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Containing Wildfires and Preserving Homes

Rugged handhelds help firefighters stay safe and battle blazes effectively.

by Jim Moore

Plenty of people chasing the American Dream have looked for it at the edge of civilization. Building a home with a backyard where the deer and the antelope play has its advantages. But over time, what firefighters call "the interface" keeps moving—that place where human development ends and Mother Nature takes over. The interface is where the balance of man versus fire becomes a very tricky proposition indeed.

It used to be that containing and controlling a wildland blaze was the firefighters' sole focus—because if it started in the wildland, it usually stayed there. But as our dwellings move further into the wild, fighting fires has become a delicate balancing act between fire containment and structural preservation. And with the added variable of structural preservation, perhaps the most valuable tool a firefighter can have is information.

A prime location—for people and fires

Sisters, Oregon is a prime example of the interface. This idyllic town, a gateway to the high-desert vacation mecca of Central Oregon, is surrounded by ponderosa pine forest, sparkling rivers, and craggy mountains. The town is named for the Three Sisters, a trio of Cascade Range peaks that loom over the area. Once a sleepy ranching town, it has become a combination of a tourist oasis and a "lifestyle destination." The main street, with its Western facades, attracts people passing through. But with plenty of available land, clean mountain air, and 300-plus days of annual sunshine, Sisters also draws people looking for a great place to live. Today there are about 4,000 residences sprinkled across a 200 square-mile area surrounding the town.

Unfortunately, wildland fires are a too-frequent hazard where the houses meet the forest. In 2006, a fire covering 9,500 acres threatened Sisters and outlying areas. A convoy of firefighting teams converged on the area to help out.

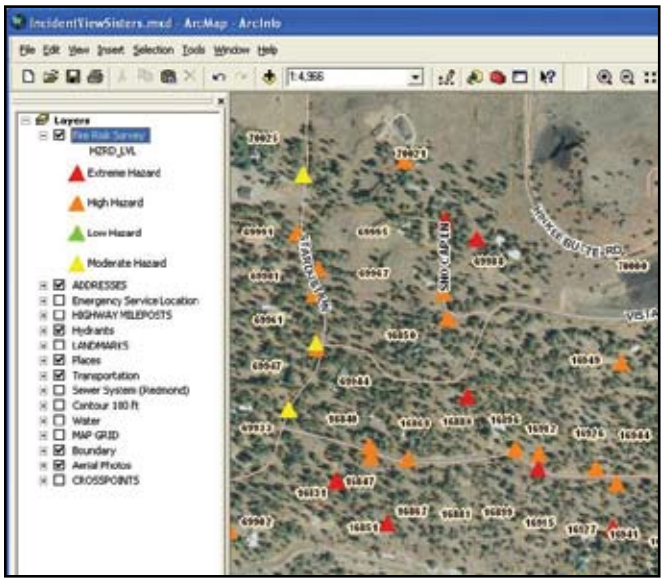
"We had hundreds of fire trucks fighting the wildland portions of the fire, and 60 trucks just dealing with structures," recounts Sisters-Camp Sherman Fire District (SCSFD) Chief Taylor Robertson. "And we were behind the curve on getting good information to those trucks dealing with areas near housing. I was trying to get copies of maps to the managers of the fire teams; I ended up spending way too much time on the computer and not enough out working."

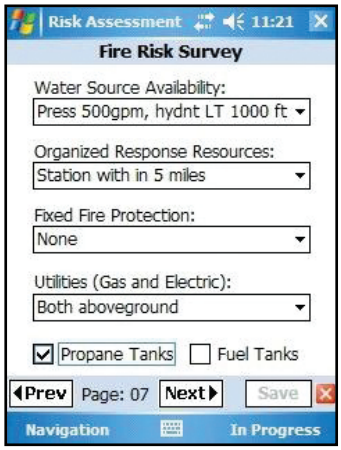
Better information for better decisions

As Robertson well knows, having information on the property where you're working is crucial to a firefighter. If you're considering how to protect a dwelling, you also want to know whether it's a good enough bet to devote effort to it. How is the driveway access? Is the roof made of non-combustible material, or fire-fueling shakes? Where is the nearest water source?

In other words, "Is this one we want to defend, or do we move on to one where we'll have a better chance?" he says.

After the fire was finally controlled and extinguished, Robertson took stock of the situation, knowing it would come up again eventually. He decided that the way to handle such a situation was to have the information compiled ahead of time, and able to be easily accessed and distributed when needed. What he was really looking for was a data interface for the wildland interface. But how do you do that?





The customized software program (right) asks assessors to evaluate a series of pertinent categories, featuring fill-in and drop-down answer formats. When all fields have been completed, the home is assigned a score and relative hazard level. Once multiple homes in an area have been assessed, firefighters can use a map that shows roads with home locations, addresses, and hazard levels on one screen (above). Selecting an individual address calls up details for that property.

"I felt we could gather and manage all the necessary information with a good database and hardware that would allow us to identify position and enter data on the same unit," Robertson says.

Rugged hardware and customized software

After some searching, he found a combination that worked for his needs. For the hardware, he chose the Trimble Recon rugged hand-

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held computer. The Recon is a compact Windows Mobile touch screen device designed for outdoor workers, built to withstand the most challenging of environments.

The software was a custom configuration, written specifically for the fire department by Alsea Geospatial Inc. (AGI). AGI specializes in programming, geographic information systems (GIS) customization, and Web mapping services.

Once the necessary resources were chosen, the task was to create a simple but powerful program to gather information that could be used effectively later. Robertson and his crew identified three main areas of information they wanted to gather for any given property:

• A rating of the property, on a scale from most defensible to least defensible

• An assessment of each property's compliance with defensible space legal requirements

• What they termed "critical info": the nearest water source, such as a hydrant or stream, escape and evacuation routes, safety zones, landing zones for helicopters, bridge load limits, etc.

One of the challenges for AGI was combining elements of Oregon Senate Bill 360 (the Oregon Forestland-Urban Interface Fire Protection Act of 1997), National Fire Protection Association 1144 (Standard for Reducing Structure Ignition Hazards from Wildland Fire), and a State Fire Marshal hazard-assessment form to create one comprehensive-but-simple survey format.

"It was a pilot test program for AGI," explains SCSFD Training Chief Ryan Karjala. "They had never combined these elements into a software program before, so they built this program just for us."

Gathering the data, effectively and easily

Here's how the finished system works. The assessor arrives at a property and turns on the Recon handheld. In the few seconds it takes the program to load, the assessor performs a quick visual scan of the property. Then, using a stylus and a series of screens on the Recon's touch screen, the assessor answers a laundry list of questions.

To begin the survey, the assessor enters his or her ID and the property's physical address. The Recon's GPS capability automatically provides location coordinates and elevation.

"There's even a way to factor in long driveways," says Karjala. "You can take a reading at the end of the driveway and another at the actual property location, and the program extrapolates from there."

After completing the items on each page, the assessor touches a "Next" button on the screen and goes step-by-step through the entire survey, entering information on all the critical-info items described above. Then the program assigns each property a score and hazard level. In addition, there's a comments section where the assessor can enter information a firefighter might want to know in a danger situation—a large dog, an elderly or handicapped resident, an exposed propane tank—that would affect strategy.

At the end of the day, the assessor returns to the fire station and downloads data directly from the Recon to a laptop. That data is backed up immediately on a thumb drive as well as onto the department's server. Then the Recon's memory is cleared and it's ready to go out the next day for more.

The system's usability and simplicity were tested right away—and proved up to the task. The fire department hired a couple high school students to perform assessments over their summer break. After some brief training, the students were able to eventually perform 100 to 200 property assessments a day, and a process that was projected to take nearly the entire summer was finished in six weeks.

"What I like about this program is that it's simple and uses layman's terms—you don't have to be a firefighter to go out and answer these questions, but those answers can provide critical information to a firefighter later," says Karjala.

Prepared for the future

One of the ways the SCSFD uses the information they've gathered is to work with homeowners to decrease firefighting risks.

"It's an educational tool for us," says Robertson. "For homes where we identify defensibility issues, we explain the potential problems to the homeowners and discuss possible ways to correct them."

And those homeowners would be well-advised to follow the advice, because their home's future could conceivably be determined by its relative level of defensibility.

"In a worst-case scenario—a significant fire and a rural property that's overgrown—yes, there's a line to draw on protecting a property," says Robertson. "The information is there to aid firefighter safety first and foremost. And part of that safety is the decision: Do we save a home, and how do we save it?"

The true measure of success for this project will be accessing and using the information to make decisions during an actual wildland fire. As Robertson reminds us, this is one of those cases where planning for a disaster can make a huge impact on mitigating the event if it happens.

"If we have a fire—God forbid—this year like we did in 2006 that threatens our community, I'll be able to generate all that critical information quickly and copy it," he says. "And it'll all be based on the data we gathered this summer. For those firefighters who are protecting our structures, most of whom have come from somewhere else, I can hand them a package and say, 'Here's maps, access, everything—the information you need to make good choices and keep yourself safe.' And being able to use that information to make good choices is infinitely better than taking chances and just hoping you're doing the right thing."

For a homeowner on "the interface," the new system's ability to connect professional firefighters to the helpful information they need could make the difference between losing a house and effectively protecting one. And if you think about it, there's even some technological poetry in the situation: It's about using one kind of interface to help another. ■