

4.20) Vegetation Mapping Initiative

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INTRODUCTION

1999 marked the beginning of a multi-year initiative to classify and map the terrestrial vegetation of Sequoia and Kings Canyon National Parks. The need for a comprehensive, accurate vegetation map for resource planning, management and research has long been recognized by Park managers and cooperators. This is especially true for the fire management program, which relies on accurate vegetation mapping to drive predictive fuels models. In 1999, the national fire management program in Boise (Firepro) agreed to initiate the vegetation mapping effort with two years of funding, provided that the national Inventory and Monitoring program commit to funding the project in subsequent years. This agreement was reached, and in spring funds were transferred to the park to begin work.

PROJECT OBJECTIVES

Our goal is to develop a highly accurate vegetation map that meets scientific and Federal Geographic Data Committee (FGDC) standards, is based on a hierarchical classification scheme consistent with the National Vegetation Classification, and has a level of detail that is useful to park managers and cooperators. Using the USGS-NPS Vegetation Mapping Program as a model, the map layer will be based on 1:15,840 color infrared aerial photography, will rely on the national classification being developed by The Nature Conservancy (TNC) and Ecological Society of America (ESA), and will result in the generation of dynamic, digital products widely available on the world wide web.

SUMMARY OF METHODS

Classification

The development of a comprehensive vegetation classification is by nature an iterative process, with field sampling and polygon delineation informing the classification and vice versa throughout the course of the project. The classification forms the basis for describing vegetation types both on the ground and on remote images, providing a powerful tool for delineating and understanding types. At SEKI, the first full year of the project will be dedicated in large part to the development of an initial classification based on existing plot data (nearly 1000 plots are currently available for this effort) and a season of intensive field sampling to increase its robustness. Where data allow, types will be described and mapped to the association level. Where subcanopy data are lacking or precise photo interpretation is not possible, we will take the classification and the map to the alliance level. The resulting classification will be based on and fully integrated with the national classification being developed by TNC and ESA.

Data acquisition

Vegetation sampling

Plot-based vegetation data will be collected using the protocols developed for the USGS-NPS Vegetation Mapping Program by TNC. Fuels will be characterized on the vegetation plots according

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to protocols developed in Yosemite as a part of their vegetation mapping effort. The GRADSECT approach (citation) will be used to stratify the landscape according to the primary environmental variables believed to drive the distribution of Sierran vegetation (e.g. substrate, topography, elevation). Sample locations will then be allocated to these landscape units based on the availability or lack of existing plot data, with those types already adequately represented receiving the lowest priority for additional fieldwork.

Aerial photography

Using a minimum mapping unit of 0.5 hectare, delineation of vegetation polygons will be based on 1:15,840 color infrared aerial photographs. A contract is already in place with Pacific Western Technologies of Albuquerque, New Mexico, to obtain these images during summer of 2000. Timing of the flights will be based on minimizing snow cover in the high country while maximizing sun angle to decrease shadow effects that can plague images of mountainous terrain. Delivery of the completed aerial photography will then lead to the implementation of a contract for photo-interpretation services in fall of 2000.

WORK ACCOMPLISHED IN 1999

A scoping meeting was held in June of 1999 at SEKI headquarters to develop a plan for the vegetation mapping initiative. Representatives from Firepro, the USGS-BRD National Vegetation Mapping program, adjacent land management agencies (USFS, CDF), TNC, BRD-Yosemite, Pt. Reyes, and CDFG joined local park and USGS-BRD personnel for a three day meeting to set goals and objectives, discuss alternatives, establish a working timeline and identify potential points of collaboration.

After lengthy discussion and deliberation both during and following the scoping session, we decided to use color infrared aerial photography as the basis for identifying vegetation polygons. Taking advantage of existing agreements in place through USGS and Bureau of Reclamation, a contract was obligated to Pacific Western Technologies for acquisition of imagery. Delays in the transfer of funds resulted in successive delays in the flights, which were originally scheduled for August of 1999. As it became apparent that flights completed in late September could result in data loss due to topographic shading and diminished IR signals as vegetation senesced, we decided to postpone the mission until summer of 2000. This contract also includes a provision for duplicate images of the East Fork Study Area in support of the Mineral King Landscape Assessment (Menning *et al.*, this document).

A site visit was made to Yosemite NP in August to meet with project collaborators and to observe the fieldwork in progress there. S. Haultain spent a week in the field with USGS-BRD YOSE biologists, TNC field crews, contract air photo interpreters, and state vegetation ecologist Todd Keeler-Wolf becoming familiar with the photo interpretation process, sampling protocols, and the development of the local classification.

Funds were obligated and a contract put in place to secure the collaboration of Dr. Todd Keeler-Wolf, CDFG vegetation ecologist, on the development of the SEKI vegetation classification and sampling strategy during FY2000.

Office supplies and equipment, field equipment, and other support materials were purchased in anticipation of the commencement of fieldwork in 2000.

PLANS FOR THE COMING YEAR

Plans for 2000 include:

- Development of a preliminary classification of the vegetation of SEKI using existing plot data
(winter/spring)
- Development of a GRADSECT based sampling strategy (spring)
- Hiring of a term field leader and 2-3 seasonal field teams (spring)
- A full season of field sampling, focused on establishment of 100-200 vegetation plots (spring/summer) and collaboration with NWI field crews to maximize efficiency
- Acquisition of aerial photography (summer)
- Award of contract for photo interpretation (summer/fall)