

**THE PRE-CONTACT DISTRIBUTION OF *CANIS LUPUS* IN CALIFORNIA:
A PRELIMINARY ASSESSMENT**



**ANTHROPOLOGICAL STUDIES CENTER
Sonoma State University
Rohnert Park, California**

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INTRODUCTION

The Anthropological Studies Center (ASC) at Sonoma State University has prepared a preliminary assessment of the distribution of gray wolf (*Canis lupus*) in California prior to contact and settlement by European and Euro-American explorers and missionaries. This assessment was undertaken by ASC Staff Archaeologist Michael Newland and ASC Staff Faunal Specialist Michael Stoyka from April to June 2013. Funding for this assessment was provided by a grant administered by the California Wolf Center, with funds provided by California Wolf Center, Center for Biological Diversity, Klamath Forest Alliance, Natural Resources Defense Council, Sierra Club California, and Winston Thomas.

METHODS

The assessment was undertaken through two tasks, described below:

TASK 1: LITERATURE REVIEW

Review ethnographic and archaeological literature to locate potential markers for the presence of wolf. The primary focus was identifying indigenous languages that had words for wolf, and, in particular, separate words for “wolf”, “coyote”, and “dog”. Where applicable, the presence of Wolf as a deity or ancestral figure was noted. Within the archaeological literature, the presence of wolf bone within faunal assemblages was noted.

Task 1 was carried out in three steps:

- A. Review ethnographic and archaeological regional anthologies, specifically Volumes 8 (1978) and 11 (1986) of the Smithsonian *Indians of North America* series, Michael Moratto’s *California Archaeology* (1984), Terry Jones and Kathryn Klar’s *California Prehistory* (1997), Alfred Kroeber’s *Handbook of the Indians of California* (1925).
- B. Review ethnographic and linguistic monographs for specific California Native American language and cultural groups, most of which was conducted by anthropologists working for the University of California at Berkeley during the first half of the 1900s.
- C. Limited review of archaeological summaries or records where the presence of *C. lupus* bone was suspected by the current authors based upon past experience.

TASK 2: INQUIRIES TO REGIONAL EXPERTS AND COLLECTIONS FACILITIES

This task consisted of contacting archaeological collections facility to request information regarding the presence of *C. lupus* bone within different collections. Where possible, the heads of these facilities were reached to discuss the logistics of reviewing any collections in person and any specific information about how the bones were identified as *C. lupus* (i.e. genetic sampling, diagnostic traits, size comparison) vs. large coyote or dog. From these inquiries, a list

of facilities and regional experts was generated that would be potentially productive to visit and review their collections in person. Table 1 contains the list of research contacts.

Table 1. Research Contacts

Contact	Title	Host Institution/Firm Association/Location
Frank Bayham, Ph.D.	Professor	Department of Anthropology, CSU Chico
Emmy Carleton	Archaeological Specialist	California Department of Parks and Recreation curation facility in Sacramento
Greg Collins, M.A.	District Archaeologist	California Department of Parks and Recreation in northwestern California
Shelly Davis-King, Ph.D.	Principal Investigator	Davis-King and Associates, central Sierran foothills
Richard Fitzgerald, M.A.	State Archaeologist	California Department of Parks and Recreation, Sacramento
Denise Furlong, M.A.	Archaeologist and Principal Investigator	Furlong Archaeological Consulting, northern Sierran foothills
Sheri Gust, M.A.	Archaeologist and Principal Investigator	Cogstone Resource Management, Orange, California
Mark Hylkema, M.A.	District Archaeologist	California Department of Parks and Recreation in central coast vicinity
Antoinette Martinez, Ph.D.	Professor	CSU Chico
Rebecca McKim, M.A.	Archaeologist	Applied Earthworks
Breck Parkman, M.A.	District Archaeologist	California Department of Parks and Recreation, northbay region
Jaime Roscoe, M.A.	Archaeologist	Humboldt State University
Aaron Sasson, Ph.D.	Co-director	San Diego Zooarchaeology Lab, Department of Birds and Mammals, San Diego Natural History Museum
Richard Shultz, M.A.	Archaeologist	San Diego vicinity
Noelle Story Shaver, M.A.	Environmental Core-Archaeologist,	Naval Facilities Engineering Command Southwest, San Diego
Dwight Simons, Ph.D.	Archaeologist and regional faunal expert	Sacramento
Michael Tuma, M.S.	Senior Biologist	SWCA Environmental Conservation
Tom Wake, Ph.D.	Director	Cotsen Institute of Archaeology Zooarchaeology Laboratory at UCLA
Greg White, Ph.D.	Archaeologist and Principal Investigator	Sub Terra Archaeology and Paleontology

FINDINGS

RESULTS OF TASK 1

Based on a review of over 20 different language and material culture monographs, in addition to regional overviews, 15 Native American languages in California have separate, distinct words for wolf, coyote, and dog (Table 2). These languages are scattered throughout California (Figure 1). In addition, there are oral traditions in 5 languages wherein wolves appear, either as a deity (e.g. Wolf as Creator in Southern Paiute traditions) or as part of ceremony or ancestral history (e.g. Tolowa traditions of sorcerers having the ability to turn into wolves) (Table 3). Finally, there are four language-speaking populations (Table 4) that have some other tradition that suggest knowledge of wolves but which lack further explanation within the reviewed literature.

Table 2. California Indigenous Languages with words for Wolf, Coyote, and Dog

Tribe	Name for Wolf	Name for Coyote	Name for Dog	Reference
Cahto	<i>yīctc</i>	<i>tc'si tcūn</i>	<i>naL gī</i>	Goddard 1912:27, 31, 32
Chemehuevi	<i>tipaci</i>	<i>sinamapi; sūnap</i>	not listed	Kelly and Fowler 1986:385; Kroeber 1907a:82
Chumash	<i>miy</i>	<i>XoXau</i> (Santa Ynez); <i>alaxüwül</i> (Santa Buenaventura)	<i>hutcu</i> (Santa Ynez); <i>tsun</i> (Santa Barbara); <i>e-tōniwa</i> (Santa Buenaventura)	Applegate, n.d. Kroeber 1910:266
Hoopa and Chilula	<i>kil na dil</i>	<i>xon tel tau</i>	<i>liñ</i>	Goddard 1905:13, 17, 23
Karok	<i>ik-kow-o-nahm-itc</i>	<i>pe^{ch} -nef-fitch</i> or <i>tish-rahm-ish-koon-te</i>	<i>chish-she</i>	Merriam 1910: 208
Kawaiisu	<i>dugūmute</i>	<i>cūnav</i>	<i>bug'uts</i>	Kroeber 1907a:81, 82:
Northern Sierra Miwok	<i>too-le'ze</i>	not listed	<i>Choo'-koo</i> (seems probable that this is borrowed from the Spanish, see Wintun below)	Merriam 1910:210
Nisenan	<i>lo'la</i>	<i>ol'e'</i>	<i>suku</i>	Kroeber 1929:283
Ohlone	<i>homun--</i> from Harrington in 1922, appears to be clarified as <i>um-muh</i> in 1929; <i>umux</i> in	<i>Tat'aki-matcan</i> (Monterey); <i>Wakshyish</i> (Mutsun); <i>mah-yan</i> (Soledad); <i>mayan, wawises</i> (San	<i>Ma'an, matcan</i> (Monterey); <i>hitcas</i> (Santa Cruz); <i>tcutcu</i> (Santa Clara) <i>puku</i> (San Francisco); also, <i>H-tshek-</i>	Merriam 1967:375, 387; Kroeber 1910:245, 249, 256

	Monterey, San Juan Batista, and Santa Clara, <i>umu</i> in Santa Cruz according to Kroeber; <i>maial</i> in San Francisco dialect	Juan Batista); mayan San Jose, also <i>maial</i> in San Francisco	<i>nish</i>	
Pomo	<i>sūmū'</i>	<i>kil'win</i>	not listed	Barrett 1952: 36
Salinan	<i>t'o'xo</i> (Antoniaño) <i>to xo'</i> (Migueloño)	<i>Lk'a'</i> (Antoniaño) <i>hel'ka'</i> (Migueloño)	<i>Xutc</i> (Antoniaño) ; <i>xutca</i> 'i (Migueloño)	Mason 1918:123,125, 126
Washoe	<i>tulici</i>	<i>ke'we</i>	<i>suku</i>	Kroeber 1907b:311
Wintun	<i>hool</i>	not noted	<i>choo'-choo</i> (listed as introduced by Spanish)	Merriam 1967:277
Wiyot	<i>ha-rak Li'riL</i>	<i>witgaL</i>	<i>wah'yeets; wa'iyits</i>	Merriam 1967:180; Reichard 1925:60, 133
Wobonuch-Entimbich Monache	<i>awuitü</i>	<i>caawite</i>	<i>buk</i>	Kroeber 1907a:81, 82:

Table 3. Indigenous Cultures with Ceremonial Traditions Associated with Wolves

Language Population	Tradition	Reference
Achumawi	Wolf pelts used in regalia, wolf chiefs significant people in ancestral histories, Wolf is a foil for Coyote, Wolf as a chief known as <i>Che'-moo</i> , the Timber Wolf-man.	McCarthy 2003:24; Merriam 1928, in McCarthy 2003:24).
Chemehuevi	Wolf (<i>tipaci</i>) is creator deity in Southern Paiute traditions, brother to Coyote (<i>sinamapi</i>); Wolf was the "powerful" one and was the most prominent of all beings, was the 'people's father' and had made heaven and earth. Wolf is a 'benign and responsible fellow". In Chemehuevi Myth, Ocean Woman stretches out the land and commands Wolf and Coyote to find out its extension.	Hultkrantz 1986:638; Kelly and Fowler 1986:385
Hoopa	Wolf-skin blinders used during White Deerskin and Kick dances	Geddes –Osborne and Margolin 2001:37-38
Karok	Wolf-skin blinders used during White Deerskin and Kick dances; ancestral telling of Samchacka, who acquired wolf skin for White Deerskin Dance through years of collection of spiritual items	Geddes –Osborne and Margolin 2001:37-39
Kumeyaay	Sand paintings contain image of <i>Etcekurik</i> , or Wolf	Geddes –Osborne and Margolin 2001:37

Lui-seño	North Star may be Wolf	Geddes –Osborne and Margolin 2001:37
Serrano	Two separate clans, <i>Wanats</i> (Wolf) clan associated with the <i>Widikut</i> (Buzzard) clan; both part of the overarching Coyote moiety	Strong 1929:25; Trafzer 2002:22
Tolowa	Sorcerer's have abilities to turn into wolves	Drucker 1937:259-260
Tübatulabal	Wolf is the deity <i>tibaitc</i> and is brother to Coyote	Voegelin 1935:192
Washoe	Wolf and Coyote are brothers and figure prominently in creation myths.	D'Azecedo 1986:489; Kroeber 1907b:311
Wintun	Spiritually powerful individuals can shape-shift to wolves; particularly malignant wolves could turn into people	Geddes –Osborne and Margolin 2001:37
Yurok	Wolf-skin blinders used during White Deerskin and Kick dances	Geddes –Osborne and Margolin 2001:37-38

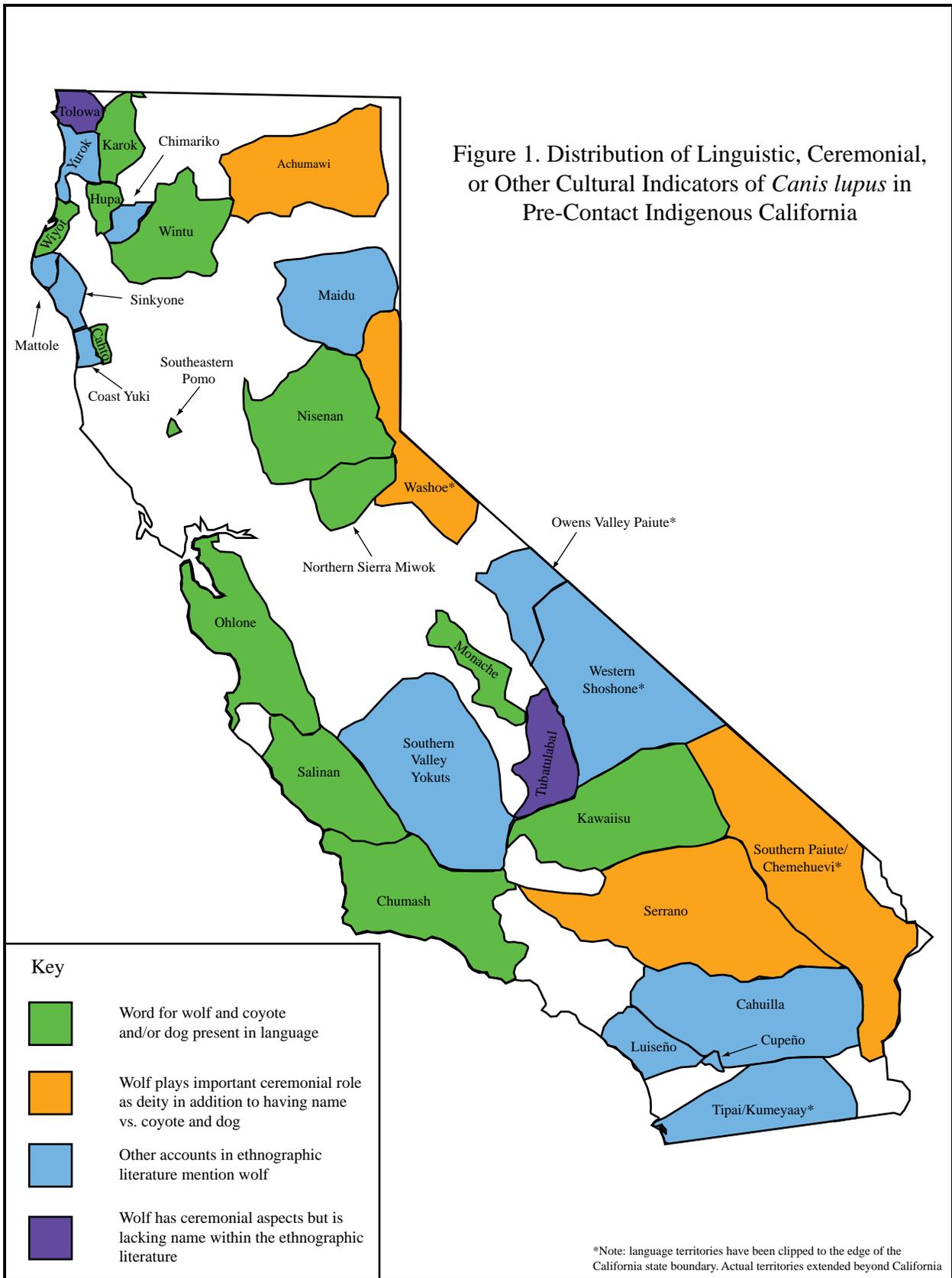
Table 4. Other Traditions, Subsistence Patterns, or Observations Made by Ethnographers Suggesting Indigenous Knowledge of Wolves

Tribe	Other observations	Reference
Cahto	Wolves eaten.	Driver 1939b:310
Cahuilla, Mountain	Wolves in area but not eaten.	Drucker 1939:8
Chimariko	Wolves in area but not eaten; Chimarikowere said to be “close to the wolf and were known for their excellent imitation of howling”.	Driver 1939b:310; Geddes –Osborne and Margolin 2001:37
Coast Yuki	Wolves in area but not eaten.	Driver 1939b:310
Cupeño	Wolves in area but not eaten.	Drucker 1939:8
Hoop and Chilula	Wolves in area but not eaten; Wolf fur used for regalia.	Driver 1939b:310, 332
Karok	Wolves in area but not eaten; Wolf fur used for regalia.	Driver 1939b:310, 332
Lake Miwok	Account of hunting style of wolves vs. mountain lion and dog	Merriam 1998:210
Lui-seño	Wolves in area but not eaten.	Drucker 1939:8
Maidu	Only wolf, coyote, and dog were not eaten.	Dixon 1905:184-185
Mattole	Wolves in area but not eaten.	Driver 1939b:310

Mono	Wolves in area but not eaten.	Driver 1939a:62
Owens Valley Paiute	Wolves eaten by some Owens Valley Paiute groups but not others.	Driver 1939a:62
Serrano	Wolves in area but not eaten.	Drucker 1939:8
Shoshone	Wolves known to some Shoshone groups, but not eaten; not present in other Shoshone areas	Driver 1939a:62
Sinkyone	Wolves eaten by some Sinkyone groups but not others.	Driver 1939b:310
Southern Yokuts	Wolves eaten by some Yokut groups but not others.	Driver 1939a:62
Tipai/Kumeyaay (Diegueño)	Wolves in area but not eaten.	Drucker 1939:8
Tolowa	Wolves in area but not eaten.	Driver 1939b:310
Tübatulabal	Wolves in area but not eaten.	Driver 1939b:62
Wintun	"Wolves, formerly common, are now very rare. A timber wolf was seen at Black Butte in the California National Forest in the winter of 1923-24".	Merriam 1967:277
Wiyot	Wolves in area but not eaten.	Driver 1939b:310
Yokut	Presence of words for wolves, coyotes, and dogs suggested but not confirmed.	Kroeber 1907c:324; 1963:239-240
Yurok	Yurok dogs are large and are often called 'wolf dogs'; wolves in area but are not eaten; Wolf fur used for regalia	Driver 1939b:310, 332; Merriam 1967:177

One caveat should be made here regarding extent of the word 'wolf'. It is presumed that, generally, the word 'wolf' is applied to *Canis lupus*. The possibility exists that the southernmost language populations may have come in contact with the Mexican gray wolf (*Canis lupus baileyi*), a subspecies currently listed as endangered (50 CFR Part 17). *C. lupus baileyi* has a range as far west as Arizona and is found in Northern Mexico (USFWS 2013). It is possible that the southern tribes may have encountered these wolves during their travels east or south; similarly, pre-contact distribution of *C. lupus baileyi* may have extended further west. Further research is needed to differentiate the two.

Figure 1. Distribution of Linguistic, Ceremonial, or Other Cultural Indicators of *Canis lupus* in Pre-Contact Indigenous California



RESULTS OF TASK 2

Known Sites

Four counties, Alameda, Contra Costa, San Francisco, and Santa Clara, all in the bay area, have archaeological records indicating the presence of *C. lupus* (Figure 2):

CA-ALA-309—this site represents the central component of the Emeryville Shellmound complex, first excavated by Max Uhle in the early 1900s, and in the subsequent decades has been used as a type site for much of the bay area (Moratto 1984:238-239). Wake (2012:9, citing Broughton 1999) noted that four *C. lupus* bones appeared in this collection.

CA-ALA-310—this site is part of the Emeryville Shellmound complex, and was excavated by Max Uhle in the early 1900s, and in the subsequent decades has been used, along with the main part of the complex at CA-ALA-309 as a type site for much of the bay area (Moratto 1984:238-239). Thomas Wake of the Cotsen Institute at UCLA recently confirmed the presence of *C. lupus* bone at CA-ALA-310, with the presence of coyote and bone that could be attributed to the *Canis* genus but not further differentiated (Wake 2012:9).

CA-CCO-30 and CCO-308—these two sites were excavated by ASC in the 1990s and were found to have very large canid bone, in one case containing a truncated mandible with retained teeth, so large that it could only be Plio-Pleistocene fossil wolf or Holocene wolf (White 2013 pers. comm.). At the time, it was only labeled as canid. The collection has not reviewed yet, nor have other canid bones been pulled from this collection to reassess as wolf.

CA-SAC-43—this site was noted by Simons (2007, in Jones 2009:49) as having a very large canid mandible that might be *C. lupus*.

CA-SCL-690 and SCL-38— this was a site excavated by the Center for Archaeological Research , with results published in 2007. One bone fragment identified as wolf was recovered (Fitzgerald 2013 pers. comm.).

CA-SCL-732 this site, also known by its Ohlone name *Kaphan Umux* (Three Wolves) was excavated by the Ohlone Families Consulting Services in the early 1990s with results published in 1996 (Cambria et al. 1996). As the site name implies, numerous faunal remains were present that were thought to represent at least three wolves, buried in a ceremonial context with cordage around the limbs. Cordage from Burial #2 was radiocarbon dated to 4370 +/- years B.P. (Cambria et al. 1996:7.1; Wilson, in Cambria et al. 1996: Appendix G). Recent DNA research by Byrd et al. (2013:2183) has found that at least one of these remains represents domesticated dog, not wolf, while the other two burial DNA samples remains inconclusive.

CA-SFR-114—this site was excavated in the late 1980s and found to have ceremonial items crafted from wolf bone. These items have been reburied at the project site (Archeo-Tec 1990).



Figure 2. Identified presence of wolf in the archaeological record

CA-SFR-175—this site was excavated in 2011 by ASC, during which time a wolf metatarsal fragments was recovered by Stoyka. This specimen remains in the ASC collections (Newland 2012).

Inquiries with Archaeologists and Regional Experts

Table 5 contains the results of the inquiry with regional experts. As can be seen, few were aware of *C lupus* remains recovered from an archaeological context.

Table 5. Responses to Inquiries

Contact	Response
Frank Bayham, Ph.D.	No response
Emmy Carleton	No known evidence, would inquire with DPR staff
Greg Collins, M.A.	No known evidence, referred to other archaeologists
Shelly Davis-King, Ph.D.	No known evidence
Richard Fitzgerald, M.A.	Confirmed CA-SCL-690; provided references to new research on the topic
Denise Furlong, M.A.	No known evidence, referred to Chico State
Sheri Gust, M.A.	No known evidence
Mark Hylkema, M.A.	No response
Antoinette Martinez, Ph.D.	No response
Rebecca McKim, M.A.	No response
Breck Parkman, M.A.	No known evidence, would inquire with DPR staff
Jaime Roscoe, M.A.	No response
Aaron Sasson, Ph.D.	No wolf bone listed in San Diego Natural History Museum database
Richard Shultz, M.A.	No known sites, referred to other local archaeologists
Noelle Story Shaver, M.A.	No known sites, referred to other local archaeologists
Dwight Simons, Ph.D.	No clear diagnostic wolf bone that he could recall. Referred to CSU Sacramento and Tom Wake
Michael Tuma, M.S.	No known evidence
Tom Wake, Ph.D.	Referred to findings at CA-ALA-309
Greg White, Ph.D.	Referred to excavations he oversaw through Sonoma State in the 1990s at CCO-30 and -308

CONCLUSIONS

The presence of wolf, seemingly little marked upon at the time of contact in California, was nevertheless observed by many indigenous peoples in California. It is curious to note the absence of a word for wolf in most of the Miwok vocabularies, cutting a swath of absence of terms for wolf across the southern Sacramento Delta and Central Valley. It is unclear whether a lack of word for wolf in these vocabularies, and elsewhere in the language monographs throughout California, is a function of there being no word for wolf in those languages, that a translation for the word 'wolf' was simply not asked, or whether such a word may have been in use prior to missionization. This lack of terms for wolf is ironic, in that the bulk of what appears to be evidence for wolf within the archaeological record comes from so many Middle Period (500 cal B.C. to cal A.D. 1050) Bay Area sites, in locations which are presumed to have had Miwok and the Ohlone neighbors.

C. lupus bone is still poorly represented in sites where it is present. However, it has to be generally acknowledged that, probably throughout California archaeological collections, the fragmentary nature of most faunal assemblages has resulted in *C. lupus* getting lumped with a general canid assemblage and not further delineated. Informal conversations with some archaeologists during the course of this work suggested that at least some researchers would be hesitant to identify canid bone as *C. lupus*, in that few California archaeologists have worked with definitive *C. lupus* collections, and that the presence or absence of *C. lupus* is loaded concept, with earlier anthropologists questioning the presence of *C. lupus*, particularly in the San Francisco Bay vicinity.

Even the reality of wolf bone in the Bay Area archaeological record is currently in question. Recent study by Byrd et al. (2013), using stable isotope data and DNA evidence, has found that previously reported coyote and wolf burials in the Bay Area have been found to be either domesticated dog or indeterminate. While only one of the sites (CA-SCI-732) discussed above was tested, their studies imply that faunal remains determined to be wolf or coyote have often been mis-identified, even when specimens in good condition were recovered. Any identification of wolf or coyote within the archaeological record should be taken with a grain of salt, and only considered reliable after DNA testing.

One hypothetical explanation for what seems to be a low *C. lupus* population at the time of Euro-American contact, is the onset of the Medieval Climatic Anomaly around A.D. 880 and continuing to about A.D. 1350 (Stine 1994:549). During this time, widespread violence, disease, and famine have been identified in human remains, particularly in the San Francisco Bay Area and Sacramento Delta populations. It is possible that this region was hit particularly hard, removing or limiting *C. lupus*. Canids, which are commonly a taboo food amongst indigenous cultures, have been found butchered for food within the faunal record dating to this time. Again, canid does not make up a large portion of the faunal record, and probably would not account for the disappearance of *C. lupus*, but it does suggest resource stress on the human populations and presumably other large carnivores and omnivores. This would explain the *C. lupus*'s absence from some of the Bay Area languages, whereas *C. lupus* populations that clearly survived this climatic shift in the Great Basin and Oregon could still come in contact with

Native Americans elsewhere in California, either on human travels to the Eastern Sierras, Great Basin, or southern Oregon regions or occasional *C. lupus* forays into California. This would account for the word for wolf, and some ceremonial traditions relating to wolves, remaining within the language while not playing as important a symbolic role as the coyote or bear.

FUTURE RESEARCH

To further assess the distribution of *C. lupus* within California prior to historic-era contact with non-indigenous peoples, the following research goals are recommended:

1. Consult with a biologist who specializes in the osteological and morphological differences between wolf, coyote and dog.

In our discussions with collections managers elsewhere in California, we have determined that the possibility exists that *C. lupus* has been mis-categorized as large coyote or dog. Consultation with a specialist able to identify diagnostic differences between these three species would be a first step in deciding whether to visit a specific collections facility to review their faunal holdings.

2. Create a database tracking physical (faunal, hide, or coprolite) or linguistic evidence for the distribution of wolf.

Some preliminary tables are provided in this letter report that will form the backbone of a more robust database. This database could be combined with GIS or Google Earth software to be searchable by the public.

3. Assess collections that are listed as having wolf bone.

To get a better understanding of the time depth and distribution of *C. lupus* prior to historic-era contact, the archaeological reports associated with collections listed as having *C. lupus* bone will be reviewed and the chronological data added to our database. If enough of this information exists, or can be gleaned from existing collections, it may be possible to not only show the historic distribution of *C. lupus* but how that distribution changed over time.

4. Identify collections that potentially have wolf bone but which need to be visited to confirm.

Following the consultation with the canine specialist, the faunal expert would visit collections facilities that held, or are likely to hold, faunal bone sufficiently diagnostic to identify *C. lupus*. Most of these facilities will be housed in universities and colleges in California; there may be small holdings outside of California, such as at the Smithsonian or at other universities.

5. Have potential wolf bone genetically tested and radiocarbon data collected.

If samples can be acquired, such samples should be sent for genetic testing to verify the samples' visual speciation by the faunal expert. Having the bones radiocarbon dated could help define the time depth and distribution of *C. lupus*. The recent study by Byrd et al. (2013) implies that DNA testing will prove critical to a clarification of the archaeological record and to a better understanding of the distribution of *C. lupus*.

6. Locate ethnographic vocabulary data for languages that have unpublished or more difficult to locate vocabularies, and that may help fill in missing gaps in what has been mapped out so far.

This data may be in university or college archival collections, in the personal collections of ethnographers or linguists, or may be the property of individual tribal groups or members. It will likely require travel to meet in person with tribal representatives or collections managers.

7. Consult with linguists specializing in California indigenous languages.

While many of the languages in California appear to have words for wolf, further linguistic research should be conducted to assess the origins of the vocabulary, i.e. whether words for dog, wolf, or coyote belong within that language group or if the words have been borrowed from another language. This would be particularly important for cultural groups where the wolf plays an important spiritual role as a deity or ancestor figure, as many of the indigenous religions span several cultural groups and such vocabulary could have been transferred as part of a religious tradition rather than the result of naming an animal that a particular group interacted with.

Following these research steps should result in a thorough assessment and analysis of the existing archaeological and anthropological data regarding the existence of *Canis lupus* in California prior to exploration and settlement of non-indigenous peoples. Upon reviewing the assessment of historical accounts prepared by Weiss (2012), this work seems thorough and no further historical research appears warranted at this time.

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