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Wildfire in the Foothills: Youth Working with Communities to Adapt to Wildfire

**Heidi L. Ballard
Emily R. Evans**

Abstract

Around the world, youth are recognized as playing an important role in reducing the risk of disasters and promoting community resilience. Youth are participating in disaster education programs and carrying home what they learn; their families, in turn, are disseminating knowledge into the community. In addition to making a difference today, youth disaster education programs train the adults of tomorrow to be more prepared citizens. As social scientists and education researchers working in wildfire risk mitigation, we asked: how can wildfire education programs for youth help develop and support fire-adapted human communities? To begin to answer this question, we studied seven wildfire education programs for youth across the U.S. Programs were based in schools, public agencies, and nongovernmental organizations (NGOs). In a series of interviews, we sought information that would enable us to describe and analyze (1) the program's characteristics and the local resources to support it, (2) ways in which the program increased knowledge and awareness of wildfire, promoted more realistic risk perceptions, and improved wildfire preparedness for youth and their families, and (3) ways in which the program contributed to the local community becoming more adapted to fire. We found that the extent to which the programs were integrated into local wildfire planning and management efforts varied, as did their effectiveness in reaching community members and homeowners. In this report we present findings from one case study—the Wildfire in the Foothills program in Butte County, California.

HEIDI L. BALLARD is an associate professor and EMILY R. EVANS is a graduate student with the School of Education, University of California-Davis, Davis, CA.

WILDFIRE IN THE FOOTHILLS

Sixth grade students in the northeastern foothills of California are taking home more than the standard homework assignments. As part of the Wildfire in the Foothills program (WIF), these students take home information and discussion questions about defensible space, evacuation planning, and fire hazards around the home to involve their families in activities that will help them prepare for wildfire. Researchers conducting a national study of wildfire education programs for youth talked with individuals involved in this program, examined the curriculum materials, and observed the lessons in action. In this report, we share what we learned about the program itself; the impact of the program on youth, families, and communities; next steps and suggestions; and lessons learned that might be useful for other communities interested in establishing or modifying their wildland fire education opportunities for youth and families.



The premise behind Wildfire in the Foothills is that students will carry home what they learn in the classroom to increase their families' wildfire preparedness. Photo by Calli-Jane Burch, Butte County Fire Safe Council.

The residents of Paradise Ridge are no strangers to catastrophic wildfire. Paradise Ridge's fire-prone vegetation and challenging topography make fire preparedness essential to residents' ability to live with fire. For one retired kindergarten teacher living on Paradise Ridge, her call to action was the realization that children in her community could be



Paradise Ridge residents not only live in highly flammable vegetation, but their location on a ridge also presents challenges for wildfire response and evacuation. Photo by Calli-Jane Burch, Butte County Fire Safe Council.

left alone to make critical decisions and care for younger siblings if a wildland fire threatened their community. In collaboration with another educator, the Butte County Fire Safe Council (BCFSC), and multiple other community partners, she developed an education curriculum for sixth graders with lessons on what to do before, during, and after a wildland fire. This program, called Wildfire in the Foothills (WIF), is voluntarily implemented by local teachers through a series of classroom lessons and take-home assignments. Although the curriculum covers fire ecology, behavior, and management, its primary focus is on how and what young people can do to help their families prepare for fire events and stay safe when fire comes to town.

About Paradise Ridge

Paradise Ridge is located northeast of the city of Chico between 1,200 and 2,800 feet above the floor of the Central Valley of California. With Butte Creek on one side and the Feather River on the other, homes perched on the ridge enjoy magnificent vistas and a peaceful solitude not found in the more bustling communities in the valley below. However, life on the ridge does not come without challenges. In the last 10 years, Paradise Ridge has had six catastrophic wildfires. When a fire starts in the densely vegetated canyons below the ridge, it can move quickly upslope and into the communities. Residents trying to escape a wildfire are challenged by limited evacuation options. A local teacher and resident described the evacuation challenge:

“There is no way to get around the fact that we are on a ridge so if you get someone in a [small vehicle] that is trying to [evacuate] out one of those gravel roads then there is going to be a giant traffic jam.”

In 2008, residents were trapped on Paradise Ridge for hours after emergency managers were forced to close all three of the main evacuation routes.

The 2008 fires caused some residents to rethink their choice of a home community. One landowner whose home and property burned chose to rebuild her home on the hillside among the charred stumps, but admitted that it can be a depressing landscape and many of her neighbors chose to leave. According to a local CAL FIRE chief, the California state forestry agency, this residential turnover and the continual influx of new people into the areas makes it difficult to keep everyone educated about wildfires. As time passes, even long-term community members’ interest and energy may wane, and they devote less time to creating defensible space and preparing evacuation plans:



The road network along Paradise Ridge made evacuation hazardous during past wildfires. Photo by Calli-Jane Burch, Butte County Fire Safe Council.

“We had a horrible summer [with regards to wildfire]. Everyone was on pins and needles. Now we feel safe and people stop attending programs. Three years and they lose interest” (Local resident).

A CAL FIRE chief shared his concerns:

“We’ve talked about the dangers on the ridge here so much for so many years sometimes I wonder if it’s become a dull roar in the background. [Residents think] ‘Oh yeah here is this flyer that they send me about evacuation, I get that every year.’ ”

About Wildfire in the Foothills

The WIF program is one of the many efforts by the BCFSC to prepare county residents for a wildfire event. What makes the WIF program different from the others is the premise that 11- and 12-year-old children can impact their families' preparedness for wildfire. The curriculum was developed by a pair of educators working with the BCFSC. They involved community groups, agencies, organizations, and local businesses in researching, securing funding, implementing, and distributing the curriculum. The curriculum was pilot tested in 2004, and every year since its development, multiple teachers at several different schools have presented the curriculum in their classroom. In 2011, the curriculum was implemented in the sixth grade classrooms at Creekside, Pine Ridge, and Evergreen schools in Butte County. In neighboring Lassen County, the Fire Safe Council modified and adopted the curriculum for their area and implemented the curriculum in nine schools.

The curriculum is designed as five 1-hour lessons; however, some teachers have found there is so much material that they need to spread it out over a longer period. Concepts covered in these lessons include fire science and behavior (focusing on fire ecology and the fire triangle), mitigation (focusing on defensible space), and safety (focusing on evacuation). Each lesson includes a homework assignment or educational material to take home to parents. The lessons culminate in the preparation of a family disaster plan, with students talking with their families about steps they can take to reduce their wildfire risk, including clearing defensible space and developing an evacuation plan.

CONNECTING WILDFIRE IN THE FOOTHILLS TO FAMILIES AND THE COMMUNITY

One key attribute of this program is that it links a classroom-based program to parents through students. In nearly every lesson there are educational materials, such as pamphlets or handouts, that students take home to their parent(s). In one of the lessons students involve their parent(s) in completing a worksheet on which they record "watch-out" fire hazards they find around their home, thereby assessing their fire risk. After identifying the "watch-outs," students are asked to list and describe ways to remedy some of the problems they found. At the end of the week of lessons, students are asked to develop an evacuation plan with their families. All teachers we talked to required parents to sign a form that stated they had read through or worked on the evacuation plan with their child, and most also required a signature for the "watch-out" assignment. The BCFSC asks teachers to distribute parent and student surveys to assess the value and impact of the lessons on the students and their families. Several teachers require a parent signature on the worksheet in order for students to receive full credit on the assignment.

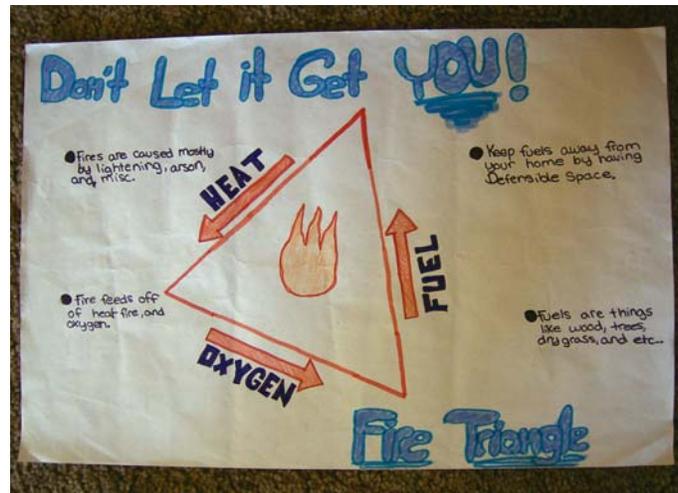
Other means of connecting the curriculum with communities and families include extension activities that give the community information and engage local media. For example, at the end of the unit, one teacher asked his students to design their own plan for creating defensible space; the plan was shared with classmates and brought home to their families. The teacher has plans for a poster contest to help educate the community. Another teacher contacted reporters, resulting in an article in the local newspaper and a feature on the evening newscast about the sixth graders' wildfire studies.

RELATED LOCAL WILDFIRE EDUCATION PROGRAMS

Although the WIF program is the only youth education program in the area that explicitly focuses on wildfire with outreach to and involvement by families and communities, it is embedded in an array of other environmental educational and youth development opportunities in Butte County that include some wildland fire content. Students that participate in the WIF program will likely participate in one or more of these other opportunities.

Trail Days

Trail Days is a program designed for fifth graders attending either of the two schools in the town of Magalia, located on the upper part of Paradise Ridge. Students learn about a variety of outdoor and environmental topics through in-class presentations and a day-long fieldtrip to a local park and nursery. Trail Days wildfire-related activities including donning a firefighter “Nomex” suit and listening to a local CAL FIRE captain talk about the fire triangle, ladder fuels, and the need for defensible space. Volunteers from the town of Magalia’s Beautification Committee partner with CAL FIRE and other organizations to help facilitate the event.



Displays of defensible space posters created by students in the Wildfire in the Foothills program help educate the local community. Photo by Calli-Jane Burch, Butte County Fire Safe Council.

FIRE Pals

This countywide program is sponsored by a variety of agencies involved in emergency management and public safety. Emergency professionals visit elementary schools throughout the county and present skits, songs, and games to engage students in learning about home safety, including fire. For example, one of the skits imitates the game show “Survivor” with two groups competing to put together a family disaster kit. In another skit, local CAL FIRE battalion chief and coordinator of the FAST camp program (below) plays a clown named EDITH (Exit Drills In The Home) who shares lessons about home evacuation.

Fire and Safety Training (FAST) Camp in Butte County

FAST is a week-long camp for teens ages 16-19, half of whom have been identified as having difficulties in school and at risk of not graduating high school. The camp gives students leadership, fire safety, rescue, law enforcement, and EMS skills, and information about different fire and safety career opportunities. The camp is staffed by volunteers from several agencies in the area including police, fire, paramedics, and rescue. Students receive college credit from Butte Community College and certification in CPR and Basic First Aid. Recently, FAST has developed a partnership with the BCFSC, and it is now officially incorporated under the umbrella of the BCFSC’s education programs.

COMMUNITY CONTRIBUTIONS TO THE PROGRAM

Community organizations, state agencies, private businesses, and local residents have contributed to WIF. The BCFSC director, board members, and volunteers helped secure the funding and helped develop the curriculum. Individuals from the BCFSC, University of California Cooperative Extension, CAL FIRE, and the Sierra Region of the California Fire Safe Council shared their technical expertise and provided and reviewed information in the curriculum. Materials such as maps and information pamphlets were donated by a variety of agencies and organizations such as the Paradise Chamber of Commerce, California State Automobile Association, the Forest Foundation, Natural Resources Conservation Service, Sierra Pacific Industries, California Department of Fire and Forestry/Butte County Fire, U.S. Forest Service, American Red Cross, and Fire Safe Councils of Butte County, El Dorado County, and Yankee Hill. The council director and curriculum coordinator (a council board member) provided teacher training and continues to distribute and support the implementation of the curriculum in sixth grade classrooms throughout the county and beyond. The curriculum was pilot tested in the Paradise Unified and Golden Feather Union Elementary School Districts.

“Just look at those kids in the Upper Ridge. They have all seen Fire Pals [elementary program]. Once they get to sixth grade most of them have been through [Wildfire in the Foothills] and they’ve all done Trail Days [fifth grade program]. So [these programs] all do interconnect.”
(local Cal FIRE chief)

IMPACTS OF WILDFIRE IN THE FOOTHILLS

Impacts on Youth Participants

- Opportunity to Address an Issue of Personal Relevance

According to their teachers, the curriculum engages students and provides them with an opportunity to explore a topic that has personal relevance—many of the students who participate in WIF have lived through a wildfire event and all have known someone who was directly impacted by fire. All the teachers we talked to said that this curriculum gave students an opportunity to share their own stories and ask questions about an issue that has directly affected them.

“Anytime you find something that [students] are kind of wanting to run with, you do [it]! And then we stop worrying about the testing and covering everything, and do something that is real.” (WIF teacher)

- Better Informed About Wildland Fire

Students who participated in the WIF program became more knowledgeable about wildland fire. The director of the BCFSC shared several examples of students demonstrating their new knowledge. She witnessed students demonstrating fluency with wildland fire-related terminology at a community event where she had set up a sand table used for Forest Service Fire Incident Training. The council director remembers watching two girls using the sand table and talking about how they could reduce the fire ladders, using a variety of terms correctly. These students, too, had just gone through the sixth grade curriculum.

When visiting a sixth grade classroom that had just completed the WIF curriculum, the director said that students were able to answer her questions about fire science, including sources of wildfire ignition. Also, when students were asked to describe different levels of wildfire risk represented in a series of photographs, she found that the seventh graders who had already been through the WIF program were able to identify and explain these differences more clearly than the sixth graders who had not yet participated in the program (even allowing for developmental differences between the two age groups). Students also demonstrated their new knowledge about wildfire preparedness on their homework risk reduction worksheets. Some of the preparedness actions students listed were:

“clearing the home ignition zone, trimming trees that create a ladder effect, make defensible space in your yard, reduce the density of fuel and ladder fuel, getting rid of spare leaves and pine needles, getting rid of brush, cutting down trees, move the wood laying up against the house, blow all around the house.”
(Taken from student worksheets)

Student participants also commented on their own learning in the student surveys distributed at the end of the WIF program. When students from two classes that had completed the program were asked if they felt that this program helped them learn important information about staying safe, 94 percent said “yes” and listed specific facts or actions they would take to reduce wildfire risk.

*“Let’s say that I hold a parent information night about wildfire. I probably wouldn’t get a huge turnout. But if I say okay kids here is your assignment all 90 of you need to go home and do this with your parents. Now we’ve got not all, but we’ve got 80 something families that have spent some time thinking about it. So it’s kind of like we are using the kids to educate the parents and I think that’s been very effective.”
(Teacher)*



Wildfire in the Foothills students used a Butte County Fire Safe Council sand box model at a community event to demonstrate the knowledge they had gained from the program. Photo by Calli-Jane Burch, Butte County Fire Safe Council.

Impacts on Parents and Families

- Increasing Discussion Within Families

Reviewing the materials brought home by their students prompted some parents to think about and discuss wildfire preparedness with their child and family. Students were required to have at least some kind of interaction with their parents in order to get full credit on their homework assignments. Some parents also wrote comments on the take-home worksheets showing they had spent at least some time considering the issues before sending the papers back to school with their child. During parent-teacher conferences, one teacher also asked parents about the WIF materials and the kinds of conversations they had with their child. This teacher said the feedback from parents was mixed with:

“about one-third [of the parents said that] they did not have that conversation at all, another third just looked [the homework assignment] over and signed it, and about one-third really sat down and made some kind of conscious maybe not even a plan maybe just went over their plan so their kids were involved.”

Parents also completed surveys distributed at the end of the curriculum unit, and many commented that they valued the conversations with their child about wildfire preparedness. One parent noted that learning about her student’s opinion about wildfire was the most valuable aspect of the program. Another parent said the best part of the program was starting a family conversation about wildfire and what the family could do to prepare.

- Increasing Awareness

In the parent surveys, some parents referred to the value of specific information or materials that came home with their children during the WIF program. Most valuable for some parents were information in the family disaster plans and the checklist cards of hazards around home. Other parents described learning about defensible space, removing branches hanging over roof tops, and raking leaves and brush at least 30 feet from the house as most valuable. One student described how the program encouraged action around her home:

“I also liked how when on the pamphlet they showed you what might be a fire hazard and so I took it home to my stepdad and he cleaned off everything around the house.”

Creating Fire-Adapted Communities

- Defensible Space

Several WIF program students helped clear defensible space around homes in their community. One teacher reported that some of his students made money raking pine

needles from neighborhood homes. Other WIF students were recruited by teachers to work as volunteers for the BCFSC's resource assistance program that helps elderly and disabled residents prepare for fire events.

- Planned Evacuation

Knowing where and how to evacuate during a wildfire is critical for all residents on Paradise Ridge. As a CAL FIRE chief noted, "It's difficult to assess whether a fire safety and prevention program 'worked' without hearing back from residents after a fire." He described a few anecdotal reports that indicate the evacuation planning exercise really might be having an impact. For example, the BCFSC director heard that after the Berry Creek Fire, former participants in the WIF program still had their evacuation plan and disaster information on their home refrigerator.



Students in the Wildfire in the Foothills program volunteered for the Butte County Fire Safe Council's resource assistance program, cleaning up around homes owned by elderly and disabled residents. Photo by Calli-Jane Burch, Butte County Fire Safe Council.

NEXT STEPS FOR WILDFIRE IN THE FOOTHILLS

The WIF program provides opportunities for formal and informal evaluation including a final survey for students, parents, and followup discussion with teachers and BCFSC staff. We combined these evaluations with our interviews to identify next steps for improving the effectiveness of the program:

- Add more visual and graphic materials. Students suggested ways to better engage next year's classes, including more videos and photos of wildfires and preparedness activities, and discussion of these visual aids. Teachers agreed that there is a need for more visual and graphic materials. One teacher proposed an activity that would have students map wildfire risk across the ridge. Teachers felt that using more digital media would make sharing with other teachers and organizations easier and would facilitate distribution of curriculum updates.
- Add more interactive learning. Students preferred games that facilitated learning rather than lectures or worksheets. One student suggested developing a board game called "Evacuate" that would reinforce WIF messages about safe evacuation.
- Provide activities in which students conduct outreach to the broader community. One teacher suggested a poster campaign as a means for students to reach beyond their families to the broader community. The WIF co-creator, who still coordinates the program, suggested a calendar contest with students' drawings depicting wildfire preparedness and safety. These calendars could then be displayed in homes, at local area businesses, and other community locations.
- Provide a variety of assessment and accountability tools. One teacher suggested that a daily writing-focused assessment could help prepare students for

conversations with their families, hold students more accountable for their learning, and provide additional student assessment. She also suggested providing more questionnaires for students and parents to ensure family participation.

- Offer events for families that complement WIF classroom activities. Several parents suggested extension activities such as a fire safety class that parents could attend with their students, and facilitating mock evacuations or a series of evacuation drills for families.
- Align the curriculum more closely with the overall goals of the BCFSC. The curriculum could provide more information on BCFSC programs that parents can take advantage of to reduce wildfire hazards around the home. One BCFSC program that could be highlighted is the chipper program that provides the services of a wood chipper to property owners to turn cleared ladder fuels into wood chips for mulch. In addition, BCFSC staff suggested replacing a current curriculum DVD developed in another California county with one produced by the BCFSC.
- Seek and obtain funding for educational programs that link classrooms and community wildfire preparedness. The BCFSC director intends to secure funding to continue to nurture and expand relationships with the teachers. She felt that youth education programs have not been favorably received by various grant programs including those funded by the federal National Fire Plan, and would like to see them expanded.
- Engage youth more directly in community service and volunteer activities that extend the impacts of the WIF program. The BCFSC director suggested that although making home evacuation plans is very important, "... helping students see that they can do community service and volunteer is the next step...like a mentoring program (in which youth) meet at school...and bring in resource professionals, and then pick a project for students to do."

LESSONS FOR OTHER WILDFIRE EDUCATION PROGRAMS FOR YOUTH

From the information we learned through assessing the WIF program, we offer the following suggestions for educational organizations and fire management agencies interested in youth wildfire education.

Integration and Collaboration

The nature of the Paradise Ridge ecological and social landscapes necessitates the development and use of partnerships to address wildland fire issues. The integration of the classroom-based curriculum into the suite of education outreach activities in the community proved a successful means to leverage resources toward an overall goal of community awareness and preparedness. For example, students from the WIF program were recruited for the BCFSC residence assistance program not to have them "working to work" but rather working as a way to apply their learning. This partnership between the

two programs allows students to apply their new knowledge to improving Paradise Ridge's fire preparedness.

The integration of programs also helped increase the visibility of both and helped generate funding for WIF and other programs. For example, all landowners who request the services of the resource assistance program are given a packet of wildfire information that includes a card that when used at any of the participating local stores generates a small amount for the BCFSC to support their activities, including the WIF program. This connection helps integrate the business community into the council's activities and establish a social norm for wildfire awareness and risk reduction.

Personal and Community Relevance

Recent wildfires provided a window of opportunity to promote the WIF program and engage students in an area of study that has relevance for them and their families. Community relevance was identified as one of the greatest contributing factors to sustaining the program. One of the teachers discussed how he was strongly encouraged by the principal of his school to implement the WIF program despite the program's relatively weak links to state science standards. This encouragement was a surprise to the teacher considering the school's "Program Improvement" status under the No Child Left Behind Act. The relevance of the curriculum to students, teachers, and communities embedded in an extremely fire-prone area superseded the need to teach only lessons specifically outlined in the state content standards.

The local relevance of wildfire to everyone living on Paradise Ridge made it easier for teachers to engage their students in the WIF program. One teacher who has been a firefighter for 20 years shared his experiences as a local resident and firefighter. This type of personal sharing engaged his students and encouraged them to share their own stories. In another class, one of the students wrote how their teacher's personal stories were the most interesting part of the curriculum.

Accountability and Evaluation

Interactions between parents and students were encouraged by requiring parents to sign homework exercises and by letting parents know they would be asked to evaluate the program. All teachers agreed that suggesting that students talk with their parents about wildfire would get little response, so requiring parent acknowledgment of take-home assignments was critical. One teacher who discussed the program with parents at their parent-teacher conference reported that these conversations helped him better understand the interest and extent of participation by students and parents. He had told students that he would be talking to their parents about WIF at the conferences and felt that this was an additional motivation for students to talk with their families. Having multiple checks on accountability was cited as crucial to promoting interaction between students and their family.

PROGRAM INFORMATION AND CONTACTS

- Anna Stephens, Education Committee, Butte County Fire Safe Council, amstephens59@sbcglobal.net
- Mary Cottrell, WIF Curriculum Co-author, cottrell@mynvw.com
- Callie-Jane Burch, Executive Director, Butte County Fire Safe Council, buttefirecouncil@yahoo.com, www.thenet411.net
- Butte County Fire Safe Council Web site, <http://www.thenet411.net/index.php/programs/6th-grade-education>

WILDFIRE EDUCATION PROGRAMS FOR YOUTH RESEARCH PROJECT TEAM:

Dr. Pamela Jakes (retired)
U.S. Forest Service
pjakesfs@gmail.com

Dr. Heidi Ballard and Ms. Emily Evans
University of California-Davis
hballard@ucdavis.edu
erevans@ucdavis.edu

Dr. Martha Monroe and Ms. Annie Oxarart
University of Florida
mcmonroe@ufl.edu
oxarart@ufl.edu

Dr. Victoria Sturtevant
Southern Oregon University
sturtevant@sou.edu

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ABOUT THIS SERIES

This is one in a series of Forest Service publications presenting descriptions of individual case studies included in the National Fire Plan study “Promoting fire adapted human communities through youth wildfire education programs.” Other research notes in the series can be found by searching the title “Youth Working with Communities” at Treesearch, <http://treesearch.fs.fed.us>, or by contacting a member of the research team.

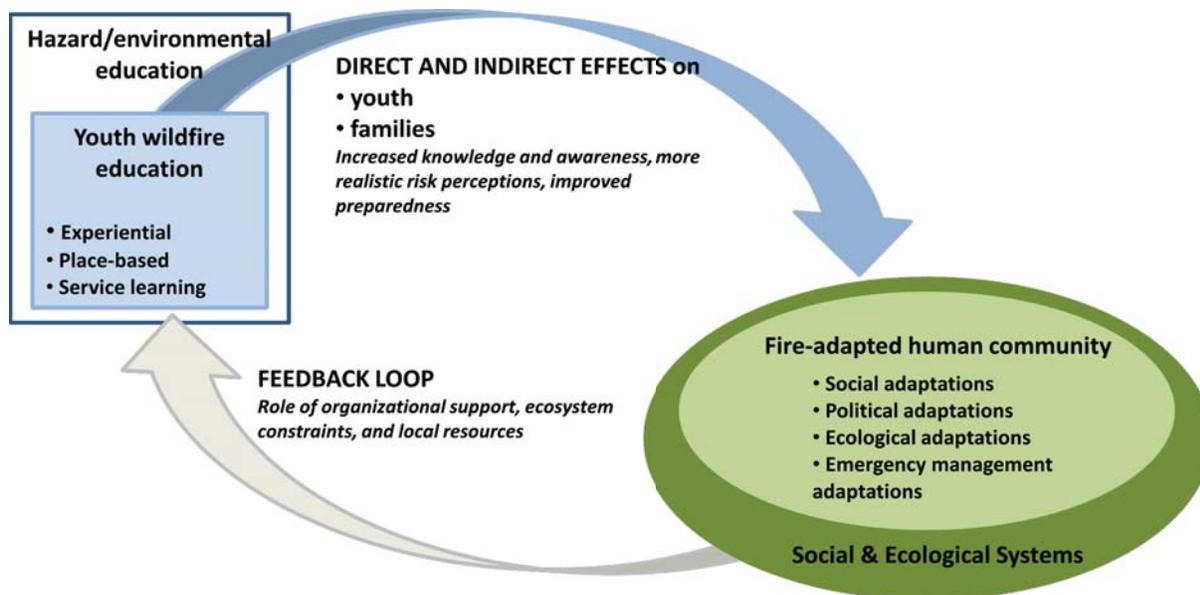


Figure 1.—Research framework for understanding the link between wildfire education programs for youth and fire-adapted human communities, where youth wildfire education programs, using environmental education methods, influence students and families and contribute to communities becoming adapted to fire, with local community resources supporting the wildfire education program.

METHODS

This report is part of a larger investigation of how youth wildfire education programs contribute to the development of fire-adapted human communities. The National Cohesive Wildland Fire Management Strategy defines a fire-adapted community as consisting of “informed and prepared citizens collaboratively planning and taking action to safely co-exist with wildland fire” (Wildland Fire Leadership Council 2011, p. 33). A working group of the Wildland Urban Interface (WUI) Mitigation Committee of the National Wildfire Coordinating Group¹ has identified four types of adaptations a community must make to become adapted to fire: (1) social adaptations, (2) political adaptations, (3) ecological adaptations, and (4) emergency management adaptations. In studying wildfire education programs for youth, we looked for ways in which the program contributed to adaptations in these four areas.

We explored the environmental education and community wildfire management literature and developed a model to explain how education programs and fire-adapted human communities interact (Fig. 1). The case study reported here is helping us further define and characterize the model. Our first step was to describe the program, focusing on program content and the extent to which the program employed experiential, place-based, and service learning activities (blue box in Fig. 1). Next, we collected data on whether and how the program increased knowledge and awareness of the physical, ecological, and

¹ The WUI Mitigation Committee provides coordinated leadership, input, and recommendations to public wildfire management agencies for the achievement of fire-adapted communities in the wildland urban interface. <http://www.nwccg.gov/branches/ppm/wuimc/index.htm>

social aspects of wildfire, promoted more realistic risk perceptions, and improved wildfire preparedness for youth and their families (down arrow in Fig. 1). We then looked for ways the program may be contributing to the local community being more adapted to fire (green oval in Fig. 1). Finally, we identified community resources that supported the program (up arrow in Fig 1).

The case study approach is a common research method applied when scientists want to study “who, what, how, and why” for a contemporary event within a real-life context (Yin 2003). We selected programs for case studies that would represent (1) programs that are contributing (even in a small way) to the development of a fire-adapted human community or have the potential to do so in the near future, (2) a range of program types (based in schools, clubs or organizations, and NGOs), and (3) different regions of the country. We used purposive sampling to select interviewees (Lindlof and Taylor 2002). This selection process is appropriate when scientists need to identify people who have specialized knowledge about the program being studied. Data were gathered using semi-structured, face-to-face interviews following an analytic induction approach (Glaser and Strauss 1999). Analytic induction is ideally suited for this study because it allows us to identify patterns and themes surrounding concepts that have received little empirical study. For the Wildfire in the Foothills case, we interviewed 12 individuals, including teachers, staff and volunteers of the Butte County Fire Safe Council, CAL FIRE (State forestry agency for California) staff, and local residents. We also observed classroom activities. We analyzed previously collected attitude surveys from teachers, students, and parents participating in the 2010 WIF program, as well as previously collected student work. Additional data were collected from secondary sources such as the WIF curriculum, Butte County Fire Safe Council outreach materials, and presentations or handouts on the WIF program, and newsletter and newspaper articles.

LITERATURE CITED

- Glaser, B.G.; Strauss, A.L. 1999. **The discovery of grounded theory: strategies for qualitative research**. New York: Aldine de Gruyter. 271 p.
- Lindlof, T.R.; Taylor, B.C. 2002. **Qualitative communication research methods**. 2nd ed. Thousand Oaks, CA: Sage Publications. 357 p.
- Wildland Fire Leadership Council. 2011. **A national cohesive wildland fire management strategy**. <http://www.forestsandrangelands.gov/strategy/national.shtml>. (Accessed August 12, 2011).
- Yin, R. 2003. **Case study research: design and methods**. Thousand Oaks, CA: Sage Publications. 181 p.

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