

Engineers

Creative minds help tackle
the unique challenges

at work

facing National Park Service lands today

By Lt. Cmdr. Gary Riley

THE CARR WILDFIRE BEGAN ALONGSIDE A HIGHWAY in Northern California's Whiskeytown National Recreation Area in late July 2018. The fire grew rapidly, swept into the city of Redding, and ultimately claimed seven lives, more than 1,000 homes and burned 229,651 acres. This was the sixth most destructive fire in California history. Faced with 97 percent of its land burned, the park immediately began the process of rebuilding historic buildings, an environmental education camp, and five of the six housing units in the park. Even after the flames were out, hazards to human and wildlife health remained.

Damaged infrastructure and ash can release hazardous levels of heavy metals, asbestos, and other byproducts of combustion into the environment. This is when a U.S. Public Health Service (PHS) engineer officer steps in to assess the fire-damaged structures, plan for safe debris removal, and prepare for rebuilding to ensure the site is safe for employees, visitors, and wildlife. I was the officer dispatched to the site to provide my expertise in public health engineering.

Few people associate public health with engineers, but in fact, the first officer assigned to the National Park Service (NPS) was a PHS Commissioned Corps sanitary engineer. Nearly 60 percent of the 58 PHS Commissioned Corps officers assigned to the NPS are engineers. These officers bring a health lens to traditional engineering fields, such as civil, environmental, sanitary, and structural, with the intent to prevent injury while protecting and advancing the health and safety of the public. OPH engineers provide design, maintenance, restoration, inspection, review, and regulatory oversight of thousands of facilities and assets across the 84 million acres of National Park Service lands. They serve all levels of the organization, from parks to regional and national offices, and the work they do protects and promotes health and prevents disease.

When I arrived on site, I had a tall order: to identify the hazardous contents of each structure and its surroundings that would need to be removed quickly and safely to protect both human and wildlife health. I quickly discovered that the ash and asbestos-containing material at many of the sites would need to be safely removed and disposed of at a landfill. Next, NPS collected soil samples from each building to ensure no contamination had migrated farther into the ground or groundwater. In some areas, up to a foot of soil was removed to meet clean-up goals.

I expanded the scope of the project to include community air monitoring during removal operations to protect NPS employees and visitors in nearby, open areas of Whiskeytown. The project removed more than 2,800 tons of material for proper disposal and we recycled 1,154 tons of concrete and 9.15 tons of metal debris. With the



Above, toxic ash is removed by the ton from the Carr Wildfire site in California's Whiskeytown National Recreation Area in 2018. At right, Cmdr. Kurt Kesteloot, a public health consultant engineer, inspects a water fountain at Hot Springs National Park in Arkansas. Photos: Office of Public Health



completion of the project, each of the building locations could safely be used for rebuilding anew or allowing sites to return to a natural state.

While an urgent response to a fire such as this may not be part of my regular duties, with the increased incidence of wildfires, I know I may need to be prepared for more of these kinds of responses in the future.

"One hundred years ago, the very first public health officer assigned to the National Park Service to protect health and safety was a sanitary engineer, responding to the needs of the time," says NPS Office of Public Health Director, Capt. Sara Newman. "Lt. Cmdr. Riley, along with the other 30 plus engineer officers assigned here to the NPS, are the backbone of public health responding to today's needs, and they will continue to be needed to respond to future challenges.

"Scientific predictions of up to six times more fires in the western U.S and 25 percent more fires in the Southwest will pose great harm to human and animal health, and the environment. We will need our engineers, not only to mitigate disaster when it hits, but more important, to help us find solutions to climate change to prevent the devastating consequences in the first place."

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