TREMAINE & ASSOCIATES, INC

Cultural And Natural Resource Sciences

"Knowing where development should not take place is at least as important as knowing where it should."

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INTRODUCTION

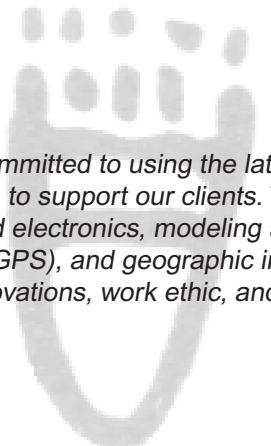
TREMAINE & ASSOCIATES, INC, established in 1994, is a cultural and natural resources consulting company headquartered in Dixon, California. Our services include all aspects of resource management, and by integrating a geophysics component, we are able to offer our clients conventional, as well as innovative strategies for the practical and regulatory problems associated with archaeological and environmental reconnaissance, site testing, mitigation, and monitoring.

Our work is well researched, objective, and intended to facilitate *the most effective approach* to managing natural and cultural resources worldwide. *What sets us apart from other firms is that we have devised a way to conduct subsurface archaeological and landform surveys!* We've developed a number of proprietary search and survey technologies which rapidly identify soils of different types and densities, delineate stratigraphy, and locate buried landforms and features, including those that mark the locations of archaeological sites.

These non-invasive, geophysical technologies examine and collect near-surface soil data for up to six separate depths between 0 and 10 meters. The synergy of our approach allows us to survey, in detail, more than 41,000 linear feet or at least 200 acres per instrument per day at a fraction of the cost of conventional methods. Our approach truly changes the way cultural, natural, and geophysical surveys are conducted.

Resource protection activities are subject to increasingly complex environmental review processes. At *TREMAINE*, we keep current of legislative changes, their applications, and implications for planning and projects. As a result, we can provide you and your project with protection and insight into licensing and permitting requirements, environmental documentation, legal compliance, and up-to-date reporting.

With over 100 projects behind us, our senior officers, Kim Tremaine, John Lopez, Nancy Sikes, and Mark Armstrong, are each solid veterans of the resource management profession. Together they possess the complementary strengths of managerial excellence, regulatory knowledge, academic scholarship, and technical proficiency needed by today's planners and developers.



TREMAINE is committed to using the latest, most appropriate techniques and technologies to support our clients. The quality of our work is enhanced by sophisticated electronics, modeling and statistical packages, global positioning systems (GPS), and geographic information systems (GIS). You will benefit from our innovations, work ethic, and philosophy.

CAPABILITIES

Cultural Resources Management The staff at *TREMAINE* has extensive experience in CRM -- from survey or excavation to protection and preservation of archaeological sites by conventional approaches or by innovative geophysical methods. We also have an excellent relationship with the Native American community in California.

Our archaeological laboratory is fully equipped with the instruments and resources needed to process, analyze, identify, and photograph (film & digital) most materials recovered from the field. We conduct faunal, lithic, and botanical analysis, obsidian hydration dating, human pathology and osteometrics. For C-14 dating we contract Beta Analytic. Our lab has an extensive library, with both published and "grey" literature, and we routinely search on-line databases and university libraries. For interim curation of archaeological collections, we have a secure, protected facility. Within the limits of NAGPRA, *TREMAINE* has long-term curation agreements with respected institutions, including Sonoma State University and the University of California at Berkeley.

Habitat Conservation & Planning *TREMAINE* has technical expertise in the creation, restoration, and preservation of native plants, riverbanksL wetlands, and other natural habitats. Habitat conservation planning and landscape planning approaches to conservation are issues that are rapidly increasing in significance and priority within and outside California.

GIS & GPS *TREMAINE* uses industry-standard geographic information system and geophysics software (ESRI's ArcView and C Tech's EVS). For GPS mapping with cm-level accuracy, we employ Trimble's RTK system, with the MS750 rover and a base station. The latest workstations, graphics programs, and business computers are networked for parallel processing of graphics and simulations. We also transfer GIS graphics and databases onto DVD RAM disks or CD-ROM, and produce graphics with our large-format printer.

Field Studies *TREMAINE* is fully equipped to perform field studies of both cultural and natural resources. Our specialized equipment includes laser range finders, hand-held GPS units, digital cameras, ESRI's Tracking Analyst software, field computers, and a Giddings hydraulic soil probe. For aerial photography or survey we call on our licensed pilot. *TREMAINE* also has 2- and 4-WD vehicles, ATV's, and watercraft at our disposal.

Soils Analysis Our Giddings hydraulic soil probe is used to ground-truth the geophysical data and to collect soil samples. At our lab, we process flotation samples and perform standard soil analyses (particle size, pH, carbonate and organic content, mineralogy, chemistry). Project specific data are also used to expand our digital soil maps and contribute to our core sample reference collection.

Project management *TREMAINE* uses an integrated project management approach to control schedules, budgets, technical performance, and deliverables. This approach is based on a 5-step process that can be successfully applied to either single tasks or complex projects.

Administrative Services Our administration focuses on financial and job-cost accounting, corporate and contract budgeting, forward pricing, and audit support. We have excellent banking relationships, along with an account receivable line-of-credit to keep pace with large-scale projects. Personnel policies and benefits encompass comprehensive safety and injury prevention, drug-free workplace programs, affirmative action and equal opportunity plans, and a profit sharing/401K retirement plan.

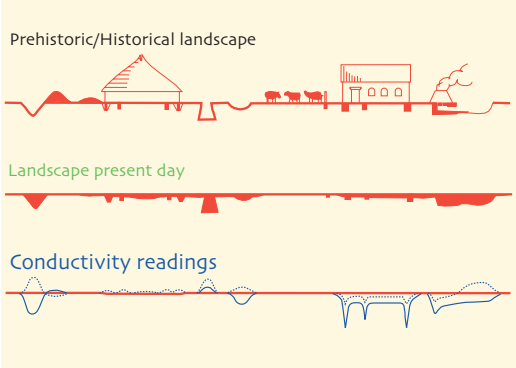
Production Our skilled team includes production specialists, graphic designers, editors, and wordsmiths. We design and produce all of our reports using creative desktop publishing software and hardware.

Outside Services Through our Associates Program we maintain professional ties with a broad range of highly-qualified scientists, often leaders in their fields, whose peer review, guidance, and research skills we employ for many of our projects. We also retain a pool of experienced, on-call field technicians.

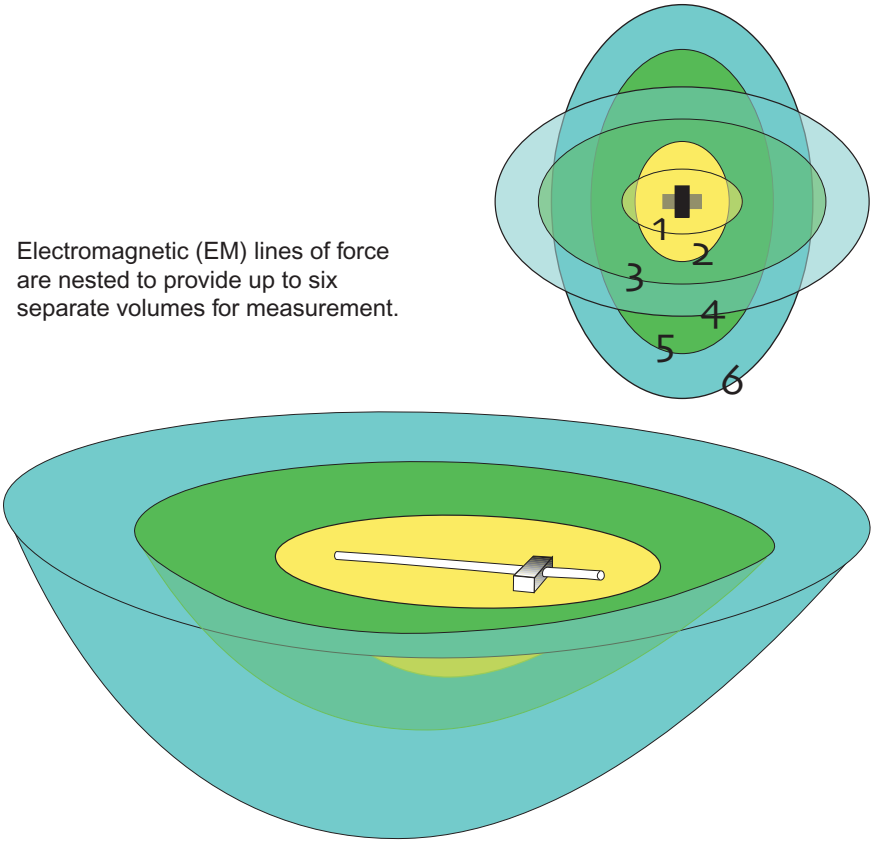
Geophysics & EM^3 Soils Conductivity

TREMAINE's proprietary EM^3 technology gives us a capability that is unique in the industry. It dramatically improves archaeological and natural resource survey results by providing a stratified view of the subsurface. We can plot 3 to 6 strata to a depth of 10 meters with our towed array. Terrain permitting, we can tow the EM^3 up to 20 mph. The EM^3 records two or more data points per meter, each of which is tagged with a GPS coordinate within cm-level accuracy. With this fine scale of resolution, we produce accurate maps of near-surface soils and landforms and pinpoint where to drill cores for further analysis. Our geophysical experts also use other remote-sensing instruments as appropriate for individual projects.

Our EM^3 instrument is used to collect near-surface conductivity and magnetic susceptibility data.



Near-surface geophysical profile of soil conductivity showing EM signatures of archaeological features.

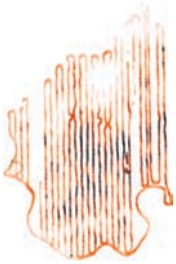


Electromagnetic (EM) lines of force are nested to provide up to six separate volumes for measurement.

We are the modern archaeological and natural resource services company demanded by today's planning and development professionals. By effectively integrating scientific research and field methods with our proprietary geophysical technologies, we are able to increase the speed and reliability of gathering field survey data, as well as reduce and eliminate work stoppages due to the inevitable "new discovery" of archaeological sites obscured by vegetation, fill, or natural deposition.

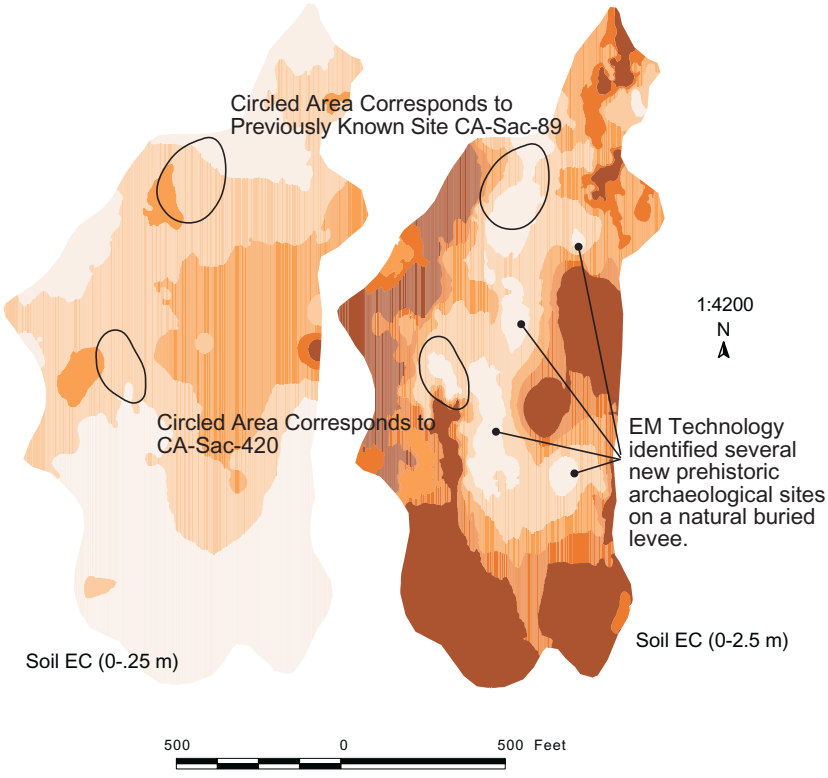
We specialize in delineating stratigraphy, locating buried landforms, and finding features with different soil types and densities that mark the location of archaeological sites *up to a depth of 10 meters (~33')*. What's more, in one day we can examine at least 200 acres at 40-foot-wide transects or 41,000 linear feet using only one towed array. This speed, accuracy, and reliability translates into *significant savings* of time and money for our clients over conventional methods alone.

Aerial Photo



Raw Data

North Stone Lakes



Electromagnetic Conductivity Survey at Stone Lakes National Wildlife Refuge.

Our near-surface technologies are ideally suited for regions with moderate-to-high sedimentation rates or terrain where surfaces are obscured by grass, brush, or patchy vegetation, and development projects with long, narrow, linear corridors or for small-to-large regional area studies.

TREMAINE's integrated approach is applicable to archaeology, ecology, and geophysical projects such as highways, mining, underground tank locating, pipeline and transmission line corridors, fiber optic lines, and precision farming.

We offer unique data sets and deliverables suited to our clients' needs:

- Delineation of strata and mapping of buried landforms
- Feature mapping including metal, carbonized material, and substance plumes
- Production of GPS Digital Elevation Models (DEM) with an accuracy of ±2 cm for X & Y axes, and ±.5 m for Z axes.
- Archaeological site and ecological habitat soils mapping
- Soils mapping
  - Chemistry
  - Profile
  - Moisture
  - Core reference collection
  - Salinity
  - Texture

Projects in Cultural & Natural Resources Management

Tremaine's approach to cultural resources management is sophisticated and comprehensive. The staff at *TREMAINE* has over 20 years experience in various phases of the mandated cultural mitigation process, ranging from simple pedestrian survey to full-scale excavation and National Register nominations. We have recently expanded our repertoire of CRM-related expertise to include the use of geophysical techniques, remote sensing, and ground-truthing for locating near-surface landforms and archaeological sites during the initial inventory phase. We also compile the data on surface and buried sites in regional models designed to identify both the environmental and cultural probability of encountering archaeological properties within a defined geographical area. Further, our company is experienced with oral history projects and other types of ethnographic research.

TREMAINE's archaeological experience includes a wide range of site types, including large habitation sites, burial grounds, sparse lithic scatters, baked clay scatters, bedrock milling stations, toolstone quarries, and seasonal encampments. We also have experience with investigating historic resources dating from the early 19th century through the early 20th century, with contexts associated with mission life, mining, ranching, logging, and transportation.

Our approach to natural resources management is refined and comprehensive. The experience of our staff ranges from simple revegetation projects to environmental assessments and habitat restoration. In addition to detailed floral and faunal analysis and environmental impact reports, our talented natural resources staff have also been involved in archaeological site preservation through native plant revegetation.

Our experience in natural resources management encompasses a wide range of ecological settings. Examples include terrestrial and aquatic habitats, marshlands, and desert within California, the Sierra Nevada , Great Basin, the Southwest, and Mexico.

TREMAINE emphasizes the importance of combining natural resources management with cultural resources management in order to maintain the highest level of integrity in all our projects.

Projects in Cultural & Natural Resources Management

Cultural Inventories & Evaluations

US Fish & Wildlife Service, Region 1
- On-call services for various cultural resources inventories throughout the region involving Partners for Wildlife Enhancement Projects.

Planning Concepts, Nevada City, California
- Cultural resources inventory for the Banner Mountain Road Corridor Improvements EIR Project. Lead Agency: Placer County.

Sacramento Municipal Parks & Recreation, California
- Burial project on the Sacramento River.

The Mansour Co, Sacramento, California
- Test excavations for 90 sites involved in major residential development project near Clarksville, California.

Stone Lakes National Wildlife Refuge, California
- Eligibility determinations for 4 ethnographic village sites on the Refuge (Ca-Sac-85, 86, 87, & the Gateway sites).

Napa County, California
- Pilot study of historic rock fences to determine their geographical distribution, associations, ages, contexts,& registry criteria development.

Monitoring

Parsons Brinkerhoff Network Services, Colorado
- Monitoring fiber-optic cable installation from Sacramento to San Bernardino & Sacramento to Emeryville, California

Department of Water Resources, California
- Monitoring Coastal Branch II Pipeline project from Kern County to Santa Barbara

San Joaquin National Wildlife Refuge, California
- Monitoring of levee project on the Refuge

Sacramento Municipal Parks & Recreation
- Archaeological site monitoring at Sand Cove Municipal Park, Sacramento, California

Clyde Steagall, Inc., Loomis, California
- Monitoring during excavation for Arcade Creek pumping station, Sacramento, California

Castle Development, Inc., California
- Monitoring during pipeline project along Rt. 16, Esparta, California

City of Dixon, California
- Monitoring during Multi Modal Rail Project

CH2MHill, Army Corps of Engineers, Sacramento, California
- Monitoring during levee testing along the Sacramento river, Sacramento county, California

Feasibility Studies

Parsons Brinkerhoff Quade & Douglas
- Identification of potential cultural resource constraints associated with 17 alternatives considered for Caltrans' Southeast Area Transportation Study, Sacramento, California.

El Dorado County Irrigation District
- Sensitivity study for the El Dorado County Water Agency, El Dorado, California.

Pacific Gas & Electric
- Sensitivity & feasibility study for Line 109 Replacement Project, San Francisco, California.

Client References

State-wide On-Call Services

"You have always been responsive to our needs, conducted excellent field work, and produced high quality professional reports… in a timely fashion. I would be happy to recommend your firm..."

Anan Raymond, Regional Archaeologist,
U.S. Fish & Wildlife Service, Region 3

Coon Creek Bridge Replacement

"(your) Historic Property Survey Report and Archaeological Survey Report... look great and I wish that all of the consultant reports that I review during the course of a year were as well prepared."

Janis Offerman, Heritage Resources Coordinator,
Caltrans, District 3

Mojave Bypass Phase 1 Inventory

"I have really appreciated your thoroughness, professionalism, and timeliness in completing work under this Task Order."

Richard A.Weaver, Contract Administrator,
Caltrans, District 9