

Encouraging Wildland Fire Preparedness: Lessons Learned from Three Wildfire Education Programs

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Introduction

Managers may often wonder why some people do not choose to adopt defensible space practices or engage in other activities to help prepare their community for wildfire. Much research has been done in other fields to understand why a new practice or innovation, like defensible space, is or is not adopted. This work¹ has identified several factors that influence adoption. While some of these have to do with personal traits of the adopter—items difficult for a manager to influence; others have to do with characteristics of the innovation and how information about it is communicated—items easier for managers to alter in order to make a practice more “adoptable.” This paper will briefly discuss these factors and describe how three different fire education programs—Firewise Communities/USA, FireFree, and Fire Safe Councils—do or do not address them (see boxes for program descriptions). All three programs share a fundamental goal of creating awareness about wildfire risk, knowledge about wildfire safety, and a stewardship ethic that extends beyond defensible space around individual homes. The purpose of this paper is (1) to provide a framework for identifying key activities managers can undertake when promoting wildfire mitigation and (2) to clarify how each activity can increase adoption of defensible space.

Key Findings

Several key lessons/findings from this analysis can help guide managers who are working with homeowners to create defensible space and reduce hazardous fuels across ownership boundaries:

- People need to know that fire mitigation practices are compatible with their lives and values. Programs that tailor their efforts to address local values and interests are more likely to be adopted.
- People are more apt to adopt practices that complement or enhance social values. Programs that increase contact between neighbors can help develop a sense of community as people work together

¹ Concepts discussed in this paper are drawn from Everett Rogers' *Diffusion of Innovations* (published in 1962 and revised and reissued in 1971, 1983, 1995, and 2003), the primary work that brings together diffusion studies in diverse areas. The book is credited with shaping and institutionalizing diffusion research in its current mode and has become an accepted base reference for the field (Fliegel 1993).

to reduce hazardous fuels across ownership boundaries. Working together increases the social advantage of adopting defensible space as such work becomes the “norm” rather than the exception.

- People prefer to try new practices in stages. Being able to adopt segments of a new practice allows people to adopt at a comfortable pace. Checklists can provide homeowners with a way to incrementally assess and test each stage of an innovation.
- People who have opportunities to observe a practice and its benefits are more likely to adopt the practice. Concrete examples allow residents to see the results, reassess their previous notions of what “defensible space” or fuel reduction might look like, and choose the actions they find acceptable. Demonstration sites and neighborhood events provide opportunities for sharing the aesthetics of fuels reduction.
- People will compare the cost of implementing defensible space with the potential benefit. Because people don’t really expect to lose a house to wildfire, highlighting the social benefits of adoption may be more effective in encouraging adoption than highlighting economic advantages.

FireFree

FireFree was created in 1997 by four local agencies in central Oregon and SAFECO Insurance Corporation. The FireFree! Get in the Zone campaign educates the public about wildfire safety and promotes defensible space around homes through mass media advertising, public relations efforts, and educational materials, as well as cooperative programs with other local government agencies and business organizations. For the past 9 years, FireFree has sponsored cleanup weekends during which residents of central Oregon can take yard waste and debris to area landfills and transfer stations at no charge. This pilot program was designed as a model for other locations in the Nation susceptible to wildfire and has been adopted in a few communities in Oregon, but not in other States, or nationwide as was hoped.

Detailed Findings

Certain characteristics of an innovation and of the methods of disseminating information about the innovation can influence how rapidly it is adopted. Our key findings were developed by examining how the three programs address each of these areas and are discussed in more detail below.

Innovation Characteristics

Hazard mitigation is a preventive innovation, something adopted primarily for its potential to protect one’s current lifestyle rather than to potentially improve one’s future through increased income, knowledge, or comfort. Innovations that decrease uncertainty are adopted more readily than those that do not, and because preventive innovations generally do little to decrease uncertainty, they tend to have a very slow adoption rate: “the undesired event may, or may not, occur if the innovation is not adopted. So the desired consequences of a preventive innovation are uncertain. Under such circumstances, the individual’s motivation to adopt are rather weak” (Rogers 1983: 171). Five characteristics of a new practice or technology influence how fast it is adopted: trialability, observability, compatibility, relative advantage, and complexity of the innovation.

Trialability is the degree to which the user can test out the innovation. A successful trial increases likelihood of full-scale adoption because it decreases the uncertainty about its effectiveness. Although it can be difficult to fully test preventive innovations, an innovation often can be tested incrementally. In fact, innovations that can be divided into smaller segments that can be tested separately tend to be more rapidly adopted.

All three programs include checklists for homeowners with a number of options or “steps” of wildfire preparedness, such as FireFree’s “10 tips—1 zone.” Such a checklist allows homeowners to incrementally assess the innovation and how it works for them. It also allows them to choose to adopt only portions of the innovation. Some defensible space is better than none, and as homeowners become comfortable with the changes, they may then try additional actions. Because Fire Safe Councils are developed locally, they have been able to address the trialability issue in creative ways. One council on the northern California coast, challenged by public apathy about wildfire risk, started with projects that had benefits for multiple resource management challenges, such as using goats to remove tall grass and noxious weeds and bringing in large water tanks that could be used for irrigation—both of which also have benefits for reducing wildfire risk. Residents “hooked” into Fire Safe are now moving on to defensible space and applying for funding to complete a wildfire mitigation plan.

Firewise Communities/USA has more comprehensive and integrated requirements for participation in the program that makes incremental trialability more difficult. All selected neighborhoods must have a community assessment completed by a wildfire specialist, sponsor a Firewise Task Force Committee that will develop a plan and track progress, observe an annual Firewise Day, invest a minimum of \$2.00 per capita annually in local Firewise projects, and submit an annual report to the national program. This required level of commitment has discouraged some communities from trying out the program and limited its scope of outreach. Individual homeowners may find Firewise information on their own, but they cannot benefit from the full range of its resources without participation in a neighborhood program.

Fire Safe Councils

The California Fire Safe Council was formed in April 1993 “to preserve California’s natural and manmade resources by mobilizing all Californians to make their homes, neighborhoods and communities fire safe.” The program is designed to function at several scales. Recognizing that local grassroots organizations are best for reaching homeowners, most activity takes place at the local level where there are more than 130 county and community Fire Safe Councils. In addition to emergency preparedness and defensible space planning and implementation, the councils provide a forum where community residents can voice concerns about related issues, such as public safety and forest health, on both private and public land. The State FSC provides a clearinghouse of materials, information, and funding to facilitate the local Fire Safe Councils and works to affect State and Federal policy, evaluating legislation pertaining to fire safety, lobbying Congress for additional funding, and gathering its membership to “speak with one voice about fire safety.” This program was recently adopted by the State of Nevada.

Observability is how apparent the benefits of the innovation are to others. Innovations generally are adopted less as a result of any type of formal or scientific information but more as a result of adoption by peers (Rogers 1987). Concrete examples allow residents to see the results, reassess their previous notions of what “defensible space” might look like, and choose the actions they find acceptable.

Firewise Communities/USA

Created in 2001, Firewise Communities/USA is a nationwide initiative that formally recognizes communities in the wildland-urban interface that are taking specific steps to address wildfire risk. Firewise Communities/USA is an offshoot of the Firewise Program that first focused on fire-safe landscaping, then added safe building and construction practices, and in 1999 began conducting workshops for a community-based, planning approach to wildland fire risk. While these programs targeted builders, planners, community leaders, and fire agencies, the Firewise Communities/USA program is designed for homeowner groups. This program seeks small communities and neighborhood associations willing to work with State forestry agents and local fire staff to conduct wildfire risk assessment, design a mitigation program, and engage homeowners in implementation. Communities are encouraged to develop a plan tailored to their local conditions and needs, and the program offers informational and promotional materials on how homeowners can create defensible space. The Firewise Communities Web site lists more than 60 recognized communities in 21 States, from Hawaii to Florida, Minnesota to Arizona.

All three programs address observability by use of demonstration sites or “show me” homes. For instance, the Post Mountain Fire Safe Council cleared dense hazardous fuels around homes at the entrance of the subdivision so that residents become familiar with the new landscape every time they leave and return to their neighborhood. Several Fire Safe Councils in northern California created a series of photo points to show before and after fuels treatment. Two councils in southern California created Fire Safe demonstration gardens, one at a community fair and another more permanent garden next to the city’s library. The FireFree program relies on its advertising business partners to help with observability. Publicizing a home signage project, posting a large sign on a new emergency egress, and flagging fire-resistant plants in nurseries were projects

undertaken by one advertising firm to demonstrate to residents the range of fire safety activities and benefits. Potential Firewise Communities/USA applicants or just interested individuals can learn from recognized communities who submit accounts of their progress in wildfire mitigation, both in pictures and testimonials, on the Firewise Web site.

Compatibility is the degree that the innovation is consistent with the needs, experience, lifestyle, and previous values and ideas of the adopter. Many interface or rural residents value characteristics—such as privacy, aesthetics, and wildlife viewing—they may consider incompatible with effective defensible space practices. Programs that can tailor their efforts to address local values and interests are more likely to effectively address compatibility issues than programs entirely packaged and disseminated from outside the community.

Both Firewise Communities/USA and Fire Safe Councils provide materials that each community can adapt to local needs. Although Firewise provides experts for the community risk assessment, it asks

the community to create its own programs for implementation. The State-level FSC provides templates for meeting notices, letters to homeowners, newsletters, and auditing forms, but local Councils are encouraged to adapt these materials to reflect local conditions and experiences. In both these programs, a few communities have used surveys to gather residents' values on wildland-urban interface issues. Survey results were then incorporated into information campaigns, demonstrating how wildfire mitigation could enhance community values such as safety, forest ecology, and habitat—as well as protect property—in the event of wildfire.

Unlike the other two programs, FireFree educational materials, such as videos and brochures, were not designed to be easily customized for local situations and tastes. This was a reported drawback for communities who tried the program but found their homeowners could not relate to the style or pace of the FireFree video. The “ten tips” checklist and fire safe landscaping also were seen as inappropriate or contradicting local specifications. Compatibility can also be an issue at the programmatic scale. While Firewise Communities/USA allows mitigation projects to be designed to fit local conditions, the program itself is less compatible for communities who cannot easily be divided into the small neighborhood units the program considers most appropriate. Many communities also may not be able to leverage the funds necessary for Firewise Communities/USA designation.

Relative advantage is essentially a cost-benefit analysis, the degree to which an innovation is seen as superior to the status quo, either from an economic or a social standpoint. The relative economic advantage of defensible space is problematic because homeowners are being asked to spend money *now* for *possible* benefits down the road. Any rational homeowner presented with “hints” and “tips” for reducing wildfire risk would ask whether the benefits are worth the costs or effort. However, structural survival might easily be attributed to chance rather than mitigation and makes proving the relative advantage of mitigation difficult. Incentives are an important way to alter relative economic advantage, but do not always work well where the innovation is easily discontinued unless the subsidy can be continued over a long time. Given that vegetation grows back without periodic maintenance, financial incentives may be effective for initial vegetation management but social incentives are more likely to be successful for long-term maintenance.

Relative social advantage can be increased by designing mitigation that enhances values important to the community and demonstrating that it does. For example, in most landscapes, mitigation efforts can improve aesthetics and wildlife habitat as well as reduce wildfire threat. Highlighting these features increases relative advantage and provides reasonably immediate benefits that do not depend on experiencing a wildfire. Increasing social capital is another immediate benefit that can increase relative



FireFree sponsors Clean Up Week where debris can be recycled for free at the landfill.

advantage. Programs that increase contact between neighbors help develop a sense of community as people working together to reduce hazardous fuels cross ownership boundaries. Celebrations and annual events provide opportunities for sharing stories and reinforcing the aesthetics of fuel reduction. Working together increases the social advantage of adopting defensible space as such work becomes the “norm” rather than the exception, encouraging individuals to take action in order to belong. Connected neighbors also can exert a kind of peer pressure to have a neighborhood norm of safety by removal of hazardous fuels.

As financial incentives, Firewise and Fire Safe

Councils promise to leverage local funds and volunteer hours into Federal grants for fuels reduction work that can cover part of the homeowner’s costs. Promise of funding is a significant incentive for local homeowners to participate in planning programs and to mobilize local funds for implementation. A less comprehensive program, FireFree does not hold the promise of future funding for fuel reduction work. But it does mobilize neighbors to work collectively, often assisting individuals unable to complete the work themselves, in effect subsidizing the costs with volunteer labor.

Socially, all three programs emphasize neighborhood-based activities. Fire Safe Councils focus on mobilizing community awareness and empowering local organizations to address wildfire and forest health issues. Firewise Communities/USA relies on local neighborhood associations and leaders to draw on community spirit and develop resolve to take responsibility for “ignition potential.” Firewise training, networking, and neighborhood events such as Firewise Days create a sense of community, often in neighborhoods of newcomers who had no previous opportunity to come together. FireFree’s annual Cleanup Days encourage civic responsibility; neighborhood associations are provided with materials and assistance, including street banners and drivers of trucks with FireFree insignia, to promote the program. Community building activities have included neighbors jointly renting a chipper and baking cookies for troubled youth brought in to help.

Complexity is how difficult the innovation is to understand and use. Innovations that are simple and easy to understand are usually more readily adopted. Fire mitigation ranks high on the complexity scale. Although on a certain level, fire is a simple phenomenon, successfully reducing wildfire risk is a

complex story that varies based on characteristics such as building materials, site location, vegetation management, and the level of cooperation expected or found among many individuals and agencies.

As with trialability, programs with a number of simple and easy to implement “steps” for fire safety are more likely to show broader success. All three programs provide a number of options for homeowners with audits and handbooks (Fire Safe Councils and Firewise Communities/USA), and “tips” for getting in the “zone” (FireFree). Organized neighborhood activities can help simplify the process of coordinating work across property lines. They also can help create an environment where individuals can be shown exactly what needs to be done and get immediate answers to questions.

Complexity of adoption also exists at the program level. Programs that are complex and require a great deal of investment and commitment are less likely to be adopted. As discussed earlier, qualifying for Firewise Communities/USA requires a significant investment, and to date only high capacity (in terms of economic, human, and social capital) communities have adopted the program. FireFree, while simple for homeowner adoption, is more complicated as a program. Although more than 400 communities have requested program information, very few have adopted it fully because of difficulties getting landfills to cooperate or because of the daunting list of organizational requirements such as securing agency and business partners, developing retail programs and advertising strategy, and recruiting and training team leaders. With Fire Safe Councils, startup can be difficult for grassroots councils. However, coaching and training materials and networking and “cross training” opportunities provided by the State have helped reduce complexity problems, and almost every California county currently has its own council and within them are many local councils.

Information Dissemination

How information is communicated also affects adoption rates. Different media channels are influential at different stages of the adoption process; using the wrong communication channel at the wrong stage can slow the adoption rate.

When simply trying to create awareness of the innovation, mass media are the most effective communication channels. All three programs have created general media materials useful for initial contact and persuasion such as informational videos and brochures. FireFree has been the most active in the media arena. An advertising agency was commissioned to develop and promote FireFree through an extensive ad campaign. Before fire season, television stations run public service spots promoting the “ten tips” and cleanup weekends, as do full-page ads in the local newspaper. A fast-paced and humorous video on FireFree is available in local video stores and shown at neighborhood association meetings; brochures with tips for “getting in the zone” are on racks at the Chamber of Commerce and public library.

Overall program strengths and weaknesses

Examining the three programs through the Diffusion of Innovations lens provides insight into why and how programs are or are not effective. Of the three programs, the adoption of FireFree has been most limited. FireFree depends more on mass media outreach than interpersonal communication; the inflexibility of the media campaign limits its adoption in other regions as people have not found it congruent to their values and ecosystem. On one hand, the program is simple in its message to homeowners, and the checklist provides discrete actions; but on the other hand, the program is too complex in its instructions for others who might want to adopt it, with a daunting recipe book for establishing business partners and too few references to agency staff who might help. This program, while clearly addressing trialability and visibility innovation characteristics, does not address the other characteristics as well as the other two programs-and has not been as successful in its diffusion to areas outside its original base.

At the neighborhood level, Firewise Communities/USA is a textbook case of diffusion of innovation with its strong incentives for membership, its understanding that each community is unique but also desires to be recognized as belonging to a distinctive network, and its use of change agents for providing technical information and opinion leaders for motivation. However, the strict requirements for qualifying as a Firewise community render the program less inclusive. Although many communities have adopted the program and succeeded in gaining significant funding to implement fuels reduction projects, many communities lack the resources or cohesion necessary to successfully apply for the program-it is not divisible or simple.

The multiscale structure of Fire Safe Councils addresses the need for local action while also offering broader support in a flexible structure accessible to a variety of communities and counties. Fire Safe Councils find a range of local organization leadership to serve as change agents and knits them into a network that provides technical assistance, centralized funding sources, and multiple templates and media materials. The State-level Fire Safe Council promises benefits to adoption of its programs, from lobbying governments and insurance companies for fuels reduction incentives to providing checklists and technical assistance for getting the work done. Concerns for forest health and community safety are incorporated into programs, and results are made clearly apparent with demonstration sites and various community and county initiatives.

All three programs recognize the key to their success is neighbors talking to one another. In effect, this helps ensure that efforts address many of the variables the theory of Diffusion of Innovation has identified as encouraging adoption. Working at the local level helps develop conditions that create social incentives for participating in hazard reduction efforts and tailor efforts to address local compatibility issues. Activities in which neighbors work together can aid trialability, simplify a complex process, and create built-in opportunities for interpersonal communication. Seeing defensible space and other fire safe measures in one's neighborhood facilitates observability. Neighborhood-based activities also effectively address the need to work with a group of similar people and identify and enlist local opinion leaders who are most effective at encouraging behavior change. Neighbors in FireFree, Firewise, and Fire Safe communities testify to their increased sense of security, visibility of wildlife, and satisfaction with increased forest health associated with defensible space and thinning.

After the initial awareness stage, interpersonal communication channels, particularly with expert information sources, become the most effective method for changing behavior. Such two-way communication is most effective in reducing the inherent uncertainty of adopting a new innovation because it allows for discussion and clarification. For preventive innovations, interpersonal communication networks are particularly critical in creating localized incentives—support and peer pressure—to adopt. This is where the neighborhood program and cleanup days play a particularly important role. All three programs have sponsored community events where organizations and volunteers assisted in removing hazardous fuels and debris. Working beside homeowners, fire agency staff can answer questions, help clarify uncertainties, and reduce complexity.

Homogeneity

Generally, the more similar the members of a group are the more easily ideas are spread. When different levels of communication are necessary because of differences in social position, education, or technical training, it is more likely that the new idea will be ignored, misunderstood, or considered suspect.

When the audience is diverse, working with separate segments with similar interests can therefore help ensure the easy spread of an idea within that segment. For preventive innovations, audience segmentation has been found particularly helpful because it allows use of messages tailored to the interests of the targeted group. In essence this ensures that the information is received by a homogeneous group, thereby facilitating its diffusion. Segmentation also allows the most effective message to be created to highlight the innovation's relative advantage to the target group. In emphasizing neighborhood-based activities, all three programs recognize the importance of trying to work with like individuals. Neighbors often cluster in residential areas of similar lifestyles or income levels and see one another on a daily basis. In addition, participating in program-sponsored cleanup days and home fire safety audits can help local fire department staff become familiar and trusted community members.

An idea might spread rapidly within a group, but for it to be widely adopted there must be some communication between levels. Outside sources can offer technologically useful and appropriate information, such as GIS mapping and fire ecologists, as well as information on sources of State and Federal funding. The multiscale structure of Fire Safe Councils acknowledges the need for communication across groups and levels. The councils rely on partners from more than 50 public and private organizations at the State level to serve as links to resources and political advocates. The Fire Safe Councils' web page has extensive information, including an Ask the Experts e-mail message board for posting questions, and a list of Speakers Bureau members willing to cover topics that range from fund raising and running of a nonprofit to urban forestry and FEMA resources.

FireFree benefited from the interest of a regional insurance corporation that sponsored the program and promoted it nationally. Firewise Communities/ USA draws professional expertise from the National Association of State Foresters, which sends State representatives to training sessions to learn how to help communities understand their wildfire risk and opportunities for mitigation. Recognized communities have access to limited-access Web site pages and participate in meetings such as the National Wildland/ Urban Interface Roundtable where communities can network and learn about technical matters and funding sources from representatives of numerous national organizations including FEMA, the American Red Cross, the USDA Forest Service, and the U.S. Department of the Interior.

Change Agents and Opinion Leaders

Two sets of individuals play an important role in the adoption process. **Change agents** provide information and create interest in the adoption of an innovation by a specific population. Rogers describes a change agent as someone who provides “a communication link between a resource system with some kind of expertise and a client system” (Rogers 2003: 368). While often professionally trained and affiliated with an agency, change agents also may be local residents knowledgeable about local conditions, but lacking in formal training. Several factors influence a change agent’s effectiveness: how frequently the agent is in contact with clients; whether the change agent’s attitude and the innovation itself are oriented to meeting client’s needs, not just the promoting agency’s; and whether the agent belongs to the clients’ peer group, is credible, and encourages the client to understand and evaluate innovations.

Fire chiefs and local representatives of State forestry agencies are good examples of change agents and play a central role in each of these programs. FireFree was the brainchild of a local fire chief in central Oregon, and State and Federal foresters are important partners. With the Fire Safe Council network, county supervisors and fire chiefs often play the role of change agent, convening county-level councils and connecting to the California Fire Safe Council network. Foresters, University Extension agents, Resource Conservation District directors, and local nonprofits can also bring their resources and leadership. Fire Safe Councils are notable in their diversity of leadership that optimizes the range of expertise and connectedness of change agents; however, it sometimes creates power contests and confusion over who is actually in charge and making important decisions, such as grant applications and allocations.

Opinion leaders are individuals within the target audience who are not necessarily the first people to adopt an innovation but rather are the individuals to whom other members of the group turn to for advice and information. Adoption is positively related with the degree to which change agents identify and use opinion leaders. Opinion leaders are important for several reasons. First, as members of the

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local audience (and therefore similar), they are often positioned to spread information more effectively than a change agent, who often belongs to a different social group. Second, because interpersonal communication is key in fostering adoption, particularly of preventive innovations, opinion leaders can access pre-existing communication networks and magnify communication efforts of change agents (Rogers 2003: 388). All three programs are designed to find community opinion leaders to manage the process. Some members or staff of the State FSC will initially work with the community, introducing them to key elements of the program and helping to find local leadership. Local leaders are found in homeowner associations, local watershed, or conservation organizations, or they just “naturally” emerge, e.g., retired foresters, engineers, or newspaper editors.

Methods

Information about the programs was collected in a variety of ways including data from Web sites and interviews with coordinators and implementers of each program. For FireFree, the program founder and designers were interviewed, a sample of 400 organizations nationwide was contacted by phone, and an Oregon Department of Forestry effort to spread the program was followed. For Fire Safe Councils, networking meetings were attended and program coordinators at all levels were interviewed. For Firewise Communities/USA, interviews with the program founder, program implementers, community members, and a potential community were completed.



Photo credit: Victoria Sturtevant

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