

ARCHAEOLOGICAL INVESTIGATIONS AT CA-SBA-1666: A LARGE MIDDLE
HOLOCENE
SHELL MIDDEN ON THE WESTERN SANTA BARBARA COAST

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In the 1980s, a large shell midden just north of Point Conception was investigated. Surface indications suggest that SBA-1666 probably contains multiple components, but deposits in the tested area appear to date primarily between 5800 and 6800 RYBP. The artifacts recovered suggest an emphasis on milling activities and biface production by the site occupants, while faunal remains indicate a subsistence focus on mussels and other rocky coast shellfish. The adaptive patterns identified are generally consistent with those identified in nearby Vandenberg sites, but provide important data on the poorly documented early Middle Holocene cultures of the California Coast.

As several archaeologists have noted, the Middle Holocene remains a relatively poorly known time period along the California Coast (e.g., Erlandson 1997a:1; Glassow 1997:160; Moss and Erlandson 1995). This problem is due, in part, to the dearth of such sites from the San Francisco Bay and North Coast areas. Middle Holocene sites are much more abundant along the southern and central California coasts, but greater emphasis has been placed on Early and Late Holocene sites – stressing the exploration of “origins” of the earliest coastal peoples and the development of cultural complexity among much later groups. The comparatively limited knowledge of Middle Holocene cultural developments is unfortunate, since the period from about 6500 to 3000 years ago is critical to bridging the gap between the earliest and latest Native cultures of the area.

In this paper, we summarize what is known about SBA-1666, a large Middle Holocene shell midden located about 4.6 km north of Point Conception on the western Santa Barbara Coast. Tested by ERCE archaeologists in 1986 (Erlandson et al. 1993), the site provides valuable information about the nature of Middle

Holocene adaptations along a poorly known stretch of coast between the Gaviota and Vandenberg areas. It also falls within an interval of time about which relatively little is known in the Santa Barbara Channel area, since relatively few sites of this age have been documented and investigated (Glassow 1997:84; Erlandson 1997b:166).

SETTING, SITE STRUCTURE, AND CHRONOLOGY

SBA-1666 is located along the north-south trending coastline between Point Conception on the south and Point Arguello to the north (Figure 1). Jalama Creek, the location of the historic Chumash village of Shilimaqstush, is located about 1.6 km to the north and marks the southern boundary of Vandenberg Air Force Base. The archaeology of the Vandenberg area is relatively well documented (see Glassow 1996; Woodman et al. 1991; and others), as is the Gaviota and Hollister Ranch area east of Point Conception (see Erlandson 1994, 1997b; Erlandson et al. 1993). Relatively little archaeological excavation has taken place on the intermediate Bixby Ranch, however, situated adjacent to a major biogeographic boundary that has

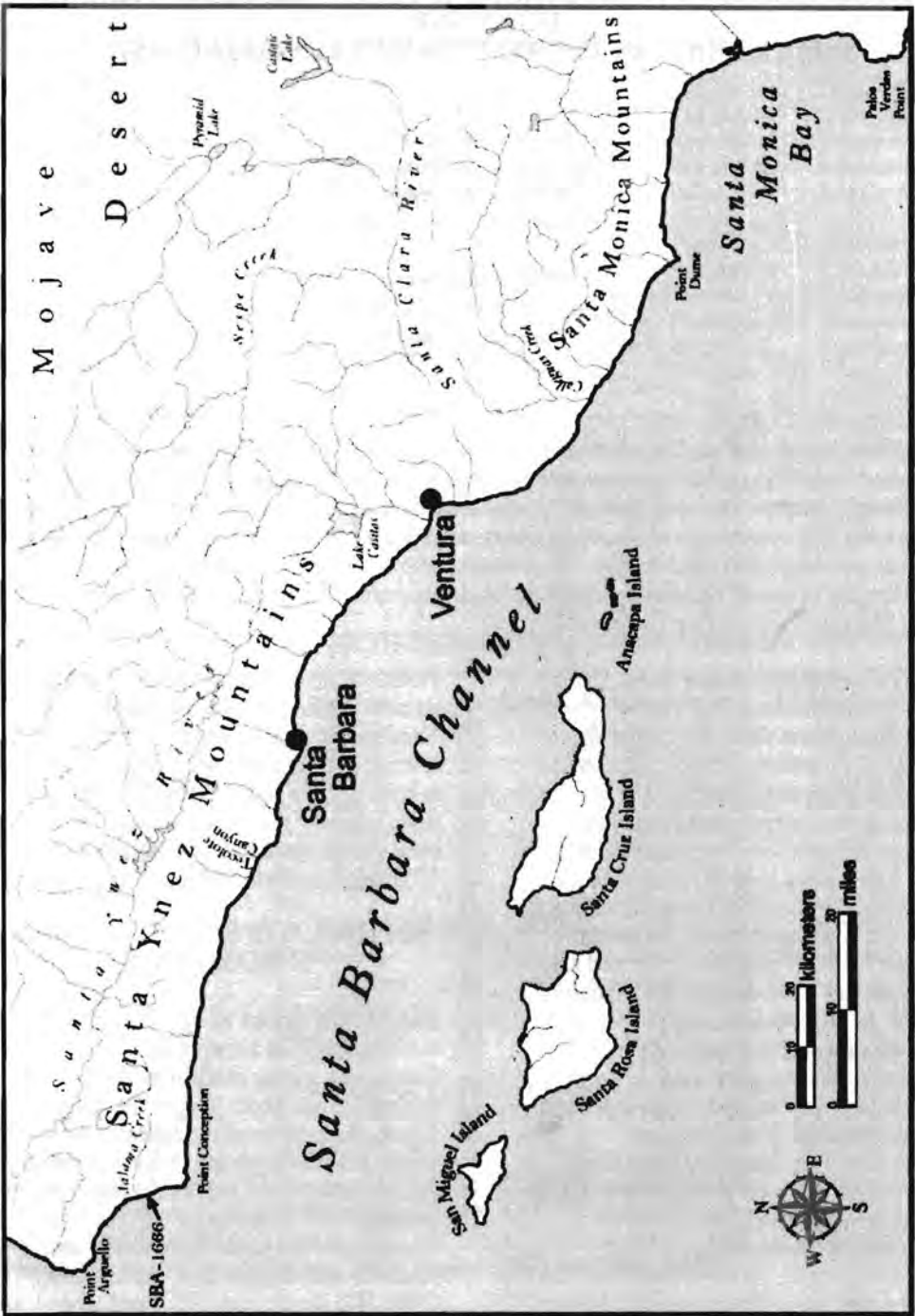


Figure 1. General Location of CA-SBA-1666.

influenced the adaptations of humans for millennia (Glassow and Wilcoxon 1988). East of Point Conception, for instance, many Late Holocene villages were located around large estuaries, supported populations of up to 1000 residents, and

contain large amounts of fish bone and other evidence for relatively intensive fishing. North of Point Conception, however, many coastal villages were located adjacent to rocky outer coast habitats, contained much smaller populations,

and were more heavily focused on shellfish and littoral adaptations.

SBA-1666 is located on the north rim of a small, unnamed canyon on a raised marine terrace between about 60 m and 80 m (200-260 ft.) above sea level. This small coastal canyon may seem an unlikely location for a major residential site, but a substantial spring located about 250 meters up the canyon undoubtedly attracted people to the site. First recorded in 1979, SBA-1666 was described by Van Horn (1979:2) as "an important site which would probably yield artifactual and ecofactual material with a high research potential." The distribution of archaeological materials on the site surface suggests that SBA-1666 extends for approximately 200 meters from north to south and as much as 150 meters from east to west. The site may have been even larger in the past, however, since sea cliff erosion and the construction of the Southern Pacific Railroad appear to have removed an unknown amount of the southwestern site area. Other than limited impacts associated with ranching activities and the construction of a narrow ranch road across the western site area, the extensive site remnants appear to be largely intact. Limited test excavations by ERCE archaeologists were conducted as mitigation for unauthorized road widening by Chevron subcontractors, which disturbed 15-25 m³ of site deposits. As a result, six 1.0 m. x 0.5 m. test pits were excavated in the vicinity of disturbance to the southern site area. Except for Unit 5, in which the midden was less than 60 cm deep, site depth exceeded one meter in every unit and reached a maximum depth of about 1.4 m. Soils consisted of an anthropogenically enriched dark gray silty loam, underlain by a well developed clay Bt horizon, and Monterey shale bedrock. Although these "Santa Lucia" soils are normally slightly to moderately acidic (Shipman 1981), soil pH in the midden deposits was neutral to mildly alkaline, ranging from 8.0 to 8.6.

The density of cultural materials was high in the test units. This was particularly true for marine shell, with densities of about 75 kg (165 lbs) and 108 kg (238 lbs) per cubic meter encountered in units 1 and 2,

respectively. Each of these two units also contained a concentration of cobbles, burned rock, and artifacts. These features extended beyond the boundaries of the test units, so their size and function remain uncertain. It seems most likely, however, that they are the remnants of hearths or roasting pits, or debris fields where the refuse from cooking or other heating features was deposited.

Four radiocarbon dates were obtained for California mussel (*Mytilus californianus*) shells from SBA-1666, two from Unit 1 and two from Unit 4. Single fragments of shell from the 20-40 cm and 60-80 cm levels of Unit 1 produced uncorrected dates of 6660 ± 100 RYBP (Beta-20406) and 6810 ± 150 RYBP (Beta-20405). After calibration, these two dates provided calendar age estimates of approximately 7340 cal BP and 7450 cal BP. Shell samples from the 20-40 cm and 60-80 cm levels of Unit 4 produced slightly younger dates of 6340 ± 140 RYBP (Beta-23026) and 5850 ± 90 RYBP (Beta-23027), with calibrated intercepts of 7150 and 6475 cal BP. The stratigraphic reversal, in which the deeper sample is over 500 years younger than the upper sample, is probably the result of bioturbation and stratigraphic mixing. Together, these four dates suggest that the tested portion of SBA-1666 was occupied primarily during a 1000 year period between about 6500 and 7500 years ago. Other data from the site, including 8 obsidian hydration readings averaging about 7.9 microns (Table 1), are generally consistent with this chronology. There is some evidence for a later occupation of the site, however, and untested site areas may well contain additional components.

Artifacts.

Numerous artifacts associated with a variety of cultural activities were recovered during field investigations at SBA-1666. Ground and chipped stone tools dominate the assemblage, suggesting that the site occupants engaged in a variety of activities related to plant food gathering and processing, hunting and fishing, and manufacturing. Complete and broken formal tools, as well as cores, hammerstones,

retouched flakes, and manufacturing debris, were among the artifacts recovered. A few shell and bone artifacts also were found, but their numbers were very small compared to the stone tool assemblage.

Pecked or ground stone tools include 10 sandstone mano fragments, two shallow-basin metate fragments, a notched-cobble siltstone net weight, a possible bola stone or net weight, and a siliceous shale cobble fragment with a shallow pit pecked on two opposing surfaces. Such pitted stones are common in some coastal middens in the northern Chumash area and may have been used for cracking shellfish such as *Tegula*, acorns or other nuts, or both. Over 60 percent of the ground stone tools were recovered from Unit 2, most of which came from depths greater than 80 cm. Bioturbation has probably moved these larger (>6-8 cm, wide) artifacts downward, while smaller site constituents tend to be homogenized in southern California shell middens (see Erlandson and Rockwell 1987; D. Johnson 1989).

Locally available Monterey chert is the dominant material type for chipped stone artifacts, although andesite, chalcedony, quartzite, siliceous shale, Franciscan chert, and obsidian artifacts were also recovered. A variety of chipped stone tool types was recovered from SBA-1666, including a relatively large number of formal artifacts. Twenty-three single or multiplatform cores comprise a majority of the chipped stone assemblage by weight. Of the 16 cores used solely for flake production, 14 were made from Monterey chert, one from chalcedony, and one from siliceous shale. The other seven may have served primarily as core hammers, a tool type common in Milling Stone sites, generally thought to have been used to shape and rejuvenate manos and metates (Erlandson 1994). Like the two other hammerstones, however, these core hammers may also have been used in the production of chipped stone tools.

Chipped stone tool production at SBA-1666 appears to have been heavily oriented towards the production of bifaces, which were found in a variety of stages of

production from relatively crude blanks to finished projectile points. Analysis of the 29 bifaces recovered identified 16 as possible preforms, 11 as probable projectile point fragments, and 2 as knife fragments. The projectile point fragments include several convex-based or leaf-shaped fragments and one clear contracting stem point base. Also recovered were 17 expedient tools, 15 from Monterey chert and 2 from Franciscan chert, that represent flakes or chunks that show evidence for retouch, use wear, or both. Santoro examined these with high power microscopy and identified four tools that appear to have been used as drills, 10 used as scrapers on a variety of materials, a graver, and a cutting tool (Erlandson et al. 1993:8-2). Percussion flakes, pressure flakes, and other debitage provide additional evidence that people manufactured stone tools at the site. A total of 2261 pieces of chipped stone debitage was recovered.

Although the preservation of shell and bone is relatively good, very few artifacts of shell and bone were recovered at SBA-1666. A single *Olivella* barrel bead, common in Middle Holocene assemblages in the Santa Barbara Channel, was recovered from the site surface. Also recovered was a whole *Olivella* shell from which a rectangular section had been cut from the shell wall. Rectangular *Olivella* beads are also typical of Middle Holocene assemblages in the Chumash area. Two small fragments of polished mammal bone tools were also recovered, and their cylindrical shape suggests that they may be from awls, bone gorges, or pins. Other artifacts collected include four tabular pieces of shale with asphaltum (bitumen) on them, small amounts of what may be red and yellow ochre, and a small siltstone slab with four roughly parallel lines incised on one surface. Similar incised stones have been found in other middens along the Vandenberg Coast.

Faunal Remains

Although not clearly represented among the recovered artifacts because it required little or no durable or diagnostic technology, shellfish gathering was a major subsistence activity for the people of SBA-1666. In all,

several hundred kilograms (kg) of marine shell were recovered from the excavated test units. A sample of almost 8.77 kg of marine shell from Column 2 in Unit 2 was analyzed in detail, over 99 percent of which was identifiable. At least 22 discrete taxa were represented, but the sample was dominated by the remains of shellfish collected from rocky intertidal habitats of the outer coast. California mussels (*Mytilus californianus*) comprise 95 percent of the shell total (Table 2), in fact, and several of the other taxa identified are commonly found in or around mussel beds. These include the platform mussel (*Septifer bifurcatus*), thorn snail (*Acanthina spirata*), small limpets, acorn (*Balanus* sp.) and goose barnacles (*Pollicipes polymerus*), turban snail (*Tegula funebris*), giant chiton (*Cryptochiton stelleri*), smaller chitons (Polyplacophora), sea urchin (*Strongylocentrotus* sp.), top shell (*Astraea undosa*), and abalone (*Haliotis* sp.). Only a small component of the shellfish assemblage, in fact, appears to have come from habitats other than the rocky outer coast. These minor midden constituents include several shell types normally found in estuaries along the Santa Barbara Coast, including the moon snail (*Polinices lewisii*), the Washington clam (*Saxidomus nuttalli*), the purple clam (*Sanguinolaria nuttalli*), and possibly the littleneck clam (*Protothaca staminea*) which is found in both estuaries and in semi-protected outer coast habitats.

Among the vertebrate remains recovered, roughly 20 percent of the bone (by weight) showed evidence of burning, suggesting that much of it is cultural in origin. The remains of small birds, gophers, rodents, and snakes show little or no evidence of burning, however, and most probably are natural intrusions into the midden. Most of the mammal bone was heavily fragmented and difficult to identify, but it appears to derive from a variety of large, medium, and small mammals including deer, rabbits, and squirrels. Among the identifiable bone, rabbit (*Sylvilagus* sp., *Lepus californicus*) remains are the most abundant, followed by ungulate (probably deer), and gopher (*Thomomys bottae*). Fish remains were relatively rare in the analyzed samples and most were not identifiable. The only two

types of fish identified were a single element from an angel shark (*Squatina californica*) and a vertebra from the Clupeid (sardine, etc.) family.

Dietary Reconstruction

Detailed data on the dietary yields of the recovered fauna, based on shell and bone weight to meat weight conversions, are not available for SBA-1666. The vast majority of the faunal remains recovered, however, consisted of California mussels and other rocky coast shellfish. In Column 2, the recovered faunal remains contained a remarkably high shell-to-bone weight ratio of approximately 2369:1, much higher than ratios for several Early Holocene middens east of Point Conception for which shellfish appear to have dominated the meat-related diet (see Erlandson 1994:162). For SBA-2061, for instance, over 96% of the estimated edible meat yield for a faunal assemblage with a shell-to-bone weight ratio of 477:1 was provided by shellfish (Erlandson 1994:138, 162). Although the data from SBA-1666 are not exactly comparable to those from SBA-2061, it seems likely that shellfish were an extremely important source of edible meat for the Middle Holocene occupants of the site. Judging from the abundance of grinding tools, plant foods probably provided an important source of carbohydrates and calories to complement the protein-rich shellfish diet (Erlandson 1988).

SUMMARY AND CONCLUSIONS

The significance of SBA-1666 lies, in part, in its large size, the density of both artifacts and faunal remains that it contains, and its antiquity. The 1986 excavations at the site sampled a minute fraction of the cultural deposits, but demonstrated that archaeological materials in the tested area date primarily between about 7500 and 6500 cal BP (6800 and 5800 RYBP). The artifacts recovered suggest an emphasis on milling activities and biface production by the site occupants, while faunal remains indicate a subsistence focus on mussels and other rocky coast shellfish. These patterns are generally consistent with those identified

in Vandenberg sites of roughly similar age, but differ significantly from contemporary sites east of Point Conception. These include (1) a heavy emphasis on intertidal foraging in outer coast rocky intertidal zones as opposed to estuarine habitats; (2) a relatively high density of shellfish remains; and (3) a heavy emphasis on biface production utilizing locally abundant Monterey chert nodules.

Despite a heavy emphasis on working of local chipped stone materials, a number of obsidian artifacts were also recovered. Geochemical analysis suggests that these volcanic glass artifacts were obtained from at least four discrete sources. Hydration values are consistently high, with almost all ranging between about 7.0 and 9.3 microns, and appear to be generally consistent with the radiocarbon chronology for the site. This suggests, as do obsidian artifacts from other early sites in the area, that early peoples of the Santa Barbara Channel region were well integrated into regional exchange networks.

NOTES

Archaeological investigations at SBA-1666 were conducted under the auspices of the Chevron Point Arguello Pipeline Project, with Erlandson, Richard Carrico, and Theodore Cooley serving as Principal Investigators for ERCE. Members of the Coastal Band of the Chumash Nation and the Santa Ynez Indian Reservation participated in the work and permission to work at the site was granted by Bixby Ranch. Chantal Cagle analyzed the shellfish remains, Greg Dean the fish remains, and Pat Lambert and Phil Walker the other vertebrates. Loren Santoro analyzed aspects of the chipped stone assemblage and George Toren compiled some of the primary data presented here. Geochemical analysis of the obsidian artifacts was conducted by Richard Hughes and hydration analysis by Thomas Origer. Finally, financial support from the Department of Anthropology and the Graduate School at the University of Oregon provided us with time to write and present this paper. We are indebted to all these individuals and institutions for their financial, logistical, and intellectual support.

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Table 1: Obsidian Provenience and Hydration Data from CA-SBA-1666

Provenience (Unit/level)	Artifact Type	Obsidian Source	Hydration Band	
			Mean	Range
Surface	Biface fragment	Napa Valley	Not measured	
1: 0-20 cm	Flake	Coso: West Sugarloaf	7.0	6.9-7.1
1: 40-60 cm	Flake fragment	Bodie Hills	7.0	6.9-7.1
1: 40-60 cm	Flake fragment	Coso: West Sugarloaf	7.8	7.7-8.1
1: 40-60 cm	Flake	Coso Field, Undiff.	9.2	9.1-9.3
3: 40-60 cm	Flake	Coso: West Sugarloaf	9.3	9.1-9.5
3: 40-60 cm	Flake	Coso: West Sugarloaf	8.5	8.5-8.6
3: 80-100 cm	Flake	Unknown	6.0	5.9-6.0
5: 20-40 cm	Flake	Mono Craters/Glass Mountain	8.1	8.0-8.2
Site Mean (n=8)			7.9	

Table 2: Shellfish Remains Recovered in Column 2, CA-SBA-1666

Shellfish Taxon	0-20	20-40	40-60	60-80	80-100	100-130	Totals	
<i>Acanthina spirata</i>	-	-	-	3.4	-	-	3.4	<0.1
<i>Astrea undosa</i>	-	-	0.5	-	-	-	0.5	trace
Acmaeidae	0.1	0.2	0.1	0.1	0.1	0.1	0.7	trace
<i>Balanus</i> sp.	5.2	13.7	12.4	10.5	17.9	12.2	71.9	0.8
<i>Crepidula</i> sp.	-	0.1	-	-	0.2	-	0.3	trace
<i>Cryptochiton stelleri</i>	4.1	8.4	9.5	1.2	2.7	1.3	27.2	0.3
<i>Fissurella volcano</i>	-	-	-	-	0.1	-	0.1	trace
<i>Halionis</i> sp.	1.5	-	-	0.3	-	-	1.8	trace
<i>Mytilus californianus</i>	785.3	2154.5	1238.4	1371.5	1703.7	1050.3	8303.7	95.0
<i>Olivella biplicata</i>	-	-	0.3	-	1.0	-	1.3	trace
Pectenidae	-	-	-	0.1	-	-	0.1	trace
Pholadidae	0.5	0.5	-	0.1	0.5	0.2	1.8	trace
<i>Polinices</i> sp.	-	-	-	10.0	-	-	10.0	0.1
<i>Pollicipes polymerus</i>	4.6	12.0	7.3	7.9	12.8	8.2	52.8	0.6
Polyplacophora	1.0	3.2	1.3	4.6	4.2	1.2	15.5	0.2
<i>Protothaca staminea</i>	0.5	9.5	3.8	5.7	6.8	1.3	27.6	0.3
<i>Sanguinolaria nuttalli</i>	-	-	0.2	-	-	-	0.2	trace
<i>Saxidomus nuttalli</i>	0.3	-	-	-	-	-	0.3	trace
<i>Septifer bifurcatus</i>	6.2	18.0	14.5	20.1	34.0	12.6	105.4	1.2
<i>Strongylocentrotus</i> sp.	0.1	0.3	0.5	0.4	0.3	0.2	1.8	trace
<i>Tegula funebris</i>	5.2	20.6	16.5	22.2	22.0	10.9	97.4	1.1
Crab, undiff.	0.5	0.5	1.9	0.8	1.2	1.0	5.9	0.1
Gastropod, undiff.	2.2	2.8	0.8	1.9	0.8	1.7	10.2	0.1
Pelecypod, undiff.	2.7	9.7	0.7	0.8	1.0	0.8	15.7	0.2
Mollusc, undiff.	2.2	0.9	2.3	2.5	3.3	1.7	12.9	0.1
Totals	822.2	2254.9	1311.0	1464.1	1812.6	1103.7	8768.5	