

The Value of Assessing Public Perceptions: Wildland Fire and Defensible Space

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Fire is a challenge in the wildland-urban interface. Although resource managers encourage residents to create defensible space, many do not. This study illustrates the value of using a needs assessment to better understand perceptions of an audience in order to develop meaningful messages and materials. In this case, our audience is residents of forested areas of Florida and Minnesota at risk of wildland fire. By using in-depth interviews, we explore their perceptions of their landscape, their perception of risk, and their willingness to reduce that risk. Their perceptions can be used to evaluate current wildfire communication tools and suggest ways to modify them to inform and change the behavior of residents. Printed materials emphasize the threat of fire and what to do. Interview data suggest that emphasizing relevant values: privacy, wildlife, and recreation opportunities, as well as acknowledging neighborhood norms, could be helpful to motivate residents when the threat of fire is not sufficient.

Resolving complex environmental challenges usually entails interaction between resource management agencies and the public. In some

cases, active involvement of the public is needed, in other cases only their approval is required. In the last decade, communicating with the public has become a critically important element of state and federal resource agencies' missions; managers have become more willing to include outreach in their management plans (USFWS, 1997; Macie & Hermansen, 2002) and target elements of the public with specific messages (Jacobson, 1999).

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When the environmental issue is urgent or when the solution is obvious to resource managers, agencies quickly produce brochures, posters, and presentations that explain the problem and encourage appropriate solutions. Wildland fire is an excellent example. To reduce the risk to structures and people living in forested ecosystems, resource agencies suggest that residents use fire resistant building

materials, reduce vegetation around the structures, and provide easy access to fire fighters. There is broad agreement among agency professionals that these techniques are effective (Cohen, 2000). Many communities have joined agencies to pass risk-reducing ordinances and promote homeowner actions (Jakes & Nelson, 2002; Jakes et al., 2003). It is curious, then, that one of the least costly actions residents can take, reducing vegetation, is also a strategy that is not well accepted by homeowners (Hodgson, 1995).

When agencies realize their message is not being effective, they often repeat it more frequently and with more noticeable graphics in an attempt to attract attention and create impact. Perhaps there are other explanations for the public's apparent disregard.

This two-part study uses a content analysis of agency-produced publications and in-depth interviews with at-risk homeowners in Minnesota and Florida to understand public perceptions. These states were chosen because they represent different forest ecosystems, different land use patterns, and similar wildfire risk. Common dimensions from these states could represent similar issues in other regions. These data suggest there is value in audience analysis research; agency messages might indeed be different if public perceptions were better understood. These audience-appropriate messages can be used in a variety of communication tools: brochures, posters, workshops, radio, and television.

REVIEW OF AGENCY BROCHURES

Wildland fire brings many agencies into communities to enlist residents' assistance. As remote homes sprout across the landscape, the distance and narrow access roads may prevent fire fighters from arriving in time to save them all. Growing fuel loads in many forests are creating a severe challenge. As a result, federal and state agencies are encouraging homeowners to take an active role in protecting their community and property. The resulting programs: FireWise, FireSafe, FireFree, etc. are designed to engage homeowners and decision makers in reducing their risk through better zoning, planning, construction, road building, water supply, and vegetation management. An important element of this strategy is for homeowners to reduce the vegetation around their home to create defensible space. A variety of brochures, billboards, televised public service announcements, newsletters, posters, and presentations provide detailed instructions on trimming branches, raking needles, removing trees, and clearing brush to maintain at least 30 feet of defensible space around a home.

While a variety of media are used to promote these concepts, we selected a sample of twelve publications from state and federal agencies in Florida and Minnesota to review (see Table 1). All publications appear to be

Table 1
Agency materials reviewed

It could happen to you	National Forests in Florida
Fire Safe Landscaping in Brushfire Country	Florida Division of Forestry
FLASH card-Wildfire	Florida Alliance for Safe Homes
Where the trees meet the eaves	Florida Division of Forestry
Woodland Homes Fire Safety	Florida State Fire Marshal, Florida Fire Chiefs, DOF
Are you firewise Florida?	DOF, Florida Department of Community Affairs
Is your home protected from wildfire disaster?	Institute for Business and Home Safety
It can't happen to my home... are you sure?	MN Incident Command System
Wildfire in Minnesota	Minnesota DNR
Wildfire... Are you prepared?	American Red Cross, FEMA
Firewise MN doorhanger	Minnesota DNR
Homeowner Watch outs!	Minnesota DNR

published within 5 years and were designed to engage homeowners in protecting their property from wildfire. Some publications include information about evacuation procedures or building retrofits, but only the landscape portion of the materials was reviewed. We evaluated the graphic choices and text for information about the risk of wildfire, why and how to reduce vegetation, and how residents might overcome barriers to reducing vegetation (e.g., neighborhood approval or personal preference).

Two publications are 8.5" × 11", multi-page, color booklets. One is a flash card and another a door hanger, the remaining eight are brochures with two, three, or four panels. Most, but not all publications use photographs or sketches to attract attention. Three publications include photographs of wildfire in a forest; three use photographs of wildfire with houses. Four use sketches of homes with nearby flames; one includes a dog in the window of the home, another a photograph of a home destroyed by fire. These images are effective at suggesting risk. The two larger format publications explain who is at risk of wildfire and why. The doorhanger explains that the resident received it because they are at risk and suggests what might be done to reduce the risk. Six brochures and the flash card emphasize what residents can do to reduce their risk by listing tasks. Little explanation is offered other than: *This type of landscaping breaks the ladder that fire uses to move from the brush to your residence* (FL DACSa), or *Create a safety zone around your home where you can take steps to reduce potential exposure to flames and radiant heat* (FL DOF). One text-heavy brochure uses one panel to explain the risk during different weather events and ecosystems. The remaining brochure cleverly explains both the concern behind observable risks and the solution with an opportunity for the resident to check whether this is their situation (see Figure 1).

All of the materials explain what the homeowner should do to trim and remove vegetation. Six brochures use a site map sketch to

OUTSIDE THE HOME

(1) *The native vegetation grows up to the side of your home!*



Concern: Direct flame contact and radiant heat from burning brush/trees will set your house on fire.

Your Situation?

Yes No

Solution: Maintain at least a 30-foot clearance (more on steep slopes) of flammable vegetation around the house. Use fire resistant plants for landscaping.

(2) *Tree limbs are within 10-feet of your chimney or stovepipe!*



Concern: Sparks from the chimney can set the tree on fire, which in turn can set the house on fire.

Your Situation?

Yes No

Solution: Remove all tree limbs from within 10 feet of the chimney; remove all dead limbs overhanging or near the house.

Fig. 1. A portion of a two-panel brochure that explains why each characteristic is a problem and what can be done (MN DNR, 2001).

illustrate defensible space. While two brochures do not include trees within the 30 foot area, the other five show one to four trees, isolated, farther from the house, and with lower limbs removed. Most of these trees would not shade the home, and some are described as "short yard trees." Only one of these sketches shows the home surrounded by a forest (see Figure 2). All of the publications use the phrase 'buffer zone,' 'safety zone,' or 'defensible space' to describe the 30 foot or 30–50 foot area of managed vegetation.

Landscape values are alluded to in many brochures, but not in support of defensible space. While six of the publications

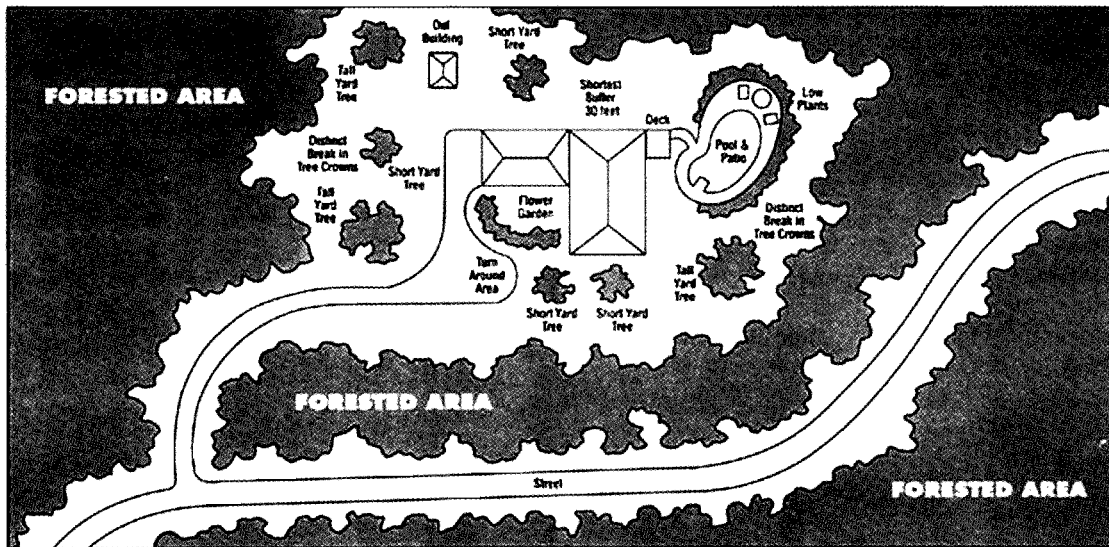


Fig. 2. This sketch demonstrates that a clearing around a house can protect a home that is nestled in the forest and hidden from view of the road (FL DACSb).

acknowledge that homeowners have chosen privacy, nature, or quiet, they all state that these qualities have increased their risk. *Today, most people's dream home is a place tucked in among the trees with a view of a lake or stream (FL DOF). There, homeowners enjoy the beauty of the environment but face the very real danger of wildfire (American Red Cross, 1993).* None of the materials explains how to achieve multiple objectives, other than the two that suggest multiple objectives are possible: *You do not have to live in a steel building or bunker to be safe (MN DNR, 2001), or You don't have to sacrifice aesthetics to have a firewise landscaped home (US Forest Service, 2003).* None mentions landscaping for wildlife or energy conservation.

Most publications are distinctly silent when it comes to mentioning neighbors, neighborhood norms, or neighbor approval of changes to the landscape. Two brochures mention that working with neighbors could lead to increased safety and preparedness, but one emphasizes working together only after a fire.

In summary, the publications provide specific, concrete suggestions for what homeowners can do to manage vegetation and reduce

their risk of wildfire. The rationale for these actions is not often included, perhaps due to space considerations. The sketches and explanations do not assure residents that they can maintain their forested privacy or the neighborhood norms.

AUDIENCE ASSESSMENT

Theories abound that suggest determinants and components of human behavior. Fishbein and Ajzen's insights (Ajzen, 1985) are often used to frame a strategy that includes attention to attitudes about the behavior, subjective norms, and personal control. Hungerford and Volk (1990) suggest that knowledge, personality variables, attitudes, and skills help create responsible citizens. Persuasive messages have a variety of characteristics (Petty & Cacioppo, 1981; McKenzie-Mohr & Smith, 1999). Appealing to the satisfactions of conserving resources, participating in a community endeavor, and contributing to making the world a better place might also be appropriate to influence behavior (De Young, 1993).

Our project used these theories to assess several concepts that could help in the design of meaningful materials. Our interview guide was designed to answer the following questions:

- What do people already know?
- What information sources do they trust?
- What do people care about?
- What do people already do?
- How influential are others?

An informative, acceptable, memorable, and meaningful message should: 1) build on what people already know and provide new knowledge, 2) confirm and not conflict with cherished values and behaviors, 3) support existing appropriate behaviors regardless of their justification, 4) come from a respected and trusted source, and 5) acknowledge that how others view this behavior is important. Developing such a message requires knowing as much about the audience as possible (Jacobson, 1999; Hernandez, 2000). Sometimes called formative evaluation (Hernandez, 2000), planning evaluation (Stevens, Lawrenz, & Sharp, 1993), or needs assessment (Jacobson, 1999), this type of audience analysis is the first step in the development of an effective communication strategy.

To understand the behaviors and attitudes associated with wildland fire and defensible space, an in-depth interview and a site visit were deemed necessary. Because such studies are generally small, reducing their generalizability, a comparative study with northern Minnesota and northeastern Florida homeowners was designed.

METHODS

The samples were drawn from tax assessor lists of landowners after initial contacts with forestry and fire officials to select areas of high risk of wildfire. Two regions of Cook County MN were chosen near the Boundary Waters Canoe

Area. Five subdivisions in Florida (some remote and some quite accessible) were selected to represent the diversity of interface homeowners. An introductory letter was sent, followed by a phone call to assess willingness to participate in the study.

Photographs of interface homes were used to prompt the respondents to talk about what they liked and disliked about the interface landscape and why. Their comments, coupled with their own land management practices helped us distinguish preferences for the land immediately surrounding their home. Questions about perception of risk, neighborhood approval, trusted information sources, and experience with wildland fire were asked during the interview and respondents completed a two-page survey.

RESULTS

A total of 80 homeowners agreed to be interviewed, representing an average response rate of 68%. Interviewers were often invited to tour the grounds after the 30–75 minute interview. All participants lived in or near forested ecosystems and most (70 percent in Florida and 78 percent in Minnesota) owned one to five acres at risk of wildland fire. All of the Florida homeowners were permanent residents and by research design, half the Minnesota homeowners were permanent and half were seasonal residents. Although more Floridians moved to this home recently (half owned this home from three to ten years while half of the Minnesotans owned this home from more than ten years), most had lived in Florida for more than ten years. All Floridians experienced a major wildland fire. In both states, the homeowners represented a range of incomes. Ranges of home values were similar, from \$30,000 to \$300,000. More Minnesota participants were retired (50 percent compared to 21 percent of Floridians) and had a college degree (71 percent in Minnesota

and 44 percent in Florida) (Nelson et al., 2003).

What Do People Already Know?

The majority of these homeowners were very aware of their risk of wildfire (84%). They acknowledged that fire is a constant threat to their home when weather conditions are appropriate. Most had taken some action to reduce their risk; some reduced vegetation and others installed sprinklers. They also had a fairly sophisticated understanding of the various conditions that affect their risk, in part from their experience.

My home is not really at risk because I have cleared at least 125 feet around the house. (Florida)

If the fire jumps I-95, how much do you have to clear to be safe? (Florida)

Our house is protected if it's not too windy. But if it's a high wind, the house would probably go anyway, even if we cleared more trees. So we keep the insurance paid up. (Minnesota)

What Information Sources Do They Trust?

People may not hear, attend to, or believe a message if they do not trust the source. The respondents in this study differentiated between information about a current fire (they go to the news media for updates) and information about reducing your risk of wildfire (they trust agency sources). Several respondents were quite skeptical about information from televised news and relied more on written news or televised interviews with experts. Some were concerned that the message was overly simplified in order to reach everyone. Neighbors and personal experience, especially long-time residents, are also trusted sources of information.

I believe the county and government entities are reliable—well I hope they are reliable; that's where the burn bans come from! (Florida)

They're just guessing. I think they're knowledgeable about fires. . . . I guess the Forest Service knows what they're talking about. (Minnesota)

What Do People Care About?

The values homeowners associate with the land near their home could have some bearing on their acceptance of a defensible space message to reduce the vegetation near their home. The residents we spoke with cared about many things and fire protection was not predominant.

Florida's range of landscape preferences was broader than Minnesota's, with some Floridians maintaining a mowed yard or grazing animals while most Minnesotans nestled their home in the woods. Despite this variation, a majority of respondents from both states valued three things in their wooded landscape: wildlife habitat, privacy, and recreation. How they achieved these goals, however, revealed differences in information, ability, and preferences. Floridians created wildlife habitat by hanging birdfeeders, planting butterfly gardens, setting up corn feeders for deer, and leaving brush piles and untended areas. Minnesotans left their woods "untouched" for wildlife. To protect their privacy, homeowners in both states planted screening shrubs at the edge of the property, while others left vegetation near the house, and still others pulled their window blinds. While Minnesotans recreated by skiing, snowshoeing, and hiking on public lands near their home, Floridians created hiking trails, firing ranges, soccer fields, and horseshoe pits on their property.

We like having a lot of wildlife . . . we've seen deer, rabbits, snakes, armadillos. We get a lot of things city people won't get. (Florida)

[We] like our privacy, let things grow in between lots. If you're in the woods, you're there because you want to be. (Minnesota)

What Do People Do Already?

How people manage the space around the house and what actions they choose to do to reduce their risk are important pieces of information for agency managers. This information tells them what messages people accept and what is

within their realm of possibility. It may be difficult to believe that people value the forest more than their own home, but the strength of the statements some respondents made about their landscape reveal they deeply cherish their wild and natural view and believe the suggested alterations are too burdensome. Some directly answered the question why they do not alter their landscape to reduce their risk of fire.

We don't know. It would be nice to know what we could do, other than clear cutting all the trees, which we won't do. (Minnesota)

For me I guess I would take the risk [of fire] because, just because I like the trees around and I don't like a stark naked looking yard in front of me. (Florida)

I know their recommendation. I should cut stuff, but I don't plan to do it. I like it the way it is. I lost so many trees from the storm I don't want to lose any more. (Minnesota)

Some values reflected the nature of the particularly community. One subdivision in Florida requires that homeowners leave 40% of the native vegetation on the lot. This attracted residents who value native landscaping and dense vegetation. Remote subdivisions tended to have residents accustomed to taking care of themselves with a pioneer mentality. In Minnesota the vast majority of the homeowners feel strongly that lawns do not belong.

We've reduced our risk by clearing most of the forest and putting in gardens. We installed an irrigation system and have a pump at the pond and a generator, but that's primarily for the gardens, not for fire. (Florida)

I've taken out all the dead trees from the spruce budworm and cleared all trees down by the blowdown. I keep the immediate area around the house cleared of debris. Nothing is stored under the deck, no wood up against the house. (Minnesota)

How Influential Are Others?

In both states, most homeowners said the dominant neighborhood norm was independence. Homeowners can do what they want with their land, but there is an unspoken agreement about what is "within reason." The Florida subdivi-

sions varied in the degree to which people interacted with neighbors. In some cases respondents were quite certain neighbors would not approve of defensible space; other respondents were equally certain that their neighbors wouldn't care what they did on their land. In Minnesota homeowners said you can do what you want as long as neighbors can't see you. In general, there was a common sense of "appropriate" behavior that was maintained by the social norm of the community.

If we came in here and took down a lot of trees there would have been a negative reaction from the neighbors. I certainly wouldn't do anything that would upset the neighborhood. (Florida)

Everyone expects solitude—people don't want to see their neighbors' homes. But we can have defensible space and not see our neighbors. (Minnesota)

The neighbors probably do have expectations. They don't want others to let their property get "run down" but neither do they expect immaculate professional landscaping. (Florida)

No one would pressure anyone, never. There is an unwritten law that you don't interfere with someone else's business. Some do have it more cleared. Don't like it but would never say anything. (Minnesota)

SUMMARY

The interviews with homeowners indicate that some clearly understand the risk of wildfire and have taken steps to reduce their risk. Some people perceive the necessary reduction in vegetation to be greater than the agency recommendations. A variety of values constrain and dictate how people manage their landscape. Wildlife habitat, privacy, and recreation activities are important, in some cases more important than reducing risk of wildfire. People tend to trust the agency sources of information regarding wildfire preparedness, and there is a strong awareness of neighborhood approval for landscaping changes. Interestingly, some residents have taken appropriate actions for completely different reasons, such as hurricane risk or pasture for horses.

CONCLUSION

Convinced that the homeowners have not gotten the message, agencies produce brochures that attract attention with pictures of flames engulfing homes and bulleted lists of simple steps that can be taken, such as “clear defensible space.”

Unfortunately, many people choose to live in the forest because they value the closeness of vegetation, the privacy it affords, the wildlife, the recreation opportunities, and natural landscape. Their understanding of what it would take to reduce the risk of fire conflicts with these values. They are not unaware of the risk of fire, and in fact direct experience with wildfire may not alter their responses. Others, however, have taken limited steps to reduce vegetation or other actions, such as installing a sprinkler and widening the driveway. The social norm within the neighborhood creates an expectation for landscaping as well. Respondents may use the neighborhood norm to justify their lack of action.

A message that concisely explains why certain actions are necessary may be helpful. Information that explains how to keep valuable views while creating defensible space are paramount. Messages have to expand the “why” of defensible space from crisis statements about the potentially deadly consequences of fire, to include a more complex message that argues “why” based on multiple values provided by a landscape. Messages that only give “how to” information but not “why” may support short-term behavior change but may not help when people are challenged with conflicting information (Petty & Cacioppo, 1981).

Agency messages appear to be trustworthy at the time of this data collection, but there are several ways agencies can damage that credibility: simplifying the message, avoiding the issues that are important to residents, and providing information that they already know. Several brochures may have these problems. These materials do not include messages that

could increase motivation to reduce vegetation. Materials could easily emphasize how to reduce vegetation so homeowners can more readily see and enjoy wildlife, to develop vegetative privacy screens at the edge of the property instead of next to the house, and to remove trees that are too close to the house for windstorm protection. Materials might include a list of plants with wildlife value and an appropriate configuration for garden beds that illustrates how fire-fighting equipment could access the home. Sketches showing homes nestled in a forest with defensible space may be more appealing than a home with nothing beyond 30 feet.

The value of talking to the audience to understand what they know, what they don't know, and what they care about is of vital importance if resource managers intend to design communication tools of any type to encourage new behaviors. This information may enable an agency to craft a message that will be better heard and that will generate greater acceptance.

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