Interface Engine

A major impediment to bringing fire back to the forest is urban interface. It's a problem that's not going to go away anytime soon. Until we implement ways to better protect people and their infrastructure from fire at the urban interface, there's no political or practical way to stop excessive fire suppression.

As I watch the wildfires around the world on the news, three things are obvious. We don't need more personnel; we need better trained personnel. We don't need more equipment; we need different equipment. We need to fire harden our structures.

I grew up in the Southern California chaparral and Santa Ana winds. I have 16 years experience as a volunteer firefighter on a well respected rural department, where I spent many hundreds of hours a year building and maintaining equipment. I have many years experience logging and thinning in our Southwestern forests. I built the sawmill that I built my 3,000 square foot house with, mostly from blow-downs, road cuts, and burn scars. I've small scale, non intrusively, salvage-logged several burn scars. My daughter and son-in-law are professional firefighters with the Forest Service. I'm a mechanic, a machinist, a welder, a millwright, and a lot of other things. I've also been studying climate for many years. I know a bit about what I'm talking about.

In 2003 I toured the Cedar Fire a few months after the fire with a friend who was one of San Diego County's fire chiefs. 280,000 acres; 2,232 structures, 15 fatalities, 1.331 billion. There were around 700 engines on that fire; almost all of them doing structural protection with equipment designed for firefighting on a fire that couldn't be fought with contemporary equipment. Since then, little has changed in both tactics and equipment.

A large part of our firefighting budget is spent on fighting fires to protect man made structures in areas where fire is a natural and necessary part of the ecosystem. In most places, it would be substantially more cost effective to protect the structures and let the fire go by till it hits a substantial firebreak, but pre-planning and liaison with the community are seriously inadequate, there are hardly any firebreaks, most structures are not very fire resistant, and there's currently no equipment and expertise specifically directed toward the protection of structures. In a moderate fire, ground crews can do structural protection with engines, hand tools, saws, and burnouts, but the hotter the fire, the more dangerous it gets. All of their equipment and expertise is focused on fighting fire, and their protection from the fire is almost nonexistent.

The Hotshots and all the rest of the ground based resources of the Forest Service and state and local firefighting crews are trained and equipped for fighting wildfire and should be used as such, but fighting the fire to protect structures in imminent danger is often too dangerous for any kind of attack with personnel on the ground, no matter what their level of skill and strength. Urgency can easily cloud judgment. Knowing that there were likely to be thunderstorms with dangerous downdrafts, teams fighting the Yarnell Hill Fire were still sent into hot dry chaparral. Even though it's widely known that it's almost always a change in the wind that gets firefighters in trouble, urgency clouded judgment that day and firefighters were put into harm's way to save homes.

It's quite obvious by now that many fires cannot be successfully fought with current equipment and tactics under current weather conditions. The entire concept of fighting fire in today's climate ignores some very basic reality. Many ecosystems are fire dependent, and most ecosystems have become extremely flammable due to climate change, misguided forest management, and excessive fire suppression. In this era of hot, dry weather, without sufficient moisture to rot dead vegetation, it piles up till it burns. We've suppressed fire for so long that many types of vegetation have grown thick and tall and extremely flammable in the dry seasons. Forest mismanagement has resulted in large areas of uniform height canopy that are very suseptable to wind driven fire. It's gonna burn. All of it will eventually burn. If you put the fire out this time there'll just be a bigger one the next time it finds a spark and some wind.

In interface firefighting, it’s speed and mobility, task diversity, water capacity, and the effectiveness and reliability of your heat shield that determine your level of success and safety. From the smallest mini to the big class ‘A’s, every engine in service today requires personnel on the ground, is quite flammable, and, if they’re overrun by the fire, the only protection they offer their crews is leave the hoses behind and make a run for it or deploy their personal fire shelters if there’s time and space or get roasted if there’s not.

Today's fire equipment is a bunch of big and clumsy, bright and shiny Rube Goldberg crap that costs twice what it should, is dangerously undependable, and is fundamentally obsolete because it's all designed for fire fighting instead of structural protection. The fire equipment industry has succumbed to an obsession with high-tech crammed into obsolete designs that has been extremely counter-productive. I don't need to tell the computer to tell the servo-motor to turn the valve. My hand is cheaper, faster, and much more dependable. The entire firefighting industry has no equipment designed specifically to protect structures in an urban interface setting, and as a result thousands of houses burn and the lives of thousands of firefighters are put at risk every year.

We need a vehicle that addresses the growing need to protect structures from wildland fires. I've spent thousands of hours building and maintaining equipment for the volunteer fire department, and we built some of the best. For many years now I’ve seen the need for a fundamentally different kind of fire truck. There are lots of wildland pumpers in service that carry from 200 to 600 gallons of water and a variety of hand tools and equipment. They are all designed for ground crew support. They almost all have very small pumps. They're all top-heavy and clumsy. As with all conventional fire engines, they offer no protection for the crew. They sell for upwards of a quarter million dollars. The best of them [and some of the worst] were hand built by volunteer departments at a fraction of the cost of the flashy, bright and shiny junk the fire equipment industry builds. Not any more. The fire equipment industry managed to outlaw anything not built by licensed professionals. A lot of structural protection on interface fires is still done with class 'A' pumpers. These are large trucks that can’t turn around at all on small roads, offer no protection for the crew, and are supposed to be committed to standby for structural fires on their district. They cost over half a million bucks.

All of these trucks are designed for use with crews on the ground with hoses and hand tools; a slow and cumbersome process in the face of a fast and dangerous opponent. Most volunteer departments succumb to the temptation to ride completely exposed on top of the truck because that’s what works, but it’s a bit dangerous. I’ve lost my eyebrows several times saving peoples homes and occasionally I’ve found myself planning which way to jump if the truck rolls.

Personally, I’d rather be riding around in a fully enclosed air conditioned turret with my choice of nozzles and spray-heads for water, foam, or gel, on a compact, powerful, well insulated, heat reflective van with 1,000 gallons in the bellytank, a large high pressure pump, a full roll cage, and a serious fire shelter for the vehicle and crew just in case. Unfortunately, this type of equipment doesn’t exist yet. Within the realities of presently available, affordable technology, I see a vehicle that can operate without exposing the crew and, if overrun by fire, can deploy a reflective shield, gel itself, and allow the truck and crew to sit it out in relative comfort.

Years ago, I drew up an apparatus on a cab-over single axle 33,000 gvw Kenworth chassis. You can put a fully enclosed turret on 1,000 gallons, keep the center of gravity low, and keep it under 10 feet. Anyone interested in building it?