

4.20) Vegetation Mapping Initiative

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INTRODUCTION

Park managers and cooperators have long recognized the need for comprehensive, accurate vegetation maps for resource planning, management and research. 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) initiated a multi-year effort to classify and map the terrestrial vegetation of Sequoia and Kings Canyon National Parks with two years of funding, provided that the national Inventory and Monitoring program commit to funding the project in subsequent years. In 2000, the project entered into its second year under FirePro funding.

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. 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, and with the Manual of California Vegetation (Sawyer and Keeler-Wolf 1995).

Data acquisition

Vegetation sampling

Plot-based vegetation data were collected using the protocols developed for the USGS-NPS Vegetation Mapping Program by TNC. Fuels were characterized on the vegetation plots according to protocols developed in Yosemite NP as a part of their vegetation mapping effort. Sampling locations were identified using a combination of local expert knowledge of gaps in existing plot data, and spatial data provided by a GRADSECT analysis (Austin and Heyligers 1989). Using work completed in Yosemite as a guide, the GRADSECT approach was used to develop an initial stratification of the landscape according to the primary environmental variables believed to drive the distribution of

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Sierran vegetation (substrate, topography, elevation), which then provided a way of assessing both the geographic and ecological completeness of existing legacy datasets.

Photo acquisition/ Photo interpretation

Using a minimum mapping unit of 0.5 hectare, manual delineation of vegetation polygons will be based on 1:15,840 color infrared aerial photographs.

WORK ACCOMPLISHED IN 2000

Field Sampling/ClassificationDevelopment

At SEKI, the first full year of the project was 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. The field crew assembled for this project established a total of 179 exhaustive field plots, and 60 fuels plots. The team was made up of a lead biological technician (term), three GS-06 field botanists, and three Student Conservation Association (SCA) field assistants. California Dept. of Fish and Game Vegetation Ecologist Todd Keeler-Wolf assisted with training the crew in sampling methodology. Sampling was carried out in two backcountry locations within each park: southern Hockett Plateau/Quinn area and the Tablelands area in Sequoia, and LeConte Canyon and Kearsarge Lakes Basin in Kings Canyon. Although crewmembers were required to hike into these remote field locations, supplies and materials were transported via packstock and/or helicopter. Plot data were stored in a modified version of the PLOTS database developed by TNC for the NPS/USGS Vegetation Mapping Program.

Photo acquisition

Taking advantage of existing agreements in place through USGS and Bureau of Reclamation, a contract was obligated to Albuquerque based 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, the mission was postponed until summer of 2000. The mission was carried out during the week July 18, 2000. Flight lines encompassed the 863,000 acres within the two parks and an additional 88,000 acres of surrounding lands, for a total of 951,000 acres and 1,915 photographs. This contract also included a provision for duplicate images of the East Fork Study Area in support of the Mineral King Landscape Assessment (Menning *et al.*, this document).

Contracting for additional services

Funds were obligated and a contract awarded to secure collaboration of Dr. Todd Keeler-Wolf, CDFG vegetation ecologist, on the development of the SEKI vegetation classification and sampling strategy during FY2000 and FY2001.

Funds were obligated and a contract awarded to ESRI/AIS for two weeks of field reconnaissance for orientation/training of photo interpreters, and preliminary interpretation of 144 photographs during FY2001.

PLANS FOR THE COMING YEAR

Plans for 2001 include:

Continued development of preliminary vegetation classification

Completion of field sampling towards classification development

Initiation of preliminary photo interpretation of 144 CIR photographs in support of field sampling

Completion of two week-long reconnaissance trips to orient photo interpreters to park vegetation types and augment preliminary list of types

REFERENCES

Austin, M.P. and Heyligers, P.C. 1989. Vegetation survey design for conservation— GRADSECT sampling of forest in NE New South Wales. *Biological Conservation* 50:13-32.

Sawyer, J. O. and Keeler-Wolf, T. 1995. A manual of California vegetation. California Native Plant Society, Sacramento, CA.

USEFUL LINKS

The USGS-BRD vegetation-mapping site can be accessed at: <http://biology.usgs.gov/npsveg/>

The TNC vegetation classification can be accessed at:
<http://www.tnc.org/frames/index.html?http://consci.tnc.org/index.html>