



Fire Plan Framework

Legislative Mandate

The Public Resources Code requires the Board of Forestry to develop a fire plan for the state responsibility wildlands that assures equal protection to lands of similar types. The California Fire Plan includes a new framework for a systematic assessment of the existing levels of wildland protection services, identifies high-risk and high-value areas that are potential locations for costly and disastrous wildfires, ranks the areas in terms of priority needs, and prescribes what can be done to reduce the future costs and losses.

The Board and CDF developed the new fire plan assessment framework that will identify where it is most cost effective to increase the level of wildland fire protection services to significantly decrease future wildfire costs and losses in those high-risk/high-value areas. CDF is implementing the new system in three pilot ranger units: Nevada-Yuba-Placer, Tuolumne-Calaveras and Riverside. In addition, CDF has made a budget change proposal (BCP) to expand the program to all 22 ranger units and six contract counties using this schedule:

Time Period	Task
November 1995—February 1996	Draft a regional vegetation zone map for the state. Design associated matrixes for setting up the LOS framework for the regional zone. Develop data sets, prepare prototype software systems, assemble products to take to the first test ranger units.
January—March 1996	Validate data sets, process and procedures in the first test ranger unit. Refine, revise and update CFES-IAM inputs as needed. Revise procedures as needed in preparation for going to the next two test units.
March—June 1996	Validate data sets, process and procedures in the next two test ranger units. Revise as needed in preparation for going to the remainder of the ranger units and contract counties.
June 1997	Produce state level of service map

Fire Plan Assessment System

This new California Fire Plan assessment system is reflected in *Chart 3, Fire Plan Assessment System* and described below.

Level Of Wildland Protection Services (LOS): The LOS rating (see *Chart 4, Level Of Service*) is a ratio of successful fire suppression efforts to the total fire workload, a method to measure initial attack success and failure rates throughout California wildlands.

The LOS rating is a new fire plan assessment system.

The LOS uses a Geographic Information System (GIS) that overlays a 10-year history of wildfires onto a vegetation type map and derives the average annual number of fires by size, severity of burning and assets lost. This data allows a LOS Success (and Failure) Rate calculation:

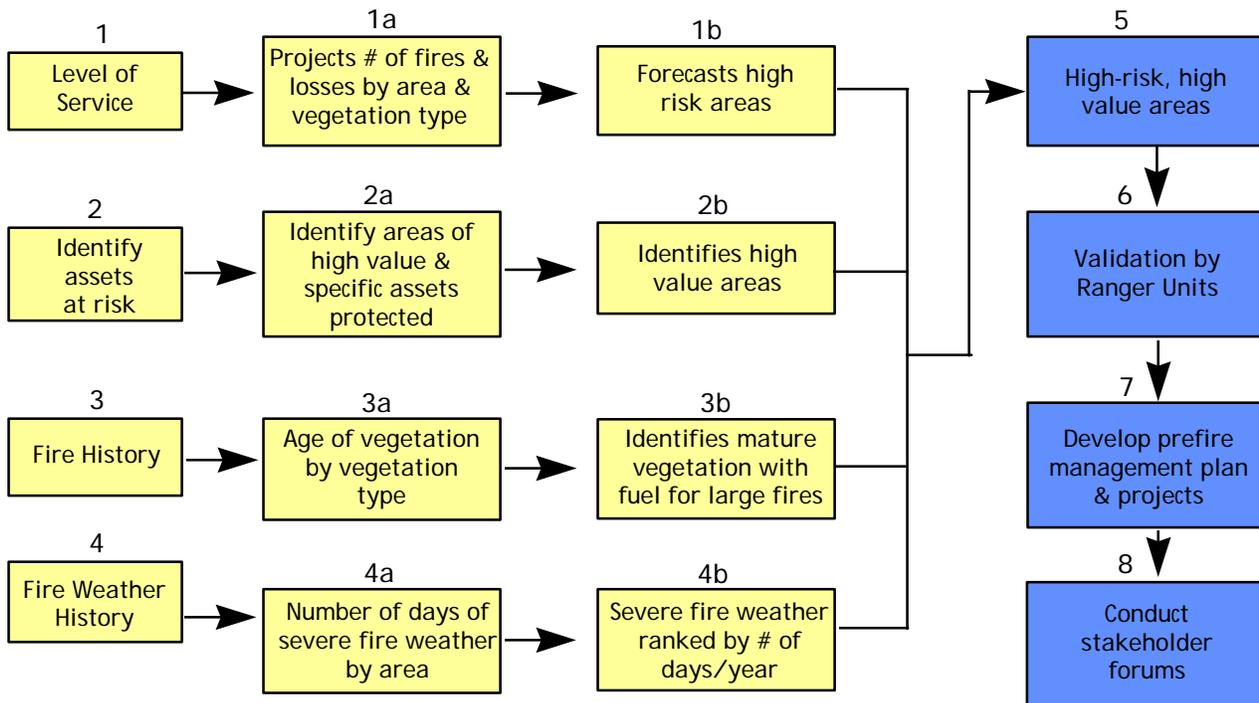
$$\text{SUCCESS RATE} = \frac{\text{annual number of fires that were small and extinguished by initial attack}}{\text{total number of fires}}$$

$$\text{SUCCESS RATE} = X \text{ percent}$$

This results in an initial attack success rate in percentage of fires by vegetation type and by area. Similar areas can be compared locally, regionally or statewide using the GIS database.

Using the GIS databases, each wildland area of a community, ranger unit, region or statewide, can be ranked by age and type of vegetation to identify high-volume fuel areas that have accumulations of dead fuel with the potential for large *conflagrations*. Areas can be ranked by high, medium or low risk of potential as sites of large damaging *conflagrations*.

Chart 3. Fire Plan Assessment System

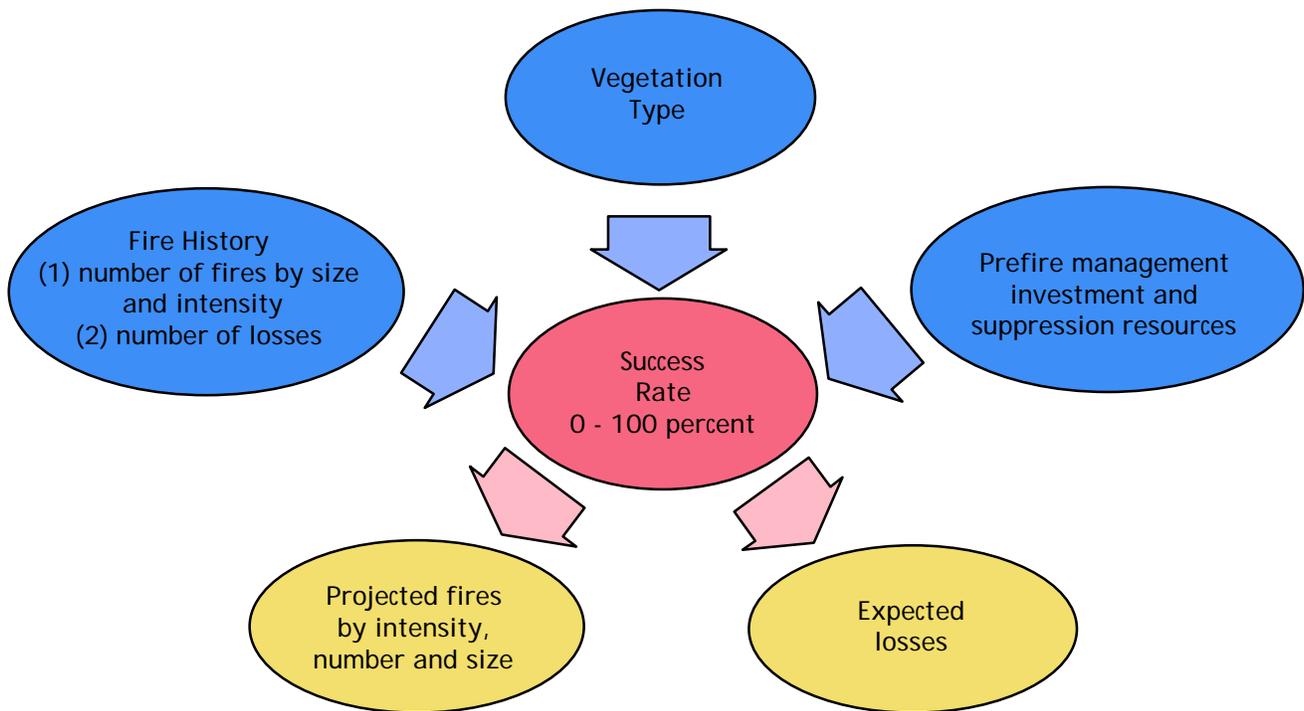


Assets at Risk: The assets at risk are the public and private assets that the wildland fire protection system is created and funded to protect. This framework identifies the following assets at risk from wildfires and delineates their economic and non-economic assets: timber, watershed, wildlife, unique scenic and recreation areas, range, wildlife, air quality, structures and people.

- Using the GIS data, overlays of each asset are made on geographic maps of the state. This provides areas of individual and collective assets that are identified by community, ownership and protection responsibility.
- For each asset, relative rankings of high, medium and low values are made geographically.

Assets are what the system protects.

Chart 4. Level of Service



Fire History: The GIS is used to overlay fire history data by vegetation type.

- The fire history overlay results in identifying the age classes of vegetation and their related maturity stage. Each vegetation type has different maturity stages in terms of the volume of fuel per acre — as it progresses from green, high-moisture vegetation to a higher percentage of dead and dying vegetation with low moisture — and different stages in the development of fuel ladders to carry fires to the tops of trees.
- With the above data on vegetation age and maturity, the areas that have the potential for severe fires can be identified by vegetation type and geographical area.

Fire history defines vegetation maturity.

Fire Weather History: The fire weather history is plotted on GIS maps.

- The fire weather history, in terms of average number of days of severe fire weather, is plotted and mapped by geographic area.

Fire weather history identifies severe fire weather days.

- Geographic areas are ranked by the average number of days of severe fire weather during peak fire season. This allows the identification of the higher risk areas in terms of probability of fires occurring during periods of severe fire weather.

Identify High-Risk/High-Value Areas: Based upon the analyses and the GIS databases described above, a ranger unit map is generated that identifies high-risk/high-value areas where large damaging wildfires are most likely to occur and become high-cost and high-loss conflagrations. These can be ranked from highest to lowest priorities for future resource allocations decisions.

Validate High-Risk/High-Value Areas by the ranger units: Most of the data used to generate the high-risk/high-value maps were developed from GIS overlays of databases for areas within ranger units. Much of this data needs to be validated on the ground by ranger unit personnel to assure that the high-risk/high-value and most likely to burn areas are properly mapped. Based upon this field review of the areas, modifications and corrections are input to the central GIS databases and revised maps are generated for use by the ranger unit and headquarters personnel in developing prefire management projects.

Prefire management projects decrease risks of high losses and suppression costs.

Identify Prefire Management Projects: The prefire management staff at the ranger units then develop a prefire management plan for the ranger unit. The prefire management plan includes specific projects for the high-risk/high-value areas that will *decrease the risks that a large fire in a specific area will occur, and create high costs to contain and high losses to the citizens.* The assumption used in developing the prefire management ranger unit plan is that a proposed prefire management project will reduce the costs and losses during periods of severe fire weather, which is when most of California's wildfire costs and losses occur. Thus, if a prefire management project is implemented, then the size and severity of a large fire burning in that specific high-risk/high-value area would be contained at a smaller size, would burn with lower temperatures and severity, would significantly reduce suppression costs and would result in significantly lower levels of losses.

Conduct Stakeholder Forums: The purpose is to acquaint stakeholders with the process; bring their expertise and knowledge to bear on the asset maps, which also identify areas of high, medium and low risk; to review the level of service in these locations, and to identify areas where the stakeholders consider the level unacceptable.

Ranger unit personnel will take the results of the above analyses into public forums with the following stakeholders:

Stakeholders help set priorities on prefire management projects.

- State, local and federal agencies with responsibilities for wildland protection in a specific area of the ranger unit, including USDA Forest Service, Bureau of Land Management, National Park Service; fire districts, county fire departments and other fire service cooperating agencies; local planning departments and county supervisors responsible for land-use planning.

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- State, local and federal agencies with responsibilities for wildland assets at risk.
- Private and non-profit stakeholders that are concerned with the economic and non-economic assets being protected in a specific community within a ranger unit.
- People living in these wildland areas.

CDF will take the following information into these series of meetings:

- What can be done by the community to develop wildfire protection zones.
- The existing LOS for the specific community area in terms of historical numbers, size and severity of previous fires and those projected to occur with no changes in the LOS. This reflects the future success rates for preventing large disastrous fires.
- Identification of the high-risk/high-value maps, showing areas within the community, where large disastrous fires are likely to occur. The specific assets being protected and designated as high value areas within the community will also be delineated on the maps.
- Identification of the high-risk/high-value areas in the community with a ranking of the probability of fires occurring in severe fire weather.
- Prefire management plans with specific projects for reducing the risks and potential damage and suppression costs from disastrous fires.
- Identification of which assets are driving the need for prefire management projects and who is fiscally responsible for the assets at risk.

As reflected in *Chart 5, Wildland Fire Protection System*, the goal of this new framework approach is to identify for state, federal and local public officials and the public, those areas within the state responsibility areas that are high-priority areas in terms of assets at risk, and with a high probability of large wildfires with associated costs and losses. This will allow the public and government decision-makers to focus on what can be done to develop wildfire protection zones and reduce future costs and losses in these areas. An important aspect of this new framework is that prefire management programs aimed at reducing wildfire risks to citizens and firefighters, and minimizing costs and losses be considered and compared for evaluating existing programs and alternatives for reducing costs and losses from large disastrous wildfires in California.



Input from the public is a critical part of the Fire Plan process. (Photo by Rob Allingham, Department of Water Resources)

The goal is to identify high risk areas with a high probability that large fires will occur.

Chart 5. Wildland Fire Protection System

