ANALYSIS OF FAUNA FROM THE THOMAS SITE (CA-MRN-115), A SHELL MOUND IN MARIN COUNTY, CALIFORNIA

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Results from a recent study of faunal remains from the Thomas Site (MRN-115) are discussed. Excavated in 1949 by Clement Meighan, MRN-115 is a large shell mound currently located in China Camp State Park. Artifacts, including 345 faunal remains, are archived at the Phoebe A. Hearst Museum of Anthropology, University of California, Berkeley. Forty percent of the assemblage consisted of avian specimens, and most are identified as Anseriformes. Indications of animal and human modification were found across taxa, including Canis latrans, Branta canadensis, Odocoileus *sp., and* Phalacrocorax *sp. We situate our findings within ongoing shell mound research in the San Francisco Bay region.*

This paper describes the methods and preliminary results from a recent study of faunal remains from the Thomas site, MRN-115. MRN-115 was excavated in 1949 by archaeologists from the University of California, Berkeley (Meighan 1953), and the collection of artifacts from this site is currently housed at the Phoebe A. Hearst Museum of Anthropology (PAHMA) at the University of California, Berkeley. Faunal data collected by Anneke Janzen (University of California, Santa Cruz) complement doctoral dissertation research conducted by Tsim Schneider (University of California, Berkeley) who is studying prehistoric and historic occupations of three shell mound sites—MRN-114, MRN-115, and MRN-328—by Coast Miwok-speaking hunter-gatherers (Lightfoot et al. 2009; Schneider 2007/2008, 2009; Schneider and Panich 2008). After a short introduction to the study sites and the MRN-115 museum collection, we discuss the limitations and benefits of working with museum collections. The bulk of our paper discusses the analysis of faunal remains, with particular emphasis on mammals and birds. Our methods are described, as well as preliminary results.

BACKGROUND

MRN-115 is a large multicomponent shell mound located in China Camp State Park, just east of San Rafael, California, on Point San Pedro (Figure 1). The MRN-115 shell mound has a maximum height of approximately 5 m and measures approximately 30 m east-west by 45 m north-south. Two smaller shell mounds—MRN-114 and MRN-328—are located only a few meters north and south of MRN-115 (Figure 2), and all together these three sites form a distinct cluster similar to hunter-gatherer settlement patterns previously identified in the Bay Area (King 1970; Luby et al. 2006; Milliken et al. 2007:105-107; Nelson 1909:328-329; Slaymaker 1974).

Intact prehistoric and historic deposits are present at all three sites and offer a unique opportunity to document long-term shifts in Late period (A.D. 900-1800) Coast Miwok settlement patterns, but also diachronic changes and continuities in shell mound use before, during, and after colonial settlement in the Bay Area (A.D. 1776-1850). The collection at the PAHMA also carries strong potential for identifying changes in representative species through time possibly due to territorial circumscription, resource intensification, or fluctuations in hunter-gatherer populations prior to and during the era of Spanish missionization (A.D. 1776-1830s). To this end, our faunal research questions address issues related to prehistoric subsistence and processing techniques practiced by the Coast Miwok, as well as taphonomic

Figure 1. Location of study area and China Camp State Park.

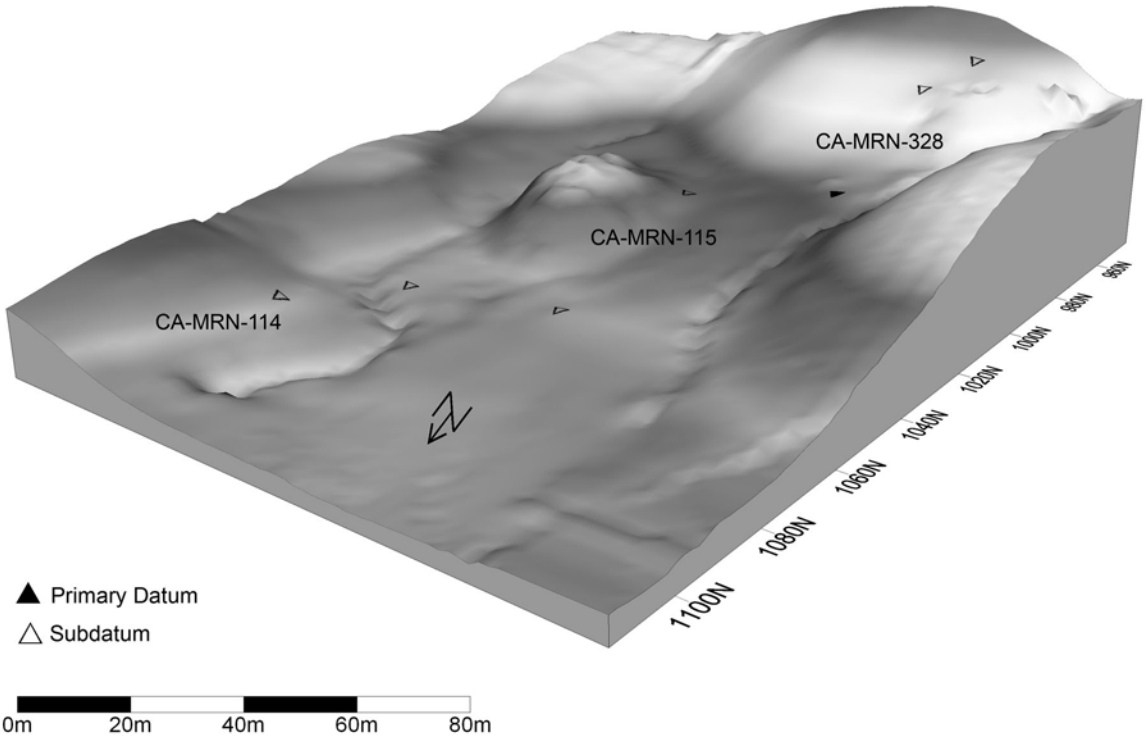

Figure 2. Surface map of MRN-114, MRN-115, and MRN-328.

processes; how and when the three sites were used through time; seasonality; and changes in, or persistence of, Coast Miwok subsistence strategies.

Archaeological research at MRN-115 was conducted in 1949 under the auspices of the newly formed University of California Archaeological Survey (UCAS), directed by Robert Heizer. As a student of Heizer's, Clement Meighan oversaw excavations of multiple subsurface units at MRN-115, including 12 5-by-5-ft. units located at the south end of the mound, five auger units placed systematically at 5 ft. intervals running south from the shell mound, and one pit feature located on top of the mound (Meighan 1953). Meighan also identified no fewer than 12 circular depressions located on the surface of the site, which were believed to be the remains of semi-subterranean conical bark houses. Meighan's subsequent excavation of one house depression yielded flaked stone artifacts, ground stone artifacts, worked bone implements, a pentagonal abalone (*Haliotis rufescens*) ornament, faunal remains, and baked clay fragments. As further evidence of an array of daily and ceremonial practices, excavation in the pit feature also yielded burned wooden house planks, grass thatching, and the nested remains of four plain and diagonal twined baskets.

The material assemblage at PAHMA includes over 500 individual artifacts of ground and flaked stone tools, shell artifacts, soil samples, baked clay fragments, wood, as well as 344 mammal, bird, and fish remains—over 70 percent of the MRN-115 collection. Because of the high proportion of faunal remains compared to the remainder of the MRN-115 assemblage, Anneke Janzen—a faunal specialist and Ph.D. student at the University of California, Santa Cruz—was enlisted to analyze the faunal remains from MRN-115. Through her research, it will be possible to answer fundamental research questions and eventually make intersite comparisons between faunal assemblages from the three shell mounds.

WORKING WITH A MUSEUM COLLECTION

Before discussing the methods and results of the MRN-115 faunal analysis, we provide a brief discussion of the limitations and benefits of working with a museum collection. Of primary concern to our research, we had no control of sample size or sampling methods. In terms of sample size, the MRN-115 collection harkens back to an era when it was accepted practice to excavate consecutive 5-by-5-ft. units—now considered oversize—and collect only formal artifacts or burial data. Excavation methods typically involved shovel broadcasting, which was believed a useful and effective method for studying shell midden sites in the greater San Francisco Bay area and central California (see Meighan 1950). However, as Rosenthal et al. (2007:150) point out in their overview of Central Valley archaeology, one drawback to early fieldwork and the prevalent use of field methods like shovel broadcasting was a "frank indifference to dietary remains."

Equally perplexing, very little provenience information is available for MRN-115. Aside from unit locations and depths for 25 faunal specimens provided in the site report (Meighan 1953), 93 percent of the assemblage lacks provenience information. Furthermore, only two bone artifacts excavated from the house pit—a bird bone tube and a deer antler artifact—have known depths. Recent personal communication with Joan Meighan, Clement Meighan's widow, and members of Meighan's 1949 field crew—David Fredrickson, Robert Greengo, and Robert Squier—yielded no additional information on the location of any field notes or possible provenience data aside from that which is already published in Meighan's 1953 site report.

Some of the limitations of working with a museum collection also have a silver lining. Our decision to work with the MRN-115 collection was supported by growing interest among archaeological practitioners in minimally invasive field methodologies, maximizing information from a limited number of carefully selected excavation units, utilizing archived archaeological collections, and also lessening the amount of material placed in curational facilities burdened by a "curation crisis." Meighan's deep excavation units—10 ft. in one area of the mound—also produced welcome information for understanding the early construction of basal deposits and patterns of site abandonment and occupation at MRN-115 over the past 1,000 years at a minimum (cf. Lightfoot and Luby 2002). Similarly, past and present maps and other archaeological information can be used to historically document natural and cultural disturbances to these rare sites and, in turn, supply State Park employees with valuable information to assist in monitoring and protecting cultural resources within the park.

METHODS

Three hundred and forty-five mammal, bird, and fish specimens comprise the total faunal collection from MRN-115 and were analyzed at the California Archaeology Laboratory, University of California, Berkeley, in 2008 (Figure 3). Because fieldwork at MRN-115 in 1949 did not involve screening excavated soils, smaller fragments of animal bone were not likely collected. As a result, there are no completely non-identifiable specimens as part of the collection. Bone specimens that have been worked to make tools and can still be identified to element or taxon have been included in the analysis.

All vertebrate materials were sorted and, when possible, each specimen was identified to element and taxon. However, due to their fragmentary nature, many of the museum specimens were identified to class and size categories. Identifications were made using basic comparative material, and a small percentage of the assemblage was brought to the Museum of Vertebrate Zoology (MVZ) at the University of California, Berkeley. Specimens analyzed at the MVZ either showed signs of modification, such as butchery marks, or were mostly complete specimens that could potentially be further identified to family or genus. A variety of attributes were recorded, including weathering stage, burning stage (Shipman et al. 1984), fragmentation, and surface modification, including butchery marks as well as damage inflicted by animal actors. Element frequencies were measured using a landmark-overlap technique.

Overall, faunal remains from MRN-115 are in very good condition, most exhibiting very little weathering. Very few elements showed evidence of burning, and the majority of bone break surfaces

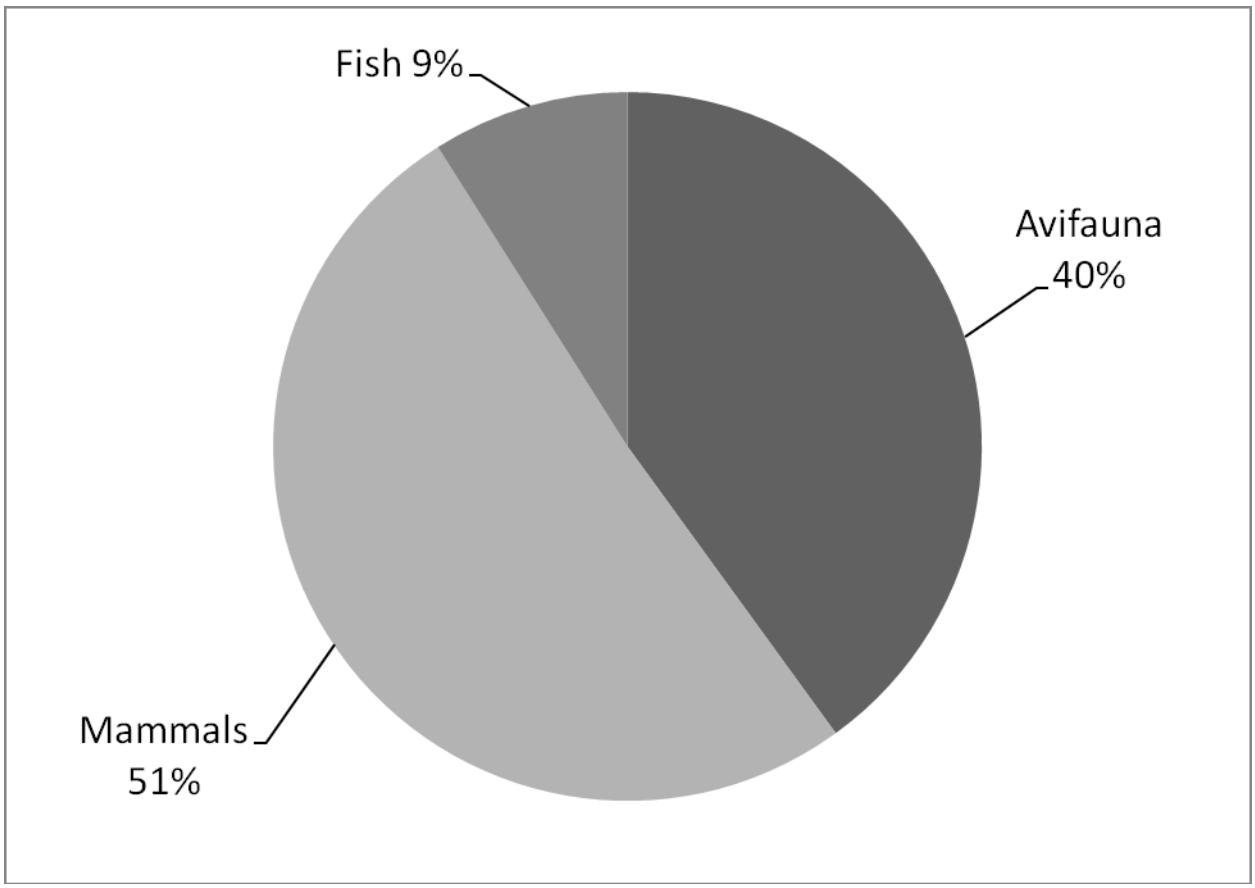

Figure 3. Percentages of mammal, bird, and fish specimens (NISP) in CA-MRN-115 faunal assemblage.

showed that the bone was broken while still relatively fresh, not as a result of excavation or 60 years of storage.

ASSEMBLAGE COMPOSITION

One hundred and thirty-eight avian specimens were recovered, equaling 40.11 percent of the assemblage. Out of 176 mammal specimens (comprising 51.16 percent of the assemblage), 76 specimens were identified as artiodactyls and made up 22.09 percent of the assemblage (or 43.18 percent of the mammals in the assemblage). Only seven specimens were identified to the class Carnivora, making up 2.03 percent (or 3.97 percent of the mammals in the assemblage), including two *Canis latrans* specimens and four *Procyon lotor* specimens. Thirty-one fish specimens were also recorded, totaling 8.40 percent, and were sent to Dr. Thomas Wake at the Cotsen Institute of Archaeology, University of California, Los Angeles, for detailed analysis. Rare clades are represented by only one element and include Testudines and Rodentia. The rodent Botta's pocket gopher (*Thomomys bottae*) is most likely intrusive, as the specimen is a whole cranium.

Artiodactyls

Seventy-six specimens were identified as artiodactyls. One of these elements was identified as *Antilocapra americana*, and three specimens were identified to *Odocoileus* sp. These identifications were all made based on cranial remains. Other specimens were highly fragmented, such that identification to family or genus was impossible without further analysis. Axial elements such as vertebrae are present in the collection, though in very low numbers. Limb bones are relatively abundant, as are tarsals. This may be

Table 1. MNI and NISP for avifauna from MRN-115.

	NISP	MNI
Anatinae	8	1
Anseriformes	68	10
Anserinae	1	1
Branta canadensis	2	2
Phalacrocorax sp.	4	1
Podiceps spp. (grebe)	1	1
Larus sp.	1	1
Aechmophorus occidentalis (western grebe)	2	2
Numenius sp.	3	1
Aves	48	5

the result of butchery practices or density-mediated attrition, where less dense elements do not survive postdepositional processes. However, this is most likely not true, as almost all the bones were in good condition and nearly half of all long bone fragments had epiphyses. Furthermore, only two isolated teeth were included in the whole assemblage; a relatively higher number would be expected if element density were a factor in differential preservation.

Avifauna

Minimum number of individuals (MNI) and the number of individual specimens present (NISP) for avifauna remains are summarized in Table 1**.** Within this sub-assemblage, skeletal element frequencies revealed no cranial elements or foot bones from avifauna. Although some axial elements (pelvis, rib, and sternum) are present in the collection, their representation is also very low. This may be due to the low density and fragility of such elements, and may also account for the absence of cranial bones. Excavation methods could also account for the paucity of cranial and certain axial elements. Individual vertebrae and broken bones were probably not purposefully collected.

MODIFIED BONE

Fifty specimens in the MRN-115 collection exhibited cut marks. The majority of these specimens are identified as artiodactyls. Consistent with avifauna from other Bay Area shell mound sites (e.g., Broughton 2004), bird taxa with cut marks include *Branta canadensis* and *Phalacrocorax* sp. Other avian specimens with cut marks could be identified only to Anseriformes. In at least two cases, cut marks on bird bones appear to be related to the manufacture of bone artifacts (Figure 4), such as bone beads, which have been recovered from ALA-328 (Patterson Mound; Bickel 1976:141) and CCO-295 (Ellis Landing; Nelson 1910:400). Two *Canis latrans* bones also had cut marks. One of them—a distal femur—had been worked.

A significant portion of the MRN-115 assemblage reveals evidence of carnivore modification. Most notably, a large tooth notch is present on the horn core of a pronghorn (*Antilocapra americana*) specimen (see, for example, Figure 5). Another interesting feature of this assemblage is the presence of tooth marks on worked bone artifacts, such as awls. The tooth marks in question are from a small carnivore, probably a raccoon or fox. These marks are not extremely abundant or deep, and it looks as though the carnivore was “testing” the bone. It is conceivable that the worked piece of bone may have been thrown out with trash, and that a carnivore rooting through the garbage would have nibbled on the awl while looking for something with more nutritive value.

CONCLUSION

To conclude, methods and preliminary findings from the study of mammal and bird remains from MRN-115 are described. MRN-115 is a large, multicomponent shell mound excavated by Clement

Figure 4. Cut marks on bird bone artifact (PAHMA Catalog # 1-127825).

Meighan in 1949. The collection is stored at the Phoebe A. Hearst Museum of Anthropology and includes over 500 artifacts, of which over 70 percent of the assemblage is composed 138 bird specimens, 176 mammal remains, and 31 fish remains. Additional data from the analysis of fish remains and shellfish, as well as faunal data from MRN-114 and MRN-328, will be important additions to this study. Although the collection and provenience of artifacts from MRN-115 remain mostly a mystery, our preliminary findings suggest high potential for understanding representative species, as well as taphonomic and depositional processes at one of the San Francisco Bay area's last remaining intact shell mounds.

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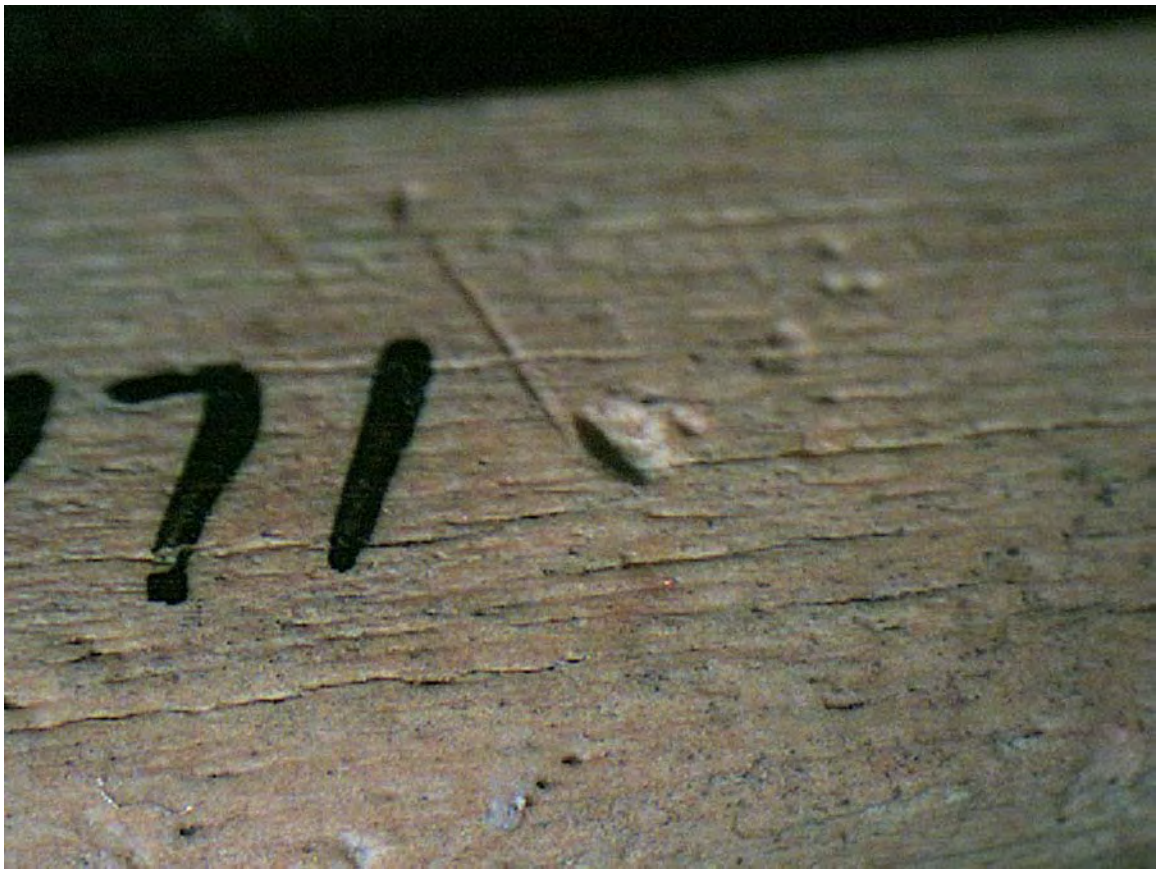

Figure 5. Singular notch in mammal bone artifact (PAHMA Catalog # 1-127871).

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