

During the Fire

Up to this point, we have discussed firefighter safety before a wildland-urban intermix incident occurs. Once such a fire starts, a whole new group of factors comes into play (Figure 11).



Figure 11—During a fire a number of interacting factors affect firefighter safety.

in Los Angeles County during the 1996 fire season. On that incident, firefighters trying to cross a midslope road were prevented from leaving a “chimney” by a civilian vehicle attempting to leave the area. When the fire made a strong uphill run through the chimney, the firefighters were burned over. To mitigate the risks posed by access problems during wildland-urban intermix fires, close coordination between the fire commanders, dispatch centers, and law enforcement agencies is essential. Traffic control, specialized road signing, and road closures will help ensure that fire personnel can safely enter a fire area and can reduce the hazards inherent with two-way traffic in an emergency environment. Local knowledge of the road systems is also an essential factor in avoiding dangerous situations. Local

firefighters may need to be assigned with firefighters from other areas to help them move throughout the fire area.

Special Hazards

Firefighters entering the wildland-urban intermix area for fire suppression activities face a variety of hazards that differ from the typical hazards in either wildfires or structural fires. Although intermix fires may appear to be simply wildfires that threaten to burn residences, such fires represent unique, high-risk hazards that require special attention to prevent injury or death.

Powerlines

Overhead powerlines, found throughout wildland-urban intermix areas, pose several threats to firefighters. The risk of electrocution from downed lines is the most obvious (Figure 12). Electrocution caused the only death of a firefighter during the 1991 Oakland Hills Fire. A more insidious risk comes from electrical current transferred through smoke, a risk that may not be as obvious as a downed wire, but can be just as deadly.

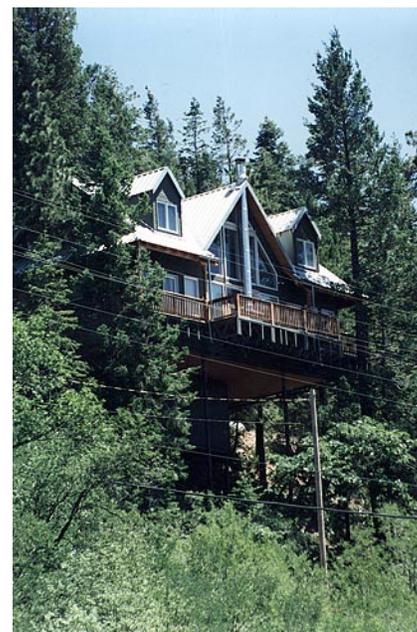


Figure 12—Power lines can be a safety hazard in the wildland-urban intermix.

Access

Although access was discussed earlier as a responsibility of both the community and the fire agencies in the planning phase for wildland-intermix fires, access can quickly become a critical factor once a fire occurs. If the civilian population is attempting to leave an area on the same narrow, curving roads that firefighters are using to enter the area, the result can be traffic jams, unsafe driving practices, and, ultimately, gridlock for both the civilian vehicles and the fire apparatus. When this occurs during active fire behavior, firefighters may become trapped in dangerous locations, as they were on the Calabasas Incident

Civilian Population

Despite all the public service announcements about fire safety, onsite inspections, and good intentions by homeowners, it is likely that the majority of the residents threatened by a wildland-urban intermix fire will be grossly unprepared for evacuation. Some may be unwilling to leave their property. Their chaotic exodus, or their refusal to leave, may pose a serious risk to firefighter safety. Fire agencies must coordinate with the other local agencies responsible for enforcing mandatory evacuation orders in areas where there is a high likelihood of fire activity.

Propane Tanks

Propane tanks and natural gas lines are found in many areas of the intermix, and can become an explosive hazard when they are burned over, or when they are damaged by equipment used in the suppression effort. Natural gas lines should be identified on preattack hazard maps. Dispatch centers must alert firefighters entering intermix areas to such hazards. If natural gas lines are believed to be in an intermix fire area, the gas distributor should be requested to shut down service to the area affected. Propane storage tanks at residences can't be mapped as easily, so firefighters must be on the lookout for them, especially in areas of heavy smoke.

Abandoned Vehicles

Vehicles abandoned during evacuation may catch fire, posing a hazard from the increased fire intensity when gas tanks rupture or melt, and from the toxic smoke they generate. While the risk of explosion from a vehicle fire is minimal, the hazards identified are such that firefighters attempting to suppress a vehicle fire must be properly trained and equipped, and should have training in the use of an SCBA (self-contained breathing apparatus).

Hazardous Materials

Hazardous materials, such as farm chemicals, are commonly found in many intermix areas. When they burn, hazardous materials are often highly toxic. Fires in barns and storage sheds should not be approached without appropriate respiratory protection. Explosives, such as dynamite or gunpowder, are often found in intermix areas. Any indication of explosives should be viewed as an extreme risk, and firefighters should not be nearby unless they are specially trained and equipped.



Mix of Forces

Nearly every wildland-urban intermix fire results in responses from a number of fire agencies, both wildland and structural. Unless properly coordinated, the mix of forces that responds to a fire can be a risk to firefighter safety. The variety of equipment (Figure 13), differing levels of training and experience, and the integration of hand crews, mechanized equipment, and air operations all offer opportunities for a breakdown in safe work practices. In that environment, firefighters and fire officers must be especially alert to the coordination required in using this mix of forces, and must follow their own agency's safe practices and procedures despite differences with the practices and procedures used by cooperators.



Figure 13—Selecting proper equipment is a key to safe operations.

Command and Control

The command and control structure on intermix fires is often complicated. Factors that can cause confusion and conflicts and increase risks to firefighter safety include: multiple jurisdictions, unified command, structural versus wildfire training and experience, lack of coordination with law enforcement

agencies, and the sense of urgency that finds multiple dissimilar resources assigned to a common protection objective. Close and timely coordination of responsible agencies is essential as soon as intermix fires occur. Although much of the needed coordination can take place during the off season, the critical interchange of information and agreements on operating procedures

must occur on the fire ground between the designated fire officers from each involved agency. Especially sensitive areas include areas of responsibility, communications links between resources, coordination of air resources, clear definition of boundaries such as division breaks, and emergency medical evacuation procedures.

Protective Clothing and Equipment

When all else fails, the “fall-back position” for individual firefighters is the proper use of their personal protective clothing and equipment. Fires in the intermix may require that some firefighters are dressed in wildland PPE while others wear structural PPE. The rapidly changing fire conditions often require that firefighters switch from a wildfire mode into structural protection, and then back again. It is critical that firefighters and fire officers have the “situational awareness” that allows them to don the appropriate PPE (Figure 14) for their immediate situation. Failure to do so can, and has, caused firefighter injuries and fatalities. All firefighters entering the wildland-urban intermix zone must be equipped and trained in the proper use of

the fire shelter. The shelter’s use (or the failure to use it) has been a factor in firefighter survival on intermix fires from California to Alaska over the past decade.

Failure to adequately plan and execute the steps necessary to ensure firefighter safety in the wildland-urban intermix has resulted in close calls, injuries, and even fatalities across the United States:

- On the Dude Fire (1990) in Arizona, six firefighters died when extreme fire behavior, terrain, and poor command and control resulted in a burnover (Figure 15).
- On the California Fire (1990), two firefighters died when they were unable to reach the fire shelters

inside their backpacks when the fire spread increased rapidly.

- On the Wasatch Fire (1990) in Utah, two firefighters died while trying to cut dozer line along a fire threatening a subdivision. Communication was difficult because of the amount of the radio traffic on the operating frequency. Only one of the firefighters had protective clothing or a fire shelter.
- On the Sunrise Fire (1995) on Long Island, New York, where numerous firefighters in full structural turnout gear experienced heat stress injuries while attempting to fight a fast-moving intermix fire on a hot August day.



Figure 14—Protective clothing must be appropriate for the fire, and must be used as intended.



Figure 15—Fatalities have occurred on fires in the wildland-urban intermix across the United States.

