

CA-SBA-2067: A BURIED MIDDLE HOLOCENE SITE ON THE WESTERN SANTA BARBARA COAST

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During pipeline construction in 1987, a Middle Holocene (3800-4300 RYBP) site was found buried beneath over 2 meters of alluvium in Gaviota Canyon. The site, which contained numerous burned rock features and a well preserved shell midden, provided valuable data about Middle Holocene environments and human subsistence in the area. In this paper, we summarize the available data from CA-SBA-2067 and briefly discuss the importance of buried sites in understanding cultural developments along the southern California Coast.

The archaeology of the southern California Coast has long focused on surface sites located on marine terraces, ridges, dunes, and stream terraces. It is increasingly apparent, however, that many archaeological sites lie buried in the sediments of coastal canyons where postglacial sea level rise has caused large amounts of alluvium to accumulate during the Holocene. In the mid-1980s, as archaeologists along the Santa Barbara Coast became increasingly aware of the potential for finding sites buried in canyon bottom landforms, a systematic search for such sites was built into some CRM projects. During studies related to Chevron's Point Arguello project along the western Santa Barbara Coast, nine buried sites ranging in age from an 8200 year old shell midden to an adobe occupied in the mid-1850s were found in five of the larger canyons in the Gaviota area (see Cooley 1992; Erlandson 1994, 1997; Erlandson *et al.* 1993). Here, we summarize the results of work at one of these sites, a Middle Holocene component at SBA-2067 found deeply buried on the floodplain near the mouth of Canada de la Gaviota.

SBA-2067 was first recorded as a historic site (SBA-2067H), when the foundations of a 19th-century adobe were uncovered by grading associated with the All American pipeline project. When All American drilled under the remnants of this adobe, rumors circulated that archaeological monitors had encountered Native American artifacts that were never reported, tested, or mitigated (Erlandson *et al.* 1993). A few weeks later as Chevron prepared to trench through an adjacent area, ERCE archaeologists tested the area and encountered the foundations of a second adobe structure, as well as a Native American site buried beneath about 1.5 to 2.5

m of alluvium (Erlandson *et al.* 1993). Ultimately, most of the site remnants were preserved by drilling beneath them, but features and midden deposits associated with both the adobe and the buried component were sampled during testing and mitigation excavations. The investigations provided valuable data on the archaeology and paleoecology of the area during the Middle Holocene.

SETTING, SITE STRUCTURE, AND CHRONOLOGY

Today, SBA-2067 is located about one km from the beach near the north end of a relatively broad floodplain at the mouth of Gaviota Canyon (Figure 1). The perennial Gaviota Creek now runs through an artificial channel cut through the eastern site area, but it appears to have been located just a short distance to the east prior to historic channelization. The site itself is located on a low stream terrace, the modern surface of which appears to have been approximately 6-8 m above sea level prior to grading. The elevation of the buried midden, therefore, appears to be just 4 to 6 m above modern sea level. Just north of the site, Gaviota Canyon narrows dramatically as it passes through a series of tilted and erosion resistant sandstone beds. These sandstone outcrops also form rocky ridges immediately northwest of the site, where shallow and stony soils support relatively dense stands of yucca (*Y. whipplei*). In many canyons in the area, these sandstone ridges also form rocky sills over which freshwater flows year-round, even in the dry season when many streams flow primarily underground through the sediments that have accumulated in the lower reaches of coastal canyons.

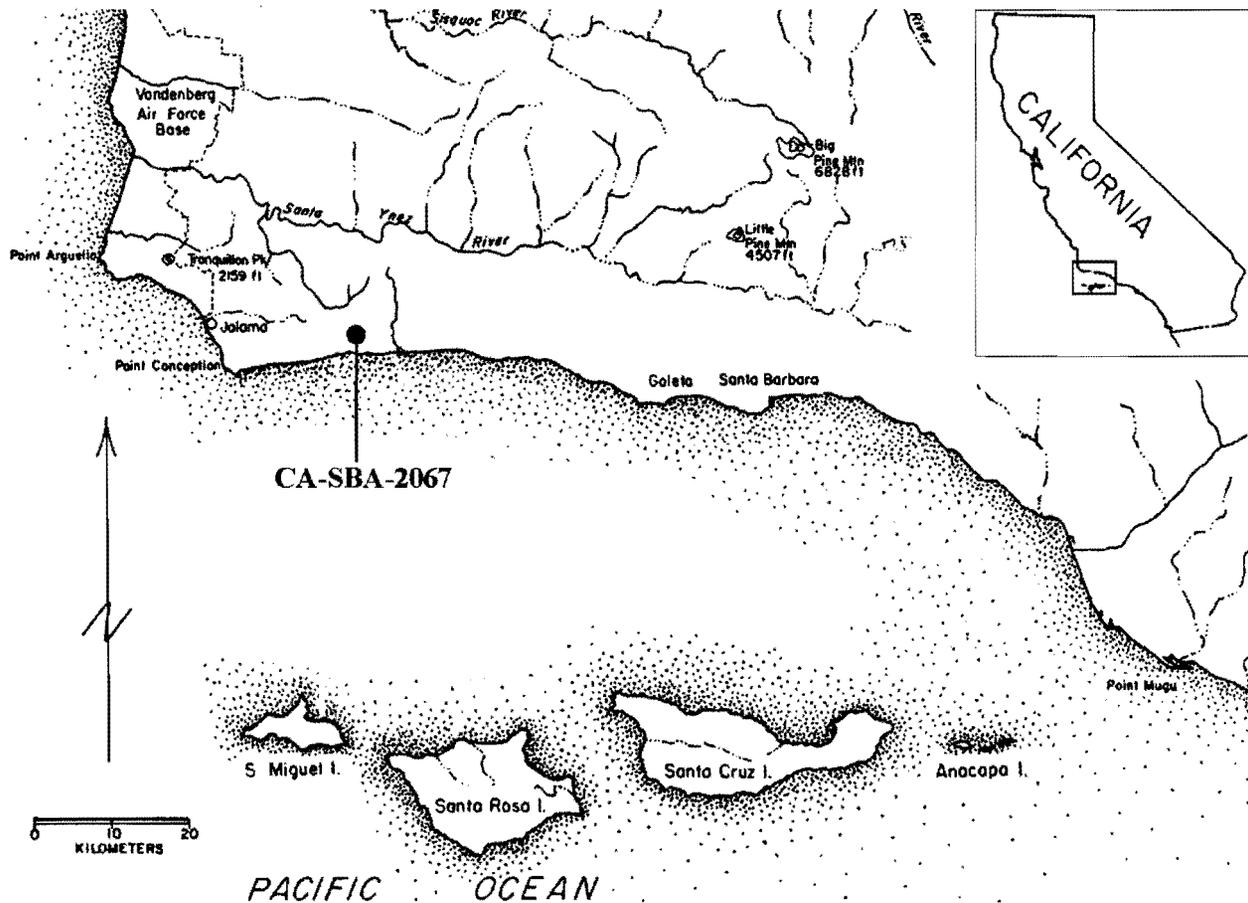


Figure 1: Location of CA-SBA-2067.

In all, 34 test units were excavated at SBA-2067, but many of these were used primarily to expose the boundaries of the adobe structure and did not extend into the buried Middle Holocene site deposits. Excavation of the buried component was also limited because work was restricted to direct impact areas within a 30 m (100 foot) wide right-of-way, the eastern site area was covered by Highway 101 or had been removed during the straightening of Gaviota Creek, reaching the buried component required elaborate shoring and the lower portions of the midden were often at or below the water table, and much of the site was eventually avoided by directional drilling below the site.

Within the right-of-way, buried archaeological materials were found in an area extending about 110 m east-west and at least 30 m north-south. In the western site area, the most visible archaeological remains were burned rock features and chipped stone artifacts, while near the eastern end of the site a well preserved shell midden was encountered.

Mechanical trenching and test pit excavations at SBA-2067 documented the presence of a variety of cultural materials buried under alluvium deposited on the Gaviota flood plain. Much of this Native American material was found in a 50-60 cm thick paleosol buried between 160-260 cm below the graded surface of the right-of-way. Prior to grading, this buried midden may have been located 2.5 m or more below the ground surface. In the buried shell midden soil, pH values ranged between about 7.2 and 8.1, essentially neutral or mildly alkaline readings that help explain the excellent preservation of faunal remains. The natural stratigraphy was truncated by grading throughout the tested right-of-way, but several deep test pits and backhoe trenches revealed a sequence of paleosols representing periods of relative stability punctuated by episodes of flooding and sedimentation. For the most part, evidence for stratigraphic mixing was limited within the intact strata, although some krotovina were visible in some strata and vertically oriented insect (cricket?) burrows were common in others. Many of the burned rock features encountered

at the site were found near the base or scattered through buried soil horizons, however, and contained little or no evidence for associated ash or charcoal concentrations, suggesting that they had been transported or altered by bioturbation (see Erlandson and Rockwell 1987; Johnson 1989).

Two ^{14}C dates are available for the buried component at SBA-2067. First, the well preserved shells of platform mussels (*Septifer bifurcatus*) from the shell midden in the eastern site area were dated to 3820 ± 100 RYBP (Beta-20410), with a calendar age (Stuiver and Reimer 1986) of 4050 cal BP and an age range (2 sigma) of 3750-4360 cal BP. Second, a large chunk of charcoal from the base of Feature 1 was dated to 4280 ± 80 RYBP (Beta-18608), with a calibrated calendar age of 4860 cal BP and an age range of 4620-5210 cal BP. These dates suggest that the occupation of the lower component at SBA-2067 may have spanned a period of 800 to 1200 years. The difference between the dates may be exaggerated by the "old wood" effect (see Schiffer 1986), however, in which the age of a charcoal sample reflects the growth of the

plant and not its use by humans. Given the stratigraphy of the site and the artifacts recovered, it seems most likely that most of this lower component dates between about 4000 and 4500 years ago. This ^{14}C chronology seems consistent with the few temporally diagnostic artifacts recovered from the buried component, including a contracting stem projectile point and obsidian hydration values ranging between 3.6 to 4.3 microns (see Cooley 1992; Erlandson *et al.* 1993).

FEATURES AND ARTIFACTS

One of the unusual aspects of the buried component at SBA-2067 was the relatively large number of burned rock features encountered during subsurface testing and trenching. At least 12 burned rock features were defined at the site, including several that were extensively excavated (Table 1). Most of these were relatively discrete clusters of burned rock, but they varied considerably in size and shape. Of the two features that were completely

Table 1: Buried Features from the Middle Holocene Component at CA-SBA-2067.
*Wt.=kg from >1/2-inch fraction.

Feature	Description	Burned Rock Wt.*	Percent Exposed
1	Burned rock cluster, 1.8 x 2.0 m wide, several layers thick; dated to ca. 4300 ± 80 RYBP; Yucca roasting pit?	523.0	100
4	Burned rock sheet dispersed over at least 4 x 4 m area; function uncertain.	>82.0	?
5	Small discrete cluster of 14 burned cobbles; hearth?	7.0	100
6	Probable dispersed hearth feature.	N/A	?
7	Low-density scatter of burned rock, probably a hearth; possible association with Features 14 and 15.	1.3	?
8	Low-density scatter of burned rock; hearth?	1.3	?
10	2 x 2 m basin-shaped burned rock concentration; probable Yucca roasting pit.	111.0	~75
11	Edge of burned rock feature; size and function unknown.	N/A	?
12	Probable hearth, only partially exposed.	1.4	?
13	Small burned rock scatter with 4 cobbles.	N/A	?
14	Burned rock ring, possibly two, probably hearths; a biface, debitage, and some bone and shell associated.	8.0	~75
15	Burned rock cluster about 80 x 100 cm wide; probable hearth.	3.1	~40

excavated, one (Feature 1) interpreted as a probable yucca roasting pit produced 523 kg of burned rock within an area less than 2 x 2 m wide. In contrast, Feature 5 consisted of 14 tightly clustered burned cobbles weighing a total of just 7 kg and probably represented a hearth. In all, 2 of the 12 features are probable yucca roasting ovens, six are probable hearths, and four were of uncertain function.

Other than chipped stone debitage, the artifact assemblage recovered from the site is limited in size and diversity. Four cores were recovered, two contracting stem point bases, several undiagnostic biface fragments, and two drill or borer fragments. A large leaf-shaped Monterey chert biface was recovered from disturbed sediments on the site surface, but it is unclear if this was associated with the lower component or low density archaeological deposits located in the upper soil horizons. The debitage recovered was dominated by local Monterey cherts, with only small amounts of other materials, including Franciscan chert, undifferentiated chert, quartzite, and obsidian. Four obsidian artifacts were geochemically analyzed by Richard Hughes to determine their source: three originated from the Sugarloaf area in the Coso Volcanic Field and the fourth was attributed to the Fish Springs source.

Just two clearly defined artifacts of shell and bone were recovered from the lower site component. The shell artifact was a disc bead made from red abalone (*Haliotis rufescens*) shell. The bone artifact was the distal end (tip) of a polished bone tool possibly used as a chipped stone flaker. Also recovered from the lower component, however, were several small fragments of purple olive (*Olivella biplicata*) shell, which may represent bead-making refuse, and an apparently unmodified volcano limpet (*Fissurella volcano*) shell that may have been used as a bead. It is also possible that the small amounts of abalone shell found at the site represent artifactual material rather than dietary refuse.

Also recovered in the lower component were three tarring pebbles, artifacts that were heated and swirled inside baskets with lumps of asphaltum to waterproof the baskets with a thin layer of tar. These appear to be at least roughly contemporary with some of the earliest examples of tarring pebbles or asphaltum basketry impressions found in the Santa Barbara Channel area (Connolly *et al.* 1995).

FAUNAL REMAINS AND SUBSISTENCE

The faunal remains from the Middle Holocene component at SBA-2067 include a variety of vertebrate

and shellfish remains, all recovered via wet-screening of excavated sediments over 1/8-inch mesh and sorting of the residuals under controlled laboratory conditions. Because the buried midden constituents were relatively well preserved and protected from extensive bioturbation, plowing, and other disturbances that tend to fragment faunal remains in surface sites, the assemblage is probably relatively representative despite the lack of analyzed 1/16-inch samples.

SHELLFISH

Shellfish remains from two 1 x 1 m wide test pits were analyzed in detail. These include approximately 2 kg of marine shell (Table 2) recovered primarily from a 60 cm thick shell midden stratum, although small amounts of shell were also found in sediments as much as 40-60 cm above this primary cultural stratum. The shellfish remains were remarkably well preserved, with numerous whole mussel valves and 97 percent of the assemblage identifiable to at least the family level. The remains of at least 16 different taxa were identified, a few of which are commonly found in estuaries or high energy sandy beach habitats. The shellfish assemblage is dominated, however, by species found in rocky outer coast habitats, which make up about 96 percent of the shell weight. Especially abundant were the mussels *Septifer bifurcatus* and *Mytilus californianus*, which make up about 54 percent and 37 percent of the assemblage, respectively. Chitons also make up about 3 percent of the assemblage.

Although not presented in Table 2, some vertical patterns in the distribution of the main shellfish taxa were evident within the midden (see Erlandson *et al.* 1993). California mussels and chitons tend to increase in comparison to *Septifer* in the upper levels of the midden, for instance, as does the percentage of undifferentiated shell. The higher percentage of unidentifiable shell in the upper levels may be due to variation in soil pH and differential weathering within the buried midden. The varying proportions of the other species, however, are probably related to the changing structure of local intertidal communities. Since *Septifer* and *Mytilus* are sometimes found in the same mussel beds along the western Santa Barbara Coast, the meaning of this pattern is not clear. *Septifer* may have been more abundant in mussel beds adjacent to SBA-2067, however, with shellfish gatherers traveling greater distances through time as local shellfish beds were depleted.

Although the two test units were located only a few meters apart, there were some notable differences in the abundance of the mussels and chitons between

the units. *Mytilus* makes up nearly 54 percent of the shell in Unit 4.5S/1E, for instance, but only about 33 percent of the shell in Unit 1S/1.5E, *Septifer* makes up about 28 percent and 61 percent in the same units, and chitons represent about 10 percent vs. 1 percent. These differences, along with the fact that one unit had nearly four times as much shell as the other, suggest that the buried midden at SBA-2067 is less homogeneous than many surface middens in the area which tend to be homogenized by rodent burrowing and other disturbance processes.

VERTEBRATES

Roughly 400 specimens (25.12 g) of mammal, bird, and fish bone were recovered from the lower component of Unit 4.5S/1E, and 14 specimens (0.35 g) from Unit 1S/1.5E (Table 3). Many specimens were

fragmented and unidentifiable to genus or species. These were identified to general categories of small fauna, medium/large mammal, large land mammal, sea mammal, fish, etc. (see Erlandson 1994:56-57). Many of the specimens were burned, with the highest percentages of burning found among the remains of turtle (85%), teleost fish (ca. 50%), land mammal (40%), undifferentiated small fauna (30-40%), and rabbit (13%).

Most of the identified bones were from mammals (82% by weight from Unit 4.5S/1E and 87 percent by weight from Unit 1S/1.5E), but most of these were highly fragmented and identifiable only to broad categories. The remains of squirrels, gophers, and mice showed little or no evidence of burning and are probably primarily of natural origin. Sea mammal bones are relatively rare, consisting of just two specimens (1.78 g) in the entire Middle Holocene

Table 2: Shellfish Remains in Two Test Units from a Middle Holocene Component at CA-SBA-2067.

Note: recovered in 1/8-inch mesh via water-screening.

Shellfish Taxon (Scientific&CommonName)	Unit 1S/1.5E		Unit 4.5S/1E		Totals	
	Wt.	%	Wt.	%	Wt	%
<i>Acmaea</i> sp. (limpet)	0.1	<0.1	—	—	0.1	<0.1
<i>Balanus</i> sp. (barnacle)	5.1	1.3	24.5	1.5	29.6	1.5
<i>Cryptochitonstelleri</i> (giant chiton)	34.3	8.7	—	—	34.3	1.7
<i>Diodora</i> sp. (limpet)	0.3	<0.1	—	—	0.3	<0.1
<i>Donaxgouldii</i> (bean clam)	0.5	0.1	—	—	0.5	<0.1
<i>Haliotis rufescens</i> (red abalone)	2.5	0.6	—	—	2.5	0.1
<i>Haliotis</i> sp. (abalone, undiff.)	—	—	2.3	0.1	2.3	0.1
<i>Mytilus californianus</i> (California mussel)	211.7	53.8	520.7	32.7	732.4	36.9
<i>Olivella biplicata</i> (purple olive)	2.3	0.6	0.5	<0.1	2.8	0.1
<i>Ostrea lurida</i> (Pacific oyster)	0.8	0.2	4.3	0.3	5.1	0.3
<i>Platyodon cancellatus</i> (boring clam)	1.0	0.3	—	—	1.0	0.1
<i>Pododesmus</i> sp. (rock oyster)	—	—	3.7	0.2	3.7	0.2
<i>Pollicipes polymerus</i> (gooseneck barnacle)	0.5	0.1	—	—	0.5	<0.1
<i>Protothaca staminea</i> (littleneck clam)	6.6	1.7	6.9	0.4	13.5	0.7
<i>Septifer bifurcatus</i> (platform mussel)	108.2	27.5	972.2	61.0	1080.4	54.4
<i>Tivela stultorum</i> (Pismo clam)	1.1	0.3	—	—	1.1	0.1
<i>Amphineura</i> (chiton, undiff.)	4.7	1.2	18.8	1.2	23.5	1.2
<i>Brachyura</i> (crab, undiff.)	0.1	<0.1	2.7	0.2	2.8	0.1
Pectenidae (scallop, undiff.)	0.1	<0.1	—	—	0.1	<0.1
Pholadidae (boring clam, undiff.)	0.4	0.1	2.2	0.1	2.6	0.1
Gastropoda (undiff. snail)	0.8	0.2	3.8	0.2	4.6	0.2
Mollusca (undiff. shell)	12.1	3.1	15.8	1.0	27.9	1.4
Pelecypoda (undiff. bivalve)	—	—	14.2	0.9	14.2	0.7
Total Weight	393.2		1592.6		1985.8	

assemblage. Notably, a 0.11 g bone fragment from a dog or coyote was recovered from the 220-240 cm level of Unit 4.

Most of the bird remains were not identifiable to specific taxa and many may be natural in origin. Three specimens identified as representing the extinct flightless duck, *Chendytes lawi*, however, were probably

brought to the site and consumed by people. Reptile remains, including snake and turtle, are also rare in the assemblage making up only about 1.2 percent by weight of the vertebrate remains in Unit 4.5S/1E.

Unlike a Late Holocene component at SBA-97 located near the mouth of Gaviota Canyon (Erlandson *et al.* 1992), fish remains are relatively rare at SBA-

Table 3. Vertebrate Fauna from Unit 4.5S/1E and Unit 1S/1.5E, CA-SBA-2067*.

*Note: recovered in 1/8-inch mesh via water-screening.

Taxon	Unit 4.5S/1E 160-280 cm				Unit 1 S/1.5E 200-260 cm			
	Wt.	%Wt.	NISP	%NISP	Wt.	%Wt.	NISP	%NISP
Teleost Fish	0.23	0.9	9	2.2	—	—	—	—
Sciaenidae (Croakers)	0.07	0.3	1	0.2	—	—	—	—
Sea Mammal	1.78	7.1	2	0.5	—	—	—	—
Bird Undif.	1.0	4.0	8	2.0	—	—	—	—
Extinct Flightless Duck	1.41	5.6	3	0.7	—	—	—	—
Deer Mouse	0.1	0.4	7	1.7	—	—	—	—
Ground Squirrel	0.1	0.4	1	0.2	—	—	—	—
Rabbit	3.27	13.0	27	6.7	—	—	—	—
Rodent	0.13	0.5	3	0.7	—	—	—	—
Small/Medium Land Mammal	0.05	0.2	1	0.2	—	—	—	—
Medium Land Mammal	1.52	6.1	5	1.2	—	—	—	—
Medium/Large Land Mammal	0.98	3.9	8	2.0	—	—	—	—
Large Mammal	0.95	3.8	1	0.2	—	—	—	—
Small Mammal	1.8	7.2	52	13.0	0.08	22.9	4	28.6
Medium/Large Mammal	1.72	6.8	8	2.0	0.07	20	1	7.1
Small Fauna	6.23	24.8	188	46.9	0.1	28.6	5	35.7
Undif. Mammal	2.04	8.1	42	10.5	0.06	17.1	3	21.4
Reptile	0.03	0.1	1	0.2	—	—	—	—
Snake	0.04	0.2	1	0.2	—	—	—	—
Turtle	0.23	0.9	4	1.0	—	—	—	—
Undif. Bone	1.44	5.7	29	7.2	0.04	11.4	1	7.1
Total	25.12	—	401	—	0.35	—	14	—

2067, attesting to the relatively specialized nature of the site. The lower component, however, contains the remains of at least three different teleost and elasmobranch taxa. In Unit 4.5S/1E only 9 teleost fish specimens and 1 croaker bone were recovered, and no fish remains were identified in Unit 1S/1.5E. The lower component of Unit 4 contains the remains of at least two sharks, one from the family Lamnidae (Mackerel shark) and one from the Carcharhinidae (Requiem shark) family. Sharks in these two families are relatively large and difficult to catch and would probably have required the use of boats, since they are rarely found close to shore.

DIETARY RECONSTRUCTION

Using the weight of the faunal remains recovered from the two test pits in the shell midden at SBA-2067, we estimated the approximate yields of edible meat represented by the faunal remains in the sample. These estimates, based on shell and bone-to-meat weight conversions (see Glassow and Wilcoxon 1988; Erlandson 1994), suggest that shellfish provided roughly 70 percent of the edible meat represented in our sample. Land mammals are the next most abundant vertebrate class (ca. 23 percent), followed by sea mammals (3.5 percent), birds (ca. 3.0 percent), and fish (<1 percent). Thus, while a variety of animals appear to have been harvested by the site occupants, mussels and other rocky shore shellfish seem to have dominated the site economy, probably complemented by plant foods poorly represented in the assemblage, and a variety of other animal resources.

SUMMARY AND CONCLUSIONS

SBA-2067, a buried residential midden deposited between about 4500 and 4000 years ago, probably represents a seasonal or other specialized site. Sealed under as much as 2.5 meters of alluvium, the site is unusually well preserved, with numerous intact rock features, excellent faunal preservation, and considerable evidence for intrasite variation in the distribution of various archaeological materials. The occupants appear to have focused heavily on the harvest of mussels and other rocky coast shellfish, combined with yucca and other plant and animal foods. The burned rock features – the remnants of both roasting pits and small hearths – were dispersed somewhat by bioturbation and lacked associated concentrations of ash and charred plant remains, but retained their essential spatial integrity. The artifacts recovered include a variety of stone tools and tool-making debris, including exotic obsidian that provides

evidence for participation in long distance trade networks.

The data from SBA-2067 provide additional evidence with which to reconstruct both local environments and human adaptations in the Gaviota area, which is known to have been occupied for at least the last 9000 years. Faunal assemblages from other sites in the area suggest that a substantial estuary was present at the mouth of Canada de la Gaviota during the Early Holocene and that by the Late Holocene little or no productive shellfish beds remained in the area. The shellfish from SBA-2067 provide an intermediate data point suggesting that estuarine habitats had largely disappeared in the canyon by about 4500 years ago, when local intertidal habitats were dominated by rocky outer coast shorelines.

Finally, the buried component at SBA-2067 offers further evidence that archaeological sites buried in the sediments of coastal canyons can provide a wealth of data to help reconstruct the evolution of the cultures and environments of the southern California Coast. In the general Gaviota area alone, at least nine buried sites are known to exist that range in age from roughly 8500 to 150 years. Because many of these buried sites have been protected from intensive bioturbation, plowing, and other disturbance processes that affect most surface sites, they often feature greater stratigraphic integrity and preservation, providing opportunities for higher chronological resolution than is possible for most sites along the mainland coast. It is extremely important, therefore, that we incorporate strategies for discovering and investigating such sites into the planning, subsurface testing, and construction monitoring phases of our work.

Acknowledgments

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