Tejon Oaks Group Project Problem Statement
Andrew Krieger, Serra Hoagland, Shannon Moy and Anderson Shepard

Client goals and needs:

Tejon Ranch (the Ranch) is the largest contiguous private property in California and is located at the intersection of four major bioregions. Currently the Ranch is going through the permitting process to develop 11% of the total ranch property. Prior to the entering into the development process an agreement was made between the Tejon Ranch Company and a consortium of environmental groups to allow development to proceed unopposed under the condition that a certain amount of the land will be preserved for posterity. This resulted in the creation of the Tejon Ranch Conservancy (the Conservancy). The goal of the Conservancy is to develop a science based Ranch-Wide Management Plan (RWMP) that will work to adhere to the mission of the ranch to “preserve, enhance and restore the native biodiversity and ecosystem values of the Ranch and the Tehachapi Range for the benefit of California’s future generations.” The RWMP will analyze baseline environmental conditions, develop adaptive management plans to conserve or enhance the Ranch conditions, and provide a cost analysis for management plans and potential monitoring programs.

The Conservancy lacks the resources to conduct field studies and data analysis which are critical components in developing the RWMP. The goal of our project is to develop the oak woodland section of the RWMP. To meet the needs of our client we must obtain ecological data on types and locations of oak woodlands, identify conservation values for oak woodlands, identify potential management and monitoring tools, and identify the costs of potential management and monitoring plans.

Specific Project Objectives:

1. **Baseline:** Establish baseline information regarding the diversity, extent, and structure of oak woodlands.
   a. Obtain current vegetation maps and utilize satellite imagery to locate and classify subsystems of oak woodlands. These will be characterized based upon the dominant oak type (ie. blue oak woodlands, valley oak woodlands, etc.).
   b. Use actual field data to validate oak subsystem classification. A systematic means of sampling the oak woodlands will be developed. Possible approaches include: transects, random points, etc.
   c. Ranch-wide oak woodland composition will be summarized: i.e. total area, percent edge and total core area for each subsystem, and for the oak woodlands as a whole.

2. **Status:** Determine the ecological condition of the various oak woodland subsystems.
   a. Access information on grazing regimes. Potentially compare Tejon oak woodlands (grazed) to non-grazed, well-managed oak woodland sites.
   b. Collect hunting data, hydrological data, and well log information if available.
   c. Perform the following field studies:
      i. Browsing: Determine the extent and impact of grazing pressure on various oak woodlands communities in different areas of the ranch. Determine primary browser in each oak woodland community.
      ii. Oak Recruitment: Determine if there is a significant difference in recruitment among low/high elevation groups, among various types of oaks, within different age classes, etc.
      iii. Oak Foliage Condition Analysis: can act as an indicator of air quality and tree health (?)
   d. According to the defined conservation values and the findings from above, we will prioritize oak woodland communities and eventually determine which subsystems are most at risk.

3. **Values:** Determine current and future oak woodland conservation values.
   a. Perform a literature review to determine if there are any existing oak woodland conservation values that have been recommended. Result to MSHCP for a list of flagship species present at Tejon Ranch.
b. Identify wildlife habitat elements based off of the MSHCP. Wildlife habitat elements could include: snags, down wood, etc.
c. Conservation values might include: wildlife habitat elements and suitability, plant diversity, aesthetic value, etc.

4. **Action:** What potential management and monitoring options exist that support the above objectives? What management and monitoring options are currently being implemented in other oak woodland systems? An emphasis will be placed on adaptive management approaches.
   a. Depending upon conclusions from the analysis above, potential management solutions may include but are not limited to the following:
      i. Invasive species management and eradication projects: starlings, feral pigs, etc.
      ii. Altering grazing practices
      iii. Altering hunting practices: increase take of ungulates, decrease take of predators
      iv. Active revegetation or oak recruitment projects
      v. Protecting sensitive habitat: fence off riparian habitats, etc.
      vi. Stream restoration to increase valley oak recruitment
   b. Management options that enhance or conserve the most at risk oak woodland communities and achieve the greatest amount of conservation values will be considered for the cost analysis.
   c. Strict monitoring guidelines will be established for the recommended management plan.

5. **Costs:** What are the economic costs and benefits of potential management and monitoring options?
   a. What are the costs of all the components of the proposed management and monitoring plan? What are the potential lost opportunity costs to the Conservancy and the Ranch?
   b. Is there any potential revenue that could be gained from this management plan?
   c. Are there any current resources available? Are additional staff required to enforce the management plans?