

## COMMUNITY ADVISOR - FIREWISE

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ABSTRACT. The old model of individual homeowners and neighborhoods depending solely on government provided fire fighting resources is gone. Recent wildland fires have demonstrated that community firefighting resources are easily outpaced when multiple structures are burning simultaneously. The cure is to move most structure protection responsibility to the homeowner and community. Effort can be made, and maintained, today to reduce future risk.

One such effort is defensible space or risk reduction activities. Complimentary to risk reduction activities is the Firewise effort. Where risk reduction activities provide modification of risk (fire ignition management), and hazard (fuel bed modification), firewise provides the social structure necessary for communities to organize and accomplish their defensible space needs.

Community advisors are an appropriate means to assist communities achieve some level of firewise success, by matching community questions to authoritative answers. Advisors are present in community groups to provide information, or find an authority to provide information, to a community making Firewise decisions. The advisor may be an expert in his or her own rite, as well. It is expected that the community has, or will soon have, a formal citizen-based Firewise committee and that the advisor will not be a member of that committee or make decisions for the community. The advisor is merely there to assist the community arrive at a decision based upon sound science and logic about ecosystem, economic, and social considerations.

This approach builds upon, and places, risk reduction activities and firewise into an ecosystem management framework. It moves theoretical silviculture, community planning, innovation diffusion, communication, decision-making, risk assessment, and protection responsibility into citizen hands for practical application. This approach encourages development of unique solutions for each community, and its corresponding ecosystem, using interdisciplinary resources to find fire risk reduction solutions, and applying community collaboration.

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### INTRODUCTION

Wildland urban interface and intermix communities across the United States of American are becoming more aware that their personal safety and property are at risk from wildland fire. Many communities are proactively taking steps to provide safe communities, while other communities are just becoming aware of the problem. Unfortunately, there are still many communities that don't recognize their risky situation at all.

Members of the Society of American Foresters can be of immense benefit to this wide spectrum of wildland urban interface/mix communities in at least three ways. First, they can identify the fire risks to the community. Second, they can advise for the community as the community struggles with solving its interface/mix fire issues. Finally, a member of the Society of American Foresters can provide many professional services necessary to reduce many fire risks.

In other words, members of the Society of American Foresters are integral players in identifying the problem, shaping the solutions, and performing service necessary to reduce wildland fire risk to many communities.

### ASSESSMENT

Following a community’s realization that they may have a wildland fire interface/mix problem should be an assessment of that potential problem. There are several assessment tools around, but they are usually very narrow in scope – focusing only on a community’s physical characteristics and attributes of structures. Community advisors will need more information than is offered in these relatively narrow assessment tools. It is recommended that community advisors supplement these narrower assessment tools with information about the community’s social, economic, and ecologic characteristics as well. This additional information will aid the advisor in helping the community avoid or overcome several of the predictable barriers that lie ahead.

As part of this technical session participants used the Wildland Fire Risk and Hazard Severity Assessment Form included in their Firewise Communities Workshop participant workbook. With an ArcView GIS projected psuedo-community, workshop participants assessed access, vegetation, topography, roofing assembly, building construction, available fire protection, and utility placement. From this assessment they assigned a total hazard risk rating of extreme hazard.

### REDUCING THE HAZARD

The second exercise performed by participants of the technical session was to develop recommendations for reducing the extreme hazard down to a moderate hazard. First, recommendations were stratified into one of four groups: short-term/low-cost, short-term/high-cost, long-term/low-cost, and long-term/high-cost. Second, a purpose statement was written to define what the community identifies as its threat. Third, a list of must and want objectives was developed for reducing the identified threat. Finally, the recommendations were ranked from highest priority solving the must objectives to lowest priority solving the want objectives.

#### Recommendations for Reducing Hazard to Moderate

	Low-cost	High-cost
S h o r t - t e r m	<ul style="list-style-type: none"> <li>• Add street signs. (C)</li> <li>• Education programs (C)</li> </ul>	<ul style="list-style-type: none"> <li>• Widen road. (C)</li> <li>• Defensible space improvement within 100 feet of structures. (P)</li> </ul>

L o n g - t e r m	<ul style="list-style-type: none"> <li>• Thin trees. (P&amp;C)</li> <li>• Organized response resources. (C)</li> </ul>	<ul style="list-style-type: none"> <li>• Additional access. (C)</li> <li>• Treat slash. (C)</li> <li>• Class A roofing. (P)</li> <li>• Noncombustible/fire resistant siding, eaves, and deck. (P)</li> <li>• Pressurized available water. (C)</li> <li>• Fixed fire protection. (P)</li> <li>• Underground Utilities. (C)</li> </ul>
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P=Personal cost. C=Community cost.

Items that cannot be reasonably changed – Must identify alternate mitigation.
Existing road location. Subdivision location. Topography and topographic features. Area fire history (risk). Separation distance between structures. Building setback from 30% or greater slope.

### **FIRE BEHAVIOR BASICS IN THE INTERFACE/INTERMIX: FUEL, WEATHER, AND TOPOGRAPHY**

Community advisors must understand basic fire behavior to be effective. The advisor should be comfortable recommending, and procuring, wildland and structure fire practitioners as communities move beyond the knowledge and experience level of the advisor.

Fire does not spread like a wave or a moving mass swooping down on its intended victims or rolling without reason across the landscape as the news media portrays. Fire needs oxygen, heat, and fuel to ignite. These requirements of combustion must be met for fire to spread. Fire behavior on the landscape is a function of fuel, weather, and topography. These three behavior factors affect fire direction, rate of spread, and intensity.

Fuel has seven characteristics that affect wildland fire behavior. They are moisture content, size and shape, compactness, loading, horizontal continuity, vertical continuity, and chemical content. Dead and live fuel moisture changes constantly. Insect infestations, disease, human activity, fire, and weather alter fuels. Weather and topography alter fuel types. Increase in fuel availability effects fire behavior intensity.

Weather has four characteristics which are closely monitored for their effect on fire behavior. They are temperature, relative humidity, atmospheric stability, and wind. These characteristics affect vegetative curing and fuel moisture. Weather changes significantly with topography and

general weather patterns. Weather effect on fire behavior includes change in rate of spread, direction of spread, and fire intensity.

Topography, of course, is terrain. Topography is considered to be constant at any one time. However, over space it can vary considerably, especially in mountainous terrain. Topography affects fuels and their availability for combustion, and can affect fire direction and rate of spread.

Ladder fuel, fuel between surface fuel and tree crown, allows fire to leave the surface and vertically climb into tree crowns. Increasing distance between surface fuel and tree crowns will reduce opportunity for fire to move vertically. Activities to increase space between surface fuel and crowns might include, but are not limited to: removing seedlings, saplings, and intermediate trees from the stand; pruning; crushing surface fuel; and prescribed burning.

There are three types of crown fires. They are passive, active, and independent. Passive and active crown fires need support from surface and ladder fuels, and close crowns to support spread. Independent crown fire initially needs surface fire and a ladder to move fire into the crown and then independently moves from crown-to-crown. Treatment activities that increase distance between crowns and decrease stand crown fuel loading include, but are not limited to: thinning and pruning.

Fire generally spreads faster uphill than downhill or across a flat. Fire spreads faster with wind. Topography and wind can work together or against each other to drive fire spread. When fires throw firebrands into the air, fire may also spread through generation of spot fires. These spot fires may ignite fuel up to  $\frac{1}{4}$  mile, and often times further, ahead of the main fire.

Fire on a slope is typically fought by anchoring at the bottom, progressing up each flank, then closing the top. If a fire is very large and spreading rapidly up slope, the top control line for a fire is an indirect line at the ridge top. This is safer for firefighters than moving in front of a fire mid-slope. For this reason mid-slope fire lines, on large active fires, are not built.

The interface/mix has some special fire behavior concerns that need to be addressed. First, houses are typically fuel that supports a fire's advance. However, fire resistant materials and construction practices are available that reduce risk of structure loss. Second, structure distance from fire radiation and direct fire impingement is helpful in reducing risk of structure ignition. Fire resistant roofing is available and necessary to reduce risk of aerial firebrands igniting structures as well. Breaking the chain of combustible materials leading to a structure will also reduce risk of ignition following the passage of a fire front. Finally, a mid-slope house needs to be constructed and have fuel reduced to survive without help. It should not be expected that firefighters put themselves in danger to defend a home under these circumstances.

## **FIRE REGIME**

The Dictionary of Forestry defines fire regime as "the characteristic frequency, extant, intensity, severity, and seasonality of fires within an ecosystem." Pyne describes the concept of fire regime as amorphous. The concept of fire regime is not very useful in natural systems, but can be very useful when applied within the context of human management. By comparing historical

natural fire regimes with current condition classes, fire managers can identify appropriate management options for moving condition classes 2 and 3 back toward condition class 1, if desired.

## **VEGETATION MANIPULATION (DISTURBANCE) AND RESPONSE (SUCCESSION)**

Here is a subject that most Members of the Society of American Foresters should be able to discuss at length with community groups. The reason it is even brought up here is because risk reduction activities are disturbance and disturbance is presently being applied uniformly across all ecosystems, like a cookie cutter making uniformly shaped cookies. Although the disturbance mechanisms applied are the same, response (succession) will be different. Succession cannot be ignored. Is vegetative response to thinning, pruning, and underburning the same in pinyon pine-juniper ecosystems as in fir ecosystems? What about the response of the same cultural practices on ponderosa pine in northern Arizona compared to South Dakota, or dormant-season burning compared to growing-season burning in Florida's longleaf pine? Succession is different in each case.

Members of the Society of American Foresters not only need to recognize the differences in vegetation response, but we need to be prepared for the response by people when vegetation disturbance is prescribed to reduce risk of wildland fire loss. Some people will accept the idea of modifying vegetation characteristics on their property readily, while others will vehemently oppose any degree of vegetative modification. It will be important to accept even the smallest of incremental improvements for this latter group and not make them feel guilty for the values they hold.

Members of the Society of American Foresters need to be proactive in identifying future possibilities when it comes to vegetative response to a disturbance. Providing clients with the best information makes our profession relevant to society. It requires members of the Society of American Foresters to take time to learn their ecosystems and know the probable responses for the planned disturbances. This is important so communities don't replace what they currently have with something that may be worse and possibly unacceptable. History is replete with cases of applying blanket solutions and ending up with something that made the situation worse than it was originally. If you, as the advisor, don't have the experience to identify disturbance responses, then find someone who can to work with you and the community.

## **DISPLAYING VEGETATION CHANGE AND FIRE EFFECTS**

Probably the weakest area of being a community advisor is getting the community to visualize what their planned disturbance will look like over time and accept it as aesthetic. Most people over react and think a disturbance will leave their once beautiful landscape austere, homogeneous, and in tatters. These people have been taught by the environmental conflict industry that all forest disturbances by humans is bad and that their forest has always looked like it does now. Only the very astute will accept some degree of degradation to achieve the larger goal of reduced risk from wildland fire to themselves, family, and capital improvements.

Probably the best way to display disturbance and its effects is to find property owners who trust you and are willing to try something to see what will happen. Once neighbors get used to the effects of disturbance on their neighbor's property, and see the advantage of the change, many will begin disturbing the vegetation on their own property.

A computer model is also available that may help display different levels of disturbance, as well as answer some of the typical why questions that will be asked. This model is the Fire and Fuels Extension to the Forest Vegetation Simulator. Applying actual stand examination data to this model allows the modeler to grow a stand of trees, and at certain times add a disturbance, such as thinning and/or prescribed fire. Once the disturbance has occurred the stand is allowed to continue growing for the period of time specified. This model does an excellent job of allowing property owners to vicariously see changes into the future without actually risking anything.

A new book, FIREWISE COMMUNITIES: Where We Live, How We Live, was developed to pictorially show that defensible space activities can be aesthetically pleasing. It is recommended that materials of this type be available when discussing vegetative disturbance activities and what they may look like in the end.

### **ELEMENTS AND EXECUTION OF A COMMUNITY ASSESSMENT**

Several assessment products exist and are easily obtained for reference and use. Most assessment products do an excellent job in focusing attention on a community's physical characteristics and attributes of its structures. However, because the community and its structures are part of a wildland, with its human influences, these assessment tools often fall short of giving a holistic view of the wildland interface/mix situation.

To cure this perceived problem of an inadequate assessment tool, an assessment tool was developed and discussed with participants of the technical session. This assessment tool adds assessment categories of social, economic, and ecological considerations.

Communities do not need to use prepared assessment forms. Since most communities are unique it is recommended that community firewise leaders look through the many available products and then design an assessment tool specifically for their use. A community advisor can be an invaluable aid in the development of this assessment product. The assessment tool should be designed to gather data that will be used to answer questions about each homeowner's and the surrounding community's preparedness for surviving a wildland fire, as well as information about ecosystem resilience, and resistance to change of the people living in the community.

Following the design of an assessment tool, data collection begins. Data is collected best through face-to-face interviews conducted with each community homeowner and business interest. Specifically, interviews with area real estate agents, real estate developers, home builders, public safety officials, landscape architects, architects, insurance representatives, community planners, and financial institution personnel will be helpful in sizing up the interface/mix situation.

Besides the community firewise committee members, local fire department personnel also make excellent candidates for collecting and assessing data. If the community is very large, volunteer groups such as the Student Conservation Association or American Red Cross may be of service collecting assessment data.

Once data is collected, and summarized, it is time to actively share it with the community. Have meetings, small and large, put results on a website, have volunteers go home-to-home, etc. Be sure everyone has the data in their hands and on their minds.

Now that the assessment is complete, fire risk alternatives can be identified. It is recommended that a decision tool be selected and used. A decision tool should include these elements at a minimum:

- 1) A decision statement. State the purpose and level of the decision to be made.
- 2) Establish objectives. Specific details of what the decision will accomplish.
- 3) Generate a reasonable number of realistic alternatives.
- 4) Compare alternatives to “must” and “want” objectives. An ideal alternative fulfills every condition.
- 5) Review the alternatives that remain. Are there any adverse consequences created by the remaining alternatives that the community can not live with?
- 6) Actively display the decision to everyone who will be affected by its adoption.
- 7) Put fire risk reduction activities into motion.
- 8) Apply for recognition as a Firewise Community/USA.

### **DIFFUSION OF INNOVATION – THE SCIENCE OF SOCIAL CHANGE**

This is a useful social model that will help the community advisor keep the process of change moving. This model identifies social groups considering a new idea/innovation, identifies conditions people have for adopting a new idea/innovation, and identifies a possible time period between their awareness of the new idea/innovation and their adoption of that new idea/innovation.

People exposed to a new idea/innovation have different degrees of personal innovativeness. Some people love new ideas/innovations and want to try everything that comes available while others shun anything that is new. It seems that innovators are about 2.5% of the population and will adopt things immediately upon learning of their existence. Early adopters, 13.5% of the population, are the next group to adopt ideas/innovations. The bulk of the adopters are divided into equal percentages of 34% each of the population and are referred to as early-majority and late-majority to distinguish the relative timing of idea/innovation adoption. The last group is laggards who make up 16% of the population. They are unlikely to ever adopt the idea/innovation.

People decide to adopt or reject an idea/innovation using five criteria. These criteria are relative advantage, compatibility, complexity, trialability, and observability. Relative advantage determines if the idea/innovation will be of any practical use to the user. After all, not every idea/innovation is useful to everyone. If the idea/innovation can fit into an existing user system

it is considered compatible to the user. If not, it might mean making changes until it is compatible enough for adoption. Complex systems usually require specialized training to put it into place and maintain it. Additionally, complex systems are perceived to have a higher break down rate costing more money than a simple system to operate. People who can input the idea/innovation into their existing system and try it are much more likely to adopt than someone who only has the option of visualizing how the idea/innovation might work if applied. Finally, if an idea/innovation can not be tried by the user, the next best thing would be able to see it in action in a similar setting.

There is a difference between awareness and the rate of adoption. It is relatively easy to determine this gap of time for the innovator and laggard groups. The innovator by definition will have no gap between awareness and adoption, whereas laggards will have an infinite gap between awareness and adoption. The other three groups typically have a gap of 1-to-3 years with early adopters taking less time and late-majority taking a little longer to adopt.

During this 1-to-3 year gap between awareness and adoption, adopter groups are not merely waiting around for the conditions of adoption to change more favorably toward them. Potential adopters are involved in many activities from obtaining the means to adopt the idea/innovation to moving through the learning stages of ignorance, confusion, confidence and finally mastery. When an idea/innovation meets the conditions for adoption the innovator must then have the means to obtain that innovation. If these conditions don't align, then the innovator is unlikely to adopt the idea/innovation at that time.

Social systems also play a major role in the adoption process. Social systems include norms, opinion leadership, change agent activity, and the type of idea/innovation decisions that need to be made. Adoptions are more likely to occur when the idea/innovation fits with adopter behaviors; the adopter has the ability or power to influence other members of the adoption group; a third-party agent influences the client to adopt; and whether the decision is individual, organizational, made by someone with authority or through consensus.

### **THE ADVISOR'S ROLE ON PRIVATE LAND**

Einstein once remarked that "insanity is doing the same old things the same old way expecting different results." Since Firewise is a blueprint for change, successful community advisors must inventory their own beliefs about the ecosystem, human behavior, and risk and, if necessary, make changes within themselves before placing themselves in a position of leading others through change.

The following is a list of principles that a community advisor should be comfortable with when doing their job.

- a) Humans are part of the ecosystem.
- b) An ecosystem is the model and framework under which we do business.
- c) Ecosystems have ecologic, economic, and social considerations.
- d) Ecosystems are generally resilient and are sustainable.
- e) There are always consequences to ecosystem disturbance. Our job is to anticipate them.

- f) Ecosystems are dynamic not static. We must identify the range of change and its probability of occurring.
- g) Change is normally exponential, but we must mete out change to match human acceptance (probably linear with very little slope).
- h) To protect natural resources we must accept a role on private land.
- i) Our desire should always be to move responsibility to the proper level of government (formal or informal).
- j) Not everyone has to participate in reaching the goal.
- k) The old model of government coming to everyone's aid is out. Government has neither the personnel nor equipment to handle simultaneous multiple structure fires in the interface/intermix.
- l) Individuals and communities must accept some responsibility and plan for protecting themselves and their property.
- m) Risk reduction activities have created markets for untrained entrepreneurs with chain saws to potentially do more damage than good. We need to train these entrepreneurs and protect communities from those who are untrained.
- n) There are no guarantees that after everything a homeowner or community does, his/her/their property will escape damage from wildland fire if it happens. Our job is to manage that risk.

The following list is made up of specific tasks a community advisor may be called upon to do either implicitly or explicitly to assist a community through the process of change and risk management.

- a) Be proactive. Get the process started and keep it going.
- b) Don't promise things that cannot be delivered.
- c) Know the advisor's role and don't exceed it. Be a leader, have a vision. Pull, don't push.
- d) Cheer lead.
- e) Use your contacts to help create partnerships.
- f) Identify the incorrect assumptions people are holding on to.
- g) Help identify the shared vision of the outcome.
- h) Assist with communication and decision-making skills.
- i) Be a listener and provide feedback.
- j) Explain answers to areas of frustration.
- k) Match scientist/practitioner to help understanding of issue/barrier/problem.
- l) Keep the focus on priorities.
- m) Help interpret assessment results and how they relate to ecosystem resilience and sustainability.
- n) Help formulate clear and concise objectives.
- o) Help develop a reasonable number of realistic alternatives.
- p) Keep maintenance of the plan always on the community's mind.
- q) Encourage a balance between carrot and stick methods for achieving goals.
- r) Always have in mind ecosystem cycles that will be interrupted.
- s) Identify the thresholds that allow initiation and support wildland fire.
- t) Protect community from those who offer, but are not trained, for risk reduction work.
- u) Monitor each process and learn from it.

## BIBLIOGRAPHY

- Cohen, Jack D. 1999. Reducing the Wildland Fire Threat to Homes: Where and How Much? USDA Forest Service Gen. Tech. Rep. PSW-GTR-173.
- Firewise Communities. 2003. Firewise Communities: Where We Live, How We Live. Quincy, MA. Firewise Communities.
- Firewise Communities. 2001. Firewise Communities Workshop, Participant Guide. Quincy, MA. Firewise Communities.
- Florida Division of Forestry. 2002. Wildfire Hazard Assessment Guide for Florida Homeowners. Tallahassee, FL.
- Helms, John A. 1998. The Dictionary of Forestry. Bethesda, MD. The Society of American Foresters. Bethesda, MD.
- Kepner, Charles H. and Benjamin B. Tregoe. 1981. The New Rational Manager. Princeton, NJ. Princeton Research Press.
- National Fire Protection Association. 2002. Standard for Protection of Life and Property from Wildfire. Quincy, MA. NFPA 1144.
- National Wildfire Coordinating Group. 1994. Intermediate Wildland Fire Behavior, Student Workbook. Boise, ID. National Interagency Fire Center.
- National Wildland/Urban Interface Fire Protection Program. Undated. Wildland/Urban Interface Fire Hazard Assessment Methodology.
- Partners in Protection. 1999. FireSmart: Protecting Your Community from Wildfire. Edmonton, Alberta.
- Pyne, Stephen J. 1984. Introduction to Wildland Fire: Fire Management in the United States. New York, John Wiley & Sons.
- Rogers, Everett M. 1995. Diffusion of Innovations, fourth Edition. New York, Free Press.
- Rothermel, Richard C. 1991. Predicting Behavior and Size of Crown Fires in the Northern Rocky Mountains. Intermountain Research Station, Research Paper INT-438.
- Smith, Ed and Marlene Rebori. 2001. Factors Affecting Property Owner Decisions about Defensible Space. In: Forestry Extension-Assisting Forest Owner, Farmer, and Stakeholder Decision-Making. Proceedings of the International Union of Forestry Research Organizations Symposium, October 29 – November 2, 2001. Lome, Australia.

USDA Forest Service. 2000. Protecting People and Sustaining Resources in Fire-Adapted Ecosystems - A Cohesive Strategy. Washington, DC. The Forest Service Management Response to the General Accounting Office Report GAO/RCED-99-65.

USDA Forest Service. 2002. Second Forest Vegetation Simulator Conference. Fort Collins, CO. Rocky Mountain Research Station, RMRS-P-25.

Voegel, Hal and Norbert Wagner. 1997. How do forest landowners learn? A study of resource agency/landowner interaction in northern California. California Department of Forestry and Fire Protection, Sacramento, CA.

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