



A35 Search and Recovery Protocols for Fatal Fire Victims of the 2018 California Camp Fire

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Learning Overview: After attending this presentation, attendees will understand protocols for the search and recovery of burned human remains from mass fatality fire scenes.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing an overview of protocols used in the search and recovery of fatal fire victims from the 2018 Camp Fire disaster in northern California. This presentation will further discuss the need to adapt existing fire scene protocols to large-scale fire fatality events.

Fatal fire scenes are among the most complex and challenging contexts for forensic archaeological recovery. Thermally altered human remains are highly fragmentary and demonstrate a wide range of color changes, making it difficult to discern skeletal material from burned non-human remains and debris. Experimental research on fire scenes has resulted in detailed protocols for the efficient and thorough recovery of fatal fire victims. However, for large-scale mass fatality fire scenes, efficient processing of multiple residences requires a more flexible protocol, especially when the medicolegal focus is on victim recovery and identification.

In the early morning hours of November 8, 2018, high winds damaged power lines on Camp Creek Road in the community of Pulga, CA, resulting in a massive wind-fueled fire that devastated the adjacent rural communities of Paradise, Magalia, and Concow. The Camp Fire resulted in 85 fire-related fatalities and the destruction of more than 150,000 acres and 19,000 structures, making it the deadliest and most destructive fire in California's history. Although the search for and recovery of fatal fire victims was primarily coordinated through the Butte County Sheriff's Office, the effort enlisted the services of all available state coroner and search and rescue teams, the California Office of Emergency Services, the National Guard, the California Department of Forestry and Fire Protection (CAL FIRE), and multiple local and regional fire departments. Early in the recovery effort, the sheriff's office requested California State University, Chico's recovery team, which in turn requested additional anthropologists from California and Nevada.

The scale and complexity of the disaster required the deployment of several smaller teams to the three affected communities. The most effective team structure involved having anthropology team members embedded within coroner's teams, with CAL FIRE personnel available to assist with moving large debris from structures. Each day, the sheriff's office provided a list of residential addresses to search, based on reported missing cases. However, each team also received numerous call-outs throughout the day by search and rescue and canine teams to determine forensic significance during their systematic search of the 19,000 destroyed structures. The majority of the call-outs involved non-human remains (e.g., pets, wildlife, and food refuse), burned debris, or false-positive canine hits. Accuracy improved when anthropologists implemented training to assist searchers with recognizing burned and calcined remains. The size of the recovery team fluctuated significantly each day, requiring flexibility in team composition and selection of recovery scenes.

Over a 20-day period, forensic anthropology teams conducted targeted searches for human remains in hundreds of burned residential structures and automobiles. Search patterns began with a perimeter walk around the structure, followed by a minimally invasive foot survey through the structure with a small team, and finally, a thorough search with small hand tools using a larger team. This approach was efficient for locating remains, especially from trailer homes and one-story residences. Multi-story residences and apartment complexes required significant debris removal, as well as more in-depth excavation and searching to locate remains. In most cases, human remains consisted of small, calcined bone fragments, although residual charred tissue often adhered to the thorax, pelvis, and thigh region. Human remains were recovered using trowels, brushes, hand sieves, and other small hand tools, and screening stations were set up to ensure a thorough recovery of smaller remains. Coroner teams were responsible for scene documentation, photography, and recording the location of remains using a total station. In total, forensic anthropology teams assisted in the recovery of 75 of the 85 fire victims and, in some instances, assisted with secondary recoveries of scenes processed previously without anthropology teams. Three scenes involved multiple fire victims and showed extensive commingling. The recovery protocol implemented in the Camp Fire disaster was effective and efficient for locating and recovering all known fatal fire victims and further aided identification efforts by other forensic experts.

Forensic Anthropology, Mass Fatality Fire Scene, Burned Remains