

Appendix D

Paleontological and Cultural Resources Assessment



**PALEONTOLOGICAL AND CULTURAL RESOURCES
ASSESSMENT FOR THE CITY OF LAKE FOREST
GENERAL PLAN UPDATE, CITY OF LAKE FOREST,
ORANGE COUNTY, CALIFORNIA**

Prepared for:

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Date:

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Cogstone Project Number: 4050

Type of Study: Paleontological and Cultural Resources Assessment

USGS 7.5' Quadrangle: El Toro, San Juan Capistrano, Santiago Peak

Area: 10,748.5 acres

Paleontological Localities (rock unit and number of localities): Silverado Formation 18, Santiago Formation 20, Sespe Formation 26, Vaqueros-Sespe Undifferentiated 122, Vaqueros Formation 24, Topanga Group 37, Monterey Formation 31, Puente Formation 32, Capistrano Formation 63, Niguel Formation 4, Niguel Formations/Quaternary Terrace 2, Pleistocene deposits 29

Archaeological Sites: P-30-000016, P-30-000037, P-30-000038, P-30-000039, P-30-000040, P-30-000042, P-30-000176, P-30-000438 through P-30-000456, P-30-000460, P-30-000489, P-30-000490, P-30-000491, P-30-000510, P-30-000514, P-30-000536, P-30-000544, P-30-000566, P-30-000579, P-30-000594, P-30-000602, P-30-000612, P-30-000628, P-30-000647, P-30-000648, P-30-000693 through P-30-000699, P-30-000739, P-30-000742, P-30-000743, P-30-000741, P-30-000756, P-30-000773, P-30-000825, P-30-000826, P-30-000827, P-30-000828, P-30-000905, P-30-000949, P-30-000950, P-30-000951, P-30-000952, P-30-000953, P-30-000954, P-30-000955, P-30-000957, P-30-000958, P-30-000959, P-30-000960, P-30-001004, P-30-001057, P-30-001058, P-30-001063, P-30-001064, P-30-001066, P-30-001097, P-30-001100, P-30-001145 through P-30-001150, P-30-001171, P-30-001242, P-30-001345, P-30-001362, P-30-001373, P-30-001430, P-30-001496, P-30-001497, P-30-001498, P-30-001500, P-30-001501, P-30-001728, P-30-001741, P-30-100186, P-30-100187, P-30-100188, P-30-100219, P-30-100220, P-30-100276, P-30-100278, P-30-100279, P-30-100280, P-30-100281, P-30-100282, P-30-100283, P-30-100285, P-30-100288, P-30-100289, P-30-100290, P-30-100294, P-30-100295, P-30-100296, P-30-100305, P-30-100309 through P-30-100313, P-30-100371, P-30-100438, P-30-100439, P-30-100444 through P-30-100449, P-30-100453, P-30-100463, P-30-100464, P-30-100491, P-30-156547, P-30-176663

Key Words: Copious fossils from 50 million to 11 thousand years old, Acjachemen, Tongva, Serrano Adobe, El Toro

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SUMMARY OF FINDINGS

The objective of this study is to review and summarize available information regarding known paleontological, archaeological, and historical resources within the boundaries of the City of Lake Forest (City) to support an update of the City's General Plan. The proposed project is an update to the City of Lake Forest General Plan and is intended to provide guidance for long-term growth, maintenance, preservation, and decision-making in the City over the next 20-plus years. Following its incorporation in 1991, the City of Lake Forest adopted its current General Plan in 1994. Since that time, the City has revised some of its elements to respond to changing circumstances and state legislation (Land Use in 2016, Housing in 2014, Circulation in 2008, and Recreation and Resources in 2015). The General Plan Update is expected to consist of the following elements: Land Use and Community Design; Circulation, Economic Development; Recreation and Resources; Public Safety and Noise; and Public Facilities.

The City has a complicated paleoenvironmental history which began at the age of dinosaurs about 66 million (Ma) years old. The past 66 Ma has seen the City transition from coastal lowlands during the Paleocene to Oligocene, to shallow marine during the early Miocene, to deep marine during the early to early-late Miocene, back to shallow marine in the latest Miocene through the Pliocene, and finally to increasingly arid terrestrial deposits from the Pleistocene to the Holocene. A search for paleontological records was completed by the Natural History Museum of Los Angeles County. Published literature, unpublished paleontological reports, and online databases were also searched for fossil records. Databases included the Natural History Museum of Los Angeles County Invertebrate Paleontology, the Paleobiology Database, and the University of California Museum of Paleontology.

Cogstone conducted a search of the California Historic Resources Inventory System (CHRIS) at the South Central Coastal Information Center (SCCIC) on March 28, 2018. Results of the record search indicate that 167 previous cultural resources studies have been completed within the boundaries of the City. The records search also determined 138 previously recorded cultural resources are located within the City boundaries. Of these 138 resources, 87 are prehistoric archaeological sites, 36 are prehistoric isolated artifacts, five are multicomponent sites, one is a historic archaeological site, two are isolated historic isolates, six are historic resources, and one, Heritage Hill, is an archaeological district and is also recorded on the Nation Register of Historic Places and designated as a California Historical Landmark as well as Orange County Historical Landmark.

A Sacred Lands File (SLF) search was requested from the Native American Heritage Commission (NAHC) on March 23, 2018. On March 23, 2018, the NAHC responded that a search of the SFL was completed with positive results. According to the NAHC, a site has been recorded in the Santiago Peak 7.5' United States Geographical Survey topographic quadrangle

that may be impacted by the project and to contact the Juaneño Band of Mission Indians for more information. The NAHC recommended that 11 Native American tribal organizations be contacted , in addition to the four tribal organization who had previously requested AB52 consultation with the City, as they may have additional knowledge of the religious and cultural significance of cultural resources within or immediately adjacent to the City of Lake Forest. The City of Lake Forest sent information and consultation to 15 tribal organizations to meet the requirements of Senate Bill 18 and Assembly Bill 52.

A general analysis of impacts of future projects within the City of Lake Forest that may adversely affect paleontological, archaeological, or historic resources is provided along with mitigation recommendations.

INTRODUCTION

PURPOSE OF STUDY

The objective of this study is to review and summarize available information regarding known paleontological, archaeological, and historical resources within the boundaries of the City of Lake Forest (City) to support an update of the City’s General Plan. The City of Lake Forest covers 10,240 acres and is located in southern Orange County (Figure 1).

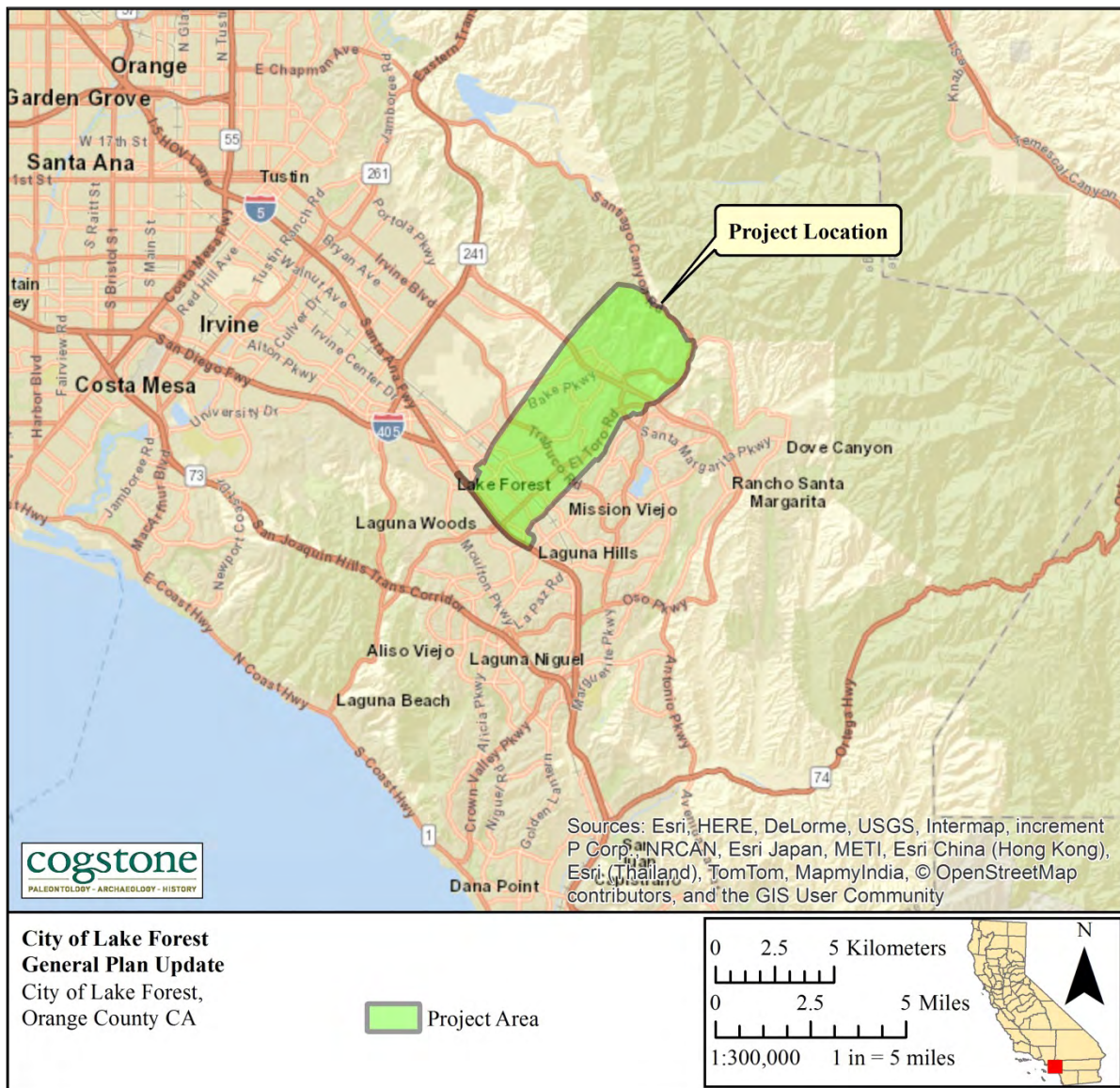


Figure 1. Project Vicinity Map

PROJECT LOCATION AND DESCRIPTION

Located in Orange County, the City of Lake Forest is located in the Saddleback Valley, southwest of Modjeska Canyon and the Santa Ana Mountains (Figures 2a and 2b). The City is bounded on the west by the Cities of Laguna Hills and Laguna Woods, on the south by the City of Mission Viejo, on the north by the Saddleback Mountains, and on the east by the City of Irvine. Oriented northwest-southeast within the Saddleback Valley, the City’s northwestern portion is located within the Aliso Creek Watershed that originates from the Santa Ana Mountains while its southeastern portions occupy portions of the Tustin Plain. Specifically, the City of Lake Forest is located primarily within the El Toro United States Geographical Survey (USGS) 7.5’ topographic map, and includes portions of the San Juan Capistrano and Santiago Peak USGS 7.5’ topographic maps (Table 1).

Table 1. City of Lake Forest Cadastral Information

USGS 7.5 Topographic Quad(s)	Township	Range	Section(s)
El Toro	5S	7W	29, 30, 31, 32
		8W	25, 36
	6S	7W	05, 06, 07, 08, 18
		8W	01, 02, 10, 11, 12, 13, 14, 15, 16, 21, 22, 23, 24
El Toro and San Juan Capistrano	6W	8W	26, 27, 28
San Juan Capistrano	6W	8W	34, 35
Santiago Peak	6W	7W	04, 33

The proposed project (project) is an update to the City of Lake Forest General Plan and is intended to provide guidance for long-term growth, maintenance, preservation, and decision-making in the City over the next 20-plus years. Following its incorporation in 1991, the City of Lake Forest adopted its current General Plan in 1994; since that time, the City has revised some of its elements to respond to changing circumstances and state legislation (Land Use in 2016, Housing in 2014, Circulation in 2008, and Recreation and Resources in 2015). The General Plan Update is expected to consist of the following elements: Land Use and Community Design; Circulation, Economic Development; Recreation and Resources; Public Safety and Noise; and Public Facilities. Because the Housing Element Update is certified through 2021, it is not included in this General Plan Update.

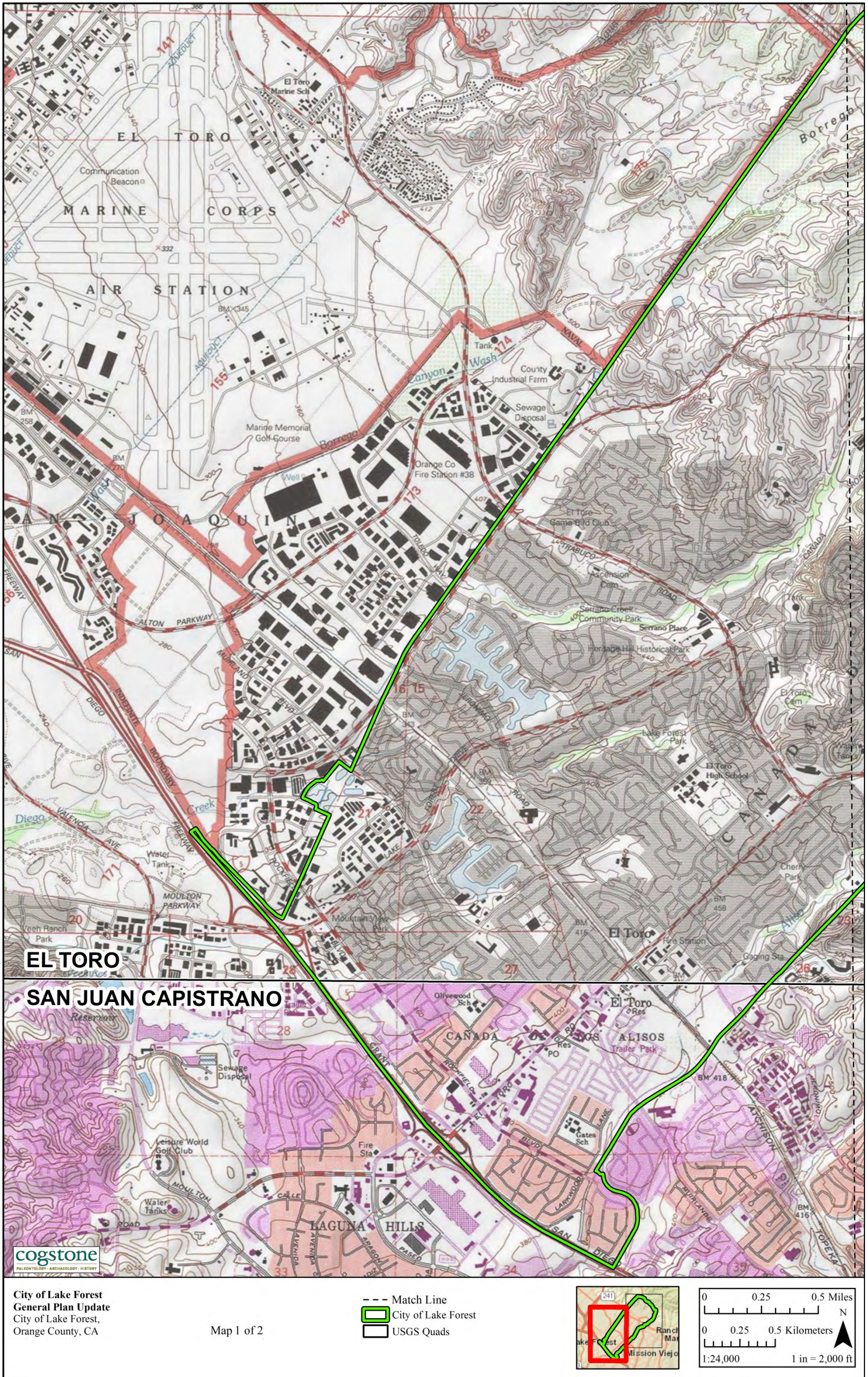


Figure 2a. Project Location, Map 1 of 2

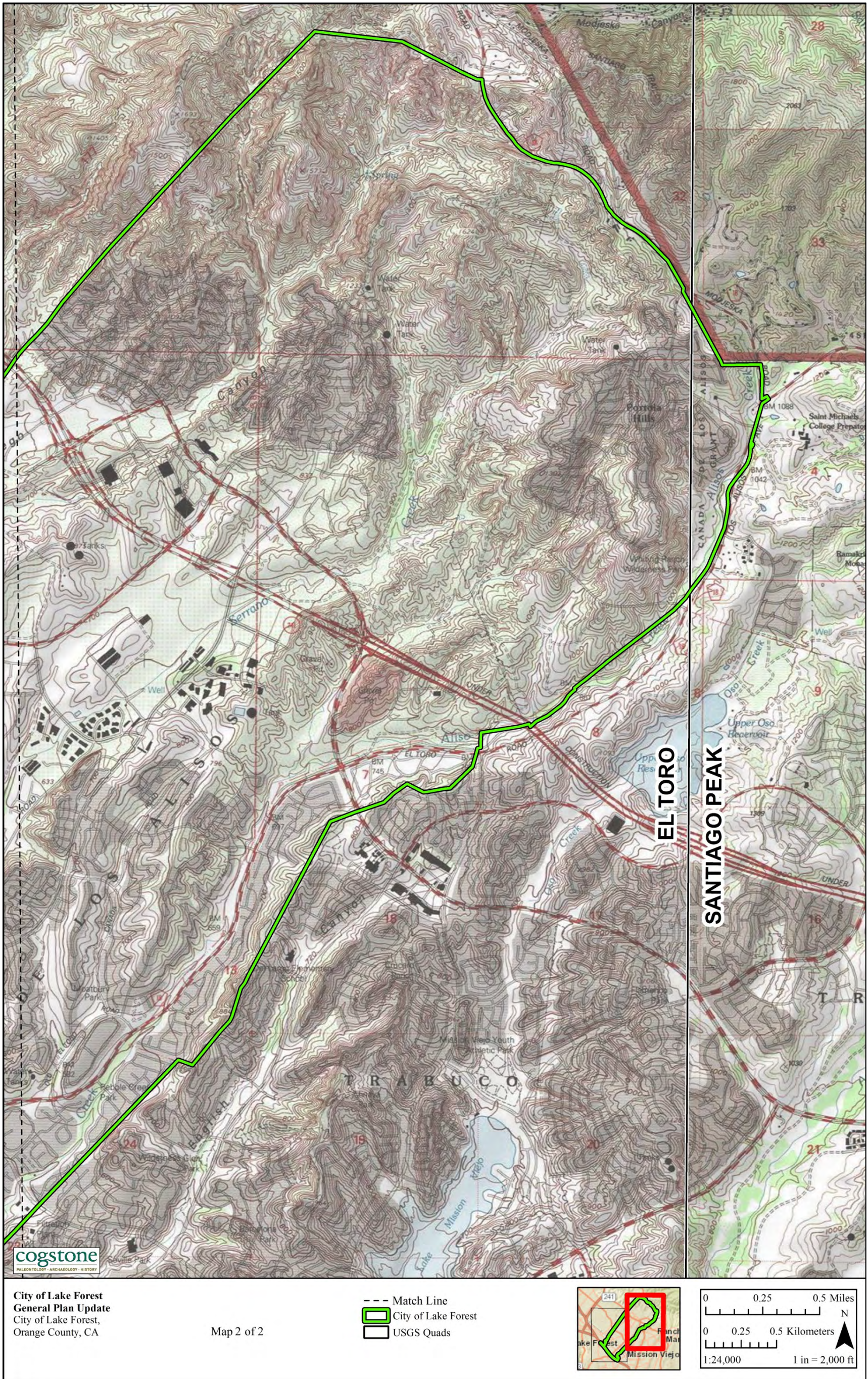


Figure 2b. Project Location, Map 2 of 2

PROJECT PERSONNEL

Cogstone Resource Management Inc. (Cogstone) conducted the cultural and paleontological resources studies. Qualifications of Cogstone personnel are provided (Appendix A).

- Desireé Martinez served as the Principal Archaeologist for this Project. Ms. Martinez has an M.A. in Anthropology from Harvard University, Cambridge, and more than 21 years of experience in southern California archaeology.
- Kim Scott served as the Principal Paleontologist for the Project and wrote the geological and paleontological portions of this report. Scott has a M.S. in Biology with paleontology emphasis from California State University, San Bernardino, a B.S. in Geology with paleontology emphasis from the University of California, Los Angeles, and over 23 years of experience in California paleontology and geology.
- Sherri Gust served as the Task Manager for this Project and wrote the prehistoric and ethnographic sections. Gust is a Registered Professional Archaeologist and has an M.S. in Anatomy (Evolutionary Morphology) from the University of Southern California, a B.S. in Anthropology from the University of California at Davis and over 36 years of experience in California.
- Megan Wilson prepared the maps, conducted the archaeological and historic records search, wrote the historic context, and drafted portions of the report. Wilson has a M.A. in Anthropology from California State University, Fullerton and has over seven years of experience in southern California archaeology.

REGULATORY ENVIRONMENT

CALIFORNIA ENVIRONMENTAL QUALITY ACT OF 1970 (CEQA) (PRC § SECTION 21000 ET SEQ.)

CEQA states that: It is the policy of the state that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects, and that the procedures required are intended to assist public agencies in systematically identifying both the significant effects of proposed project and the feasible alternatives or feasible mitigation measures which will avoid or substantially lessen such significant effects.

CEQA declares that it is state policy to: "take all action necessary to provide the people of this state with...historic environmental qualities." It further states that public or private projects financed or approved by the state are subject to environmental review by the state. All such projects, unless entitled to an exemption, may proceed only after this requirement has been satisfied. CEQA requires detailed studies that analyze the environmental effects of a proposed project. In the event that a project is determined to have a potential significant environmental effect, the act requires that alternative plans and mitigation measures be considered. If archaeological or paleontological resources are identified as being within the proposed project study area, the sponsoring agency must take those resources into consideration when evaluating project effects. The level of consideration may vary with the importance of the resource.

TRIBAL CULTURAL RESOURCES

In 2015, CEQA was amended and established that "[a] project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment" (Public Resources Code [PRC] § 21084.2). In order to be considered, a "tribal cultural resource" must be a site, feature, place, cultural landscape, sacred place, or object, which is of cultural value to a California Native American Tribe and is either:

- (1) listed, or determined to be eligible for listing, on the national, state, or local register of historic resources, or
- (2) a resource that the lead agency chooses, in its discretion, to treat as a tribal cultural resource.

To help determine whether a project may have such an effect, the lead agency must consult with any California Native American tribe that requests consultation and is traditionally and culturally affiliated with the geographic area of a proposed project. Consultation must take place prior to the determination of whether a negative declaration, mitigated negative declaration, or environmental impact report is required for a project (PRC § 21080.3.1).

In applying those criteria, a lead agency must consider the value of the resource to the tribe. For example, in considering the criterion that a resource is "associated with the lives of persons important in our past," a lead agency would ask whether the resource is associated with the lives of persons important to the relevant tribe's past. That determination must be supported with substantial evidence.

If a lead agency determines that a project may cause a substantial adverse change to tribal cultural resources, the lead agency must consider measures to mitigate that impact. PRC §20184.3 (b) (2) provides examples of mitigation measures that lead agencies may consider to avoid or minimize impacts to tribal cultural resources.

CALIFORNIA REGISTER OF HISTORICAL RESOURCES (PRC § 5024.1)

The California Register of Historical Resources (CRHR) is a listing of all properties considered to be significant historical resources in the state. The California Register includes all properties listed or determined eligible for listing on the National Register, including properties evaluated under Section 106, and State Historical Landmarks number No. 770 and above. The California Register statute specifically provides that historical resources listed, determined eligible for listing on the California Register by the State Historical Resources Commission, or resources that meet the California Register criteria are resources which must be given consideration under CEQA (see above). Other resources, such as resources listed on local registers of historic registers or in local surveys, may be listed if they are determined by the State Historic Resources Commission to be significant in accordance with criteria and procedures to be adopted by the Commission and are nominated; their listing in the California Register, is not automatic.

Resources eligible for listing include buildings, sites, structures, objects, or historic districts that retain historical integrity and are historically significant at the local, state or national level under one or more of the following four criteria:

- 1) It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;
- 2) It is associated with the lives of persons important to local, California, or national history;
- 3) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
- 4) It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition to having significance, resources must have integrity for the period of significance. The period of significance is the date or span of time within which significant events transpired, or significant individuals made their important contributions. Integrity is the authenticity of a historical resource's physical identity as evidenced by the survival of characteristics or historic fabric that existed during the resource's period of significance.

Alterations to a resource or changes in its use over time may have historical, cultural, or architectural significance. Simply, resources must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. A resource that has lost its historic character or appearance may still have sufficient integrity for the California Register, if, under Criterion 4, it maintains the potential to yield significant scientific or historical information or specific data.

PUBLIC RESOURCES CODE SECTION § 5097.5

Section 5097.5: No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands (lands under state, county, city, district or public authority jurisdiction, or the jurisdiction of a public corporation), except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor. As used in this section, "public lands" means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

NATIVE AMERICAN HUMAN REMAINS

Sites that may contain human remains important to Native Americans must be identified and treated in a sensitive manner, consistent with state law (i.e., Health and Safety Code §7050.5 and Public Resources Code §5097.98), as reviewed below:

In the event that human remains are encountered during project development and in accordance with the Health and Safety Code Section 7050.5, the County Coroner must be notified if potentially human bone is discovered. The Coroner will then determine within two working days of being notified if the remains are subject to his or her authority. If the Coroner recognizes the remains to be Native American, he or she shall contact the Native American Heritage Commission (NAHC) by phone within 24 hours, in accordance with Public Resources Code Section 5097.98. The NAHC will then designate a Most Likely Descendant (MLD) with respect to the human remains. The MLD then has the opportunity to recommend to the property owner or the person responsible for the excavation work means for treating or disposing, with appropriate dignity, the human remains and associated grave goods.

CALIFORNIA ADMINISTRATIVE CODE, TITLE 14, SECTION 4307

This section states that “No person shall remove, injure, deface or destroy any object of paleontological, archeological or historical interest or value.”

ATTACHMENT A, CITY OF LAKE FOREST LOCAL GUIDELINES FOR IMPLEMENTING THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

In 2017, the City of Lake Forest adopted procedures to implement the California Environmental Quality Act (“CEQA”), Public Resources Code Section 21000 et seq., and the State CEQA Guidelines (“State CEQA Guidelines”), 14 California Code of Regulations Section 15000 et seq. The procedures established herein implement and tailor the general provisions of the State CEQA Guidelines to the specific operations of the City of Lake Forest (“City”). These Local Guidelines are intended to supplement the State CEQA Guidelines” (City of Lake Forest 2017). Section 5-1 specifically identifies the evaluation of impacts to historic (Section 5-1, l) and archaeological (Section 5-1, m) resources:

L) EVALUATING IMPACTS ON HISTORIC RESOURCES

Projects that may cause a substantial adverse change in the significance of a historical resource, as defined in Local Guidelines Section 10.28, are projects that may have a significant effect on the environment, thus requiring consideration under CEQA. Particular attention and care should be given when considering such projects, especially projects involving the demolition of a historical resource, since such demolitions have been determined to cause as significant effect on the environment.

Substantial adverse change in the significance of a historical resource means physical demolition, destruction, relocation or alteration of the resource or its immediate surroundings, such that the significance of a historical resource would be materially impaired The significance of a historical resource is materially impaired when a project:

- (1) Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in, the California Register of Historical Resources;
- (2) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources or its identification in a historical resources survey, unless the Lead Agency establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
- (3) Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by the Lead Agency for purposes of CEQA.

Generally, a project that follows either one of the following sets of standards and guidelines will

be considered mitigated to a level of less than significant: (a) the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings; or (b) the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (1995), Weeks and Grimmer.

In the event of an accidental discovery of a possible historical resource during construction of the project, the City may provide for the evaluation of the find by a qualified archaeologist or other professional. If the find is determined to be a historical resource, the City should take appropriate steps to implement appropriate avoidance or mitigation measures. Work on non-affected portions of the project, as determined by the City, may continue during the process. Curation may be an appropriate mitigation measure for an artifact that must be removed during project excavation or testing.

M) EVALUATING IMPACTS ON ARCHAEOLOGICAL SITES

When a project will impact an archaeological site, the City shall first determine whether the site is a historical resource, as defined in Local Guidelines Section 10.28. If the archaeological site is a historical resource, it shall be treated and evaluated as such, and not as an archaeological resource. If the archaeological site does not meet the definition of a historical resource, but does meet the definition of a unique archaeological resource set forth in Public Resources Code Section 21083.2, the site shall be treated in accordance with said provisions of the Public Resources Code. The time and cost limitations described in Section 21083.2(c-f) do not apply to surveys and site evaluation activities intended to determine whether the project site contains unique archaeological resources.

If the archaeological resource is neither a unique archaeological resource nor a historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment. It shall be sufficient that both the resource and the effect on it are noted in the Initial Study or EIR, if one is prepared to address impacts on other resources, but they need not be considered further in the CEQA process.

In the event of an accidental discovery of a possible unique archaeological resource during construction of the project, the City may provide for the evaluation of the find by a qualified archaeologist. If the find is determined to be a unique archaeological resource, the City should take appropriate steps to implement appropriate avoidance or mitigation measures. Work on non-affected portions of the project, as determined by the City, may continue during the process. Curation may be an appropriate mitigation measure for an artifact that must be removed during project excavation or testing.

When an Initial Study identifies the existence of, or the probable likelihood of, Native American human remains within the Project, the City shall comply with the provisions of State

CEQA Guidelines Section 15064.5(d). In the event of an accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the City shall comply with the provisions of State CEQA Guidelines Section 15064.5(e)

BACKGROUND

GEOLOGICAL SETTING

The project area is in the northern extent of the California Geomorphic Province known as the Peninsular Ranges. The Peninsular Ranges geomorphic province extends from Mount San Jacinto in the north, through the tip of Baja, Mexico in the south. Subparallel to these ranges on the east is the San Andreas Fault Zone. The northwestwards motion of the Pacific Plate has created these ranges and their corresponding valleys (Wagner 2002).

PALEONTOLOGICAL SETTING

The City has a complicated paleoenvironmental history which began at the age of dinosaurs about 66 million years old (66 Ma; Table 2). The past 66 Ma has seen the City transition from coastal lowlands during the Paleocene to Oligocene, to shallow marine during the early Miocene, to deep marine during the early to early-late Miocene, back to shallow marine in the latest Miocene through the Pliocene, and finally to increasingly arid terrestrial deposits from the Pleistocene to the Holocene. Detail on each geological unit is in the Stratigraphy Section below.

STRATIGRAPHY

Geologic mapping by Morton and Miller (2006) maps the area as 28 separate units ranging from modern deposits to Paleocene sediments (Table 2; Figures 3a and 3b). Geological units are discussed in order from oldest to youngest.

Table 2. Geologic units within the City

Epoch	Age Range	Unit Name	Paleoenvironment
modern	<200 years	artificial fill (Qaf)	man-made
late Holocene	<5,000 years (<5 ka)	very young colluvial deposits (Qc)	slope deposit
		very young landslide deposits (Qls, Qls?)	landslide
		very young slope wash deposits (Qsw)	slope wash
late Pleistocene to Holocene	<120 ka	young axial-channel deposits (Qya)	flood-plains
		young alluvial-fan deposits (Qyf)	alluvial fan
		young landslide deposits (Qyls)	landslide
early to middle Pleistocene	~11.7 ka - ~2.6 million years (Ma)	very old axial-channel deposits (Qvoa, Qvoa ₂ , Qvoa ₃)	flood-plains
		very old alluvial-fan deposits (Qvof)	alluvial fan
Pliocene	~2.6 Ma - ~5.3 Ma	Niguel Formation (Tn)	shallow marine
late Miocene to early Pliocene	~3.6 Ma - ~11.6 Ma	Capistrano Formation (Tc, Tco, Tcs)	shallow-marine
late Miocene	~5.3 Ma - ~11.6 Ma	Puente Formation (Tp, Tplv, Tpsq)	deep marine, submarine fan
		Monterey Formation (Tm)	deep marine
middle Miocene	~11.6 Ma - ~16 Ma	Topanga Group (Tt)	shallow to deeper marine
latest Oligocene to latest early Miocene	~16 Ma - ~23 Ma	Vaqueros Formation (Tv)	shallow marine
		Vaqueros-Sespe Formation (Tvs)	shallow marine - nonmarine
late Eocene to early Miocene	~16 Ma - ~41.2 Ma	Sespe Formation (Ts)	nonmarine
Paleocene	~56 Ma - ~66 Ma	Santiago Formation (Tsa)	coastal lowland
		Silverado Formation (Tsi, Tsicg, Tsis)	coastal nonmarine to very shallow-marine

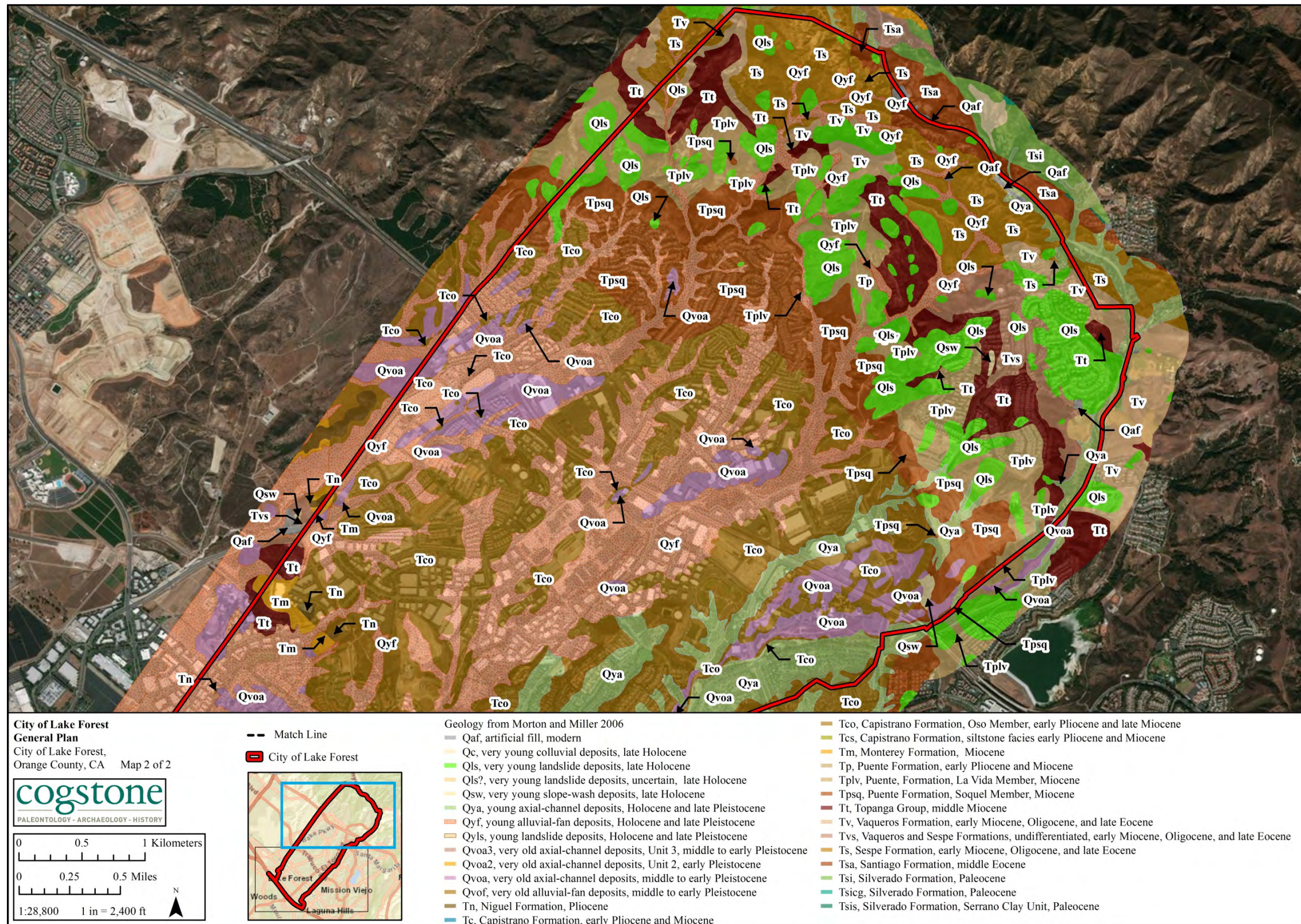


Figure 3a. Geology Map, 1 of 2

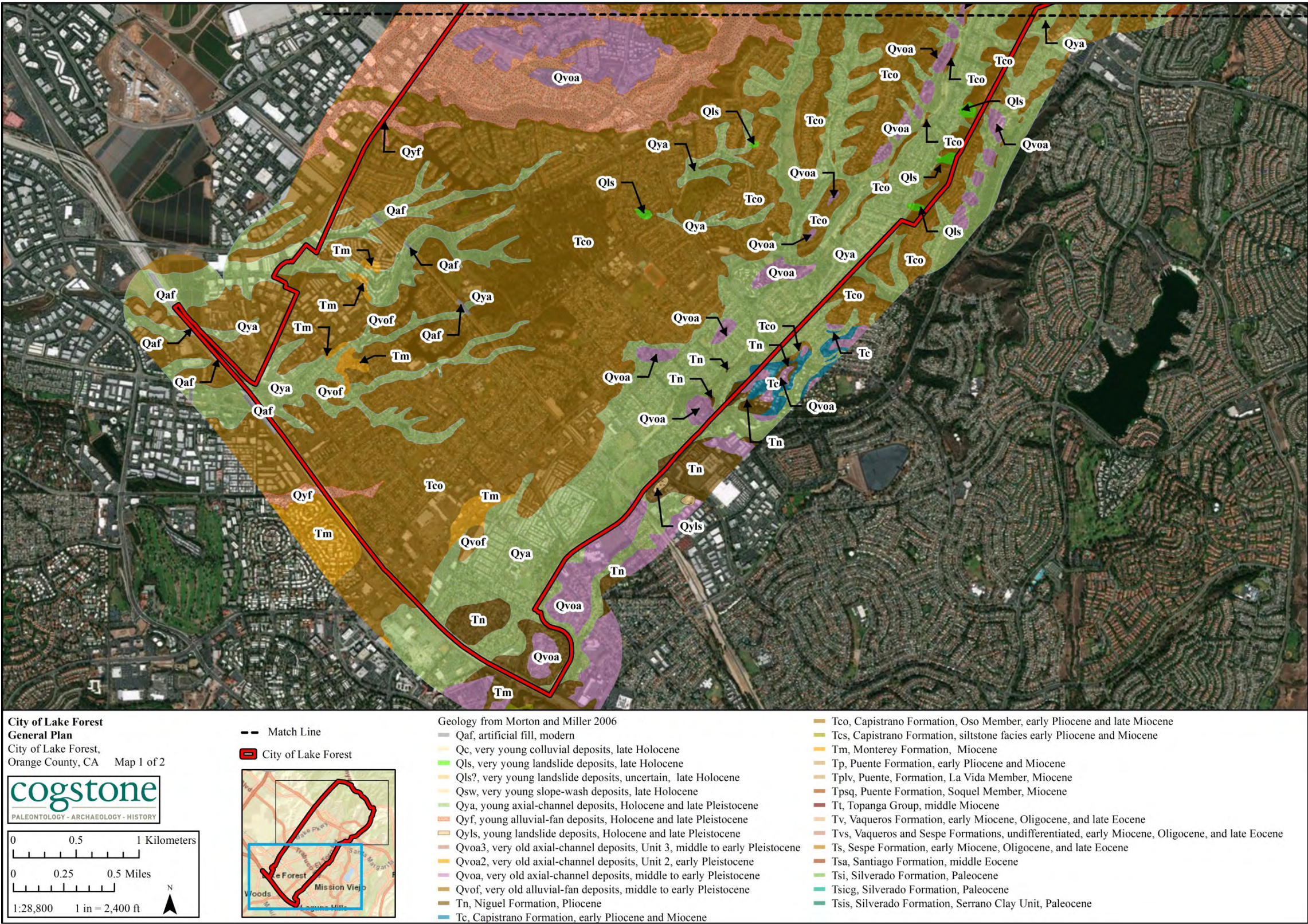


Figure 3b. Geology Map, 2 of 2

PALEOCENE ROCKS (~66 MILLION YEARS OLD [MA] TO ~56 MA)

Silverado Formation (Tsicg, Tsi, Tsis)

Thickness of these coastal nonmarine swamp and slough to very shallow-marine delta and bay, sandstone and siltstone deposits range from 200 m to 450 m in the Santa Ana Mountains. This formation is divided into a basal conglomerate (Tsicg) overlain by sandstone and siltstone of the undifferentiated Silverado Formation (Tsi) that locally includes the Serrano Clay bed (Tsis). The basal conglomerate is typically between 2 m and 12 m thick but can reach a thickness of 40 m. It is typically massive, pale gray to reddish-brown, nonfossiliferous, pebble to cobble conglomerate. In some areas, clast sizes increase to a boulder conglomerate (Schoellhamer et al. 1981, Morton and Miller 2006).

Above the basal conglomerate, the Silverado Formation consists of marine and nonmarine, sandstone and siltstone. Clasts are largely of quartz and clay with some conglomerate. In the Robinson Ranch area, a prolific flora of fossil land plants has been recovered. The Serrano Clay is present within the upper Silverado Formation. It is a 1 m thick marker bed composed of pale gray to white, soft and plastic clay and quartz with carbonaceous shale and lignite beds. Marine mollusks can be abundant and include the distinctive and diagnostic Paleocene marine snail, *Turritella pachecoensis* in some eastern exposures (Schoellhamer et al. 1981, Eisentraut and Cooper 2002, Morton and Miller 2006).

MIDDLE EOCENE DEPOSITS (~47.8 MA TO ~37.8 MA)

Santiago Formation (Tsa)

Sediments consist of marine and nonmarine deposits from a coastal lowland paleoenvironment. At the base is a conglomerate with the clasts that originated from western central Mexico where the Santiago Formation was originally deposited. The north-westerly movement of the Pacific Plate by the San Andreas Fault Zone brought these sediments into southern California. Pale gray sandstone and some interbedded siltstone occurs above the conglomerate. Marine invertebrates and petrified wood are present in this unit (Schoellhamer et al. 1981, Morton and Miller 2006).

LATE EOCENE TO LATEST EARLY MIOCENE DEPOSITS (~41.2 MA TO ~17.4 MA)

Sespe Formation (Ts)

This red to grey, non-marine mudstone to conglomerate occurs as massive to thick bedded deposits with poorly developed bedforms (Eisentraut and Cooper 2002, Morton and Miller 2006). This terrestrial deposit includes fluvial, floodplain, and alluvial fan deposits. This formation also reflects a major drop in global sea levels (Eisentraut and Cooper 2002, McCulloch and Bayer 2004). Fossils of the late Uintan (middle Eocene - 44.5 Ma to 39.5 Ma) North American Land Mammal Age (NALMA) to latest Hemingfordian (middle Miocene ~17.5 Ma) NALMA are present within the Sespe Formation (Lander 1983, Lucas et al. 1997, Whistler and Lander 2003).

MIOCENE EPOCH (~23 MA TO ~5.3 MA)

The Miocene Epoch was a dramatic time in southern California. The San Andreas Fault began bringing Pacific Plate lands from the south, volcanoes erupted, mountains grew, and numerous coastal marine basins were formed. Orange County rests in one of these basins - the Los Angeles Basin. During the Miocene, the Los Angeles Basin was tectonically active. Opening of the basin began about 17.4 Ma (McCulloch and Bayer 2004) and was followed by subsidence and creation of a deep marine depositional basin (Figure 4). Sediments are estimated to be up to six miles thick, one of the thickest Neogene stratigraphic successions in the world (Eisentraut and Cooper 2002).

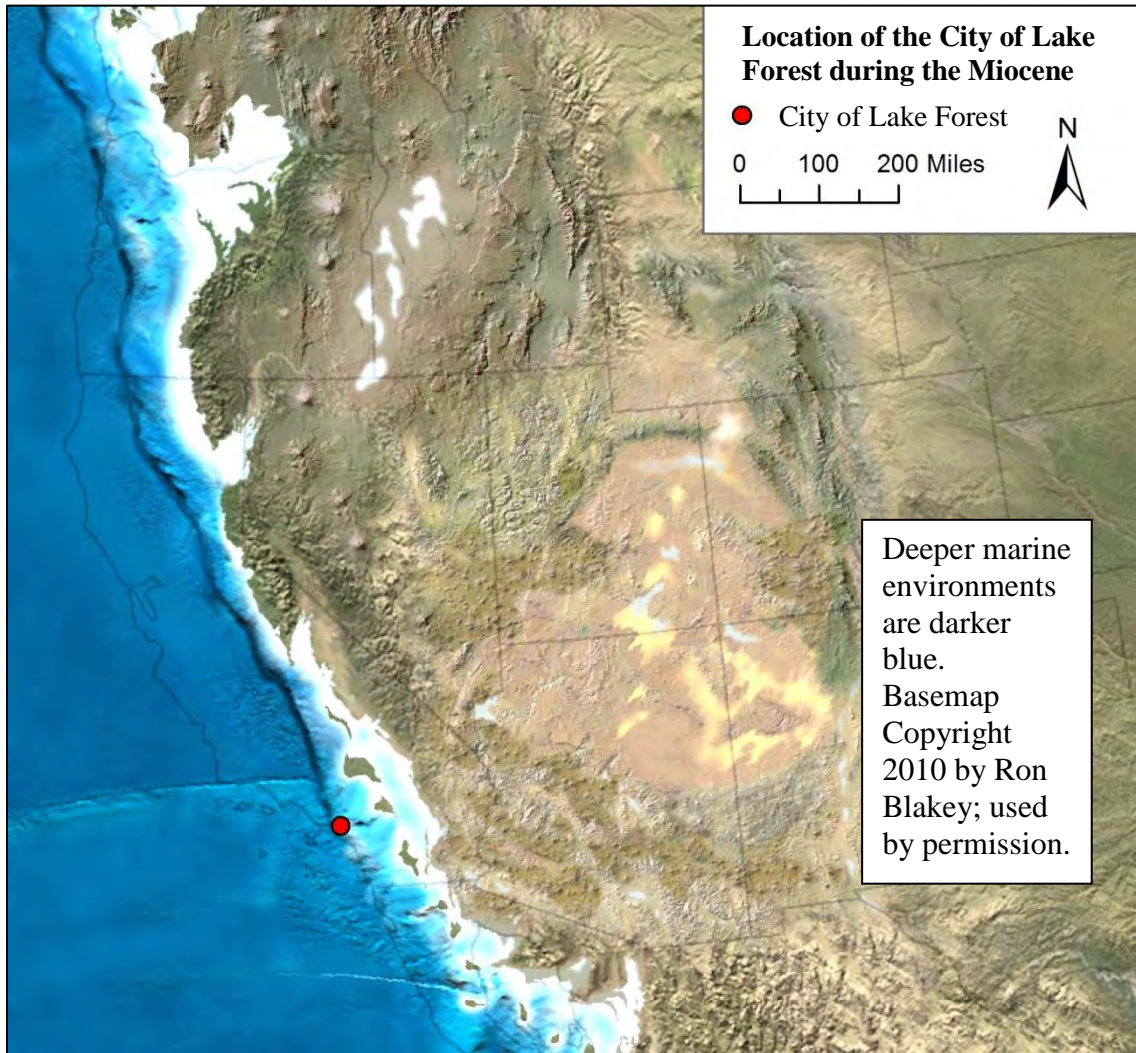


Figure 4. City in late to middle Miocene at the edge of a deep marine environment

LATEST OLIGOCENE TO LATEST EARLY MIOCENE (~19.5 MA TO ~17.4 MA)

Vaqueros-Sespe Formation (Tvs)

These two formations interfinger so much in many areas of California that they are mapped together. Sespe Formation sediments are generally coarser than those of the Vaqueros Formation. The Vaqueros-Sespe section can reach thicknesses between 1,500 and 2,000 feet in the Lake Forest area (McCulloch and Bayer 2004). See the individual descriptions for each for more information.

Vaqueros Formation (Tv)

The shallow marine Vaqueros Formation occurs as greenish-gray to very dark gray, massive- to thick-bedded silty sandstone. Sandstone beds interfinger with thin-bedded siltstone and shale, mudstone, and minor conglomerate (Morton and Miller 2006, McCulloch and Bayer 2004). Deposition of the Vaqueros Formation began about 24 Ma and ended in most of the Los Angeles area between 17.5 Ma and 17.4 Ma based on the dating of volcanics, marine mollusks, benthic foraminifera, magnetic polarity stratigraphy, and other methods (Nagle and Parker 1971, Yerkes and Campbell 1979, Schoellhamer et al. 1981, Blake 1983, Mason and Swisher 1989, Nourse et al. 1998, Prothero et al. 1996, Lucas et al. 1997, Liddicoat 2001, McCulloch et al. 2001, Prothero and Donohoo 2001, McCulloch et al. 2002, Ludtke and Prothero 2003, Lander et al. 2003, Whistler and Lander 2003, McCulloch and Bayer 2004). The appearance of marine sediments after the non-marine Sespe Formation indicates rising global sea levels.

MIDDLE MIOCENE DEPOSITS (~17.4 MA TO ~11.6 MA)

Topanga Group (Tt)

Undifferentiated Topanga Group sediments consist primarily of coarse-grained, massive to thick-bedded sandstone and conglomerate. A tan to grey, well indurated, basal sandy conglomerate bed ranging from 2 m to 9 m is present (Schoellhamer et al. 1981). Clasts in the conglomerate are predominantly granitic and gneissic with some volcanics. Above the basal conglomerate, are interfingering, thinly bedded, fine to coarse-grained sandstone, siltstone, and minor amounts of diatomaceous and partially silicified shale. While the shale is grey to greyish-white, coarser sediments are yellow to yellowish-tan (Morton and Miller 2006). Deposition began about 17.4 Ma and ended about 15.9 Ma based on dating of underlying and overlying volcanics (Turner and Campbell 1979, McCulloch et al. 2002, McCulloch and Bayer 2004).

The shallow to deep marine Topanga Group was one of the first units to be deposited in the rapidly deepening Los Angeles Basin. Much of these deep submarine fan and plain deposits occurred between 13 Ma and 5 Ma and corresponds with deposition of the Topanga and Monterey formations (Redin 1991, McCulloch and Bayer 2004). The Los Angeles Basin – Tustin Plain continues to be filled by modern deposition today.

LATE MIOCENE DEPOSITS (~11.6 MA TO ~5.3 MA)

Monterey Formation (Tm)

This siliceous and diatomaceous marine mudstone, shale, diatomite, and some chert is primarily white to pale brown and thinly laminated or bedded. In the San Juan Capistrano area, lower part of Puente Formation grades laterally southward into Monterey Formation (Morton and Miller 2006). Sediments are part of a deep submarine fan and plain deposits that was deposited between 13 Ma and 5 Ma (Redin 1991). Locally named “Pecten Reef”, a limestone in the Aliso Viejo area has produced abundant invertebrate and vertebrate fossils. The Monterey Formation was deposited at the same time as the Soquel Member, La Vida Member, and the lower portion of the undifferentiated Puente Formation (Morton and Miller 2006).

Puente Formation (Tp, Tpsq, Tplv)

The deep marine Puente Formation has produced numerous fossil localities of marine animals and algae as well as terrestrial plants and animals that were washed in. Fossils are found primarily in the finer grained deposits, but can occur in all sediments. These sediments were deposited at the same time as the Monterey Formation. Within the City are three units: the undifferentiated Puente Formation, the younger Soquel Member, and the basal La Vida Member (Morton and Miller 2006).

The undifferentiated Puente Formation consists of sandstone, siltstone, and shale. The Soquel Member is primarily a marine sandstone with minor amounts of shale. Beds are yellowish grey to grey, massive to well-bedded, silts to very coarse grained sandstone, interbedded with matrix supported pebble conglomerate (Morton and Miller 2006). The member ranges from 200 to 310 feet thick in the eastern Puente Hills and the sediments have been interpreted to be middle to inner submarine fan facies (Cooper 1981).

The basal La Vida Member sediments are primarily light-gray to black, massive to well bedded, generally friable siltstone with some sandstone beds from a 2 cm to over 1 meter thick. Fish remains are common and include deep water species (Morton and Miller 2006).

LATE MIOCENE TO EARLY PLIOCENE DEPOSITS (~11.6 MA TO ~3.6 MA)

Capistrano Formation, undifferentiated (Tc)

The undifferentiated Capistrano Formation consists of marine siltstone and sandstone which is widespread in the San Joaquin Hills (Morton and Miller 2006).

Capistrano Formation, Siltstone Facies (Tcs)

The informal siltstone facies of the Capistrano Formation appear as white to pale gray, massive to crudely bedded, friable, siltstone and mudstone. Locally this unit contains sandstone,

calcareous mudstone beds, and sparse diatomaceous and tuffaceous beds (Morton and Miller 2006).

Capistrano Formation, Oso Sand (Tco)

The Oso Sand of the Capistrano Formation consists of white to light gray, massive, medium- to coarse-grained, friable, marine sandstone with scattered matrix-supported pebbles, cobbles, and concretions (Morton and Miller 2006). The bay that occupied the region was named the Capistrano Embayment (Reed and Hollister 1936). This embayment was a broad flat-bottomed structural trough that extended at least 22 miles inland from the present-day shoreline. How far offshore it extended is undetermined because of its merging with the deep offshore basins. Water depths in the Capistrano Embayment reached nearly 2,000 meters at its deepest point (Ingle 1979). Marine fossils are typically well preserved and provide an excellent look into this time period in California.

PLIOCENE DEPOSITS (~5.3 MA TO ~2.6 MA)

Niguel Formation (Tn)

These very near-shore marine, brownish-gray, poorly sorted, coarse-grained sandstone is interbedded with conglomeratic sandstone and conglomerates. Marine mollusks recovered previously indicates water of a sublittoral-depth (Vedder 1960, Morton and Miller 2006).

EARLY TO MIDDLE PLEISTOCENE DEPOSITS (2.6 MA TO 120,000 YEARS OLD [120 KA])

Axial channel deposits were emplaced adjacent to streams in through-going stream valleys. Undifferentiated very old axial channel sediments are dominated by sand, but contain scattered gravel and pebble layers, as well as silt and clay-bearing alluvium. These deposits are moderately to well-indurated, reddish-brown, and are highly pigmented in upper parts. Upper surfaces are mostly very dissected (Morton and Miller 2006).

Two subunits are present within the project area, the early to middle Pleistocene unit 3 (Qvoa₃) and the early Pleistocene unit 2 (Qvoa₂). Both descriptions are essentially the same as that of the undifferentiated very old axial channel (Morton and Miller 2006).

Very old alluvial fan deposits (Qvof)

Alluvial fan deposits are deposited into our valleys from local mountains via the mouths of canyons. Sediments are moderately to well indurated, silts to bouldery conglomerates, with slightly to moderately dissected fan surfaces. In much of Peninsular Ranges these sediments are moderately well indurated, orangish brown sand and silt with well dissected fan surfaces (Morton and Miller 2006). Clasts coarsen upstream with boulders up to several meters across being deposited near the mountains during flash floods

LATE PLEISTOCENE TO HOLOCENE DEPOSITS (LESS THAN 120 KA)

Young axial channel deposits (Qya)

Axial channel deposits were emplaced adjacent to streams in through-going stream valleys. Sediments are slightly to moderately indurated and consist of silts to pebbles (Morton and Miller 2006).

Young alluvial fan deposits (Qyf)

Alluvial fan deposits are deposited into our valleys from local mountains via the mouths of canyons. Sediments are unindurated to moderately indurated, silts to bouldery conglomerates, with slightly to moderately dissected fan surfaces (Morton and Miller 2006). Clasts coarsen upstream with boulders up to several meters across being deposited near the mountains during flash floods.

Young landslide deposits (Qyls)

Landslides are the result of slope failures and typically result in chaotically emplaced sediments. Slides may or may not be active and have slightly dissected or modified surfaces (Morton and Miller 2006). In less chaotic slides and slumps beds can sometimes be traced and given stratigraphic context.

LATE HOLOCENE DEPOSITS (LESS THAN 5 KA)

Very young colluvial deposits (Qc)

Colluvium is present as unconsolidated scree, soils, or other materials and are primarily found at the base of hills. These sediments have been emplaced by rain wash or slow continuous downslope creep (Morton and Miller 2006).

Very young landslide deposits (Qls, Qls?)

Landslides are the result of slope failures and typically result in chaotically emplaced sediments. Slides may or may not be active and have well preserved morphology (Morton and Miller 2006). In less chaotic slides and slumps beds can sometimes be traced and given stratigraphic context.

Very young slope wash deposits (Qsw)

Very similar to the colluvial deposits, slope wash is also associated with hillsides. The unconsolidated, typically angular, sand to boulder sized clasts have been emplaced by water not confined to channels (Morton and Miller 2006).

MODERN DEPOSITS (LESS THAN 200 YEARS OLD)

Artificial fill (Qaf)

Modern fill is frequently not mapped on geologic maps due to its ubiquitous nature. Although fill is typically less than a few feet thick, it can be substantially thicker in the areas of overpasses, freeways, and other large earthworks. Any fossils that may be encountered therein are not scientifically significant.

ETHNOGRAPHY

The City is mostly located within the traditional territory of the Tongva (Gabrielino) but along the boundary of the territory of the Acjachemen (Juaneño) (McCawley 1996; Figure 5). Ethnographically, Aliso Creek was recorded as the boundary between the Gabrielino to the northeast and the Juaneño to the southwest (Kroeber 1976). The names Juaneño and Gabrielino were names imposed on Native Americans by Spanish missionaries to identify the indigenous peoples who occupied the surrounding areas of Mission San Juan Capistrano and Mission San Gabriel Arcángel, respectively.

TONGVA

The Tongva speak a language that is part of the Takic language family. At the time of Spanish contact, their territory encompassed a vast area stretching from Topanga Canyon in the northwest, to the base of Mount Wilson in the north, to San Bernardino in the east, Aliso Creek in the southeast and the four Southern Channel Islands, in all an area of more than 2,500 square miles (Bean and Smith 1978, McCawley 1996).

The Tongva are considered to have been one of the wealthiest tribes and to have greatly influenced tribes they traded with (Kroeber 1976:621). Houses were domed and circular structures thatched with tule or similar materials (Bean and Smith 1978:542). The best known artifacts were made of steatite and were highly prized. Many common everyday items were decorated with inlaid shell or carvings reflecting an elaborately developed artisanship (Bean and Smith 1978:542).

The main food zones utilized were marine, woodland, and grassland (Bean and Smith 1978). Plant foods were, by far, the greatest part of the traditional diet at contact. Acorns were the most important single food source. Villages were located near water sources necessary for the leaching of acorns, which was a daily occurrence. Grass seeds were the next most abundant plant food used along with chia. Seeds were parched, ground, and cooked as mush in various combinations according to taste and availability. Greens and fruits were eaten raw or cooked or sometimes dried for storage. Bulbs, roots, and tubers were dug in the spring and summer and usually eaten fresh. Mushrooms and tree fungus were prized as delicacies. Various teas were

made from flowers, fruits, stems and roots for medicinal cures as well as beverages (Bean and Smith 1978:538-540).

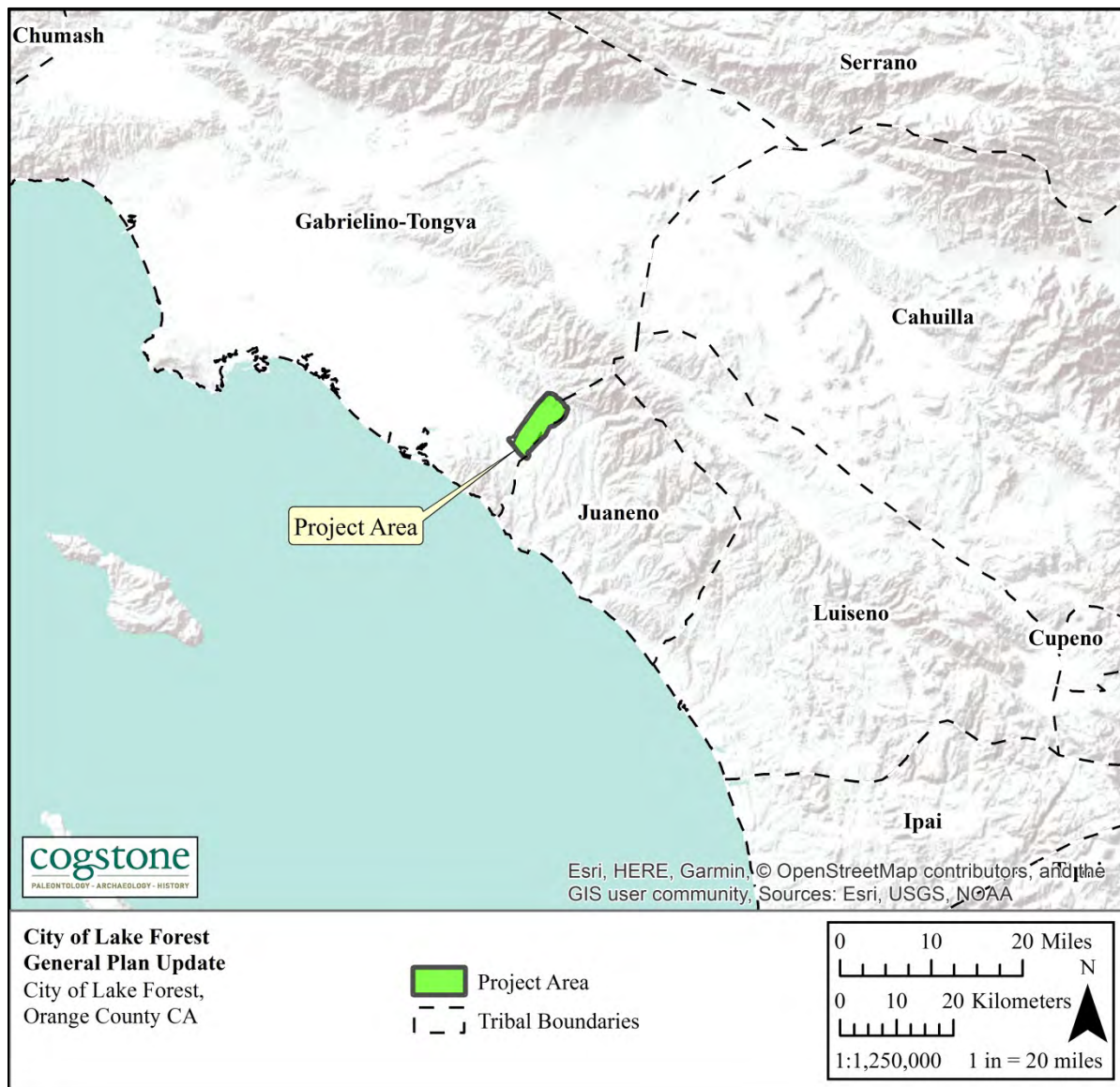


Figure 5. Ethnographic Tribal Boundaries.

The principal game animals were deer, rabbit, jackrabbit, woodrat, mice, ground squirrels, antelope, quail, dove, ducks and other birds. Most predators were avoided as food, as were tree squirrels and most reptiles. Trout and other fish were caught in the streams, while salmon were available when they ran in the larger creeks. Marine foods were extensively utilized. Sea mammals, fish and crustaceans were hunted and gathered from both the shoreline and the open ocean, using reed and dugout canoes. Shellfish were the most common resource, including abalone, turban, mussels, clams, scallops, bubble shells, and others (Bean and Smith 1978:538-540).

Acjachemen

The Acjachemen (Juaneño) speak a language that is part of the Takic language family also. Their traditional tribal territory was situated partly in northern San Diego County and partly in southern Orange County (Figure 5). The boundaries were Las Pulgas Creek (south), Aliso Creek (north), the Pacific Ocean (west) and the Santa Ana Mountains (east). Villages were mostly along San Juan Creek, Aliso Creek, Trabuco Creek and San Mateo Creek (O'Neil and Evans 1980).

In prehistory, the Acjachemen had a patrilineal society and lived in groups with other relatives. These groups had established claims to places including the sites of their villages and resource areas. Marriages were usually arranged from outside villages establishing a social network of related peoples in the region. There was a well-developed political system including a hereditary chief. Religion was an important aspect of their society. Religious ceremonies included rites of passage at puberty and mourning rituals (Kroeber 1925:636-647).

Houses were typically conical in shape and thatched with locally available plant materials. Work areas were often shaded by rectangular brush-covered roofs (ramada). Each village had a ceremonial structure in the center enclosed by a circular fence where all religious activities were performed (Bean and Shippek 1978:553).

Women are known to have been the primary gatherers of plants foods, but also gathered shellfish and trapped small game animals. Men hunted large game, most small game, fished, and assisted with plant food gathering, especially of acorns. Adults were actively involved in making tools including nets, arrows, bows, traps, food preparation items, pottery and ornaments. Tribal elders had important political and religious responsibilities and were involved in education of younger members (Bean and Shippek 1978:555).

PREHISTORIC SETTING

Approaches to prehistoric frameworks have changed over the years from being based on material attributes to radiocarbon chronologies to association with cultural traditions. Recently the fact that generalized terminology is suppressing the identification of cultural, spatial and temporal

variation and the movement of peoples throughout space and time was noted. These factors are critical to understanding adaptation and change (Sutton and Gardner 2010:1-2; Table 3).

The older Encinitas Cultural Tradition characteristics are abundant metates and manos, crudely made core and flake tools, bone tools, shell ornaments, very few projectile points with subsistence focusing on collecting (plants, shellfish, etc.). Faunal remains vary by location but include shellfish, land animals, marine mammals and fish (Sutton and Gardner 2010:7). The Encinitas Tradition pattern in coastal Los Angeles and Orange Counties has is represented by the Topanga Phase (Sutton and Gardner 2010: 8-25; Table 3).

In Topanga Phase I typical characteristics were a few mortars and pestles, abundant core tools (scraper planes, choppers and hammerstones), relatively few large, leaf-shaped projectile points, cogged stones, and early discoidals (Table 3). Secondary inhumation under cairns was the common mortuary practice. In Orange County as many as 600 flexed burials were present at one site and dated 6, 435 radiocarbon years before present (Sutton and Gardner 2010:9, 13).

In Topanga Phase II, flexed burials and secondary burial under cairns continued. Adoption of the mortar and pestle is a marker of this phase. Other typical artifacts include manos, mutates, scrapers, core tools, discoidals, charmstones, cogged stones and an increase in the number of projectile points. In Orange County stabilization of sea level during this time period resulted in increased use of estuary, near shore and local terrestrial food sources (Sutton and Gardner 2010:14-16).

In Topanga Phase III, there was continuing abundance of mutates, manos, and core tools plus increasing amounts of mortars and pestles. More numerous and varied types of projectile points are observed along with the introduction of stone-line earthen ovens. Cooking features such as these were possibly used to bake yucca or agave. Both flexed and extended burials are known (Sutton and Gardner 2010:17).

The younger Cultural Traditions consist of two roughly contemporaneous patterns called Angeles in Los Angeles and northern Orange Counties and Palomar in southern Orange and San Diego Counties. They are marked by a series of changes in the archaeological record, including bow and arrow, new rock art styles, settlement and subsistence systems, and perhaps ideology. The Angeles Phase appears to have been less technologically conservative and more ecologically diverse, with a largely terrestrial focus and greater emphases on hunting and nearshore fishing.

Table 3. Culture Change Chronology

Pattern	Phase	Dates (BP)	Material Traits	Other Traits
Encinitas	Topanga I	8,500 to 5,000	Abundant manos and metates, many core tools and scrapers, few but large points, charmstones, cogged stones, early discoidals, faunal remains rare	Shellfish and hunting important, secondary burials under metate cairns (some with long bones only), some extended inhumations, no cremations
	Topanga II	5,000 to 3,500	Abundant but decreasing manos and metates, adoption of mortars and pestles, smaller points, cogged stones, late discoidals, fewer scraper planes and core tools, some stone balls and charmstones	Shellfish important, addition of acorns, reburial of long bones only, addition of flexed inhumations (some beneath metate cairns), cremations rare
	Topanga III	3,500 to 1,500	Abundant but decreasing manos and metates, increasing use of mortars and pestles, wider variety of small projectile points, stone-lined ovens	Hunting and gathering important, flexed inhumations (some under rock cairns), cremations rare, possible subsistence focus on yucca/agave
Angeles/ Palomar	Angeles III & IV/ San Luis Rey I	1,500 to 500	Appearance of bow and arrow technology, bone awls and stone/shell ornaments; changes in <i>Olivella</i> beads; asphaltum becomes important; reduction in obsidian use; Obsidian Butte obsidian largely replaces Coso	Small game hunting and the gathering of seeds and nuts, especially acorns important. Some small major villages, some focus on coastal resources; larger seasonal villages; flexed primary inhumations but no extended inhumations and an increase in cremations; appearance of obsidian grave goods
	Angeles V & VI/ San Luis Rey II	500 to 150	Ceramic pipes definitely present, addition of Tizon Brown pottery and ceramic figurines, Addition of Euroamerican material culture (e.g., glass beads and metal tools), locally made pottery, metal needle-drilled <i>Olivella</i> beads	Primary pit cremation as the principal mortuary practice, no formal cemeteries, summer villages near water with winter villages in mountains, use of domesticated species from Euroamericans; apparent adoption of Chingichngish religion

Angeles and San Luis Rey Phases demonstrate formation of major village sites along with small satellite villages. Angeles III & IV and San Luis Rey I Phases reflect a number of changes including a decrease in the use of scrapers, occasional mortars with associated manos and pestles, the appearance of bow and arrow technology, bone awls, and stone/shell ornaments. Conspicuous black midden appears also. Primary inhumation was common with primary pit cremation used more through time (Sutton 2010).

Angeles V & VI and San Luis Rey II Phases reflect important changes including appearance of Tizon Brown pottery and ceramic figurines, steatite shaft straighteners, and introduction of Euroamerican materials such as glass beads and metal knives. Other characteristics include an increase in bedrock milling features with mortars and slicks, and the appearance of cupule boulders and rock rings. Primary cremation in pits appears to have been the principal mortuary practice. Locations of cremations were not marked and there were no formal cemeteries (Sutton 2010).

HISTORIC SETTING

SPANISH EXPLORATION

Juan Cabrillo was the first European to sail along the coast of California in 1542 and was followed in 1602 by Sebastian Vizcaino (Bean and Rawls 1993). The Spanish colonization of what was then known as Alta California began with the 1769 overland expedition led by Gaspar de Portolá with a crew of 63 men in order to explore the land between San Diego and Monterey (Fox 1939). Between 1769 and 1822 the Spanish had colonized California and established missions, presidios, and pueblos and documented the people and landscape along the way (McCawley 1996).

Portola and his expedition crossed the area north of Lake Forest in July 1769, naming the perennial creek that empties from the Santa Ana Mountains “*aliso*”, the Spanish word alder; an error on the Spanish identifier, since they were in fact, referring to the sycamore tree, which still grow along the creek. It should be noted that the Juaneño term for the creek was *Seeevenga*, meaning “at the sycamores” (O’Neil 1988). However, historically, alder and sycamore trees were much more prominent, particularly in the riparian and floodplain areas where an oak-woodland habitat existed. During the Mission period, many of the trees along the creek, including alder, oak, sycamore, and other species were cut down for the construction of ships and structures, charcoal production, and other uses (Nasser 2003).

Following the Portolá Expedition, vast tracts of land were granted to the Missions. The seventh of the Franciscan missions in California was Mission San Juan Capistrano, founded in 1776; shortly after Portolá’s visit to the area. The goals of the missions were tri-fold: they helped establish a Spanish presence on the west coast, allowed for a means to Christianize the native peoples, and served to exploit the native population as laborers. The Spanish also hoped each mission would become a town center, whereas, “the pueblo would receive a ground of four square leagues of land... and other property would be parceled out among the Indians”. The missionaries, or padres, would essentially serve as a mayor, or head of the town (Bean 1968:29-30).

MEXICAN PERIOD

In 1821 Mexico won its independence from Spain and worked to lessen the wealth and power held by the missions. The Secularization Act was passed in 1833, appropriating the vast mission lands to the Mexican governor and downgrading the missions’ status to that of parish churches. The governor then redistributed the former mission lands, in the form of land grants, to private owners (Bean and Rawls 1993; Robinson 1948). The lands were typically granted to soldiers who proved their loyalty to the Mexican government once liberated from the Spanish crown.

One these Mexican soldiers was José António Fernando Serrano who was the youngest son of Francisco Serrano, former Alcalde (mayor) of the Pueblo of Los Angeles (Fox 1939). José António Fernando Serrano was granted the 10,688 acre Rancho Canada De Los Alisos, or “glen of the alders” by Governor Juan Bautista Alvarado in 1842. The grant was enlarged in 1846 by a second grant by Pio Pico in 1846 (Robinson 1948). The two combined grants that made the rancho closely mirror the shape of present day City of Lake Forest (Figure 6). The boundaries of the land grant were El Camino Real to the west, Aliso Creek and Rancho Trabuco to the south, Santiago Road and the Santa Ana Foothills to the east, and Rancho San Juan and Lomas Santiago to the north.

Rancho Canada de Los Alisos, like the other ranchos in what would become Orange County was centered on cattle husbandry and was a self-sustaining operation at its conception (Irons 1976). Cattle dominated and transformed the landscape. As the hide and tallow industry grew, and rancheros began trading their raw goods for manufactured good that came by the way of ship in the Bay (Bahía) of San Juan Capistrano, what is now present day Dana Point. Steer hides and tallow were traded for manufactured goods (hides-harnesses, shoes, saddles, door hinges, tallow-candles, horns-buttons) often made from, in many cases, from the same hide the rancheros were trading. The trade in cow hides was so ubiquitous that a steer hide, dried and folded in half (worth between one-and-a-half to two-and-a-half dollars) was referred to a “California bank note”, or a “leather dollar”, or “one buck”, hence the popular American slang term (Dana 1840). The area was long known as “El Toro” after the steers who roamed Canada de Los Alisos, whose loud, bellowing sounds could be heard from great distances (Irons 1976).

José Serrano used the local Native American population as well as the mestizo (Spanish and Native) population to build, plant, plow, and tend to the livestock of the rancho, resembling the feudal system (Osterman 1992). In addition to cattle, Serrano bred Mustangs and sheep, he also grew grain, corn, watermelons, and grapes. José Serrano acted as the *Juez de Campo*, or judge of the fields, an official role that was tasked with settling disputes between rancheros over livestock ownership as well as presiding over (Irons 1976).

AMERICAN PERIOD

Following the cession of California to the United States after the Mexican-American War, a claim for the Rancho was filed with the Public Land Commission in 1852 as required by the Land Act of 1851, and the grant was eventually patented to Serrano in 1871 after much litigation (Carpenter 2003).

After the cession of California to the United States, a stagecoach route passed through the El Toro as early as the late 1850s and a stagecoach stop was established just south of El Toro (Fox

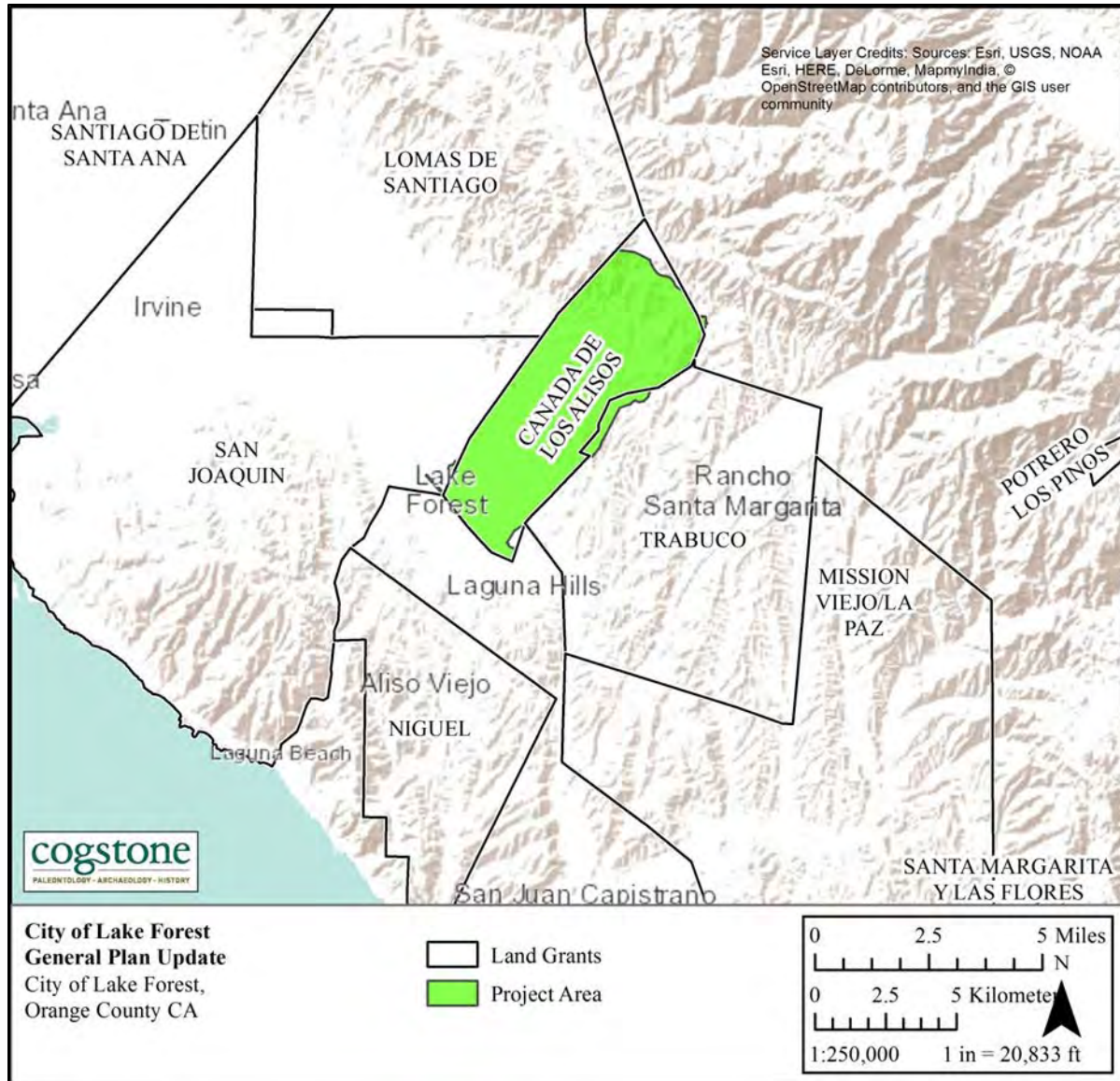


Figure 6. Mexican Land Grants.

1979). Stagecoaches primarily carried mail, but carried passengers as well. The El Toro stop became a popular holdover for passengers traveling to the coast via Laguna Canyon.

A series of droughts affected the area from 1863 until 1883 causing the death of Serrano’s herds as well as the herds of the surrounding ranchos (Fox 1939). Serrano borrowed money at outrageous interest rates, using his land as collateral. Serrano eventually went bankrupt and was forced to mortgage and ultimately foreclose the ranch to J.S. Slauson, a Los Angeles banker. Losing control of the Rancho Canada de Los Alisos, Serrano and his family were evicted from their land (Irons 1976). Serrano purchased U.S. government claims just north of their former

rancho near Cooks Corner at the intersection of El Toro, Santiago Canyon, and Live Oak Canyon where some of his descendants still live (Osterman 1992).

Slauson subdivided the land into ten parcels and leased a portion of the rancho lands to Juan Gless and his sons who raised sheep during the drought. When the drought subsided, more families settled into the Saddleback Valley. Settlers raised cattle and sheep, planted vineyards and fruit trees. By 1886 the majority of the Saddleback Valley was planted in grapes, until plant disease called the “Anaheim Disease” decimated the vineyards. Orange and walnuts trees soon replaced the failed vineyards (Irons 1976).

By the time Bostonian Dwight Whiting purchased 10,000 acres of the former Rancho de Los Alisos in 1884, the area was already a stagecoach stop that connected San Diego and Los Angeles, with later diversions to Santa Ana and Laguna Beach (Figure 7). Whiting intended to establish a new town inhabited by English gentlemen farmers. Whiting was able bring the San Bernardino and San Diego Railway Co. through his land in 1887, thus founding the town of Aliso City (Irons 1976). The railroad “boom” brought an influx of people into southern California and numerous cities were proposed. On paper, many of these cities were absorbed by larger ones, while most, like Aliso City, remained small towns (Osterman 1992).

The young Aliso City was laid out just north of the railroad tracks, and some of those original streets remain on the map today. Front, Second, and Third Streets run parallel to the railroad tracks, while Orange, Olive, and Cherry Street run parallel to El Toro Road. At the time, El Toro Road was originally Los Alisos Avenue and present day Los Alisos Boulevard was formally Lemon Avenue (Osterman 1992). The “boom” never attached the hordes of people to Aliso City that its founders had hoped for and the name Aliso City was too similar to a nearby place, so the local residents of the area held a meeting in a freight room of the railroad depot and voted to permanently rename their small town to El Toro (Osterman 1992).

Determined to attract “gentlemen farmers” of English heritage, Whiting used his vast land holding to experiment on a number of agricultural ventures to attract the second and third born English sons who could not inherit land, but could use their family’s wealth to sponsor careers in farming (Osterman 1992). Whiting experimented with multiple crops including fruit trees like apricots, peaches, plums, prunes, and olives; all with little success. Another unsuccessful, but lasting contribution to the area was Whiting’s investment in the Eucalyptus craze that struck the lumber starved southern California. Whiting established a 400 acre of dense Eucalyptus tree forest located between present day Ridge Route, Jeronimo, Lake Forest and Serrano Roads. However, when it was discovered that the grain twisted and cracked as it dried, rendering it worthless for construction and furnishings the hopeful cash crop busted. While the failed project was later referred to as “Whiting’s Folly”, the Eucalyptus is now a ubiquitous characteristic of

the present day Lake Forest, the city's name originating from Whiting's man-made forest (Irons 1976).

In the 1890s, the Saddleback Valley was dry framed by tenant farming, in which farmers did not own their land, but rented it from their landlords, also known as sharecropping (Osterman 1992). Dry farming crops included barley (the major grain crop), and hay for the livestock. Black-eyed beans were also dry farmed and, while more difficult to farm, turned a higher profit (Osterman 1992). It wasn't until the 1920s that citrus came to the Saddleback Valley. Charles Bennet, an early pioneer attracted to the former Aliso City, pioneered the citrus industry in El Toro by drilling deeper wells (Osterman 1992). Despite the success in citrus in El Toro, the City remained small, serving as the Saddleback Valley's shipping and social center (Osterman 1992).

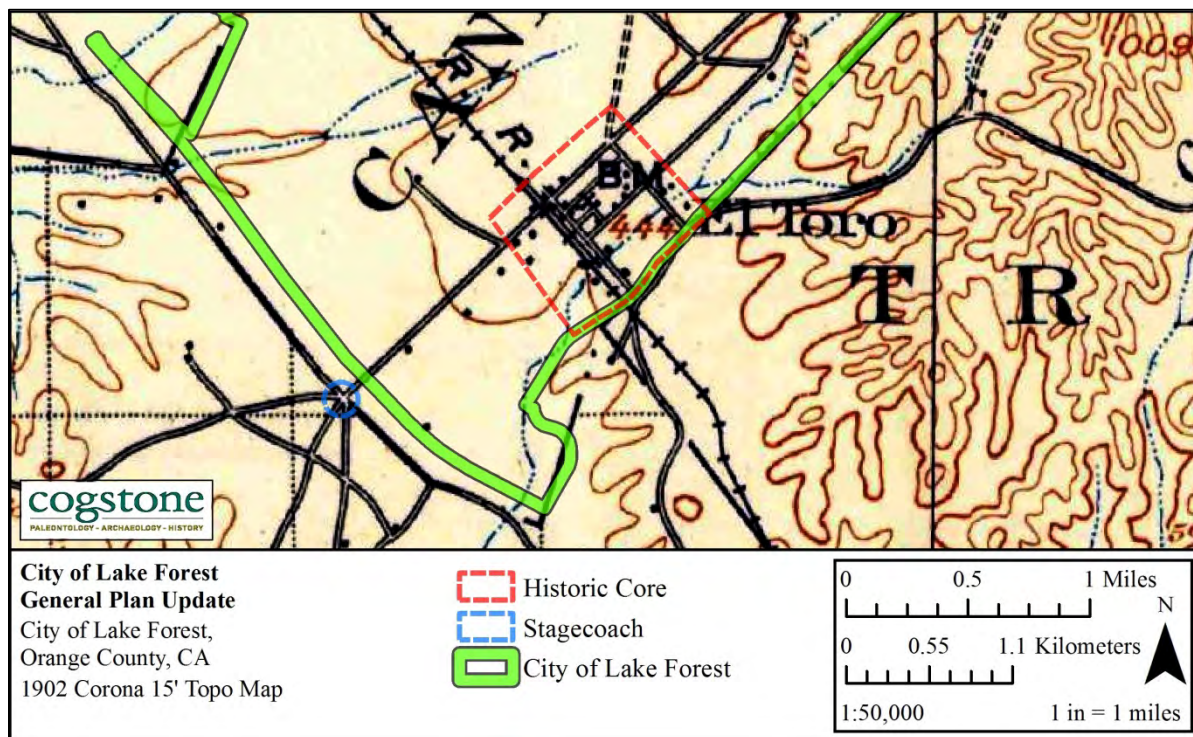


Figure 7. 1902 Corona 15' USGS topographic map showing historic core and stagecoach stop.

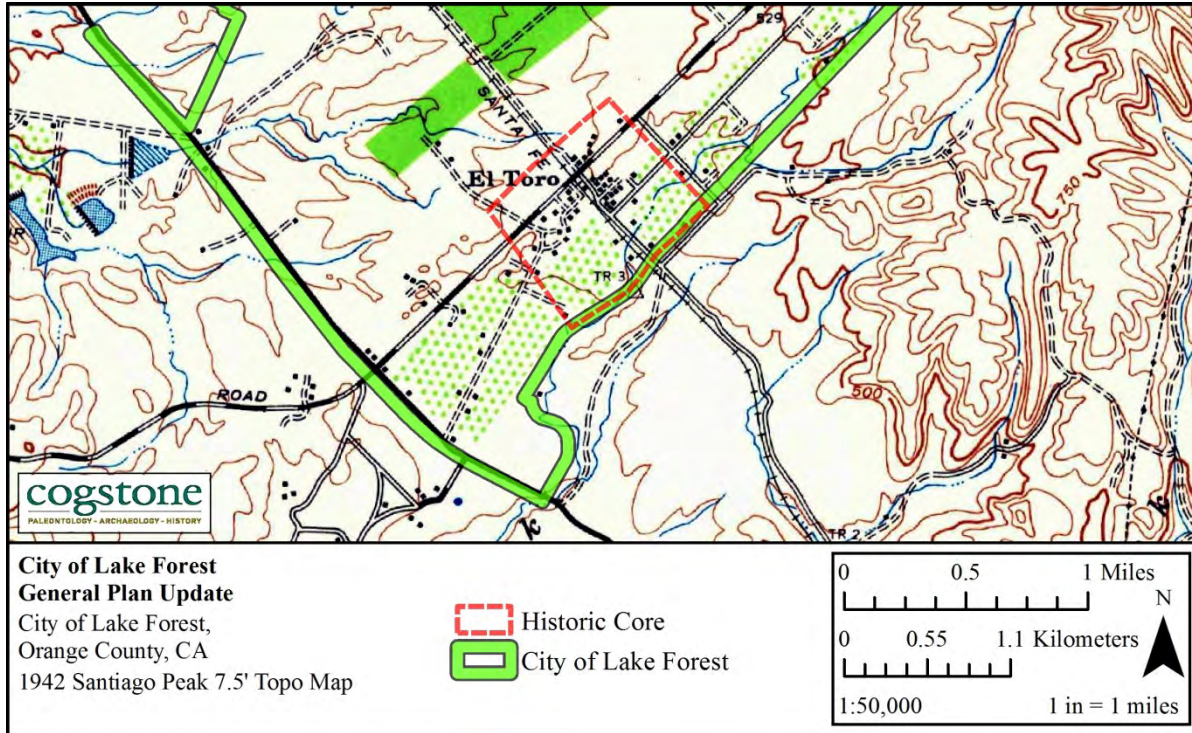


Figure 8. 1942 Santiago Peak 7.5' USGS topographic map showing Historic Core.

MODERN PERIOD

In 1942, El Toro Marine Corps Air Station was established and was designated as a Master Jet Station and after World War II all United States Presidents landed in Air Force One at this base. After World War II the agricultural land was developed into residential, commercial, and industrial areas. In 1999 the Marine Corps Air Station El Toro was decommissioned.

In 1958, Whiting sold the Rancho to V.P. Baker and associates. In 1969, the Bakers sold the property to the Deane Bros. who later incorporated into the Occidental Petroleum, Land Development Division. They started the residential development of the area, executing a master planned community that eventually became the City of Lake Forest. During the 1960s, a steady supply of water brought in by aqueducts from Northern California, as well as from the Colorado River, facilitated the transformation of the Saddleback Valley from an agricultural community to the multi-city, suburban sprawl it is known as today (Osterman 1992). The City of Lake Forest was incorporated in 1991 and is named for the two man-made lakes within the city as well as the man-made Eucalyptus forest.

LITERATURE REVIEW AND RECORD SEARCHES

PALEONTOLOGICAL RECORD AND LITERATURE SEARCHES

A search for paleontological records was completed by the Natural History Museum of Los Angeles County (LACM; McLeod 2018; Appendix B). Published literature, unpublished paleontological reports, and online databases were also searched for fossil records (Appendix C). Databases included the Natural History Museum of Los Angeles County Invertebrate Paleontology (LACMIP 2018), the Paleobiology Database (PBDB 2018), and the University of California Museum of Paleontology (UCMP 2018).

The artificial fill and Holocene sediments do not contain fossil resources due to their age, by nature of their formation, or paleoenvironment. Although the Paleocene Silverado Formation and Santiago Formation, as well as the Pleistocene alluvial deposits have produced fossils within Orange County, there are no records of fossils from these formations from within the City. The rest of the formations have produced fossils from within the City. Formations are discussed from oldest to youngest (Appendix C).

PALEOCENE: SILVERADO FORMATION

At least 25 fossils of marine snails and bivalves have been recovered from the northwestern Santa Ana Mountains in Orange County (Schoellhamer et al. 1981). Sixteen localities were recovered from the Black Star Canyon 7.5' USGS topographic quadrangle and a single locality was recovered from the Orange 7.5' USGS topographic quadrangle. The Eastern Transportation Corridor (ETC) database listed one potential Silverado Formation locality from the El Toro 7.5' USGS topographic quadrangle which produced plant fossils (Appendix C).

PALEOCENE: SANTIAGO FORMATION

At least 100 fossils of marine snails and bivalves have been recovered from this formation in the northwestern Santa Ana Mountains in Orange County. Eleven localities was recovered from the Black Star Canyon 7.5' USGS topographic quadrangle, four localities were recovered from the El Toro 7.5' USGS topographic quadrangle, three localities were recovered from the Orange 7.5' USGS topographic quadrangle, and a single locality was recovered from the Tustin 7.5' USGS topographic quadrangle (Schoellhamer et al. 1981). The Orange County Paleontological Database (OCPC 2018) listed one locality from the Black Star Canyon 7.5' USGS topographic quadrangle which produced a crocodile and plant fossils (Appendix C).

LATE EOCENE TO LATEST EARLY MIOCENE: SESPE FORMATION

At least 25 fossils of terrestrial animals have been recovered from 17 localities in the Sespe Formation in Orange County. Two localities were recovered from the Lower Bowerman Landfill, nine localities were recovered from the Upper Bowerman Landfill, four localities were recovered from the Foothill Transportation Corridor-Oso segment, a locality was recovered from the San Joaquin Hills, and a locality was recovered from the San Joaquin Hills (Whistler and Lander 2003). The OCPC listed one locality from the El Toro 7.5' USGS topographic quadrangle (Appendix C). These localities have produced fossils of canine, weasel, peccary, oreodont, camel, musk deer, opossum, shrew, pika, squirrel, rodent, and iguana (Appendix C).

EARLY MIOCENE: VAQUEROS-SESPE FORMATION

At least 2400 fossils of terrestrial animals and plants have been recovered from 122 localities in the Vaqueros-Sespe Formation in Orange County (OCPC 2018, Whistler and Lander 2003, McLeod 2018). These localities have produced fossils of canine, bear, weasel, rhinoceros, horse, peccary, pig-like artiodactyl, oreodont, camel, deer-like artiodactyl, musk deer, hedgehog, shrew, pika, rabbit, squirrel, rodent, opossum, and reptile (Appendix C).

EARLY MIOCENE: VAQUEROS FORMATION

At least 150 fossils of marine animals have been recovered from 24 localities in the Vaqueros Formation in Orange County (LACMIP 2018, SDNHM 2018, UCMP 2018). These localities have produced fossils of baleen and toothed whales, sea cows, birds, sea turtles, bony fish, sharks and rays, and invertebrates (Appendix C).

MIDDLE MIOCENE: TOPANGA GROUP

At least 375 fossils of marine and terrestrial animals have been recovered from 37 localities in the Topanga Group in Orange County (McLeod 2018, UCMP 2018, OCPC 2018). These localities have produced fossils of pinnipeds, baleen and toothed whales, dugongs, sea cows, desmostylians, proboscideans, rodents, birds, sea turtles, bony fish, sharks, rays, and invertebrates (Appendix C).

LATE MIOCENE: MONTEREY FORMATION

At least 150 fossils of marine animals have been recovered from 31 localities within and near to the City of Lake Forest (McLeod 2018, OCPC 2018, SDNHM 2018, UCMP 2018). These localities have produced fossils of pinnipeds, baleen and toothed whales, dugongs, desmostylians, birds, crocodile, sea turtles, bony fish, sharks and rays, and invertebrates. Numerous species of land plants and algae have also been recovered from these localities (Appendix C).

LATE MIOCENE: PUENTE FORMATION

At least 275 fossils of marine animals have been recovered from 32 localities from the La Vida Member (OCPC 2018). These localities have produced fossils of sea lions, desmostylians, bony fish, sharks and rays, and invertebrates. Numerous species of land plants and algae have also been recovered from these localities. A fossil of a herring have been recovered a locality in the Soquel Member (OCPC 2018). Two fossils of bony fish have been recovered two localities in undifferentiated Puente Formation (OCPC 2018, Appendix C).

LATE MIOCENE TO EARLY PLIOCENE: CAPISTRANO FORMATION

At least 375 fossils of marine and terrestrial animals have been recovered from 33 localities from the Oso Sand of the Capistrano Formation (OCPC 2018, SDNHM 2018). These localities have produced fossils of pinnipeds, rodents, camels, baleen and toothed whales, horses, rhinoceros, mastodon, dugong, sea cows, desmostylians, birds, sea turtles, tortoise, bony fish, sharks and rays, and invertebrates. Numerous species of land plants and algae have also been recovered from these localities (Appendix C).

At least 100 fossils of marine and terrestrial animals have been recovered from 30 localities from undifferentiated deposits of Capistrano Formation (McLeod 2018, UCMP 2018). These localities have produced fossils of pinnipeds, camels, baleen and toothed whales, horses, birds, sea turtles, tortoise, crocodile, bony fish, sharks and rays, and invertebrates (Appendix C).

PLIOCENE: NIGUEL FORMATION

An unknown number of fossils of marine and terrestrial animals have been recovered from four localities from undifferentiated deposits of Niguel Formation (McLeod 2018). These localities have produced fossils of camels, baleen whales, dugongs, and bony fish (Appendix C).

PLIOCENE TO PLEISTOCENE: NIGUEL FORMATION- QUATERNARY TERRACE

A fossil of a sea lion and a camel have been recovered two localities in Niguel Formation – Quaternary terrace deposits (McLeod 2018; Appendix C).

PLEISTOCENE DEPOSITS

At least 225 fossils of terrestrial animals have been recovered from 29 localities from Pleistocene deposits outside of the City of Lake Forest (McLeod 2018, OCPC 2018, Jefferson 1991b). These localities have produced fossils of ground sloth, short faced bear, American lion, mammoth, mastodon, horses, ancient bison, shrews, reptiles, and amphibians (Appendix C). The most significant of these localities is Costeau Pit located in the City of Laguna Hills, just south of Lake Forest which has additionally produced coyote, dire wolf, saber-toothed cat, camel, llama, diminutive pronghorn, long-horned bison, rabbits, rodents, and birds.

The following units include Pleistocene sediments:

- Quaternary very old axial channel deposits (Qvoa, Qvoa₂, Qvoa₃); early to middle

Pleistocene

- Quaternary very old alluvial fan deposit (Qvof); early to middle Pleistocene
- Quaternary young axial channel deposit (Qya); late Pleistocene to Holocene
- Quaternary young alluvial fan deposit (Qyf); late Pleistocene to Holocene
- Quaternary young landslide deposit (Qyls); late Pleistocene to Holocene

HOLOCENE DEPOSITS

No fossils are known from any of the Holocene deposits as they are all too young to contain fossils. The following units are Holocene in age:

- Very young colluvial deposits (Qc); late Holocene
- Very young slope wash deposits (Qsw); late Holocene
- Very young landslide deposits (Qls); late Holocene
- Artificial fill; modern

CALIFORNIA HISTORIC RESOURCES INVENTORY SYSTEM

A search of the California Historic Resources Inventory System (CHRIS) at the South Central Coastal Information Center (SCCIC) located on the campus of California State University, Fullerton (CSUF) was conducted on March 28, 2018 by Cogstone archaeologist Megan Wilson. The records search covered the entire 10,748.50 acres of the City of Lake Forest and covered portions of the El Toro, San Juan Capistrano, and Santiago Peak USGS 7.5 topographic maps. Results of the record search indicate that 167 previous cultural resources studies have been completed within the boundaries of the City of Lake Forest (Appendix D).

The records search determined that 138 previously recorded cultural resources are located within the City boundaries (Table 4). Of these 138 resources, one resource includes a portion of the Upper Aliso Creek Archaeological District, 87 prehistoric archaeological sites, 36 prehistoric archaeological isolates, five multicomponent sites, one historic archaeological site, two historic isolates, six historic resources, one historic district listed (Heritage Hill Historical Park) on the NRHP and CHL.

P- 30-156547. This site consists of a historic district, the Heritage Hill Historical Park located at 25151 Serrano Road, Lake Forest CA 92630-2534. This site is registered on the National Register of Historic Places (NR No. 7600050), California Historical Landmark (No. 199), and is registered as an Orange County Historical Landmark. The Site consists of the original location of the Serrano Adobe (1868) as well as the relocated Bennet Ranch House (1908), the El Toro Grammar School (1890), and the St. George's Episcopal Mission (1891).

Table 4. Previously Recorded Cultural Resources within the City of Lake Forest

Primary No.	Other Identifier	Site Type	Site Description	Year Recorded	Maps
P-30-000016	CA-ORA-000016	Prehistoric Archaeological Site	Lithic scatter	1949	San Juan Capistrano
P-30-000037	CA-ORA-000037	Prehistoric Archaeological Site	Unidentified	1949	El Toro
P-30-000038	CA-ORA-000038	Multicomponent Site	Multicomponent	1949	El Toro
P-30-000039	CA-ORA-000039	Prehistoric Archaeological Site	Lithic scatter	1949, 1976, 1978	El Toro
P-30-000040	CA-ORA-000040	Prehistoric Archaeological Site	Lithic scatter	1949	El Toro
P-30-000042	CA-ORA-000042	Prehistoric Archaeological Site	Lithic scatter	1949, 1980	El Toro
P-30-000176	CA-ORA-000176	Prehistoric Archaeological Site	Lithic scatter	1966, 1991	El Toro
P-30-000438	CA-ORA-000438	Prehistoric Archaeological Site	Lithic scatter	1973, 1995, 1997, 2001	El Toro
P-30-000439	CA-ORA-000439	Prehistoric Archaeological Site	Lithic scatter	1973, 2001	El Toro, Santiago Peak
P-30-000440	CA-ORA-000440	Prehistoric Archaeological Site	Lithic scatter	1973, 2001	El Toro
P-30-000441	CA-ORA-000441	Prehistoric Archaeological Site	Lithic scatter, cairn	1973, 2001, 2007, 2014	El Toro
P-30-000442	CA-ORA-000442	Prehistoric Archaeological Site	Lithic scatter	1973, 2007	El Toro
P-30-000443	CA-ORA-000443	Prehistoric Archaeological Site	Lithic scatter	1973, 2001, 2007	El Toro
P-30-000444	CA-ORA-000444	Prehistoric Archaeological Site	Lithic scatter	1974, 1994, 20017	El Toro
P-30-000445	CA-ORA-000445	Prehistoric Archaeological Site	Lithic scatter	1973, 2001, 2007	El Toro
P-30-000446	CA-ORA-000446	Prehistoric Archaeological Site	Lithic scatter	1973, 2001, 2007	El Toro
P-30-000447	CA-ORA-000447	Prehistoric Archaeological Site	Lithic scatter	1973, 1978, 2007	El Toro
P-30-000448	CA-ORA-000448/H	Multicomponent Site	Lithic scatter, foundations	1974, 2001	El Toro
P-30-000449	CA-ORA-000449	Prehistoric Archaeological Site	Lithic scatter	1974, 2001	El Toro, Santiago Peak
P-30-000450	CA-ORA-450	Prehistoric Archaeological Site	Lithic scatter	1974, 2001	El Toro, Santiago Peak
P-30-000451	CA-ORA-000451	Prehistoric Archaeological Site	Lithic scatter	1973, 1982	Santiago Peak
P-30-000452	CA-ORA-000452	Prehistoric Archaeological Site	Lithic scatter, projectile points	1974, 2001	El Toro
P-30-000453	CA-ORA-000453	Multicomponent Site	Rockshelter, lithic scatter, historic carving "1887/4"	1974, 2001	El Toro

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Primary No.	Other Identifier	Site Type	Site Description	Year Recorded	Maps
P-30-000454	CA-ORA-000454	Prehistoric Archaeological Site	Lithic scatter	1974, 2001	El Toro
P-30-000455	CA-ORA-000455	Prehistoric Archaeological Site	Lithic scatter	1974, 2001	El Toro
P-30-000456	CA-ORA-000456	Prehistoric Archaeological Site	Lithic scatter	1974, 1978, 2001	El Toro
P-30-000460	CA-ORA-000460	Prehistoric Archaeological Site	Lithic scatter	1974	El Toro
P-30-000489	CA-ORA-000489	Prehistoric Archaeological Site	Lithic scatter	1973, 1980, 2004	El Toro
P-30-000490	CA-ORA-000490	Prehistoric Archaeological Site	Lithic scatter	1973, 1982	El Toro
P-30-000491	CA-ORA-000491	Prehistoric Archaeological Site	Lithic scatter	1973, 1980, 1980	El Toro
P-30-000510	CA-ORA-000510	Prehistoric Archaeological Site	Lithic scatter	1975, 1994	El Toro
P-30-000514	CA-ORA-000514	Prehistoric Archaeological Site	Habitation site, discoidal	1976, 1977	El Toro
P-30-000536	CA-ORA-000536	Prehistoric Archaeological Site	Lithic scatter	1976	El Toro
P-30-000544	CA-ORA-000544	Prehistoric Archaeological Site	Lithic scatter	1976, 1977	El Toro
P-30-000566	CA-ORA-000566	Prehistoric Archaeological Site	Lithic scatter	1973, 1977	El Toro
P-30-000579	CA-ORA-000579	Prehistoric Archaeological Site	Shell scatter	1975	San Juan Capistrano
P-30-000594	CA-ORA-000594	Prehistoric Archaeological Site	Lithic scatter	1977	El Toro
P-30-000602	CA-ORA-000602	Prehistoric Archaeological Site	Lithic scatter	1976, 2002	El Toro
P-30-000612	CA-ORA-000612/H	Multicomponent Site	Lithic scatter, habitation debris, and historic refuse scatter. Serrano-Whiting Adobe Site	1977	El Toro
P-30-000628	CA-ORA-000628	Prehistoric Archaeological Site	Lithic scatter	1977	El Toro
P-30-000647	CA-ORA-000647	Prehistoric Archaeological Site	Quarry site, lithic tools and scatter	1977, 1986, 1994	El Toro
P-30-000648	CA-ORA-000648	Prehistoric Archaeological Site	Temporary habitation area	1977, 1994	El Toro
P-30-000693	CA-ORA-693	Prehistoric Archaeological Site	Lithic Scatter	1977, 1978	
P-30-000694	CA-ORA-000694	Prehistoric Archaeological Site	Lithic Scatter	1977, 1978	El Toro
P-30-000695	CA-ORA-000695	Prehistoric Archaeological Site	Lithic Scatter	1977, 1978	El Toro
P-30-000696	CA-ORA-000696	Prehistoric Archaeological Site	Habitation area, lithic scatter	1977, 1978	El Toro
P-30-000697	CA-ORA-000697	Prehistoric Archaeological Site	Lithic scatter	1977, 1978	El Toro
P-30-000698	CA-ORA-000698	Prehistoric Archaeological Site	Lithic scatter	1977	El Toro

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Primary No.	Other Identifier	Site Type	Site Description	Year Recorded	Maps
P-30-000699	CA-ORA-000699	Prehistoric Archaeological Site	Lithic scatter	1977, 1978	El Toro
P-30-000739	CA-ORA-000739	Prehistoric Archaeological Site	Lithic scatter	1978	El Toro
P-30-000742	CA-ORA-000742	Prehistoric Archaeological Site	Lithic scatter	1978	El Toro
P-30-000743	CA-ORA-000743	Prehistoric Archaeological Site	Lithic scatter	1978	El Toro
P-30-000741	CA-ORA-000741	Prehistoric Archaeological Site	Lithic scatter	1978	El Toro
P-30-000756	CA-ORA-000756	Prehistoric Archaeological Site	Lithic scatter	1978, 1996	El Toro
P-30-000773	CA-ORA-000773	Prehistoric Archaeological Site	Lithic scatter	1978	El Toro
P-30-000825	CA-ORA-000825	Prehistoric Archaeological Site	Lithic scatter	1979, 1997, 2014	El Toro
P-30-000826	CA-ORA-000826	Prehistoric Archaeological Site	Lithic scatter	1979, 1982, 1997	El Toro
P-30-000827	CA-ORA-000827	Prehistoric Archaeological Site	Lithic scatter	1979, 1995	El Toro
P-30-000828	CA-ORA-000828	Prehistoric Archaeological Site	Lithic scatter	1979, 1980	El Toro
P-30-000905	CA-ORA-000905	Prehistoric Archaeological Site	Lithic scatter	1980, 1982	El Toro
P-30-000949	CA-ORA-000949	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000950	CA-ORA-000950	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000951	CA-ORA-000951	Prehistoric Archaeological Site	Rockshelter, habitation area, midden, lithic scatter, hearth	1980	El Toro
P-30-000952	CA-ORA-000952	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000953	CA-ORA-000953	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000954	CA-ORA-000954	Prehistoric Archaeological Site	Lithic scatter, shell scatter	1980	El Toro
P-30-000955	CA-ORA-000955	Prehistoric Archaeological Site	Bedrock milling features	1980	El Toro
P-30-000957	CA-ORA-000957	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000958	CA-ORA-000958	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000959	CA-ORA-000959	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000960	CA-ORA-000960	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-001004	CA-ORA-001004	Prehistoric Archaeological Site	Lithic scatter	1981	El Toro
P-30-001057	CA-ORA-001057	Prehistoric Archaeological Site	Rock cairn, lithic scatter	1984	El Toro

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Primary No.	Other Identifier	Site Type	Site Description	Year Recorded	Maps
P-30-001058	CA-ORA-001058	Prehistoric Archaeological Site	Rock cairn, lithic scatter	1984	El Toro
P-30-001063	CA-ORA-001063	Prehistoric Archaeological Site	Projectile point, lithic scatter	1984, 1994	El Toro
P-30-001064	CA-ORA-001064	Prehistoric Archaeological Site	Lithic scatter, hearth	1984, 1994	El Toro
P-30-001066	CA-ORA-001066	Prehistoric Archaeological Site	Lithic scatter, hearth	1984, 1994	El Toro
P-30-001097	CA-ORA-001097/H	Multicomponent Site	Lithic scatter, ruins of the Henry Serrano Adobe, and historic refuse deposit	1985	Santiago Peak
P-30-001100	CA-ORA-001100	Prehistoric Archaeological Site	Lithic scatter	1985, 1991	El Toro
P-30-001145	CA-ORA-001145	Prehistoric Archaeological Site	Lithic scatter	1988	El Toro
P-30-001146	CA-ORA-001146	Prehistoric Archaeological Site	Lithic scatter, hearth	1988	El Toro
P-30-001147	CA-ORA-001147	Prehistoric Archaeological Site	Quarry, lithic scatter	1988	El Toro
P-30-001148	CA-ORA-001148	Prehistoric Archaeological Site	Lithic scatter	1988	El Toro
P-30-001149	CA-ORA-001149	Prehistoric Archaeological Site	Lithic scatter, hearth	1988	El Toro
P-30-001150	CA-ORA-001150	Prehistoric Archaeological Site	Lithic scatter, hearth	1988	El Toro
P-30-001171	CA-ORA-001171	Prehistoric Archaeological Site	Lithic scatter	1988, 1994	El Toro
P-30-001242	CA-ORA-001242	Prehistoric Archaeological Site	Lithic scatter	1990	El Toro
P-30-001345	CA-ORA-001345	Prehistoric Archaeological Site	23 hearths	1992	El Toro
P-30-001362	CA-ORA-001362	Prehistoric Archaeological Site	Lithic scatter	1994	El Toro
P-30-001373	CA-ORA-001373	Prehistoric Archaeological Site	Lithic scatter	1994	El Toro
P-30-001430	CA-ORA-001430	Prehistoric Archaeological Site	Lithic scatter	1995	El Toro
P-30-001496		Historic Resource	Concrete and metal troughs, holding pen	1980	El Toro
P-30-001497		Historic Resource	Water tower	1980	El Toro
P-30-001498		Historic Resource	Metal shed	1998	El Toro
P-30-001500	CA-ORA-001500H	Historic Resource	Wood water tank	1998	El Toro
P-30-001501	CA-ORA-001501H	Historic Archaeological Site	Collapsed shed and structural debris	1998	El Toro
P-30-001728		Archaeological District	Upper Aliso Creek Archaeological District	1978, 2001	El Toro, Santiago Peak
P-30-001741	CA-ORA-001741	Prehistoric Archaeological Site	Lithic scatter	1986	El Toro

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Primary No.	Other Identifier	Site Type	Site Description	Year Recorded	Maps
P-30-100186	N/A	Prehistoric Isolate	Utilized chert flake	1977	El Toro
P-30-100187	N/A	Prehistoric Isolate	Scraper-core fragment and flake	1977	El Toro
P-30-100188	N/A	Prehistoric Isolate	Cobble and debitage	1977	El Toro
P-30-100219	N/A	Prehistoric Isolate	Granitic mano	2014	El Toro
P-30-100220	N/A	Prehistoric Isolate	Chert flake	2014	El Toro
P-30-100276	N/A	Prehistoric Isolate	Core tool	1980	El Toro
P-30-100278	N/A	Prehistoric Isolate	Hammerstone	1980	El Toro
P-30-100279	N/A	Prehistoric Isolate	Mano	1980	El Toro
P-30-100280	N/A	Prehistoric Isolate	Core tool	1980	El Toro
P-30-100281	N/A	Prehistoric Isolate	Flake tool	1980	El Toro
P-30-100282	N/A	Prehistoric Isolate	Mano	1980	El Toro
P-30-100283	N/A	Prehistoric Isolate	Core tool	1980	El Toro
P-30-100285	N/A	Prehistoric Isolate	Flake tool	1980	El Toro
P-30-100288	N/A	Prehistoric Isolate	Flake tool	1980	El Toro
P-30-100289	N/A	Prehistoric Isolate	Metate	1980	El Toro
P-30-100290	N/A	Prehistoric Isolate	Core tool	1980	El Toro
P-30-100294	N/A	Prehistoric Isolate	Core tool	1980	El Toro
P-30-100295	N/A	Prehistoric Isolate	Core	1980	El Toro
P-30-100296	N/A	Prehistoric Isolate	Flake tool	1980	El Toro
P-30-100305	N/A	Prehistoric Isolate	Utilized flake	1980	El Toro
P-30-100309	N/A	Historic Isolate	Concrete foundation/slab	1984	El Toro
P-30-100310	N/A	Prehistoric Isolate	Chert flake	1998	El Toro
P-30-100311	N/A	Prehistoric Isolate	Chopper/scraper	1984	El Toro
P-30-100312	N/A	Historic Isolate	Concrete trough	1980	El Toro
P-30-100313	N/A	Prehistoric Isolate	Quartzite core	1993	El Toro
P-30-100371	N/A	Prehistoric Isolate	Abalone shell fragment	2006	El Toro

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Primary No.	Other Identifier	Site Type	Site Description	Year Recorded	Maps
P-30-100438	N/A	Prehistoric Isolate	Chert scraper	1984	El Toro
P-30-100439	N/A	Prehistoric Isolate	Mano fragment	1984	El Toro
P-30-100444	N/A	Prehistoric Isolate	Quartzite chopper	1989	El Toro
P-30-100445	N/A	Prehistoric Isolate	Chert flake	1991	El Toro
P-30-100446	N/A	Prehistoric Isolate	Metate fragment	1991	El Toro
P-30-100447	N/A	Prehistoric Isolate	Core	1991	El Toro
P-30-100448	N/A	Prehistoric Isolate	Mortar and core	1991	El Toro
P-30-100449	N/A	Prehistoric Isolate	Chert flake	1991	El Toro
P-30-100453	N/A	Prehistoric Isolate	Flake	1994	El Toro
P-30-100463	N/A	Prehistoric Isolate	2 utilized chert flakes	1991	El Toro
P-30-100464	N/A	Prehistoric Isolate	Chert flake	1991	El Toro
P-30-100491	N/A	Prehistoric Isolate	Mano fragment	2011	El Toro
P-30-156547	NR. No 76000505, CHL No. 199, HRI No. 035907, OC Historical Landmark	Historic Resource	Heritage Hill Historic Site; Serrano Adobe, :1856-1860, Bennet House (1908), El Toro School (1890), St. George's Church (1891).	1935, 1959, 1976, 1980	El Toro
P-30-176663	N/A	Historic Resource	Railroad, Aitchison-Topeka-Santa Fe	2002, 2002, 2007, 2012, 2016	El Toro, San Juan Capistrano

OTHER SOURCES

In addition to the SCCIC records search, a variety of sources were consulted in February and May 2018 to obtain information regarding the cultural context of the City of Lake Forest (Table 5). Sources included the National Register of Historic Places (NRHP) and the California Register of Historic Resources (CRHR) which includes the California Historical Resources Inventory (CHRI), California Historical Landmarks (CHL), and California Points of Historical Interest (CPHI). The Bureau of Land Management (BLM) General Land Office records were also searched (Table 6).

Table 5. Additional Sources Consulted

Source	Results
National Register of Historic Places (NRHP/NR; 1979-2002 & supplements)	Positive: one listing, the Serrano Adobe, NR. 76000505
Historic USGS Topographic (Topo) Maps	Positive: The earliest USGS Topo map for the area is the 1901 30' Southern California Sheet no. 1 that shows the Canada de Ls Alisos Rancho the then Southern California Railroad, El Toro Road (then Los Alisos Avenue), El Camino Real, as well as the town of El Toro and the old stagecoach stop can be inferred from this Topo map. No new information can be gleaned from following Topo maps until the 1942 Santiago Peak 7.5' Topo map that shows El Toro Road (still Los Alisos Avenue at that time) as a secondary highway and shows Highway 101 as a primary highway. More development is present at old El Toro's historic downtown core. The area around Aliso Creek is symbolized as agricultural enterprises and likely included citrus orchards. The 1968 El Toro and San Juan Capistrano 7.5' Topo maps show the completed of Interstate 5 at the former location of Highway 101 and the beginning of small housing tracts near the old El Toro downtown area.
Historic US Department of Agriculture Aerial Photographs	The earliest historical aerial for the City dates to 1938 and shows numerous agricultural fields surrounding El Toro Road, then Los Alisos Avenue. Development is concentrated with old El Toro's Historic downtown core and near the area of the Serrano Adobe/Heritage Hill Area. A conspicuous feature on the landscape is Whiting experimental Eucalyptus forest, which can be seen spanning the area north of the railroad to Jeronimo Road, centered along Ridge Route. The landscape dramatically changes in the 1967 aerial with the replacement of Highway 101 with Interstate 5 and the aggressive commercial and residential development south of Jeronimo Road and north of Interstate 5. Development creeps northwest in later years.
California Historical Resources Inventory (CHRI/HRI; 1976-2014)	Positive: one listing, the Serrano Adobe HRI No. 035907
California Historical Landmarks (CHL; 1995 & supplements to 2014)	Positive: one listing, the Serrano Adobe, CHL 199

Source	Results
California Points of Historical Interest (CPHI; 1992 to 2014)	Negative
Orange County Historical Sites	Positive: one listing, Heritage Hill Historical Park
Mills Act Property Contract Program	Negative
Historic Bridges	Positive: 55C0212, Ridge Route Drive, Union Pacific:1967
Bureau of Land Management (BLM) General Land Office Records (GLO)	Positive: See Table 6
Local Historical Society, Saddleback Valley Historical Society (SVHS)	Positive: 3572 Prothero, Lake Forest. "Prothero House": 1920 23512 El Toro Rd, Lake Forest, CA 92630, Big Shots Pool Hall and El Toro Meat Market, original location of the El Toro General Store (1890s) (Figure 9).

Table 6. BLM General Land Office records.

USGS 7.5 Topographic Quad(s)	Township	Range	Section(s)	Year, Name	
El Toro	5S	7W	29,	1866, Southern Pacific Railroad; 1871, Jose Serrano; 1878, Samuel Shrewsbury	
			30, 31,	1871, Jose Serrano;	
			32	18591, Joaquin Serrano	
	6S	7W	8W	36	1871, Jose Serrano
			7W	07, 08, 18	1866, Juan Forster
		8W	01	1871, Jose Serrano; 1868 Theodocio Yorba	
			13, 23, 24	1866, Juan Forster; 1871, Jose Serrano	
			22	1867 Jose Sepulveda; 1871 Jose Serrano	
El Toro and San Juan Capistrano	6W	8W	01, 02, 10, 11, 12, 14, 15, 16, 21	1871, Jose Serrano	
			26	1866 Juan Forster; 1871, Jose Serrano; 1875 & 1666, George Y. Barry; 1892 Charles M. Salter	
			27	1871, Jose Serrano	
San Juan Capistrano	6W	8W	28	1871, Jose Serrano; 1877, 1882, State of California;	
			34	1871, Jose Serrano; 1883 Hiram H. & Cyrus Rawson, J.E. Bacon	
			35	1871 Jose Serrano	

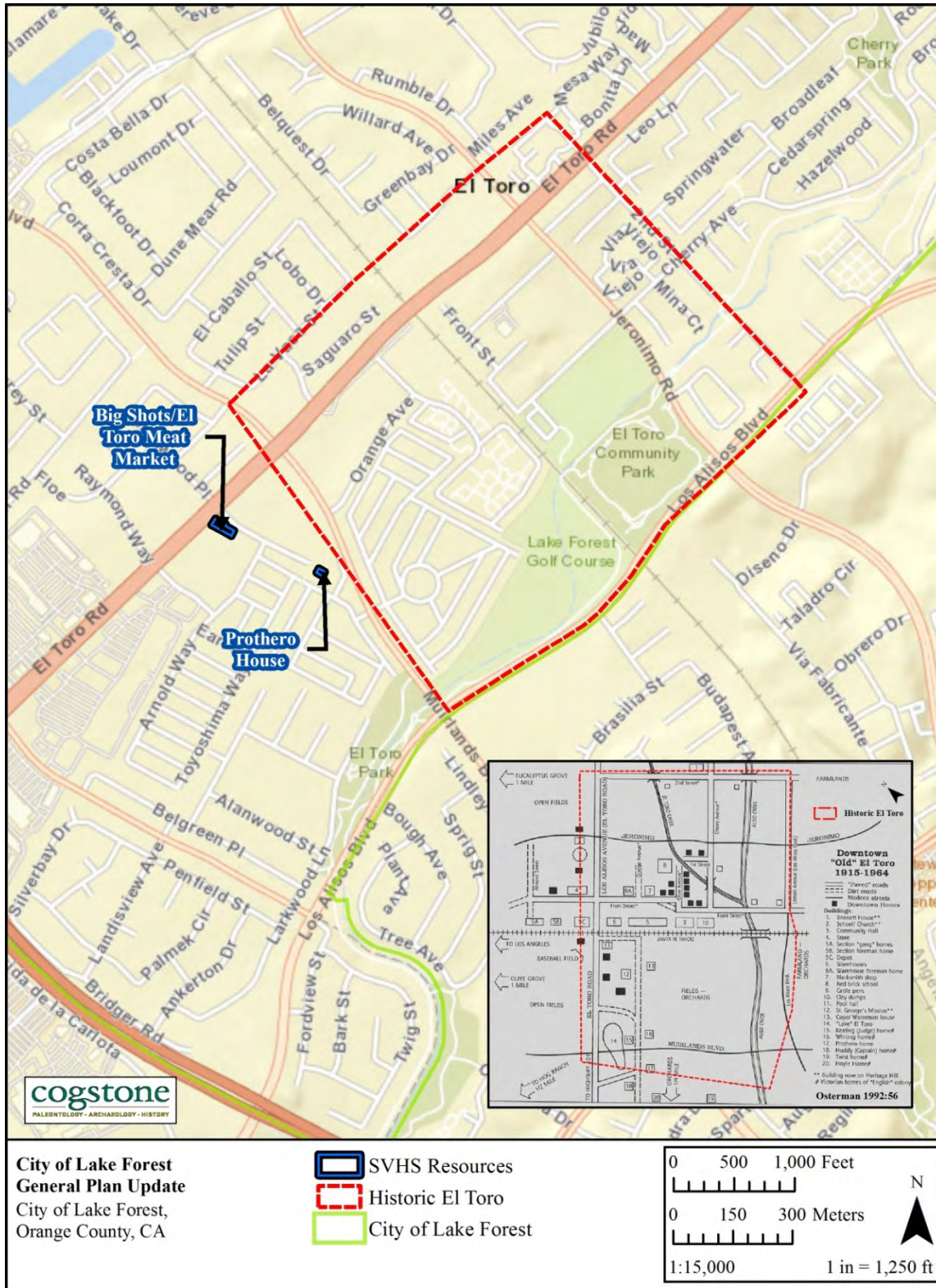


Figure 9. Historic core of “Old El Toro” showing SVHS proposed resources.

NATIVE AMERICAN CONSULTATION

A Sacred Lands File (SLF) search was requested from the Native American Heritage Commission (NAHC) on March 23, 2018, the NAHC replied the same day and indicated that a search of the SFL was completed with positive results in the Santiago Peak USGS Quadrangle and that the Juaneño Band of Mission Indians should be contacted for more information about the site (Appendix F).

The City of Lake Forest conducted Native American consultations under Senate Bill 18 (Chapter 905, Statutes of 2004), also known as SB18, which requires local governments to consult with Tribes prior to making certain planning decisions and requires consultation and notice for a general and specific plan adoption or amendments in order to preserve, or mitigate impacts to, cultural places that may be affected. In addition to SB18 consultation, the City conducted tribal consultations under the provisions of the California Environmental Quality Act (CEQA) (Public Resources Code section 21080.3.1 subdivisions (b), (d) and (e)), also known as AB 52, which requires consulting for projects within the City of Lake Forest's jurisdiction and within the traditional territory of the Tribal Organizations who have previously requested AB52 consultations with the City. Three Tribal Organizations were contacted under AB52 and 13 were contacted under SB18.

The City of Lake Forest sent letters to all 15 Tribal Organizations on June 4, 2018 via certified mail. Follow up emails were sent on June 26, 2018, and follow up phone calls were made on July 18, 2018; however, additional contact attempts were made to the Juaneño Band of Mission Indians Acjachemen Nation. To date, four responses have been received and are summarized below, a log of all tribal consultations and related documents are located in Appendix F.

- On August 31, 2018 Ms. Joyce Perry of the Juaneño Band of Mission Indians Acjachemen Nation, via phone conversation, requested that the City of Lake Forest notify the Tribe regarding any development projects located within the City limits. She informed that the Santa Ana foothills and area around the Aliso Creek watershed are extremely sensitive for tribal cultural resources including ancestor remains.
- On August 31, 2018, Mr. Marcos Guerrero indicated that he believed the UAIC was placed on the City of Forest /Orange County list by accident.
- On June 12, 2018 Mr. Ray Teran indicated that Viejas Tribe has determined that the project has little cultural significance to the Viejas Tribe. He recommended that local Tribes be consulted.
- On July 18, 2018 the receptionist of the Jamul Indian Village indicated that the City of Lake Forest is off their reservation and outside of their traditional tribal territory and defers to local Tribes.

IMPACT ANALYSIS AND MITIGATION

The potential impacts to paleontological and cultural resources within the City of Lake Forest are discussed below. Because the General Plan Update for the City of Lake Forest does not directly address specific future projects, these impacts are described generically.

PALEONTOLOGICAL SENSITIVITY

A multilevel ranking system was developed by professional resource managers within the Bureau of Land Management (BLM) as a practical tool to assess the sensitivity of sediments for fossils. The Potential Fossil Yield Classification (PFYC) system (BLM 2008; Appendix E) has a multi-level scale based on demonstrated yield of fossils. The PFYC system provides additional guidance regarding assessment and management for different fossil yield rankings.

Fossil resources occur in geologic units (e.g., formations or members). The probability for finding significant fossils in a project area can be broadly predicted from previous records of fossils recovered from the geologic units present in and/or adjacent to the study area. The geological setting and the number of known fossil localities help determine the paleontological sensitivity according to PFYC criteria.

Sediments that are close to their basement rock source are typically coarse; those farther from the basement rock source are finer. The chance of fossils being preserved greatly increases once the average size of the sediment particles is reduced to 5 mm in diameter or less. Moreover, fossil preservation also greatly increases after natural burial in rivers, lakes, or oceans. Remains left on the ground surface become weathered by the sun or consumed by scavengers and bacterial activity, usually within 20 years or less. So the sands, silts, and clays of rivers, lakes, and oceans are the most likely sediments to contain fossils.

Using the PFYC system, geologic units are classified according to the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts within the known extent of the geological unit. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher PFYC value; instead, the relative abundance of localities is intended to be the major determinant for the value assignment.

No formations are assigned a very high sensitivity (PFYC 5; Figures 10a and 10b). The late Eocene to early Miocene Vaqueros, Vaqueros-Sespe, and Sespe formations; the late Miocene

Monterey Formation; the late Miocene La Vida Member of the Puente Formation; and the late Miocene to early Pliocene Capistrano Formation are assigned a high sensitivity (PFYC 4).

Formations assigned a moderate but patchy sensitivity (PFYC 3a) include the Paleocene Santiago Formation, the middle Miocene Topanga Group, the Pliocene Niguel Formation, the early to middle Pleistocene very old axial-channel deposits, and the Pleistocene sections of the young axial-channel deposits. No formations are assigned a potential but not determined sensitivity (PFYC 3b).

Formations assigned a low sensitivity (PFYC 2) include the Paleocene Silverado Formation, the late Miocene Puente Formation (exclusive of the La Vida Member), Pleistocene and Holocene alluvial fan and landslide deposits, and all Holocene deposits exclusive of the modern artificial fill. Only the modern artificial fill is assigned a very low sensitivity (PFYC 1) (Table 7).

Table 7. Paleontological Sensitivity Rankings.

Age	Formation	Member	# of localities	Group										PFYC							
				terrestrial mammals	marine mammals	birds	reptiles	amphibians	bony fish	sharks and rats	invertebrates	land plants	algae	1: none	2: low	3b: potential but not determined	3a: moderate but patchy	4: high	5: very high		
modern	artificial fill (Qaf)		0												X						
late Holocene	very young colluvial deposits (Qc)		0													X					
	very young landslide deposits (Qls, Qls?)		0													X					
	very young slope wash deposits (Qsw)		0													X					
Pleistocene	unlisted		29	X		X	X	X										X			
late Pleistocene to Holocene	young axial-channel deposits (Qya)		*															X			
	young alluvial-fan deposits (Qyf)		*													X					
	young landslide deposits (Qyls)		*													X					
early to middle Pleistocene	very old axial-channel deposits (Qvoa, Qvoa ₂ , Qvoa ₃)		*															X			
	very old alluvial-fan deposits (Qvof)		*													X					
Pliocene	Niguel Formation (Tn)		4	X	X				X									X			
late Miocene to early Pliocene	Capistrano Formation	Oso Sand (Tco)	33	X	X	X	X		X	X	X	X	X						X		
		Siltstone Member (Tcs)	*																	X	
		undifferentiated (Tc)	30	X	X	X	X		X	X	X									X	
late Miocene	Puente Formation	La Vida Member (Tplv)	32		X				X	X	X	X	X						X		
		Soquel Member (Tpsq)	1						X							X					
		undifferentiated (Tp)	2						X							X					
	Monterey Formation (Tm)		31		X	X	X		X	X	X	X	X						X		
middle Miocene	Topanga Group (Tt)		37	X	X	X			X	X	X								X		
latest Oligocene to latest early Miocene	Vaqueros Formation (Tv)		24		X	X	X		X	X	X								X		
	Vaqueros-Sespe Formation (Tvs)		122	X			X												X		

Age	Formation	Member	# of localities	Group										PFYC					
				terrestrial mammals	marine mammals	birds	reptiles	amphibians	bony fish	sharks and rats	invertebrates	land plants	algae	1: none	2: low	3b: potential but not determined	3a: moderate but patchy	4: high	5: very high
late Eocene to latest early Miocene	Sespe Formation (Ts)		17	X			X											X	
Paleocene	Santiago (Tsa)		15				X				X	X					X		
	Silverado	Serrano Clay bed (Tsis)	*								*	*			X				
		basal conglomerate (Tsicg)	*								*	*			X				
		undifferentiated (Tsi)	16								X	X			X				

* indicates that the number of fossils from the unit is unknown as paleontology collections may not list the unit in some cases

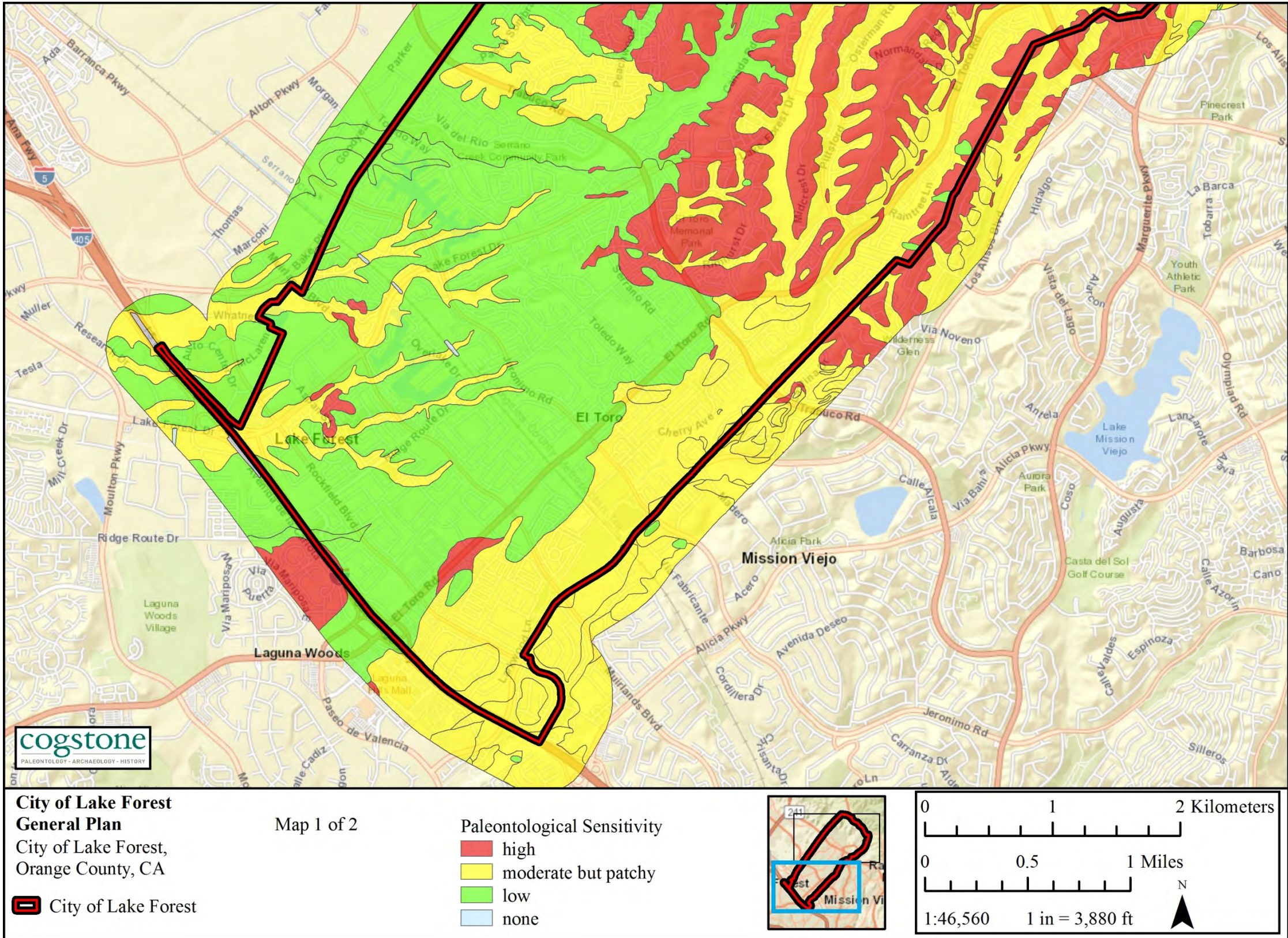


Figure 10a. Paleontological Sensitivity of the City, southwestern half.

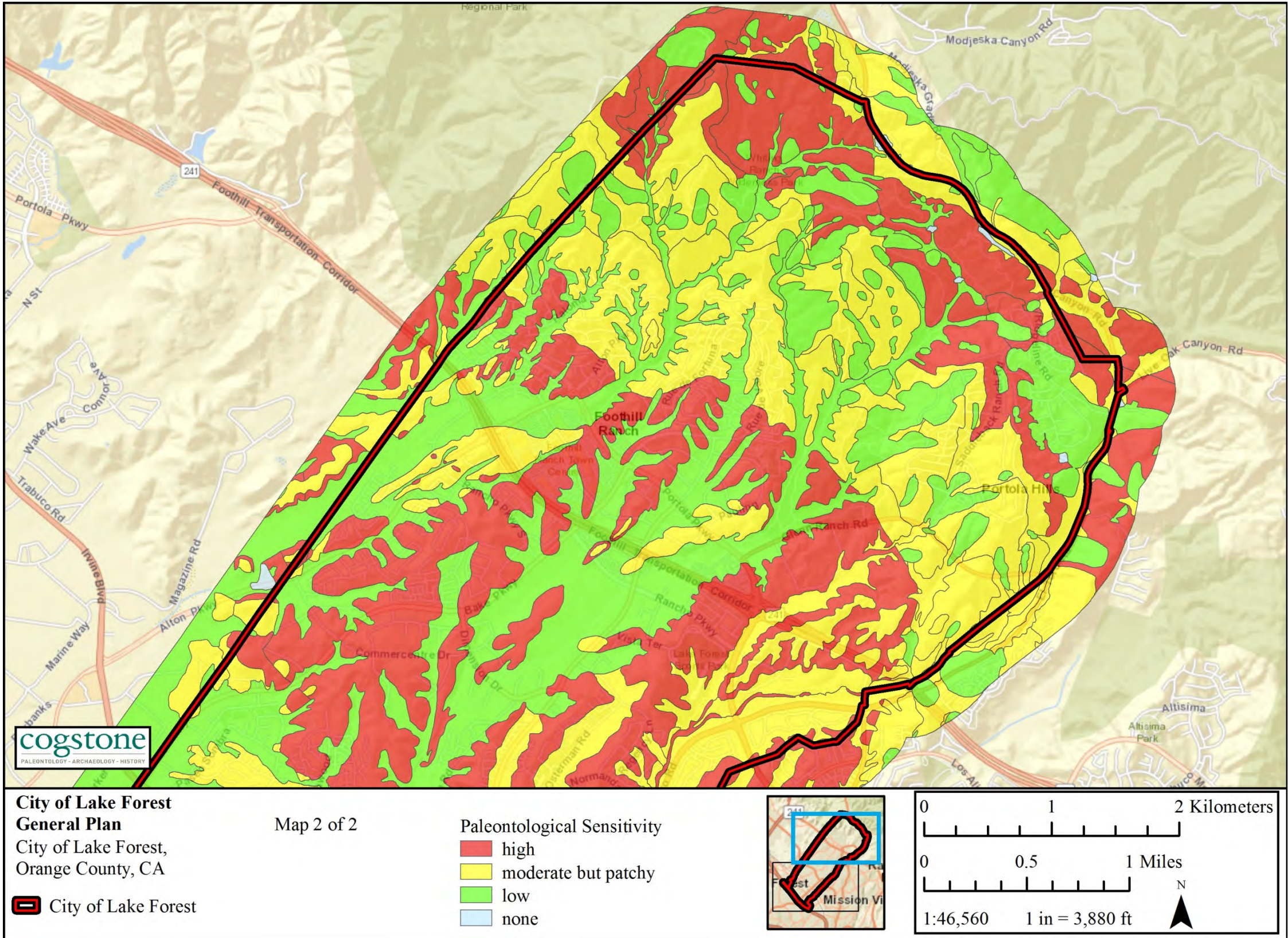


Figure 10b. Paleontological Sensitivity of the City, northeastern half.
Cogstone

DEFINITION OF SIGNIFICANCE FOR PALEONTOLOGICAL RESOURCES

Only qualified, trained paleontologists with specific expertise in the type of fossils being evaluated can determine the scientific significance of paleontological resources. Fossils are considered to be significant if one or more of the following criteria apply:

1. The fossils provide information on the evolutionary relationships and developmental trends among organisms, living or extinct;
2. The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;
3. The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas;
4. The fossils demonstrate unusual or spectacular circumstances in the history of life;
5. The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations.
6. All identifiable vertebrate fossils are considered significant due to the rarity of their preservation.

As so defined, significant paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, uncommon, or diagnostically important. Significant fossils can include remains of large to very small aquatic and terrestrial vertebrates or remains of plants and invertebrate animals previously not represented in certain portions of the stratigraphy. Assemblages of fossils that might aid stratigraphic correlation, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, and paleoclimatology are also critically important (Scott and Springer 2003, Scott et al. 2004).

CULTURAL SENSITIVITY

The City of Lake Forest currently has 93 previously recorded archaeological sites and six built historic resources within the City boundaries (refer to Table 4). Additionally, the historic core of “Old El Toro” bounded by Los Alisos Boulevard to the west, Second Street to the north, El Toro Road to the east, and Muirlands Boulevard to the south has the potential to be sensitive for subsurface historic archaeological deposits. The area immediately surrounding the Aliso Creek Watershed as well as undeveloped ridge and knoll tops have the potential for subsurface prehistoric archaeological deposits.

ADVERSE CHANGES TO HISTORICAL BUILT ENVIRONMENT RESOURCES

Very few built historic structures remain within the City of Lake Forest. It is recommended that

the City of Lake Forest create and implement policies to identify, protect, and minimize adverse impacts to its remaining historical structures and features. The potential exists for significant impacts to these resources to occur as a result of development projects proposed or permitted by the City. It is recommended that the City survey, identify, inventory, and document their remaining historic resources.

ADVERSE CHANGES TO ARCHAEOLOGICAL RESOURCES

Based on what is known abundant potentially significant archeological resources are known to exist within the boundaries of the City of Lake Forest. Future projects may require ground disturbance (e.g., earthmoving activities) which may cause the destruction of significant archaeological resources, or previously unknown buried archaeological resources as defined in the CEQA Guidelines, Section 15064.5(b). As stated, a project with an effect that may cause a substantial adverse change in the significance of an archaeological resource is a project that may have a significant effect on the environment. Effects on an archaeological resource deemed to be significant could be considered adverse if they involve physical demolition, destruction, or alteration of the resource or its immediate surroundings such that the significance of a resource would be materially impaired. Thus, significant prehistoric and historical archaeological resources must be considered in the City's planning and development process, and any proposed City project that may affect significant archaeological cultural resources must be submitted to the State Historic Preservation Officer (SHPO) for review and comment prior to project approval by the City and prior to construction.

POTENTIAL TO DISTURB NATIVE AMERICAN HUMAN REMAINS

Although Native American human remains are normally associated with former residential village locations, isolated burials and cremations have been found in many other locations. Future projects may disturb or destroy buried Native American human remains, including those interred outside of formal cemeteries. Consistent with state laws protecting these remains (that is, Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98), sites containing Native American human remains must be treated in a sensitive manner.

PROPOSED MITIGATION MEASURES

MM PAL-1. City staff shall require applicants for future proposed projects with planned impacts in undisturbed sediments ranked PFYC 3 or above to provide a technical paleontological assessment consisting of a record search, survey, background context and project specific recommendations performed by a qualified paleontologist (with a graduate degree and a specialization in vertebrate paleontology). If resources are known or reasonably anticipated the recommendations shall provide a detailed mitigation plan which shall require monitoring during grading and other earthmoving activities in undisturbed sediments, provides a fossil recovery protocol that includes data to be collected, requires professional identification, radiocarbon dates

and other special studies as appropriate, requires curation at local curation facility such as such as the John D. Cooper Center operated by the County of Orange for fossils meeting significance criteria, requires a comprehensive final mitigation compliance report including a catalog of fossil specimens with museum numbers and an appendix containing a letter from the museum stating that they are in possession of the fossils.

MM CUL-1. City staff shall require applicants for future proposed projects with intact extant building(s) more than 45 years old to provide a historic resource technical study evaluating the significance and data potential of the resource. If significance criteria are met, detailed mitigation recommendations are required as part of the technical study. All work will be performed by a qualified architectural historian meeting Secretary of the Interior Standards.

MM CUL-2. City staff shall require applicants for future proposed ground disturbing projects to provide a technical cultural resources assessment consisting of a record search, survey, background context and project specific recommendations performed by a qualified archaeologist meeting Secretary of the Interior Standards and certified by the County of Orange. If resources are known or reasonably anticipated the recommendations shall provide a detailed mitigation plan which shall require monitoring during grading and other earthmoving activities in undisturbed sediments, provide a treatment plan for potential resources that includes data to be collected, requires professional identification, other special studies as appropriate, requires curation at an accredited museum such as the John D. Cooper Center operated by the County of Orange for artifacts meeting significance criteria, requires a comprehensive final mitigation compliance report including a catalog of specimens with museum numbers and an appendix containing a letter from the museum stating that they are in possession of the materials.

MM CUL-3. Unanticipated discoveries of human remains shall require immediate cessation of ground disturbance and notification to City staff and shall follow state law as stated in Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98.

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APPENDIX A. QUALIFICATIONS



DESIREÉ RENEÉ MARTINEZ
Principal Archaeologist

EDUCATION

1999 M.A., Anthropology (Archaeology), Harvard University, Cambridge
1995 B.A., Anthropology, University of Pennsylvania, Philadelphia

SUMMARY QUALIFICATIONS

Ms. Martinez is a qualified archaeologist with 21 years of experience in archaeological fieldwork, research, and curation. She has expertise in the planning, implementation, and completion of all phases of archaeological work and has participated in archaeological investigations as a crew member, tribal monitor, and principal researcher. She meets national standards in archaeology set by the Secretary of Interior's *Standards and Guidelines for Archaeology and Historic Preservation* and the standards outlined in Attachment 1 to Caltrans Section 106 Programmatic Agreement with the FHWA. Her experience also includes compliance with CEQA, NEPA, NAGPRA, SB 18 and other cultural resource laws. In addition, Ms. Martinez has vast experience in lab analysis and museum collections management. Ms. Martinez also has extensive experience consulting with Native American leaders and community members in a variety of contexts.

SELECTED PROJECTS

I-10 Grove Avenue Interchange and Grove Avenue Corridor Improvements, Caltrans District 8, Ontario, San Bernardino County, CA. Managed literature and Sacred Lands searches, Native American consultation, pedestrian survey for the 22.6 acre APE and preparation of an Archaeological Survey Report (ASR) and Paleontological Identification Report (PIR) on behalf of the City. CEQA and NHPA Section 106 compliance. 2015-2017

SR 138 Crowder Canyon Realignment Data Recovery, Caltrans District 8, Hesperia, San Bernardino County, CA. Project Manager. The project involves realignment of a ~2-mile segment of SR 138 including construction of three bridges, one lane in each direction, drainage construction and demolition of the existing segment. Cogstone participated in data recovery at two archaeological sites. All work was performed in compliance with the Caltrans SER and NEPA, CEQA, and Section 106 of NHPA. Tasks included Native American coordination, manual and mechanical excavation, backfilling, and controlled destruction. 2016-2017

Longboat Solar Photovoltaic, EDF Renewable Energy, Barstow and Lenwood, San Bernardino County, CA. Project Manager/Principal Investigator. The project was construction of a new solar facility. Managed the cultural resources assessment including Phase I and Extended Phase I studies to support MND for this ~235-acre site. Managed archaeological monitoring, Native American coordination, Phase II testing, and was co-author of the treatment plan and compliance report. 2015-2017.

Fisher House and Golf Course, Veterans Affairs Long Beach Healthcare System, Long Beach, Los Angeles County, CA. Principal Investigator. The project was preconstruction testing and monitoring for two new constructions projects. In compliance with the Historic Property Treatment Plan preconstruction work included ground penetrating radar and magnetometry, truck mounted auger testing and mechanical excavation units. One historic refuse area was defined and recorded. Monitoring recovered additional cultural materials. Co-author of compliance reports. 2015-2017.

High Desert Corridor/ SR-138 Widening Project, Caltrans District 7 On-Call (07A3145)/LA Metro, Los Angeles and San Bernardino Counties, CA. Co-Principal Investigator. This project proposed by Caltrans and Metro involves construction of a new, approximately 63-mile long, east-west freeway/expressway and rail line between SR-14 in Los Angeles County and SR-18 in San Bernardino County. Phase II/III testing and data recovery at the three sites that will be directly impacted by the project. Analyzed lithic material. Compliance with Section 106 of the NHPA and CEQA are required. 2015.



SHERRI GUST
Task Manager/Author

EDUCATION

1994 M. S., Anatomy (Evolutionary Morphology), University of Southern California, Los Angeles
1979 B. S., Anthropology (Physical), University of California, Davis

SUMMARY QUALIFICATIONS

Ms. Gust is an Orange County Certified Professional Paleontologist and Archaeologist and a Registered Professional Archaeologist with more than 34 years of experience in cultural resources management. She is accepted as a principal investigator for both prehistoric and historical archaeology by the State Office of Historic Preservation's Information Centers and exceeds the qualifications required by the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation*. She has managed more than 650 projects at Cogstone and has a reputation for professional work, regulatory compliance and client satisfaction. She has conducted technical studies and prepared cultural resources chapters for CEQA/EIR compliance documents for project-level and program-level Specific Plans, General Plans, Master Plans, and Zoning Amendments for mixed-use, residential, commercial and industrial developments. She has expertise in research, survey, assessment of impacts/effects, significance criteria and determinations, management plans, mitigation implementation, and bone identification and analysis.

SELECTED PROJECTS

Historic Town Center Master Plan Update EIR, San Juan Capistrano, CA. Conducted a survey and assessment to determine the potential effects on cultural resources of potential changes to the Historic Town Center Master Plan area in support of a project-level EIR. Supervised archaeological and paleontological record searches, research, and survey plus Native American consultation for the 31-acre town center. Evaluated resources, including updated site records and impact assessment. Sub to the Templeton Planning Group. Principal Archaeologist. 2011

Los Angeles International Airport (LAX) Northside Plan Update, Los Angeles, CA. Conducted a paleontological study to determine the potential project-related effects on paleontological resources by proposed construction activities. The project consists of updating regulations for future development of facilities for employment, retail, restaurant, office, hotel, research and development, education, civic, airport support, recreation, and buffer uses within the Northside area of the LAX Specific Plan. The work was performed on behalf of Los Angeles World Airports under subcontract to URS Corporation. Principal Paleontologist. 2012

Chino Hills General Plan EIR, San Bernardino County, CA. Performed archaeological and paleontological record searches, Native American consultation, and prepared assessment report for the City of Chino Hills under subcontract to Comprehensive Planning. This study was conducted to provide available information on paleontological and cultural resources to support an update of the General Plan program-level environmental documents. The City consists of 28,723 acres. The work was performed on behalf of the City of Chino Hills under subcontract to Comprehensive Planning Services. Principal Archaeologist. 2010

Yucca Valley General Plan Update EIR, Town of Yucca Valley, San Bernardino, CA. Conducted a paleontological and cultural resources assessment of the Town's 25,470 acres with programmatic mitigation measures in support of the General Plan Update Environmental Documents on behalf of the Town of Yucca Valley under subcontract to The Planning Center. The project involved record searches, sacred lands search, Native American consultation, and a final report. Principal Archaeologist and Paleontologist. 2012



KIM SCOTT

Principal Investigator for Paleontology

EDUCATION

2013 M.S., Biology with a paleontology emphasis, California State University, San Bernardino
2000 B.S., Geology with paleontology emphasis, University of California, Los Angeles

SUMMARY QUALIFICATIONS

Scott has more than 20 years of experience in California paleontology. She is a qualified geologist and field paleontologist with extensive survey, monitoring and fossil salvage experience. In addition, she has special skills in fossil preparation (cleaning and stabilization) and preparation of stratigraphic sections and other documentation for fossil localities. Scott serves as company safety officer and is the author of the company safety and paleontology manuals.

SELECTED PROJECTS

Purple Line Extension (Westside Subway), Metro/FTA, Los Angeles. The project involves extension of the subway from Wilshire/Western to the VA Facility in Westwood for 9 miles. Cogstone prepared the supplemental Archaeology and Architectural History Reports and the cultural and paleontological sections of the FEIS/FEIR. Cogstone subsequently prepared the cultural and paleontological mitigation and monitoring plans for the entire project. Currently providing monitoring and all other cultural and paleontological services for Section One of the project. Paleontological Field and Lab Director, Report Co-author. 2011-present

Barren Ridge Transmission Line, Los Angeles Department of Water and Power (LADWP), Saugus to Mojave, Los Angeles and Kern Counties, CA. Over 75 miles of LADWP electrical lines were installed Angeles National Forest, BLM and private lands. Supervised paleontological monitoring and lab work and prepared a Paleontological Monitoring Report to CEQA, BLM and PRPA standards. Sub to Aspen Environmental Group. Principal Paleontologist. 2015-2017.

Dola and Lanzit Bridges, San Bernardino County Department of Public Works, CA. Reviewed previous studies: paleontological assessment, paleontological mitigation measures, and geotechnical report. Conducted a field survey and prepared Paleontological Resources Management and Monitoring Plan to CEQA and county standards to more accurately reflect the project needs when compared to the mitigation measures. Subsequently provided monitoring and a compliance report. Contracted to ECORP. Principal Paleontologist. 2016-2017.

Perris Valley Line Rail Improvements, Riverside County Transportation Commission (RCTC), Riverside County, CA. RCTC added a second track and other modifications of 22 miles of the Perris Valley line from Highgrove, south through Riverside, south and east through Moreno Valley and south through to Perris to link this area to the MetroLink rail service. Performed a field survey and prepared an abbreviated Paleontological Resource Assessment to CEQA standards. Supervised all paleontological monitoring and prepared a Paleontological Monitoring Report to CEQA standards. Sub to HDR Engineering. Principal Paleontologist. 2014-2016.

Elvira to Morena Double Track, San Diego Associate of Governments (SANDAG), San Diego County, CA. SANDAG improved a 10.3 mile stretch of the line with double track and other modifications from Control Point (CP) Elvira to CP Moreno. Project development will be closely coordinated with the Mid-Coast LRT Project, California High Speed Rail (Los Angeles to San Diego) and the Rose Canyon and Coastal Rail Trail Projects. Author of a Paleontological Resources Report addressing potential impacts and mitigation measures to CEQA standards. Supervised paleontological monitoring of Rose Canyon. Sub to HDR Engineering. Co-Principal Paleontologist/Report Co-author. 2012-2015.



MEGAN PATRICIA WILSON, RPA
Archaeologist

EDUCATION

- 2014 M.A. Anthropology, California State University, Fullerton *cum laude*
- 2013 GIS Certificate, California State University, Fullerton
- 2006 B.A., Anthropology, University of California, Los Angeles *cum laude*

SUMMARY QUALIFICATIONS

Ms. Wilson is a Registered Professional Archaeologist (RPA) and cross-trained paleontologist. Ms. Wilson regularly conducts records searches, tribal consultations, completes DPR site records, and gathers historic building information from local municipalities, and assists in drafting archaeological assessment reports for state, federal, and private development projects. She meets the qualifications required by the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation*. Further, she is certified in Geographic Information Systems (GIS) and specializes in ESRI's ArcGIS software. Ms. Wilson is responsible for supervising GIS data collection and management, geospatial analysis, and the production of GIS maps and databases for large and small-scale projects. Ms. Wilson has seven years of experience in southern California archaeology.

SELECTED PROJECTS

Park Place Extension and Grade Separation EIR EA, Caltrans District 7, El Segundo, Los Angeles County, CA. Conducted a pedestrian survey to record and evaluate cultural resources within the archaeological and architectural APEs for a ~0.5-mile project along NBSF and UPRR rail lines and spur tracks on behalf of the City of El Segundo for HPSR/ASR/HRER and paleontological reports. Seven built-environment resources were identified, evaluated, and DPR 523 forms were prepared. Archaeologist. 2017

Whittier Boulevard / I-605 Arterial Hot Spot Improvements, Environmental Clearance and Preliminary Engineering for Three Intersection Improvements, Whittier, Los Angeles County, CA. Conducted an intensive-level cultural resources survey to support cultural and paleontological resources technical studies for improvements proposed for three intersections in a disturbed urban environment. Drafted APE maps, records search, Sacred Lands search, and NAHC consultation for intersections at Colima Road, Santa Fe Springs Road and Painter Avenue. Archaeologist. 2016

Hidden Oaks Country Club Specific Plan and TT 18869, Chino Hills, San Bernardino County, CA. Prepared report maps, conducted cultural and paleontological resources assessments and assisted the City with SB 18 compliance. Services included records search, drafting project maps, Sacred Lands search, NAHC consultation, field survey, and mitigation recommendations. Cogstone responded to the cultural section of the project EIR comment for this proposed 537-acre residential. Archaeologist. 2015-2016

On-Call Cultural Resources Services, Sanitation Districts of Los Angeles County, CA. Prepared APE maps, conducted record searches, NAHC consultation, field surveys, and prepared DPR forms to support upgrades and improvements to pipelines at Mesquite Landfill, Clearwater, and Santa Clarita facilities. Archaeologist. 2015-2016

Accelerated Charter Elementary School, Los Angeles Unified School District, Los Angeles, Los Angeles County, CA. The project involves documentation of five historic-age buildings prior to demolition, background research, mitigation monitoring plans, archaeological and paleontological monitoring and preparation of a monitoring compliance report. LAUSD is constructing a new facility on a 2.3-acre site in South Central Los Angeles consisting of classrooms, open areas and parking. Drafted project related maps, conducted background research and contributed to preparation of DPR forms. Archaeologist. 2015

Sweany Pipeline, Phase II, Laguna Beach County Water District, Orange County, CA. Completed a cultural resources assessment; conducted archaeological/paleontological records search, NAHC consultation, and drafted project maps for inclusion in a CEQA environmental document. Archaeologist. 201

APPENDIX B. PALEONTOLOGICAL RECORDS SEARCH RESULTS

City of Lake Forest Paleontological and Cultural Assessment Report



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of Los Angeles County
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Los Angeles, CA 90007
tel 213.763.DINO
www.nhm.org

Vertebrate Paleontology Section
Telephone: (213) 763-3325

e-mail: smeleod@nhm.org

5 April 2018

Cogstone Resource Management, Inc.
1518 West Taft Avenue
Orange, CA 92865-4157

Attn: Megan Wilson, Archaeologist & GIS Technician

re: Vertebrate Paleontology Records Check for paleontological resources for the proposed City of Lake Forest General Plan Update Project, Cogstone Project # 4050, in the City of Lake Forest, Orange County, project area

Dear Megan:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for the proposed City of Lake Forest General Plan Update Project, Cogstone Project # 4050, in the City of Lake Forest, Orange County, project area as outlined on the portions of the El Toro, San Juan Capistrano, and Santiago Peak USGS topographic quadrangle maps that you sent to me via e-mail on 22 March 2018. We have several vertebrate fossil localities that lie directly within the proposed project area boundaries, and we have other localities nearby from the same sedimentary deposits that occur within the proposed project area.

Surface deposits in the lower lying terrain in much of the southwestern portions of the proposed project area consist of younger Quaternary Alluvium, derived as alluvial fan deposits from the hills of the Santa Ana Mountains to the northeast and east via Borrego Canyon Wash in the north, Serrano Creek in the central portion, and Aliso Creek in the south. These deposits typically do not contain significant vertebrate fossils in the very uppermost layers, but at relatively shallow depth they may be underlain with older sedimentary deposits that do contain significant vertebrate fossils. In the slightly elevated terrain in most of the southwestern portion of the proposed project area older Quaternary terrace deposits occur at the surface, and similar deposits may underlie the younger Quaternary deposits exposed in adjacent portions of the proposed project area.

Inspiring wonder, discovery and responsibility for our natural and cultural worlds.

Geological mapping indicates that in the hills east of the Borrego Canyon Wash near the northwestern border of the proposed project area there are relatively small exposures of the marine middle to late Miocene Monterey Formation and even smaller exposures of the marine Pliocene Niguel Formation. The elevated terrain in most of the central portion of the proposed project area though has exposures of the Oso Sand Member of the marine late Miocene Capistrano Formation.

The northeastern portion of the proposed project area has exposures of a succession of older rock units. Proceeding northeastward from younger to older these are the Soquel Member followed by the La Vida Member of the marine late Miocene Puente Formation, the marine middle Miocene Topanga Formation, the marine late Oligocene to early Miocene Vaqueros Formation that interfingers with the terrestrial late Oligocene to early Miocene Sespe Formation, and the marine Eocene Santiago Formation. From geologic mapping it appears that exposures of the marine Paleocene Silverado Formation occur adjacent to but not within the proposed project area.

Our closest fossil locality in older Quaternary sediments is LACM 65129, just southeast of the southeastern-most portion of the project area in what is now Costeau Park. Locality LACM 65129 produced an extensive fauna of predominately terrestrial vertebrates (see faunal list in the appendix). W. E. Miller (1971. Pleistocene vertebrates of the Los Angeles basin and vicinity (exclusive of Rancho La Brea). Science Bulletin, Natural History Museum of Los Angeles County, 10:1-124) described this site as Costeau Pit and figured or published on most of the taxa known at that time.

We have one Niguel Formation locality, LACM 7058, that occurs either within or adjacent to the southeastern-most point of the proposed project area in Aliso Creek immediately north of the San Diego Freeway (I-5). Locality LACM 7058 contained fossil specimens of six-gilled shark, *Hexanchus*, and bony fish, Osteichthyes. Our closest locality that includes fossils from both the terrestrial Quaternary Terrace deposits and the marine Pliocene Niguel Formation is LACM 7131, almost due east of the southeastern-most point of the proposed project area east of the San Diego Freeway (I-5) and north of La Paz Road in Mission Viejo, that produced fossil specimens of camel, Camelidae, and sea lion, Otariidae. Other nearby Niguel Formation localities just southeast of the proposed project area include LACM 65187, north of La Paz Road west of the San Diego Freeway (I-5), that produced fossil specimens of giant white shark, *Carcharocles megalodon*, and whale, Cetacea; LACM 5551, south along La Paz Road west of the San Diego Freeway (I-5), that produced fossil specimens of sea cow, Dugongidae, early baleen whale, *Herpetocetus*, and sea lion, Otariidae; and LACM 3804, immediately south of Oso Parkway approximately one half mile west of the San Diego Freeway (I-5), that contained specimens of the fossil white shark, *Carcharodon sulcidens*.

We have a number of localities from the Capistrano Formation that occur within the boundaries of the central portion of the proposed project area: LACM 3199, 3218, 3221, 3410-3411, 3491, 4177, 4666-4668, 5500, 7370-7372, and 7546-7547. These Capistrano Formation localities have produced a suite of predominately marine vertebrates and a few terrestrial vertebrates including giant white shark, *Carcharocles megalodon*, bonito sharks, *Isurus hastalis*

and *Isurus oxyrinchus*, salmon shark *Lamna*, eagle ray, *Myliobatis*, sturgeon, *Acipenser*, parrotfishm Scaridae, halibut, *Paralichthys*, sabretoothed salmon, *Oncorhynchus rastrosus*, crocodile, Crocodylidae, leatherback turtle, *Psephophorus*, tortoise, *Geochelone*, puffin, Mancallinae, otter, *Satherium*, false walrus, *Gomphotaria pugnax*, sea lion, *Imagotaria*, dugong, Dugongidae, horse, *Pliohippus*, rhinoceros, Rhinocerotidae, right whale, Balaenidae, orqual whale, Balaenopteridae, primitive baleen whale, *Herpetocetus*, sperm whale, Physeteridae, and camel, Camelidae. Specimens of the sturgeon, *Acipenser*, from locality LACM 3221 were published in the scientific literature by F. J. Hilton and L. Grande (2006. Review of the fossil record of sturgeons, family Acipenseridae (Actinopterygii: Acipenseriformes), from North America. *Journal of Paleontology*, 80(4):672-683). A specimen of the false walrus, *Gomphotaria pugnax*, from locality LACM 4177 was published in the scientific literature by J. Velez-Juarbe in 2017 (*Eotaria citrica*, *sp. nov.*, a new stem otariid from the "Topanga" formation of Southern California. *PeerJ*, 5(3022):1-25).

We have a great many vertebrate fossil localities in southern California from the Puente Formation but only one, LACM 6287, from Orange County. Locality LACM 6287, situated north of the western portion of the proposed project area southeast of Santiago Reservoir along Santiago Canyon Road in Limestone Canyon, produced fossil specimens of tonguefish, *Symphurus*.

We have a number of Monterey Formation localities that occur in the southwestern portion of the proposed project area: 3198, 3486, 3209-3210, 3412-3413, and 4103-4114. These localities produced a suite of fossil marine vertebrates including hammerhead shark, *Sphyrna*, giant white shark, *Carcharocles megalodon*, bonito sharks, *Isurus benedeni* and *Isurus oxyrinchus*, bramble shark, *Paraechinorhinus barnesi*, eel, Anguilliformes, jack, Carangidae, bonito, *Sarda*, barracuda, *Sphyrna*, crocodile, *Crocodylus*, bird, Aves, sea lion, Otariidae, dugong, *Dioplotherium allisoni*, baleen whale, Mysticeti, and dolphin, Kentriodontidae. A specimen of the dugongid sirenian *Dioplotherium allisoni* from locality LACM 3210 was figured in the scientific literature by D. P. Domning in 1978 (*Sirenian Evolution in the North Pacific Ocean*. University of California Publications in Geological Sciences, 118:1-176). Specimens of the fossil crocodile *Crocodylus* from localities LACM 3209 and 3210 were published in the scientific literature by C. A. Brochu in 1999 (*Phylogenetics, Taxonomy, and Historical Biogeography of Alligatoroidea*. *Journal of Vertebrate Paleontology*, 19(2):9-100). F. H. Pfeil designated the holotype (name bearing specimen for a species new to science) of the echinorhinid shark *Paraechinorhinus barnesi* from locality LACM 3198 (1983. *Zahnmorphologische Untersuchungen an rezenten und fossilen Haien der Ordnungen Chlamydoselachiformes und Echinorhiniformes*. *Palaeoichthyologica*. 1:1-315).

Our closest vertebrate fossil locality from the Topanga Formation is LACM 5511, just outside the eastern-most border of the proposed project area near Cook's Corner, that produced a specimen of the fossil dugong *Metaxytherium arctodites* figured in the scientific literature by F. J. Arranda-Manteca in 1994 (*A New Middle Miocene Sirenian of the Genus Metaxytherium from Baja California and California: Relationships and Paleobiogeographic Implications*. *Proceedings of the San Diego Society of Natural History*, 29:191-204). Further south of LACM 5511 we have the Topanga Formation locality LACM 7200, that produced a fossil specimen of the peculiar and extinct four-legged marine mammal, *Desmostylus*.

We have several vertebrate fossil localities from the Topanga Formation around the Oso Dam just east of the central portion of the proposed project area including LACM 4464, 4545-4552, 4556-4558, 4961, and 5494-5496. These localities produced a suites of marine vertebrates including smoothhound shark, *Mustelus*, horn shark, *Heterodontus*, bonito shark, *Isurus hastalis*, eagle ray, Myliobatidae, guitarfish, *Rhinobatos*, eel, Anguilliformes, surgeonfish, *Prionurus*, leatherback turtle, Dermochelyidae, duck, Anatinae, auklet, *Alcodes ulnulus*, booby, Sulidae, albatross, *Diomedea milleri*, shearwater, *Puffinus priscus*, sea lions, *Allodesmus*, *Eotaria citrica*, *Neotherium*, and *Pelagiarcos*, four-legged marine mammal, *Desmostylus*, primitive baleen whale, Cetotheriidae, and primitive dolphin, *Lamprolithax*. Specimens of the fossil birds from these localities were figured or published in the scientific literature by H. Howard and L. G. Barnes in 1987 (Middle Miocene Marine Birds from the Foothills of the Santa Ana Mountains, Orange County, California. Contributions in Science, Natural History Museum of Los Angeles County, 383:1-9). In 2017 J. Velez-Juarbe designated the holotype of the new fossil sea lion species *Eotaria citrica* from locality LACM 4546 and also published on specimens of the fossil sea lions *Allodesmus* and *Pelagiarcos* from these localities (*Eotaria citrica*, sp. nov., a new stem otariid from the "Topanga" formation of Southern California. PeerJ, 5(3022):1-25).

Further south of the Oso Dam, but still along Oso Creek, our Topanga Formation locality LACM 5769 produced a fossil specimen of great white shark, *Carcharocles megalodon*. Southeast of the southeastern part of the proposed project area, in Mission Viejo east of Oso Creek, our Topanga Formation locality LACM 6064 produced fossil specimens of desmostylian, *Paleoparadoxia*, and sea lion, *Eotaria crypta*. The *Paleoparadoxia* specimen was published in the scientific literature by A.I. Panofsky in 1998 (Stanford *Paleoparadoxia* Fossil Skeleton Mounting. Stanford Linear Accelerator Center Publication, 7829:1-143). The *Eotaria crypta* specimen was figured in the scientific literature by J. Velez-Juarbe in 2017 (cited above).

The Sespe and Vaqueros Formations intergrade and interdigitate so that they are often difficult to distinguish and then they are typically referred to as the Sespe / Vaqueros Formations undifferentiated. We have one Sespe / Vaqueros Formation locality, LACM 5448, that occurs either within the proposed project area or adjacent to the central western border in the hills immediately east of Borrego Canyon Wash. Fossil specimens of undetermined bird, Aves, and whale, Cetacea, were recovered from locality LACM 5448.

Just north of the northern-most border of the proposed project area, between Bolero Lookout and Santiago Canyon Road, our Sespe / Vaqueros locality LACM (CIT) 449, produced a suite of both marine and terrestrial fossil vertebrates including horn shark, *Heterodontus*, requiem shark, *Carcharhinus*, tiger shark, *Galeocercdo*, bonito shark, *Isurus*, megamouth shark, Megachasmidae, eagle rays, *Myliobatis*, sea turtle, Cheloniidae, horse, *Parahippus pawniensis*, extinct pig-like artiodactyl, *Daeodon hollandi*, camel, cf. *Michenia*, baleen whale, Mysticeti, and toothed whale, Odontoceti, published in the scientific literature by S.G. Lucas et al. (1997). Giant Entelodont (Mammalia, Artiodactyla) from the Early Miocene of Southern California. LACM Contributions in Sciences, 466:1-9).

Around Oso Dam just east of the central portion of the proposed project area we have several localities from the Sespe / Vaqueros Formations including LACM 4553-4555, 4559-4560, 5146-5147, and 5497. The terrestrial facies localities LACM 4553-4554 produced fossil specimens of


turtle, Testudinata, opossum, *Peratherium*, rabbit, *Archaeolagus*, deer mouse, *Yatkolamys*, pocket mouse, *Trogomys*, and badger, Mustelidae. The marine facies locality LACM 4559 produced fossil specimens of dusky shark, *Carcharhinus*, tiger shark, *Galeocerdo*, snaggletooth shark, *Hemipristis*, daggernose shark, *Isogomphodon*, smoothhound, *Mustelus*, horn shark, *Heterodontus*, basking shark, *Cetorhinus*, stingray, *Dasyatis*, devil ray, *Mobula*, eagle ray, *Myliobatis*, nurse shark, *Ginglymostoma*, skate, *Raja*, guitarfish, *Rhinobatos*, wedgefish, *Rhynchobatus*, sawfish, *Pristiophorus*, dogfish, *Squalus*, angel shark, *Squatina*, herring, Clupeidae, bonefish, Albulidae, beakfish, Oplegnathidae, swordfish, *Cylindracanthus*, and triggerfish, Balistidae.

All of our fossil vertebrate localities from the Santiago Formation, LACM 3881, 3883-3884, 3979, 4022, 5346-5347, 6926 and 68102, occur much to the south of the proposed project area in the northwestern part of San Diego County, clustered around Carlsbad. These localities produced a suite of vertebrate fossils including turtles, crocodiles, birds, rodents, insectivores, brontothere, and amynodont rhinoceroses. David J. Golz (1976. Eocene Artiodactyla of Southern California. Los Angeles County Museum Science Bulletin, 26:1-85) published on the LACM specimens of the protoceratid artiodactyl *Leptoreodon leptolophus* and the camels *Protylopus petersoni* and *Protylopus stocki* from our Santiago Formation locality LACM 68102.

Shallow excavations in the younger Quaternary Alluvium exposed in the lowest lying terrain and the drainages of the proposed project area are unlikely to uncover significant fossil vertebrate remains. Deeper excavations in those younger Quaternary deposits that extend down into older Quaternary deposits, however, as well as any excavations in the exposures of older Quaternary terrace deposits, the Niguel Formation, the Capistrano Formation, the Puente Formation, the Monterey Formation, the Topanga Formation, the Sespe / Vaqueros Formations undifferentiated, or the Santiago Formation, may well encounter significant vertebrate fossils. Any substantial excavations in the proposed project area, therefore, should be monitored closely to quickly and professionally recover any fossil remains discovered while not impeding development. Also, sediment samples should be collected and processed to determine the small fossil potential in the proposed project area. Any fossil materials uncovered during mitigation activities should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,



Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosures: appendix, invoice

Fauna from Emery Borrow Pit - LACM 65129

Chondrichthyes	Aves (continued)	Mammalia (continued)
Lamniformes	Columbiformes	Lagomorpha
Lamnidae - mackerel sharks	Columbidae - pigeon	Leporidae - rabbits
<i>Carcharocles</i>	Galliformes	<i>Lepus californicus</i>
<i>Carcharodon sulcidens</i>	Phasianidae - quail	<i>Sylvilagus audubonii</i>
<i>Isurus</i>	<i>Lophortyx</i>	<i>Sylvilagus bachmani</i>
Osteichthyes	Gruiformes	Perissodactyla
Perciformes	Rallidae - coot	Equidae - horse
Labridae - wrasse	<i>Fulica americana</i>	<i>Equus</i>
<i>Pimelometopon</i>	Passeriformes	Proboscidea
Amphibia	Corvidae - crow	Elephantidae - mammoth
Anura	Fringillidae - finch	<i>Mammuthus columbi</i>
Bufonidae - toad	Hirundinidae - swallow	Rodentia
<i>Bufo</i>	Icteridae - blackbirds	Cricetidae - voles & rats
Ranidae - frog	Turdidae - thrush	<i>Microtus californicus</i>
<i>Rana</i>	Strigiformes	<i>Neotoma</i>
Urodela	Strigidae - burrowing owl	<i>Ondatra</i>
Plethodontidae - salamander	<i>Speotyto</i>	<i>Peromyscus maniculatus</i>
<i>Aneides lugubris</i>	Tytonidae - barn owl	<i>Reithrodontomys humulis</i>
Reptilia	<i>Tyto alba</i>	Geomyidae - pocket gopher
Squamata	Mammalia	Thomomys bottae
Crotalidae - rattlesnake	Artiodactyla	Heteromyidae - pocket mice
<i>Crotalus</i>	Antilocapridae - pronghorn	<i>Dipodomys</i>
Phrynosomatidae - spiny lizard	<i>Capromeryx</i>	<i>Perognathus californicus</i>
<i>Sceloporus</i>	Bovidae - bison	Sciuridae - squirrel
Teiidae - whiptail lizard	<i>Bison antiquus</i>	<i>Spermophilus beecheyi</i>
<i>Cnemidophorus</i>	<i>Bison latifrons</i>	Xenarthra
Testudinata	Camelidae - camels	Mylodontidae - ground sloth
Emydidae - pond turtle	<i>Camelops hesternus</i>	<i>Paramylodon harlani</i>
<i>Clemmys</i>	<i>Tanupolama</i>	
Testudinidae - tortoise	Cervidae - deer	
<i>Gopherus</i>	Tayassuidae - peccary	
Aves	<i>Platygonus</i>	
Accipitriformes	Carnivora	
Accipitridae - hawk	Canidae - dogs	
<i>Buteogallus</i>	<i>Canis dirus</i>	
Anseriformes	<i>Canis latrans</i>	
Anatidae - ducks	Felidae - cats	
<i>Anas</i>	<i>Felis concolor</i>	
Charadriiformes	<i>Smilodon californicus</i>	
Burhinidae - stone curlew	Mustelidae - weasel	
	<i>Mustela frenata</i>	
	Insectivora	
	Soricidae - shrew	
	<i>Notiosorex crawfordi</i>	

APPENDIX C. FOSSIL LOCALITY DATA

PALEOCENE SILVERADO FORMATION

17 localities, none in the City of Lake Forest

Common Name	Taxon	locality #	Location	# of localities	Within City?	Reference
marine snails and bivalves	numerous	Report # F83-F99	Black Star Cyn 7.5' topo- 16 localities; Orange 7.5' topo- 1 locality;	16	no	Schoellhamer et al. 1981
willow leaf?	? <i>Salix</i> sp.	OCPC 02267	ETC, El Toro 7.5' topo	1	no	OCPC 2018
dicot leaf	Dicotyledonae					

PALEOCENE SANTIAGO FORMATION

20 localities, none in the City of Lake Forest

Common Name	Taxon	locality #	Location	# of localities	Within City?	Reference
marine snails and bivalves	numerous	Report # F99a-F99b, F100-F114, F114a-F114b	Black Star Cyn 7.5' topo- 11 localities; El Toro 7.5' topo- 4 localities; Orange 7.5' topo, 3 localities; Tustin 7.5' topo, 1 locality	19	no	Schoellhamer et al. 1981
crocodile	Crocodylidae	OCPC 02259	ETC, Black Star Cyn 7.5' topo	1	no	OCPC 2018
magnolia	<i>Magnolia</i> sp.					
laural	<i>Laurus</i> sp, cf. <i>Laurus</i> sp.					
pea plant	? <i>Dryophyllum</i> sp., Fabaceae					
walnut	<i>Juglans</i> sp.					
fig	†" <i>Ficus</i> " <i>amballi</i> , " <i>Ficus</i> " sp.					
willows	† <i>Idesia cordata</i> , <i>Idesia polycarpa</i> , <i>Idesia</i> sp., ? <i>Salix</i> sp.					
plant	? <i>Lamonia</i>					
katsura	cf. <i>Cercidiphyllum</i> sp.					
dicot	Dicotyledonae					

LATE EOCENE TO EARLY MIOCENE SESPE FM.

17 localities, none in the City of Lake Forest

Locality	Location	In City?	Reference
LACM 7327, 7341	Lower Bowerman Landfill	no	Whistler and Lander 2003
LACM 6935-6939, 6942-6945	Upper Bowerman Landfill	no	Whistler and Lander 2003
LSA SR-73	San Joaquin Hills	no	Whistler and Lander 2003
LC 196, 199, 202, 204	Foothill Transportation Corridor/ Oso segment	no	Whistler and Lander 2003
OCPC 2030	El Toro USGS 7.5' topo	no	OCPC 2018

EARLY MIOCENE VAQUEROS - SESPE FM.

122 localities

Locality	Location	In City?	Reference
LACM (CIT) 449	between Bolero Lookout and Santiago Cyn Road	yes	McLeod 2018
LACM 4553-4555, 4559-4560, 5146-5147, 5497	Oso Dam	no	McLeod 2018
LACM 5448	Borrego Canyon Wash	possibly	McLeod 2018
LACM 6927- 6930	Parkridge, Santa Ana Mtns.	no	Whistler and Lander 2003
LC 151, 162-174, 194	Santiago Canyon Landfill	no	Whistler and Lander 2003
OCPC 2015-2020, 2037-2040, 2059-2063, 2065-2067, 2077, 2099-2100, 2109, 2112, 2117, 2132-2134, 2156-2158, 2160, 2162-2170, 2173-2175, 2178, 2249, 2257	Blackstar Canyon USGS 7.5' topo	no	OCPC 2018
OCPC 2010-2012, 2027, 2073-2075, 2083-2084, 2088, 2096, 2102-2103, 2106-2108, 2111, 2122, 2125-2126, 2172, 2176, 2251, 2260, 2265-2267	El Toro Canyon USGS 7.5' topo	no	OCPC 2018
OCPC 2008-2009, 2013-2014, 2021-2024, 2031-2032, 2085, 2089-2090, 2104, 2113-2114, 2127	Orange USGS 7.5' topo	no	OCPC 2018
USGS 18445, 18451, 18454, 18459, 18461, 18462, 18469, 18470, 18472, 18477, 18996	Santa Ana Mountains	no	Schoellhamer et al. 1981
F138 Palomar College	Santa Ana Mountains	no	Schoellhamer et al. 1981
F130, F132	Santa Ana Mountains	no	Schoellhamer et al. 1981

Terrestrial Animals: Sespe Formation and Vaqueros-Sespe Formation

Common Name	Taxon	Sespe	Vaqueros -Sespe
bear-dogs	† <i>Cynelos</i> cf. <i>C. helbingi</i>		X
	† <i>Cynelos malasi</i>		X
	† <i>Cynelos</i> sp.		X
bone-crushing dogs	† <i>Cynarctoides gawnae</i>		X
	† <i>Cynarctoides whistleri</i>		X
	† <i>Phlaocyon taylori</i>	X	
	† <i>Phlaocyon</i> sp.	X	X
canid	† <i>Leptocyon vulpinus</i>	X	
	†cf. <i>Leptocyon</i> sp.		X
bears	†? <i>Cephalogale</i> sp.		X
	† <i>Phoberogale shareri</i>		X
weasel	Mustelidae	X	X
rhinoceros	† <i>Menoceras barbouri</i>		X
	†Rhinocerotidae		X
horses	†? <i>Kalobatippus clarancei</i>		X
	† <i>Parahippus pawniensis</i>		X
peccary	†? <i>Cynorca</i> sp.	X	X
pig-like artiodactyl	† <i>Daeodon hollandi</i>		X
oreodonts	† <i>Sespia nitida</i>	X	X
	† <i>Merychyuus elegans</i>		X
	† <i>Merychyuus</i> sp.	X	X
	†Merycoidodontidae		X
camels	† <i>Michenia agatensis</i>	X	X
	† <i>Tanymyktek brachyodontus</i>		X
	†? <i>Tanymyktek</i> sp.	X	X
	†Camelidae		X
deer-like artiodactyl	†Palaeomerycidae		X
musk deer	†? <i>Nanotragulus ordinatus</i>	X	X
	† <i>Machaeromeryx tragulus</i>	X	X
	† <i>Machaeromeryx</i> sp.		X
	† <i>Pseudoblastomeryx advena</i>		X
hedgehogs	† <i>Sespedectes singularis</i>		X
	† <i>Sespedectes</i> sp.		X
	†Erinaceidae		X
shrews	†Heterosoricidae	X	X
	Soricidae		X
pikas	† <i>Cuyamalagus dawsoni</i>	X	X
	† <i>Cuyamalagus</i> sp.		X
	†? <i>Gripholagomys</i> sp.	X	X
rabbit	† <i>Archaeolagus</i> sp.		X
chipmunks	† <i>Nototamias</i> sp.	X	X
	† <i>Tamias</i> sp.		X
squirrels	† <i>Miospermophilus</i> sp.	X	X
	†? <i>Petauristodon</i> sp.	X	X
vesper rodents	† <i>Hesperomys (Ledimys) nematodon</i>	X	X
	† <i>Ledimys</i> sp.	X	X
cricetid rodents	† <i>Trogomys</i> sp.	X	X
	† <i>Yatkolamys</i> sp.		X
paramyid rodents	† <i>Leptotomus</i> sp.		X
	† <i>Microparamys</i> sp.		X

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Common Name	Taxon	Sespe	Vaqueros -Sespe
relative of pocket gophers/ kangaroo rats/ pocket mice	† <i>Cupidinimus</i> near <i>C. lindsayi</i>		X
	† <i>Griphomyssp.</i>		X
	† <i>Heliscomys</i> sp.	X	X
	† <i>Proheteromys</i> sp.	X	X
	† <i>Pseudotheridomys cuyamensis</i>		X
	† <i>Pseudotheridomys</i> sp. (large)		X
	† <i>Schizodontomys</i> sp.	X	X
simimyid rodents	† <i>Simimys simplex</i>		X
	† <i>Simimys</i> sp.		X
opossums	† <i>Herpotherium</i> sp.	X	X
	† <i>Peratherium</i> sp.		X
iguana	<i>Parasauromalus</i> sp.	X	
boa	Boidae		X
turtle	Testudinata		X
palm	Palmaceae		X

EARLY MIOCENE VAQUEROS FM.

24 localities

Common Name	Taxon	locality #	Location	# of localities	Within City?	Reference
invertebrates	numerous	LACMIP 1189	Moulton Parkway; 2 miles south of intersection with El Toro Road	1	no	LACMIP 2018
		LACMIP 16392	west side of Plano Trabuco; Santa Ana Mts.; Corona Topo	1	no	LACMIP 2018
		LACMIP 16508	Hicks Canyon, El Toro 7.5'topo	1	no	LACMIP 2018
		LACMIP 7700, 16443,16667	Orange County	3	no	LACMIP 2018
		LACMIP 17601	Bee Canyon Landfill	1	no	LACMIP 2018
whale	Cetacea	SDNHM 4610	Bolero Lookout	1	possibly	SDNHM 2018
sea cow	Sirenia					
mammal	Mammalia					
sharks and rays	numerous					
turtle	Testudinidae					
invertebrates	numerous	UCMP A527	Laguna Canyon	1	no	UCMP 2018
		UCMP A538	French Hill	1	no	UCMP 2018
		UCMP 1152	Aliso Creek	1	no	UCMP 2018
		UCMP 2335	Bee Canyon		no	UCMP 2018
		UCMP 2339	Oso Creek	1	no	UCMP 2018
		UCMP A528-A529, A534-A535, A537, A543, 1151, 1157, 2330, 2344, 6128	Orange County	11	no	UCMP 2018

MIDDLE MIOCENE TOPANGA FORMATION

37 localities

Locality	Location	In City?	Reference
LACM 3222	western side of Aliso Creek	yes	McLeod 2018
LACM 4007	at the head of Rim Rock Canyon south of Temple Hill Drive	yes	McLeod 2018
LACM 4464, 4545-4552, 4556-4558, 4961, 5494-5496	Oso Dam area	no	McLeod 2018
LACM 5511	near Cook's Corner	no	McLeod 2018
LACM 5769	Oso Creek	no	McLeod 2018
LACM 6064	Mission Viejo east of Oso Creek	no	McLeod 2018
LACM 7200	south of LACM 5511	no	McLeod 2018
LACM 7249	Top of the World; on top of the ridge above Temple Hill	yes	McLeod 2018
OCPC 2003, 2007, 2036, 2044, 2045, 2051, 2079, 2094, 2097-2098, 2123, 2250	ETC Blackstar Canyon USGS 7.5' topo	no	OCPC 2018
UCMP 1056	Santiago Canyon Road	possibly	UCMP 2018
UCMP V72060	Top Of The World	yes	UCMP 2018

Common Name	Taxon	LACM 3222	LACM 4007	LACM 4464, 4545-4552, 4556-4558, 4961, 5494-5496	LACM 5511	LACM 5769	LACM 6064	LACM 7200	LACM 7249	OCPC 2003, 2007, 2036, 2044, 2045, 2051, 2079, 2094, 2097-2098, 2123, 2250	UCMP 1056	UCMP V72060
walrus-like seal	† <i>Allodesmus</i> sp.			X						X		
eared seal	† <i>Eotaria citrica</i>			X			X					
seal	Otaridae									X		
walrus	† <i>Neotherium</i> sp.			X						X		
	† <i>Pelagiarctos</i> sp.			X								
right whale	Cetotheriidae			X								
baleen whale	Mysticeti									X		
dolphin	† <i>Lamprolithax</i> sp.			X								
	Delphinidae									X		
sperm whale	Physeteridae									X		
toothed whale	Odontoceti									X		
whale	Cetacea									X		
elephant	Proboscidea									X		
dugong	† <i>Metaxytherium arctodites</i>				X							
sea cow	† <i>Dioplotherium allisoni</i>								X		X	
	†Dugongidae		X									
desmostylus	† <i>Desmostylus hesperus</i>											X
	† <i>Desmostylus</i> sp.	X		X				X				
	† <i>Paleoparadoxia</i> sp.						X					
	Desmostylia									X		
rodents	numerous									X		
duck	Anatinae			X								

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Common Name	Taxon	LACM 3222	LACM 4007	LACM 4464, 4545-4552, 4556-4558, 4961, 5494-5496	LACM 5511	LACM 5769	LACM 6064	LACM 7200	LACM 7249	OCPC 2003, 2007, 2036, 2044, 2045, 2051, 2079, 2094, 2097-2098, 2123, 2250	UCMP 1056	UCMP V72060
auklet	† <i>Alcodes ulnulus</i>			X								
booby	Sulidae			X								
albatross	† <i>Diomedea milleri</i>			X								
shearwater	† <i>Puffinus priscus</i>			X								
leatherback sea turtle	Dermochelyidae			X								
sea turtle	Chelonioidea									X		
bony fish	numerous			X						X		
sharks and rays	numerous			X		X				X	X	
invertebrates	numerous									X		

LATE MIOCENE MONTEREY FORMATION

Monterey Formation – 31 localities

Locality	Location	In City?	Reference
LACM 3198, 3486, 3209-3210, 3412-3413, 4103-4114	southwestern portion of the proposed project area	no	McLeod 2018
OCPC 00023	Pecten Reef I	yes	OCPC 2018
OCPC 05431	Pecten Reef, Carol Stadum collection	yes	OCPC 2018
SDNHM 4520	Pecten Reef- Lake Forest	yes	SDNHM 2018
SDNHM 4522	Pecten Reef - Lake Forest - Phosphate Bed	yes	SDNHM 2018
SDNHM 4892	Pecten Reef - Lake Forest - Diatomite/Ash	yes	SDNHM 2018
SDNHM 4964	Pecten Reef- Lake Forest- Orange Sand	yes	SDNHM 2018
UCMP 1910	Aliso Creek	no	UCMP 2018
UCMP 6131	Bee Canyon	no	UCMP 2018
UCMP 36218	Antonio Parkway	yes	UCMP 2018
UCMP V71020	El Toro 1	no	UCMP 2018
UCMP V91240/ LACM 7136	Moulton Parkway	yes	UCMP 2018
UCMP V99592, V99593	Turtles	yes	UCMP 2018

Common Name	Taxon	LACM 3198, 3486, 3209-3210, 3412-3413, 4103-4114	OCPC 00023, 5431	SDNHM 4520, 4522, 4892, 4964	UCMP 1910, 6131, 36218	UCMP V71020	UCMP V91240/ LACM 7136	UCMP V99592, V99593
walrus-like seal	† <i>Allodesmus kernensis</i>					X		
walrus-like seal	†Desmatophocidae?			X				
sea lion	Otariidae	X				X		
dolphin	†Kentriodontidae	X						
sperm whale	Physeteridae					X		
toothed whale	Odontoceti			X				
rorqual whale	Balaenopteridae?			X				
baleen whale	Mysticeti	X						
whale	Cetacea			X				
dugong	† <i>Dioplotherium allisoni</i>	X						
	<i>Dusisiren jordani</i>					X		
desmostylus	†Desmostylidae			X				
bird	Aves	X					X	
crocodile	† <i>Crocodylus</i> sp.	X						
	†Crocodylidae			X				
leatherback sea turtle	† <i>Psephophorus</i> sp.						X	
leatherback sea turtle	Dermochelyidae							X
sea turtle	Cheloniidae			X				
bony fish	numerous	X		X		X	X	
sharks and rays	numerous	X	X	X		X	X	
invertebrates	numerous	X	X	X	X			
land plants	numerous			X				
algae	numerous			X				

LATE MIOCENE PUENTE FORMATION

35 localities

Common Name	Taxon	Puente Formation Member	locality #	Location	# of localities	Within City?	Reference
sea lion	Otariidae	La Vida	OCPC 2041-2043, 2046 2050, 2053, 2056, 2058, 2110, 2124, 2130-2131, 2155, 2177, 2191, 2193, 2211, 2235-2244, 2246- 2248, 2254-2256, 2261- 2262	ETC Blackstar Canyon USGS 7.5' topo	35	no	OCPC 2018
desmostylus	† <i>Desmostylus</i> sp. †Desmostylidae						
bony fish	numerous						
sharks and rays	numerous						
invertebrates	numerous						
land plants	numerous						
herring	Clupeioidi	Soquel	OCPC 2245	ETC Blackstar Canyon USGS 7.5' topo	1	no	OCPC 2018
tonguefish	<i>Symphurus</i> sp.	undifferentiated	LACM 6287	southeast of Santiago Reservoir along Santiago Cyn Rd in Limestone Cyn	1	no	McLeod 2018
bony fish	Osteichthyes	undifferentiated	UCMP V68103	Aliso Creek	1	no	UCMP 2018

LATE MIOCENE TO PLIOCENE CAPISTRANO AND PLIOCENE NIGUEL FORMATIONS

Capistrano Formation, Oso Sand – 33 localities

Locality	Location	In City?	Reference
OCPC 00013	El Toro Materials Co. Rocky Rd	yes	OCPC 2018
OCPC 00131	El Toro Rd Island	yes	OCPC 2018
OCPC 00429, 00559	Orange County	no	OCPC 2018
OCPC 00721	Waldo locality, JMTC-828	yes	OCPC 2018
OCPC 01000	Aliso Creek Flying Whale	yes	OCPC 2018
OCPC 03203	JMTC-F-8		OCPC 2018
OCPC 03204- 03223	JMTC-808 to JMTC-827		OCPC 2018
OCPC 03224	JMTC-829		OCPC 2018
OCPC 04129	Baker Ranch, MM93-511-1	yes	OCPC 2018
OCPC 05337	El Toro Materials, ELT230, BRS-030523-0	yes	OCPC 2018
OCPC 05340	El Toro Materials, ELT230, BRS-030905-01	yes	OCPC 2018
OCPC 05341	El Toro Materials, ELT230, BRS-041103-01	yes	OCPC 2018
OCPC 05342	El Toro Materials, ELT230, KSB-030509-01	yes	OCPC 2018
OCPC 05344	El Toro Materials, ELT230, BRS-040520-01	yes	OCPC 2018
OCPC 05345	El Toro Materials, ELT230, LSA-ETM-General	yes	OCPC 2018
OCPC 05346	El Toro Materials, ELT230, BRS-021127-01	yes	OCPC 2018
OCPC 05348	El Toro Materials, ELT230, BRS-040106-01	yes	OCPC 2018
OCPC 05349	El Toro Materials, ELT230, BRS-040114-01	yes	OCPC 2018
OCPC 05350	El Toro Materials, ELT230, SKY-030325-01	yes	OCPC 2018
SDNHM 6316 - 6320	AJ West Ranch	yes	SDNHM 2018

Capistrano Formation – 30 localities

Locality	Location	In City?	Reference
LACM 3199, 3218, 3221, 3410-3411, 3491, 4177, 4666-4668, 5500, 7370-7372, 7546-7547	Lake Forest	yes	McLeod 2018
UCMP IP7081	Doheny State Park	no	UCMP 2018
UCMP V5049	Petrel		UCMP 2018
UCMP V72103	El Toro 2	yes	UCMP 2018
UCMP V72149	Sulpher Creek Reservoir		UCMP 2018

Niguel Formation – 4 localities

Locality	Location	In City?	Reference
LACM 3804	south of Oso Parkway ~1/2 mi west of I-5	yes	McLeod 2018
LACM 5551	south along La Paz Road west of I-5	yes	McLeod 2018
LACM 7058	almost due east of the southeastern-most point of the proposed project area east of I-5 and north of La Paz Rd in Mission Viejo	yes	McLeod 2018
LACM 65187	north of La Paz Road west of I-5	yes	McLeod 2018

Common Name	Taxon	Niguel Fm.	Capistrano Fm., Oso Sand	Capistrano Fm.
giant otter	† <i>Satherium</i> sp.			X
walrus-like seal	† <i>Allodesmus</i> sp.		X	
false walrus	† <i>Gomphotaria pugnax</i>		X	X
false walrus	† <i>Gomphotaria</i> sp.		X	
walrus	† <i>Pliopedia</i> sp., Odobenidae		X	
sea lion	† <i>Imagotaria</i> sp.			X
sea lion	†Imagotariinae		X	
sea lion	Otariinae, Otariidae		X	
fur seal	<i>Arctocephalus</i> sp.		X	
true seal	Phocidae		X	
pinniped	Pinnipedia		X	
carnivore	Carnivora		X	
rodent	Rodentia		X	
antilocaprid	Antilocapridae		X	
camels	† <i>Camelops</i> sp., † <i>Megatylopus</i> sp.		X	
camel	†Camelidae	X	X	X
artiodactyl	Artiodactyla		X	
right whale	Balaenidae		X	X
rorqual whale	Balaenopteridae		X	X
primitive baleen whale	† <i>Herpetocetus</i> sp.	X		X
baleen whales	Cetotheriidae, Mysticeti		X	
dolphin	† <i>Piscolithax</i> sp., Delphinidae		X	
sperm whale	<i>Physeter microcephalus</i>		X	
sperm whale	Physeteridae			X
toothed whale	Odontoceti		X	
whale	Cetacea	X	X	X
horses	† <i>Pliohippus</i> sp.		X	X
horses	†cf. <i>Dinohippus</i> sp., †Equidae		X	
rhinoceros	†Rhinocerotidae		X	X
mastodon	†Mammutidae		X	
dugong	Dugonidae	X	X	X
sea cow	Sirenia		X	
desmostylus	† <i>Desmostylus</i> sp., †Desmostylidae		X	
storm petrel	† <i>Oceanodroma hubbsi</i>			X
toothed-bird	† <i>Osteodontornis</i> sp.		X	
sandpiper	Scolopacidae			X
puffin	Mancallinae			X
bird	Aves		X	
leatherback sea turtle	† <i>Psephophorus</i> sp.			X
leatherback sea turtle	Dermochelyidae		X	
sea turtle	Chelonioidea		X	

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Common Name	Taxon	Niguel Fm.	Capistrano Fm., Oso Sand	Capistrano Fm.
tortoise	† <i>Geochelone</i> sp.			X
tortoise	<i>Testudo</i> sp.		X	
crocodile	Crocodylidae			X
bony fish	numerous	X	X	X
sharks and rays	numerous		X	X
invertebrates	numerous		X	X
land plants and algae	numerous		X	

PLEISTOCENE LOCALITIES

29 localities

Locality	Location	In City?	Reference
LACM 65129	Costeau Pit	no	McLeod 2018
LACM 69121	Bolsa Chica State Park	no	Jefferson 1991
OCPC 2005, 2006, 2033, 2048, 2049, 2054, 2055, 2070-2072, 2093, 2120, 2129, 2210, 2232, 2233	Black Star Canyon 7.5', Hwy 241	no	OCPC 2018
OCPC 2002, 2004, 2029, 2086, 2121, 2229-2231	El Toro 7.5', Hwy 133	no	OCPC 2018
OCPC 2000, 2001, 2258	Tustin 7.5', Hwy 133	no	OCPC 2018

Common Name	Taxon	other localities	Costeau Pit, Laguna Hills
Harlan's ground sloth	† <i>Paramylodon harlani</i>	X	X
Jefferson's ground sloth	† <i>Megalonyx jeffersoni</i>	X	
ground sloth	†cf. <i>Megalonyx</i> sp.	X	
coyote	<i>Canis</i> sp. cf. <i>C. latrans</i>		X
dire wolf	† <i>Canis</i> sp. cf. <i>C. dirus</i>		X
short faced bear	† <i>Ursus arctodus</i>	X	
saber-toothed cat	† <i>Smilodon</i> sp. cf. <i>S. fatalis</i>		X
American lion	† <i>Felis atrox</i>	X	
Columbian mammoth	† <i>Mammuthus columbi</i>		X
mammoth	† <i>Mammuthus</i> sp.	X	
American mastodon	† <i>Mammut</i> sp. cf. <i>M. americanum</i>	X	
mammoth or mastodon	†Proboscidea	X	
horses	† <i>Equus occidentalis</i>	X	
horses	† <i>Equus</i> sp.	X	X
yesterday's camel	† <i>Camelops</i> sp. cf. <i>C. hesternus</i>		X
llama	† <i>Hemiauchenia</i> sp.		X
diminutive pronghorn	† <i>Capromeryx</i> sp.		X
deer	Cervidae		X
ancient bison	† <i>Bison antiquus</i>	X	X
long-horned bison	† <i>Bison latifrons</i>		X
desert shrew	<i>Notiosorex crawfordi</i>		X
shrew	<i>Sorex</i> sp.	X	
brush rabbit	<i>Sylvilagus</i> sp. cf. <i>S. bachmani</i>		X
desert cottontail	<i>Sylvilagus audubonii</i>		X
black-tailed jack rabbit	<i>Lepus</i> sp. cf. <i>L. californicus</i>		X
California ground squirrel	<i>Spermophilus beecheyi</i>		X
Botta's pocket gopher	<i>Thomomys bottae</i>		X
kangaroo rat	<i>Dipodomys</i> sp.		X
California pocket mouse	<i>Perognathus</i> sp. cf. <i>P. californicus</i>		X
eastern harvest mouse	<i>Reithrodontomys</i> sp. cf. <i>R. humulis</i>		X
deer mouse	<i>Peromyscus maniculatus</i>		X
wood rat	<i>Neotoma</i> sp.		X

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Common Name	Taxon	other localities	Costeau Pit, Laguna Hills
vole	<i>Microtus</i> sp.		X
muskrat	<i>Ondatra</i> sp.		X
long-tailed weasel	<i>Mustela frenata</i>		X
duck	<i>Anas</i> sp.		X
hawk	<i>Buteogallus</i> sp.		X
quail	<i>Callipepla</i> sp.		X
American coot	<i>Fulica</i> sp. cf. <i>F. americana</i>		X
owl	<i>Athene</i> sp.		X
passerine bird	Passeriformes		X
fence lizard	<i>Sceloporus</i> sp.		X
whip-tailed lizard	<i>Cnemidophorus</i> sp.		X
Mojave green rattlesnake	<i>Crotalus viridis</i>		X
rattlesnake	<i>Crotalus</i> sp.	X	
pine snake	<i>Pituophis melanoleucus</i>		X
gopher snake	<i>Pituophis</i> sp.	X	
lizard or snake	Squamata		X
western pond turtle	cf. <i>Actinemys marmorata</i>		X
desert tortoise	<i>Gopherus</i> sp.		X
western toad	<i>Anaxyrus boreas</i>		X
northern red-legged frog	<i>Rana aurora</i>		X
arboreal salamander	<i>Anedes lugubris</i>		X
mole salamander	<i>Ambystoma</i> sp.	X	
frog	Anura	X	

APPENDIX D. CULTURAL RESOURCE STUDIES

City of Lake Forest Paleontological and Cultural Assessment Report

Report No.	Author(s)	Title	Year	Quad Maps
OR-00019	Howard, Jerry B.	Archaeological Site Survey, El Toro Road Realignment	1975	El Toro
OR-00052	Van Horn, David M.	Archaeological Survey Report on the Site of the Proposed El Toro Community Park in the Unincorporated Territory of El Toro	1977	El Toro, San Juan Capistrano
OR-00064	Desautels, Roger J.	Archaeological Survey Report on Tentative Tract No. 9037 Lot G in Block a of County of Orange	1976	El Toro
OR-00069	Desautels, Roger J.	Archaeological Survey Report on the Planning Area, Lake Forest 1, Orange County, California	1976	El Toro
OR-00070	Desautels, Roger J.	Archaeological Survey Report on the Proposed Park Lane Mobile Estates Located in the El Toro Area, Orange County, California	1976	San Juan Capistrano
OR-00074	Desautels, Roger J.	Archaeological Survey Report on the Northwesterly Boundary of Tentative Tract No. 8461 in the El Toro Area of Orange County, California	1976	El Toro
OR-00078	Desautels, Roger J.	Area 16-13 Located at 25114 Irvine Blvd. in the Lake Forest Area of Orange County, California	1976	El Toro
OR-00088	Desautels, Roger J.	Archaeological Survey Report on Lot D and a Portion of Lot C of the Baldwin and Bridgers Subdivision Located in the El Toro Area of Orange County	1976	San Juan Capistrano
OR-00101	Desautels, Roger J.	Archaeological Survey Report on Tract No. 9106 Located in the Lake Forest Area of Orange County	1976	El Toro
OR-00135	Whitney-Desautels, Nancy A.	Archaeological Survey Report on Approximately a Twenty-one (21) Acre Parcel Located in the El Toro Area of the County of Orange	1977	El Toro
OR-00148	Desautels, Roger J.	Archaeological Survey Report on 17.63 Acres of Land Located in the Rancho De Los Alisos Area of the County of Orange	1977	El Toro
OR-00171	Desautels, Roger J.	Archaeological Survey Report on Lot 5, Tract 70 in the Aliso City Area of the County of Orange	1987	El Toro
OR-00180	Desautels, Roger J.	Archaeological Survey Report on a Parcel of Land Located in the Cook's Corner Area of the County of Orange	1977	Santiago Peak
OR-00185	Desautels, Roger J.	Archaeological Survey Report on a 34 Acre Parcel of Land Located in the El Toro Area of the County of Orange	1977	El Toro
OR-00189	Desautels, Roger J.	Archaeological Survey Report on a Fifty (+) Acre Parcel of Land in the El Toro Area of the County of Orange	1977	El Toro
OR-00201	Perry, Robert	Archaeological Survey Report on an Archaeological Survey of a Fifty (50) Acre Parcel of Land Located in the El Toro Area of the County of Orange	1977	El Toro
OR-00208	La Fontaine, Keith	Archaeological Survey Report on Seventy-seven (77) Acres of Land Located in the El Toro Area of the County of Orange	1978	El Toro
OR-00209	La Fontaine, Keith and Mark Desautels	Archaeological Survey Report on 7.42 Acres of Land Located in the El Toro Area of the County of Orange	1978	El Toro
OR-00238	Howard, Jerry B.	A Reevaluation of the Cultural Resources of the Glen Ranch	1977	El Toro, Santiago Peak
OR-00251	Desautels, Roger J. and Paul G. Chace	Archaeological Report on an Archaeological Survey, Inventory, and Analysis of Alternate Realignment of El Toro Road Between 2.6 Miles Northerly of Trabuco Road and Live Oak Canyon Road in Orange County, California	1976	El Toro, Santiago Peak

City of Lake Forest Paleontological and Cultural Resources Assessment Report

Report No.	Author(s)	Title	Year	Quad Maps
OR-00254	Whitney-Desautels, Nancy A.	Archaeological Report on the Aliso Creek Specific Plan-planning Unit 1 Located in the El Toro and Laguna Hills Area of the County of Orange	1977	El Toro, San Juan Capistrano
OR-00277	Cottrell, Marie G.	Archaeological Reconnaissance of the Serrano Highlands, Project Area (rancho De Los Alisos, Units 1 & 2)	1978	El Toro
OR-00286	Bean, Lowell	Cultural Resources and the High Voltage Transmission Line From San Onofre to Santiago Substation and Black Star Canyon	1979	,El Toro, San Juan Capistrano
OR-00322	Mabry, Theo N.	Archaeological Records Search and Reconnaissance Survey for Tentative Tract 10633, Orange County, California	1979	El Toro, San Juan Capistrano
OR-00327	Whitney-Desautels, Nancy A.	The Archaeology and History of Heritage Hill: a Proposed Historical Complex of Serrano Community Park	1978	El Toro
OR-00387	Unknown	Archaeological Survey Report on a 120 Acre Parcel of Land Located Along Santiago Canyon Rd. 2 Miles North of Cook's Corner	1977	El Toro
OR-00398	Kearns, Timothy M. and Nancy Whitney-Desautels	Archaeological Report on Archaeological Sites CA-ORA-693, ORA-694, ORA-695, ORA-696, ORA-697, and ORA-699 Located on Rancho De Los Alisos in the County of Orange	1978	El Toro
OR-00404	Wright, Thomas	Archaeological Investigations at CA-ORA-566	1976	El Toro
OR-00444	McCawley, William	Letter Report: Archaeological Survey of a 20 Acre Parcel in the County of Orange (t.r. 10633)	1979	El Toro, San Juan Capistrano
OR-00457	Clevenger, Joyce M.	Archaeological Investigations on Portions of CA-ORA-647 and Ca ORA-648: Two Sites Located Within the Santiago Aqueduct Parallel Project	1979	El Toro
OR-00465	Desautels, Roger J.	Archaeological Survey Report on Tt 10789, Located in the Rancho Serrano Area of the County of Orange	1979	El Toro
OR-00471	Whitney-Desautels, Nancy A.	Cultural Resources Report on Site Plan Number 79-26 Located in the Lake Forest Area of the County of Orange	1980	El Toro
OR-00495	Cottrell, Marie G.	Archaeological Assessment of Rancho De Los Alisos Planning Area 6.	1980	El Toro
OR-00545	Munoz, Jeanne and Theodore G. Cooley	Glenn Ranch: Archaeological Resources and Their Recommended Management	1977	El Toro, Santiago Peak
OR-00546	Cottrell, Marie G.	Records Search for 19+ Acres of the Glen Ranch	1978	El Toro
OR-00560	Cottrell, Marie G.	Letter Report to Mr. Richard Schmid, Envista Inc.	1977	El Toro
OR-00571	Ahlering, Michael L.	Report of Findings of a Scientific Resources Survey and Study: Conducted on a Portion of the Whiting Ranch, Orange County, California	1973	El Toro
OR-00580	Anonymous	The Aliso Creek Watershed, Orange County, California a Proposal for Creating an Archaeological District for the National Register of Historic Places and a Suggested Research and Study Design	1977	El Toro, ,San Juan Capistrano, Santiago Peak

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Report No.	Author(s)	Title	Year	Quad Maps
OR-00581	McCoy, Lesley C. and Kirkish, Alex N.	Cultural Resources Data Recovery Program for the 230kv Transmission Line Rights-of-way From San Onofre Nuclear Generating Station to Black Star Canyon and Santiago Substation and to Encina and Mission Valley Substations	1982	El Toro, San Juan Capistrano,
OR-00591	Cooley, Theodore G. and Marie G. Cottrell	Archaeological Assessment of the Whiting Ranch	1980	El Toro
OR-00611	Bissell, Ronald M.	Cultural Resources Reconnaissance of the Baker Ranch Property, El Toro Orange County,	1988	El Toro
OR-00613	Whitney-Desautels, Nancy A.	Archaeological Report on a Micro-surface Collection of CA-ORA-741 Located on Tt 10323 in the El Toro Area of the County of Orange	1981	El Toro
OR-00627	Jertberg, Patricia R.	An Archaeological Test and Salvage Investigation of CA-ORA-39 and CA-ORA-773, Orange County, California	1981	El Toro
OR-00629	Cottrell, Marie G.	Archaeological Resource Assessment for Two Parcels Near El Toro, California	1981	El Toro
OR-00648	Breece, Bill and Beth Padon	Cultural Resource Survey: Archaeological Resources: Foothill Transportation Corridor, Phase Ii	1982	El Toro, Santiago Peak,
OR-00656	Bissell, Ronald M.	Cultural Resources Survey, Country Home Road Properties (shefflette/carisoza/buckley, Lyon, Watson and 4s Ranch Parcels, Santiago and Live Oak Canyon Roads, Orange County, California	1983	El Toro, Santiago Peak
OR-00730	Bissell, Ronald M.	Cultural Resources Assessment Tentative Tract 12110 Orange County, California	1984	El Toro
OR-00738	Bissell, Ronald M.	Cultural Resources Assessment Tentative Tract 11986 Orange County, California	1984	El Toro
OR-00748	Bissell, Ronald M.	Cultural Resources Assessment Los Alisos Research and Development Park El Toro, Orange County, California	1984	El Toro
OR-00766	Bissell, Ronald M.	Archaeological Survey of the Peterson Property, Four Acres in Santiago Canyon, Orange County, California	1985	El Toro
OR-00773	Bissell, Ronald M.	Archaeological Site CA-ORA-1057, a Late Prehistoric Period Hunting Camp in El Toro, Orange County, California	1985	El Toro
OR-00791	Bissell, Ronald M.	Archaeological Sites CA-ORA-1058 and CA-ORA-698: a Milling Stone Period Complex in El Toro	1985	El Toro
OR-00798	Bissell, Ronald M.	Archaeological Survey of the Canada Apartments Property in El Toro, Orange County, California	1985	El Toro
OR-00799	Bissell, Ronald M.	Archaeological Survey of Property Belonging to the William Lyon Company El Toro, Orange County, California	1985	El Toro
OR-00819	McKenna, Jeanette A.	Final Report on Archaeological Investigations at Sites CA-ORA-858, 859, and 698, Rancho De Los Alisos, Orange County, California	1986	El Toro
OR-00851	Bissell, Ronald M.	Archaeological Sites CA-ORA-176 and CA-ORA-1100 in the El Toro Area, Orange County, California	1986	El Toro
OR-00868	Padon, Beth	Historic Property Survey Report for the I-5/I-405 Confluence City of Irvine, Ca	1987	El Toro, San Juan Capistrano
OR-00875	Bissell, Ronald M.	Cultural Resources Reconnaissance of the Canada Ridge Lane Property, El Toro, Orange County, California	1987	El Toro

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Report No.	Author(s)	Title	Year	Quad Maps
OR-00899	Anonymous	Draft Environmental Impact Report No. 481 Foothill Ranch (formerly Whiting Ranch) Planned Community Area Plan, General Plan Amendment and Zone Change	1987	El Toro
OR-00909	Bissell, Ronald M.	Cultural Resources Reconnaissance of Tentative Parcel 83-110, El Toro, Orange County	1988	El Toro
OR-00934	Drover, Christopher E. and Henry C. Koerper	Archaeological Test Investigations: the Phase I Development of the Whiting Ranch	1982	El Toro
OR-00940	Bissell, Ronald M.	Interim Report Test Excavation of Nine Archaeological Sites on the Pacific Commercentre Property, El Toro Area, Orange County California	1988	El Toro
OR-00970	Brock, James P.	Report on Archaeological Monitoring of Rough Grading for the Baker Extension of Lake Forest Drive, El Toro, California	1989	El Toro
OR-01011	Sorensen, Jerrell H.	Archival Research for Interstate 5, From the Confluence With I 405 to Route 1, Capistrano	1990	El Toro, San Juan Capistrano
OR-01026	Mason, Roger D.	Cultural Resources Survey Report Santiago Canyon Road Alignment Study Orange County, California	1990	El Toro, Santiago Peak
OR-01036	Anonymous	Archaeological Resource Survey Valley Vista Development Orange County, California	1989	Santiago Peak
OR-01038	Brock, James P.	Report on Archaeological Monitoring of Rough Grading for Sta. 55+20.64 to Sta. 70+00.00 of Portola Parkway, El Toro, California	1990	El Toro
OR-01067	Brown, Joan C.	Cultural Resources Reconnaissance of the 72 Acre El Toro Industrial Park	1991	El Toro
OR-01088	Brock, James P.	Report on Archaeological Monitoring of Rough Grading of Bake Parkway From Portola Parkway to Station 159+40.81, El Toro, California	1990	El Toro
OR-01099	Cooley, Theodore G.	Archaeological Resources Assessment Conducted for Proposed Irvine Ranch Water District Pipeline Right of Ways	1979	El Toro
OR-01108	Padon, Beth	Archaeological and Paleontological Resource Assessment, Laguna Canyon Reclaimed Water Facilities	1991	El Toro
OR-01137	Demcak, Carol R.	Cultural Resource Assessment for Planning Areas 11, 17, 27, 67, 80, and 81, Mission Viejo.	1991	El Toro, San Juan Capistrano, Santiago Peak
OR-01150	Perry, Robert	Archaeological Survey Report on Approximately 200 Acres of Rancho De Los Alisos Located in the El Toro Area, County of Orange	1977	El Toro
OR-01152	Sire, Joan, Edward Johnstone, and Doren Desautels	Archaeological Test Report on the Archaeological Resources Contained on a 279+ Acre Parcel of Land Located in the Canada De Los Alisos Area of the County of Orange	1978	El Toro
OR-01156	Brock, James P.	Report on Archaeological Monitoring of Rough Grading of Portola Parkway at Aliso Creek, El Toro, California (station 13+67 to El Toro Road)	1991	El Toro

City of Lake Forest Paleontological and Cultural Resources Assessment Report

Report No.	Author(s)	Title	Year	Quad Maps
OR-01157	Brock, James P.	Report on Archaeological Monitoring of Rough Grading of Portola Parkway From Station 13+67 to Station 42+24, El Toro, California	1991	El Toro
OR-01158	Brock, James P.	Report on Part-time Archaeological Monitoring of Rough Grading of Portola Parkway From Station 42+24 to Station 55+02, Foothill Ranch, El Toro, California	1991	El Toro
OR-01163	Macko, Michael E.	Letter Report on the Results of an Archaeological Survey for the Proposed Botanical Study Area, Wilderness Glen, City of Mission Viejo	1991	El Toro
OR-01309	Macko, Michael E.	Final Report Summary of Archaeological Monitoring, Test Excavations, and Data Recovery for the Foothill Transportation Corridor Northern Segment	1993	El Toro, Santiago Peak
OR-01310	Macko, Michael E. and Gary Hurd	Results of Archaeological Test Excavations for the Foothill Transportation Corridor Northern Segment, Construction Section F8 and F9	1992	El Toro
OR-01354	Munoz, Jeanne	History and Historical Resources of the Whiting Ranch	1980	El Toro
OR-01364	Brock, James P.	Report on Archaeological Monitoring of Rough Grading of Planning Area 6, Foothill Ranch, El Toro, California	1993	El Toro
OR-01372	Brown, Joan C.	Mitigation and Monitoring of Eight Prehistoric Archaeological Sites, CA-ORA-510, CA-ORA-647, CA-ORA-648, CA-ORA-1062, CA-ORA-1063, CA-ORA-1065, CA-ORA-1066, CA-ORA-1171, Located in Southern Orange County, California	1994	El Toro
OR-01376	Brock, James P.	Archaeology of Foothill Ranch Planning Area 15 and a Portion of Planning Area 16, El Toro, California	1994	El Toro
OR-01378	Becker, Kenneth M.	Cultural Resources Reconnaissance of the Proposed Irvine Ranch Water District Zone 9 Reservoir and Transmission Main, Orange County, California.	1994	El Toro
OR-01407	Brown, Joan C.	Cultural Reconnaissance for the Service Connection Enlargement of the Flow Control Facility St-04	1994	El Toro
OR-01408	Demcak, Carol R.	Final Report of Test Level Investigation at ORA-758, Alton Parkway Extension Project, County of Orange, California	1994	El Toro
OR-01425	Brock, James P.	Report on Archaeological Monitoring of the Glenn Ranch Road Right-of-way, Foothill Ranch, El Toro, Orange County, California	1995	El Toro
OR-01432	Harris, Nina M. and James Brock	Test Investigations at CA-ORA-827 and CA-ORA-1373, Glenn Ranch Road Right-of-way, Foothill Ranch, El Toro, Orange County, California	1994	El Toro
OR-01439	McCoy, Lesley C. and Phillips Roxana	National Register Assessment Program of Cultural Resources of the 230 Kv Transmission Line Rights-of-way From San Onofre Nuclear Generating Station to Black Star Canyon and Santiago Substation and to Encina and Mission Valley Substation	1980	El Toro, San Juan Capistrano,
OR-01445	Desautels, Roger J., David Van Horn, Paul Chase, and Nancy Whitney	Archaeological Field Test Report on Archaeological Sites Ora458, Ora485, Ora486, Ora488 & Ora507 Located in the Upper Aliso Creek Area of Orange County P.O. No. C 60012 Control No.39717	1977	El Toro, Santiago Peak
OR-01495	Brock, James P.	Report on Archaeological Monitoring of Rough Grading of Planning Area 8, Foothill Ranch, El Toro, California	1996	El Toro

City of Lake Forest Paleontological and Cultural Resources Assessment Report

Report No.	Author(s)	Title	Year	Quad Maps
OR-01536	Brown, Joan C.	Archaeological Reconnaissance for the Whiting Zone 9 Reservoir and Transmission Main, Orange County, California	1995	El Toro
OR-01545	Brown, Joan C.	Archaeological Monitoring of a Portion of the Whiting Zone 9 Reservoir and Transmission Main, Orange County	1997	El Toro
OR-01549	Brock, James P.	Cultural Resources Assessment of an Approximately 11-acre Property in Lake Forest California	1997	El Toro
OR-01551	Brock, James P.	Report on Archaeological Monitoring of a Rough Grading of Planning Area 9, Foothill Ranch, El Toro California	1997	El Toro
OR-01563	Brock, James P.	Report on Archaeological Monitoring of Planning Area 12, Foothill Ranch, El Toro, Orange County, California	1997	El Toro
OR-01567	Jertberg, Patricia R.	Archaeological Services for 25781 Atlantic Ocean Drive, Lake Forest (permit #w007506)	1997	El Toro
OR-01583	Nicoll, Gerald A.	Archaeology and Paleontology Report for Rancho De Los Alisos Area, Orange County, California	1974	El Toro
OR-01637	Sawyer, William A. and Brock, James	Report on Archaeological Monitoring for the Aliso Oaks Ranch Project (tentative Tract 11919), Santiago Canyon, Orange County, California	1998	Santiago Peak
OR-01679	Jertberg, Patricia R.	Archaeological Services for Tract 13343, Lot 5, Pacific Commercentre, Lake Forest	1998	El Toro
OR-01687	Brock, James P.	Report on Archaeological Monitoring of Rough Grading of Planning Area 16, Tentative Tract 13419, Foothill Ranch, El Toro, California	1998	El Toro
OR-01696	Jertberg, Patricia R.	Archaeological Services for Tract 13344, Lot 13, 26012 Atlantic Ocean Drive, and Lot 39, 26021 Commercentre Drive, Lake Forest	1998	El Toro
OR-01697	Jertberg, Patricia R.	Archaeological Services for Tract 13343, Lot 1, 20571 Crescent Bay Drive, Lake Forest	1998	El Toro
OR-01698	McLean, Deborah K.	Archaeological Assessment for Pacific Bell Mobile Services Telecommunications Facility Cm 310-04, 1505-3533 East Chapman Avenue, City of Orange, County of Orange, California	1998	Orange
OR-01749	Brechbiel, Brant A.	Cultural Resources Records Search and Literature Review Report for a Pacific Bell Mobile Services Telecommunications Facility: Cm 225-22 in the City of Lake Forest, California	1998	El Toro
OR-01750	Brechbiel, Brant A.	Cultural Resources Records Search and Literature Review Report for a Pacific Bell Mobile Services Telecommunications Facility: Cm 243-39 in the City of Lake Forest, California	1998	El Toro
OR-01752	Brechbiel, Brant A.	Cultural Resources Records Search and Literature Review Report for a Pacific Bell Mobile Services Telecommunications Facility: Cm 410-11 in the City of Lake Forest, California	1998	El Toro
OR-01996	Brown, Joan C.	Cultural Resources Literature and Records Review for the Foothill/Trabuco Project (Revised)	1999	El Toro, Santiago Peak
OR-02039	Duke, Curt	Cultural Resource Assessment for Pacific Bell Mobile Services Facility Cm 285-04, County of Orange, California	1999	San Juan Capistrano
OR-02100	Duke, Curt	Cultural Resource Assessment for Pacific Bell Wireless Facility Cm 367-01, County of Orange	2000	El Toro
OR-02110	Duke, Curt and Nicole Wallock	Results of the Cultural Resource Records Search and Extended Survey for Pacific Bell Wireless Facility Cm 324-03, Orange County	2000	El Toro
OR-02111	Brock, James P.	Cultural Resources Assessment of a 13.2 Acre Property in Lake Forest	2000	El Toro

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Report No.	Author(s)	Title	Year	Quad Maps
OR-02112	Brock, James P.	Cultural Resources Evaluation for the Foothill Gateway Project, City of Lake Forest, Orange County	2000	El Toro
OR-02211	Hoover, Anne M.	Cultural Resources Reconnaissance and Monitoring of Pacific Commercentre, and Mitigation of CA-ORA-1581, City of Lake Forest, County of Orange, Ca	2001	El Toro
OR-02218	Brock, James P.	Archaeological Assessment for the Proposed Comfort Inn Project, 20768 Lake Forest Drive, Orange County, Ca	2000	El Toro
OR-02219	White, Robert S., White, Laurie, and Minch, John	Archaeological and Paleontological Assessments of a 12.05 Acre Parcel Located Just East of Dimension Drive and Enterprise Way in Lake Forest, Orange County	2000	El Toro
OR-02334	Hoover, Anna M.	Archaeological and Paleontological Monitoring at Lots 9 and 10, Tract 15753, Lake Forest , Orange County, California	2001	El Toro
OR-02420	Duke, Curt	Cultural Resource Assessment Cingular Wireless Facility No. Sc 059-02 Orange County, California	2002	San Juan Capistrano
OR-02522	Wallock, Nicole	Upper Aliso Creek Archaeological District	2001	El Toro, Santiago Peak
OR-02531	Duke, Curt	Cultural Resource Assessment AT&T Wireless Services Facility No. 13113a, Orange County, California	2002	El Toro
OR-02569	Henriksen, Karen J.	Final Archaeological Report on Archaeological Sites CA-ORA-693, CA-ORA-694, CA-ORA-695, CA-ORA-696, CA-ORA-697, and CA-ORA-699 Located on Rancho De Los Alisos in the County of Orange	1983	El Toro
OR-02575	Colegrove, Stephen E.	Archaeological and Paleontological Site Survey of Planning Areas 70, 41, and 3, Mission Viejo	1975	El Toro, San Juan Capistrano
OR-02646	Duke, Curt	Cultural Resource Assessment at & T Wireless Services Facility No. 13339a Orange County, California	2002	El Toro
OR-02655	Duke, Curt	Cultural Resource Assessment for Pacific Bell Wireless Facility Cm 367-01, in the County of Orange, California	2000	El Toro
OR-02660	Duke, Curt	Cultural Resource Assessment at & T Wireless Services Facility No. 13110b Orange County, California	2002	El Toro
OR-02927	Padon, Beth	Archaeological and Paleontological Monitoring of Ascension Cemetery, Phase I Improvements, in the City of Lake Forest, California	2005	El Toro
OR-02928	Demcak, Carol R.	Final Report of Salvage Level Investigations at ORA-758, Alton Parkway Extension Project, County of Orange, California	1994	El Toro
OR-02930	Bonner, Wayne H.	Records Search Results and Site Visit for Cingular Telecommunications Facility Candidate Sc-141-01 (sub Abd Sail Club), 24752 Toledo Lane, Lake Forest, Orange County, California	2003	El Toro
OR-02932	Fulton, Phil	Cultural Resource Assessment Verizon Wireless Services Julio Facility Lake Forest, Orange County, California	2005	El Toro
OR-02951	Bonner, Wayne H.	Records Search Results for Cingular Wireless Site Sc-096-04 (el Toro Memorial Park), 25741 Trabuco Rd., Lake Forest, Orange County, California	2002	El Toro
OR-02954	Wlodarski, Robert J.	Records Search Results for the Proposed Mountain Union Telecom Regency Lane Cell Site (po/ref# Sfc4001), Located at 20595 Regency Lane, City of Lake Forest, County of Orange, California	2004	El Toro

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Report No.	Author(s)	Title	Year	Quad Maps
OR-03049	Bonner, Wayne H.	Cultural Resources Records Search Results and Site Visit for T-Mobile Candidate La02894a (cm367 Regency Lane), Lake Forest, Orange County, California	2006	El Toro
OR-03050	Bonner, Wayne H.	Cultural Resources Records Search Results and Site Visit for Cingular Wireless Candidate Oc-0056-01 (sce Tower/Trabuco Canyon) Santiago Canyon Road, Portola Hills, Orange County, California	2005	El Toro
OR-03063	Bonner, Wayne H.	Records Search Results for Sprint Pcs Facility Og65xc417d (the Pacific World Site), Located at 25791 Commercentre Drive, El Toro in Orange County, California	2001	El Toro
OR-03127	Smith, Brooks R. and Deborah K.B. McLean	Archaeological Monitoring Report the Orchard at Saddleback-phase Ii City of Lake Forest, Orange County, California	2006	San Juan Capistrano
OR-03148	Kyle, Carolyn E.	Cultural Resource Assessment for Cingular Wireless Facility Sc059-04 City of Laguna Hills, Orange County, California	2002	San Juan Capistrano
OR-03278	McLean, Deborah K. and Shannon, Carmack	Archaeological Monitoring Report the Orchard at Saddleback City of Lake Forest, Orange County, California	2005	San Juan Capistrano
OR-03285	Fulton, Terri and Deborah McLean	Archaeological Mitigation Monitoring Report for the Irvine Desalter Pipelines Project	2006	El Toro, Tustin
OR-03370	Greene, Richard and Brian F. Smith	A Cultural Resources Study of the Portola Center Project	2007	El Toro
OR-03373	Arrington, Cindy and Nancy Sikes	Cultural Resources Final Report of Monitoring and Findings for the Qwest Network Construction Project State of California: Volumes I and Ii	2006	El Toro, San Juan Capistrano, Santiago Peak
OR-03385	Fulton, Terri	Cultural Resource Assessment: Verizon Wireless Portola Hills Fast Track Facility Project No. 25005-005032.03 City of Lake Forest, Orange County, California	2006	El Toro
OR-03433	Bonner, Wayne H.	Cultural Resource Records Search and Site Visit Results for Sprint Nextel Candidate Ca7093 (intense), 25751 Trabuco Road, Lake Forest, Orange County, California	2007	El Toro
OR-03600	Garcia, Kyle H. and Marcy Rockman	Results of Archaeological Survey and Monitoring for Southern California Edison's Pole Replacements After Santiago Fire Along Santiago Canyon Road, Modjeska Canyon Road, and Hicks Canyon Road; Orange County, California; Jo:6259-0468	2007	El Toro, Santiago Peak
OR-03747	Bai "Tom" Tang and Michael Hogan	Identification and Evaluation of Historic Properties- Lake Forest ADA Wheelchair Access Ramp Improvement Project	2008	El Toro
OR-03748	Patrick O. Maxon	Phase II Archaeological Evaluation CA-ORA-1004 & CA-ORA-1150	2009	El Toro

City of Lake Forest Paleontological and Cultural Resources Assessment Report

Report No.	Author(s)	Title	Year	Quad Maps
OR-03749	Patrick O. Maxon	Phase I Cultural Resources Reconnaissance Survey- Proposed Alton Parkway Extension Project, Including Baker Ranch, Lake Forest, CA	2008	El Toro
OR-03757	Bai "Ton" Tang and Michael Hogan	Identification and Evaluation of Historic Properties: Lake Forest ADA Wheelchair Access Ramp Improvement Project (Phase III)	2009	El Toro, San Juan Capistrano
OR-03770	Clark, Fatima	Results of the Cultural Resource Assessment for the Southern California Edison Replacement of Deteriorated Pole Nos. 2140160E, 2140170E, 2140171E, 2140178E, 2140179E, and 2280425; Orange County, California; WO 4805-0557	2009	El Toro
OR-03840	Marken, Mitch	Phase I Archaeological Assessment for the IRWD Baker Regional Water Treatment Plant Project, Orange County, CA	2009	El Toro, Orange
OR-03866	Tang, Tom	Identification of Known Historical/Archaeological Resources Lake Forest ADA Wheelchair Access Ramp Improvement Project (Phase IV) City of Lake Forest, Orange County, California, Project no. PW 2009.09; CRM Tech Contract #2415	2010	El Toro
OR-03950	Billat, Lorna	Hotel Furniture Liquidators, CA-ORC4024C, Collocation Submission Packet	2010	Tustin
OR-03989	Deering, Mark and Mason, Roger D.	Cultural Resources Documentation and Monitoring of Southern California Edison Access Roads During Maintenance by the Orange County Fire Authority, 2010 Orange County, California	2011	El Toro, San Juan Capistrano, Santiago Peak
OR-03992	Bray, Madeleine	Archaeological Addendum Report for the IRWD Baker Regional Water Treatment Plant Project, Orange County, CA	2010	El Toro
OR-04029	Deering, Mark and Roger Mason	Cultural Resources Monitoring of Southern California Edison Access Roads Maintained by Orange County Fire Authority, Orange County, California (JPA E6088-0031; I.O. 305869)	2010	El Toro, San Juan Capistrano, Santiago Peak
OR-04084	Fulton, Terri and Deborah McLean	Cultural Resource Assessment of 22 Natural Treatment System Facility Sites Within the San Diego Creek Watershed - Natural Treatment System Project, Irvine Ranch Water District, Orange County, California	2005	El Toro
OR-04096	Wlodarski, Robert	Record Search Results for the Proposed Bechtel Wireless Telecommunications Site LA3133 (El Toro Storage), located at 23122 El Toro Road, Lake Forest, California	2010	El Toro
OR-04169	Tnag, Tom	Identification of Known Historical/Archaeological Resources Lake Forest ADA Wheelchair Access Ramp Improvement Project (Phase V) City of Lake Forest, Orange County, California	2011	El Toro, San Juan Capistrano
OR-04182	McKenna, Jeanette	El Toro High School Archaeological Records Search	2012	El Toro
OR-04184	Maxon, Patrick	Cultural Resources for Rancho Las Lomas	2009	Santiago Peak
OR-04196	Wlodarski, Robert	LAR138 -- Manchester/Broadway, 1500 West Center Street Anaheim, CA 92802	2012	Anaheim
OR-04289	Stone, David and Victorino, Ken	Archaeological Survey Report Tertiary Treatment Plant and Recycled Water Distribution System Expansion Project Laguna Hills and Laguna Woods, Orange County, California	2012	El Toro, San Juan Capistrano
OR-04308	Smith, Brian	A Section 106 (NHPA) Cultural Resources Study for the Portola Center Project Orange County, California	2014	El Toro

City of Lake Forest Paleontological and Cultural Resources Assessment Report

Report No.	Author(s)	Title	Year	Quad Maps
OR-04336	O'Neil, Stephen	Identification and Evaluation of Historic Properties ADA Wheelchair Access Ramp Improvement Project, City of Lake Forest, Orange County, California	2012	El Toro
OR-04357	Burres, Cara L.	Paleontological and Archaeological Monitoring Report for Pacific Jack, L.L.C. - Palm Terrace, Lake Forest, California	2000	El Toro
OR-04358	Gust, Sherri	Archaeological and Paleontological Monitoring Report for Serrano Creek Business Center, Lake Forest, California	1999	El Toro
OR-04389	Brunzell, David	Cultural Resources Assessment of the Aspen Project, Lake Forest, Orange County, California (BCR Consulting Project No. TRF 1408)	2014	El Toro

APPENDIX E. PALEO SENSITIVITY CRITERIA

Potential Fossil Yield Classification (PFYC) rankings are as per the Bureau of Land Management (BLM 2008)

PFYC Description	PFYC Rank
Very Low. The occurrence of significant fossils is non-existent or extremely rare. Includes igneous or metamorphic and Precambrian or older rocks. Assessment or mitigation of paleontological resources is usually unnecessary.	1
Low. Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils. Includes rock units too young to produce fossils, sediments with significant physical and chemical changes (e.g., diagenetic alteration) and having few to no fossils known. Assessment or mitigation of paleontological resources is not likely to be necessary.	2
Potentially Moderate but Undemonstrated Potential. Units exhibit geologic features and preservational conditions that suggest fossils could be present, but no vertebrate fossils or only common types of plant and invertebrate fossils are known. Surface-disturbing activities may require field assessment to determine appropriate course of action.	3b
Moderate Potential. Units are known to contain vertebrate fossils or scientifically significant nonvertebrate fossils, but these occurrences are widely scattered and of low abundance. Common invertebrate or plant fossils may be found. Surface-disturbing activities may require field assessment to determine appropriate course of action.	3a
High. Geologic units containing a high occurrence of significant fossils. Fossils must be abundant per locality. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. If impacts to significant fossils can be anticipated, on-the-ground surveys prior to authorizing the surface disturbing action will usually be necessary. On-site monitoring or spot-checking may be necessary during construction activities.	4
Very High. Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. Vertebrate fossils or scientifically significant invertebrate fossils are known or can reasonably be expected to occur in the impacted area. On-the-ground surveys prior to authorizing any surface disturbing activities will usually be necessary. On-site monitoring may be necessary during construction activities.	5

APPENDIX F. NATIVE AMERICAN CONSULTATION

**Local Government Tribal
Consultation List Request**

**Native American
Heritage Commission**

1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
916-373-3710
916-373-5471 – Fax nahc@nahc.ca.gov

Type of List Requested: AB 52 and SB 18

CEQA Tribal Consultation List (AB 52) – *Per Public Resources Code § 21080.3.1, subs. (b), (d), (e) and 21080.3.2*

General Plan (SB 18) - *Per Government Code § 65352.3.*

Local Action Type:

General Plan Update ___ **General Plan Element** ___ **General Plan Amendment**

___ **Specific Plan** ___ **Specific Plan Amendment** ___ **Pre-planning Outreach Activity**

Required Information

Project Title: City of Lake Forest General Plan Update

Local Government/Lead Agency: The City of Lake Forest

Contact Person: Gayle Ackerman, AICP

Street Address: 25550 Commercentre Drive, Suite 100

City: Zip: 92630

Phone: (949) 461-3463 **Fax:** _None Provided

Email: GAckerman@lakeforestca.gov

Specific Area Subject to Proposed Action

County: Orange

City/Community: Lake Forest/El Toro

Project Description: The City of Lake Forest is updating its General Plan first adopted in 1994 to guide the physical development of the City.

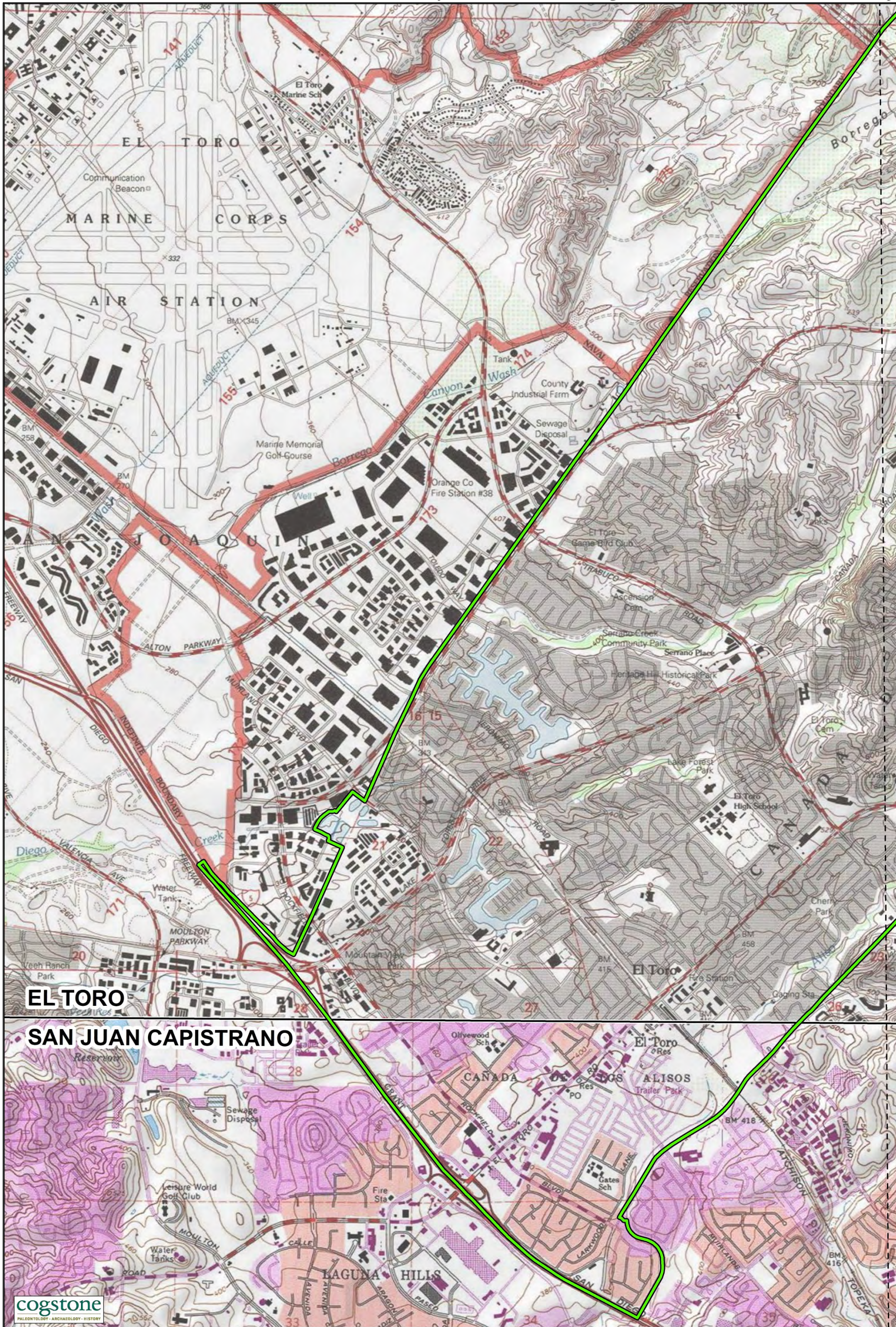
Additional Request



Sacred Lands File Search - *Required Information:*

USGS Quadrangle Name(s): El Toro, San Juan Capistrano, and Santiago Peak

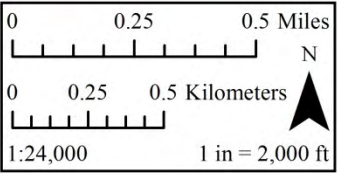
TOWNSHIP	RANGE	SECTION
5 S	7W	25, 29, 30, 31, 32, 33
5 S	8 W	7, 8, 18, 25, 31, 32, 33, 36
6 S	7 W	4, 5, 6, 7, 8
6 S	8 W	1, 2, 10, 11, 12, 13, 14, 15, 16, 21, 22, 23, 24, 26, 27, 28, 34, 35

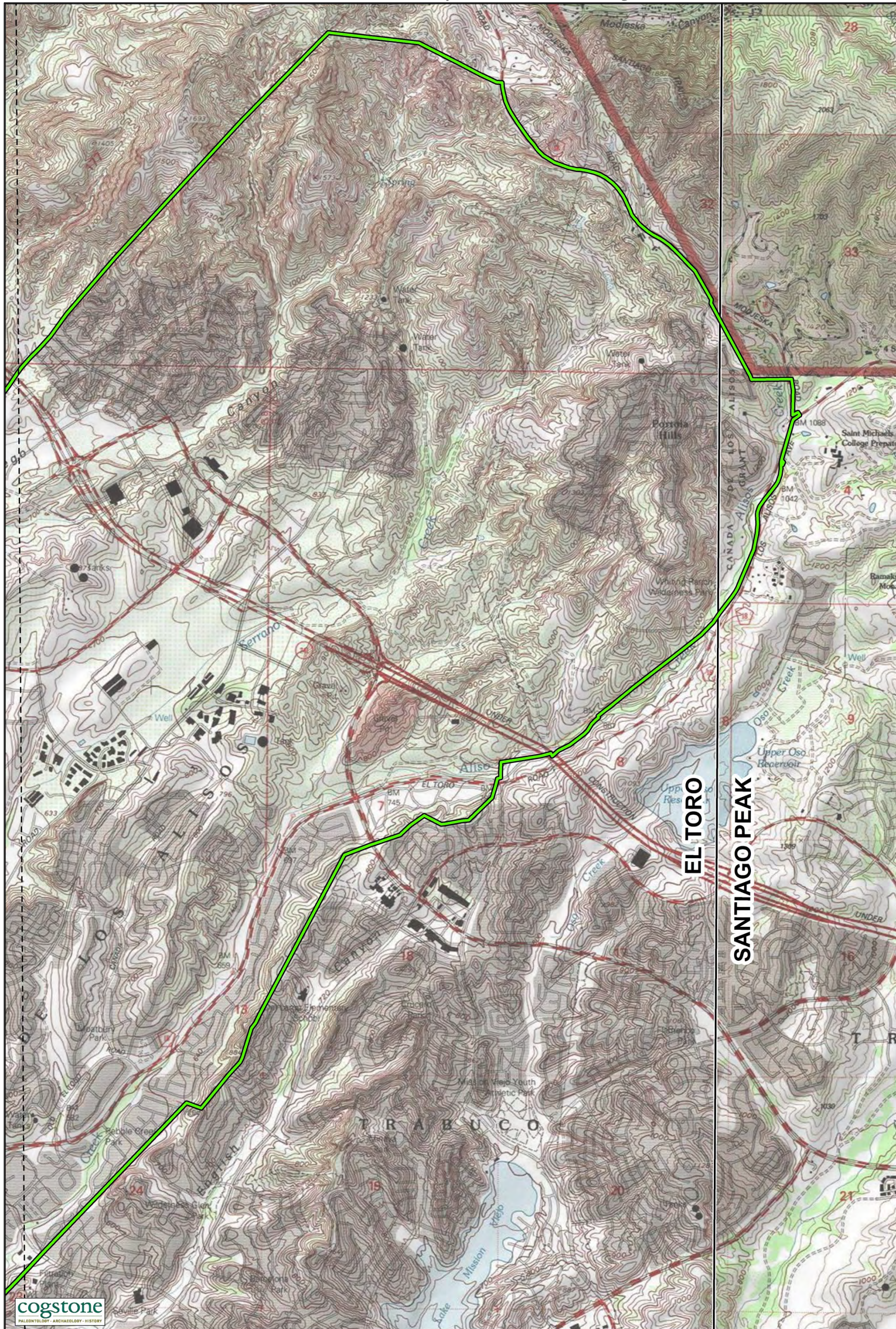


City of Lake Forest
 General Plan Update
 City of Lake Forest,
 Orange County, CA

Map 1 of 2

- Match Line
- City of Lake Forest
- USGS Quads

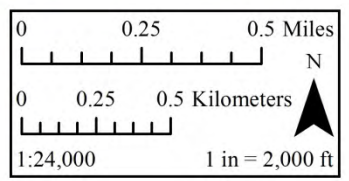




**City of Lake Forest
General Plan Update**
City of Lake Forest,
Orange County, CA

Map 2 of 2

- Match Line
- City of Lake Forest
- USGS Quads



NATIVE AMERICAN HERITAGE COMMISSION

Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95891
(916) 373-3710



March 23, 2018

Gayle Ackerman
City of Lake Forest

Sent via e-mail: gackerman@lakeforestca.gov

RE: Proposed City of Lake Forest General Plan Update Project, City of Lake Forest; El Toro, San Juan Capistrano, and Santiago Peak USGS Quadrangles, Orange County, California

Dear Ms. Ackerman:

Attached is a consultation list of tribes with traditional lands or cultural places located within the boundaries of the above referenced project.

Government Code §65352.3 requires local governments to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose of protecting, and/or mitigating impacts to cultural places in creating or amending general plans, including specific plans. As of July 1, 2015, Public Resources Code Sections 21080.3.1 and 21080.3.2 require public agencies to consult with California Native American tribes identified by the NAHC for the purpose mitigating impacts to tribal cultural resources:

Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section. (Public Resources Code Section 21080.1(d))

The law does not preclude agencies from initiating consultation with the tribes that are culturally and traditionally affiliated with their jurisdictions. The NAHC believes that in fact that this is the best practice to ensure that tribes are consulted commensurate with the intent of the law.

In accordance with Public Resources Code Section 21080.1(d), formal notification must include a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation. The NAHC requests that lead agencies include in their notifications information regarding any cultural resources assessment that has been completed on a potential "area of project affect" (APE), such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:
 - A listing of any and all known cultural resources have already been recorded on or adjacent to the APE;
 - Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
 - If the probability is low, moderate, or high that cultural resources are located in the APE.

- Whether the records search indicates a low, moderate or high probability that unrecorded cultural resources are located in the potential APE; and
 - If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.
2. The results of any archaeological inventory survey that was conducted, including:
- Any report that may contain site forms, site significance, and suggested mitigation measures.
- All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code Section 6254.10.
3. **THIS INFORMATION IS CONFIDENTIAL. PLEASE DO NOT INCLUDE IN PUBLIC DOCUMENTS.**
The results of any Sacred Lands File (SFL) check conducted through Native American Heritage Commission. A site is recorded in the Santiago Peak USGS Quadrangle you provided that may be impacted by the project. Please contact the Juaneño Band of Mission Indians at sonia.johnston@sbcglobal.net for more information about the site. Please contact all the tribes on the attached list for potential additional sites.
4. Any ethnographic studies conducted for any area including all or part of the potential APE; and
5. Any geotechnical reports regarding all or part of the potential APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS is not exhaustive, and a negative response to these searches does not preclude the existence of a cultural place. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

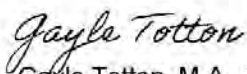
This information will aid tribes in determining whether to request formal consultation. In the case that they do, having the information beforehand will help to facilitate the consultation process.

Lead agencies or agencies potentially undertaking a project are encouraged to send more than one written notice to tribes that are traditionally and culturally affiliated to a potential APE during the 30-day notification period to ensure that the information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance we are able to assure that our consultation list contains current information.

If you have any questions, please contact me at my email address: gayle.totton@nahc.ca.gov.

Sincerely,



Gayle Totton, M.A., PhD
Associate Governmental Program Analyst

CONFIDENTIALITY NOTICE: This communication with its contents may contain confidential and/or legally privileged information. It is solely for the use of the intended recipient(s). Unauthorized interception, review, use or disclosure is prohibited and may violate applicable laws including the Electronic Communications Privacy Act. If you are not the intended recipient, please contact the sender and destroy all copies of the communication.

**Native American Heritage Commission
Tribal Consultation List
Orange County
3/23/2018**

Campo Band of Mission Indians

Ralph Goff, Chairperson
36190 Church Road, Suite 1 Kumeyaay
Campo, CA, 91906
Phone: (619) 478 - 9046
Fax: (619) 478-5818
rgoff@campo-nsn.gov

Ewiiaapaayp Tribe

Robert Pinto, Chairperson
4054 Willows Road Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
wmicklin@leaningrock.net

Ewiiaapaayp Tribe

Michael Garcia, Vice Chairperson
4054 Willows Road Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
michaelg@leaningrock.net

Jamul Indian Village

Erica Pinto, Chairperson
P.O. Box 612 Kumeyaay
Jamul, CA, 91935
Phone: (619) 669 - 4785
Fax: (619) 669-4817
mohusky@jiv-nsn.gov

Juaneno Band of Mission Indians

Sonia Johnston, Chairperson
P.O. Box 25628 Juaneno
Santa Ana, CA, 92799
sonia.johnston@sbcglobal.net

Juaneno Band of Mission Indians Acjachemen Nation

Matias Belardes, Chairperson
32161 Avenida Los Amigos Juaneno
San Juan Capistrano, CA, 92675
Phone: (949) 293 - 8522
kaamalam@gmail.com

Juaneno Band of Mission Indians Acjachemen Nation - Romero

Teresa Romero, Chairperson
31411-A La Matanza Street Juaneno
San Juan Capistrano, CA, 92675
Phone: (949) 488 - 3484
Fax: (949) 488-3294
tromero@juaneno.com

La Posta Band of Mission Indians

Javaughn Miller, Tribal Administrator
8 Crestwood Road Kumeyaay
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
jmiller@LPtribe.net

La Posta Band of Mission Indians

Gwendolyn Parada, Chairperson
8 Crestwood Road Kumeyaay
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
LP13boots@aol.com

Manzanita Band of Kumeyaay Nation

Angela Elliott Santos, Chairperson
P.O. Box 1302 Kumeyaay
Boulevard, CA, 91905
Phone: (619) 766 - 4930
Fax: (619) 766-4957

Pauma Band of Luiseno Indians - Pauma & Yuima Reservation

Temet Aguilar, Chairperson
P.O. Box 369 Luiseno
Pauma Valley, CA, 92061
Phone: (760) 742 - 1289
Fax: (760) 742-3422
bennaecalac@aol.com

This list is current only as of the date of this document and is based on the information available to the Commission on the date it was produced. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable only for consultation with Native American tribes under Government Code Sections 65352.3, 65362.4 et seq. and Public Resources Code Sections 21080.3.1 for the proposed City of Lake Forest General Plan Update Project, Orange County.

**Native American Heritage Commission
Tribal Consultation List
Orange County
3/23/2018**

***San Pasqual Band of Mission
Indians***

Allen E. Lawson, Chairperson
P.O. Box 365 Kumeyaay
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
allenl@sanpasqualtribe.org

***Sycuan Band of the Kumeyaay
Nation***

Cody J. Martinez, Chairperson
1 Kwaaypaay Court Kumeyaay
El Cajon, CA, 92019
Phone: (619) 445 - 2613
Fax: (619) 445-1927
ssilva@sycuan-nsn.gov

***Viejas Band of Kumeyaay
Indians***

Robert Welch, Chairperson
1 Viejas Grade Road Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 3810
Fax: (619) 445-5337
jhagen@viejas-nsn.gov

This list is current only as of the date of this document and is based on the information available to the Commission on the date it was produced. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable only for consultation with Native American tribes under Government Code Sections 65352.3, 65362.4 et seq. and Public Resources Code Sections 21080.3.1 for the proposed City of Lake Forest General Plan Update Project, Orange County.

CITY OF LAKE FOREST



June 4, 2018

TEMPLATE:

Mayor
Dr. Jim Gardner

Mayor Pro Tem
Leah Basile

Council Members
Tom Cagley
Dwight Robinson
Scott Voigts

City Manager
Debra DeBruhl Rose

RE: AB 52 Consultation Request for the General Plan Update and Environmental Impact Report for the City of Lake Forest, Orange County, California.

Dear Representative:

The City of Lake Forest (City), located in Orange County, California (Figure 1), is preparing a comprehensive General Plan Update (Project) which will encompass the entire City of Lake Forest, located south of the Saddleback Mountains (Angeles National Forest), east of the City of Irvine, north of the City of Laguna Hills, and west of the City of Mission Viejo (see Figures 2 and 3, Table 1). The existing General Plan was adopted by the City of Lake Forest in 1994 and is available on the City's website at: <https://www.lakeforestca.gov/292/Planning-Documents>. This General Plan Update will comply with California Environmental Quality Act (CEQA) regulations and an Environmental Impact Report (EIR) will be prepared.

We are contacting you because your Tribal Organization requested to be notified and provided information, under the provisions of the CEQA (Public Resources Code section 21080.3.1 subdivisions (b), (d) and (e)), also known as AB 52, regarding projects with the City's jurisdiction and within the traditional tribal territory of your Tribal Organization. Please consider this letter and preliminary Project information as the formal notification of the proposed Project. The City of Lake Forest is requesting to consult with the your Tribal Organization to identify tribal cultural resources that may be impacted by the proposed Project. The point of contact for the City of Lake Forest on the following page:



City of Lake Forest Point of Contact Information	
Name:	Gayle Ackerman
City:	City of Lake Forest
Address:	25550 Commercentre Drive, Suite
City, Zip:	Lake Forest, CA 92630
Tel:	(949) 461-3463
E-Mail:	GAckerman@lakeforestca.gov

The Native American Heritage Commission (NAHC) was contacted on March 22, 2018 to perform a search of the Sacred Lands File (SLF). The NAHC responded on March 23, 2018 that a sacred land is recorded on the Santiago Peak United States Geological Survey (USGS) topographic quadrangle. The NAHC also provided a list of Native American tribal contacts that may have knowledge of cultural resources within the General Plan area and recommended that we contact you, among others.

A cultural resources records search was performed at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton to identify resources within the City's limits on March 28, 2018. The results of the records search indicate that 140 cultural resources have been previously recorded within the City's limits and include: 126 prehistoric archaeological resources, five multicomponent sites, and nine historic archaeological sites.

The City would appreciate receiving any comments, issues and/or concerns relating to cultural resources, sacred lands, or tribal cultural resources located within the General Plan area. All information provided will be kept strictly confidential.

For consultation under AB 52, **please respond within 30 days from the date of this letter**, pursuant to PRC 21080.3.1(d) if you would like to consult. If you have any questions or concerns, please do not hesitate to contact Gayle Ackerman at the address above or via email GAckerman@lakeforestca.gov or phone (949) 461-3463. Thank you for your attention to this matter.

Sincerely,

Gayle Ackerman

Attachments: Figure 1. Project Vicinity Map
Figure 2. Project Location Map, aerial
Figure 3. Project Location Map, topo
Table 1. Cadastral Information

CITY OF LAKE FOREST



June 4, 2018

TEMPLATE:

RE: SB 18 Consultation Request for the General Plan Update and Environmental Impact Report for the City of Lake Forest, Orange County, California.

Mayor
Dr. Jim Gardner

Mayor Pro Tem
Leah Basile

Council Members
Tom Cagley
Dwight Robinson
Scott Voigts

City Manager
Debra DeBruhl Rose

Dear Representative:

The City of Lake Forest (City), located in Orange County, California (Figure 1), is preparing a comprehensive General Plan Update (Project) which will encompass the entire City of Lake Forest, located south of the Saddleback Mountains (Angeles National Forest), east of the City of Irvine, north of the City of Laguna Hills, and west of the City of Mission Viejo (see Figures 2 and 3, Table 1). The existing General Plan was adopted by the City of Lake Forest in 1994 and is available on the City's website at: <https://www.lakeforestca.gov/292/Planning-Documents>. This General Plan Update will comply with California Environmental Quality Act (CEQA) regulations and an Environmental Impact Report (EIR) will be prepared..

We are requesting consultation under Senate Bill 18 (Chapter 905, Statutes of 2004) which requires local governments to consult with tribes prior to making certain planning decisions and requires consultation and notice for a general and specific plan adoption or amendment to preserve, or mitigate impacts to, cultural places that may be affected. The Native American Heritage Commission (NAHC) provided us with a list of tribal entities and individuals who have requested to be placed on the SB 18 consultation list. Your Tribal Organization is on the list provided. As a result, please consider this letter as a notice of the project and an invitation to provide comments regarding the project. The point of contact for the City of Lake Forest is:

City of Lake Forest Point of Contact Information	
Name:	Gayle Ackerman
City:	City of Lake Forest
Address:	25550 Commercentre Drive, Suite
City, Zip:	Lake Forest, CA 92630
Tel:	(949) 461-3463
E-Mail:	GAckerman@lakeforestca.gov



The Native American Heritage Commission (NAHC) was contacted on March 22, 2018 to perform a search of the Sacred Lands File (SLF). The NAHC responded on March 23, 2018 that a sacred land is recorded on the Santiago Peak United States Geological Survey (USGS) topographic quadrangle.

A cultural resources records search was performed at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton to identify resources within the City's limits on March 28, 2018. The results of the records search indicate that 140 cultural resources have been previously recorded within the City's limits and include: 126 prehistoric archaeological resources, five multicomponent sites, and nine historic archaeological sites.

The City would appreciate receiving any comments, issues and/or concerns relating to cultural resources, sacred lands, or tribal cultural resources located within the General Plan area. All information provided will be kept strictly confidential.

Please respond within 90 days from the date of this letter if you would like to consult. If you have any questions or concerns, please do not hesitate to contact Gayle Ackerman at the address above or via email GAckerman@lakeforestca.gov or phone (949) 461-3463. Thank you for your attention to this matter.

Sincerely,

Gayle Ackerman

Attachments: Figure 1. Project Vicinity Map
Figure 2. Project Location Map, aerial
Figure 3. Project Location Map, topo
Table 1. Cadastral Information

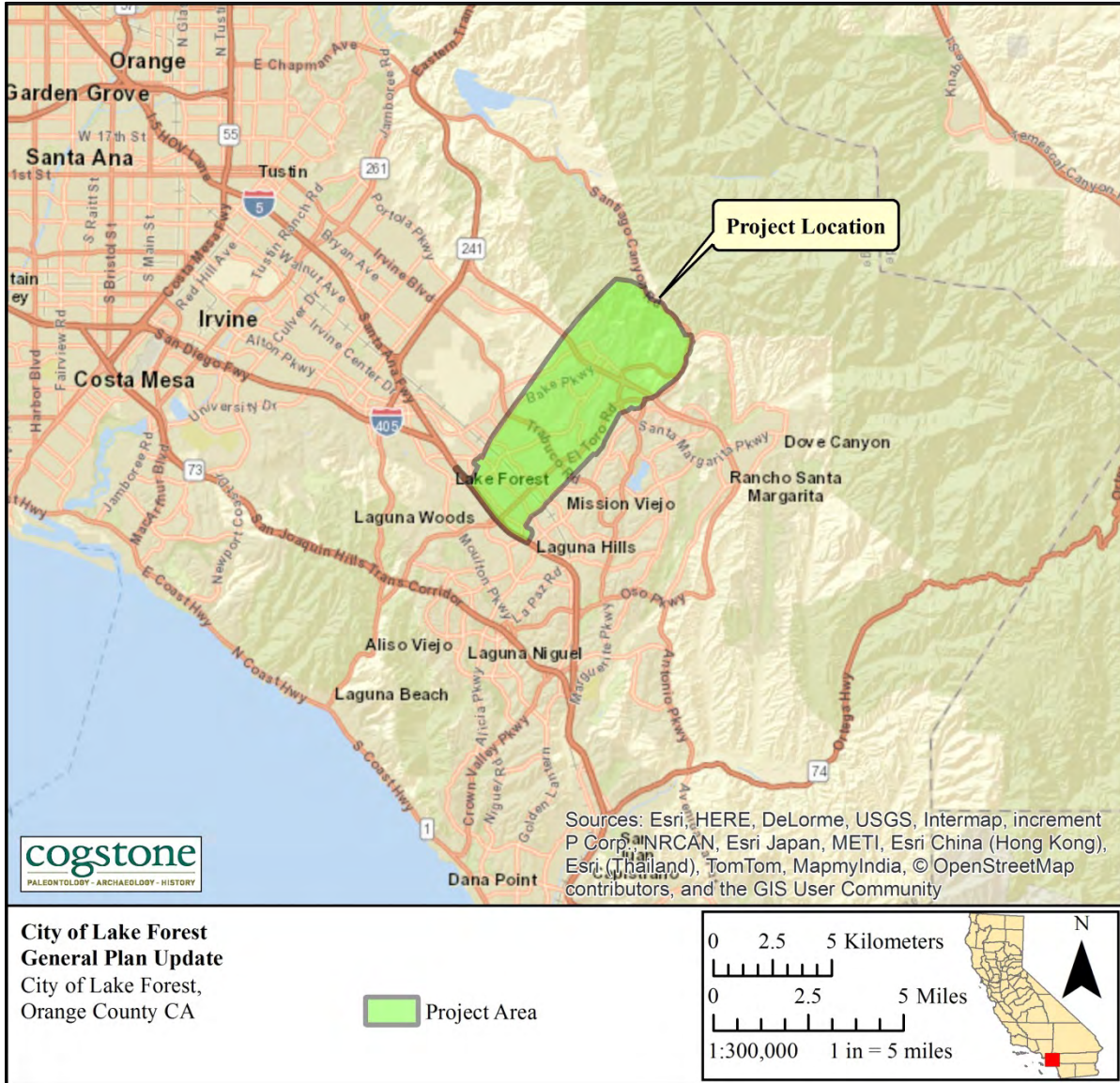


Figure 1. Project Vicinity Map

Table 1. Cadastral Information

TOWNSHIP	RANGE	SECTION
5 S	7W	25, 29, 30, 31, 32, 33
5 S	8 W	7, 8, 18, 25, 31, 32, 33, 36
6 S	7 W	4, 5, 6, 7, 8
6 S	8 W	1, 2, 10, 11, 12, 13, 14, 15, 16, 21, 22, 23, 24, 26, 27, 28, 34, 35

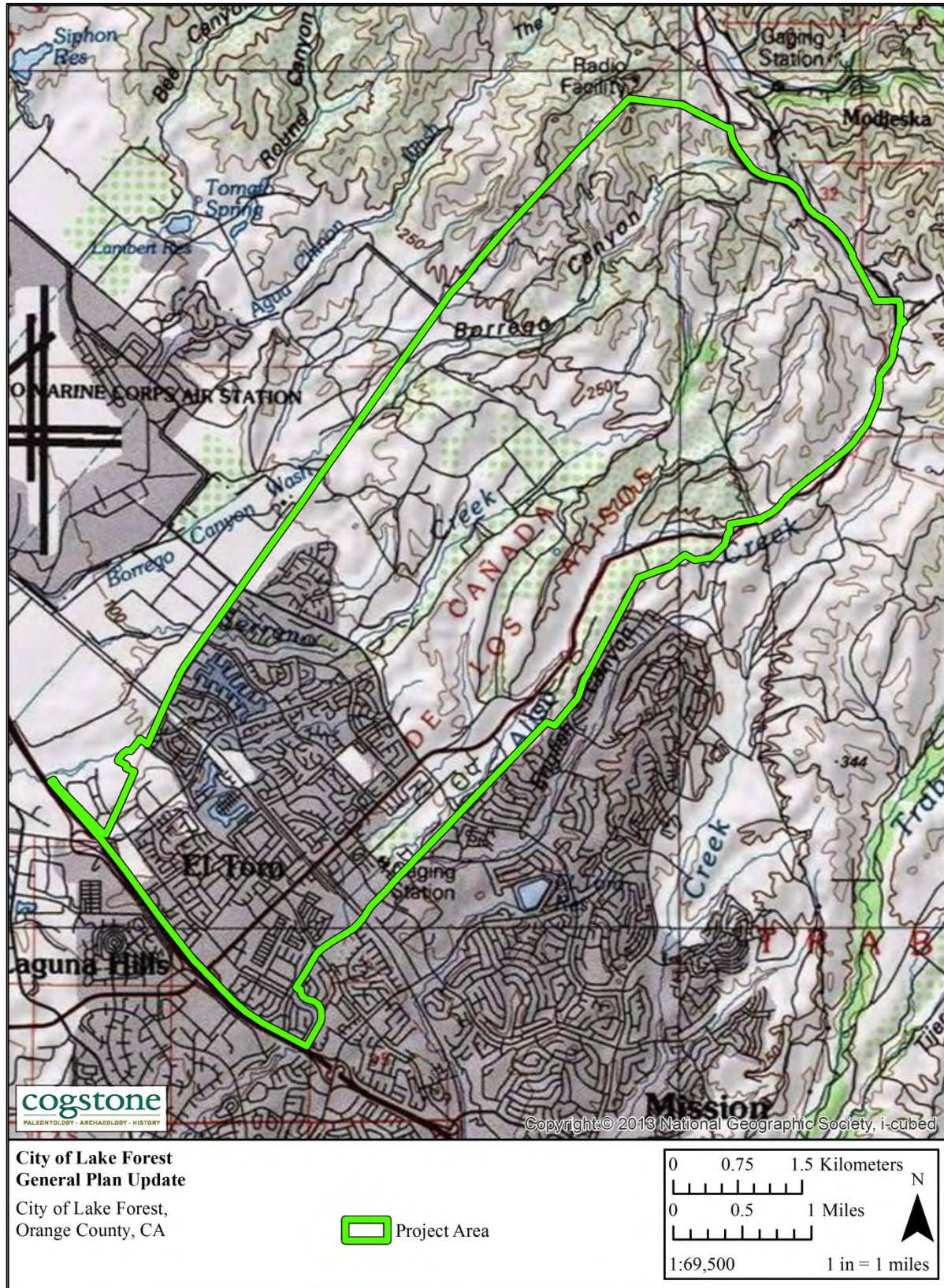


Figure 2. Project Location Map



Figure 3. Project Aerial Map

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Joseph Gutierrez
P.O. Box 4879
San Jacinto, CA 92581

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Jason Camp
16720 Indian Hill Road
Auburn, CA 95603

SB18

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Teresa Romero
3141 - A La Mantanza St.
San Juan Capistrano, CA 92675

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Ralph Goff
36190 Church Road
Auburn, CA 91906

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Matias Belardes
3216 Avenida Los Amigos
San Juan Capistrano, CA 92675

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06/04/2018

Angela Elliot Santos
P.O. Box 1302
Boulevard, CA 91905

AB52

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Robert Pinto
4054 Willows Rd.
Alhambra, CA 91901

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06/04/2018

Robert Welch
10115 Girayole Rd.
Alhambra, CA 91901

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06/04/2018

Guendolyn Parada
2 Chestwood Road
Alhambra, CA 91905

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For delivery information, visit our website at www.usps.com®

OFFICIAL USE

Certified Mail Fee \$3.45 0300

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06/04/2018

Michael Garcia
9154 Willows Road
Alhambra, CA 91901

Native American Consultation Log

Tribal Organization	Type of Request	Date(s) and Method of First Contact Attempt	Date(s) and Method of Second Attempt	Date(s) and Method of Third Attempt	Date(s) of Replies Rec'd
Campo Band of Mission Indians	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail	No response.
Ewiiapaayp Band of Kumeyaay Indians	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail	No response.
Jamul Indian Village, Erica Pinto, Chairperson	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, phone conversation	On July 18, 2018 the receptionist of the Jamul Indian Village indicated that the City of Lake Forest is off their reservation and outside of their traditional tribal territory and defers to local Tribes.
Juaneño Band of Mission Indians Acjachemen Nation : Belardes/Perry	AB 52	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail and email: additional emails and 8/20 and 8/31 2018. Phone conversation 8/31/2018	On August 31, 2018 Ms. Joyce Perry of the Juaneño Band of Mission Indians Acjachemen Nation, via phone conversation, requested that the City of Lake Forest notify the Tribe regarding any development projects located within the City limits. She informed that the Santa Ana foothills and area around the Aliso Creek watershed are extremely sensitive for Tribal Cultural resources including ancestor remains.
Juaneño Band of Mission Indians Acjachemen Nation: Romero	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail and email: additional emails sent 8/20 and 8/31, 2018	No response.
Juaneño Band of Mission Indians: Johnston	SB 18	August 18, 2018	-	-	No response.

Tribal Organization	Type of Request	Date(s) and Method of First Contact Attempt	Date(s) and Method of Second Attempt	Date(s) and Method of Third Attempt	Date(s) of Replies Rec'd
La Posta Band of Mission Indians	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail	No response.
Manzanita Band of Kumeyaay Nation	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail and email	No response.
Pauma Band of Luiseno Indians - Pauma & Yuima Reservation	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail	No response.
San Pasqual Band of Mission Indians	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail	No response.
Soboba Band of Luiseno Indians	AB 52	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail	No response.
Sycuan Band of the Kumeyaay Nation	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail	No response.
Torres Martinez Desert Cahuilla Indians	AB 52	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail	No response.
United Auburn Indian Community of the Auburn Rancheria	AB 52	June 4, 2018, certified mail	June 26, 2018, email	August 31, 2018, email	On August 31, 2018, Mr. Marcos Guerrero indicated that he believed the UAIC was placed on the City of Forest/Orange County lists by accident.
Viejas Band of Kumeyaay Indians	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail	On June 12, 2018 Mr. Ray Teran indicated that Tribe as determined that the project has little cultural significance of ties to the Viejas Tribe. He recommended that local Tribes be consulted.



RECEIVED

JUN 25 2018

CITY OF LAKE FOREST
DEVELOPMENT SERVICES DEPT.
P.O. Box 908
Lake Forest, CA 91903
#1 Vieja Grade Road
Alpine, CA 91901

Phone: 6194453810

Fax: 6194455337

viejas.com

June 12, 2018

Gayle Ackerman
City of Lake Forest
25550 Commercentre Drive, Suite 100
Lake Forest, CA 92630

RE: SB 18 Consultation Request for General Plan Update and Environmental Impact Report for the City of Lake Forest

Dear Ms. Ackerman,

The Viejas Band of Kumeyaay Indians ("Viejas") has reviewed the proposed project and at this time we have determined that the project site has little cultural significance or ties to Viejas. We further recommend that you contact the tribe(s) closest to the cultural resources. We, however, request to be informed of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains in order for us to reevaluate our participation in the government-to-government consultation process.

Please do not hesitate to contact me if you have further questions. Please call Ernest Pingleton at 619-659-2314 or me at 619-659-2312, or email, epingleton@viejas-nsn.gov or rteran@viejas-nsn.gov. Thank you.

Sincerely,

A handwritten signature in blue ink, appearing to read "Ray Teran".

Ray Teran, Resource Management
VIEJAS BAND OF KUMEYAAY INDIANS

City of Lake Forest Paleontological and Cultural Resources Assessment Report

From: [Marcos Guerrero](#)
To: [Megan Wilson](#)
Subject: RE: Confirmation the United Auburn Indian Community wished to Consult with the City of Lake Forest
Date: Friday, August 31, 2018 3:34:26 PM

Thanks Megan this helps.

Mg

From: Megan Wilson [mailto:mwilson@cogstone.com]
Sent: Friday, August 31, 2018 11:13 AM
To: Marcos Guerrero <mguerrero@auburnrancheria.com>
Subject: RE: Confirmation the United Auburn Indian Community wished to Consult with the City of Lake Forest

Good morning Mr. Guerrero,

The Contact information for the City of Lake Forest is provided below.

City of Lake Forest Point of Contact Information	
Name:	Gayle Ackerman
City:	City of Lake Forest
Address:	25550 Commercentre Drive, Suite
City, Zip:	Lake Forest, CA 92630
Tel:	(949) 461-3463
E-Mail:	GAckerman@lakeforestca.gov

Thank you for your attention to this matter,

Megan

From: Marcos Guerrero [<mailto:mguerrero@auburnrancheria.com>]
Sent: Friday, August 31, 2018 9:49 AM
To: Megan Wilson; Jason Camp
Cc: Matthew Moore
Subject: RE: Confirmation the United Auburn Indian Community wished to Consult with the City of Lake Forest

Hello Megan,

I think UAIC may have gotten on the City of Forest /Orange County list by accident. I will follow up with the NAHC and City of Lake Forest to make this correction.

If there is a contact person at the City of Forest, please share their information. Best,

Marcos

From: Megan Wilson [<mailto:mwilson@cogstone.com>]
Sent: Friday, August 31, 2018 9:02 AM
To: Jason Camp <jcamp@auburnrancheria.com>
Cc: Marcos Guerrero <mguerrero@auburnrancheria.com>
Subject: Confirmation the United Auburn Indian Community wished to Consult with the City of Lake Forest

Good Morning,

On behalf of the City of Lake Forest, located in Orange County, CA, I want to confirm that the United Auburn Indian Community wished to consult with the City regarding Projects within their jurisdiction under AB52.

Please confirm via email, or phone that the City of Lake Forest is a City your Tribe wished to consult with.

Thank you,



PALEONTOLOGY - ARCHAEOLOGY - HISTORY

Federal Certifications: SDB, EDVOSB
State Certifications: DBE, WBE, SBE, UDBE

Megan Wilson, MA, RPA
Archaeologist/GIS Technician
11518 W Taft Ave, Orange, CA 92665
714-974-8300 ex 108 office
mwilson@cogstone.com www.cogstone.com
Field Offices in San Diego, Riverside, Morro Bay, San Francisco

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