

**PLUMAS FSC MEETING PRESENTATION**  
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RORGEN, Rate Of Return GENerator  
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## Living in a Fire Ecosystem: Helping Homeowners Assess Fuel Load Reduction

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*"Risk from wildfire to life, property, natural resources, and firefighter safety is increasing"* (California Fire Plan, March 1996, p.4).

The California State Economist, in cooperation with the Auburn, California NRCS Field Office, the USDA Forest Service Foresthill Field Office, and the California Department of Forestry and Fire Protection, has developed a tool which helps landowners understand the value of fuel load reduction on their residential properties. This tool has been demonstrated many times and has received enthusiastic support. This article briefly describes the motivation for creating this tool, the support for this tool, the actions required to actually use this tool in your area, and a brief description of the program. The tool is named RORGEN, Rate Of Return GENerator. It treats the cost of fuel load reduction practices as an investment and estimates the rate of return this investment earns.

Why would a community decide to use RORGEN? First, RORGEN presents a distinct format for communicating with the local fire experts. RORGEN requires specific assumptions about the relationship between the homeowner's fuel load reduction work and the survival of the residential structures and trees when individual action is taken by one homeowner. Such communication can help a community understand more about its fire hazard and fire risk. Second, RORGEN can be used in a public information campaign which encourages dialog with homeowners. Homeowners walk away with a paper copy of their interviews, as well as a floppy disk containing the program. Having the floppy disk allows them to share this program with their family, friends, and neighbors, and to rerun RORGEN again for themselves. Third, in the process of communicating with homeowners, RORGEN can be also be used to gather information about the aesthetic values of vegetation and the sentimental values of home contents (without retaining an individual's identity) in order to estimate these benefits for a local geographic area and, later, for the whole state. Fourth and last, one can estimate the value of the public outreach program which uses RORGEN by using follow-up phone calls to ask about resulting fuel load reduction actions.

It is important to understand that the existing version of RORGEN requires that the homeowner have a fire proof roof, and that the parcel is, by itself, defensible. That is, the actions of the one, individual homeowner will change the survival probability of the structures and mature trees on that private property. If the parcel is too small to defend by itself or if the home does not have a fire proof roof or if the home cannot be accessed by fire fighters, then RORGEN cannot be used. If inappropriately used, RORGEN will overstate the benefits of fuel load reduction.

Motivation for creating RORGEN: "Fuel load reduction" is the thinning of vegetation in fire-prone areas. Thinning is vital to the health of watersheds in the fire-prone areas because it reduces the amount of fuel a fire has available to burn, thus reduces the heat and intensity of a fire, hence reduces the negative effects a fire creates in a watershed. With proper thinning, a fire will move through an area consuming only grass and small shrubs allowing the mature trees and human-built structures to survive.

Given how important fuel reduction is, we might expect homeowners to request our assistance to design practices which would increase the chances of their homes surviving a wildfire. However, many homeowners say "It's too expensive". Others say "I already have fire insurance". Those comments indicate that homeowners do not understand the value of fuel load reduction. RORGAN can help them understand the risk holes which are still left after fire insurance benefits are fully counted.

Enthusiasm for RORGAN: RORGAN has been presented to fuel load reduction professionals from NRCS, local fire departments, Department of Forestry and Fire Protection, local and state-wide Fire Safe Councils, and Water-shed Associations. The fuel load professionals are enthusiastic about RORGAN because it communicates so clearly, takes less than 15 minutes to use, and allows homeowners to supply ***their own*** numbers thereby enabling homeowners to:

- visualize ***their own*** (and no one else's) losses before a wildfire creates those losses,
- visualize the extent of ***their own*** fire insurance protection before they need to use it, and
- visualize fuel load reduction as an investment comparable with ***their*** other investments.

RORGAN has also been presented to homeowners at various Home & Garden Shows, a Spring Festival, and several County Fairs. A colleague conducted post-interviews asking homeowners what they thought about the RORGAN interview and subsequent analysis. Homeowners thought the set of questions was useful in reminding them or in making them aware of the fire protection gap they currently have on ***their own*** properties. Supplying the numbers themselves, homeowners were able, during the interview, to visualize the possibilities before and after fuel load reduction. In summary, both professional and homeowner evaluations of RORGAN suggest it may be useful in your area.

The actions needed to actually use RORGAN in the field: In order to bring RORGAN to a community, the following basic steps are required.

- (1) Create the Fire Assumptions. Work with local fire professionals to create fire assumptions which portray the effect of fuel load reduction on the survivability of a house during a wildfire in that particular locale.
- (2) Estimate the Cost Parameters. Work with local experts to estimate the per acre installation and maintenance costs of fuel load reduction practices.
- (3) Check the Types of Benefits. Consider adding new fuel load reduction benefits which are important to the local community. For example, some communities have unusually expensive permitting costs for rebuilding after a fire. Such a community should include the permit cost savings as a benefit of fuel load reduction.
- (4) Test the modified RORGAN with local fire fighters and others who understand the specifics of fuel load reduction in that local community. The objectives are to check RORGAN's competence and to build professional support within the community for using RORGAN.
- (5) Assemble a volunteer group. This group would learn RORGAN and learn interview techniques which put homeowners at ease in order to answer difficult and awkward questions about the value of sentimental items. Recently, a high school junior, who was somewhat familiar with Excel, was trained to run RORGAN in 30 minutes. The volunteers could, in turn, train homeowners in order for homeowners to demonstrate RORGAN at small neighborhood meetings.

Brief Description of RORGAN: RORGAN, the Rate of Return Generator, is an Excel workbook which estimates the internal rate of return to a homeowner's fuel load reduction costs. To do this, RORGAN estimates the costs and benefits of fuel load reduction. The costs include both the installation and maintenance costs of fuel load reduction. The benefits equal the values of those items which are NOT compensated by the homeowner's fire insurance policy such as the magnificent vegetation of the foothills and the sentimental items contained in the homes (pets, memorabilia, heirlooms, hobbies).

The internal rate of return is that rate at which the present value of fuel reduction costs grow to equal the present value of the benefits. For example, suppose a homeowner invests \$1,000 to implement a fuel load reduction plan in 2002. Further, suppose a wildfire occurs five years later in the year 2007. If the fuel load reduction prevented a loss as small as \$3,000 then the homeowner will experience a 24.5% rate of return on the \$1,000 for every year of the five years between the fuel load reduction and the fire.

The parameters for the fire and cost assumptions which are contained in the existing version of RORGEN are those representing the general case for the Meadow Vista area (near Auburn, California). Thus, the existing parameters will have to be changed if an area has slopes, vegetation, access and general prices different from the Meadow Vista area. The fire and cost parameters are easy to change.

RORGEN does not include all of the possible homeowner benefits from fuel load reduction. If a missing benefit is considered important for an area, RORGEN can be modified to include that benefit. In particular, RORGEN does not, at this time, include: uncompensated costs of temporary family relocation while the home is being rebuilt, the time costs of overseeing the reconstruction, the uncompensated costs of cleaning up the erosion and fire debris from the property, costs of replanting, uncompensated costs of erosion prevention during the time vegetation is re-growing, an average lawsuit cost value, uncompensated costs of building code upgrades (such as roof upgrades, sprinklers, geology reports, water main extensions) required in a home reconstruction and often not covered by fire or homeowner's insurance, costs of permits for various rebuilding activities, nor the market value of the timber. Further, RORGEN does not include questions about the homeowner's property characteristics such as access for fire fighting equipment. All of these considerations can be incorporated into subsequent versions of RORGEN.

Caveats in using RORGEN: Homeowner must understand the fire assumptions which are used. In the existing version, RORGEN assumes that the home has a fireproof roof and that the fuel load reduction of an individual homeowner on a parcel as small as two acres substantially reduces the risk of loss even if the adjacent properties do not implement fuel load reduction. Further, the homeowner must understand that RORGEN assumes that fuel load reduction lowers the probability of loss and does not guarantee the home will survive a wildfire. The existing RORGEN assumes a 10% probability of loss due to wildfire even after fuel load reduction is implemented on the whole property in the Meadow Vista area.