

REVISITING THE LITTLE SYCAMORE SITE: AN EARLY PERIOD MILLINGSTONE SITE ALONG THE SANTA MONICA COASTLINE

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A recent stabilization project and limited testing project at CA-VEN-1 (the Little Sycamore) site has resulted in some new data on subsistence strategies and aboriginal occupation dates along the Santa Monica Coastline. Results of Plant and Faunal studies indicate that while subsistence focused on local resources, there was a more important focus on marine resources than previously was postulated. Plant data infers that the use of acorns early in the Early Period might alter our theory of how these inhabitants lived. Wallace characterized this Early Period site as one of a "simple culture" with a meager toolkit (Wallace 1956:40). These new findings indicate that the inhabitant's toolkit was more complex and that resource exploitation is more varied than previous data indicated. It is clear that the early study by Wallace was hampered by the recovery methods used at the time. Flotation studies showed that significantly more bone was deposited at the site, reflecting a wider exploitation strategy than was previously supposed. The use and processing of acorns, generally thought to have been introduced later in the Early Period, may have actually begun at the onset of the Early Period. It has not been interpreted previously because, earlier recovery techniques did not include flotation studies to recover small seed and plant fragments.

Members of the Southern Service Center and the Angles District participated in a joint Resource Management Project to stabilize and revegetate an archeological site in Leo Carrillo State Park. This park is located north of Malibu and South of Ventura. The project's goal was to stabilize a coastal Chumash Village site, check the effects of erosion that were degrading the site, and offer the public easy pedestrian access from the terrace down to the beach without adversely impacting the site. This significant archeological site has been radiocarbon dated to almost 7,000 years Before the Present. Coastal erosion is a common factor on terraces along the California coastline. In this location, the natural bluff erosion was being amplified by erosion due to volunteer trails and poor trail stabilization techniques employed earlier. A joint team of archeologists, ecologists, engineers, park aides, maintenance workers, and trail crews helped implement this project.

BACKGROUND

A few years ago, Department of Parks and Recreation (DPR) consulted with Bob Thorne, an erosion control specialist. Bob visited this site (CA-VEN-1) and recommended several erosion control measures to help stabilize and preserve archeological site VEN-1 for the long term. In his recommendations, he mentioned providing pedestrian access to the beach in two locations. He recommended shaving the angle of the bluff edge in order to prevent further erosion (from 60-80 degrees down to 45 degrees). Revegetation of the site is an important component of the project as well. Planting native vegetation in the

eroded areas will stabilize the area and prevent future erosion. The goal for this project was to follow and implement his recommendations. In the first phase of the project, we stabilized the erosion and installed flexible drainage pipe at three locations. Then we followed this with construction of stairs at two locations in the area: 1) off of the archeological site at the parking lot and 2) at the west-end, with above ground redwood platform steps. The second phase of work entailed shaving the west bluff edge and recontouring the slope to a more natural 45 degree slope. We consulted with Charlie Cooke, a Chumash most likely descendant for advice on the project prior to and during the project's scheduled work phases. Charlie monitored the excavation phase of work.

PREVIOUS ARCHEOLOGICAL WORK

The most famous work done at the site previously is the 1950's dig conducted by William Wallace that help defined the Early Millingstone Period. This was based on the collection of Millingstones that had been ritually broken as well as manos, hammers, pitted stones, and bone gorges. He also reported bay mussel, black abalone, deer, sea otter, waterfowl, and a few fish bones (Moratto 1984:129 Wallace 1956:3-6). His identification of bay mussel is surprising as there is no bay or estuary nearby to the VEN-1/Little Sycamore site. The paucity of fish bones as well as the presence of bay mussel were puzzling data in the earlier Wallace study. Wallace aptly described the lower component as an early cultural component, that he described as a "simple culture" relying on shellfish, terrestrial mammals, and plant material for subsistence. Approximately 70 percent of the 640 artifacts found

were millingstones, manos, or hammerstones. Yet about 9 percent of all the artifacts are bone awls or gorges. Other than millingstones, bone tools that are likely gorges, make up the next largest artifact category, with scrapers (49 artifacts, 8% of total) being the next common artifact category. Choppers are a distant fourth (21 artifacts, 3% of artifact total), in the total number of artifacts present as an artifact category (Table 1). The paucity of bones in the Wallace study is puzzling.

Originally recorded by A. Bierman and H. Eberhart in 1949, the site was described as a shell midden with hammerstones, scrapers, millingstones, faunal remains, manos, and a serpentine "fertility stone." Later, John Foster examined the site. The goal was to redefine the location of sites VEN-1 and VEN-264. The site location for VEN-264 is about 50 meters to the northeast of VEN-1 (Foster 1989:6). This site is on a slope below a paved road and east of the restaurant (Neptune's Net). Only 2 artifacts were found in his excavation of a one 1x1 meter unit. The artifacts were a cherty siltstone core and a chalcedony flake. Shellfish analysis showed that *Mytilus californianus* dominated the remains with *Tegula* next and with only minor amounts of *Protothaca*, *Haliotis*, *Septifur*, *Pollicipies*, *Olivella*, *Tivella*, and *Acanthina*. Foster characterized VEN-1 as a village. He dated the site VEN-265 as being contemporary with VEN-1 (1570 B.C.) (Foster 1989:24). He went on to note that the area of VEN-1 south of the highway is significant and warrants eligibility to the National Register, while the area north of the highway has been extensively disturbed. Foster submitted two dates for radiocarbon analysis and derived dates of 510±80 B.P. (50-60 cm) and 560±70 years B.P. at 0-10 cm.

Wallace excavated fifteen human burials at site VEN-1. Most of the intact burials were interred in oval pits (22-33 inches long by 15-27 inches wide). Burials on the west-end, were more orderly and isolated as individual burials (Wallace 1956:33). Seven graves included artifacts in association with the burials. Wallace dug approximately 60 inches in depth (152 cm).

Wallace never conducted any radiocarbon dates on the material recovered but subsequent studies on this material yielded radiocarbon dates of 510 and 560 (Foster 1989) and 2610 and 6960 years before present (Radiocarbon 1966; Breschini, Haversat, and Erlandson 1996:100). Until excavations by Dallas and Mealey at LAN-92 in 1995, (Dallas and Mealey 1995), Ven-1 was previously the oldest radiocarbon dated site along the Santa Monica coast.

ENVIRONMENTAL CONDITIONS

Site VEN-1 is located on an elevated terrace along the Santa Monica coastline between Malibu and Pt. Mugu. This area includes several plant communities including the Southern foredunes and Southern Coastal Bluff Scrub. Dominant species include bush sunflower (*Encelia californica*), coast goldenbush (*Haplopappus venetus*), and giant coreopsis (*Coreopsis gigantea*), plus California sagebrush (*Artemisia californica*), purple sage (*Salvia leucophylla*), black sage (*Salvia mellifera*), seacliff buckwheat (*Eriogonum parvifolium*), and our Lord's candle (*Yucca whipplei*).

The project area includes an ecosystem that is the coastal terrace. This ecosystem consists of flat to gently sloping terrace inland of the coastal beach and bluff system. The sensitive coastal bluff scrub community has been disturbed and this is evident at VEN-1. Volunteer trails criss-cross the site; fill and asphalt concrete has been dumped at this location in the past. Some of that fill has been used to attempt to check coastal erosion and volunteer trails on the slopes of the bluff.

ETHNOGRAPHIC BACKGROUND

Leo Carrillo State Park and the area of VEN-1 is in the ethnographic area of the Chumash. Specifically this is in the Ventureno sub-group of the Chumash language family. The Ventureno occupied an area bounded from the San Buenaventura Mission (Venturra), east to Mt. Pinos and the community of Chatsworth, south to Malibu Creek, and west to the Pacific Ocean.

Although characterized by some as being a fairly simple lifestyle, recent evidence indicates that the inhabitants used tomols (ocean going canoes) maybe for thousands of years; they hunted, gathered, and fished the local environment (1997 Gamble personal communication). They benefited from the diverse habitats and rather temperate climate of the area. Early occupation consisted of small nuclear family groups (or bands) moving seasonally from the coast inland to hunt and gather resources for survival. Later groups of families occupied a village year-round, where they shared in the collection of resources, ceremonies, and community provided by a group sharing a common lifestyle. A local site, LAN-52, the village of Lisiqsi, would be an example of that lifestyle, as would a component of VEN-1.

MISSION PERIOD

The Mission Period along the Santa Monica coastline lasted from 1772 until 1834. The missions were secularized in 1834, removing them from the control of the Catholic Church. When the Spanish explorers visited this area they found a large population of Chumash Indians. They recruited heavily from the local Chumash villages for converts to the local missions including San Buenaventura and San Fernando. Native Americans from the villages around Leo Carrillo State Park were recruited into these two missions. San Buenaventura mission was founded in 1782 and San Fernando was founded in 1797. The traditional lifestyle of the Chumash changed with their move to the missions and the move had a dramatic effect on these indigenous people.

MISSION LIFESTYLE

The Mission Period in the Chumash region lasted from 1772 until 1834 when the missions were secularized. However, their impact on the native society continued past secularization in 1834. They altered the Native lifestyle forever. When the Spanish explorers visited the Ventura and Santa Monica coast they found an active local population.

When the missions recruited the Chumash, the traditional lifestyle changed dramatically. They had less freedom and were required to work long and hard hours at menial tasks at the missions. The diet was less than adequate for the hard work required daily, consisting of one to two rations of a starchy soup called *atole*. The neophytes day consisted of awaking, going to work, eating, returning to work again, maybe they ate again, conducting chores, and going to bed. They did this 6 days a week. There was little free time for fun and games as in their traditional lifestyle. Men were taught to plant, make tools, and build mission facilities. They toiled in the fields. Traditional spiritual worship was forbidden. Punishment could be excessive from beatings, being placed in the stocks, to harder work details.

Women were taught European techniques for weaving yarn, candle making, cooking, and housekeeping duties. Unless they were married by Christian standards, the sexes were separated. The Natives were required to live in cramped quarters with minimal ventilation and heat. They were punished for minor infractions of Christian beliefs and methods. Sometimes they were subjected to harsh treatment

and cruel punishment from the soldiers at the missions. Women were especially vulnerable.

The Native Americans practiced many types of resistance, from simple escape to abortion and infanticide. This rebellion was common throughout the Mission Period in California. The Chumash rebellion against the mission lifestyle is attested to by the presence of traditional tools, money, and religious artifacts that have been recovered from the missions.

Diseases took their toll on the Chumash in the cramped confines of the missions. The Chumash had no immunity to the diseases brought over from Europe, and their population dropped dramatically. In 1770 there might have been over 8,000 people, but by 1852 only 1,107 Chumash are listed in the census (Grant 1978:507). In 1920, only 74 Chumash are recorded in the census. They were not prepared for the European diseases or the regimented life prescribed in the missions.

METHODOLOGY

The goal of the excavation strategy was modest. One 1x1 meter unit was excavated in the vicinity of the landing for the platform steps. This was to evaluate the potential impact of the project on the archeological deposit. Also, we wanted to reexamine the occupation dates for the site and the subsistence strategy of the inhabitants. An earlier study by Wallace (1956) had indicated that there was little reliance of fishing and other marine resources. This seemed strange given the location and the number of fishing gorges that were recovered in the earlier excavation. The current strategy was to take flotation samples from each level and from features to determine if a more comprehensive examination might shed new light on occupation/activities for this site.

The other goal of the project was to stabilize the terrace, by repairing the erosional gullies, eliminating the volunteer trails from the terrace down the slope to the beach, improving site drainage, and revegetating the area for long-term stability. The other need was to provide pedestrian access from the terrace to the beach without adversely impacting the archeological deposit. This was accomplished in two ways: 1) a cable stairway was installed off the archeological site (in the parking lot) and 2) platform steps were installed at the west end of the site (following Bob Thorne's recommendations). Excavated material from the unit was screened through 1/8-inch mesh screen. Flotation

samples were submitted to UCLA's Zooarcheology and Ethnobotanical labs for analysis.

PROCESSING AND LABORATORY METHODS

All artifacts and non-artifactual constituents from the test unit were taken back to the Southern Service Center archeology lab. The artifacts and cultural materials collected from the field screening process (dry screen) were then washed and air-dried. The remaining screen residue was sorted into general categories. All items were then bagged in polyethelene zipper-locking bags, and marked with site, unit, and level numbers, as well as any additional information from the original bags.

The next phase of laboratory work consisted of sorting the collected materials, and to separate the artifacts into categories in preparation for the cataloging process. The materials were sorted by lot number (level) into broad categories of cultural materials such as lithic debitage, lithic tools, shell, bone, charcoal, and other unique items (such as bone tools). Each individual tool or category of items were weighed and measured (using digital calipers). These groups of items were then bagged in polyethelene zipper-locking bags by category type within each lot. Paper tags listing the site number, level, screen size, artifact type, count, and weight were filled out in pencil and included in each bag.

After the materials were sorted, the cataloging process was started. Artifactual material was sorted into narrower categories based on species, color, shape, and/or material type. Cataloging was carried out in Excel 5.0® for Windows on an IBM compatible computer. The catalog was based on the DPR archeological catalog form (DPR form 361). All cultural material from a single level of the unit was assigned the same lot number. Cataloging began with the artifacts collected from the 0-10 cm level of Unit 1. Each item or group of items was assigned an individual catalog number. The catalog was written in ink on the paper tag (acid free paper) that was enclosed with the artifact in the storage bag. All the items collected were described by name, material type, condition, weight, and color. Groups of related items were weighed together and counted. Large groups of cultural materials (such as charcoal and undifferentiated shell were only weighted). Tools, ornaments, and some whole objects were measured for length, width, and thickness (using digital calipers).

Bulk soil samples were taken from each level and each feature (minimum 2.0 liters) in order to submit

for flotation studies at UCLA Ethnobotanical and Zooarcheological laboratories. It was hoped that this sampling strategy might resolve any earlier sampling biases and compensate for the 1/8-inch mesh screen used for this study. Four shell samples were submitted for radiocarbon analysis to GeoScience Analytical Inc. for analysis. Results are shown in their respected sections.

RESULTS

The test excavations at Ven-1 resulted in the recovery of more than 300 artifacts and over 10,000 non-artifactual constituents (Table 1). Artifacts consisted of hammerstones, a core, flakes, manos, pestles, shell beads, gorges, and a stone pendant. Non-artifactual constituents included bones, spalls, FAR, shellfish, and some miscellaneous historic material and modern trash. Much of the artifactual material came from the levels 50-60 to 80-90 cm. Little cultural material was found in the 0-10 cm and 10-20 cm levels because we excavated in contour levels. These first levels were sloping significantly and had little soil volume to sample.

GROUNDSTONE ANALYSIS

Fifteen groundstone artifacts were recovered during this investigation. This is significantly fewer groundstone tools than found in the Wallace study. Many of these artifacts appeared to have been multifunctional artifacts used for many purposes. However, following the Wallace typology of use and morphology, the collection includes 1 bifacial mano, 3 pestles, 4 hammerstones, 3 pitted cobbles, 3 cobble tools, and a stone ornament (Parker 2000). Virtually all the artifacts have caliche adhering to them. The caliche on the surface made analysis of the groundstone artifacts nearly impossible, as it obscures the wear pattern on the artifacts.

It is possible that the pitted stones and pestles could have been used to process oak acorns or shellfish. Other Millingstone sites have yielded manos, pestles, and mortars that might have been used to process acorns (Heizer and Lemert 1947). One of these sites is the tank site (LAN-1). Pitted stones similar to those found at VEN-1 were found at LAN-1. In the earlier study, they describe these manos as being multifunctional with thinner edges showing wear patterns and ends often blunted or squared which infer secondary use as pestles (Heizer and Lemert 1947:245). If additional funds are garnered, samples will be submitted to a lab for protein analysis.

Artifact Category	0-10cm	10-20cm	20-30cm	30-40cm	40-50cm	50-60cm	60-70cm	70-80cm	80-90cm	90-100cm	100-110cm	110-120cm	Misc	TOTAL
Bifacial core												1		1
Flake		3		1	7	14	16	20	7	9	17	9	3	106
Shatter		3	4	3	19	14	9	13	6		11	11	4	97
Spall		1			2	3	2	1	1			1		11
Cobble Core Tool							1					1	1	3
Pestle					1	1							1	3
Uniface mano						1			1				1	3
Pitted biface mano						1								1
Pitted uniface mano							1			1	1			3
Pitted uniface mano (poss)										1			1	
Biface pitted hammerstone					2								2	
Pitted hammerstone						1								1
Pitted anvil									1					1
Stone Pendant							1							2
<i>Olivella biplicata</i> Bead										2	3		1	6
<i>Olivella biplicata</i>					1	1		2	5	2	3		1	15
Polished bone											4			4
Worked bone											1			1
Mammalia (Irg)/Barb							1							1
Mammalia (Irg)/Gorge								1	1	3	4			9
Mammalia (Irg)/Tool										1				1
FAR			1		3	10	15	2	1		1	2	5	40
Mammal			5	3	90	10	94	171	155	87	446	459	6	1526
Bird							1	4	7	6	27	19		64
Reptile					1		1	2			1	1		6
Fish					8	5	11	18	75	40	251	184	8	600
Vertebrates												21		21
Unidentified bone								5		33	2	47	1	88
Shells-bivalve			10	20	26	34	14	19	20	21	14	8	9	195
Shells - other		3	23	18	67	82	132	269	513	162	885	781	17	2952
<i>Mytilus californianus</i>		7	111	295	419	1012	955	1851	1672	1243	2716	1294	137	11712
<i>Haliotis</i> sp					1	5	5	2	11	3	24	5		56
<i>Tegula</i> sp.		2	5	8	8	58	42	61	46	45	115	47	2	439
<i>Septifer bifurcatus</i>			1	4	7	24	47	90	78	55	172	102	2	582
TOTAL	0	19	160	352	680	1278	1348	2532	2600	1713	4699	2998	194	18553

Table 1: Artifact catalog by level of unit 1.

SHELL BEAD ANALYSIS

A total of fourteen unmodified *Olivella* shells, two broken shells, and six *Olivella* shell beads were recovered during the excavation. Results of the shell bead analysis indicated, five of the spire removed beads and one oblique spire removed bead were found in unit 1 at VEN-1 (Zepeda 2000:2-3). The typology used for the analysis was that of Bennyhoff and Hughes (1987) and the bead chronology based on King (1990). Five of the beads are type A1 and one bead is a type A2.

The beads based on the typology would date to the Early Period (6000-1400 B.C.) or the early Middle Period (1400-800 B.C.) (King 1990:28). However, the level 90-100 cm and 100-110 cm level were dated at 6590 ± 60 B.P. (6800 ± 70 adjusted) and 7430 ± 70 B.P. (7650 ± 80 adjusted). These dated levels correspond to dates of 7020 and 7870 years before present or 5870 B.C. and 5920 B.C. These dates correspond to a very early usage of these beads along the southern California Coast. There was only one bead that was small (3-6, 5 mm) which Gibson attributes to the Early Period.

The use of spire ground beads is indicative of the secular economic subsystem (King 1981). This was part of a market economy based on an egalitarian society. But was the economy of the Little Sycamore reflective of an egalitarian society? In theory probably, but in reality it is hard to say. If the making of boats was a specialized activity much as bead making: requiring specific tools and knowledge, then certain specialists might have wielded more power because they held keys to movement and the procurement of specialized tools and important food. Another example would be that if the society was truly egalitarian, only personal goods might have been buried with the bodies. There was no clear pattern from the Wallace study (1956), although reexamining his findings indicate that some had red ochre, some had beads, and some had tools inferring more than just a personal connection. Many had abalone shells with the burials. The presence of red ochre with a few of the burials indicates some type of religious ceremony with the interment and the presence of abalone shells indicates a belief in the afterlife. Beads were a significant percentage of the artifact collection in the current study, with 18 percent versus 2.5 percent by number in the Wallace study.

FLOTATION ANALYSIS

Six bulk soil samples of cultural material from VEN-1 were submitted to the Paleoethnobotany Laboratory at UCLA. A total volume of 21.1 liters was analyzed for the flotation samples. Unfortunately, few seed remains were recovered that could be identified. Most of the seeds recovered from the flotation samples were too distorted or fragmented to classify even to the family level and are thus placed in the unidentifiable seeds category. Only one Poaceae (grass family) seed and numerous *Marah macrocarpus* (wild cucumber) seed coat fragments were identified (Martin and Popper 1999:3).

Botanical material that lacked any diagnostic characteristics and that could not be positively identified to a known taxa, was placed in the amorphous category. Amorphous material is typically very porous, possesses minimal vessel structure, and lacks a distinctive shape. Some of the amorphous material recovered here compares favorably with *Quercus* sp. nutmeat, however, the fragments were too small to allow for positive identification.

Identifiable wood charcoal types recovered from the samples included: Asteraceae cf. (sunflower family), *Ceanothus* sp. (California-lilac), *Rhus* sp. (Lemonadeberry or sugar bush), Rosaceae (rose family), *Quercus* sp. (Oak), *Salvia* sp. cf. (sage), *Salix/Populus* sp. cf. (willow/poplar), and *Yucca* sp. cf. (yucca). Indications that carry some uncertainty are indicated as "cf." Which of these species were specifically eaten at VEN-1 is unknown, but it is known that the Chumash utilized *Salvia*, *Yucca*, *Quercus*, *Ceanothus*, Asteraceae. The use of *Quercus* (acorn) as a food would indeed be significant at VEN-1. The identification of this material at a depth of even 40-50 cm could indicate one of the earliest examples of the collection and processing of acorns in California (Michael Glassow 2000: personal communication). Level 50-60 cm was ^{14}C dated to 6850 ± 80 B.P.

The preservation of plant remains at CA-VEN-1 is extremely poor, possibly a result of the extensive disturbance of the site (Martin and Popper 1999:5). Seed and charcoal densities are low, but increase slightly in the more-protected deeper deposits. The paucity of plant remains could also reflect minimal processing and use of plants at the site. The results indicate that the inhabitants collected plants from nearby communities but also from more distant habitats. This is probably a result of their nomadic lifestyle and a desire to maximize subsistence by extending their range to other habitats and hence other resources. It is difficult to know whether preservation,

disturbance, or lack of plant processing in this western area of the site is the cause for the lack of plant remains at VEN-1. A preliminary study at nearby LAN-92 also yielded few plant remains (Martin and Popper 1999b).

Certainly the age of the deposits is a factor in preservation as is the previous disturbances. The soil chemistry could also be a factor, as the high alkaline and porous nature of the deposits tends to allow chemical/biological reactions of organic matter. Generally high pH soils tend to be a poor plant preservation medium, but a good bone preservation medium. Organic matter will tend to break down, especially after 7000 years. It is likely that all of these conditions are factors contributing to the low density of plant remains recovered at VEN-1. Future studies will reexamine this issue of the use of *Quercus* (Oak) as a food in the Early Period at VEN-1.

FAUNAL REMAINS

Shellfish

For the bulk material of shell and faunal material, four cultural levels, were analyzed in detail by Tom Wake at UCLA Zooarchaeology Lab. From his species identification, the results are presented below. In addition, DPR staff went back to the other levels and analyzed the other levels based on the identification by Tom Wake. The results are shown in Table 1.

Sixteen Shellfish or invertebrate species were positively identified from the recovered material. The identified shellfish included *Mytilus californianus*, *Septifer bifurcata*, *Pseudochama exogyra*, *Crepidula onyx*, *Crepidula lingulata*, *Acanthina spirata*, *Alia carinata*, *Amphissa columbiana*, *Astrea undosa*, *Hipponyx antiquatus*, *Littorina* sp., *Mitra catalina*, *Mucela emarginata*, *Olivella biplicata*, *Tetraclia squamosa*, and *Balanus* cf. *Nubilius*. Wallace (1956:3-4) had previously identified Bay mussel *Mytilus edulis* as the dominant species present at VEN-1. Tom Wake and our lab team found no *Mytilus edulis* in the sample recovered. We had first identified about four to six possible specimens as *Mytilus edulis*. Wake found only *Mytilus californianus* and *Septifer bifurcata* (platform mussel) in the collection (Wake 1999:3).

Of the identified species, *Mytilus californianus* dominates the assemblage with about 65 percent of the sample by number. Barnacle (all varieties) is next in abundance with about 19 percent, turban snail 7 percent, Limpets 5 percent, urchin 2 percent, and clam, Chiton, and abalone <1 percent each (Table 1). Clearly they recovered a variety of the available

shellfish in the local environment. Other than the clam, most of the species recovered can be found in the rocky intertidal zone surrounding VEN-1. By weight *Mytilus* hinges yield over 6500 g/cm³, barnacle with over 200 g/cm³, abalone over 340 g, *Tegula* over 315 g/cm³, Platform mussel 127 g/cm³, pismo clam over 220 g/cm³, and urchin < 11 g/cm³. *Mytilus* and *Tegula* still dominate the assemblage by weight, but barnacle, clam, and abalone rise somewhat in importance.

Bone

Marine mammals are represented in the assemblage by dolphin, sea otter, and southern fur seal. Other mammals include black-tailed deer, rabbits, and rodents. Birds were recovered but in fairly low numbers. The only positively identified species was cormorant. A wading bird was identified (Table 2), but not to the species level.

The low numbers of amphibians and reptiles is fairly common in coastal Ventura and Los Angeles County sites. It is clear from this area of the site at least that the inhabitants of VEN-1 were not subsisting on large terrestrial mammals in significant amounts. They were not going out of their way to hunt larger terrestrial game. Unidentified mammal account for about 43.7 percent, sea mammals 14 percent (Dolphin accounts for 11.75%), terrestrial mammals about 59 percent of the faunal assemblage by weight. Birds and reptiles are negligible components by weight. The three major components of the faunal assemblage are fish, sea mammals, and terrestrial mammals.

Fish

Bony fish dominate the assemblage from VEN-1 (Table 2). Bony fish were represented by 11 genera and 11 species. Fish constitute 22 percent of the bone assemblage by weight, a significant increase from earlier studies. Fish also account for 27 percent of the fauna by count in this study compared to 10 percent in the Wallace study. Identified bony fish taxa include representatives of *Atherinopsis californiensis*, *Sebastes* sp., *Paralabrax clathratus*, *Seriola lalandi*, *Atractoscion nobilis*, *Embitoca lateralis*, *Hypsurus caryi*, *Rhacochilus toxotes*, *R. vacca*, *Sphyrana argenta*, *Semicossyphus pulcher*, and *Somber japonicus*. The families of Clupidae (herrings), Engraulidae (anchovies), and Pleuroncetidae (flounders) are represented by specimens identified only to this level.

Cartilaginous fish (Elasmobranchii) are represented by four genera and four species: both sharks and rays (Table 2). Sharks and rays constitute less than 1 percent of the recovered sample. These

include Leopard and Pacific Angel sharks, rays, and shovelnose guitarfish.

Many of the species recovered in this study are fish commonly found in archeological sites along the California coast (Wake 2000:4, 11-12). *Sebastes*,

Table 2: Vertebrates recovered from VEN-1.

Object Name	Common Name	Count	Weight (gm)
<i>Odocoileus hemionus</i>	Mule Deer	3	17.79
<i>Artiodactyla</i>	Even-toed Ungulate	4	11.33
Mammalia	Unidentified Mammal	1406	82.64
<i>Canis sp.</i>	Dog, Wolf, Coyote	3	0.76
Pinnipedia	Seal, Sea Lion	4	3.40
<i>Enhydra lutris</i>	Sea Otter	3	1.43
<i>Sylvilagus audubonii</i>	Cottontail Rabbit	5	0.40
<i>Thomomys bottae</i>	Pocket Gopher	12	0.62
Rodentia	Rodent	17	0.46
<i>Delphinus delphis</i>	Dolphin	2	22.29
<i>Phalacrocorax sp.</i>	Cormorant	1	0.12
Scolopacidae	Wading Bird Family	1	0.08
Aves	Unidentified Wading Bird	57	4.02
Anatidae	Duck, Geese, Swan Family	1	0.39
Iguanidae	Iguana	1	0.01
Colubridae	Colubridae Snake Family	1	0.02
<i>Crotalus sp.</i>	Rattlesnake	1	0.23
<i>Anniella pulchra</i>	Legless lizard	2	0.01
Reptilia	Unidentified Reptile	1	0.03
Atherinidae	Silverside Family	5	0.04
<i>Atherinopsis californiensis</i>	Jacksmelt	2	0.04
<i>Atractoscion nobilis</i>	White Seabass	1	3.36
Clupeidae	Herring Family	24	0.35
Clupeiformes	Anchovy, Herring Order	3	0.03
Embiotocidae	Surfperch	18	0.56
Engraulididae	Anchovy Family	2	0.02
Osteichthyes	Unidentified Bony Fish	468	26.27
<i>Paralabrax sp.</i>	Sea Bass	8	1.34
Pleuronectidae	Flounder, Halibut, Sole Family	1	0.03
<i>Rhacochilus sp.</i>	Rubberlip-Surfperch	3	0.08
<i>Rhinobalos productus</i>	Shovelnose Guitarfish	3	1.00
<i>Scomber japonicus</i>	Mackerel	1	0.02
<i>Sebastes spp</i>	Rockfish	29	2.69
<i>Semicossyphus pulcher</i>	Sheephead	20	6.03
<i>Seriola lalandi</i>	Yellowtail	2	0.53
<i>Sphyræna argentea</i>	Baracuda	3	0.66
<i>Myliobatis californica</i>	Bat Ray	1	0.14
<i>Squantina californica</i>	Pacific Angel Shark	2	0.03
<i>Trakis semifasciata</i>	Leopard Shark	1	0.05
Elasmobranchiomorphi	Shark/Ray	2	0.41
Total Vertebrates		2,124	189.71

Paralabrax, *Seriola*, *Embiotoca sp.*, *Rhacochilus*, *Semicossyphus*, and others are commonly found in archeological sites in Ventura, San Luis Obispo, Santa Barbara, and Los Angeles (Van Slyke 1998; Gobalet 2000). Fitch found similar fish species at SLO-2 including leopard shark, seaperch, anchovies, bat rays, rockcods, and pacific angel shark. However, Fitch did not identify fish vertebrae (Fitch 1972:1114-1116). Fitch found 669 otoliths, 8315 vertebrae, and 3170 teeth and jaw fragments. It seems clear that more vertebrae are found in middens than most other body fragments. He found only 10 *Elasmobranch* vertebrae. Bony fish also dominated the assemblage at SLO-2. The largest amount of fish bones recovered from SLO-2 were found in the 120-130 cm level.

Results of our fish study indicated that in 1/8-inch screen, 483 fish bones were recovered. In the 6 flotation samples, another 117 were recovered. A total of 600 fish remains were recovered. Fitch (1969) found 10 species of fish based on 7,357 otoliths recovered from Ven-3 from 1/8-inch screen. Additional samples recovered and screened through 1 mm mesh screen yielded an additional 12 species. Going down to .5 mm mesh screen, the species count rose to 45. It is clear that by not utilizing finer mesh screens, smaller fractions and species diversity utilized by the inhabitants are not reflected in the results. In order to do reliable estimates on diet or subsistence, an accurate reflection of the prehistoric diet is necessary (Van Slyke 1998:37-39).

If we project what the earlier findings (of Wallace) might have found using smaller mesh screens the total is astounding. Correcting for volumetric differences it is estimated that, 739,500 fish remains might have been recovered at VEN-1 by Wallace (actual recovered remains tended to be less than projected). Mammal remains are harder to estimate, but conservatively about 27,000 might have been recovered. It is difficult to make these projections, but if it is taken into account that Wallace excavated 25 times more volume and found 20 times less fish remains and seven times less mammal remains, then these constituents are significantly under-represented in the previous assemblage. This indicates that fish would constitute a more sizable portion of the diet for the inhabitants of VEN-1. Reptiles and birds still probably would not make sizable contributions to the subsistence pattern at VEN-1. Analysis of the bulk flotation material yielded far fewer bones in the respective categories than were predicted. In each category except birds, this study found significantly more bones than the Wallace study.

RADIOCARBON DATES

Four shell samples were submitted to GeoScience Analytical, Inc. for analysis. The four shell samples came from 50-60 cm, 90-100 cm, 100-110 cm, and 110-120 cm depths. The radiocarbon ages were 6560 ± 60 B.P. (6780 ± 80 adjusted), 6590 ± 60 B.P. (6800 ± 70 adjusted), 7430 ± 70 B.P. (7650 ± 80 adjusted), and 6670 ± 80 B.P. (6890 ± 90 adjusted). The conventional dates range from 7000, 7020, 7870, and 7110 years before present. The oldest date (100-110 cm level) is 900 years older than the previous oldest date from VEN-1. That earlier radiocarbon date was 6960 ± 100 with no listed provenience (Breschini *et al.* 1996:100).

The one inverted date at the bottom is probably a result of rodent activity or more likely, slumping as the unit was situated on the slope of the coastal terrace. This suite of dates indicates that the early component dated from this site is most likely one occupation event or period. The 50-60 cm radiocarbon sample was *Haliotis* sp. (Abalone), the 90-100 cm sample was *Mytilus californianus* (mussel), 100-110 cm *Haliotis* sp. (abalone), 110-120 cm sample was *Mytilus californianus* (mussel). These were all whole samples weighing 45 g, 40 g, 43 g, and 20 g respectively. Additional suitable shell samples were taken that could be used for more ^{14}C dates.

The dates range from 5050 B.C. to 5920 B.C. Mussel shell valves got significantly larger, deeper in the cultural matrix and some of them were still complete. In the upper levels most of the shell was broken and fragmented in tiny pieces. Each potential ^{14}C sample was removed separately and quickly bagged in polyethelene bags with minimal handling. Dirt adhering to the inside of the samples was left intact to be removed in the lab.

INTERPRETATION

The results from this study indicate that this site was occupied early in the cultural sequence for coastal California. The dates range from 5050 B.C. to 5920 B.C. or from 7000-7870 radiocarbon years before the present. The inhabitants of the Little Sycamore site were not simple hunter-gatherers or big game hunters that also subsisted on shellfish. The inhabitants utilized a wide variety of plant and animals from the local environment. This required some specialized tools and a diverse toolkit ranging from gathering and processing of plants, shellfish, fish, reptiles, birds, sea mammals, and terrestrial mammals. They were foragers who also hunted. The inhabitants stayed relatively close to their camp, as few to no distant

plants or animals were recovered. Chumash who occupied this site were at least semi-sedentary or sedentary as virtually no foreign plant or animal species were recovered from the excavation.

A previous investigation by Wallace had indicated that the inhabitants had an "exceedingly simple culture with a meager toolkit," yet the results from our study indicate that his interpretation was colored by the recovery techniques utilized at that time (that is $\frac{1}{4}$ -inch screen and no flotation). His artifact and faunal data, colored by these techniques, which actually did not reflect what the inhabitants were subsisting on or what tools were used at this site. Also it is evident that smaller artifacts like beads and bone tools, for example are under-represented in the assemblage. The presence of charmstones and a fertility stone, as well as the use of red ochre in burials indicates some ceremonial events. They subsisted on a variety of faunal remains from each of the eco-zones locally available. Our results indicate that they relied more on fish than previously thought. Fish comprised a significant portion of the inhabitant's diet. Fish comprised approximately 27 percent of the diet by number and about 22 percent by weight. A more detailed analysis of the fish and mammal remains awaits final results of the other levels analyzed.

The plant study was somewhat inconclusive although it did yield one very significant fact. If the analysis is correct, the inhabitants of VEN-1 were one of the earliest groups to process and eat acorns anywhere in California. The artifacts recovered both by Wallace (1956:6-7, 12-13) and in this study indicate that pestles were found and that along with the *Quercus* nutmeat identification from the plant component of the flotation study, acorn processing may have occurred. This use of acorns would be much earlier in California than previously thought. Generally, it is thought that the use of mortars and pestles along with the processing of acorns did not occur until about 2900 B.C. (Glassow 1996:14-23). Ven-1 would push that plant processing technique and the use of acorns as a food source back another 2000-3000 years. However, from the current evidence acorn use and processing occurred later in the occupation period at VEN-1, closer to the 5000 B.C. rather than 5900 B.C. The *Quercus* nutmeats were found at the 40-50 cm level.

The artifacts found at VEN-1 by Wallace (1956:6-22) and in this study support the possible processing of acorns as a food as manos, millingstones, and pestles dominate the assemblage. The counts are significantly less in this study, but that is probably a result of the small sample. Similarly, hammerstones, metates, a mortar, pestle, and numerous manos were also found

at LAN-1 (Heizer and Lemert 1947:244-246). Many of the manos described in the Heizer study appear to be multi-functional from the description given. Many of the manos described by Heizer and Lemert have small pecked pits:

The thinner edges often show wear, perhaps a sign of the use of manos as acorn mashers. Ends are often blunted or "squared" and manos appear to have served a secondary use as pestles...A few which show pecked pits of some size (20 mm. Diameter, 5 mm. Deep) may have been acorn anvils (Heizer and Lemert 1947:245).

As early as 1947 it was proposed that many of the "manos" might have served functionally as "pestles" (Heizer and Lemert 1947:245). They are very similar to the artifacts found in this study, as many of the manos were identified as being multifunctional. LAN-1 dates to the same Early Period as VEN-1 (Moratto 1984:126-133). What specific purpose these artifacts are being utilized for actually is still unknown.

Another difference between Wallace's early study and the current study is the faunal investigation. Wallace (1956:4-5) found very few vertebrate remains in his study. Wallace found only 322 bones in his investigation despite excavation of 2500 cubic feet of material. In comparison, in our study while excavating only a 1 x 1 meter unit, 2,217 bone fragments were recovered. That means this study recovered 8 times the number of bones excavating 25 times less volume of cultural material from VEN-1 than Wallace. This shows that the Wallace results and interpretation were colored by his recovery techniques. Wake, Parker, and Dallas identified a larger variety of animals that were subsisted upon, especially a wide variety of fish and sea-mammals (Wake 2000).

Similarly, we found a great variety of shellfish as well. *Mytilus californianus* dominated the assemblage by number and weight with about 5500 MNI and 7735 grams of material. This is intriguing also as Wallace had identified his dominate invertebrate as *Mytilus edulis*, with black abalone and cockle shell as next important. *Mytilus* is a high ranked species in terms of yield and the effort necessary to collect them. Barnacle ranked high in our finding along with *Pollicipes* (Gooseneck barnacle), chitons, and *Tegula*. All of these species can be found in the rocky shore environment adjacent to the Little Sycamore site. Abalone and clam were not significant components of the diet, at least in the area we tested on the western edge of the site.

It seems clear from these findings that what was occurring here at VEN-1, was the inhabitants were collecting and harvesting most of the resources that

were locally available. The Chumash or their ancestors at VEN-1 were collecting and fishing for shellfish and fish associated with rocky shorelines and kelp beds. This subsistence strategy was aimed at maximizing their diet and yet making the most of the local resources without having to forage far way from this location. It is also apparent that they relied more on marine resources than was previously thought.

This subsistence strategy is not clearly reminiscent of the Paleo-Coastal Tradition as defined in Moratto (1984:104-111) and originally coined by E. Davis *et al.* (1969). It certainly follows the guide of a littoral and marine influence: as this site has abundant millingstones (Wallace 1956:6), has early radiocarbon dates (Breschini *et al.* 1996:100), but seems more generalized than one would define for most of the early period sites previously identified. It is very similar in adaptation to the Diablo Canyon Site (SLO-2) and the Tank site (LAN-1) (Greenwood 1972; Heizer and Lemert 1947), except that abundant millingstones were found in the earliest dated components at VEN-1 and LAN-1 while at SLO-2, they were not. The abundant mollusks and fish species in the assemblage at both sites are very similar to VEN-1.

Greenwood also found many whistles, awls, fishhooks, bone tubes, and blades at the lower levels. Scrapers and scraper planes are also fairly common (1972:24). What this indicates is a diverse toolkit to maximize subsistence of the local environment. This is also true at VEN-1 (Wallace 1956:6-22).

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