

4.19) Develop a Landscape – Scale Framework for Interagency Wildland Fuels Management

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INTRODUCTION

This project is focused on developing and testing an approach to incorporate wildland fuels information management into an interagency, landscape-scale, planning framework. The project area includes six major watersheds (Kaweah, Kings, Kern, Caliente, Tule, and Mojave) covering an area of about 4.7 million acres. The major stakeholders include: Sequoia and Kings Canyon National Parks, Sequoia National Forest, Bureau of Land Management – Bakersfield District, California Department of Forestry and Fire Protection, and Kern County Fire Department (**Fig. 4.19-1**). The website is located at <http://ssgic.cr.usgs.gov>.

A spatial database system is being created for coordinated fuels management planning utilizing a Geographic Information Systems (GIS) framework. The primary goals include improved firefighter and public safety, reduced fiscal costs to both government agencies and the public, and attainment of ecological and hazard reduction goals across jurisdictional boundaries. The project focuses on utilizing GIS and Internet technologies to overcome institutional and organizational barriers to interagency fuels management within very large, diverse ecosystems. Common geographic data and analyses are being developed to prioritize treatment areas based on value, hazard, and risk criteria. The framework will develop and test procedures to manage and update complex information and to institutionalize coordinated planning efforts. This project is funded by a three-year Joint Fire Sciences Program (JFS) grant.

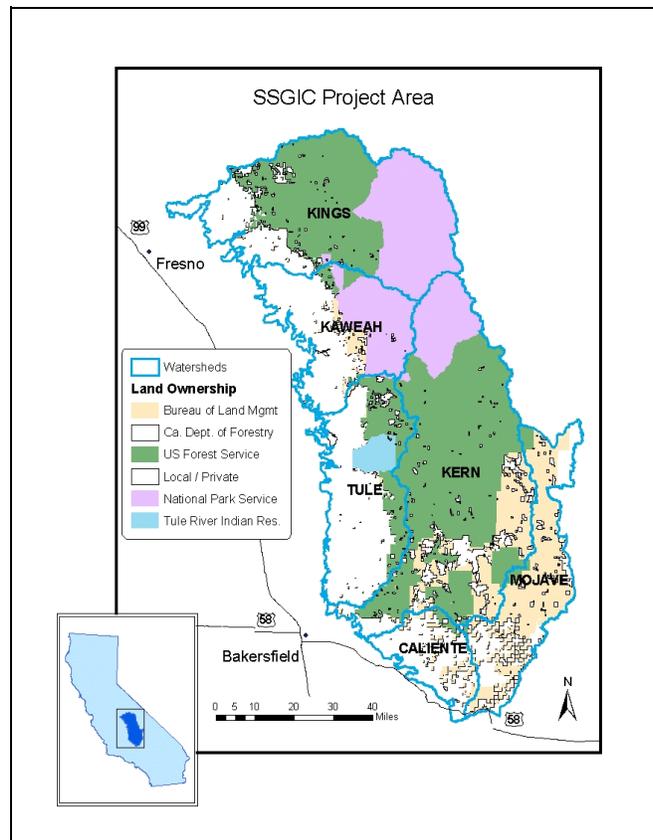


Figure 14.19-1. - Southern Sierra Geographic Information Cooperative (SSGIC) Project Area map.

PROJECT OBJECTIVES

- Develop seamless data across the SSGIC analysis area that meets National Spatial Data Infrastructure requirements.
- Provide continuous access to data and analyses outputs via the Internet utilizing ArcIMS mapping technology.
- Develop standardized business processes that optimize long-term interagency collaboration.
- Develop and implement analyses across the SSGIC analysis area.
- Implement an interagency collaboration system based on web technologies.
- Utilize analysis results to develop a multi-year, interagency fuels treatment plan.
- Written documentation captures protocols and processes to facilitate replication of the project by others.
- Project Plan is developed and maintained as a guide to meeting project goals and fiscal accountability.
- Meet Joint Fire Sciences Program requirements.

SUMMARY OF METHODS

A Cooperative Agreement has been developed and signed by the stakeholder agencies. A Project Plan is developed and maintained that describes specific goals and links the specific tasks/strategies required to achieve these goals. A budget strategy is also included.

Data development needs were prioritized and stakeholder agencies provided available data. Source datasets were integrated into seamless, SSGIC-wide GIS themes of “best available” data. Metadata is being developed to meet National Geographic Data Committee standards. Analytical processes, models, and methods were collaboratively developed by agency fire /fuels personnel to assign Risk, Hazard, and Value measures and integrate these to identify high priority fuels treatment areas at the project level.

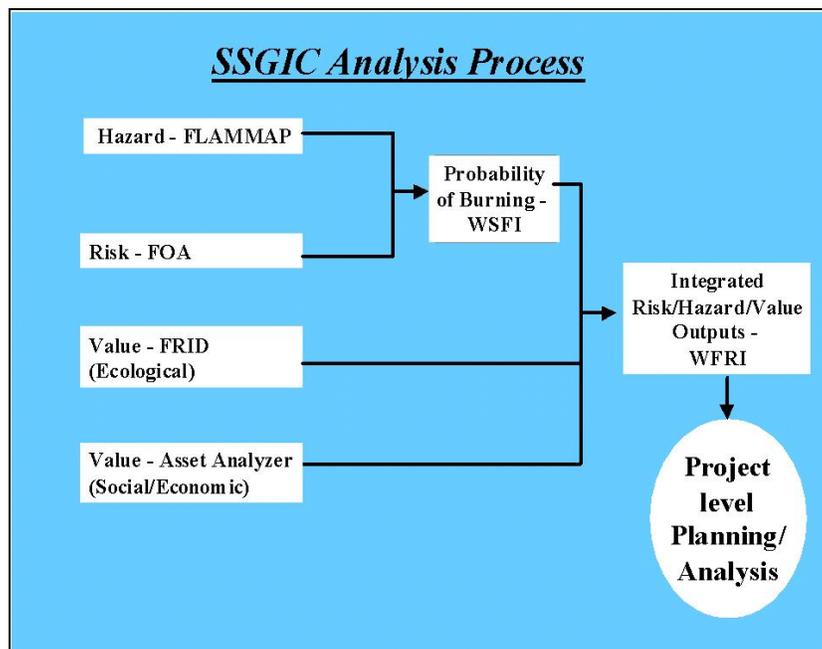


Figure 24.19-2 – Flowchart of analytical process being implemented to identify high priority project level fuels treatment areas.

A website has been established deploying ArcIMS to provide web based mapping functionality. Developed datasets are incorporated into map services to provide interactive viewing and printing of mapped data. Data and metadata are available for download by watershed. Documentation of the project to date is also available. Long-term strategies include the development of web based collaborative tools to facilitate interagency data management, analyses, and planning.

WORK ACCOMPLISHED IN 2001

Significant progress has been made during the 2001 calendar year in the areas of data development, analysis implementation, and website development. A program manager was hired as of September 2001 to coordinate the day to day activities of the organization. Wildland Urban Interface (WUI) funds are supporting this position.

Data Development

Significant progress has been made on acquiring and assembling seamless spatial datasets across the SSGIC analysis area and integrating tabular datasets. Completed datasets necessary to implement the analysis flow chart include 20 years of fire ignition data, fire perimeters of historical fires, fuels (Anderson fuel model codes), direct protection areas, slope, elevation, and aspect. Nearing completion are vegetation data and canopy cover data. Numerous supporting base data layers have also been completed including land status, watersheds, state responsibility areas, air basins, wilderness boundaries, roads, hydrography, public land survey, soils, wildland urban interface, counties, cities, etc. The SSGIC has entered a 14-month contract with the United States Geological Survey (USGS) to provide continuing GIS technical support. This will include development of additional data layers, maintenance and update of existing layers and analytical support.

Analysis Implementation

FOA – Fire Occurrence Areas

This analysis represents the potential “Risk” of a fire ignition occurring (ignitions/1000 acres/year) and is derived from historic ignition data (Fig. 4.19-3). The analysis has been completed and will soon be available on the website. Constraints applied to the dataset include using 1981-2000 ignitions, eliminating management fire ignitions, and clipping agency datasets to their respective boundaries. Both human caused and lightning ignition were included in this dataset of 8,000 ignition points.

FRID – Fire Return Interval Departure

This analysis is based on extensive research identifying fire as a keystone natural process within the Sierra Nevada and provides an index to rank areas based on the need to restore historic fire regimes. Source spatial data include vegetation and historic fire

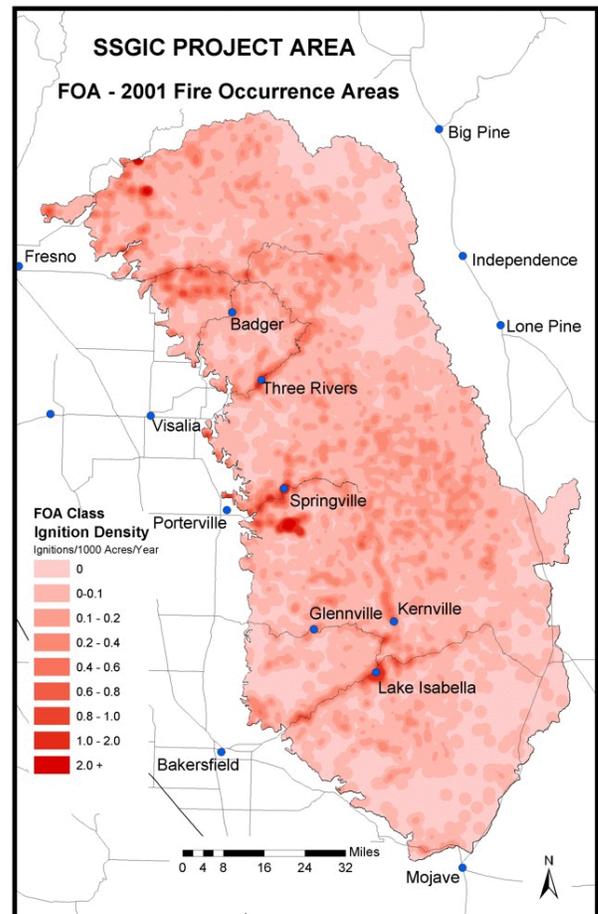


Figure 34.19-3 – The FOA (Fire Occurrence Areas) model calculates the “risk” of an ignition occurring (ignitions/1000 acres/year) based on historical ignition data.

perimeters. A Fire Return Interval (FRI) is assigned to each vegetation type which represents the historical (preEuropean settlement) burn interval. The model uses the historic fire perimeter data to calculate how many FRI's have elapsed since the last recorded fire across the landscape. FRID analysis is nearing completion.

Website Development

The SSGIC website at <http://ssgic.cr.usgs.gov> has been established. An agreement was reached with the USGS to house the web server and provide administrative support to the website from their Denver, CO office. Remote access to server is via Terminal Services Client. Website functionality includes interactive map viewing, data download, access to SSGIC program documentation, and links to a variety of related sites. Map services currently available include an SSGIC overview map interactively displaying several base data layers (Fig. 4.19-4); analysis results will be added as they become available. It is hoped that next fire season we will be able to provide the fire community with 24/7 access to information valuable at the operational level.

ArcIMS software, which provides the web mapping functionality, is new GIS technology requiring with a significant learning curve. The contract with USGS provides ArcIMS implementation, management, and support. One of our goals for interagency collaboration is to ensure that each stakeholder agency has full access to the web site to add, update, and modify, data and collaborate on spatial data via the website. To facilitate this, each agency (with the exception of Kern County Fire Dept.) identified an individual as ArcIMS manager for the agency who received three days of ArcIMS training in November, 2001.

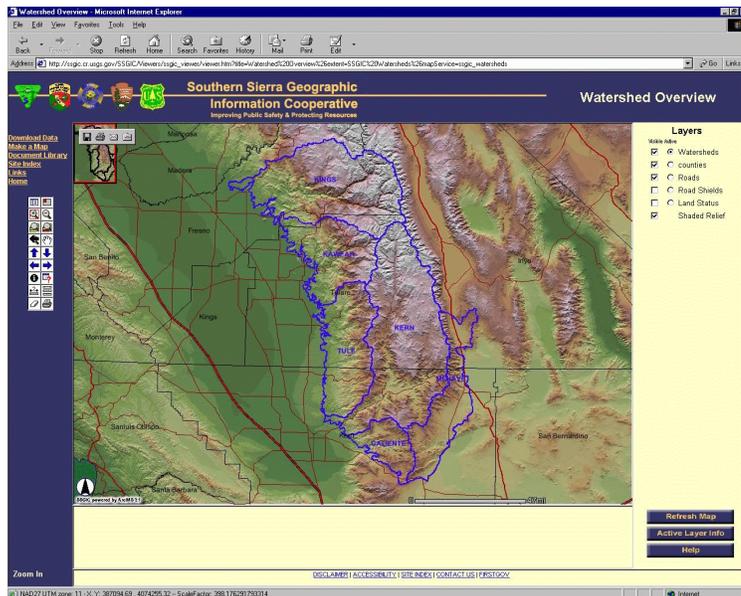


Figure 4.19-4 – SSGIC overview map as displayed by ArcIMS software on the website.

PRELIMINARY FINDINGS AND DISCUSSION

One of the major challenges of this project has been to maintain effective interagency collaboration. There continues to be a high level of interest in the project by stakeholder agencies and the agencies and individuals within them continue to find the time and resources to contribute to SSGIC goals. A program manager position has been filled and the benefits of having an individual dedicated to facilitating the complex program are being realized. Interest in the program from outside organizations and agencies is also increasing as we have become more visible via meetings and the website and have begun to distribute useful datasets and analyses.

As data development and analysis proceeds, the need for improved information becomes increasingly clear. Some of the most critical issues facing the fire community today, such as fuels reduction and restoring fire dependent ecosystems, are dependent on valid vegetation and fuels information. Obtaining and maintaining this information at a scale sufficient for project level planning is an enormous task. While "best available" data has been assembled, continuing efforts are underway to improve datasets on the part of many agencies. These include collecting field data, improvements to imagery processing, standardizing business processes, more effective distribution, and implementing national data standards.

The Internet continues to be the primary means for information distribution. Website development has required a larger investment than anticipated, especially implementation of ArcIMS web based mapping software. Although ArcIMS has a steep learning curve, as requests for SSGIC products are increasing, the data download and mapping capabilities of the website are paying off. As the software matures, the promise of real web based collaboration may come to fruition.

PROBLEMS ENCOUNTERED

As anticipated, successful interagency coordination does require significant effort and commitment. Coordinating meetings becomes more difficult between agencies with offices across a wide geographic area. Differing agency guidelines make formal agreements difficult to write. Finding a host agency for an interagency web server encountered significant difficulties. Each stakeholder agency has a unique mission and finding consensus on process and developing joint burns becomes more difficult. Additionally, work done in support of the SSGIC represents collateral duties and most employees are fully obligated with their agency duties.

As datasets were integrated, technical difficulties emerged relating both to spatial and tabular data. These were often the consequence of differing data standards and guidelines or differences in business processes between agencies. Establishing national data standards and consistent business processes is critical to interagency collaboration.

2002 WORKPLAN

The year 2002 is the final year of the JFS grant supporting SSGIC. All stated project requirements will be completed. The remainder of the analytical process established by SSGIC will be completed and the results utilized by agency fire staff to develop an interagency fuel management plan. The entire process will be documented and a workshop presented at the Association for Fire Ecology conference scheduled for December of 2002. Recommendations will be made to identify improved and consistent business processes to facilitate more efficient collaboration into the future. Development of the website will continue with datasets being expanded and updated as new data are acquired and developed. Analysis will results will be posted as completed and updated. This will include identified treatment areas resulting from joint planning efforts.

Looking beyond meeting grant requirements, we will develop strategies for continuing the program with support and funding from local agencies. A number of opportunities exist to expand the program. Several additional agencies in the analysis area could add their support to SSGIC and the analysis area could be extended beyond the southern Sierra Nevada geographically. SSGIC could become more active in providing direct support to local groups with limited resources such as local FireSafe Councils. The SSGIC website has been designed to accommodate additional resources beyond fire/fuels, agencies outside the stakeholder agencies, and the development of agency centric data and analyses.