Appendix C

A MAMMALIAN FAUNAL ANALYSIS OF CA-Ala-307*

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Introduction

The faunal assemblage described in this report was obtained from various different excavations of site 4-Ala-307, commonly known as the West Berkeley Shellmound, and is a more complete (in terms of presented data) analysis than a previous attempt by J.A. Freed (n.d.). Excavations were conducted at various times during the years 1950-1954 by several University of California, Berkeley archaeological field classes in the course of salvage operations at the site. Much of the unmodified faunal material obtained during the course of the excavations has served as practical teaching material for several graduate seminars on the mechanics of faunal analysis given jointly by the Departments of Anthropology and Paleontology at the University of California, Berkeley at various times. This brief paper represents the results of one such seminar.

Due to these and other factors, much of the excavated material has become scattered and only partially analyzed over time. This has resulted in the loss of much valuable data on CA-Ala-307 in terms of subsistence, determination of butchery practices and patterning, activity areas, ecology and so on. This report should therefore be viewed as a partial, qualitative salvage attempt in understanding the faunal remains present at the West Berkeley Shellmound. As such, no attempt has been made to go into minimum and maximum numbers of species present, stratigraphic and areal analysis of units and other information currently considered essential in a report on a modern faunal assemblage. (See Daly 1969, Payne 1972, Ziegler 1965, for discussions on various aspects of faunal analysis.)

Methodology

From the excavated material stored in the collections of the Robert H. Lowie Museum of Anthropology, a selection was made of a series of related and non-related units for the analysis. Care was taken to see that the units selected would (1) cover a fairly large portion of the site (2) that they would present a viable and reliable overview of the site by representing a broad enough sample and (3) that several of the selected units would have a reasonable depth.

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* Submitted December, 1974.

Units K-1 and including K-8, L-1 to L-3, F-7, G-4 and C-2 were selected from the material available for study. (See Map I). The K and L units had been excavated in 1954, the F-7 and G-4 units had come from earlier excavations in 1951 and unit C-2 was from the summer excavations of 1950. These 14 units yielded a total of 415 mammal specimens weighing a total of 2465.2 grams for analysis.

Identification of the material was made possible by the use of the Department of Paleontology Element Collection, University of California, Berkeley and by the collections housed in the University of California Museum of Vertebrate Zoology. All bones were identified, where possible, to genus/species. Of the 415 mammal specimens, 204 (49.2%) could be identified to this level. Identification was hindered by the fact that much of the material was badly broken or fragmented and complete specimens of any element were relatively rare in the assemblage. This factor accounts in part for the large number of unidentified medium to large mammal long bone fragments. (See Table A for Distribution Frequencies of Mammals.)

The mammalian skeletal remains were identified as belonging to five orders: Carnivora, Rodentia, Lagomorpha, Artiodactyla and Cetacea. All species identified were found to be within their present range and habitat. (See Ingles 1947 for a discussion of distribution, habitats and so forth.) The remains of the following 18 species were recovered.

Identified Mammal Species Present at West Berkeley

Large Mammals

Antilocapra americana (Pronghorn Antelope)
Cervus sp. (Elk)
Odocoileus hemonius (Mule Deer)
Phoca sp. cf. *vitulina* (Harbor Seal)
Tursiops gilli (Bottle-nosed Dolphin)
Zalophus or *Eumatopias* sp. (Sea Lion)
Delphinus bairdi (Common Dolphin)**
Phocaena vomerina (Bay Porpoise)**

Medium Mammals

Canis sp. cf. *latrans?* (Coyote)
Enhydra lutra (Sea Otter)
Lepus sp. cf. *californicus* (Blacktailed Jackrabbit)
Procyon lotor (Raccoon)
Taxidea taxus (Badger)

Small Mammals

citellus beecheyi (Ground Squirrel)**
Mephitis mephitis (Striped Skunk)**
Neotoma sp. (Wood Rat)

Sylvilagus sp. (Rabbit)
Thomomys bottae (Pocket Gopher)

** Not found in present analyzed material but have been noted and identified in previous analyses, (Crader n.d.; Kreed n.d.; Harris and Kurashima n.d.; and Karoma and Gifford n.d.).

Results

The dominant identified species present at West Berkeley is *Odocoileus hemonius* (35.8%) with *Canis* sp. (19.6%) and *Enhydra lutra* (14.2%) coming in as poor seconds. *Thomomys bottae* (12.2%), *Phoca* sp. (6.3%) and *Zalophus* or *Eumatopias* sp. (4.9%) also are present to some degree. *Antilocapra americana* (0.9%), *Cervus* sp. (1.9%), *Lepus* sp. (0.9%), *Procyon lotor* (0.9%), *Neotoma* sp. (0.5%), *Sylvilagus* sp. (0.5%) and *Tursiops gilli* (0.5%) are all present in small quantities. It should be noted that these percentages are based on raw counts of the material and therefore may not represent the actual importance of each species at West Berkeley. They do, however, give us a rough quantitative indication of the relative abundance of each species.

Individual elements of the total mammalian fauna (Genus/Species/Category) are represented in Table A. The most commonly recurring bone elements of the total assemblage are long bone fragments (26.7%) followed by long bone elements (18.3% - excluding astragali, calcanei and phalanges), rib elements (11.3%) and vertebrae (8.0%). It should be noted that 45.0% of the total faunal assemblage is comprised of long bone elements/fragments and that of the specimens identified to the genus/species level, identifiable long bones (femur, radius, tibia, etc.) comprised 31.9% of the total. While the percentages appear to be slightly skewed by the large numbers of long bone elements and fragments present, one should expect such a large representation in the sample since these are among several of the more resistant and durable body parts that would be preserved in the archaeological record.

Out of the total mammalian remains, 23 (5.5%) were noted as belonging to immature individuals on the basis of standard characteristics (eg. unfused epiphyses, deciduous molars and so on). Of these, *Odocoileus hemonius* (2.4%) and *Enhydra lutra* (2.0%) had the largest number of juvenile specimens present of the identified species.

Twenty specimens, 4.8% of the total assemblage, were either completely carbonized or showed traces of charring. Of these, 1.4% were identified as to the genus/species level.

Conclusions/Observations

Due to the fragmented nature and incompleteness of the analyzed sample, no firm inferences can be derived from the faunal analysis of West Berkeley. However, several observations can be pointed out and from these several tenuous inferences can be drawn.

From the analysis it appears that the ecology of West Berkeley, as it pertains to the mammal distribution and their habitats, has not changed drastically over the time span of the occupation of the site. The subsistence of the aboriginal inhabitants, in regards to the exploitation of mammals and as determined from the relative frequencies of the faunal remains, appears to have been orientated primarily toward the exploitation of one land mammal, *Odocoileus hemonius*, and one marine mammal, *Enhydra lutra*. While other land and marine mammals also appear in the faunal record, these two are the dominants.

The large number of long bone fragments could perhaps be indicative of butchery practices or an alternate explanation could be that they were broken in order to obtain the marrow as a food. Still another reason could be that they were used as raw material in the manufacture of artifacts (see Wallace and Lathrap n.d.). The high percentage of both identifiable long bone elements and unidentifiable fragments could be due to either one or a combination of these suppositions. Lastly, as a final observation, it appears that the percentage of *Odocoileus hemonius* steadily increases from the lower levels to the upper levels of the site, while the frequency of *Enhydra lutra* shows a drastic increase at the 60-72" level. This might be explained either as a change in food preference or in methods of hunting (both in regards to *Enhydra lutra*) or it may be attributed in part to differential preservation due to depth and other edaphic factors, (see Table B).

As a concluding remark, this report should be viewed as only a brief, qualitative and incomplete summary of the mammalian fauna represented at CA-Ala-307, and as such any conclusions drawn from the data are at the best only tenuous inferences. It is unfortunate that one cannot use this existent data base more informatively.

Acknowledgments

The author gratefully acknowledges the assistance provided by the faculty members of Interdepartmental Studies 215, Faunal Analysis in Archaeology, Drs. Clemens, Isaac, Rodden and Savage, in completing this analysis. I am also indebted to my fellow students and especially to Larry S. Kobori and Eric Blinman for their comments and discussion on various aspects of the material and of this report. I should also like to thank Dr. William Z. Lidicker, Jr., Curator of Mammals, who gave me permission to use the comparative specimens in the University of California Museum of Vertebrate Zoology and Dr. R.F. Heizer, Department of Anthropology, for his advice and assistance.

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ADDENDUM

Explanation of Categories - Reference mammal sizes used as a basis for Table A categories.

Large Mammal - Wolf through Deer size.

Medium Mammal - Jackrabbit through Coyote size.

Small Mammal - Through cottontail size.

(After Ziegler 1965).

Distribution Frequencies of Mammals - CA-Ala-307

Bone elements		Neotoma sp.	Sylvilagus sp	Thomomys bottae	Canis sp.	Enhydra lutra	Lepus sp.	Procyon lotor	Taxidea taxus	Antilocapra americana	Cervus sp.	Odocoileus hemonius	Phoca sp.	Tursiops gilli	Zalophus or Eumatopias sp.	Unidentified Small Mammal	Unidentified Medium Mammal	Unidentified Large Mammal	Total	% of Total
Total number		1	1	25	40	29	2	2	1	2	4	73	13	1	10	1	62	148	415	
Total weight		0.5	0.5	4.4	153.3	223.7	4.3	10.8	6.6	4.2	194.3	741.1	105.8	25.3	116.6	0.1	97.0	776.7	32465.2	
Adult		1	1	25	38	25	2	2	1	2	2	68	11	1	9	1	60	143	392	
Juvenile					2	4					2	5	2		1		2	5	23	5.6
Burnt									1		1	3	1				1	13	20	4.8
Complete bone		1	1	13	19	13					1	14	5	1	4		3	2	77	18.6
Bone fragment				12	21	16	2	2	1	2	3	59	8		6	1	59	146	338	81.4
Antler											1	2						5	8	1.9
Astragalus																				
Right					1							2							3	0.8
Left												2			1				3	0.8
Calcaneum																				
Right			1		2							1	1						5	1.2
Left												1							1	0.2
Femur						1					1		2					1	5	1.2
Right				1		1													2	0.5
Left						2						1	2						5	1.2
Fibula																				
Right												2							2	0.5
Left																				
Humerus						1						2					1		4	1.0
Right					1	1													2	0.5
Left				2	1				1										4	1.0
Mandible				1	1	1									1				4	1.0
Right						2													2	0.5
Left						1						2							3	0.8
Maxillae				4	1														5	1.2
Metacarpals					4							2						3	9	2.2
Metatarsals					1							2	2				1		6	1.5
Metapodials					1							5						5	11	2.6
Pelvis & Sacrum		1		2		1					1	10	2						17	4.1
Phalanges					8	2						10	2		5			1	28	6.7
Radius						3						2					1	2	8	1.9
Right						3						1							4	1.0
Left												2							2	0.5
Ribs																	20	27	47	11.3
Scapulae								1		2		4							7	1.7
Right								1											1	0.2
Left					1												1		2	0.5
Skull				2	12	1						5	2		1	1	3	6	33	8.0
Teeth																				
I				11														1	12	2.9
M					1	3													4	1.0
C					2	1									2				5	1.2
Tibia												1					1	2	4	1.0
Right				1		1						2							4	1.0
Left				1		3	1					1							6	1.4
Ulna												1							1	0.2
Right					2														2	0.5
Left																				
Vertebrae												1					3	10	14	3.4
Caudal					1									1			2		4	1.0
Cervical												2					1		3	0.8
Lumbar																		1	1	0.2
Thorasic											1	7					1	2	11	2.6
Long bone frags						1	1										27	82	111	26.7

Table B

OCCURRENCE OF MAMMAL BONE BY DEPTH

	0-12	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180
Neotoma sp.											1				
Sylvilagus sp.	1														
Thomomys bottae	8	1		1		13		1							
Canis sp.	3	2	4	12	4	1	3		2			1			1
Enhydra lutra	4	6	6		1	4	1				1	1			
Lepus sp.		1		1											
Procyon lotor	1		1												
Taxidea taxus				1											
Antilocapra americana	2														
Cervus sp.			2	1											
Odocoileus hemonius	12	10	15	7	1	1	4	2	6		1	4	5		
Phoca sp.		3	2			1		2	1		1	2		1	1
Tursiops gilli						1									
Zalophus or Eumatopias	1		3	1		1	1			1	1				
Small Mammal	9	2		2		13		1			1				
Medium Mammal	18	17	27	25	8	9	6	3	9		2	9	3		1
Large Mammal	46	40	35	31	7	12	11	8	10	2	12	20	14	1	1