Educating and Engaging the Business Sector in Reducing Wildfire Property Losses

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Abstract—*Most wildfire education programs have relied overwhelmingly on homeowner information and education, limiting the role of such business professionals as architects, builders, insurance agents, landscape architects and contractors, planners, media, and realtors. This project was undertaken to engage and educate professionals who design landscapes and homes, work for home and property owners, and make decisions that affect homeowners and communities—and in the long run, to change best management practices in these industries. Market surveys for the target professions were conducted at the outset, reaching 58 individuals and organizations and gathering information on continuing education requirements, subject relevance, training format, pricing, and marketing. About 30 business professionals were involved in the selection of existing materials and development of curriculum for four modules: industry issues, fire environment, building materials and design, and site planning and maintenance. Four seminars were held in March 2007 at sites that provided geographic and time-of-day distribution, and 100 business professionals attended from the target audiences. Ongoing project evaluation incorporated the market scoping, interaction with business groups, and classes. The project team identified new business practices and cooperative efforts that contribute to property-loss prevention, are economically viable, are likely to be adopted, and extend the reach of the traditional fire and land management professionals.*

Introduction

The challenges of reducing wildfire property losses, while sustaining healthy natural environments, grow with the increase in homes built at the wildland-urban interface and intermix. Substantial gains have been made in the past half-century on the technology of building ignition-resistant homes; selecting and maintaining landscapes that minimizes radiation exposure of the house; and siting structures and developments. Yet many individuals, businesses, and agencies are still unaware of, or are unwilling to apply, these measures. Furthermore, most wildfire education programs have relied overwhelmingly on homeowner information and education, limiting the contributions of such business professionals as architects, builders, insurance agents, landscape architects and contractors, planners, media, and realtors.

The planning profession produced and published "Planning for Wildfires" in their professional series (Schwab and Meck 2005). Schwab and Meck emphasize wildfire planning in a comprehensive context, regulation and enforcement that stresses property owner responsibility, and education and outreach to affected residents and property owners. Whereas the "Planning for Wildfires" manual exemplifies the application of wildfire risk reduction

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principles and practices by planning professionals, the authors do not address the importance of accurate and effective advice to homeowners from architects, landscape designers, realtors, and other business professionals. The extensive information published by the National Fire Protection Association (2002) on planning, construction, maintenance, education, and management elements for reducing wildfire losses is written for fire officials and is likely referenced by few business professionals.

Various studies underscore the value of specific information applied to local community settings. Although these studies do not mention business professionals, who advise and do work for homeowners, it is their expertise and individual advice that could contribute to decisions by homeowners to reduce their wildfire risks. Kumagai and others (2004) reported that people are more likely to believe wildfire hazard risk information if it is specific, consistent, certain, and disseminated repeatedly. Brenkert and others (2005) conducted interviews with residents in Larimer County, Colorado, regarding wildfire mitigation actions, and found that the most common motivating factors were the informal social processes by which homeowners learn about and form opinions about wildfire risk; their perceptions about the biophysical setting of their property, community, and nearby public lands; and their knowledge about the effectiveness of various mitigation measures. The authors noted that one-on-one information tailored to a particular property, from a credible source, was associated with homeowners taking mitigation action.

The sessions at a national wildfire education conference (FireWise Communities 2006) highlighted public education, community involvement, and government partnerships. Only three of the 75 presentations focused on the role of business professionals: how forestry and arborists can communicate with potential homeowner clients and provide quality services; how landscape architects can balance safety, aesthetics, and ecology in their designs; and how insurance agents work cooperatively with homeowners and fire agencies.

Social science and marketing research are now being applied to better understand the attitudes and behaviors of homeowners about fire prevention investments in the wildland-urban interface. Social marketing builds on social exchange theory wherein people adopt behaviors that they believe have a positive benefit for them or their community, and that results in both individual and societal gains. Social marketing principles suggest that information should be tailored to the cultural, political, and economic conditions of the community that is expected to invest in survivable space (Absher and others 2006; Andreasen 1995; Kotler and others 2002; Hoban and others 2003). Similar gains could be made with the business sector, as objectives can be adapted to fit their physical, social, economic, and political environment.

With the support of the Joint Fire Sciences program and the U.S. Fish and Wildlife Service, San Diego Wildlife Refuge Complex, this project was undertaken to engage and educate business professionals who design landscapes and homes, work for home and property owners, and make decisions that affect homeowners and communities. The San Diego Natural History Museum developed, marketed, and conducted seminars entitled, "Wildfire Education for Business Professionals," cooperating with local professional associations to promote and provide certification or sponsorship. Curriculum for these interdisciplinary seminars was developed with local professionals, emphasizing property risk reduction while minimizing the impact to the native environment.

San Diego Setting

San Diego is a large urban area with a rapid rate of development; the scientific, business, educational, and professional resources are extensive; the October 2003 wildfires affected virtually every community, business, and individual, at least indirectly. The biodiversity, fire-adapted landscapes, low rainfall, and rapid rate of development in San Diego are unique and unequaled—and San Diego is always "between wildfires." In late October 2003, three wildfires in San Diego County burned 152,000 ha, almost 15 percent of the land area of the county—including the Cedar Fire, the largest in California since historical records were first kept in 1910. Sixteen lives and more than 3,200 structures were lost.

A Damage Assessment Team was assigned to document damaged structures and property after the Cedar Fire, and the findings were included in a report about wildfire losses in California (Fire Cause Analysis 2004). Destruction and damage were attributed to poor accessibility, inadequate clearance of vegetation, wooden landscape improvements, wood or composition shingles, flammable exterior siding, and uncovered vents to attics and crawlspaces.

Absher and Kyle (2006) surveyed homes in the wildland-urban interface zone in San Diego County, near the Cleveland National Forest. Of the 770 returning surveys (35 percent), 98 percent of the households saw smoke in 2003; 97 percent saw flames; 40 percent were evacuated; 42 percent had their work or livelihood disrupted; and 30 percent had property damage. They found high compliance for some behaviors (such as cleaning roof and gutters, stacking firewood away from the house); moderate compliance for others (such as reducing vegetation density); and low to moderate levels of community participation (49 percent received information, 22 percent attended meetings, 12 percent volunteered time, 26 percent willing to get involved with a FireSafe Council).

In the county of San Diego, local building and brush reduction codes have been passed in virtually all jurisdictions and are fairly similar though not identical. There is abundant, if somewhat scattered, technical information for homeowners and business professionals on how to reduce wildfire risks. Numerous forums and workshops have been held by groups such as the San Diego Fire Recovery Network in cooperation with the Museum, the San Diego Horticultural Society, the Fire and Rescue and the Water Departments in the city of San Diego, National Fire Protection Association, local chapters of the American Society of Landscape Architects and the California Native Plant Society, and the University of California Cooperative Extension program.

Methods

Market Surveys

Because business professionals have generally not been targeted in wildfire education and prevention activities, market research was needed to understand their vested interests in wildfire risk reduction and continuing education. The audience was defined as businesses and professionals who work in and around home sites and community developments, and included architects, builders, insurance agents, landscape architects and contractors, planners, media, and real estate professionals. Market surveys for the target professions were conducted at the outset, reaching 58 individuals and organizations and gathering information on continuing education requirements, subject relevance, training format, pricing, and marketing.

Market research into these business sectors was focused initially on national professional organizations that are membership-based, provide services that range from continuing education to advocacy and lobbying, and have unique insights into their industry trends and needs. Information was gathered in phone calls to officers and staff within each organization, asking questions regarding how to best accommodate the learning style of professionals in that industry; how to provide value to the professionals to motivate them to attend and utilize the concepts once taught; and how to address budget and time constraints to accommodate the greatest number of potential students.

A second phase of market research focused on the local chapters of those organizations and/or companies unique to southern California. This outreach gathered information on the curriculum and training products that address local business practices in wildfire loss prevention, market forces behind changes in business practices, ways to market seminars to local professionals and companies, and how to develop partnerships and involvement with local organizations and businesses.

Curriculum Development

The project "Wildfire Education for the Business Sector" assumed that existing wildfire education materials were adequate and could be adapted by local professionals and experienced national and regional experts for the seminars. Wildfire education materials applicable to the southern California setting had already been gathered and used in local wildfire education grants after the 2003 wildfires (McElhinney and Younkman 2005), and more recently gathered by the University of California Extension Service (Janis Gonzales, personal communication, March 2007).

Resource professionals have for decades known most of the principles and practices for reducing wildfire-related property and resources losses in southern California. A homeowners' guide—Radtke (1982)—was produced from earlier research, and this guide was more recently slightly modified and reprinted (Radtke 2004). These publications describe chaparral ecology and fire regimes, the effect of topography on fire behavior, risk reduction through planning and site design, modification of existing structures to reduce risks, and more. Compared with contemporary wildfire education publications, Radtke (1982) placed greater emphasis on watershed values, erosion reduction, rooting depth and drought tolerance, slope engineering, hillside landscaping, and postfire rehabilitation.

An advisory committee provided guidance throughout the development of the project, helped with curriculum development, and helped train and evaluate the instructors in the material to be presented. Originally a group of about 10, it was informally expanded to include 29 local professionals involved in curriculum development from various fields (table 1). Whereas involvement by national experts was originally planned, it was discovered that several local experts were on the "leading edge" of various subject areas, and consultation with national experts was done occasionally and informally.

The local experts assisted with the selection of existing materials, development of curriculum objectives, and PowerPoint presentations for four modules:

1. Industry issues. Representatives from the various target industries were asked to prepare a 3 to 5 minute presentation about the issues they face in the field with regard to wildfire. A conference call was held with all participants to provide an opportunity for practice and feedback.

Table 1—Professional affiliations of participants in wildfire education project.

Participants	Curriculum development	Seminar attendance
Architects	1	5
Consultants (environmental, wildfire prevention planning)	10	14
FireSafe council and homeowners' association members	1	9
Insurance agents, brokers and underwriters	1	8
Landscape architects, landscape designers, and contractors	6	17
Property managers, real estate agents, and appraisers	1	16
Public employees (planning, wildfire, land management)	18	26
Total	**38**	**98**

2. Fire environment (including fire basics, local habitats, and local fire ecology). The fire basics objectives and illustrations were drawn from basic wildland firefighting training materials. The local habitats section was developed by RECON Environmental, Inc., a consulting firm based in San Diego, CA, as a partnership and donation to the project. The fire ecology section was developed by California Chaparral Institute, based in Escondido, CA.
3. Building materials and design. Information from damage assessments after the 2003 Cedar and Paradise Fires, as well as Statewide deliberations about local building codes, had been incorporated into a PowerPoint presentation by Rancho Santa Fe Fire Protection District (2006). This was shortened and otherwise unaltered for this module.
4. Site planning and maintenance. A task force of about a dozen landscape architects, arborists, and planners met four times to outline, discuss extensively, and develop the objectives and the presentation for site design, defensible space, and fuels management. Two landscape architects provided most of the photos and review, one in private practice and one working for a local agency planning review department.

Drafts of the written outlines and corresponding PowerPoint presentations were distributed electronically for review by all of those who contributed to the curriculum development, as well as local fire officials and professionals willing to support the review process. Finally, two dry-run presentations were held with an open invitation to attend. This provided instructors with the opportunity to practice, the team with an opportunity to refine the curriculum, and local stakeholders an opportunity to review the materials.

Seminar Marketing Efforts

The Museum's marketing department assisted with media outreach, sending three press releases in the 6 months prior to the seminars. Contacts were made with local professional organizations and associations, to request that they include the wildfire seminar information in scheduled e-mail messages and newsletters. Announcements were sent directly to about 500 real estate professionals and were distributed as "e-mail blasts" to such other organizations as local chambers of commerce, Rotary Club and other service clubs, Sierra Club, and California Native Plant Society.

Results

Market Surveys

Respondents generally recommended a training format of about 4 to 6 hours, and indicated that a cross-training (interdisciplinary) format would be beneficial to most industries. Most organizations indicated that there are few wildfire education opportunities targeted toward their respective industry, either currently or in the past. Education programs commonly are in the form of offsite seminars with presentations and handouts.

Education is generally pursued by individual professionals, with companies reimbursing them when it is applicable to their jobs and benefits their performance. When continuing education credits are required to maintain licensure, the course provided must be approved by the regulatory agency or organization, and professionals expect to pay for the courses that they attend. Courses can be comarketed with professional associations, and information provided in e-mail announcements and newsletters.

There are clear differences between the five business sectors that were the focus of this project (table 2). These differences underscore the importance of adapting seminar offerings and marketing to various business sectors, to enhance participation and educational value.

Table 2—Summary of market survey of business sectors.

Architecture, building, and design industries	Formal wildfire information is limited and generally is obtained inefficiently as professionals deal with codes and enforcement in each jurisdiction. Architects in California have annual CE requirements for maintaining their licenses, and few courses are offered to meet the hours required in health, safety, and welfare.
Insurance agents, brokers, and underwriters	These professionals are required to complete some CE-certified training annually and are most interested in how to gain local site-specific information and make onsite assessments. Most contacts indicated that existing programs charged a nominal fee, and one contact from the Insurance Education Association recommended a $199 fee for a half-day class.
Landscape architects, landscape designers, and contractors	Landscape professionals' interests include the effectiveness of various mitigation techniques to meet local codes, and how to plan for clients in the back country. Most have no CE requirements and are accustomed to attending offsite programs, workshops, and seminars that are free or have only a nominal charge.
City planners, environmental consultants	Planning professionals attend both luncheon meetings and workshops and are particularly interested in knowing county fire protection plan requirements, different jurisdictional standards, and ways to address community fire planning early in the development decision process.
Real estate agents, brokers, and appraisers	Real estate professionals are looking for courses on either "how to make money or how to stay out of trouble (risk management)."

Curriculum

Protecting property from wildfire requires a systems approach. That is, no one aspect of mitigation protects the structure entirely but instead works within a larger system of mitigations and preparation to save the home. It is important then for landscapers not only to have a deeper understanding of how their work contributes to a fire-safe landscape, but that they also have an understanding of how it fits into the larger system that includes structural design and fire physics. It is therefore useful for them to learn about "Building materials and design" and other subject areas in order to understand the larger system. It is also likely that larger system information has not been presented to landscape architects in their traditional education, whereas they may already be familiar with fire-safe landscaping principles.

Therefore, it was decided that all sections would be presented to all professionals, reinforcing the comprehensive systems approach that underlies the concepts of wildfire risk reduction and protection of natural environments. By giving different industries the full curriculum, better interaction and partnership were facilitated among professionals and industries. Landscapers can theoretically work better with building contractors or insurance professionals, for example, now that they both have a better understanding of the full scope of what is involved, not just the aspects that relate to their narrow scope of work.

Concerns about wildfire risk mitigation practices, when accomplished initially by excessive fuel reduction, have been expressed repeatedly by biologists and other environmental professionals in southern California (Halsey 2004). This curriculum was developed to teach the principles of wildfire mitigation while minimizing the impact to the native environment. The wildfire education seminars focus on appropriate vegetation reduction practices that reduce water use, plant maintenance, erosion, slope instability, invasion by highly flammable nonnative plants, and therefore also costs to the homeowner. When ignition-resistant structures are considered the first "line of defense," and when the landscape practices minimize the width of defensible space necessary to protect structures, the acreage of natural habitat loss will be minimized.

Reports, brochures, State codes, county and city of San Diego codes, contacts for smaller jurisdictions, sample fire management plans, and Web site links were provided on a CD to seminar participants. For example, copies of materials produced by the Center for Fire Research and Outreach at the University of California in Berkeley (2006) were included, from their Web-based "Fire Information Engine Toolkit" that has extensive information on mitigating home-related fire hazards based on observations of wildfire damage, data from fire tests, and input from firefighters. The "Homeowner's Wildfire Mitigation Guide" has descriptions and illustrations of problems and solutions for roofs and gutters, vents, siding, windows, garages, decks, fences, plants, and trees. The CD also included copies of the fire performance tests of roofs, decks, walls, and windows that provide detail suitable for architects and construction professionals (Quarles 2006).

The core curriculum consisted of PowerPoint presentations with written outlines and slide printouts distributed to each participant, for the four modules: industry issues, the fire environment, building materials and design, and site planning and maintenance (San Diego Natural History Museum 2007). PowerPoint presentations were included, and attendees were encouraged to use and adapt them in their work with clients, employees, and other contacts. The Museum synchronized audio from the live presentations with

their corresponding PowerPoint slides, suitable for Web-casts or for training new instructors. Attention was given to the exact wording of the outlines, as they are the principles that seminar participants will apply and share with their clients. An excerpt from the "fire environment" module is provided in table 3.

Following the development of curriculum objectives and outlines, professional associations were approached for their willingness to assign continuing education units (CEUs) for these classes, ostensibly as an attractive motive for professionals to attend. By partnering with local organizations, CEUs were secured for the following:

1. Certified arborists, through the Western Chapter International Society of Arboriculture
2. Certified urban foresters, through the California Urban Forests Council

Table 3—Excerpts from wildfire education curriculum.

a. Local fire ecology – Why Sunshine, Shrubs and Wildfire?
    i. Survival in a Mediterranean climate
        1. Mediterranean climate exists in only five places in the world, representing only 2% of the world's land area. This unique climate helps makes Southern California's flora and fauna some of the most unique and diverse in the world.
        2. Seasons dictated by rainfall that is distributed differently than other climates.
            a. Spring: After first rains, usually in November/December
            b. Fall: Very brief, usually in June (or August at higher elevations)
            c. Summer drought
    ii. Adaptation: An adaptation is a pre-existing behavioral or physical trait of a group of organisms that allows it to survive an environmental condition.
        1. Drought adaptations
            a. Leaf adaptations
            b. Avoiders: Usually have deep tap roots that find water
            c. Persisters: Shallow roots but hang on through conservation
            d. Retreaters: Annuals
            e. Chameleons: Hang out but leaves change; semi-deciduous
        2. Fire adaptations
            a. Obligate resprouters: Don't completely die, resprout after fire
            b. Obligate seeders: Adults die, seeds can't germinate unless scarified by fire in some way
            c. Facultative seeders: respond both by resprouting and germination
            d. Annuals and short-live perennial "fire followers"
            e. Geophytes: bulbs that bloom after until fire removes the canopy and allows sunlight on these sites
    iii. Fire regimes
        1. Difference between "fire" and fire regimes with distinct frequency, intensity and seasonality of fire
        2. Chaparral not dependent on fire for regeneration, but has survived certain fire regimes in Mediterranean climate and human occupation
        3. Fire ignitions have increased linearly with population increases
        4. Fire suppression has not led to bigger fires in Southern California
    iv. So what do we do about it?
        1. Create sustainable, fire-safe environments for our homes by starting from the house out, rather than from the wildland in.
        2. Systems approaches
            a. Community design
            b. Building design
            c. Landscape design
            d. Personal responsibility

3. Community managers, through the California Association of Community Managers
4. Architects, through the American Institute of Architects (self-reporting)
5. Planners, through the American Planning Association (self-reporting)

Seminar Marketing Efforts

Through periodic press releases and contacts with local media, the Museum was able to secure media coverage in four publications. Two local newspaper articles were written from the press release information, and two articles in national insurance and real estate trade publications were written from interviews with the project manager and local professionals referred by the project manager.

Professional associations provided a major outlet for distribution of seminar information. Different organizations took different levels of interest in the project and promoted them accordingly. Some simply forwarded the seminar invitations in their e-mail blasts. Others, such as the local chapter American Society of Landscape Architects (ASLA) and California Association of Community Managers (CACM), were far more aggressive with their promotion and, as a result, landscape and property professionals constituted 13 and 17 percent of the participants, respectively.

Class registration fees played a role in marketing. Market research indicated that some industries were used to paying over $100 for similar classes, and other industries commonly pay no registration fees or only nominal fees for similar offerings. When the seminars were initially announced with $100 tuition, some industry representatives indicated they would register multiple employees if fees were lower, and some in the government and nonprofit sector advised us that the fee was too high. A "scholarship" was originally envisioned, but that become awkward to administer. In order to promote the classes for this initial offering, the seminar fee was reduced to $25, and no one commented further about the fee.

Seminar Offerings

Four seminars (classes) were held in March 2007 at sites that provided geographic and time-of-day distribution in order to attract the widest possible audience. They were held on Friday morning, Thursday afternoon, Friday afternoon, and Saturday morning, each for five hours (including 10 minute breaks after every 50 minutes of instruction). Professional affiliations of attendees are listed in table 2.

One class was cohosted by the San Miguel Fire Protection District, at a location convenient for professionals in eastern San Diego County, where there is extensive wildland-urban interface. Another class was hosted by the San Diego chapter of the American Society of Landscape Architects. Although it was expected that the class would be heavily slanted toward landscape professionals, a diverse range of professionals attended and it was one of the more dynamic classes. The Rancho Santa Fe Fire Protection District cosponsored a class at their facilities, and this drew professionals from northern San Diego County.

The insurance industry was an active, enthusiastic participant in the curriculum development, marketing, and attendance at the seminars. Chubb Group of Insurance provided extensive perspectives and suggestions, and an industry panelist for three seminars. Chubb Group of Insurance and the Museum cohosted an introductory 1.5-hour wildfire course in February 2007 with an out-of-town instructor and CEUs through the California Department

of Insurance. The class reached 22 insurance professionals and likely contributed to insurance sector participation in the wildfire education seminars in March 2007. It is expected that this course will continue to be available to insurance professionals in southern California, though it is cost-effective for insurance offices to attend the local Wildfire Education for the Business Sector seminars, rather than bringing out-of-town instructors.

A fire prevention course was initiated about 3 years ago by the Fire-Safe Council of San Diego County and was accredited by the California Department of Real Estate in March 2007, "Rural Home Fire Safety for Real Estate Professionals Course." This 6-hour course includes an overview of the wildfire problem in California, factors that increase the fire danger to a home, features that make a structure more fire-resistant, and how to assist their clients in selling and selecting homes located and built with fire safety in mind. Course instructors will be qualified professionals approved by the FireSafe Council of San Diego County, and six Consumer Service CEUs will be given to real estate professionals who complete the course. Because of the many common elements, it is expected that it will be comarketed with the Wildfire Education Seminars in the future.

Evaluation

Feedback forms were provided to each participant in order to gather information about the effectiveness of the training; 39 feedback forms were returned. The feedback indicated that participants understood the fundamental points. Many professionals indicated a new understanding of the need to look at fire-wise building and landscape design within the context of the natural environment. Professionals who are in a position to advise homeowners indicated they would use this information to better educate their clients. Design professionals indicated that they received ideas that would help them early in the planning process. Some design professionals indicated a desire for greater detail and potentially a more advanced course. Selected comments are provided in table 4.

Project evaluation elements also included the market scoping, interaction with business groups, and feedback from professionals developing the curriculum. From these insights, new business practices and cooperative efforts are already being identified that will contribute to property-loss prevention, are economically viable, are likely to be adopted, and extend the reach of the traditional fire and land management professionals.

Future Seminars

Businesses and professionals gained greater understanding of fire-safe principles and codes, an understanding that will benefit their clientele in the form of knowledgeable homeowners and fire-resistant homes or communities. As the wildfire knowledge base in southern California expands through such wildfire education efforts, property protection will likely increase and losses in the next wildfire will likely decline.

Discussions are ongoing, about whether and how to shorten the seminars from 5 to 3 hours. Some possible scenarios for continuing the wildfire education seminars have been explored and include:

1. Offer seminars regularly by local organizations with ongoing educational programs on related topics, including the Museum, the Water Conservation Garden (which is sponsored by water companies), Quail Botanical Gardens, and the Burn Institute.

Table 4—Comments from participant feedback forms.

"How very naïve we are, regarding our native environment" *
"Homeowners must understand where they live and accept the responsibility through a fire-safe lifestyle that includes house, landscape, and evacuation (or staying to defend the house)."
"Industry panel was very insightful; include city code enforcement and planning department as panelists." "Include local land use regulation perspective on panel—I volunteer!"
"Suggest alternatives for building materials during architectural review." Property manager.
"Great to have real examples of building ignitions, alternative materials, landscaping techniques, and local ecology."
"Printing brush management codes on landscape architects' plans (City of San Diego) provide ongoing reminders."
"Establish demonstration gardens around a typical home to show 'fire-safer' gardens, perhaps a garden at the local fire station or a Sunset 'idea home' that goes on tour periodically to demonstrate the latest designs and products."
"Suggest more information on how to combine defensible space with aesthetic appeal, annual calendar for maintenance, considerations for wildlife plantings, and more time for questions." Property manager.
"As a land conservancy, we've had illegal brush management clearing adjacent to our preserves; we need to work with insurance agents, developers and homeowners to address this problem." Biologist.
"Talk about how local communities and organized neighbors could organize to review their needs and take corrective actions to help the fire department prevent disasters." Real estate professional.
*Professional identity listed, if provided on feedback form.

2. Package the seminars and arrange for local organizations and companies to undertake marketing, registration, and logistics. To retain the valuable cross-training aspects of the seminars, it would be advisable for two or more professional organizations to cohost a seminar and market to their professional base. Examples include American Society of Landscape Architects and American Institute of Architects, or a real estate office and a nearby homeowner's association, or a fire marshal and local Fire-Safe council.
3. Package the seminars and market them to other regions of southern California. If this approach is taken, it would be advisable for the hosts to arrange a short review process involving local regulators and professionals and to arrange for a local industry panel.
4. Incorporate any related courses, targeted to the insurance and real estate industries, into the marketing efforts.

Conclusions and Recommendations

The businesses and individuals who advise and interact with homeowners are in a unique position to affect the physical properties of homes, communities, and landscapes. This project successfully developed and held seminars for business professionals to impart the fundamentals of mitigating for wildfire with minimal impact to the surrounding environment.

The wildfire knowledge base in southern California has been enhanced by engaging professionals in wildfire education efforts. If these efforts continue, property protection will likely increase and, potentially, losses from the next fire would decrease. Businesses and professionals gained greater understanding of fire-safe principles and codes, an understanding that will benefit their clientele (homeowners, property owners, and communities). By participating in this project, businesses and professionals gained information that can be applied as greater understanding of local codes, better business practices with respect to mitigation investments and maintenance, and perhaps greater accountability for wildfire risk reduction without constant compliance checks by fire marshals and other officials.

The development of this project revealed that engaging professionals in the development of seminars or similar programs may be just as valuable as getting students into the wildfire education seminars. Education in this instance is not a one-way street with information flowing from the fire knowledge base to professionals, but instead a two-way street of information to address complex wildfire issues. Application of this information can shift "best management practices" and reduce wildfire property losses through better design, construction, maintenance, and advice. As professionals are engaged, they add their own field expertise to the larger fire knowledge base, and develop new business practices and cooperative efforts that are economically viable and will increase investments in property-loss prevention. Such discussions also revealed the need for further adaptation of some practices, notably the use of targeted goat grazing, width of defensible space approved in new developments, irrigation demands in light of future water shortages, and investments in existing, nonconforming structures.

The collaboration that developed around this project is a priceless product of the wildfire education efforts. The development of the project both required and provided the ideal conditions for stakeholders of every bias and background to come together and bring their respective specialized knowledge to the table. In that respect many individuals and organizations played several roles throughout the project: providing written materials, developing the outlines and PowerPoint presentations, instructing class sessions, marketing the seminars through their business and professional contacts, and providing feedback and other valuable assistance. This project succeeded only with these invaluable investments from business and government partners.

By engaging business professionals, the fire agencies gain a larger "militia" in the effort to reach homeowners and help protect homes and communities in wildfire prone areas. When they understand the potential of improving their services to homeowners and the principles of wildfire-resilient homes in harmony with natural lands, business professionals can be a large, effective asset that complements the traditional fire prevention programs of fire and land management agencies.

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