

A Bolder Boulder

County Races Ahead with Wildfire Mitigation

“The truism is that wherever you have wildlands... you will have wildland fire.”

— Stephen J. Pyne, *World Fire*

THE HISTORY OF THE BOULDER VALLEY in Colorado is in many ways the history of the American West.

For hundreds of years, the land of the Boulder Valley was used by American Indians to hunt and plant, and the area was a winter home for the Southern Arapahoe. Tribes of Comanche, Ute and Cheyenne also frequented the valley.

When the gold rush came to what is now Boulder County in 1858 and the first permanent, non-native settlement was established, it heralded a fundamental shift in the use of the land. Three years later, the Arapahoe and Cheyenne tribes relinquished their land rights and settlement of the region intensified.

By the time Boulder City was incorporated in 1871, the town was already taking shape, and soon the University of Colorado would open and the railroad would arrive. Subsequent years would bring still greater change, as infrastructure expanded to accommodate the influx of new residents and tourism became an increasingly important part of the local economy.

Census figures help tell the story of the city's growth: In 1920, there were 11,006 residents, in 1940 there were 12,958, and by 1950 there were 20,000. As new industries emerged and housing opportunities expanded, the population grew to 72,000 people in 1972. Today, there are more than 96,000 Boulder residents, with an additional 25,000 students at the University of Colorado. Overall, more than 291,000 people live in Boulder County.

But even in the midst of this dramatic change, townspeople showed a determination to preserve the environment around them. According to the city's official Web site, “Even before the turn of the century, it was clear to early Boulder residents that the

mountain backdrop was a special place, and the city began to acquire Mountain Parks property[.]”

That commitment remains a hallmark of Boulder's development, demonstrated more recently by the purchase of thousands of acres of open space and the adoption of a comprehensive growth management plan. In all, the city owns 60,000 acres of undeveloped land, which is larger than Mesa Verde National Park in southwestern Colorado. Boulder County has another 70,000 acres that it has preserved as open space.

Yet by retaining so much of the natural environment, residents of the Boulder Valley have created a challenge for themselves: How can they continue to live safely within the beauty of rustic settings while addressing the wildfire threat that is such an enduring part of nature?

‘Rural renaissance’

Stephen J. Pyne is a professor at Arizona State University and a leading expert on fire and its role in shaping global landscapes. In his 1995 book *World Fire*, he addressed the wildfire risks associated with what he called the new “rural renaissance”—the shifting of populations from urban to rural lands:

From the perspective of fire protection the intermix environment is often the worst of all worlds.... There is little zoning for fire control. There are few building codes to reduce hazards such as wooden roofs. There is scant pressure to reduce wildland fuels around dwellings. Open spaces that serve as buffer zones shrink as houses and woodlands expand.... Narrow roads to sheltered homesites, rustic wooden houses with shake-shingle roofs, lush vegetation dripping over walls and roofs, distances from prying officials and taxes—all this is why the exurban communities were created. To render them fireproof is to recreate the environments from which the residents fled in the first place.

“...the wood shingle industry sued the city of Boulder and sued me personally for defamation of the industry because I said that ‘wood burns.’”

— Larry Donner

In the years since that was written, destructive wildfires have reinforced the point and highlighted the challenges with alarming regularity. More than 7 million acres and 71,000 fires burned in the United States in 2002, affecting homes and communities to an unprecedented degree.

But during this same period something else has also been happening — legions of creative, dedicated people from all walks of life have joined forces and are working to lessen wildfire risks in communities located within the wildland/urban interface.

As Pyne wrote in his 2001 book *Fire: A Brief History*: “Technical solutions are possible, and widely known. Eliminate wood-shingle roofs. Clear vegetation from around structures. Design roads for easy entry and exit.... Create, in brief, a suitable system of building codes and fire practices to keep the landscape from erupting into deadly flame. The problem, however, is not one of technology or knowledge — the means to cure the disease are at hand — but of values.”

And perhaps nowhere has that been more clearly demonstrated than in the Boulder Valley, where technical know-how and shared purpose are coming together in an effort to

create an environment in which people and fire can more peacefully coexist.

Window of opportunity

Fittingly, the impetus for change in the Boulder area was fire. In Boulder County, the Left Hand Fire in 1988, the Black Tiger Fire in 1989 and the Old Stage Road Fire in 1990 together claimed dozens of homes and thousands of acres.

At around the same time, firestorms were striking other populated regions in the West, particularly in California, where the Oakland Hills erupted in flames in 1991 and stretches of Malibu, Altadena and Laguna Beach burned in 1993.

This spate of fires heightened public awareness and opened a window of opportunity for the Boulder fire community. In the years since, remarkable progress has been achieved, underlined by a multi-jurisdictional approach that emphasizes coordination, education and partnership.

As important as what was done, though, is how it was done. Behind each accomplishment is a story in which people have worked together — often in the face of opposition and sometimes with little initial hope of success — to take a positive step toward improving fire management in the wildland/urban interface.

During the 1990s, the Boulder area saw three initiatives with far-reaching effects come to pass:

- ✓ a campaign to phase out wood roof coverings in the city;
- ✓ a push to design a new subdivision with wildfire safety at the forefront; and
- ✓ a plan to identify and mitigate fire risks in the county.

A detailed look at each of these efforts shows how people throughout Boulder are making a difference.

Full court press

When Boulder Fire Chief Larry Donner first proposed in 1993 that the

The Black Tiger Fire,
1989



city's building code be amended to prohibit wood roof coverings—including shakes and shingles—he knew it would be a long, difficult process.

The local building and planning board, which is responsible for enforcing the code, would have to sign off on the proposed ordinance. The elected city council would have to approve it. Arguments from the wood roofing industry would have to be anticipated and addressed. And perhaps most importantly, residents would have to be persuaded that the change was a necessary and prudent step.

One thing happened, however, that Donner didn't anticipate—he was sued.

"Shortly after the city council passed the ordinance, the wood shingle industry sued the City of Boulder and sued me personally," he recalled. "They sued me for defamation of the industry because I said that 'wood burns.'"

But as the trial would ultimately demonstrate, the Boulder Fire Department had done its homework before proposing the ordinance.

The process actually began a couple of years earlier, when in the course of updating the city's codes the department tried to locate a wood shingle on the market that maintained its flame-resistance rating after actual weather testing. At the time, the department couldn't find any shingles that passed the Uniform Building Code (UBC) weather tests and qualified for re-certification beyond the initial three-year period.

"So we made the decision to ban wood shingles entirely—treated or untreated," Donner said. Even though parts of Boulder are not immediately adjacent to the wildland/urban interface, it was also decided that the roof ordinance should apply citywide.

"Western Boulder is next to some wildlands," Donner said. "We have prevailing westerly winds, so any fires that would start to our west would quickly be blowing toward the city given our normal weather patterns. We knew that if we had significant spotting and started some roofs on fire that we were at high risk for urban conflagration

just due to the high numbers of wood shingles we had."

Donner and his colleagues brought the proposal to the building and planning department, which reacted favorably, and together they took the next steps. According to Boulder Deputy Fire Chief Steve Stolz, who was head of the department's division of prevention in 1993, "We started our planning by looking at what we would put out in front of the community, our rationale for the change. We also knew the wood roof industry would not go quietly and let us do this."

At the many community forums, administrative hearings and council sessions that followed, the fire department made its case, and there was surprisingly little reaction from residents. While a handful of community members voiced some opposition, most showed little interest, even though the initial proposal would have required that all homes in the city change to non-wood roofing within 10 years.

"The public was generally very good," Donner said. "If you have a meeting and explain the problem, the public will understand. Even though we hadn't had any catastrophic fires, most people here were familiar with the problem."

As expected, though, the wood shake and shingle industry did take notice, and representatives soon arrived in Boulder. While Boulder was the first community in Colorado to pursue a ban on wood roof coverings, it was not the first jurisdiction in the country to do so. In fact, Los Angeles was going through a similar process at about the same time. Donner thinks he knows why Boulder drew so much attention.

"Other communities have banned untreated wood shingles, but what alarmed the wood shingle industry is that we went after the treated shingles as well," he said. "They didn't want us to take any action because they thought other communities might copy us."

The proposed ordinance was eventually approved by the city council, with one key modification. Rather than a 10-year phase in, the council elected to provide a 20-year window



Boulder Fire Chief Larry Donner



The Dakota Ridge subdivision

during which existing wood roof coverings could be replaced. The ordinance also prohibited wood roof coverings on new homes and mandated replacement of wood roof coverings when repairs exceeded 50 percent of the roof total.

“We intentionally took the strategy of phasing it out because we didn’t want to take people who were established in the community and cost them money unnecessarily,” Donner said. “I think that was key in selling the code provisions to the city council. We know that roofs wear out. It took the community a while to build itself into the situation, so we can take a little time to build ourselves out of the situation.”

After the ordinance passed, a lawsuit was filed in federal court by a group representing wood shake and shingle roofing interests. In a December 1994 ruling, while agreeing with the wood roofing industry that the Boulder ordinance was too vague because it did not define wood, the judge said that the city had in fact acted on a rational basis.

The judge also dismissed Donner — who had been on the witness stand for six hours during the trial — as an individual defendant in the lawsuit. Soon after the court’s decision, the ordinance was rewritten to define wood and it went into effect in 1995. While Boulder lost the battle it won the war, and for Donner the fight was worth it.

“We’re now seven years into it and we’ve had a turnover of approximately 30 to 40 percent of the roofs in Boulder,” he said. “It helps

reduce our concern for urban conflagration. We still have an interface problem, but at least it won’t be compounded by acres of wood shingles downwind from the interface.”

Deputy Chief Stolz drew a number of lessons from the experience. “The process can be painful at times. It requires research and analysis. The building officials are a critical component, and it takes lots of cooperation with them. The timing has to be right. In any jurisdiction, there are windows of opportunity. You have to be patient and persistent. Education is a huge component. You need the support of the community and the political establishment.”

And if all that doesn’t work? “Take another run at it,” he said.

The high road

On the north side of Boulder, the Dakota Ridge subdivision sits nestled against grasslands and rolling foothills, on the edge of a greenbelt that encircles the city.

The first phase of construction began in November 2000 and features design principles of “new urbanism,” which promotes interaction among residents by combining homes with places for people to work and socialize. Eventually, Dakota Ridge will contain 400-plus residential units, including single-family homes, town-houses and condominiums. It will also have commercial and civic sites, and a park.

At first glance, the Dakota Ridge subdivision looks like any other. New houses sit on gently winding streets and young trees line the sidewalks, against a backdrop of open skies. Nearby, construction workers continue adding to the development.

But in fact, a road that runs around the exterior of the development makes this subdivision quite different.

From a firefighting perspective, many subdivisions near wildlands share similar drawbacks in their design that make the job of protecting the homes from wildfire difficult. Marc Mullenix, the wildland fire

division chief for the city of Boulder, has seen the problem in subdivisions throughout the United States, particularly in the West.

“What typically happens in the interface is that you end up with homes directly up against the open space,” he explained. “The difficulty is that the water is on the inside where the road is and the homes are on the outside. So to protect these homes you have to park an engine in the subdivision, hook up to the hydrant and wrap the hoses around the outside of the houses.

“Then you have to go and put firefighters in harm’s way.”

The process that led to the construction of Dakota Ridge actually began in the early 1990s, when local developer Rich McCabe moved to build on the 57-acre site, which at

the time was one of the last major pieces of undeveloped land in the city. From the beginning, the project received significant attention.

“It is a unique subdivision,” said Brent Bean, a senior planner with the Boulder Planning Department. “It is on the fringe of the city and it is right at the step of the foothills in open space areas.”

Bean, whose father was the first planning director for Boulder, said that once the project was introduced the city’s planning and fire departments worked closely with McCabe and his team. As it turned out, there was common ground that served the interests of everyone, and it involved a bold proposal — place a road around the exterior of the subdivision, with hydrants, to act as a buffer between the housing and the open space.

This view of construction at the Dakota Ridge subdivision clearly shows the road that forms a fire barrier from the wildland



“To talk about hazards to homeowners, we realized that we needed to have a better understanding of them ourselves.”

— Nan Johnson

As the process moved forward over an eight-year period, there were numerous meetings among the various parties involved — including, at times, the developer, the builder, the design consultant, city planners and firefighters, and local residents. When a plan for the new community finally came together, the exterior road was a prominent feature of the design.

For firefighters like Mullenix, the benefits were clear. “The road on the outside up against the open space acts as a fuel modification, and then we have the water out there also,” he said. “That gives firefighters a place where they can work efficiently and safely.”

Justin Dombrowski, the wildland fire management officer for the city of Boulder, explained why the direct access offered by an exterior road is so important, especially in a large fire where resources are limited.

“To protect a typical subdivision, we’d have to put one engine at every single house, plus extra mobile engines,” he said. “We staff eight engines, and that’s for an entire city of 100,000 people. Even working with our volunteer fire departments, we don’t have enough resources to do that. With a design like this, we can have a couple engines float around the outside and protect the entire subdivision.”

From McCabe’s perspective it was a win-win, even though it meant increased development costs. “The perimeter road works with the principles and goals of new urbanism,” he said. “Having the street on the perimeter next to the prairie lands allows the public to enjoy it, walking or driving down the street. They have a clear view of all that wonderful open space. And it turns out the wildfire element fits quite well with that design concept.”

According to Nan Johnson, who at the time was with the Boulder County Land Use Department and later moved on to a similar position with the city of Boulder, the outcome demonstrates not only the importance of private-public partnerships, but partnerships within government.

“If the fire department hadn’t said anything about it, the planning department probably wouldn’t have picked up on it,” she said. “Wildfire design is just not something that planners have a background in. It was a unique thing and it was a good collaboration.”

In addition to the exterior road, the subdivision will include other fire-safe elements. For example, a manicured, three-acre park will be strategically located, and the landscaping will avoid flammable and combustible vegetation like pine trees.

McCabe, who moved to Boulder in 1961 and has worked as a developer there since 1965, said he has heard “nothing but good things” about the subdivision’s design. McCabe also noted that approximately 10 acres on the original site were given to the city to be preserved as open space.

When the exterior road was first proposed, the 1990 Old Stage Road Fire was fresh in everyone’s mind. That fire, which destroyed 10 homes and covered 2200 acres, burned land that would one day be home to Dakota Ridge. More than 10 years later, in July 2002, the Wonderland Lake Fire struck near the same area — and a wide trail designed for fire trucks to drive on behind the subdivision was widely credited with aiding firefighters’ response.

The road that circles Dakota Ridge has had at least one other important benefit. According to McCabe, it works as an effective buffer against encroaching prairie dogs.

AWHIMSical idea

The Black Tiger Fire began in the Rocky Mountains near Boulder in July 1989 and quickly swept through nearby residential areas. After a four-day rampage, the blaze had claimed 44 homes and structures and burned more than 2,000 acres. At the time, it was the worst fire loss in Colorado history.

In the months after the fire, the Boulder Board of County Commissioners began to look for ways to help minimize the loss of life and property from future wildfires. Out

of this effort, the Boulder County Wildfire Mitigation Group was born.

As the group met, it became apparent that helping responders pre-plan and educating the public about risks would be top priorities. But according to Nan Johnson — who joined the county planning staff in 1991 and started attending sessions of the wildfire mitigation group soon thereafter — something else grew equally apparent.

“To talk about hazards to homeowners, we realized that we needed to have a better understanding of them ourselves,” she said. “We needed to know what the hazards were, where they were and what it would take to mitigate them.”

Johnson came to the group with a background in Geographic Information Systems (GIS), and she and others thought that the county’s already-existing GIS system could be an effective way to pull all the pieces together and show fire protection issues in a dynamic way. As the discussions grew increasingly more technical, it was decided that a separate working group would form to examine the issue.

That was the beginning of what is now called the Wildfire Hazard Identification and Mitigation System, or WHIMS, and the beginning of a years-long crusade for Johnson and her colleagues.

Although the county already had access to some helpful material, such as lot boundaries, ownership records and other parcel data from the assessor’s office and topographic figures from the U.S. Geological Survey, the specific fuel-type and homeowner assessment information needed to plug into GIS for a complete picture did not exist.

So the WHIMS team elected to go out and get it, developing a questionnaire and planning one-on-one, on-site interviews with area landowners. “We decided we were going to take a project area and start with one local fire district,” Johnson said. “We also put a lot of time into figuring out what questions to ask.”



At the same time, the Colorado State Forest Service undertook a survey of its own to generate critical data about area fuel types.

Johnson said that defining what makes a hazard was a learning process for everyone. A turning point came when the group shifted from its initial assumption that water and access were the chief culprits.

“We learned through our firefighters that they aren’t, because in this county we don’t have water and we don’t have access,” she said. “So the emphasis in the surveys became building location, construction, landscaping and defensible space.”

One other key question remained: Who should conduct the surveys? A lengthy debate followed, and it was finally decided that — despite the size of the job — volunteer firefighters should handle the assignment.

“They are the ones that need to respond to these events,” Johnson said. “They are the ones that need to know the property. That is their constituency. The homeowners need to get the correct answers and need to be asking their volunteer firefighters these questions.”

Getting the 20 fire protection districts in Boulder County on board involved a series of discussions in which the WHIMS team had to demonstrate the tangible benefits of the project. There were also concerns about how planning departments and insurance companies might use the information gathered.

Marc Mullenix (foreground) and Justin Dombrowski, Boulder Fire Department

“Those concerns still exist, and that’s the reason why some districts haven’t participated,” Johnson said. “It is a matter of trust and of seeing benefits. We made a commitment to homeowners and told them what the information is for — for educating and motivating.”

WHIMS information packets were mailed out beforehand so residents would not be surprised by a visit from a survey team. The information packets were assembled by local inmates.

Today, some 10 years after the process started, more than 6,000 homes have been evaluated. While the county maintains the central database, the information is shared with the local fire districts, and they are putting it to good use.

Mike Tombolato, who as Boulder County’s first wildfire mitigation coordinator was heavily involved in the development of WHIMS, is now chief of the Cherryvale Fire Protection District. According to Tombolato, WHIMS has grown into a true multi-purpose tool.

“We use it for pre-planning and hazard assessments,” he said. “We provide the

assessment data to homeowners for education, to engine companies for response, and to mutual aid for addresses and roads.”

Every summer, Cherryvale has a wildland crew performing mitigation, and once the fire season slows that same crew updates the WHIMS assessments to keep information as current as possible. In terms of homeowner education, Tombolato said WHIMS offers immediate benefits.

“We’ve started making our assessments on Palm Pilots,” he explained. “Now we can make the assessment, plug into a laptop and printer, and give the assessment to the homeowner in real time. We can show them how to make their hazard rating come down. For example, we can show that if you move the propane tank, here is how the assessment would change, and why.”

The city of Boulder has its own version of WHIMS, called FIRMIT (for fire mitigation), and it, too, has become an important education tool.

“We originally thought the surveys would take ten minutes,” said Dombrowski, the Boulder wildland fire management officer. “But they averaged thirty to forty-five minutes because of the one-on-one education. We know that the best education is face-to-face at the person’s house, by the local firefighter who is going to be the one responding to the house if needed.”

The county maintains wildfire hazard maps online at its Web site, as well as a WHIMS manual at www.co.boulder.co.us/lu/wildfire. For Johnson, it is important that mitigation always be talked about in tandem with identification.

“The mapping and hazard rating is just a tool, it is part of a bigger program,” she said. “WHIMS is not just about mapping, but finding out what the hazards are, getting them into a medium for educating and training and planning, and then getting programs implemented based on that.”

To that end, Johnson hopes to see expanded uses of WHIMS and FIRMIT data to

Nan Johnson, city of Boulder



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— Justin Dombrowski

include code and policy changes as well as more involvement with planning. “Hopefully, it won’t take another big fire to do it,” she said.

A question of when

While much has been accomplished throughout Boulder County, significant work remains. The challenge ahead continues to occupy the efforts and thoughts of firefighting professionals and their partners in the government and the community.

New residents arrive in Boulder every day, many from places where wildfire is not a

threat and for whom the earlier fires are not a memory. And as with many jurisdictions nationwide, mitigation must often compete for funding and support among other critical needs. It is a balancing act that requires equal parts dedication and creativity.

For communities in the wildland/urban interface, questions about wildfire have to be prefaced by when and where, not if. In the Boulder Valley, that fundamental truth is firmly rooted in the fires that continue to burn across its lands, and in the efforts of residents to pull together and live safely there anyway. ■

Successful Boulder-Area Wildfire Mitigation Initiatives

- ✓ Formation of the Boulder County Wildfire Mitigation Group, which brings government and community leaders together with firefighting professionals and area residents to address issues of shared concern.
- ✓ Creation by the city of Boulder of a full-time wildland fire coordinator position to help manage wildland fire issues on city properties and to work with adjacent fire departments.
- ✓ Formation of the Boulder County Wildland Fire Cooperators to address training and coordination among area fire agencies and cooperators.
- ✓ Initiation by the city of Boulder of a comprehensive prescribed burn program in the wildland/urban interface.
- ✓ Development of a GIS-based risk assessment tool for Boulder County, known as the Wildfire Hazard Identification and Mitigation System (WHIMS).
- ✓ Passage by the city of Boulder of an ordinance phasing out all wood roof coverings.
- ✓ Creation by Boulder County of a full-time wildfire mitigation coordinator position to help deal with wildland fire threats in wildland/urban interface areas of the county.
- ✓ Implementation of a Boulder County site plan review ordinance requiring a wildfire mitigation plan for any new house as a condition of occupancy.
- ✓ Establishment of the Boulder County Ecosystem Cooperative, designed to identify and promote innovative ecosystem restoration opportunities on public and private lands.
- ✓ Passage of a public safety tax in the city of Boulder that funds mitigation and education efforts, including a seasonal Wildfire Response Group that reduces fire fuels on city open spaces.
- ✓ Development of a task force composed of the various county wildland firefighting jurisdictions that can deploy within the county or to nearby counties as a quick-attack hand crew or fire suppression team.
- ✓ Creation of a wildfire evacuation plan for the city of Boulder and neighboring communities, with permanent signs posted on evacuation routes.
- ✓ Establishment of a helicopter firefighting program that makes a helicopter and crew available for the Boulder area and beyond during fire season. ■