Curb, Dustin (DES)

From: DES SBCC
Sent: Friday, November 3, 2023 1:13 PM
To: Curb, Dustin (DES)
Cc: Bumbalov, Stoyan (DES)
Subject: FW: Comments from Go Alliance & Dr. Jack Cohen - Missoula Fire Lab (Ret.) To be Attached to November 17 SBCC Packet
Attachments: WU Fire-effective approach.pdf

From: Ralph Bloemers <ralph@greenoregon.org>
Sent: Friday, November 3, 2023 12:01 PM
To: Bumbalov, Stoyan (DES) <stoyan.bumbalov@des.wa.gov>
Cc: DES SBCC <sbcc@des.wa.gov>; Ghanie, Rozanna (DES) <rozanna.ghanie@des.wa.gov>
Subject: Comments from Go Alliance & Dr. Jack Cohen - Missoula Fire Lab (Ret.) To be Attached to November 17 SBCC Packet

To whom it may concern:

I am commenting on several WU fire perspective issues related to the SBCC proposal for wildfire readiness in

I want to acknowledge Dr. Jack Cohen for his review and input, the Insurance Institute for Business and Home
the National Fire Protection Association, whose work has informed these comments.

I have attached a briefing paper from Dr. Jack Cohen to support these comments, and I ask that you include t

Introduction: Our Current Landscape

As the climate warms, extended drought and heat events in the United States are driving an increase in acres
happen when dry winds carry embers long distances, start new spot fires and enter into communities and igni
nearby homes, causing mass conflagrations. Destructive wildfires are happening more often, burning longer a
wildfire or mapped as being at risk.

By redefining the wildfire problem as one of too many human caused-ignitions in the wrong place and the wro
inevitable wildfires, we can prepare communities for more smoke on the land and to survive even extreme fire

Despite these challenges, leaders within the fire community are embracing paradox and trying to shift the fire
simultaneously preparing communities to be ready for more fire and smoke. Fire management and suppressio
fire do its work in maintaining natural systems. Firefighters are empowering homeowners to prepare their hom
situational awareness before, during, and after fire comes. While many strategies may have impact, given limi
and effective solutions. For society to move from unpredictable disasters to prepared and resilient communitie
public will all need to accept inevitable fires and smoke and embrace a new approach to living with fire.

General Comments

Over the past several decades, the focus in the United States has been on ramping up vegetation clearing an
(US Forest Service 2023). Yet if one looks at devastating fires, it is clear that during periods of extreme fire be
burned areas, fuel breaks, dirt roads, city streets, paved multilane highways, and natural barriers such as the
River Gorge (Vance, Templeton, and Wilson 2017) did not keep fire from spotting great distances or igniting r
grasses and shrubs outside Superior, Colorado, to generate enough embers to ignite one home and then burn
(Boulder Country 2022). These events are forcing communities to reexamine strategies that are not working t

The US Forest Service's Missoula Fire Sciences Laboratory, the National Fire Protection Association, the Insu
Laboratory's Fire Safety Research Institute are at the forefront of this effort.

They have conducted extensive experiments that show the design and maintenance of a home and the imme
most critical area for preventing or reducing the chance a home will ignite (NFPA n.d.). Within the next 30 to 6
homeowners need to reduce fuels from the home outward—for example, by not having shrubs next to the hou
disconnecting fences that can wick fire to a house (See work of Dr. Jack Cohen).

These actions to make homes ignition-resistant should be done collectively by a community, as homes are mo

Specific Comments

- the HIZ concept defines ignition resistance as the performance of the home characteristics related to the flam

spread. That means extensive tree removal is not necessary to reduce community wildfire risk (as it only will b
factors. Importantly, I did not see any mention of how deciduous trees (e.g. big leaf maple and alder) provide a
characteristic of historical west Cascade forests). We recommend retention of hardwoods outside the home ig

- the geographic designations of "Appendix 2" have nothing to do with how homes-structures ignite and comm
fire destruction initiated by extreme wildfire such as Coffey Park-Santa Rosa (Tubbs Fire), Talent-Phoenix, OR
were suburbs with adjacent field of grass and light shrubs. Although during extreme wildfire conditions, that is
wildfires.

- the structure density designations of Appendix 2 should not be taken as indicative of community structure-to-
wildfire ignition influence ceases) occurs from burning structure generated ember spot ignitions. Persistent str
distances less than ~25 ft for 1 story and 40 ft for 2 story without flammable structures (fences, sheds, etc.) be

I hope this is helpful to you all to develop a program that everyone can participate in - as that is what is neede
comes and reduce the chances of community destruction. I urge you to check out FireAside.com/impact for re
will greatly reduce the odds of loss - in Truckee and Marin, California.

I am happy to visit with you all to discuss these items further.

Regards,
Ralph

Ralph Bloemers
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<WU Fire-effective approach.pdf>

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A More Effective Approach for Preventing Wildland-Urban Fire Disasters

Jack Cohen, PhD; Research Physical Scientist; US Forest Service, retired

Introduction

Inevitable extreme wildfire conditions do not have to result in disastrous community fire destruction. Local conditions, the characteristics of a home and its immediate surroundings within 100 feet (30 meters) principally determine home-structure ignitions. This area, called the *home ignition zone* (HIZ), effectively defines wildland-urban (WU) fires as a structure ignition problem and not a problem of controlling wildfires. Alternatively, readily reducing structure ignitability within the HIZ and collectively communities, property owners can prevent WU fire disasters without depending on wildfire suppression that fails during extreme wildfire conditions.

Inevitable Wildfires and Extreme Burning Conditions

Wildfire suppression has successfully controlled 95 to 98 percent wildfires with initial attack for over one-hundred years (Stephens and Ruth 2005). Paradoxically, the high degree of successful fire suppression has ensured the inevitability and increased likelihood of uncontrollable, extreme wildfires (Arno and Allison-Bunnell 2002; Williams 2013). Importantly, WU fire disasters have only occurred during these extreme wildfire conditions when fire control fails (Cohen 2010; Calkin et al. 2014). Without seriously questioning this failure, Federal, state and local fire agencies continue wildfire suppression, along with pre-suppression fuel breaks and shrub and forest fuel treatments, as the principal approach for protecting communities (Finney and Cohen 2003; Cohen 2010; Calkin et al. 2014).

Community fire destruction will continue as long as wildfire suppression is the primary approach. The inevitability of uncontrolled extreme wildfires suggests inevitable disastrous home destruction; however, available science indicates practical opportunities for effectively creating ignition resistant homes and thereby preventing community fire disasters without necessarily controlling wildfires (Cohen 2000a; Cohen 2001; Cohen 2004; Cohen and Stratton 2008; Cohen 2010; Calkin et al. 2014; Cohen 2017; Cohen and Westhaver 2022). Readily observable patterns of unconsumed tree canopies and other vegetation surrounding totally destroyed homes indicates high intensity wildfire flames did not spread through communities.

Patterns of Home Destruction during Wildfires

Unconsumed vegetation post-fire, often remaining green, adjacent to and surrounding home destruction is the typical WU fire pattern associated with extreme wildfire conditions (Cohen 2000b; Cohen and Stratton 2003; Cohen 2003; Cohen and Stratton 2008; Graham et al. 2012; Cohen 2017; Cohen and Westhaver 2022). The three photos (Figure 1) of home destruction with adjacent unconsumed shrub and tree vegetation indicate the following:

- ***High intensity wildfire did not continuously spread through the residential area as a wave or flood of flame.***
- ***Unconsumed shrub and tree canopies adjacent to homes did not produce high intensity flames that ignited the homes.***
- ***Homes could have only ignited from lofted burning embers on the home, low intensity surface fire spreading to contact the home, and in high density development, structure-to-structure fire spread.***
- ***The 'big flames' of high intensity wildfires did not cause total home destruction.***

Paradise, CA; 2018 Camp Fire **Southwest CO; 2002 Missionary Ridge Fire** **S Cal; 2007 Grass Valley Fire**

Figure 1.

High intensity wildfires do not spread through communities that experience disastrous fire destruction. A community's streets, driveways, parking areas, building sites, etc. create gaps in the continuous tree and shrub canopies required to maintain high intensity wildfire spread (crown fires) (Cohen 2010). Figure 2 shows a crown fire that spread to but could not continue beyond the first residential street. Although the crown fire terminated at the street, burning embers showered downwind resulting in several blocks of total home destruction (Cohen 2010). Extreme wildfire conditions initiate ignitions within residential areas but the residential fuels, structures and vegetation, continue the residential burning resulting in total home destruction. The community fire spread continues hours after the wildfire ceases influence to the community (Cohen and Stratton 2008; Cohen 2010; Cohen and Westhaver 2022).

Figure 2.

The typical WU fire patterns indicate that conditions local to a structure principally determine structure ignitions with burning embers the principal source of ignitions. The totally destroyed home in Figure 3 indicates burning embers as the only possible ignition source igniting the home directly, and from igniting flammable materials immediately adjacent to the home. Burning embers should be expected during extreme WU fire conditions; however, regardless of the distance burning embers travel, burning ember ignitions depend on the local conditions of the ignitable materials on and adjacent to a home.

Figure 3.

An Effective Approach for Preventing WU Fire Disasters

Extensive research has identified local ignition conditions that determine home ignitions during extreme wildfire conditions (Cohen 2000a; Cohen 2000b; Cohen and Stratton 2003; Cohen 2003; Finney and Cohen 2003; Cohen and Stratton 2008; Graham et al. 2012; Cohen 2017; Cohen and Westhaver 2022). The "local ignition conditions" area has been quantified as a home's ignition characteristics in relation to burning materials in its immediate surroundings within 100 feet (30 meters) and burning embers for all sources (Cohen 1995; Cohen 2000a; Cohen 2004). This area is called the ***home ignition zone*** (HIZ; Cohen 2010; NFPA 2018). An ignition resistant HIZ is not necessarily a unique, specified home ("hardening") and surrounding area ("defensible space") coded list of factors. An ignition resistant HIZ is how a home performs in resisting ignitions related to burning materials within the HIZ and burning embers from all sources. For example, a home with a flammable wood roof can readily ignite during extreme wildfire conditions having no flammable materials within its HIZ. Or, an earth-berm house can be ignition resistant having intensely burning materials within its HIZ.

The relatively small area of the HIZ principally determines home ignitions during extreme wildfires and defines WU fire destruction as a *home ignition problem* that can be prevented by readily addressing home ignition vulnerabilities within the HIZ without necessarily controlling wildfires. Thus, community wildfire risk is not directly determined by wildfire intensity and its location related to wildland. Burning embers, initially from the wildfire and then from burning structures within the community are a principal contributor to community fire spread. Thus, not having a flammable wood roof, removing flammable tree debris from the roof, in rain gutters, on decks, assuring nothing burns (flaming or smoldering) within 5 feet (1.5 m) of flammable walls and attachments, and vents covered with 1/8 inch (3 mm) mesh screen can significantly increase home ignition resistance. Reducing home exposure from flame radiation and convection may require reduced vegetation and trimming but not the necessary removal of most vegetation and large trees within the HIZ (as noted in Fig. 1). As indicated by the typical patterns of WU fire destruction, shrub and tree canopies are not spreading high intensity fires through communities.

The inevitability of uncontrolled extreme wildfires spreading to communities does not mean WU fire disasters are inevitable. We can effectively prevent WU fire disasters by reducing home ignitability and collectively, the community. Ignition resistant communities will increase community fire protection effectiveness, life-safety options for residents and firefighters, and can decrease wildfire suppression costs by not ineffectively attempting control of extreme wildfires to prevent WU fire disasters. For more information on creating ignition resistant homes visit www.firewise.org (NFPA 2018).

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Appendix 2: Washington WUI Code Language

SECTION 603: DEFENSIBLE SPACE

603.1 Objective. Provisions of this section are intended to modify the fuel load in areas adjacent to structures to create a defensible space.

603.2 Fuel modification. Buildings or structures, constructed in compliance with the conforming defensible space category of Table 503.1, shall comply with the fuel modification distances contained in Table 603.2. For all other purposes the fuel modification distance shall be not less than 30 feet (9144 mm) or to the lot line, whichever is less. Distances specified in Table 603.2 shall be measured on a horizontal plane from the perimeter or projection of the building or structure as shown in Figure 603.2. Distances specified in Table 603.2 are allowed to be increased by the code official because of a site-specific analysis based on local conditions and the fire protection plan.

TABLE 603.2 REQUIRED DEFENSIBLE SPACE

WILDLAND-URBAN INTERFACE AREA	FUEL MODIFICATION DISTANCE (feet)[a]
Moderate hazard	30
High hazard	50
Extreme hazard	100

For SI: 1 foot = 304.8 mm.

a. Distances are allowed to be increased due to site-specific analysis based on local conditions and the fire protection plan.

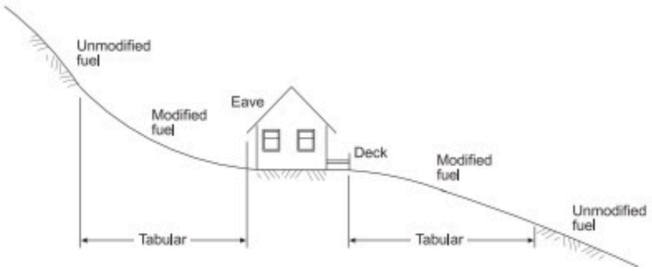

FIGURE 603.2 MEASUREMENTS OF FUEL MODIFICATION DISTANCE

603.2.1 Responsible party. Persons owning, leasing, controlling, operating or maintaining buildings or structures requiring defensible spaces are responsible for modifying or removing nonfire-resistive vegetation on the property owned, leased or controlled by said person.

603.2.2 Trees. Trees are allowed within the defensible space, provided that the horizontal distance between crowns of adjacent trees and crowns of trees and structures, overhead electrical facilities or unmodified fuel is not less than 10 feet (3048 mm).

603.2.3 Ground cover. Deadwood and litter shall be regularly removed from trees. Where ornamental vegetative fuels or cultivated ground cover, such as green grass, ivy, succulents or similar plants are used as ground cover, they are allowed to be within the designated defensible space, provided that they do not form a means of transmitting fire from the native growth to any structure.

SECTION 604: MAINTENANCE OF DEFENSIBLE SPACE

604.1 General. Defensible spaces required by Section 603 shall be maintained in accordance with Section 604.

604.2 Modified area. Nonfire-resistive vegetation or growth shall be kept clear of buildings or structures, in accordance with Section 603, in such a manner as to provide a clear area for fire suppression operations.

604.3 Responsibility. Persons owning, leasing, controlling, operating or maintaining buildings or structures are responsible for maintenance of defensible spaces. Maintenance of the defensible space shall include modifying or removing nonfire-resistive vegetation and keeping leaves, needles and other dead vegetative material regularly removed from roofs of buildings and structures.

604.4 Trees. Tree crowns extending to within 10 feet (3048 mm) of any structure shall be pruned to maintain a minimum horizontal clearance of 10 feet (3048 mm). Tree crowns within the defensible space shall be pruned to remove limbs located less than 6 feet (1829 mm) above the ground surface adjacent to the trees.

604.4.1 Chimney clearance. Portions of tree crowns that extend to within 10 feet (3048 mm) of the outlet of a chimney shall be pruned to maintain a minimum horizontal clearance of 10 feet (3048 mm).

604.4.2 Deadwood removed. Deadwood and litter shall be regularly removed from trees.