

PHASE I PALEONTOLOGICAL ASSESSMENT

**San Jacinto Residential**

**TTM 38202 Project**

**City of San Jacinto**

**Riverside County, California**

**PREPARED FOR:**

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January 2022

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## 1.0 MANAGEMENT SUMMARY

Vandermost Consulting Services, Inc., dba as VCS Environmental (VCS), has prepared this Phase I Paleontological Assessment (PA) for the San Jacinto Residential Project, City of San Jacinto, Riverside County. VCS Senior Paleontologist, Brian Kussman, authored the report. The City of San Jacinto is the California Environmental Quality Act (CEQA) lead agency. VCS is also preparing the Initial Study/Mitigated Negative Declaration (IS/MND) for this project (VCS 2022). This PA was prepared in conformance with the format set forth in the Society of Vertebrate Paleontology Best Practice Guidelines (2019).

The Project proposes to develop 33.8 acres west of N. Lyon Ave. and north of Cottonwood Ave., in the city of San Jacinto. Excavations associated with the Project will impact the Holocene Alluvial Deposits on the Project site and could potentially impact paleontological resources (Radford 2021). To mitigate this potential impact to a level that is less than significant under CEQA, VCS Environmental recommends paleontological monitoring during Project grading activities in paleontologically sensitive sediments (SVP 2019).

## 2.0 INTRODUCTION

### 2.1 Project Description

The proposed Project would develop an approximately 33.8-acre vacant site with up to 181 single-family residential homes and associated infrastructure. The Project requires subdividing five (5) existing parcels (APNs 436-280-011, 436-280-012, 436-280-013, 436-280-014 and 436-280-025). Offsite improvements include connecting the proposed internal circulation system to the intersections of Lyon Avenue/Appaloosa Drive and Marilyn Drive/Estrella Street; connecting to existing utility systems within Lyon Avenue; frontage improvements along Lyon Avenue including a Class I multi-use path (per City of San Jacinto Trails Master Plan), sidewalk and street lights; and constructing a portion of the San Jacinto Valley Master Drainage Plan storm drain system Line G-3 from Marilyn Drive/Estrella Street along the northeast edge of the development to a future connection point (note: continuation of Line G-3 to be constructed by others) at the Monte Vista Middle School property to the north. Excavations associated with the Project will impact the Holocene Alluvial Deposits on the Project site and could potentially impact paleontological resources (Bell et al. 2004, Radford 2021).

### 2.2 Project Location

The Project area encompasses 33.8 acres, Tentative Tract Map No. 38202, in Riverside County. The Project site location is in Township 4 South, Range 1 West, Section 28, of the United States Geological Survey (USGS) *San Jacinto, CA* 7.5-minute quadrangle (S.B.B.M.). Figure 1, derived from the *San Jacinto* topographic map, depicts the regional and specific location of the Project site. Figure 2 is a Geologic Map of the Project site (from ESRI and the USGS). Figure 3 is an aerial map of the Project footprint. Refer to Attachment A for site maps.

### 2.3 Paleontological Resources

Paleontological resources are the fossilized remains, imprints, or traces of past life preserved in the geologic record. This can include bones, teeth, soft tissues, shells, plant material, microscopic organisms, footprints, trackways, and burrows. Fossils are the only record of the natural history of life on this planet. Despite the frequency of sedimentary rock in the geologic record, and the number of organisms that have lived throughout the planet's history, only a very small number of remains have been preserved in the fossil record. Fossils are important scientific resources, allowing the study of:

- The evolutionary history of extinct organisms, including their lifestyle, interrelationships, distribution, speciation, extinction, and relation to modern groups.
- The taphonomic agents responsible for fossil preservation, including biases in the fossil record.
- Ancient environments, in which these organisms lived, and the distribution and change in these environments and their organisms through time.
- The temporal relationships of rock deposits from one area to another, and the timing of geologic events.

### 3.0 FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS

Because of the rarity of fossils, and because the organisms the fossils represent usually no longer exist, paleontological resources are considered non-renewable and are often afforded federal, state, and local protection. Several federal and state statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized projects.

Under California law, paleontological resources are protected by CEQA. Section 5097.5 of the California Public Resources Code (PRC) protects historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological sites, or any other archaeological, paleontological, or historical feature that is situated on land owned by, or in the jurisdiction of, the State of California, or any city, county, district, authority, or public corporation, or any agency thereof. Section 5097.5 states, “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, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.” Additionally, PRC Section 30244 requires “reasonable mitigation measures” to address impacts on paleontological resources identified by the State Historic Preservation Officer. San Jacinto's rich history has left the City with a great number of significant prehistoric and historic archaeological resources. These resources help define the community and offer opportunities for cultural, educational, and community enrichment. The City encourages the protection and enhancement of these resources for generations to come. Resource Management Goal 4: Promote cultural awareness through the preservation of the City's historical, archaeological, and paleontological resources. Policy 4.1: Wherever possible, identify, protect and preserve the historical resources of the City. Policy 4.2: Encourage historic preservation in the downtown core. Policy 4.3: Increase public awareness of and accessibility to the City's cultural heritage and resources through educational visitor-oriented programs. Policy 4.4: Ensure new development is compatible with and complementary to adjacent historic resources (City of San Jacinto 2006).

Sections of the City of San Jacinto General Plan regarding cultural and paleontological resources listed below:

- b. For all development proposals within areas with the potential to contain prehistoric/historic resources, the City shall require a study to be conducted by a professional archaeologist. The objective of the study will be to determine if significant archaeological resources are potentially present and if the project will significantly impact these resources. If significant impacts are identified, the City may require the project to be modified to avoid the impacts, or require mitigation measures to mitigate the impacts. Mitigation may involve archaeological investigation and resources recovery.
- c. The City shall require an assessment of the potential for development proposals to significantly impact paleontological resources pursuant to the California Environmental Quality Act Guidelines. If the project involves earthworks, the City may require a study conducted by a professional paleontologist to determine if paleontological assets are present, and if the project will significantly impact the resources. If significant impacts are identified, the City may require the project to be modified to avoid impacting the paleontological materials, require monitoring of rock units with high potential to contain significant nonrenewable paleontological resources, or require mitigation measures to mitigate the impacts, such as recovering the paleontological resources for preservation.

## 4.0 GEOLOGY AND PALEONTOLOGY

The geologic map for the region was published in 2003, by Dibblee and Minch. There is one rock unit mapped on the Project site: Holocene alluvial deposits (Qv), that is assigned a high paleontological sensitivity. These deposits consist of alluvial sands and gravels. Many of the Diamond Valley Lake Project localities approximately 3 miles from the project site, were also mapped as Holocene alluvial deposits, but yielded Pleistocene taxa such as Bison (*Bison* sp.) and Horse (*Equus* sp.). These extinct taxa allude to the deeper portions of the sediments mapped by Dibblee and Minch (2003) as Holocene alluvium, in this region, belonging to the Pleistocene (Bell et al. 2004, SVP 2019, Radford 2021).

## 5.0 METHODS/RESULTS

### 5.1 Records Search and Literature Review

On June 24, 2021, the Western Science Center of Riverside County (WSC) performed a paleontological records search to determine if any fossil localities are located on or near the Project (Attachment C). The records search determined there are no documented fossil localities on the Project or within a one-mile radius, but numerous vertebrate fossil localities of the Diamond Valley Lake Project are within a 3-mile radius of the Project area (Radford 2021). The Diamond Valley Lake Projects localities have produced one of the most extensive late Pleistocene faunas in southern California (Springer et al. 2010). Excavations into Pleistocene sediments in the area have the potential to uncover extinct taxa that are poorly represented in the fossil record (Pajak et al. 1996, SVP 2019). Examples of these rare taxa potentially present include Saber Tooth Cat, extinct and living bears, Dire Wolf, many birds, reptiles, and amphibians.

In 2019, a new species of Mastodon called *Mammuth pacificus* sp. nov., was described from fossils found in the Diamond Valley Lake sediments (Dooley et al. 2019). Recognition of this animal from other fossil localities would help paleontologists to better understand the evolutionary history of this animal and the environments where it lived. Although Mastodons are relatively common in the Pleistocene of North America, this new species would be considered rare, as it was so recently recognized (Pajak et al. 1996, Bell et al. 2004). This illustrates the importance of all fossil material to the understanding of the evolutionary trends for many different taxa (SVP 2019).

### 5.2 Field Survey

An intensive pedestrian field survey of the Project area was conducted by the author (B. Kussman) on December 17, 2021. Patrick Maxon, M.A., RPA, was also present on December 17, 2021, and assisted with the field survey. The survey was performed using 10-meter north-south transect intervals moving from west to east, across the Project area. Visibility during the survey was generally good due to recent discing, with approximately 5-10 percent vegetation cover. All exposed ground surfaces were examined. No paleontological resources were identified during the intensive pedestrian field survey.

## 6.0 PERSONNEL

This Phase I Paleontological Resources Assessment Report was completed by Brian N. Kussman, B.A., Senior Paleontologist with VCS Environmental. Mr. Kussman has worked in all phases of paleontology, including archival research, paleontological research, field survey, excavation, laboratory analysis, fossil identification, and construction monitoring, since 1993. Mr. Kussman holds a B.A. degree in Earth Sciences with an emphasis in Vertebrate Paleontology from California State University, Fullerton. Mr. Kussman has worked extensively throughout southern and central California and is currently researching Pleistocene paleontology of the region. The report was reviewed by VCS Archaeologist and Director of Cultural Services, Patrick Maxon, M.A., RPA.



## 7.0 IMPACT ANALYSIS AND RECOMMENDATIONS

Paleontological mitigation measures were formulated by the City of San Jacinto specifically for the protection of fossil resources potentially recovered from the San Jacinto Residential Project. Monitoring is recommended during earth disturbance activities in Pleistocene and older Holocene alluvial soils, estimated to start at a depth of five feet below the surface, as required by the City of San Jacinto. A proposed Mitigation Monitoring and Reporting Program (MMRP) is detailed below. When implemented with the provisions of CEQA, the City of San Jacinto, Western Science Center (Radford 2021; Appendix C), and the guidelines of the Society of Vertebrate Paleontology (2010), this MMRP would mitigate any adverse impacts (loss or destruction) to potential nonrenewable paleontological resources (fossils), if present, to a level below significant.

**Measure:** Prior to issuance of a grading permit, the Applicant shall retain a qualified paleontological monitor to implement a paleontological Mitigation Monitoring and Reporting Program (MMRP) as follows:

1. Monitoring of mass grading and excavation activities in areas identified as likely to contain paleontological resources shall be performed by a qualified paleontologist or paleontological monitor. Monitoring for paleontological resources will be conducted in areas where grading, excavation, or drilling activities occur in Pleistocene and older Holocene alluvial soils, estimated at five feet below the surface, in order to mitigate any adverse impacts (loss or destruction) to potential nonrenewable paleontological resources. Monitoring of any artificial fill or disturbed soils that may be present at the project is not warranted.
2. Paleontological monitors will be equipped to salvage fossils as they are unearthed to avoid construction delays and to remove samples of sediment that are likely to contain the remains of small fossil invertebrates and vertebrates. The monitor must be empowered to temporarily halt or divert equipment to allow for the removal of abundant or large specimens in a timely manner. Monitoring may be reduced if the potentially fossiliferous units are not present in the subsurface, or if they are present, are determined upon exposure and examination by qualified paleontological personnel to have low potential to contain fossil resources.
3. Preparation of recovered specimens to a point of identification and permanent preservation, including screen-washing sediments to recover small vertebrates and invertebrates if indicated by the results of test sampling. Preparation of any individual vertebrate fossils is often more time-consuming than for accumulations of invertebrate fossils.
4. All fossils must be deposited in an accredited institution (university or museum) that maintains collections of paleontological materials. The Western Science Center in Hemet, California, is the preferred institution by the County of Riverside. All costs of the paleontological monitoring and mitigation program, including any one-time charges by the receiving institution, are the responsibility of the developer.
5. Preparation of a final monitoring and mitigation report of findings and significance. including lists of all fossils recovered and necessary maps and graphics to accurately record their original location(s). A letter documenting receipt and acceptance of all fossil collections by the receiving institution must be included in the final report. The report, when submitted to and accepted by the appropriate lead agency (e.g., the City of San Jacinto), will signify satisfactory completion of the project program to mitigate impacts to any nonrenewable paleontological resources.

## 8.0 REFERENCES

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City of San Jacinto

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Society of Vertebrate Paleontology (SVP)

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VCS Environmental



- 2022 Initial Study/Mitigated Negative Declaration for the San Jacinto Residential Development Project TTM38202 Project, VCS Environmental, San Juan Capistrano.

Society of Vertebrate Paleontology (SVP)

- 2019 Best Practice Guidelines for Repositing and Disseminating Contextual Data Associated with Vertebrate Fossils: *Society of Vertebrate Paleontology*, 6 p.

ATTACHMENT A

PROJECT MAPS

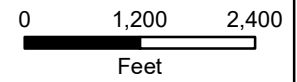
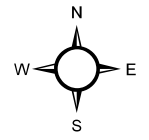
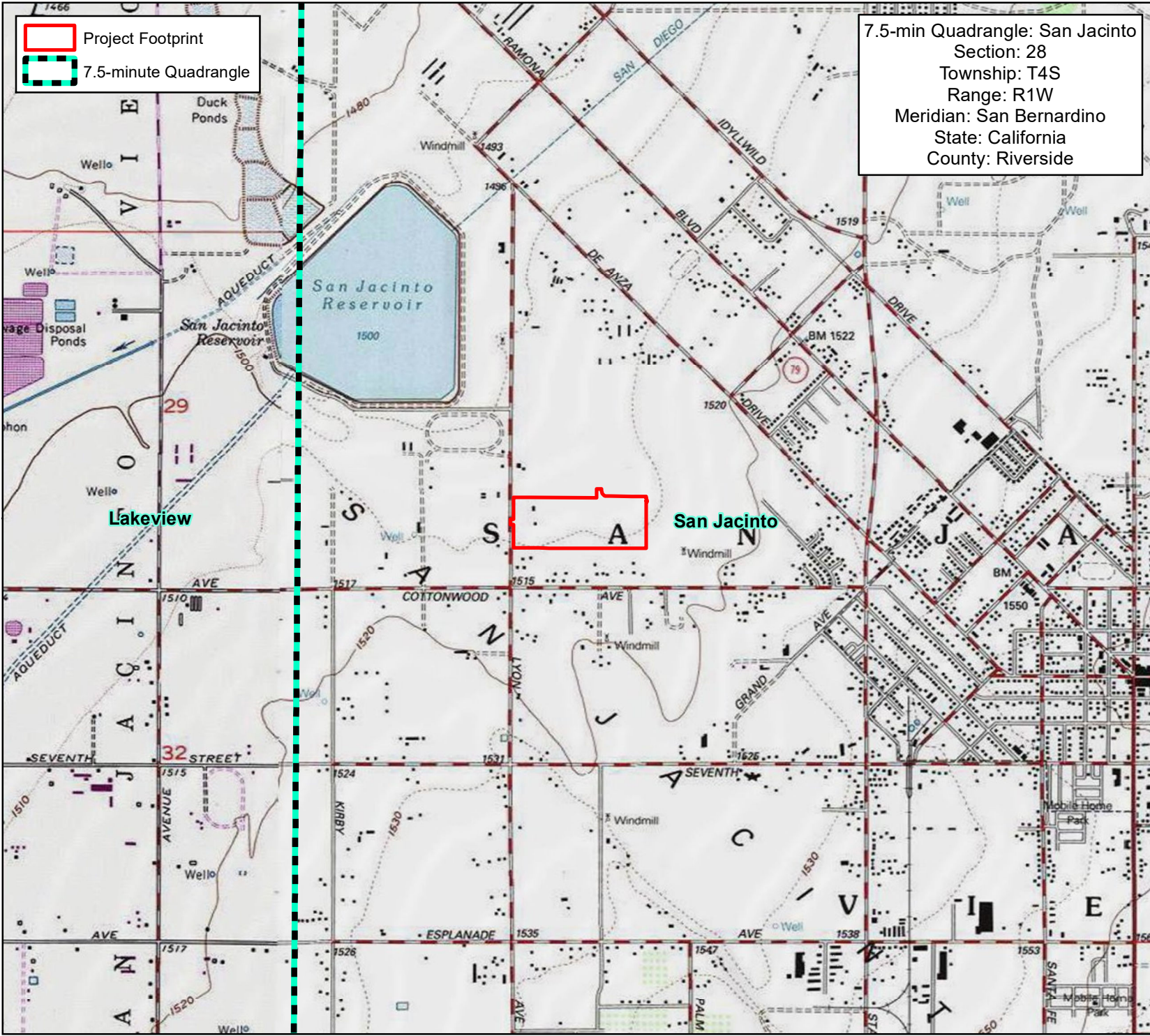
 Project Footprint  
 7.5-minute Quadrangle

7.5-min Quadrangle: San Jacinto  
 Section: 28  
 Township: T4S  
 Range: R1W  
 Meridian: San Bernardino  
 State: California  
 County: Riverside



## San Jacinto Residential Development - TTM 38202

Figure 1  
USGS  
Topographic  
Map



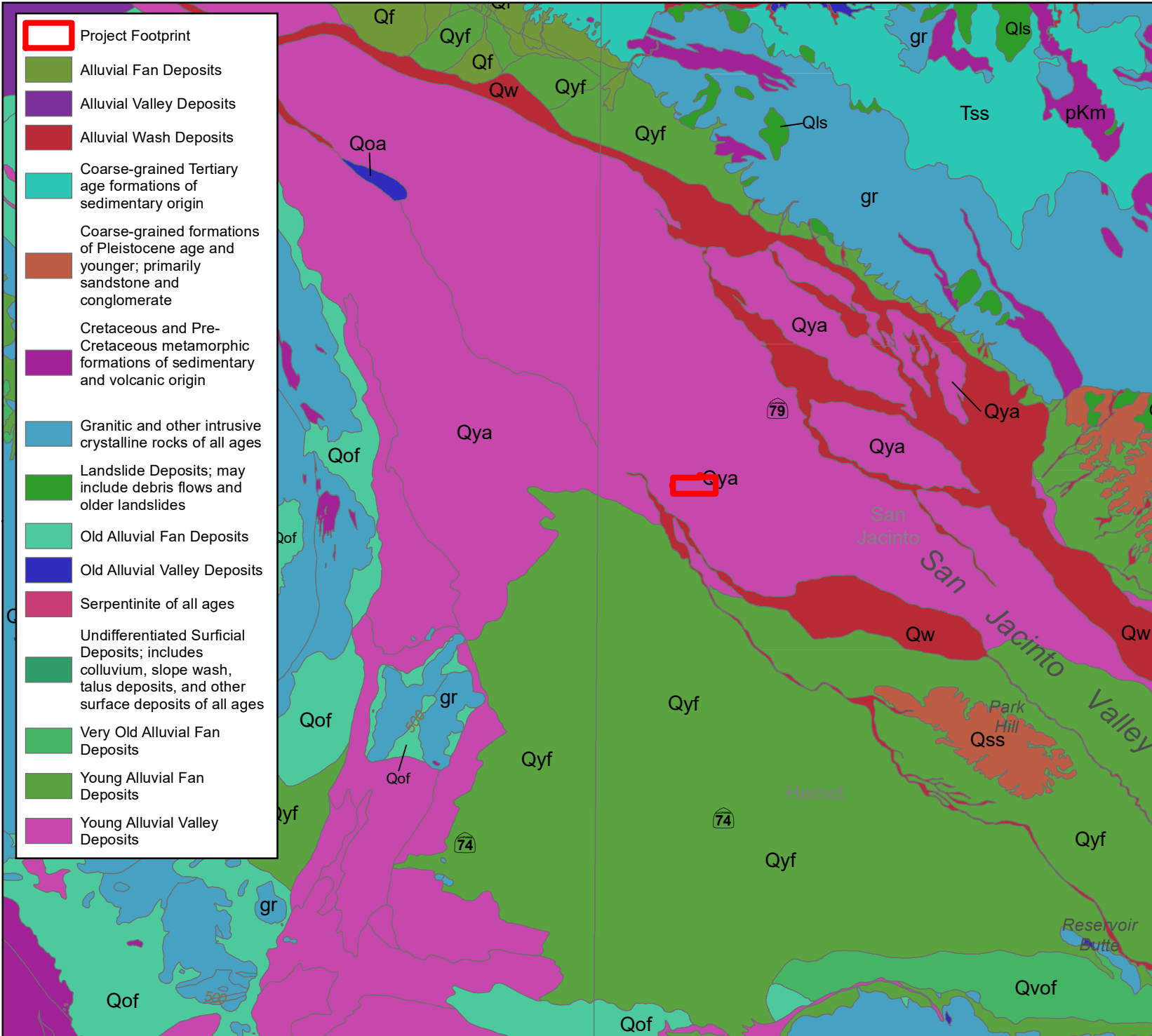
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Map Date: April 2022  
 Data Sources: ESRI,  
 BAWCE

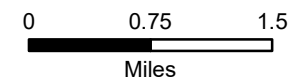
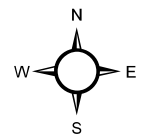
Service Layer Credits:  
 Copyright: © 2013 National  
 Geographic Society, i-cubed

# San Jacinto Residential Development - TTM 38202

## Figure 2 Geologic Map







- Project Footprint
- Alluvial Fan Deposits
- Alluvial Valley Deposits
- Alluvial Wash Deposits
- Coarse-grained Tertiary age formations of sedimentary origin
- Coarse-grained formations of Pleistocene age and younger; primarily sandstone and conglomerate
- Cretaceous and Pre-Cretaceous metamorphic formations of sedimentary and volcanic origin
- Granitic and other intrusive crystalline rocks of all ages
- Landslide Deposits; may include debris flows and older landslides
- Old Alluvial Fan Deposits
- Old Alluvial Valley Deposits
- Serpentinite of all ages
- Undifferentiated Surficial Deposits; includes colluvium, slope wash, talus deposits, and other surface deposits of all ages
- Very Old Alluvial Fan Deposits
- Young Alluvial Fan Deposits
- Young Alluvial Valley Deposits



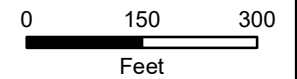
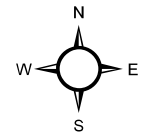
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Map Date: April 2022  
Data Sources: ESRI, USGS

-  Project Footprint
-  Project Site
-  Offsite Improvements
-  Site Plans

**San Jacinto Residential Development - TTM 38202**

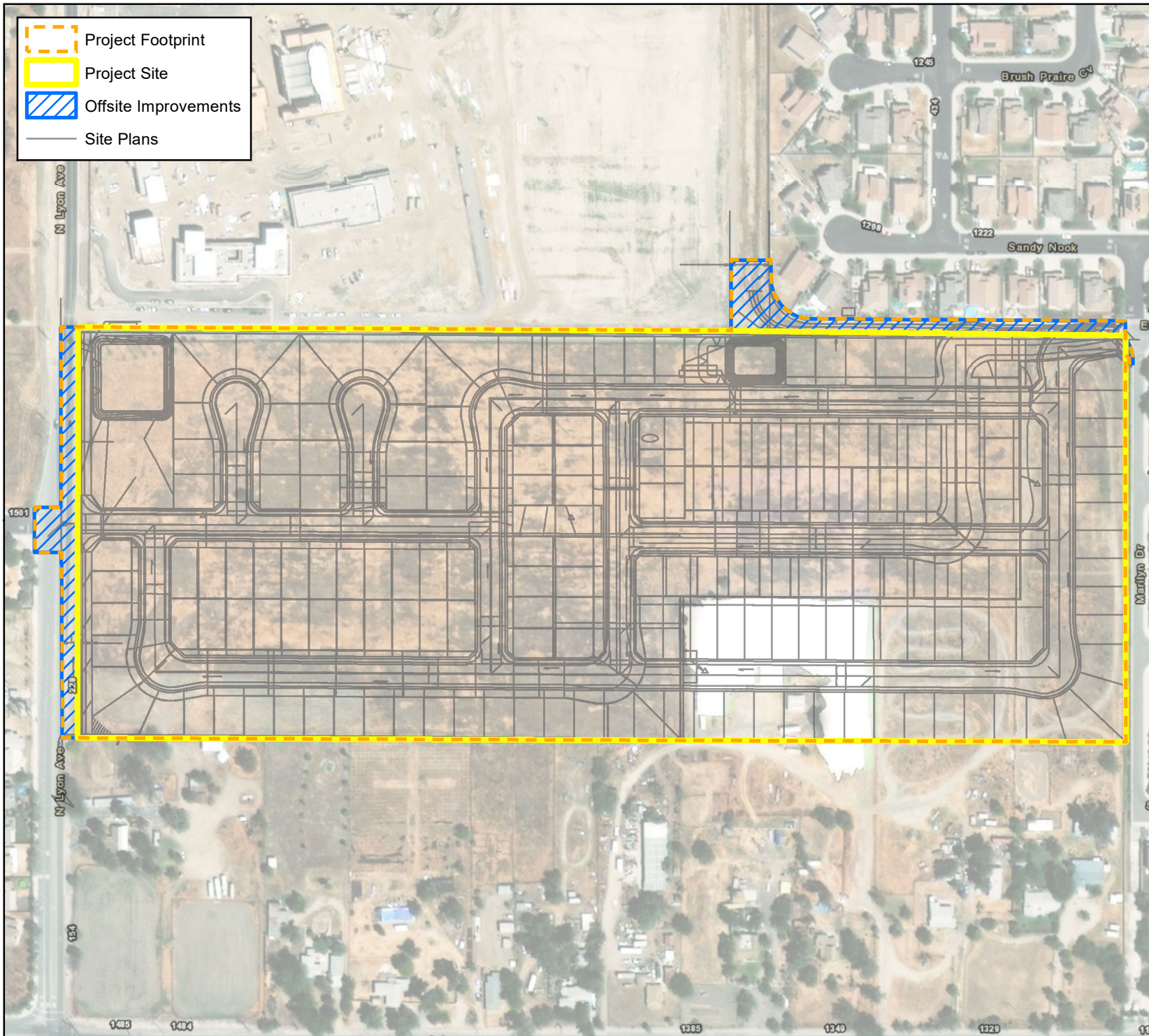
**Figure 3**  
**Project Aerial Map**



1:3,000

Map Date: April 2022  
 Data Sources: ESRI,  
 BAWCE

Service Layer Credits: Source:  
 Esri, Maxar, GeoEye, Earthstar  
 Geographics, CNES/Airbus  
 DS, USDA, USGS, AeroGRID,  
 IGN, and the GIS User  
 Community  
 Esri, HERE, Garmin, (c)  
 OpenStreetMap contributors



ATTACHMENT B  
PERSONNEL RESUME



# BRIAN KUSSMAN

Senior Paleontologist



## ABOUT

Brian began working for VCS Environmental in 2018 and has over 27 years of experience conducting paleontological research, field survey, fossil salvage, fossil preparation, laboratory identification, report preparation, and curatorial experience throughout Southern California. This includes background research, project proposals and reports, field surveys and monitoring, lab preparation and storage, identification and analysis, and curation of paleontological materials in repositories. Project experience includes housing construction, business construction, highway construction, and public utilities development throughout Southern California. He is also responsible for field monitoring, and has assisted with archaeological surveying, monitoring, and the preparation of paleontological monitoring reports.

## EDUCATION

B.A., Earth Science, California State University Fullerton

## CERTIFICATIONS/TRAINING

AEP CEQA Basics Training, October 2021

## PROFESSIONAL AFFILIATIONS

South Coast Geologic Society Member  
Society of Vertebrate Paleontology  
Association of Environmental Professionals

## SELECT EXPERIENCE

### PALEONTOLOGY

- Led and worked alongside Mark Roeder on many salvage excavations with L&L, PEA, and VCS. Also led salvage excavations with LSA. Led excavation for a mostly complete Mastodon skeleton at Majestic in California.
- Volunteer experience since 1989 at Clark Regional Park Interpretative Center, including several research projects.
- Monitoring experience on southern California sites, since 1994.
- Pleistocene fossil mammal identification expert.
- Familiarity with other fossil types found in local rock units.
- Volunteer at Rancho La Brea during the 1991 summer volunteer session.
- Sampled carbon, using proper field protocols for contamination prevention, for radiometric dating.
- Briefly assisted with curation at the John Cooper Center in 2016.

### GEOLOGY

- Led drilling efforts utilizing hollow stem auger, sonic, reverse mud rotary (800 foot + boreholes), standard mud rotary (130 feet to 325 feet boreholes) and direct push.
- Logged soil cuttings, from both conventional and mud drill rigs.
- Utility clearance oversight: utility company record searches, metal detection, ground penetrating radar, hand auger, and air knife.
- Groundwater and soil sampling for pollutants, GW sampling includes use of all types of pumps commonly used and interface probes for sounding (lead on those projects).
- Borehole geological description entry and creation of diagrams using LogPlot software, and report QA.
- Hazwoper 40 taken but would need to retake, TWIC card clearance.
- Familiar with rock and mineral identification.

### ARCHAEOLOGY

- Found numerous hearth features in Orange County with Psomas and LSA, as well as lithic artifacts associated with these features. One complete hearth feature excavated with LSA.
- Sampled carbon, for radiometric dating, from these features.
- Archaeological monitoring for both prehistoric and historic resources.
- Excavation experience recently at a central California coastal site extremely rich in lithics.

# BRIAN KUSSMAN

Senior Paleontologist

VCS Environmental

- Have worked alongside monitors from almost all tribal affiliations in central and southern California.

## BIOLOGY

- Twice, verified for authorities, that remains were not human. Very familiar with differences between human and other mammalian osteology.
- Familiar with local endangered/threatened animals and plants.
- Familiar with taxonomy and field identification of cacti and succulents of the Southwest.

## INSTITUTIONAL AFFILIATIONS

### Ralph B. Clark Regional Park Interpretive Center

Ralph B. Clark Regional Park includes an interpretive center with an extensive fossil collection. It displays marine fossils dating from about one million years ago, to more recent terrestrial mammals that walked the earth tens of thousands of years ago. These specimens were recovered inside the boundaries of Clark Park, and from the development of the Coyote Hills area in northern Orange County. Brian has volunteered at the park since 1989 and his experience includes the following:

- Worked extensively with modern comparative collections at the Interpretive Center, for identification purposes.
- Learned fossil preparation techniques (Pleistocene predominantly, but also Miocene terrestrial fossils of the Sespe-Vaqueros Formation as well as marine vertebrates from throughout Orange County).
- Acted as unofficial collections manager at the Ralph B. Clark Interpretive Center.
- From late 1990's, began with research, primarily focused on the Pleistocene terrestrial fossils from the Ralph B. Clark Park.
- In 2014, presented a poster at SVP pinpointing the age of the terrestrial fossils in the park. Also coauthored a poster concerning the age of the Oso Member (primarily exposed in Orange County), of the Capistrano Formation.
- Beginning of 2020, began a research project with paleontologists from Anza-Borrego State Park, concerning a rare animal only found in sufficient numbers for research, at these 2 institutions.
- Worked on several other research projects for Ralph B. Clark Interpretive Center, including a collaborative project with paleontologists at Anza-Borrego State Park, concerning a rare fossil animal found at both localities.

### George C. Page Museum - Rancho La Brea

Rancho La Brea represents the largest collection of late Pleistocene asphaltic fossils in the world, and uses this opportunity to train students, build collections through excavation, prepare and conserve fossils in our public viewing Fossil Lab and curate this massive collection onsite. Rancho La Brea staff also use these collections to study scientific questions with visiting academics. Brian volunteered at Rancho La Brea in 1991 and his experience includes the following:

- Preparation and reconstruction of Mammoth and Mastodon limb bone specimens.
- Separation and initial sorting of microfossils from matrix.
- Sorting and identification of fossils returned to Rancho La Brea from the California Academy of Sciences, San Francisco, CA.
- Cursory observation of Western Camel vertebrae, as part of a potential research project.

## SPEAKER AT THE SOCIETY OF VERTEBRATE PALEONTOLOGY 75TH ANNUAL MEETING | OCTOBER 14-17, 2015

VERTEBRATE FAUNA AND UNGULATE BIOSTRATIGRAPHY OF THE HIGHLY FOSSILIFEROUS OSO SAND MEMBER, CAPISTRANO FORMATION, ORANGE COUNTY, CA.

Barboza, Michelle, California State University, Fullerton, CA, United States of America

Parham, James F., John D. Cooper Archaeology and Paleontology Center, California State University, Fullerton, CA, United States of America

Kussman, Brian N., California State University, Fullerton, CA, United States of America

The Oso Sand Member is the highly fossiliferous, nearshore facies of the Capistrano Formation, which spans the southwestern rim of the Los Angeles Basin in Orange County, California. Over 20 vertebrate taxa have been identified from this unit, including well preserved fossils of marine taxa, such as a nearly complete skull of a blue marlin and the most complete fossil walrus found to date. In addition to other marine

mammals (whales and sea cows), terrestrial mammals are also known from the Oso Sand Member including gomphotheriids, rhinocerotids, antilocaprids, canids, cricetids, and lagomorphs. Despite the abundance of material from Oso Sand Member sites, just three papers have reported on this unit: one paper focused on the skull of the blue marlin mentioned above, the other two mentioned mammal fossils in passing. We provide an overview of all known vertebrate fossils from Oso Sand Member, and establish a more refined age for the Oso Sand Member, which will help provide a temporal framework for ongoing paleontological studies. Based on stratigraphic correlation, the Capistrano Formation is reported as Upper Miocene to Lower Pliocene. Previous workers have referred to undescribed specimens to place the Oso Sand Member in the Hemphillian North American Land Mammal Age. Partial camelid teeth are identified as *Alforjas*, known from the late early to latest Hemphillian (Hh2 to Hh4). Horse teeth previously referred to *Pliohippus* (Barstovian to Hemphillian) are reidentified as *Dinohippus interpolatus*, which is characteristic of the early late Hemphillian (Hh3). Based on these identifications, we can constrain the age of the Oso Sand Member to the early late Hemphillian (Hh3). By better defining the age of the Oso Sand Member, we can place the marine and terrestrial vertebrate fossils from this unit into a more precise chronostratigraphic framework that allows us to make more detailed comparisons to other late Neogene faunas in California.

## BIOSTRATIGRAPHIC ANALYSIS OF MAMMALIAN TAXA REVISES THE AGE OF RICH PLEISTOCENE SITES FROM THE LA HABRA FORMATION (ORANGE COUNTY, CALIFORNIA) FROM RANCHO LA BREA TO IRVINGTONIAN

Kussman, Brian N., California State University, Fullerton, CA, United States of America

Parham, James F., John D. Cooper Archaeology and Paleontology Center, California State University, Fullerton, CA, United States of America

Babilonia, Lisa C., Clark Paleontology Museum, Buena Park, CA, United States of America

This study provides a new age assessment for the La Habra Formation at the Emery Borrow Pit, Ralph B. Clark Regional Park, Orange County, California, which contains one of the richest non-asphalt Pleistocene sites in California. Over 35 species of mammal, 19 species of birds, and 16 species of amphibians and reptiles have been identified from this site, although it remains poorly represented in the literature. Although Pleistocene terrestrial fossils from the Emery Borrow Pit have been mentioned occasionally, to date only a single fossil, a tapir tooth (*Tapirus merriami*), has been described and figured from the La Habra Formation. The La Habra Formation has been assigned to the Rancholabrean North American Land Mammal Age largely due to its proximity to another site, La Mirada. However, unlike La Mirada and other Rancholabrean sites, no *Bison* (a hallmark taxon for the Rancholabrean) have been found at the Emery Borrow Pit. This is despite an abundance of grazers such as *Camelops* and *Equus* have been found. Furthermore, the *Microtus* from the La Habra Formation most closely resemble *Microtus meadensis* (an Irvingtonian taxon). Combined with the presence of *Megalonyx jeffersonii* (known from the Late Irvingtonian to Rancholabrean), the *Microtus* and the lack of *Bison* suggest a late Irvingtonian age for the La Habra Formation. Faunas from the Irvingtonian are relatively rare compared to those from the Rancholabrean, increasing this site's importance for interpreting other Pleistocene faunas in the region. The high diversity and antiquity of the fauna from La Habra Formation present an excellent opportunity to characterize the fauna of the Los Angeles Basin just prior to the well-known asphalt site of Rancho La Brea, less than 40 km away.

## PUBLICATION

Barboza, M.M., J.F. Parham, G-P. Santos, B.N. Kussman, J. Velez-Juarbe. 2017. The age of the Oso Member, Capistrano Formation, and a review of fossil crocodylians from California. *PaleoBios*, 34. ucmp\_paleobios\_33797.

## SELECT PROJECTS

### SUMMERLY PROJECT | LAKE ELSINORE, CA

Summerly is a 706-acre master-planned golf community in the Lake Elsinore Back Basin. The development consists of approximately 1,955 residential units, 40 acres of roads, and 329 acres of open space, including an 18-hole golf course. This project included grading for a drainage channel, a large sewer line, the subsequent residential development, and a 71-acre detention basin which required cultural monitors on the project and ensured that any discovery of cultural or paleontological resources was handled appropriately. No archaeological resources were observed or collected during monitoring activities; however, a large, important assemblage of Pleistocene fossils (bison, camel, mammoth, et al.) was recovered from the lake sediments and recently curated at the Western Science Center in Hemet. Brian identified fossil remains during the course of salvage excavation efforts so as to prevent damage to adjacent fossils not yet uncovered.

### YORBA LINDA ESTATES - LAKEVIEW AVENUE | YORBA LINDA, CA

Shea Homes retained VCS Environmental (VCS) to provide cultural and paleontological resources monitoring pursuant to Mitigation Measures 122, 129, 130, and 131, of the Yorba Linda Estates Mitigation Monitoring Program developed in the project's Initial Study, govern the mitigation of impacts to paleontological, archaeological, and Tribal Cultural resources. Due to the project's location near a waterway and former existence as a nursery, it required monitoring for cultural and historic

resources, as well as paleontological. Monitoring occurred on 80 separate days beginning in April 2018 and extending through October 17, 2018. The Lead Monitor for the project was VCS Archaeologist/Paleontologist, Brian Kussman. Brian monitored for paleontological and cultural resources during soil removal as part of remediation, mass excavation, and deep utility trenching.

## LANDMARK | CHINO, CA

The construction project includes grading of lots for the development of 38 single family homes and trenching for the installation of sewer, water, and utilities. Monitoring of this work was required pursuant to the Mitigation Monitoring and Reporting Program, Mitigation Measures (MMs) CUL-1 through CUL-3 developed in the Initial Study/Mitigated Negative Declaration (IS/MND) for the project (Dudek 2017). Monitoring occurred on 90 separate days beginning on February 11, 2019, with grubbing and clearing and extending through December 20, 2019. Brian monitored for both paleontological and cultural resources on this project.

## RANCHO DIAMANTE PROJECT | HEMET, CA

The 244.9-acre Rancho Diamante Project site is located south of the Hemet-Ryan Airport in the City of Hemet. The proposed Project is a subdivision of 294 residential lots with paseos and open space consisting of residences, roadways, a stormwater drainage system, and associated infrastructure. To achieve said development, grading operations are required to obtain finished grade elevations. The grading operation will consist of 370,000 cubic yards of excavation and embankment of native soil. Brian monitored for both paleontological and cultural resources.

## PACIFIC MAYFIELD CULTURAL MONITORING | MENIFEE, CA

The current project site consists of approximately the southern half (Parcels 5-10) of the 2001 site boundaries. La Piedra Road defines the northern end of the current Project site, and Holland Road defines its southern boundary. Brian has conducted both paleontological and cultural resource monitoring at Pacific Mayfield.

## STATE ROUTE 210 MIXED FLOW LANE ADDITION FROM HIGHLAND AVENUE TO SAN BERNARDINO AVENUE PROJECT | CITIES OF HIGHLAND, SAN BERNARDINO, AND REDLANDS, CA

The San Bernardino Associated Governments (SANBAG), in cooperation with the California Department of Transportation (Caltrans) District 8 and the City of Highland, proposes to widen State Route 210 (SR-210) from Sterling Avenue to San Bernardino Avenue in the cities of Highland, San Bernardino, and Redlands, as well as a portion of unincorporated San Bernardino County, California. The land uses surrounding the proposed project corridor are urban and moderately densely developed primarily with residential, public facilities, open space, and general commercial uses. The widening would occur between post miles (PM) Revised (R) 26.3 and R32.4, for a total distance of 6.1 miles. The total length of the proposed project limits is approximately 8.2 miles (PM R25.0 to R33.2), which includes transition striping and signage. Within the limits of the proposed project, SR-210 is a four-lane divided freeway with two 12-foot-wide lanes in each direction, which are flanked by five foot-wide left and right shoulders. The purpose of the proposed project is to reduce congestion and improve operational efficiency by providing lane continuity with existing segments of freeway west and east of the proposed project limits. Brian monitored excavations into native alluvium for new bridge foundations. Excavations took place along a several mile section of SR-210 in Highland, CA.

## BANNING DISTRIBUTION CENTER PROJECT | BANNING, CA

The project property encompasses 108 acres, with 64.1 acres onsite and 43.9 acres for offsite improvements. The project is located south of Interstate 10 and the Southern Pacific Railroad and north of the Banning Municipal Airport at the eastern edge of the City of Banning. Ground disturbance is estimated to reach a maximum depth of 33 feet below the current grade. The offsite improvements to the project include a road, fire access road, sewer, and water lines. The proposed project's offsite roadways include a 5,688 linear foot extension of John Street from the project's west property line to Lincoln Street and a 3,871 linear foot emergency fire access roadway at the southwestern corner of the property, across a creek that flows to Smith Creek, and onto Banning Airport property. The offsite utility improvements include a sewer line and an associated lift station; the lift station is approximately 0.4 miles from the southern edge of the project. A water line will start where the line will tie into the existing water line at the intersection of South Hathaway Street and East Barbour Street, then north on Hathaway and east on the extension of John Street. The remaining water line will be located east and south of the project site, terminating at the intersection of Scott Street and East Westward Avenue. Brian monitored for paleontological and cultural resources during all stages of construction.

## ONTARIO GATEWAY PROJECT | ONTARIO, CA

The approximately 21-acre project site, located within the City of Ontario, is situated on the east side of Mill Creek Avenue, south of Ontario Ranch Road, and west of vacant/undeveloped land. The project site is located within the Standalone Residential land use district of the Rich-Haven Specific Plan and consists of Assessor Parcel Number (APN): 0218-652-27. Brian monitored for paleontological and cultural resources due to the project's proximity to a very fossiliferous site immediately east of Ontario Gateway, made it of high sensitivity.

## TIERRA DEL SOL BENTON PARCEL | RIVERSIDE COUNTY, CA

The 16.6-acre project site is located within the Southwest Area Plan (SWAP) of unincorporated Riverside County, approximately 1.2 miles east of the City of Murrieta and approximately 2.8 miles north of the City of Temecula. Tentative Tract Map No. 37715 proposes to subdivide the 16.6-acre lot into 141 residential lots with a minimum lot size of 2,700 square feet and a density of 8.75 dwelling units per acre. Access into the subdivision will be provided from San Remo Drive and Benton Road. Two detention basins will be constructed within the project site; one located along the northwestern corner of the project site and the other to the east of the main entrance along Benton Road. Brian monitored for paleontological and cultural resources, including historic, during the initial ground disturbances through to completion of mass excavation.

## HEIRLOOM FARMS/HARVESTON CULTURAL RESOURCES MONITORING | TEMECULA, CA

The project consists of a Development Plan to allow for the construction of a 321 unit, single-family residential community built on 27.86 acres consisting of detached homes and attached townhomes and a Tentative Tract Map (TTM 37509) for the creation of 111 single family residential lots, 31 condominium lots and 9 open space lots. VCS provided archaeological and paleontological resources monitoring, Tribal Coordination to develop a Monitoring Agreement with Pechanga, Sensitivity Training at the pre-grade meeting, preparation of a Cultural Resources Treatment Plan, and a Phase IV Negative Findings Monitoring Report. Brian provided paleontological and cultural resources monitoring, during mass excavation, on this project.

## ORCHARD HILLS | TUSTIN, CA

Found numerous sites of cultural significance including numerous hearth features, and lithic sites. Participated in the gridded excavation and documentation of a hearth Feature. Multiple carbon samples taken, from hearths, for radiometric dating. Both terrestrial and marine fossil locations were also recovered on this project.

## OLINDA LANDFILL | BREA, CA

Brian served as paleontological field technician to perform monitoring at the Brea-Olinda Landfill. He monitored and reported compliance with mitigation measures. He also prepared and identified fossil remains recovered from the excavations into a very fossiliferous marine unit, the Puente Formation.

## SANTIAGO CANYON LANDFILL | UNINCORPORATED ORANGE COUNTY, CA

Paleontological field technician at Santiago Canyon Landfill. Brian monitored for compliance with mitigation measures, screenwashed sediments for microfossils, in addition to preparing and identifying fossil remains from the project site.

## SIMI VALLEY LANDFILL | SIMI VALLEY, CA

Brian served as paleontological field technician monitoring at several construction projects. He monitored and reported compliance with mitigation measures. He also prepared and identified fossil remains recovered from numerous sites on the project area.

## PRIMA DESHECHA LANDFILL | SAN JUAN CAPISTRANO, CA

Brian monitored for both paleontological and archaeological resources at the Prima Deshecha Landfill. Archaeological resources consisted of both Native American and historic features. He also participated in the recovery excavations of 2 different whale fossils approximately 10 years apart.

## LA PATA ROAD EXTENSION | SAN JUAN CAPISTRANO/SAN CLEMENTE, CA

Brian performed paleontological and archaeological monitoring for the La Pata Road Extension. Archaeological resources consisted of both Native American and historic features. Paleontological resources were derived from the marine Capistrano Formation outcrops on the project.

# BRIAN KUSSMAN

Senior Paleontologist

VCS Environmental

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## EMPLOYMENT EXPERIENCE

### VCS Environmental

30900 Rancho Viejo Road, Suite 100, San Juan Capistrano, CA 92675  
Paleontologist/Cultural Resources Monitor | Date of Employment: April 2018 to Present

### Dudek

605 Third Street, Encinitas, CA 92024  
Paleontologist/Cultural Resources Monitor | Date of Employment: July 2021 to Present

### LSA and Associates

20 Executive Park, Suite 200, Irvine, CA 92614  
Paleontology/Cultural Resources Monitor | Date of Employment: July 2014 to May 2021

### Psomas

5 Hutton Centre Drive, Suite 300, Santa Ana, CA 92707  
Paleontology/Cultural Resources Monitor | Date of Employment: 2015

### Ultrasystems Environmental Inc.

16431 Scientific, Irvine, CA 92618  
Paleontology/Cultural Resources Monitor | Date of Employment: April 2015 to September 2015

### L&L Environmental, Inc.

721 Nevada Street, Suite 307, Redlands, CA 92373  
Paleontology Monitor | Salvage excavation only, 2014

### Paleo Environmental Associates, Inc.

2248 Winrock Avenue, Altadena, CA 91001  
Paleontology Monitor | Date of Employment: May 1993 to November 2010

ATTACHMENT C

RECORD SEARCH



VCS Environmental  
Pat Maxon  
30900 Rancho Viejo Road, Suite 100  
San Juan Capistrano, CA 92675

June 24, 2021

Dear Mr. Maxon,

This letter presents the results of a record search conducted for the San Jacinto Project in the city of San Jacinto, Riverside County, California. The project site is located east of North Lyon Avenue, and north of Cottonwood Avenue in a non-sectioned portion of Township 4 South, Range 1 West on the *San Jacinto, CA USGS 7.5 minute quadrangle*.

The geologic units underlying this project are mapped entirely as alluvial sand and gravel deposits dating to the Holocene (Dibblee & Minch, 2003). While Holocene alluvial units are considered to be of high preservation value, material found is unlikely to be fossil material due to the relatively modern associated dates of the deposits. The Western Science Center does not have localities within the project area or within a 1 mile radius. However, the Western Science Center does have numerous fossil localities associated with the Diamond Valley Lake Project within 3 miles of the proposed project area. These localities are also mapped in Holocene alluvial but did produce Pleistocene fossil material including bison (*Bison sp.*) and horse (*Equus sp.*) material. The presence of these localities indicates the sediment of the area may be older than indicated in the geologic mapping.

While the presence of any fossil material may be unlikely, there is a chance that sediment dates to the earlier Pleistocene epoch. Caution should be observed during the excavation activity associated with the development of the project area.

If you have any questions or would like further information, please feel free to contact me at [dradford@westerncentermuseum.org](mailto:dradford@westerncentermuseum.org)

Sincerely,

A handwritten signature in black ink, appearing to read 'Darla Radford', is written over a white background.

Darla Radford  
Collections Manager