstrated that intact and deep deposits still exist on the island despite extensive erosion and looting. Results of the analysis are not yet available.

Nature of the Archaeological Collections: Over 100 artifacts and abundant faunal remains. The collection is housed at the Los Angeles County Museum of Natural History and is accessible for study.

Project Name: Excavations at SMI-261

Principal Investigator: Charles E. Rozaire

Institutional Sponsor: Los Angeles County Museum of Natural History

Dates of Fieldwork: August 17-30, 1967, and June 2l-July 1, 1968.

Published and Unpublished Mss.: No publications or reports are available yet. Field records and photographs are on file with Rozaire at the Los Angeles County Museum.

Location of Fieldwork: A rock shelter site overlooking the northeast coast just south of Bay Point.

Theoretical and Empirical Goals of Research: Rozaire wished to obtain a large collection from a shelter site, partly in hopes of finding perishable items such as woven seagrass.

Types of Data Collected: All artifacts, flakes, and faunal remains, as well as provenience information by pit and level. A map of the site was made.

Site Nos. or Locations from which Data Were Collected: SMI-26l, using Rozaire and Kritzman's numbering system.

Person-Days and Crew Size: Rozaire and three crew during both episodes of fieldwork.

Data Collection Procedures: A trench was dug through the apron of midden in front of the shelter, and nearly all of the shelter interior was excavated. Perhaps 30 percent of the total deposit was excavated, which equals about 12 5 x 5-ft. squares, including the trench. Each grid was excavated in six-inch levels with shovel and trowel. All deposit was quarter-inch screened.

Significant Descriptive and Theoretical Conclusions of the Research: The analysis of the collection is not yet completed. Apparently Rozaire did not find the amount of perishable materials that he had hoped.

Nature of the Archaeological Collections: Several hundred artifacts and abundant faunal remains. The collection is housed at the Los Angeles County Museum of Natural History and is accessible for research.

Project Name: San Miguel Island Field Conference

Principal Investigator: Donald Lee Johnson and Charles E. Rozaire

Institutional Sponsor: Los Angeles County Museum of Natural History (the project was funded by the National Science Foundation).

Dates of Fieldwork: November 17-20, 1969.

Published and Unpublished Mss.: A trip report and a final report to NSF, both written by D. L. Johnson, are on file at NPS and with Rozaire and Johnson.

Location of Fieldwork: Various sites on the island.

Theoretical and Empirical Goals of Research: The purpose of the conference was to obtain the opinions of scientists from various relevant disciplines on the observable evidence in the field concerning the relationship between supposedly burned dwarf mammoth bones and human intervention—in particular areas of burned earth and possible stone tools.

Types of Data Collected: The opinions of the scientists.

Site Nos. or Locations from which Data Were Collected: Various sites. Numbers not available.

Person-Days and Crew Size: A 15-member party of archaeologists, physical geographers, and geologists (including Fred Bohannon of NPS).

Data Collection Procedures: N/A

Significant Descriptive and Theoretical Conclusions of the Research of Research: The collective opinion of the invited scientists was that the evidence was not sufficient to be confident of an association between dwarf mammoths and human occupation.

Nature of the Archaeological Collections: N/A