Appendix

The Vertebrate Faunal Remains from Red Rock Canyon Rockshelter (CA-KER-147)

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Introduction

The CA-KER-147 site is located in a canyon to the northwest of Koehn Lake and sprawling Fremont Valley, in the western Mojave Desert. The site, which was excavated in 1973, is on a small knoll with coarse sandstone formations in a Creosote Brush Scrub plant community. The rockshelter consists of an overhang with two small adjacent shelters, designated A and C. There was a relatively deep and extensive midden in front of the rockshelters that was laden with cultural materials extending out about 10 m. The deposit had a depth of about 70 cm below the current ground surface. Five units were excavated within and in front of Shelter A (Units TU-1 and A1 through A4), and three units were excavated at Shelter C (Units C1 to C3). The vast majority of bone (79 percent) was in the upper 40 cm of the deposit.

Eight bedrock mortars and four bedrock metates are on rocks above Shelter A, indicating that relatively intensive food processing activities (e.g., acorn processing) were conducted at this site. The shelters also contained several burials and a rich artifact deposit. Surface collections of artifacts and some vandalism had occurred over the years, and much of the soil at this site had been heavily disturbed. Although much of the recovered faunal material was obtained from disturbed soil contexts, all productive levels from the units placed at both shelters yielded a preponderance of jackrabbit bones. There were no appreciable differences in the types of bones recovered from the various levels, including deeper levels that had not been previously impacted.

The excavations at KER-147 yielded a large faunal sample (n = 8,441) (Table 1) dominated by black-tailed jackrabbit (*Lepus californicus)* fragments. Twelve other taxa were represented in the assemblage, including rodents and deer, although the counts of these other animals were so low that their contributions to the meat-protein pools at the site appear to have been comparatively negligible.

The species richness (see Grayson 1984) of these samples, or the number of different taxa found in the samples, is surprisingly low (n = 13). Faunal assemblages of this region usually have high species richness, containing the bones of various rodents (e.g., woodrats, kangaroo rats, and ground squirrels), birds, reptiles, and some large mammals (e.g., deer, pronghorn), and they are dominated by lagomorphs (Basgall 1982; Yohe 1984; Yohe and Goodman 1991). The predominance of jackrabbit bones at KER-147 suggests that the late prehistoric biome of the area was relatively open and more suitable for jackrabbits than for cottontails. This is not surprising, as the apparent intense focus on jackrabbits was common for Mojave Desert sites.

Perspectives and Orientation

The central objectives of faunal analyses include determining the primary food animals that were exploited by a particular group, providing insights into the hunting and subsistence practices of a group, and revealing information on site seasonality, the former ecozones of an area, and perhaps ceremonial activities.

Faunal samples also provide data on various behaviors conducted at a site, such as animal carcass and bone processing activities, food refuse discard patterns, and bone tool use. In addition to these primary topics, this study explores ideas regarding the apparent systematic sectioning and processing of jackrabbit carcasses by the occupants of KER-147.

Regional faunal assemblages in the western Mojave Desert usually have the bones of a variety of small animals that were collected during daily foraging activities. Although large mammals were sometimes hunted, small animals that were easily captured and that had high fat yields (e.g., rabbits, rats, and quail) were primary dietary animals for many groups living in the region. The bones of most animals were pulverized into fragments to release marrow and bone oils, and some groups pulverized bone to a finer degree than others. Smaller animals, such as rats and lizards, were often completely pulverized, probably using manos and metates (see Yohe et al. 1991). Entire crushed animals (or their parts) were cooked over coals or added to stews and broths. Because many animals were crushed and pulverized, faunal assemblages in this region usually have an abundance of small shaft and axial fragments, although small numbers of

Table 1. Summary of Vertebrate Faunal Remains[a] from CA-KER-147 (All Units and Levels [cm]).

Taxon	Surface	0-40	40-60	60-80	80-100	100-120	Unknown Level	Totals
Gopherus agassazi	–	7	1	–	–	–	–	8
Sauromalus obesus	–	1	–	–	–	–	–	1
unidentified lizard	–	3	–	1	–	–	–	4
unidentified snake	–	4	–	–	–	–	–	4
unidentified bird	–	4	–	–	–	–	–	4
Sylvilagus audubonii	–	3	1	–	2	–	–	6
Lepus californicus	184	2,009	119	155	23	5	122	2,617
Dipodomys spp.	–	13	–	–	–	–	2	15
Perognathus spp.	–	29	1	7	–	–	–	37
Spermophilus spp.	1	1	–	–	–	–	–	2
Neotoma spp.	–	63	4	4	3		1	75
Thomomys bottae	–	1	–	–	–	–	–	1
Canis latrans	–	3	–	–	–	–	–	3
unidentified fox	–	1	–	–	–	–	–	1
Lynx rufus	–	8	–	–	–	–	–	8
Odocoileus hemionus	–	23	2	–	–	–	2	27
Ovis spp.	–	2	–	–	–	–	–	2
small-medium mammal	259	3,726	273	377	283	25	262	5,205
large mammal	6	354	5	9	12	–	35	421
Totals	450	6,255	406	553	323	30	424	8,441

a. In NISP (Number of Identified Specimens).

teeth, shaft ends, and other diagnostic pieces are also recovered.

Animal bones accumulate in the ground as a result of human activity and natural agency. Decomposition of carnivore scat, raptor pellets, burrow deaths, and other sources may contribute to bone components found in soil strata. Determining whether faunal material was culturally or naturally deposited, or a combination of both, can sometimes be difficult. Coyotes, foxes, bobcats, and other scavengers leave bone-filled scat on the surface of sites, and over years the bone from their decomposed scat mixes with culturally deposited bone. Sites located near outcrops or trees may yield abundant intrusive bone from predatory bird pellets (regurgitated castings of bone and fur). Individual pellets can contain complete skeletons of small prey that disarticulate as the pellets decompose. Larger prey (e.g., rabbits and squirrels) are often dismembered by large predatory birds, leaving complete long bones and vertebral sections.

In general, however, more recent noncultural bone is generally white in color and does not have the characteristics of "midden-stained" bone, and complete elements can sometimes be found. At KER-147, many of the complete woodrat elements are probably from woodrats that lived and died in the shelters, and raptor pellets and coyote scat may have also added complete woodrat elements into the deposit. Culturally deposited bone often include taxa in nonnatural abundance or concentrations, and such osteological remains are typically found in association with other cultural materials or features. The average size of bone fragments that had been intentionally pulverized can generally be differentiated from bone derived from carnivore scat or other scavengers. As noted above, small animals and the bones of large mammals were pulverized on stone milling implements, and bone meals were produced in many areas (Drucker 1937; Michelsen 1967; Bean 1972; Yohe et al. 1991).

A relatively high percentage of culturally deposited bone appears burned, which facilitates differentiating between naturally or culturally deposited bone. Burned bones resulted from a variety of processes. For instance, animals that were roasted over coals often exhibit charring on lateral appendages (such as fingers and toes), and distal tips of vertebral neural spines and dorsal skull elements sometimes exhibit charring when carcasses were roasted on their backs. The dregs of soups and stews containing crushed bones were often tossed into fires, which caused the bone to become charred. Hearths and roasting pits were excavated into soils that contained discarded unburned bone, and these bones would become secondarily charred from contact with such intrusive fires. Brush fires sweeping over sites can also char exposed surface bones.

Most of the discarded bones from meat that was grilled, roasted, or baked—bones that retained their oils and fats—would have quickly been removed by scavengers, especially by Indian dogs. A high percentage of bone fragments recovered from sites in the western Mojave Desert was probably derived from the dregs of broths and soups, bone that had been cooked to release most of the oils and fats. When this "dreg bone" was discarded, scavengers were not much interested in it. Most late prehistoric and early historic groups of the region cooked soups/stews with small "cooking stones" that were placed in pots or stone bowls. Cooking temperatures in these "broth pots" were relatively low and of short duration, because the cooking stones quickly cooled down. Perhaps it was necessary to pulverize bone into small pieces to facilitate the release of bone oils when low-temperature cooking techniques were employed.

The remains of small game animals, such as rodents, lizards, and insects, are not usually retrieved in high frequencies due to the use of large-mesh recovery screens, creating biases in the recovery and analysis of bone (Thomas 1969; Grayson 1984; Shaffer 1992). During handpicking of materials from recovery screens, large pieces are usually retrieved in much higher frequencies than small fragments. The bones of microfauna (e.g., mice and lizards) are sometimes mistaken for small rootlets and are therefore overlooked. To add to the problem, larger and denser bone preserves better than fragile pieces, and damp or acidic soil often destroys bone.

Western Mojave Desert groups swallowed the bones of small game animals, epiphyseal ends were chewed off, and bone fragments were evacuated at off-site defecation areas. For example, prehistoric Cahuilla coprolites in the Coachella Valley in southeastern California have contained relatively large bone fragments from a variety of different animals, including complete tortoise phalanges (Wilke 1978; Sutton and Wilke 1988). Animal carcasses were sometimes left at hunting or fishing locations, and only boneless fillets were brought to sites. These practices suggest that numerous taxa that may have been exploited at a site have very low archaeological visibility.

Methods

The faunal specimens from KER-147 were recovered in the field by dry-screening through 3.2 mm (1/8 in) mesh. Materials were separated by unit and level, brushed clean, and catalogued prior to analysis. The bones were sorted, counted, and each specimen was examined for diagnostic characteristics and alteration due to burning, gnawing by scavengers, butchering cut marks, etc. Many pieces were examined under a dissecting microscope for cut marks, grinding striae, or other modifications. Recorded attributes of identified elements included specimen orientation (right, left, or axial), the condition of the piece (weathered or burned), and the relative age of the represented animal. Taxonomic classifications were based on external macromorphological attributes of identified specimens. In all cases, specimens were identified to the lowest taxonomic category possible. Taxonomic identifications were achieved by matching identifiable elements against specimens in the author's comparative vertebrate collection.

Unidentified shaft fragments were placed into one of two categories, depending upon diaphyseal thickness and curvature or other characteristics. The first category was unidentified small to medium mammal, and the second was unidentified large mammal. Small to medium mammals are the size of rats/mice to rabbit-size animals, while large mammals are the size of coyotes or bobcats to deer.

Because the deposit was mixed and comprised of tiny fragments of many individual animals and because the units were excavated in arbitrary 20-cm levels, measuring taxonomic abundance by the standard minimum number of individuals (MNI) method would have been very difficult to accomplish; the individual animal counts would have been very misleading. Due to these difficulties, quantification of the samples was based on the total number of specimens per taxon (number of identified specimens [NISP]) rather than MNI values. The species descriptions below were compiled by consulting Hall and Kelson (1959); Burt and Grossenheider (1976); Behler and King (1979); Jameson and Peeters (1988); and Whitaker (1980).

Results

A total of 8,441 vertebrate faunal specimens were recovered from KER-147 (Table 1). All of the bones examined in this study were relatively well preserved, with no evidence of natural, chemical, or mechanical degradation that might have significantly biased the sample by removing bone from the site.

Species Accounts

The faunal collection was mostly mammalian in composition and was overwhelmingly dominated by black-tailed hare (*Lepus californicus*), although significant numbers of rodents and some large mammals were present. The distribution of elements by unit and level are provided in Tables 2 through 11, and the species accounts are provided below.

Class Reptilia

Reptiles may have had an important role in the diets of the prehistoric populations of the Desert West at times when other sources of protein, such as rodents, lagomorphs, and ungulates, were in short supply or unavailable. Many southern California groups consumed tortoises, lizards, and snakes (Drucker 1937), and the Kawaiisu exploited the chuckwalla (Zigmond 1986). Information on specific taxa contained in the species accounts below are from Bezy (1981).

Order Testudines, Family Testudinidae, Gopherus agassizi (desert tortoise)

A total of eight elements of desert tortoise were recovered, none of which was burned. Fragments of the shell (carapace and plastron) and of the axial skeleton (e.g., femur and pelvis) were found. It is possible that the eight elements represent a single animal and may not be cultural in origin.

Nevertheless, the desert tortoise was an important faunal resource for many desert peoples both prehistorically and in historic times (Schneider and Everson 1989). Tortoise remains have been recovered from a number of archaeological sites in the Mojave Desert (Kent 1985; Yohe 1987; Sutton and Yohe 1989), including the nearby Cantil site (Yohe and Goodman 1991).

Order Squamata, Suborder Sauria (lizards), Family Iguanidae' Sauromalus obesus (chuckwalla)

One unburned mandible identified as chuckwalla was found in the faunal material. The chuckwalla was a favorite food lizard, both for its large size and delicate flavor. It was considered a delicacy by many desert people (Bean 1972; Wallace 1978) and is known to have been eaten by the Kawaiisu (Zigmond 1986). This single specimen is unburned, and it is not clear whether it was food refuse.

Unidentified Lizard

Four elements of unidentified lizard were in the collection, all unburned. None of these elements could be attributed to human activity.

Suborder Serpentes, Family Colubridae

Four unburned vertebrae from unidentified snakes were found, representing at least one large and one small snake. These elements could not be attributed to human activity.

Class Aves

Only four bird elements were found at KER-147, and none could be identified to genus. One element was the caracoid of a jay-sized bird, with the other elements being smaller. It could not be determined whether these elements were the result of human activity.

Class Mammalia

Mammalian remains comprise the bulk of the faunal remains from the Cantil sites in general. Hares, rabbits, and rodents seem to have had the greatest economic significance.

Order Lagomorpha (rabbits, hares, and pikas), Family Leporidae (rabbits and hares)

Leporids (hares and rabbits) were a predominant faunal resource for many North American aboriginal groups. Such remains comprise the bulk of many prehistoric faunal assemblages in the deserts of California and the Great Basin (Basgall 1982; Reynolds and Shaw 1982; Langenwalter et al. 1983; Kent 1985; Yohe and Goodman 1991). These mammals were abundant in most habitats and were easily captured. Individual hunters obtained jackrabbits and cottontails with curved throwing sticks, and many groups conducted large-scale

Table 2. Summary of Individual Faunal Specimens[a] from Test Unit 1[b] at CA-KER-147.

Taxon	Surface	10-30	20-40	40-60	60-80	Totals
unidentified snake	–	–	1 ub small vertebra	–	–	1
unidentified bird	–	1 ub femur	–	–	–	1
Sylvilagus audubonii	–	1 ub proximal ulna	–	–	–	1
Lepus californicus[c]	146	377	83	1	21	628
Dipodomys spp.	–	1 b distal radius	–	–	–	1
Perognathus spp.	–	2 ub cranial, 5 ub incisors	1 ub mandible, 2 ub femora, 6 ub incisors	–	1 ub cranial, 1 ub mandible, 1 ub femur (juvenile), 1 ub patella	20
Spermophilis spp.	1 b distal tibia	–	–	–	–	1
small-medium mammal	117 ub, 134 b	229 ub, 215 b; 1 ub thoracic vertebra (fox?)	101 ub, 25 b	–	35 ub, 14 b	871
large mammal	6 b shaft	8 ub shaft, 17 b shaft	17 ub shaft, 1 ub enamel	–	2 b	51
Totals	404	857	237	1	76	1,575

a. Fragments; b = burned, ub = unburned.
b. By level in cm.
c. See Table 12 for details on jackrabbit elements.

Table 3. Summary of Individual Faunal Specimens[a] from Unit A-1[b] at CA-KER-147.

Taxon	0-20	20-40	40-60	60-80	80-100	Totals
unidentified snake	1 ub large vertebra	–	–	–	–	1
Sylvilagus audubonii	–	1 ub distal radius	–	–	–	1
Lepus californicus[c]	38	101	21	27	3	190
Perognathus spp.	–	–	–	1 ub mandible, 1 ub incisor, 1 ub humerus	–	3
Neotoma spp.	–	1 ub mandible	3 ub mandible, 1 ub molar	1 ub mandible, 1 b mandible, 1 ub tibia	1 ub mandible, 1 ub molar	10
canid (fox?)	–	1 b astragalus	–	–	–	1
Lynx rufus	–	1 ub proximal ulna	–	–	–	1
Odocoileus hemionus	1 ub proximal phalanx	–	–	–	–	1
small-medium mammal	60 ub, 84 b	15 ub, 71 b, 1 ub talus	42 ub, 25 b	96 ub, 62 b	8 ub, 8 b	472
large mammal	3 ub, 5 b	7 ub, 4 b	5 b	2 ub	3 b	29
Totals	192	203	97	193	24	709

a. Fragments; b = burned, ub = unburned. See Table 4 for Unit A-1 column sample faunal remains.
b. By level in cm.
c. See Table 13 for details on jackrabbit elements.

Table 4. Summary of Individual Faunal Specimens in Column Sample from Unit A-1[a] at CA-KER-147.

Taxon	0-10	10-20	20-30	30-40	40-50	50-60	60-70	Totals
unidentified lizard	–	–	–	–	–	–	1	1
Lepus californicus	–	2	1	1	–	–	–	4
small-medium mammal	22	26	38	51	18	8	43	206
large mammal	–	–	1	–	–	–	–	1
Totals	22	28	40	52	18	8	44	212

a. By level in cm.

Table 5. Summary of Individual Faunal Specimens[a] from Unit A-2[b] at CA-KER-147.

Taxon	0-20	20-40	40-60	60-80	80-100	Totals
unidentified lizard	1 ub femur	–	–	–	–	1
Lepus californicus[b]	264	43	–	10	–	317
Perognathus spp.	1 ub pelvis, 1 ub humerus	–	–	–	–	2
Neotoma spp.	1 ub mandible, 1 ub molar	–	–	–	–	2
Lynx rufus	1 ub distal radius	–	–	–	–	1
small-medium mammal	175 ub, 264 b	53 ub, 26 b	–	2 ub	–	520
large mammal	21 ub, 10 b, 1 ub enamel	1 ub, 8 b	–	2 ub	–	43
Totals	741	131	0	14	0	886

a. Fragments, b = burned, ub = unburned.
b. By level in cm.
c. See Table 14 for details on jackrabbit elements.

Table 6. Summary of Individual Faunal Specimens[a] from Unit A-3[b] at CA-KER-147.

Taxon	0-20	20-40	40-60	60-80	80-100	100-120	Totals
Gopherus agassazi	–	1 ub distal phalanx	1 ub carapace	–	–	–	2
Sylvilagus audubonii	–	–	1 b talus	–	2 b mandible	–	3
Lepus californicus[c]	109	189	97	46	20	5	466
Dipodomys spp.	1 b proximal femur	–	–	–	–	–	1
Perognathus spp.	1 ub premaxilla	–	1 ub radius	–	–	–	2
Neotoma spp.	1 ub mandible	–	–	1 ub mandible	1 ub tibia	–	3
Odocoileus hemionus	4 ub molar	3 ub molar	2 b metacarpal	–	–	–	9
Ovis spp.	1 ub metacarpal	–	–	–	–	–	1
small-medium mammal	109 ub, 208 b	183 b	206 b	47 ub, 42 b	93 ub, 62 b	18 ub, 7 b	975
large mammal	1 ub, 5 b	9 b	–	1 b, 1 ub molar	4 ub	–	21
Totals	440	385	308	138	182	30	1,483

a. Fragments; b = burned, ub = unburned.
b. By level in cm.
c. See Table 15 for details on jackrabbit elements.

Table 7. Summary of Individual Faunal Specimens[a] from Unit A-4 at CA-KER-147.

Taxon	0 cm-base	Totals
Lepus californicus[b]	54	54
Dipodomys spp.	1 ub cranial, 1 b mandible	2
small-medium mammal	20 ub, 66 b	86
large mammal	3 ub, 17 b	20
Totals		162

a. Fragments; b = burned, ub = unburned.
b. See Table 16 for details on jackrabbit elements.

drives for the purpose of capturing many animals during a single hunt (Kroeber 1925; Gifford 1931; Kniffen et al. 1935; Steward 1938; Zigmond 1986). Rabbit skins were used for the manufacture of clothing, cordage, blankets, and other items.

Sylvilagus audubonii (desert cottontail). A very few elements (n = 6) could be specifically identified as cottontail rabbit, although some of the unidentified small to large mammal elements may represent this species. The most common subspecies in this region is *S. a. arizonae*. Cottontail rabbits are common to the shrub-covered and desert areas of California. Desert cottontails weigh between 835 and 1,191 g and have an average length between 350 and 420 mm (13.7 to 16.5 in). As with all leporids, does are larger than bucks.

Cottontails mate year round and produce at least two litters of one to six young per year. Born primarily between January and June, the young are naked, their eyes are closed, and they require an extended period of maternal care. The home range of individual cottontails is up to 15 acres for males and nine acres for females. They "freeze" when threatened, which can be an advantage for predators. Cottontails are less proficient runners than jackrabbits and attempt to elude predators by hiding in dense cover. Also, to avoid predators, leporids have evolved a protective mechanism of quickly filling their stomachs with food, hurrying to a hiding place where they defecate undigested pellets, and then leisurely eating the pellets in seclusion.

Lepus californicus (black-tailed hare). A large number of black-tailed hare elements (n = 2,617) were identified at KER-147, representing all portions of the skeleton. The black-tailed hare, popularly referred to as the jackrabbit, is perhaps the most commonly observed mammal in the deserts of southern California. Ranging throughout most of the western United States, this large lagomorph (43 to 53 cm [17 to 21 in] in length and 1.1 to 2.8 kg [2.4 to 6.2 lb] in weight) is most active during the early morning and evening, at which time it feeds on various forbs and herbs. The race of hare living in the western Mojave Desert is *L. c. deserticola* and usually is found in open areas along foothills and on the desert floor, such as the Fremont Valley.

In antiquity, hares seem to have been an important food source in the deserts of southern California and the Great Basin (Basgall 1982; Reynolds and Shaw 1982; Langenwalter et al. 1983; Yohe 1984; Kent 1985; Yohe and Goodman 1991). This is documented in the ethnographic record (Gifford 1931; Steward 1938; Bean 1972). Gifford (1931) noted that jackrabbits were driven along dry waterways by setting fire to vegetation and then killed with throwing sticks. Driving into nets was another common method of capture in southern California and in the Great Basin (Kroeber

Table 8. Summary of Individual Faunal Specimens[a] from Unit A-Extension (All Levels) at CA-KER-147.

Taxon	All Levels	Totals
Lepus californicus[b]	12	12
Odocoileus hemionus	2 ub metacarpals	2
small-medium mammal	8 ub, 3 b	11
large mammal	2 ub, 3 b	5
Totals	30	30

a. Fragments; b = burned, ub = unburned.
b. See Table 17 for details on jackrabbit elements.

Table 9. Summary of Individual Faunal Specimens[a] from Unit C-1[b] at CA-KER-147.

Taxon	0-20	20-40	Totals
Gopherus agassazi	2 ub carapace, 1 ub femur	–	3
unidentified snake	1 ub vertebra (small)	–	1
unidentified bird	2 ub shaft (small), 1 ub caracoid (jay-sized)	–	3
Sylvilagus audubonii	–	1 ub proximal ulna	1
Lepus californicus[c]	83	449	532
Dipodomys spp.	–	1 ub molar, 2 ub humeri, 1 ub distal femur, 1 ub humerus (juvenile), 1 ub pelvis,	6
Perognathus spp.	1 ub humerus	1 ub cervical vertebra, 1 ub mandible, 2 ub humeri, 1 ub phalanx	6
Spermophilus sp.	–	1 ub maxilla	1
Neotoma spp.	1 ub humerus, 3 ub mandibles, 1 ub femur, 1 ub molar	1 ub humerus, 19 ub mandibles, 4 ub molars, 1 ub maxilla, 2 ub pelves, 2 ub femurs, 2 ub caudal vertebrae	37
Canis latrans	–	1 ub phalanx I, 1 bu phalanx III	2
Lynx rufus	–	1 ub distal radius, 1 ub metatarsal, 1 ub proximal scapula	3
Odocoileus hemionus	–	1 ub proximal ulna (juvenile), 1 ub proximal radius (juvenile), 1 ub phalanx (juvenile), 1 ub phalanx (fetal), 1 b distal radius, 1 b distal tibia	6
Ovis spp.	–	1 ub mandible	1
small-medium mammal	110 ub, 118 b	699 b	927
large mammal	3 ub shaft, 12 b	17 ub shaft, 64 b, 3 molar	99
Totals	340	1,288	1,628

a. Fragments, b = burned, ub = unburned.
b. By level in cm.
c. See Table 18 for details on jackrabbit elements.

Table 10. Summary of Individual Faunal Specimens[a] from Unit C-2[b] at CA-KER-147.

Taxon	0-20	20-40	40-60	60-80	Totals
Gopherus agassazi	–	2 ub plastron, 1 ub pelvis	–	–	3
Sauromalus obesus	–	1 ub mandible	–	–	1
unidentified lizard	–	2 ub shaft	–	–	2
unidentified snake	1 ub vertebra (small)	–	–	–	1
Lepus californicus[c]	233	81	36	26	376
Dipodomys spp.	1 ub mandible, 1 ub femur	1 ub molar, 2 b molar	–	–	5
Perognathus spp.	3 ub incisors, 1 ub phalanx	–	–	–	4
Neotoma spp.	1 ub skull, 7 ub mandible, 3 ub vertebrae, 3 ub pelves, 1 ub humerus, 2 ub femora, 3 ub tibiae	1 ub mandible, 1 ub humerus	–	–	22
Thomomys bottae	1 ub molar	–	–	–	1
Canis latrans	1 ub premolar	–	–	–	1
Lynx rufus	1 ub phalanx, 1 ub vertebra, 1 ub proximal scapula	–	–	–	3
Odocoileus hemionus	9 ub phalanx	–	–	–	9
small-medium mammal	836 ub	4 ub	51 ub	69 ub	960
large mammal	26 ub, 2 ub enamel	102 bu, 6 b	3 ub	5 b	144
Totals	1,138	204	90	100	1,532

a. Fragments; b = burned, ub = unburned.
b. By level in cm.
c. See Table 19 for details on jackrabbit elements.

Table 11. Summary of Individual Faunal Specimens[a] from Unit C-3 at CA-KER-147.

Taxon	0 cm-Base	Totals
Lepus californicus[b]	42	42
Neotoma spp.	1 ub femur	1
small-medium mammal	118 ub, 47 b	165
large mammal	3 ub, 10 b	13
Total		221

a. Fragments, b = burned, ub = unburned.
b. See Table 20 for details on jackrabbit elements.

1925; Steward 1938). The Kawaiisu may also have used brush fire surrounds to facilitate the capture of these animals (Zigmond 1986).

Seasonality of the apparent rabbit drives at KER-147 is difficult to estimate. Very few juvenile specimens were in the collection, suggesting that the site was occupied during a time when few juveniles were present. In California, jackrabbits breed from January to August, although breeding at other times of the year also is possible (Dunn et al. 1982). Given the mean gestation period of 43 days for black-tailed hares in California (Haskell and Reynolds 1947), the KER-147 site may have been occupied in the fall. Ethnographic accounts suggest fall as being the best time of year to capture rabbits because of their desired winter fur (e.g., Steward 1938).

The identification and distribution of jackrabbit elements from KER-147 is presented in Tables 12 through 20. Most elements of the skeleton are represented (Figure 1), indicating that the animals were processed whole on site. However, a number of elements were consistently rare, including vertebrae, patellae, proximal humeri, distal femora, proximal tibiae, and fragile pieces of the cranium, scapula, and innominate. These absences may be due to natural preservation factors or to the likelihood that the bones were processed into fragments too small to identify to species. Many (47.4 percent) of the hare remains are burned to some degree.

The jackrabbit remains recovered from the two small adjacent shelters are quite similar in composition. Shelter A (Units TU-1 and A1 through A4) produced 1,667 elements, 834 (50 percent) of which were burned, and Shelter C (Units C1 through C3) produced 951 elements, 407 (42.8 percent) of which were burned. This suggests that the faunal procurement and processing activities were not confined to one small area at the site.

Order Rodentia

Shipek (1968), Bean (1972), Luomala (1978) and Zigmond (1986) all reported that rodents played a significant part in the diet of the desert peoples of southern California. Woodrats were driven from their nests with poles, killed with deadfall traps, or shot with bows and arrows (Luomala 1978). Deadfall traps were commonly used for other rodents as well (Spier 1923; cf., Zigmond 1986).

Family Heteromyidae (pocket mice, kangaroo rats, and kangaroo mice). Dipodomys spp. (kangaroo rat). A total of 15 kangaroo rat elements were recovered. Two species of kangaroo rat are known in this region, *D. merriami* and *D. deserti*, but the species could not be determined for these specimens. Of the 15 elements, five were burned, suggesting the use of these small mammals as an occasional food source.

Perognathus spp. (pocket mouse). Thirty-seven pocket mouse elements were recovered from KER-147. None was burned. It appears that these represent intrusive fauna.

Spermophilus spp. (unidentified ground squirrel). Only two ground squirrel elements were recovered, one of which was burned. Red Rock Canyon is within the range of the Mojave ground squirrel (*S. mojavensis*), a rarely observed species.

Suborder Myomorpha. Family Cricetidae. Subfamily Cricetinae (mice and rats). *Neotoma lepida (desert woodrat).* A total of 75 woodrat elements were found, only one of which was burned. While woodrats were eaten by desert groups (e.g., Bean 1972), there is little evidence that they were consumed at KER-147. The small shelters at the site would have provided appropriate habitat for woodrat nests.

Table 12. Jackrabbit (*Lepus californicus*) Elements[a] from Test Unit 1[b] at CA-KER-147.

Element	Surface	10-30	20-40	40-60	60-80	Totals
cranial	1 ub, 7 b	8 ub, 2 b	1 ub, 12 b	–	2 ub	33
mandible	3 ub, 9 b	158 ub, 16 b	1 ub, 1 b	–	1 ub	189
maxilla	1 ub, 2 b	18 ub, 6 b	1 ub, 3 b	–	–	31
premaxilla	1 ub, 3 b	2 ub, 2 b	2 ub	–	–	10
molar	8 ub, 8 b	28 ub	3 ub, 1 b	–	3 ub	51
incisor	2 ub, 2 b	1 ub	3 ub	–	3 b	11
vertebra	1 b	1 b	–	–	–	2
rib	7 ub, 2 b	16 ub, 3 b	2 ub	–	4 ub	34
scapula	4 ub, 13 b	19 ub, 9 b	7 ub, 2 b	1 b	2 b	57
pelvis	1 b	2 ub, 3 b, 1 ub ilium	2 ub, 2 b	–	–	11
humerus	2 ub distal, 3 b distal	1 b proximal (J), 1 b midsection, 4 ub distal, 4 b distal	2 ub midsection, 4 b midsection, 3 ub distal, 1 b distal	–	1 ub midsection, 1 ub distal	27
ulna	1 b proximal, 25 b midsection, 1 ub distal	3 b proximal	1 ub proximal	–	1 ub proximal	32
radius	4 ub proximal, 2 b proximal, 12 b distal	5 b proximal, 18 b midsection, 2 ub distal, 6 b distal	3 ub proximal, 3 ub midsection, 2 b midsection, 2 ub distal	–	–	59
metacarpal	3 ub, 2 b	1 ub, 2 b proximal, 1 ub midsection	–	–	–	9
phalanx	2 ub, 3 b	5 ub, 9 b, 1 ub proximal	6 ub, 1 b, 2 ub distal	–	1 ub	30
femur	–	2 ub head, 1 b head, 1 ub midsection, 1 b midsection	1 ub proximal, 1 ub midsection	–	–	7
patella	–	1 b	–	–	–	1
tibia	2 b, 5 ub midsection	1 ub midsection, 2 b midsection, 4 ub distal, 3 b distal	1 b midsection, 2 ub distal, 1 b distal	–	–	21
calcaneus	2 b	1 ub	1 ub	–	–	4
metatarsal	2 ub proximal	1 ub proximal, 1 b	3 ub proximal	–	1 ub proximal, 1 b distal	9
Totals	146	377	83	1	21	588

a. Fragments; b = burned, ub = unburned, J = juvenile.
b. By level in cm.

Table 13. Jackrabbit (*Lepus californicus*) Elements[a] from Unit A-1[b] at CA-KER-147.

Element	**0-20**	**20-40**	**40-60**	**60-80**	**80-100**	**Totals**
cranial	2 ub, 1 b	1 ub, 3 b	1 ub	3 ub, 1 b	–	12
mandible	3 ub, 4 b	12 ub, 2 b, 3 ub distal, 3 b distal	2 ub	1 b	1 b	31
maxilla	1 b	7 ub	2 ub	–	–	10
premaxilla	1 ub	1 ub, 1 b	1 ub	–	–	4
molar	1 ub, 1 b	12 ub	1 ub	2 b	–	17
incisor	–	–	1 b	2 ub	–	3
vertebra	1 b	–	–	–	–	1
rib	–	4 ub midsection, 1 b proximal, 1 b mid-section	–	1 ub proximal	–	7
scapula	1 ub midsection, 2 ub proximal, 4 b proximal	1 ub midsection, 2 b midsection, 3 ub proximal, 2 b proximal	2 ub proximal, 1 b proximal	1 b midsection	–	19
pelvis	–	2 ub, 4 b	–	1 ub, 1 b	–	8
humerus	1 b distal	1 ub distal, 1 b distal	2 b midsection, 1 b distal	–	–	6
ulna	–	1 ub proximal, 12 b mid-section	–	1 b proximal	–	14
radius	3 ub midsection, 2 b midsection, 1 b distal,	–	–	3 ub proximal, 1 ub distal, 2 b distal	–	12
metacarpal	3 b, 1 b proximal	–	–	1 b proximal	1 ub distal	6
phalanx	1 b proximal	2 ub, 2 b, 1 b proximal, 6 b distal	1 ub, 1 b	4 ub	–	18
tibia	1 ub midsection, 1 ub proximal, 1 ub distal, 1 b mid-section	1 ub midsection, 3 b midsection, 1 ub distal, 3 b distal	2 b midsection	2 b midsection	1 b proximal	17
calcaneus	–	1 ub midsection	–	–	–	1
metatarsal	–	1 b proximal	3 b proximal	–	–	4
Totals	38	101	21	27	3	190

a. Fragments, b = burned, ub = unburned.
b. By level in cm.

Table 14. Jackrabbit (*Lepus californicus*) Elements[a] from Unit A-2[b] at CA-KER-147.

Element	0-20	20-40	40-60	60-80	80-100	Totals
cranial	7 ub, 10 b	1 ub, 2 b	–	1 b	–	21
mandible	27 ub, 27 b	7 b	–	2 b	–	63
maxilla	3 ub, 9 b	1 ub, 5 b	–	–	–	18
premaxilla	7 ub	2 b	–	–	–	9
molar	3 ub, 5 b	–	–	–	–	8
incisor	7 ub	–	–	–	–	7
rib	2 ub proximal, 1 b proximal, 8 ub midsection, 3 b midsection	1 ub midsection	–	–	–	15
scapula	11 ub proximal, 4 b proximal, 2 ub midsection, 10 b midsection	1 ub proximal, 3 b proximal	–	1 b	–	32
pelvis	1 b	–	–	–	–	1
humerus	4 ub distal, 6 b distal	1 ub distal	–	–	–	11
ulna	4 ub proximal, 2 b proximal	1 ub proximal	–	–	–	7
radius	8 ub proximal, 1 ub midsection, 46 b midsection, 1 ub distal, 1 b distal	1 b proximal, 6 b midsection	–	3 b	–	67
metacarpal	–	–	–	1 b	–	1
phalanx	1 ub, 7 b, 2 ub proximal, 5 b proximal, 3 ub distal	1 ub proximal, 1 b, 2 b distal	–	1 b	–	23
femur	1 ub proximal, 1 b proximal	1 ub proximal, 1 ub distal	–	–	–	4
tibia	1 b, 3 b midsec-tion, 1 ub distal, 4 b distal	2 b midsection, 1 ub distal, 1 b distal	–	1 b distal	–	14
talus	1 b	–	–	–	–	1
calcaneus	3 ub, 4 b	–	–	–	–	7
metatarsal	1 ub juvenile, 2 ub distal, 4 b proximal	1 ub proximal	–	–	–	8
Totals	264	43	0	10	0	317

a. Fragments; b = burned, ub = unburned.
b. By level in cm.

Table 16. Jackrabbit (*Lepus californicus*) Elements[a] from Unit A-4 at CA-KER-147.

Element	0 cm-Base	Totals
cranial	1 ub	1
mandible	3 ub, 5 b, 2 b proximal	10
maxilla	1 ub, 2 b	3
scapula	1 ub midsection, 3 ub proximal, 3 b proximal	7
humerus	3 ub distal, 1 b midsection, 2 b distal	6
ulna	1 b proximal	1
radius	1 ub proximal, 2 b proximal, 17 b midsection, 1 b distal	21
metacarpal	1 ub proximal	1
femur	1 b proximal	1
tibia	2 b midsection, 1 b proximal	3
Total		54

a. Fragments, b = burned, ub = unburned.

Table 17. Jackrabbit (*Lepus californicus*) Elements[a] from Unit A-Extension at CA-KER-147.

Element	0 cm-Base	Totals
mandible	2 ub, 2 b	4
maxilla	2 b	2
pelvis	1 ub proximal	1
radius	1 ub proximal, 1 ub midsection	2
tibia	1 b midsection	1
metatarsal	1 ub	1
phalanx	1 ub proximal	1
Total		12

a. Fragments, b = burned, ub = unburned.

Table 18. Jackrabbit (*Lepus californicus*) Elements[a] from Unit C-1[b] at CA-KER-147.

Element	0-20	20-40	Totals
cranial	4 ub	26 ub, 7 b	37
mandible	3 ub, 10 b, 2 ub (juvenile)	26 ub, 24 b	65
maxilla	2 ub, 5 b	25 ub, 10 b	42
premaxilla	–	7 ub	7
molar	9 ub	62 ub, 9 b	80
incisor	1 ub	–	1
vertebra	1 ub, 1 b	1 ub juvenile, 1 ub atlas, 4 b axis	8
rib	4 ub, 2 b	2 ub proximal	8
scapula	4 ub proximal, 2 ub midsection, 3 b	11 ub proximal, 13 b proximal, 15 ub midsection, 18 b midsection	66
pelvis	–	1 ub	1
humerus	1 ub distal	3 ub proximal, 2 b proximal, 10 ub distal, 6 b distal	22
ulna	1 ub proximal	2 ub (juvenile), 8 ub proximal, 7 b proximal, 1 b distal	19
radius	2 ub proximal, 2 ub distal, 1 b distal, 11 b midsection	1 ub proximal, 2 b proximal, 46 ub midsection, 25 b midsection, 6 ub distal, 6 b distal	102
metacarpal	1 ub	3 ub	4
phalanx	5 b	14 ub, 7 b	26
femur	1 b proximal	1 ub proximal, 3 b proximal	5
patella	2 ub	–	2
tibia	–	1 ub proximal (juvenile), 1 ub proximal, 5 ub midsection, 2 b midsection, 2 ub distal, 3 b distal	14
talus	2 b	1 ub, 2 b	5
calcaneus	1 ub	7 ub, 5 b	13
metatarsal	–	3 ub proximal, 2 b proximal	5
Totals	83	449	532

a. Fragments, b = burned, ub = unburned.
b. By level in cm.

Table 19. Jackrabbit (*Lepus californicus*) Elements[a] from Unit C-2[b] at CA-KER-147.

Element	**0-20**	**20-40**	**40-60**	**60-80**	**Totals**
cranial	22 ub, 5 b	3 ub	3 ub	4 ub	37
mandible	10 ub, 15 b	2 ub, 8 b	6 ub, 4 b	2 ub	47
maxilla	9 ub, 14 b	3 ub	1 b	–	27
premaxilla	3 ub, 2 b	1 ub	1 b	1 b	8
molar	2 ub, 4 b	6 ub	1 b	–	13
incisor	3 ub, 1 b	–	–	2 ub	6
vertebra	–	–	1 b	–	1
rib	14 ub midsection, 1 b proximal	8 ub, 2 b	1 ub	2 ub proximal	28
scapula	2 ub, 5 b, 3 ub proximal, 2 b proximal, 2 ub midsection, 3 b midsection	6 ub proximal, 4 b proximal	3 ub, 1 b, 1 b proximal	3 ub mid-section, 3 b midsection, 1 b proximal	39
pelvis	1 ub midsection, 1 b midsection	1 ub	–	1 b	4
humerus	1 ub midsection, 6 ub distal, 2 b distal	2 ub distal, 1 b distal	–	–	12
ulna	1 ub proximal, 1 b proximal, 2 b distal	2 ub proximal, 1 b	1 ub distal, 1 b proximal	1 b distal	10
radius	6 ub proximal, 2 b proximal, 37 b midsection, 1 ub distal, 4 b distal	13 b proximal, 8 b midsection	1 b midsection, 1 b distal, 1 b proximal	3 ub midsection	77
metacarpal	–	–	1 ub proximal, 1 b distal	–	2
phalanx	2 ub distal, 2 b proximal, 9 b	2 b	2 b distal	–	17
femur	1 ub proximal	–	1 b distal	2 b proximal	4
tibia	1 b, 13 b midsection, 2 ub distal, 7 b distal	3 b midsection, 2 b distal	1 b midsection, 1 b distal	1 ub midsection	31
talus	–	2 b	–	–	2
calcaneus	3 ub, 2 b, 1 b proximal	1 b	1 b	–	8
metatarsal	3 b	–	–	–	3
Totals	233	81	36	26	376

a. Fragments, b = burned, ub = unburned.
b. By level in cm.

Table 20. Jackrabbit (*Lepus californicus*) Elements[a] from Unit C-3 at CA-KER-147.

Element	0 cm-Base	Totals
cranial	3 ub	3
mandible	5 ub, 3 b	8
maxilla	1 b	1
molar	1 ub, 1 b	2
scapula	4 ub proximal, 5 b proximal	9
humerus	1 ub proximal, 2 ub distal	3
radius	1 ub distal, 2 b distal	3
tibia	2 ub distal, 2 b distal	4
calcaneus	2 ub	2
metatarsal	1 ub	1
phalanx	6 ub complete	6
Total		42

a. Fragments, b = burned, ub = unburned.

Family Geomyidae (pocket gopher). ***Thomomys bottae*** (**Botta pocket gopher).** Only one gopher element was found and is believed to be intrusive.

Order Carnivora

Various carnivore elements have been retrieved from sites in the general region (Yohe and Goodman 1991; Yohe and Chace 1995). Some groups such as the Hualapai in northwestern Arizona considered carnivores appropriate game animals (Kniffen et al. 1935), while other groups such as the Cahuilla maintained various taboos against eating these mammals (Bean 1972).

Like other groups in the area, the Kawaiisu probably considered most carnivores appropriate game animals. Bears, coyotes, foxes, badgers, mountain lions, bobcats, and other carnivores were probably hunted for food and pelts. Mountain lions may have been hunted in the winter when their tracks could easily be followed in the snow. Bobcats were probably hunted year round, often being shot in trees. The Kawaiisu sometimes ate coyotes and dogs as starvation food (Zigmond 1986).

Suborder Fissipedia. Family Canidae (foxes, wolves, and coyotes). ***Canis latrans*** **(coyote).** Three coyote elements were found, two phalanges and one tooth (none burned). It is difficult under the best conditions of preservation to differentiate between coyotes and domestic dogs based on skeletal remains, and so it is possible that the remains were that of a dog (*C. familiaris*). It is also possible that the elements are noncultural or represent "novelties." Coyotes were, however, eaten as a starvation food by the Kawaiisu (Zigmond 1986).

Unidentified fox. One burned astragalus of an unidentified fox was found at KER-147. This specimen may represent either the grey fox (*Urocyron cinereoargenteus*) or the common kit fox (*Vulpes macrotis*), both of which are known to inhabit this region.

Family Felidae (cats). ***Lynx rufus*** **(bobcat).** Eight bobcat elements were found, none burned. This medium-sized cat weighs from 6.4 to 30.8 kg (14 to 68 lb) and preys on jackrabbits, rodents, and birds. Bobcats produce litters of one to seven young that are generally born in late April or early May. Although found in most habitats, bobcats are especially abundant in brush-covered country. This animal is sometimes referred to as a lynx, like its larger relative (*L. canadensis*) which generally occupies deep northern forests. Bobcats have comparatively small lungs for their size and get easily winded; consequently, when pursued by hunters, they soon seek cover. Besides being used for meat, arrow quivers were sometimes made of bobcat skin (Kniffen et al. 1935:92).

Order Artiodactyla. Family Cervidae (elk, moose, caribou, and deer). *Odocoileus* ***sp. (deer).***

A total of 27 deer elements were recovered. Of that number, five were teeth, and the rest were from

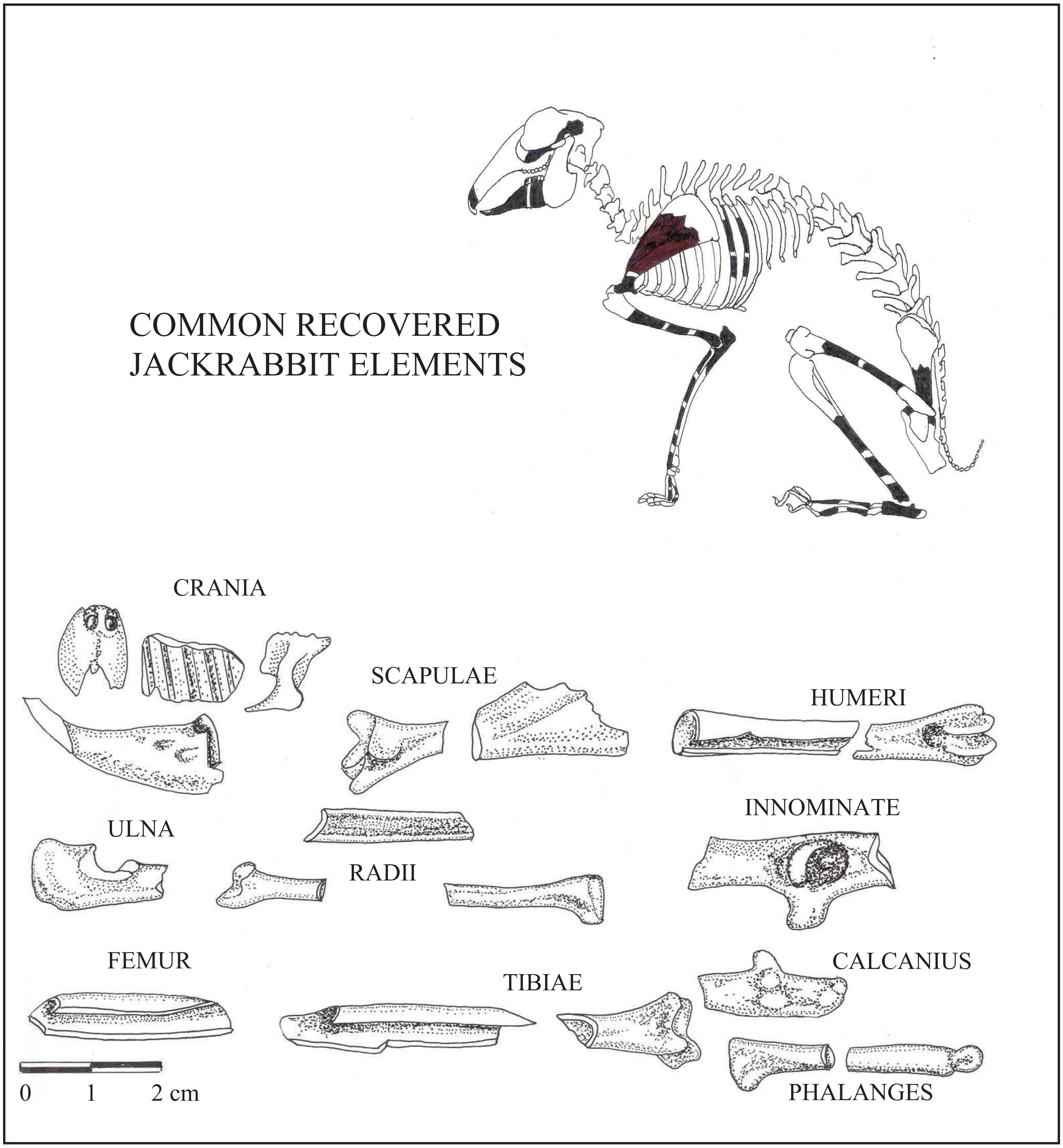

Figure 1. Common jackrabbit elements recovered from the Red Rock Canyon Rockshelter (KER-147).Elements that were consistently missing include vertebrae, proximal humeri, distal femora, proximal tibiae, and fragile pieces of the cranium, scapula, and innominate.

lower legs and feet; no core body elements were identified, and only four elements were burned. At least one fetus was represented in the collection (along with one juvenile), suggesting that it was taken sometime in the spring.

The common deer native to the region is the mule deer (*O. hemionus*), which resides in a variety of habitats. Males range in weight from 50 to 215 kg (110 to 474 lb) and females average between 31.8 and 72.6 kg (70 to 160 lb). Mule deer generally do not form large herds, although in winter they may "yard up." A typical group consists of a doe with her fawns. Bucks generally are solitary, although they band together before and after rutting season. After a gestation period lasting between six and seven months, once-bred does generally give birth to a single fawn and older does to twins (usually in May or June). Does first breed when they are about a year and a half old. Deer are primarily active in mornings, evenings, and on moonlit nights. They may also be active at midday in winter.

Many groups ground deer (and other) bone into meals (Drucker 1937; Michelsen 1967; Yohe et al. 1991). The split long bones of deer were fashioned into awls and other implements. Hides were tanned and fashioned into clothing and cordage. Zigmond (1986) noted that venison was regarded as the favorite food of the Kawaiisu, and deer were probably available in the immediate area. The predominance of leg and foot elements suggests that deer were killed at another location, with only the legs brought back to the site. It is also possible that the axial skeleton was processed into small fragments (and thus listed in the unidentified large mammal category).

Family Bovidae (cattle, sheep, Old World antelope, and goats). Ovis spp. (bighorn sheep). Two elements tentatively identified as bighorn sheep (*O. canadensis*) were found, both unburned. Given that historic sheep and goat grazing in the western Mojave Desert has a 100-year history, it is possible that these elements represent domestic sheep (*O. aries*) or goat (*Capra* spp.).

Discussion

Due to the high fragmentation of the bones in the faunal collection from KER-147, most specimens could only be identified to small-medium mammal (n = 5,205; 62 percent) or large mammal (n = 421; 5 percent). Given that very few rodents or cottontail rabbits were found in the collection, it seems likely that most of the unidentified small to medium mammals represent black-tailed hares. It also seems likely that the unidentified large mammals can be attributed largely to deer. The vast majority (79.6 percent) of the faunal remains came from the upper 40 cm of the deposit, as did most of the artifacts. This indicates that much of the activity at the site occurred late in time.

Interestingly, few reptiles were recovered from KER-147. This is in contrast to the Cantil site (CA-KER-2211) in the Fremont Valley to the south (see Yohe and Goodman 1991), where a number of reptile remains were found, including tortoise and horned lizard (*Phrynosoma* sp.). As the Cantil site dates earlier than KER-147 (Sutton 1991), perhaps reptiles had been a less important food source in later times.

While the dominance of jackrabbits in the lagomorph assemblages in western Mojave Desert sites is common, it seems surprising that so few cottontail elements (n = 6) were found at KER-147. At Cantil, the cottontail NISP was 106, still meager when compared to the jackrabbit NISP (6,353).

Ethnographic data on the Kawaiisu frequently mention that they were proficient hunters of deer and were noted for making deer jerky. Deer jerky was used as a portable food, it was saved for winter use, and it was also an important trade item (Zigmond 1986). The

Kawaiisu would customarily hang out strands of meat to dry. It would be interesting to know if other animals (such as jackrabbits) were also dried for winter use; detailed ethnographic data are lacking on this subject.

The abundant jackrabbit bones may reflect many organized jackrabbit drives conducted to procure the animals en masse, after which they may have been simultaneously processed and cooked. Alternatively, the assemblage may represent casual hunting and processing of individual animals from daily foraging and cooking activities. During the analysis, it became very obvious that certain elements and/or portions of specific elements were consistently missing or found in very low frequencies, suggesting that butchering and/or cooking techniques may have been responsible for the abundance of certain elements or element portions and the paucity of other elements or element portions.

Despite the apparent cultural emphasis on deer, it is clear that jackrabbits provided a considerable proportion, if not most of the meat in the diet of the people at KER-147. Few details are known regarding the procurement and processing of jackrabbits. The abundance of repeated elements with the same breakage patterns appears to indicate that jackrabbit carcasses were systematically sectioned and processed in routine ways, such as first chopping off limbs with expedient choppers/cleavers that might have obliterated some bone ends during the sectioning of the limb elements at their joints. The fresh long bones may then have been struck several times to release fats and oils into the meat, or they may have first been cooked in soups and stews and then later pulverized into small pieces for making broths. It may be that certain elements, such as the proximal tibia and vertebrae, were simply chewed up, which might explain their absence.

It is noteworthy that very few jackrabbit vertebrae are in the collection. Jackrabbit spines may have been used for certain recipes and/or were crushed to obtain neural tissue for use in tasks such as hide tanning. Relatively soft bones, such as vertebrae, may have been chewed up and the small fragments evacuated at off-site defecation areas. Perhaps the general paucity of soft elements (such as vertebra and cranial vault fragments) has more to do with bone recovery techniques (i.e., missing tiny bone pieces in the screen) than with prehistoric food processing or food consumption behaviors. However, relatively few tiny vertebra fragments were obtained from the fine-screen column sample from Unit A, suggesting that there was a general lack of vertebra pieces in the midden. The collection also has a very low incidence of certain elements such as distal femora and proximal tibiae that may have been obliterated when these adjoining bone parts were sectioned with rough tools (e.g., choppers).

Jackrabbit carcasses may have been dried for winter use, and if so, this may indicate winter food-storage activities. Like dried deer jerky, it is possible that dried jackrabbit carcasses (and pelts) were also traded. If jackrabbits were plentiful during the mid-winter, this might have precluded the necessity for caching dried jackrabbit carcasses in the fall for winter use.

Comparisons to Nearby Sites

Comparative faunal data are available at three other nearby archaeological sites in the western Mojave Desert, and the faunal collection from KER-147 exhibits both similarities to and differences from these site collections. All three date earlier than KER-147; thus, temporal variance may account for some of the differences.

The Bickel site (CA-KER-250) is located in the El Paso Mountains just east of Red Rock Canyon. This site contained a Rose Spring Complex component dated between about 1,100 and 1,400 B.P. (Basgall 1982). Jackrabbits dominated the identified faunal assemblage, comprising some 73 percent of the vertebrate specimens, with rodents and artiodactyls comprising the remainder of the collection. The site was interpreted as a jackrabbit procurement and processing site.

The Coffee Break site (CA-KER-5043) is located in the El Paso Mountains south of the Bickel site and east of Red Rock Canyon. This site also contained a Rose Spring Complex component that generally dated between 700 and 1,200 B.P. (Gardner 2002), slightly later than the Bickel site. The faunal materials were highly fragmented but dominated by small to medium mammals, presumably lagomorphs. The site was interpreted as a small camp that may have been a satellite to the Koehn Lake site (CA-KER-875) on the southeastern shore of Koehn Lake, located in the Fremont Valley to the southeast (Sutton 1990, 1991; also see Gardner 2007).

The Cantil site (KER-2211) lies in the Fremont Valley, west of Koehn Lake and southeast of Red Rock Canyon. This site dated to about 1,000 B.P. and contained a Rose Spring Complex component, the top of which was mixed with a Late Prehistoric Complex component (Sutton 1991). The faunal remains (Yohe and Goodman 1991) indicated a focus on jackrabbit procurement and processing but with some use of reptiles and birds.

Conclusions

The faunal collection from the KER-147 site clearly indicates that jackrabbit procurement and processing was a major subsistence focus. Some deer were used, but there was little to no use of reptiles and birds. From a faunal perspective, the occupants of KER-147 appear to have been focused on jackrabbits.

Most mobile prehistoric groups were opportunistic dietary generalists; they consumed a wide variety of plants and animals gathered across the landscape during daily foraging activities. It is possible that jackrabbits were so plentiful in the area that other animals were generally ignored. It may be that this specialized focus on jackrabbits is a later prehistoric phenomenon.

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