Caltrans Paleontological Evaluation Report Template

February 2025

Caltrans Division of Environmental Analysis, Office of Hazardous Waste, Air, Noise & Paleontology

Template Introduction and Instructions

The first page contains information and guidance text that should be omitted from the final document.

Questions and comments regarding this template should be forwarded to the Hazardous Waste, Air, Noise & Paleontology Office.

For additional information about Caltrans requirements and standards for addressing paleontological resources visit:

[Standard Environmental Reference (SER), Volume 1, Chapter 8 - Paleontology](https://dot.ca.gov/programs/environmental-analysis/standard-environmental-reference-ser/volume-1-guidance-for-compliance/ch-8-paleontology)

Document Standards:

* If acronyms are used, use all applicable terms at the first occurrence in the document, e.g., California Environmental Quality Act (CEQA). If a term is used only a couple times, it should be spelled out each time, particularly for acronyms not commonly known. Do not make acronyms for a unit or formations.

Standards used in this template are designed to comply with the Americans with Disabilities Act and Caltrans Americans with Disabilities Act policies. Colored text is used to convey meaning throughout the template and the sections of colored text are preceded with the requirements of the colored text as needed to convey the meaning to users relying on screen reading software. The requirements of the colored text and examples of its use are provided below.

* Black text = Required headings with navigable header tags.
* Blue text = (Guidance text) Instructions and guidance to be considered and deleted from the final document.
* Red text = (Boilerplate text) Boilerplate text to be inserted into document, as appropriate.
* Purple text = (Example text) Example text that can be used and edited in document, as appropriate.

**The text in this document is guidance unless it is a heading (headings should be retained and used) or is otherwise specified.**

**Enter project title**

A photograph of your project can be added below this line. Remember to tag the photograph with alt text if posting to the internet.

**Paleontological Evaluation Report**

Enter general location information

Enter District-County-Route-Post Mile(s)

Enter project number(s)

**Enter month and year**



**Paleontological Evaluation Report**

Enter general location information

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Enter project number(s)

**Enter month and year**

STATE OF CALIFORNIA
Department of Transportation

Prepared By: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_

Enter preparer's name and title

Enter phone number

Enter office name

Enter District/Region

Recommended for

Approval By: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_

Enter reviewer's name and title

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Approved By:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_

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**Alternative Formats:**

Update the following to reflect what alternative formats will be made available and update contact information as needed. For individuals with sensory disabilities, this document can be made available in Braille, in large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to enter Caltrans or (Local Agency), Attn: Enter contact name and address; enter phone number (Voice), or use the California Relay Service 1 (800) 735-2929 (TTY to Voice), 1 (800) 735-2922 (Voice to TTY), 1 (800) 855-3000 (Spanish TTY to Voice and Voice to TTY), 1-800-854-7784 (Spanish and English Speech-to-Speech) or 711.

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Acronym List for Paleontological Evaluation Report Template

Any acronyms that are used in the report which are not listed here need to be added to the list or defined within the report.

BLM - Bureau of Land Management

Caltrans - California Department of Transportation

CCC - California Coastal Commission

CFR - Code of Federal Regulations

CGS - California Geological Survey

CCO- Construction Change Order

ESA - Environmentally Sensitive Area

FHWA - Federal Highway Administration

FLPMA - Federal Land Policy and Management Act

Ka - Kilo-annum (thousand years ago)

Ma - Mega-annum (million years ago)

NHPA - National Historic Preservation Act

NNL- National Natural Landmark

NPS - National Park Service

PM - postmile

PRC - Public Resources Code

PRPA - Paleontological Resources Preservation Act

SER - Standard Environmental Reference

SVP - Society of Vertebrate Paleontology

USC - United States Code

USFS - United States Forest Service

USGS - United States Geological Survey

UTM - Universal Transverse Mercator

# Executive Summary

Include the following boilerplate text:

The purpose of this Paleontological Evaluation Report is to provide technical information and to review the proposed project in sufficient detail to determine to what extent the proposed project potentially may affect paleontological resources. The California Department of Transportation (Caltrans) has prepared this Paleontological Evaluation Report under its responsibilities pursuant to the California Environmental Quality Act and its assumption of responsibility under the National Environmental Policy Act. **[End boilerplate]**

The Executive Summary should briefly present the:

* Title and purpose of the transportation project;
* Identification of potential paleontological resources in the project area;
* Evaluation of the paleontological potential of geologic units underlying the project location and scientific significance of any identified paleontological resources;
* Expected impacts to the paleontological resources each alternative would cause;
* Recommendations regarding the need for avoidance, minimization, and/or mitigation.

The target audience for paleontological technical documents is primarily the technical reviewers in the regulatory and partner agencies, secondarily for decision makers, and lastly for the interested public. Documents should be written in technically appropriate language that conveys particular technical meaning, without using unnecessary technical jargon. Take all opportunities to use common language when it does not confuse technical issues.

# Project Description and Setting

## Introduction

Include the following boilerplate text:

The purpose of this Paleontological Evaluation Report is to provide technical information and to review the proposed project in sufficient detail to determine to what extent the proposed project potentially may affect paleontological resources. Paleontological resources, or fossils, are afforded protection by environmental legislation set forth under the California Environmental Quality Act and the National Environmental Policy Act. **[End boilerplate]**

### Caltrans Policy

Include the following boilerplate text:

Caltrans and local project sponsors, as part of the project delivery process, are obligated to conduct paleontological studies in response to federal and state laws and regulations. Local project sponsors must comply with local laws and ordinances. Caltrans complies with local laws and ordinances when practicable but is not obligated to do so. If rock units with a high paleontological potential ranking may be impacted by a project, avoidance, minimization, and/or mitigation measures must be considered. **[End boilerplate]**

## Definition and Significance of Paleontological Resources

Include the following boilerplate text:

Paleontological resources are the remains or traces of once-living organisms that are preserved in the geologic record as fossils. Paleontological resources can include body fossils (e.g., bones, teeth, shells, leaves), trace fossils (e.g., tracks, trails, burrows, coprolites), and microfossils (e.g., pollen grains, spores, diatoms). Fossils are generally considered to be older than about 11,700 years (the end of the Pleistocene Epoch), but organic remains older than middle Holocene age (about 5,000 years) can also be considered to represent fossils because they are part of the record of past life. Paleontological resources also include fossil localities and the formation or rock unit containing fossils or with the potential to contain fossils.

Fossils are considered important scientific and educational resources because they serve as direct and indirect evidence of past life and are used to understand the history of life on Earth, and of past environments, ecosystems, and climates. Fossils can answer questions relating to patterns and processes of evolution and extinction, and how life has responded to changes in climates and environments through time. **[End boilerplate]**

### Scientific Significance

Include the following boilerplate text:

Fossils vary in their preservation, abundance, and distribution. Therefore, not all fossils are considered scientifically significant. Scientifically significant paleontological resources are fossils and fossiliferous deposits consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. **[End boilerplate]**

### Paleontological Resource Assessment Criteria

Include the following boilerplate text:

Evaluating the potential effects to paleontological resources involves assigning paleontological potential rankings to individual geologic units based on the potential for the unit to contain scientifically significant fossils. The ranking systems are based on both the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils, and the sensitivity of these fossils to adverse impacts.

Caltrans uses a tripartite scale for assessing paleontological potential. This scale consists of high potential, low potential, and no potential.

High Potential - Rock units which, based on previous studies, contain or are likely to contain significant vertebrate, significant invertebrate, or significant plant fossils. These units include, but are not limited to, sedimentary formations that contain significant nonrenewable paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. These units may also include some volcanic and low-grade metamorphic rock units. Fossiliferous deposits with extremely limited geographic extent or an uncommon origin (e.g., tar pits and caves) are given special consideration and ranked as highly sensitive. High sensitivity includes the potential for containing: 1) abundant vertebrate fossils; 2) a few significant fossils (large or small vertebrate, invertebrate, or plant fossils) that may provide new and significant taxonomic, phylogenetic, ecologic, and/or stratigraphic data; 3) areas that may contain datable organic remains older than Recent, including Neotoma (sp.) middens; or 4) areas that may contain unique new vertebrate deposits, traces, and/or trackways. Areas with a high potential for containing significant paleontological resources require monitoring and mitigation.

Low Potential - This category includes sedimentary rock units that: 1) are potentially fossiliferous, but have not yielded significant fossils in the past; 2) have not yet yielded fossils, but possess a potential for containing fossil remains; or 3) contain common and/or widespread invertebrate fossils if the taxonomy, phylogeny, and ecology of the species contained in the rock are well understood. Sedimentary rocks expected to contain vertebrate fossils are not placed in this category because vertebrates are generally rare and found in more localized stratum. Rock units designated as low potential generally do not require monitoring and mitigation. However, as excavation for construction gets underway it is possible that new and unanticipated paleontological resources might be encountered. If this occurs, a Construction Change Order (CCO) must be prepared in order to have a qualified Principal Paleontologist evaluate the resource. If the resource is determined to be significant, monitoring and mitigation is required.

No Potential - Rock units of intrusive igneous origin, most extrusive igneous rocks, and moderately to highly metamorphosed rocks are classified as having no potential for containing significant paleontological resources. For projects encountering only these types of rock units, paleontological resources can generally be eliminated as a concern when the Preliminary Environmental Analysis Report is prepared and no further action taken. **[End boilerplate]**

BLM (Bureau of Land Management) has its own system for classifying areas according to their potential to contain paleontological resources which must also be taken into consideration when working on land under BLM jurisdiction. Discuss, describe, and explain the BLM system if it applies and any other assessment criteria or scale used or considered in the evaluation. These may include those used by the Society of Vertebrate Paleontology (SVP) or that of the local county/city.

## Project Location and Description

This section identifies the project’s location, including county, route, and postmile. It will include Figure 1 and any additional maps or aerial photographs needed to identify the project vicinity and location.

**Figure 1: Project Location Map**

Summarize and describe the proposed project. Include the following:

* A detailed description of the project footprint and all construction excavation methods and excavation depths anticipated.
* A map showing the project footprint. It must include the entire area of the proposed project. Overlay the project footprint from design on top of the map.
* A description of the land use, (e.g., agricultural, residential, industrial, recreational, etc.). Discuss whether land is publicly or privately owned. Provide a list and/or map as appropriate.
* The location of expected methods and depths of excavation. Provide as much specific documentation as available information allows.
* Aerial photos of the project footprint (if many, put in Appendix D).
* Description of the topographical features.
* Information regarding limitations and caveats that may affect the ability to relate project footprint and depth of excavation to geologic formations.

## Regulatory Setting

The following sections outline the federal, state, and local regulatory protections for paleontological resources that apply to the proposed project.

Identify and explain the paleontological resource laws, regulations, and ordinances that apply to this specific project. Identify and include ONLY the federal and state laws regarding paleontological resources that apply to the specific project. See the SER for assistance in determining which laws and regulations apply. Identify applicable local ordinances or General Plans (city, county, etc.) that should also be considered.

### Federal Laws & Regulations

Evaluate the following to determine whether they apply to the project and include those that do. If none apply, simply state that there are no federal laws and regulations applicable to the project.

* American Antiquities (54 USC 320301-320303)
* Archaeological and Paleontological Salvage (23 USC 305)
* Forest Service Prohibitions (36 CFR 261)
* National Historic Preservation Act (54 USC 300101 et seq)
* Limitation on Federal Participation (23 CFR 1.9)
* National Environmental Policy Act (42 USC 4321 et seq.)
* National Natural Landmarks Program (36 CFR 62)
* Paleontological Resources Preservation Act (36 CFR 291)
* Section 4(f) of Department of Transportation Act (23 USC 138; 49 USC 303)

### State Laws & Regulations

Evaluate the following to determine whether they apply to the project and include those that do.

* Archaeological, Paleontological, and Historical Sites (PRC, Division 5, Chapter 1.7)
* California Coastal Act (PRC, Division 20, Sections 30000-30900)
* California Environmental Quality Act (PRC Section 21000 et seq.)
* Department of Parks and Recreation (CCR, Title 14, Division 3, Chapter 1)

### Agencies with Jurisdiction

Identify any federal or state regulatory/land management agencies with jurisdiction over the project area or a portion of the project area and discuss their requirements such as permits.

### Local Regulatory Setting

Identify applicable local ordinances or city or county general plans that should also be considered.

## Geologic Setting

Include a brief introduction, you may use the following example text: Knowledge of the project geology and stratigraphy is needed to assess paleontological resource potential. It is important to know what rock units are present in the project area, what makes up the units, and the depth of these units. **[End example]**

### Regional Geologic Setting

Describe the regional geological setting.

### Local Geologic Setting (Project Area)

Identify surface and subsurface conditions. List and describe the rock units underlying the project area. Include in the report:

* Rock Units/ Stratigraphic Units
* Stratigraphic column
* Depositional environments

**Geologic Map:** Include geologic map(s) that illustrate the relationship of the project activities to the formations/rock units that have the potential to contain paleontological resources. Overlay the project footprint from design on top of the map.

**Figure 2: Geologic Map of the Project Area**

**Cross Sections:** Include cross sections that illustrate the relationship of the depth of planned excavation to fill and formations/rock units showing potential paleontological resources, if available. Alternatively, a stratigraphic section measured during the field survey may be included.

The implications of making inferences about subsurface geology in this report should be discussed. The information about subsurface geology in this report are based on limited available data and will likely differ from geologic interpretations in the geotechnical report which is based on more detailed information. Caveat language can include an explanation about how subsurface geological inferences contained in this paleontological report are intended only for determining the potential to impact paleontological resources, not for geological hazard purposes, and may be revised if additional information becomes available at a later time.

# Paleontological Resources Impact Evaluation

## Paleontological Potential of the Proposed Project

Assess each identified formation/rock unit and assign the appropriate Caltrans paleontological potential ranking. Include justification for all assessments.

Reiterate that the Caltrans tripart classification is the primary system used and reference the assessment criteria discussion in section 1.2.2. Discuss assignment according to any other classification scales described.

Paleontological potential ranking could include discussions of the likelihood of paleontological resources being present in the formations or rock units based on data reviewed and observations made, and depositional environments represented by the formations or rock units.

Include a discussion of the possibility and implications of potential facies changes.

No consideration is generally afforded to paleontological sites in which significance cannot be determined and/or demonstrated. To demonstrate compliance with applicable statutory requirements, any determination that a site’s paleontological resource assessment is insignificant or low paleontological potential must be documented.

Use the following table to summarize the paleontological formation sensitivity ratings (note this table can also be used in other reports as needed).

**Table 1: Paleontological Sensitivity**

| **Caltrans Sensitivity Designation** | **Characteristics of Geologic Units in this Category** |
| --- | --- |
| High Potential (High Sensitivity)* Insert name of fossiliferous deposit/formation with High Sensitivity
 | Sedimentary units which, based on previous studies, contain or are likely to contain significant vertebrate, invertebrate, plant fossils, and/or trace fossils. These units include, but are not limited to, sedimentary geologic units that contain significant nonrenewable paleontological resources anywhere within their geographical extent, and sedimentary geologic units temporally and lithologically suitable for the preservation of fossils. These units may also include some tuffs as well as low-grade metamorphic geologic units. Fossiliferous deposits with very limited geographic extent or an uncommon origin (e.g., Irvington Bell Quarry, tar pits and caves) are given special consideration and ranked as having high potential. To summarize, high potential includes the potential for containing:* Abundant vertebrate fossils or abundant and ecologically/phylogenetically significant invertebrate, plant, or trace fossils.
* A few significant fossils (large or small vertebrate, invertebrate, plant, or trace fossils) that may provide new and significant taxonomic, phylogenetic, ecologic, stratigraphic, and/or climate data.
* Areas that may contain datable organic or fossil remains older than Recent, including Neotoma (sp.) middens as well as fossils with the potential to provide important geochronologic information.
* Areas that may contain unique new vertebrate or invertebrate deposits, traces, and/or trackways.
 |
| Low Potential (Low Sensitivity)* Insert name of fossiliferous deposit/formation with Low Sensitivity
 | Sedimentary geologic units and some volcanic and low-grade metamorphic geologic units that: * Are fossiliferous but have not yielded fossils of scientific value in the past.
* Have not yet yielded fossils but possess a potential for containing fossil remains.
* Contain common and/or widespread invertebrate fossils if the taxonomy, phylogeny, and ecology of the species contained in the rock are well understood.

Sedimentary geologic units expected to contain vertebrate fossils are not placed in this category because vertebrates are generally rare and found in more localized strata. Projects affecting geologic units designated as having low potential generally do not require full time mitigation monitoring during construction and may not require mitigation monitoring at all. However, in the case of geologic units that have not yet yielded fossils but possess a potential for containing fossil remains, the Principal Paleontologist must determine the most effective and cost-effective way to protect the resource with the approval of the Caltrans District Paleontology Technical Specialist. |
| No Potential (No Sensitivity)* Insert name of fossiliferous deposit/formation with No Sensitivity
 | Geologic units of intrusive igneous origin, most extrusive igneous rocks, moderately to highly metamorphosed rocks, and artificial fill are classified as having no potential for containing scientifically significant fossils. For projects encountering only these types of geologic units or undisturbed sediments, paleontological resources can generally be eliminated as a concern when the Paleontological Initial Screening or Paleontological Identification Report is prepared. |

Note: sedimentary rocks expected to contain vertebrate fossils are considered highly sensitive, because vertebrates are generally rare and found in more localized strata. Show citation for geologic formation name.

**Paleontological Potential Map:** Include a paleontological resource potential map. Overlay the project footprint from design on top of the map. Individual fossil localities are not shown but the potential of each formation/unit must be. Consider the vertical as well as the lateral extent of formations and rock units when preparing potential maps. For example, it may be relevant to define an area that has high potential below 5 feet even though there may be no potential at the surface.

**Figure 3: Paleontological Potential Map of the Project Area**

## Paleontological Resource Impact Analysis

Include a brief introduction, you may use the following example text: Paleontological data and resources can be affected or lost by earth moving operations during project construction activity. For potential impacts to occur to paleontological resources, native, non-disturbed sediments or rock containing potential paleontological data or resources must be disturbed by the project. **[End example]**

### Proposed Project

This section serves to assess the impacts to paleontological resources from construction of the proposed project.

For projects with multiple build alternatives, impacts expected from each individual project alternative should be described and compared. If there is only one build alternative, then only a description of the impacts is needed.

#### Build Alternative 1

* Specify anticipated construction excavation/ground disturbance locations, depths, and methods as well as their relationships to sensitive formations/rock units. As needed, provide tables of the construction methods, depths of earth disturbance, and geologic units potentially impacted.
* Specify the relationship of anticipated project specific construction excavation/ground disturbance methods and the depths of the formations that may be impacted. Explain whether construction activities are expected to impact formations or rock units likely to contain paleontological resources.
* Include a summary in plain language that can be easily incorporated into the environmental document for the project.

#### Build Alternative 2

* Provide the same information outlined above for Alternative 1, add or delete additional sections as needed to provide an analysis for all project alternatives.

#### No-Build Alternative

* The No-Build alternative would not result in any construction-related excavation or ground disturbance and, therefore, no impact to paleontological resources potentially present within the project footprint.

### Comparison of the Alternatives

* Include this section if there are multiple build alternatives.
* Provide a plain language summary of the difference in impacts between the alternatives.

## Data Gaps

In this section, summarize any and all data deficiencies, limitations, or constraints:

* Identify the date of the project plans used in the study and any uncertainties relating to the current preliminary design information.
* Include a statement that the report is based on plans and data available at the time of writing and will be updated if design changes warrant it.
* Identify information limitations and caveats that may affect the ability to relate the project footprint and depth of ground disturbance to the geologic formations and rock units impacted.

### Solutions to Data Gaps

Provide a description of any data deficiencies, limitations, or constraints that need to be addressed for this project impact analysis. Recommend solutions needed to correct the data deficiencies, limitations, or constraints so that project impact analysis can be completed.

# Recommendations

## Required Actions

### **Avoidance, Minimization, and/or Mitigation**

If no impacts to paleontological resources are expected, explain why. Use plain language so that the information can be easily incorporated into the environmental determination/document for the project. Recommend no further action be taken.

If a project is determined to have a potential to impact paleontological resources, then a Paleontological Mitigation Plan must be developed and implemented. Do not make a significance determination under the California Environmental Quality Act or the National Environmental Policy Act, this will be determined by the Project Development Team and discussed in the environmental determination/document.

Evaluate available management strategies and recommend a course of action. Use plain language so that the information can be easily incorporated into the environmental determination/document and the environmental commitments record for the project.

The normal procedure is to consider:

* avoiding impacts, if possible,
* then consider minimizing impacts, if possible, and
* mitigating impacts if the other two options are not viable.

In most cases, impacts to paleontological resources are mitigated because stratigraphic formations/rock units extend too far laterally and vertically to avoid or minimize impacts.

### **Limitations**

Detail the limits of the recommendations. For example, explain that changes in project scope, particularly project footprint and locations or depths of ground disturbance will necessitate re-evaluation of impacts to paleontological resources. If paleontology resources are within the project vicinity but are not anticipated to be impacted by the project, the Paleontological Evaluation Report must include the recommendation that a reassessment be performed if the project scope changes.

## Resource Agency Coordination

### **Required Contacts**

Identify regulatory/land management agencies with jurisdiction that need to be contacted and notified regarding the potential impacts to paleontological resources.

### Permits and Land Access

Indicate whether any permits or land access will be required for paleontological mitigation to proceed.

## Paleontological Mitigation Plan

### Outline

Provide recommendations for a Paleontological Mitigation Plan. Note: This should only include a generalized discussion of the necessary Paleontological Mitigation Plan elements. The full Paleontological Mitigation Plan will be prepared during the Plans, Specifications, and Estimates (PS&E) phase of project delivery. However, if the Paleontological Evaluation Report is updated during the PS&E phase of project delivery, it is possible that the Paleontological Evaluation Report and Paleontological Mitigation Plan may be presented as a combined document.

* + - 1. References

The standard reference system for geological technical documents is the Name-Year citation system [e.g., Smith 1999, Smith and Jones 1899] common to many geological resource publications. This follows the reference system of the [Geological Society of America Reference Guidelines](https://www.geosociety.org/GSA/GSA/Pubs/ref-guide-examples.aspx).

Preparers should have copies of cited references available for reviewers at the reviewer’s request and are responsible for the applicability of the references to the study.

* + - 1. Preparer’s Qualifications

Identify person(s) preparing the Paleontological Evaluation Report and their qualifications. When written by a consultant, Paleontological Evaluation Report preparation requires the services of a professional meeting the experience/education requirements of a qualified Principal Paleontologist as described in the SER.

* + - 1. Fossil Locality Records Search Results

This section will include all results of record searches.

* + - 1. Photo Log

This section will include all relevant photos of the project area.

* + - 1. Preliminary Project Plans for Construction

This section will only include relevant preliminary plans for potential construction related impacts to paleontology resources.