

Synthesis and Summary: Land Use Decisions and Fire Risk¹

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Rapidly changing land use patterns are having a significant impact on watershed management and the included elements of fuel management and fire protection. The complexity of watershed management was defined in the Watershed Management Council's publication prepared for the first conference. This publication, California's Watersheds, emphasized that all land use activity has an impact, that individual impacts can be cumulative and even synergistic. In California, the impact of development on fire effects and fire protection is a grand example.

In my summary, I will not follow the schedule of individual papers presented. I will, instead, structure the review and my comments to emphasize the impact of demographics and population growth on fuel management and fire protection, concerns stated or implied in all presentations.

Jim Davis described the application of demography, the study of population characteristics, to the analysis and prediction of fire management problems. In so doing, he suggested that demography and the social sciences might be more important than new technology to land managers and fire protection agencies.

In Cooperative Extension, we assessed the character of populations in several Mother Lode counties to help us design better information delivery systems. These counties were among 10 that represent less than 10 percent of the state's land mass and, in 1980, represented less than 3 percent of the population. However, in 75 percent of this 10-county area, the population growth rate is at least three times that of the state as a whole. The area represents watershed resources that present major management and fire protection problems.

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A preliminary analysis of the population, based on questionnaires, indicated that the average age of respondents is 54 years. Two-thirds have some college and nearly one-third have a Bachelor's or higher degree. Slightly less than half grew up in a city or a town. Half of the remainder had a rural childhood, but they did not grow up on a farm or ranch. Slightly less than two-thirds have owned their property for less than nine years. As a group, this audience appears to be middleaged, well educated, with a predominantly urban or nonfarm background, and they have owned their rural property for a relatively short time. These characteristics are not peculiar to California. A similar evaluation appears in *Wildfire Strikes Home*, the report of the National Wildland/Urban Fire Protection Conference published in 1987.

Added to the problem of changing land use patterns is the variability in fire protection responsibility. Agencies responsible for structural protection often are not trained to handle wildfire situations; agencies such as the California Department of Forestry and Fire Protection (CDF) and U.S. Forest Service often find themselves ill prepared to address structural fire protection in wildlands situations. This problem was discussed in the report *Wildfire Strikes Home*, which describes the disastrous fire season of 1985 and documents the costs in lives and property that resulted from lack of preparedness in communities across the country where the interface (or intermix) exists. During 1985, 44 people died from fire-related causes, 1,400 structures and homes were destroyed or damaged, and nearly \$.5 billion was spent in fire suppression. The bill for all costs and damages amounted to more than \$1 billion. Given the projected growth in rural areas, losses can only increase unless a concerted effort is made to address the problem. Locally, the Forty-Niner Fire near Grass Valley in Yuba County and the Miller Fire near Vacaville in Solano County, fires that occurred in California this summer, are examples of what can be expected. The Forty-Niner Fire destroyed more than 100 homes and structures.

As Jim points out, growth is occurring for a variety of reasons related to the perceived quality of life and a desire by urbanites to escape urban problems. However, as rural com-

munities grow, urban-related problems emerge, often aggravated by the physical setting, and frequently become watershed and fire management problems.

Currently, technology represents a major part of fire management programs, and use of prescribed fire is a consideration in development of new policy. Both Bob Martin and Tom Spittler discussed the value of this important tool for protection. They described the technical use of fire and the use of fire for fuel management driven by socioeconomic concerns and changing demographics.

The extent of the use of prescribed fire deserves attention. On State Responsibility Areas in California, CDF is burning less than 50,000 acres (123,000 hectares) annually using this tool under the Chaparral Management Program (CMP). This is considerably less than the targeted 120-150,000 acres (296-370,000 hectares) discussed in the Program EIR. In many areas, the acreage burned may prove inadequate from a fire protection standpoint.

Tony Dunn pointed out the inadequacies of current prescribed fire programs created as a deterrent to large wildfires in San Diego County. Current prescribed fires burn too little acreage to create an effective age class mosaic. Under severe fire weather conditions, wildfires burn through small acreages of young fuels. He emphasizes that young fuels may provide increased opportunities for fire suppression by decreasing fire intensities, but the scale created must be greater. Tony's analysis might be applied to the entire state.

He concludes by saying that prescribed fire, as currently used, can be effective only when considered as an adjunct to other measures such as fuel breaks, roads, and changes in fuel type. However, the value of fire as a tool to enhance wildlife habitat and promote watershed management gives it an intrinsic value that can be exploited when fire protection is a consideration.

Fire as a management tool cannot be used without caution. Limits on its employment are imposed by several constraints, not the least of which is urbanization of wildlands. But other, less obvious limits exist, and one of these is social tolerance for fire and the smoke it produces. Air pollution is a major environmental concern, and smoke from agricultural burning, industrial sources, and home fireplaces is being regulated.

Jim Agee addressed the issue of smoke pollution in his presentation. He suggested that the social environment in which fire ecosystems exist has had a more significant impact on fire policy than the physical-biological environment. Continued evolution of fire as a management tool

probably will be controlled by air pollution concerns, the impact of smoke from prescribed fire on air quality. The prediction is that air pollution will be perceived as a greater threat than wildfire. This will occur for two reasons: (1) air quality is more easily dealt with because of existing organizational structure, and (2) smoke from prescribed fire will probably affect more people more often than smoke from wildfire. Social acceptance of prescribed fire may depend on recurring disasters.

Jim also pointed out that funding for control and use of fire occurs differently and contributes to the problem; fuel treatment is billed to operating (budgeted) funds, and losses foregone from wildfire are not counted as benefits. (However, in California, the CDF acknowledges the fire protection value of prescribed fire in computing costs and benefits of a CMP burn.)

Public perceptions of wildfire and its impacts also complicate the use of fire as a management tool. People wrongly assume that wildfire will not occur twice in the same place, and that the occurrence of a wildfire reduces future vulnerability.

Jim concluded by emphasizing that social factors and the level of public understanding drive development of fire policy. This must be recognized by land managers and fire protection personnel in the development of future policy.

Future fire management policies must be flexible to respond to both changing demographics and social pressure. Alternatives to current and projected strategies must be developed to insure effective response to growing fire risk. This might be done by examining selected scenarios as is being done for wildfire management in Southern California chaparral wilderness.

As reported by Chris Childers, evaluation of the cost-effectiveness of fuel management and fire suppression strategies for chaparral wilderness is being accomplished through fire gaming. To date, the most valuable part of this exercise has been the experience gained by fire fighters who have had to consider their responses to different management strategies.

Gaming is essentially reactive and assumes a set of rules. However, at the interface and under the pressure of changing land use patterns, fire management agencies cannot easily define those rules. For gaming to be effective, rules for development must be established. Lack of such rules has forced the adoption of limited strategies.

The CDF, with responsibility for protection of one-third of the state, has been forced by rural development to set as its Primary objective the protection of homes and structures. As described by Rich Schell and Dianne Mays, this

objective is complicated and hazardous to achieve because state laws and local ordinances do not effectively address the need for defensible space. Unlike other disasters, wildfire does not receive the attention from planners that is given to other accepted forms of disaster.

CDF funding is based on wildland fire protection needs, not population growth and development. Program deficiencies must be addressed by application of fire protection standards through local planning and design.

In Dianne's presentation, she emphasized that CDF must be involved in local planning to help mitigate the impacts of growth and development. Fire protection expertise is needed to ensure adoption of measures providing adequate defensible space. The key is planning for and building in a basic level of protection around structures that would include adoption of minimum standards for specific elements of a fire protection program. This and related needs were emphasized by Hal Malt in his luncheon presentation.

Legislation establishing minimum fire-safe standards for greenbelts, water supplies, and building materials was passed by the California Legislature this year. Legislation like this, SB-1075, often is necessary, but it is reactive to the problem. Planning for fire protection is at its best when it is proactive and recognizes trends.

This year the California Legislature passed, but the Governor failed to sign, legislation that would have required updating of county general plans. Counties would have been required to develop and implement policies in the Safety, Land Use, and Conservation Elements for mitigation of the wildfire threat. CDF would have

been authorized to provide its expertise in the process.

At this time, there is, perhaps, too great an emphasis on technology (building materials, greenbelts, prescribed burning) as the primary solution to fire risk. This observation is based on public perceptions and politics that are forcing adoption of strategies that may not allow aspects of technology to adequately support reduction of the threat from wildfire.

Human behavior is part of the problem. People are not enthusiastic about strategies that include zoning and density requirements. This has been shown through surveys. The surveys also revealed that people are generally unwilling to bear direct costs for hazard mitigation. These responses suggest that people may expect disaster relief that the future cannot guarantee.

While developing rules to define fire gaming plans, it will be necessary to direct effort towards modification of human behavior. As Jim Agee pointed out, the social environment is an important consideration. This means an educational program to raise public awareness and develop support for needed change.

I believe it is fair to assume that those of us in management, service, and educational programs must, in the future, focus less on technical solutions to physical-biological problems in the field of watershed management and more on the problems generated by socioeconomic concerns. It appears that demography must become one of our studies and that sociology along with psychology will be useful tools, as well. These "new" tools will help us find out how far apart are the bars of our cage and how best to modify this confinement.