

SAMPLE SCORE OF WORK

Exhibit A
Scope of Work

Sample

5. Overview

The Department of Fish and Game is entrusted by the State of California to protect and restore native wildlife populations. The red fox (*Vulpes vulpes*) is known to be native to the Sierra Nevada and southern Cascades of California (Sierra Nevada red fox, *V. v. necator*). The Sierra Nevada red fox is considered a state-threatened species and currently could be limited to a handful of remaining individuals. Additionally, it has recently been discovered that red foxes inhabiting the Sacramento Valley also are native and closely related to the Sierra Nevada red fox. The Sacramento Valley red fox population, however, differs ecologically from the Sierra Nevada red fox in its habitat, body size, and functional regions of its mtDNA, arguing for its consideration as a distinct population segment of the Sierra Nevada red fox. The Sacramento Valley red fox is phylogenetically distinct from the nonnative red foxes south of the American River and the San Francisco Bay-Delta system.

Genetic and prevalent anecdotal information indicate that the Sacramento Valley red fox has declined considerably in abundance from its historical numbers. Otherwise, little is known of the status of this population or of the relative importance of potential threats to its persistence. The current awareness of its native status, its close relationship to the Sierra Nevada red fox, and its proximity to a growing nonnative population dictate the necessity to rapidly gain basic information of the status and ecology of this population so that management priorities can be identified and its persistence in California ensured.

6. Scope of Work

OBJECTIVES

- Determine current distribution in the Sacramento Valley.
- Locate dens in focal areas (Mar—Jun).
- Assess population genetic structure.
- Assess genetic diversity of core and peripheral populations.
- Characterize reproductive habitats currently used by red foxes.
- Grossly estimate vital rates in designated locations (fecundity, stage-specific survival).
- Assess threats of hybridization with nonnatives.
- Identify potential mortality factors (coyotes, human(s), disease).
- Survey for potentially harmful pathogens (fecal assays for parvovirus).

Future objectives

- Compare historic and current land-use practices with changes in fox occurrence.
- Determine fine-scale habitat use via radio telemetry
- Determine age-specific survival rates via radio telemetry
- Serosurvey for potentially harmful pathogens (e.g., distemper).

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APPROACH

The named Principal Investigator will conduct and/or oversee the various tasks to be accomplished. Tasks will include:

- Actively seek sighting information from community.
- Maintain web site for gathering sighting data.
- Locate dens in focal areas (Mar—Jun).
- Monitor dens.
- Obtain litter size estimates.
- Collect non-invasive genetic samples (scats, hair).
- Record prey remains.
- Characterize reproductive seasons via pup size and growth.
- Design and conduct standard survey methods for focal areas.
- Opportunistic recovery and necropsy of road-killed foxes.
- Sequence to determine native/nonnative matriline.
- Genotype at autosomal loci for individual ID, hybrid assessment, genetic diversity, and population genetic structure.

EXPECTED OUTCOMES

- Maps of Sacramento Valley red fox
 - a. Occurrence
 - b. Preliminary habitat
 - c. Population genetic structure
 - d. Genetic diversity
- List of likely threats
- Genetic “fingerprint” of a sub-sample of pups from known den locations in known cohorts (2007, 2008, 2009)
- Relationships between breeding males and females to assess ability to outbreed
- Genomic information enabling assessment of nonnative introgression
- Identification of denning habitat, correlates of reproductive success
- Materials preserved for additional genetics (e.g., MHC), parasitology, food habits, morphological comparisons, etc. in future (to be accessioned in museum research collections)
- Recommendations for an Action/Conservation Plan

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AREA of STUDY/RESEARCH

Initially, efforts will focus on south end of range as this is where nonnative invasion and introgression are most likely. However, reports will be solicited throughout the Sacramento Valley and efforts made to investigate and survey to some extent in the northern section. Obtaining genetic material from the north will be essential to assess fragmentation/connectivity and genetic effective population size.

PROJECT SCHEDULE

Year 1

1. Begin den surveys and collect genetic material.
2. Finalize genetic sample collection and laboratory protocols.
3. Finalize data collection protocols for den monitoring (e.g., hours, time of day, counting pups, adults).
4. Pilot survey techniques (camera/scent station and/or spotlight).
5. Pilot capture methods using box traps and snares.

Year 2

1. Continue den surveys and fecal collection, expand north.

Year 3

1. Continue all.
2. Write up final report.
3. Make recommendations.

MILESTONES SCHEDULE OF COMPLETION DATES

<u>Activity/Task</u>	<u>Scheduled Completion Date</u>
Progress Report #1 (6-15-08 to 10-31-08)	December 31, 2008
Progress Report #2 (11-01-08 to 10-31-09)	December 31, 2009
Draft Final Report sent to Cont. Mgr	April 30, 2010
Final Report Submitted	May 30, 2010

PROGRESS REPORTS

Progress reports will be due on the dates indicated. Progress reports shall include detailed updates on the progress toward objectives, tasks and work performed during the progress reporting period. Draft/Final reports shall provide detailed write-up, analysis, data, and maps regarding the contract performance.

SCOPE OF WORK

Sample

1. Background

Contractor will provide the Department of Water Resources (DWR) with the necessary level of expertise for cooperative activities associated with geologic studies of subsurface stratigraphy in the Sacramento Valley. This work will also include study and review of surface exposures in and around the Sutter Buttes of Northern California. Using a team approach, the work will be overseen by CSUS Principal Investigator and will be coordinated with DWR staff.

This effort is required so that DWR can further interpret the stratigraphy of the Sacramento Valley and assess its groundwater resources. The focus of the work is to determine the stratigraphy of the subsurface, especially as it relates to groundwater resources.

2. Scope of Work

The Contractor will collect, prepare, and analyze geologic samples, prepare tables and graphs using results of the analyses, conduct geologic mapping, interpret results of these activities, and review and prepare reports to aid DWR in the interpretation of the geology and hydrogeology of the Sacramento Valley near the Sutter Buttes, nearby foothill locations, and other Sacramento Valley sites where volcanic rocks and volcanic-derived sedimentary rocks are found. The Contractor will provide petrographic, geochemical, and mapping analyses for geological studies conducted by DWR's Division of Planning and Local Assistance.

Task 1 – Field Work

Contractor will coordinate with the DWR to select drilling sites where appropriate geologic material will be available for sampling and analysis. Contractor will travel to the site and with the assistance of DWR personnel, collect samples for laboratory analysis, and, in some cases, analyze samples in the field. The contractor may conduct field trips to collect surface samples that can be used to interpret the stratigraphy of the Sacramento Valley as it relates to groundwater resources and to collect GPS data to include in geologic maps and stratigraphic cross-sections.

Task 2 – Sample Preparation

Contractor will prepare thin sections and grain mounts from field samples for microscope analysis. Contractor will select samples and provide them to either the USGS tephrochronology lab or the UC Davis microprobe laboratory.

Task 3 – Sample Analysis

Contractor will examine geologic samples and provide data regarding texture, mineralogy, grain size and shape, and other characteristics that will be useful in the stratigraphic interpretation of the subsurface of the Sacramento Valley. The analyses will help identify the geologic formation, depositional environment, and age of the samples. Under the contractor's direction, either the USGS tephrochronology laboratory or the UC Davis microprobe laboratory will analyze up to 20 geologic samples.

Task 4 – Data Management

The Contractor will input and maintain the results of field and laboratory analyses in computer files. In addition to tables and graphs presented in quarterly and final reports, the Contractor will provide data in digital format approved by DWR staff. The Contractor will also maintain geographic coordinates of sampling and mapping locations under this contract.

Task 5 – Data Analysis

Analyze data from sample collection and analysis to interpret the subsurface stratigraphy of the Sacramento Valley, especially as it relates to groundwater resources.

Task 6 – Report Preparation

The Contractor may review and edit drafts of DWR student employee's work on the stratigraphic study of subsurface geologic samples from the Sacramento Valley around the Sutter Buttes. These drafts are subject to DWR approval. On a quarterly basis, the contractor will provide a summary of activities completed under this contract. On completion of this contract, Contractor will provide a final report documenting the activities completed under this contract.

Students chosen to provide assistance outlined in this scope will be qualified California State University, Sacramento Geology-major students other than Steven Springhorn, who is currently employed through DWR as a student assistant.

3. Deliverables

The Contractor will compile the results of laboratory and field analyses in tabular, and graphical form and provide observations on the stratigraphy of the Sacramento Valley, especially as it relates to groundwater resources. The Contractor will provide these results to DWR on a quarterly basis throughout the duration of the contract.

Contractor will prepare and transmit a draft final report on or before 60 days from the end of the contract term. DWR may provide comments on this draft to the Principal Investigator within 15 days of its receipt. The Contractor will deliver the final report on or before the end of the contract term.

The final report will include, but may not be limited to, the following:

- Interpretation of regional stratigraphy based on lithologic comparison, stratigraphic position, and results of tephrochronology analyses of well samples from the Sacramento Valley samples from surface exposures in and around the Sutter Buttes
- Microphotographs of samples prepared for analysis
- Laboratory reports from tephrochronology analyses
- Graphical summaries of data from all analyses
- Tabular results of all analyses

The final report and associated data will be presented in digital format approved by DWR staff.

Sample

I. Project Overview:

This project will mitigate the loss of scientific and ecological value resulting from modification of a known rare bat (*Antrozous pallidous*) roosting site of substantial quality. This will be achieved through data collection obtained by banding individuals and tracking them to alternative sites. These locations and associated data will provide the basis for subsequent studies to monitor population effects on a rare bat species (*Antrozous pallidous*) affected by displacement of a night roost site, and will enable monitoring the effectiveness of experimental mitigation measures included in the replacement bridge design by measuring species use and composition.

Contractor will provide the necessary levels of experience and equipment to conduct field surveys and evaluations following methodology approved by the California Department of Fish and Game, Non-game Division, and CalTrans.

The results will be documented in standard scientific paper report format. The CSUS team will also be available for presentation and discussion of the results and be available as a resource for any discussions with the California Department of Fish and Game and /or U.S. Fish and Wildlife Service.

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II. Scope of Work:

A. Prior to project construction in the summer of 2004, the team will do the following:

1. Identify the species composition and density, and characterize use of the bridge during the spring, summer, fall, and winter.
2. Capture bats and attach identification markers (band) consistent with CDFG protocols to allow re-identification of *Antrozous pallidus* individuals.
3. Identify associated *A. pallidus* day roosts, and alternate night roosts, where feasible using radio telemetry to allow present and future bat researchers to relocate colonies on a portion of the *A. pallidus* captured.
4. Provide a context of possible *A. pallidus* alternative roost sites in the area where researchers could relocate these individuals.
5. Provide a written report, using a format to be provided, of the findings for use by researchers, to include findings useful for construction strategies.

III. Schedule of Deliveries

Work Plan	July 30, 2003
First Season Findings and DFG Capture Records Meetings and Data Presentation (Min 4)	November 1, 2003 On-Going
Draft Report	May 15, 2004
Final Draft Report	<u>June 21, 2004</u>
