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Firescaping: Wildfire-Resistant Landscaping in Georgia

Holly Campbell, *UGA Warnell School of Forestry & Natural Resources*

Fire-resistant landscaping, or firescaping, is a type of landscaping that helps reduce a home or other structure's risk to wildfire. This publication provides a comprehensive overview of why firescaping is important and details how to establish and maintain a firescape.

WHY FIRESCAPING IS IMPORTANT

WILDLAND FIRE HISTORY

Fire that occurs in nature, known as wildland fire, has been a defining part of Georgia's natural environment for millennia, shaping several of the plants, animals, and ecosystems seen in the state today. Historical fires were ignited by both lightning and Native Americans, who used fire in agriculture, hunting, travel, and more. Wildland fire continues to play an important role in Georgia landscapes today.

There are two main types of wildland fire: prescribed fire and wildfire. Prescribed fire is a planned fire that is ignited by experienced burners under specific weather and other conditions to achieve management objectives (Fig. 1). Prescribed fire is usually a low intensity fire and has been shown to reduce wildfire severity (Addington et al., 2015), improve wildlife habitat, support plant regeneration, prepare land for agriculture or planting trees, and reduce forest understory vegetation. The Southeast uses more prescribed fire than any other US region, with Georgia burning tens to hundreds of thousands of acres every year.

Figure 1: *(a) Prescribed burn practitioner igniting a prescribed fire in a longleaf pine ecosystem in Georgia.* **Credit: Holly Campbell.** *(b) The 2007 Bugaboo Scrub Fire was one of the largest wildfires in Georgia history, burning over 560,000 acres in Georgia and Florida.* **Credit: Mark Wolfe, Federal Emergency Management Agency**

Wildfire is an unplanned wildland fire. Though not always catastrophic, wildfires can threaten lives and property, dramatically alter natural landscapes, and create hazardous air quality and transportation conditions. Firefighters seek to quickly extinguish wildfires that threaten human communities and infrastructure but may allow a wildfire to burn if it poses no immediate risk. Wildfires can range anywhere from burning at a low intensity to a catastrophic conflagration. Like prescribed fire, the effects of wildfire on a natural landscape can be ecologically beneficial, especially when burning at a lower intensity. Wildfires regularly occur in Georgia. On average from 2008-2017, Georgia had 4,300 fires and burned over 51,400 acres a year (NIFC, 2020). The vast majority of these wildfires were small, (ex., a quarter to one acre in size), while others were hundreds to thousands of acres (Fig. 1).

WILDFIRE RISKS TO COMMUNITIES

Some Georgia residents and communities are at an increased risk to wildfire based on where they are located. The Wildland-Urban Interface and Intermix (WUI) are defined as areas where human infrastructure is adjacent to or intermingles with undeveloped natural areas, or wildlands (Fig. 2). More specifically, the Wildland-Urban Interface includes developed areas that have minimal wildland vegetation but are in close proximity to a wildland. The Wildland-Urban Intermix is defined as an area where structures and wildland vegetation intermingle. Residences in WUI areas are more at risk to wildfire than non-WUI areas because wildfires ignited in adjacent wildlands have a shorter distance to travel and potentially ignite nearby homes compared to homes and neighborhoods not adjacent to wildlands. Often, these wildland areas have minimal vegetation management (ex., prescribed fire, mowing, thinning trees, herbicide use, or other fuels management) that could reduce wildfire risk. According to the 2010 U.S. Census, Georgia has one of the fastest growing populations and contains a high percentage of WUI area (Martinuzzi et al., 2015).

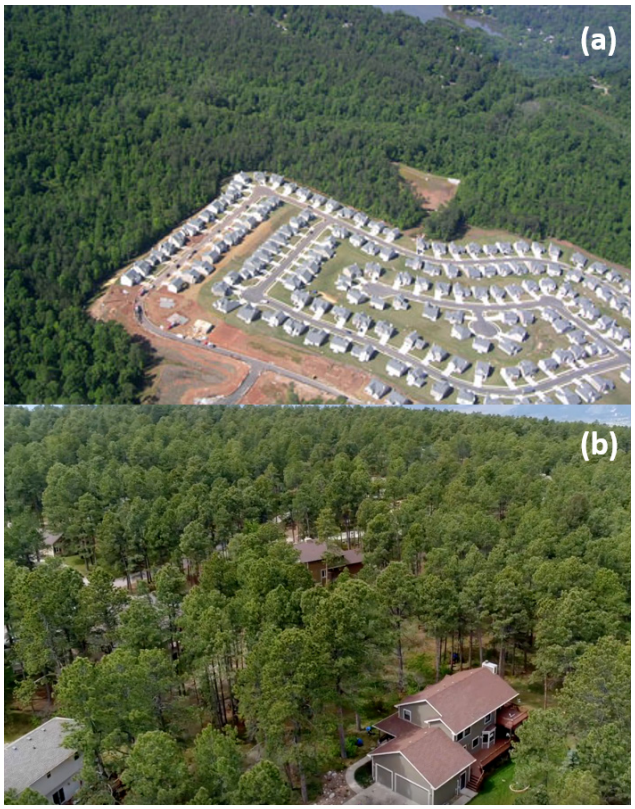


Figure 2: *Examples of the (a) Wildland-Urban Interface and (b) Wildland-Urban Intermix.* **Photo by Georgia Forestry Commission**

Most wildfires in the US today are ignited by humans. The vast majority of these ignitions are accidental (ex., campfire, brush pile, or engine spark) while other ignitions are caused by arson. A study by Balch et al. (2017) found that over 20-year period (1992-2012) humans were responsible for 84% of US wildfires, a 3-fold increase in wildfire season length, and half of the acres burned. Human-caused wildfire ignitions are usually seasonal and occur more commonly where people congregate (Long and Prestemon, 2013), such as near suburban and vacation areas.

Drought creates significant wildfire risk. This was experienced during the fall of 2016 when many southeastern Appalachian states received little to no precipitation for two to three months. The drought combined with human and lightning ignitions resulted in over 80,000 acres burning across seven states. The most tragic of these wildfires was the Gatlinburg, Tennessee Chimney Tops II Fire that claimed the lives of 14 people, burned over 17,000 acres, damaged or destroyed over 2,400 structures, and caused nearly $1 billion in economic damages. Though the 2016 drought conditions are rare for most parts of the region, temperatures and drought are projected to increase with climate change (USGCRP, 2018), leading to higher future wildfire potential in the southeastern states (Liu et al., 2012).

FIRE BEHAVIOR

Understanding how firescaping reduces wildfire risk requires a basic awareness of fuels and fire behavior. A fuel is anything that will burn. Figure 3 lists examples of fuels that occur in the natural and human-built landscape.

All fuels will burn under dry weather conditions, but some fuels are more flammable than others due to their chemical make-up, shape, size, quantity, and more. Additionally, the way fuels are spaced on a landscape will influence how fire moves, or spreads. Fuels that are closely spaced along the ground (horizontal fuels) or layered from the ground to the canopy (vertical or ladder fuels) can allow a fire to spread more easily than if fuels are more widely spaced (Fig. 4). An example of ladder fuels is a garden bed containing mulch and closely spaced ground cover, shrubs, and trees.

Natural Fuels:	**Human-Built Landscape Fuels:**
forest floor duff	house
pine straw/ leaf litter	fence (wood/ vinyl)
fallen trees/ branches	shed
grass	play structure
groundcover	arbor/ trellis
shrubs	propane tank
vines	firewood storage
trees	

Figure 3: *A few of the many examples of fuels that can be found in the natural environment and human-built landscape.*

Fire requires three ingredients to occur: oxygen, heat, and fuel (Fig. 5). Oxygen is readily available in the atmosphere, heat can originate from several sources (ex., lightning strike, ember from a campfire), and fuels are readily available in most WUI areas.

Wildfire behavior is influenced by weather, topography (slope), and fuel characteristics previously mentioned (Fig. 5). Weather factors that strongly influence fire include wind, precipitation, relative humidity (RH), and temperature. Wind provides more oxygen to a fire and can transport embers. High winds, especially, allow wildfire to quickly spread. The severity of the 2016 Gatlinburg wildfire was, in part, due to 80+ mile per hour winds. Precipitation, RH, and temperature all strongly influence fuel moisture. For example, a combination of higher temperature, lower precipitation, and lower RH can dry fuels. Alternatively, lower temperatures, higher precipitation, and higher RH have the opposite effect. **The drier a fuel is, the easier it is to ignite.**

Fire typically moves faster upslope than downslope. This occurs, in part, because the heat and gases from the fire burning downslope rise up, pre-heating and drying out the unburned fuels upslope. Once the fire reaches these pre-heated fuels, they can ignite more easily and allow the fire to quickly spread up the slope.

Of all the factors we just discussed that influence fire behavior and community risk, fuel is the one factor we can manipulate. Fuels management is a primary objective in firescaping.

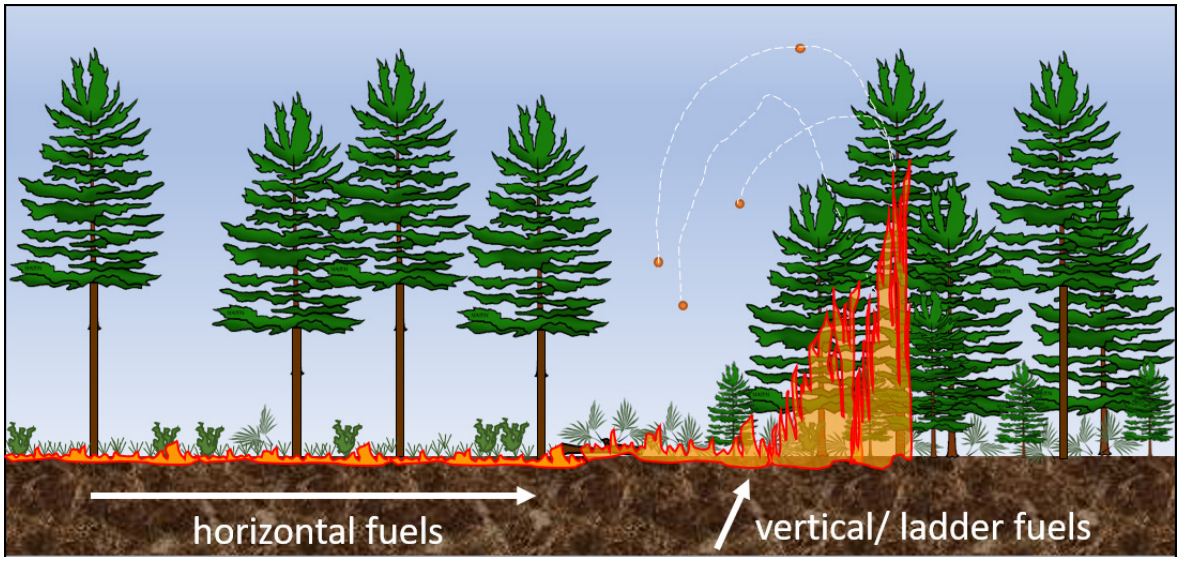


Figure 4: *Horizotal fuels can allow a fire to spread from fuel to fuel along the ground. Ladder fuels can allow a fire to burn from the ground to a canopy of trees. Once in the canopy, a fire spreads quickly from tree to tree and generates embers that ignite new fires. Firescaping aims to create space between horizontal fuels and ladder fuels, so the spread of fire toward a structure is disrupted.*

KNOWING YOUR WILDFIRE RISK

Is it necessary for all Georgia residents to follow firescaping recommendations? Only communities most at-risk to wildfire, like those in the WUI or those that have a history of wildfires, should follow firescaping recommendations. There are a few ways you can learn about your communities' wildfire history and whether your residence lies in the WUI.

- Inquire with your local fire department or Georgia Forestry Commission representative, https://gatrees.org/about/county-contacts/
- Identify your WUI risk on the Southern Group of State Foresters Southern Wildfire Risk Assessment Portal (SouthWRAP): www.southernwildfirerisk.com/
- Identify your wildfire risk on the USDA Forest Service Wildfire Risk to Communities webpage: https://wildfirerisk.org/

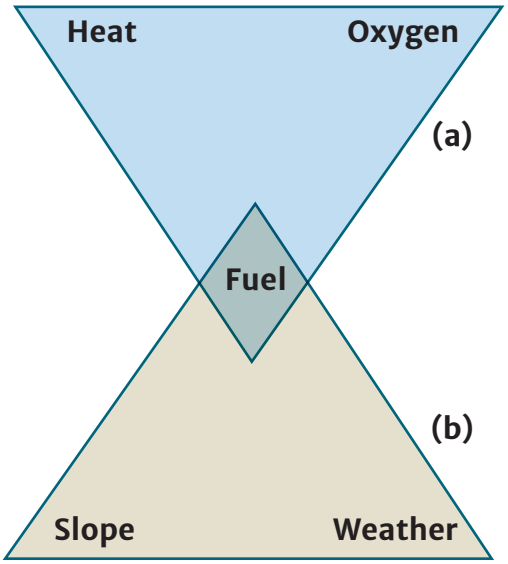


Figure 5: *The (a) ingredients of fire and (b) the three environmental factors that affect fire behavior. Fuel is the only one of these five factors that can be manipulated. Fuels management is a primary objective in firescaping.*

Using SouthWRAP

1. Go to www.southernwildfirerisk.com/

2. Create a free account, login and select "Public Viewer."

3. Enter your address in the search bar (located above the map in the top right corner of the webpage) then click the magnifying glass to the right of this bar for the software to evaluate if your home lies in the WUI.

4. Your WUI result will be listed on the panel to the left of the map.

SouthWRAP results are based on recent wildfire activity, housing density, vegetation, and other factors. If the map reveals that your residence is at risk to wildfire, you can better prepare for potential wildfires by checking with your local fire departments about recent wildfire activity and implementing firescaping and other risk reduction measures on and around your home (and community).

STRUCTURAL AND LANDSCAPE FUELS

The main goal of firescaping is to prevent a wildfire from igniting a structure. Before learning how to implement firescaping, it is important to understand how fuels on and around a structure ignite.

STRUCTURAL FUELS

Structures in a WUI landscape can include a residence (ex., single family home, condominium, apartment, etc.) and its attachments (ex., deck, arbor, patio), as well as an outbuilding, storage shed, detached garage, etc. WUI structures may also include businesses, churches, vacation homes, and community buildings. Structural ignition from wildfire typically occurs in one of three ways: radiant heat, direct flame contact, and embers (Fig. 6). Radiant heat ignition occurs when the heat from a nearby fire dries out and raises the temperature of the structure's building material enough for it to ignite. Direct flame contact (process referred to as conduction) occurs when flames come in direct contact with a part of the structure, transferring heat and leading to ignition. Lastly, embers from a wildfire are lifted into the atmosphere by heat generated from a fire (process referred to as convection). Embers can travel over a mile and ignite a new fire where they land. If a wildfire ember lands in dry leaves on a roof or in a gutter, the ember can ignite the leaves and potentially ignite the structure.

Embers are the primary way homes ignite during a wildfire.

Firescaping helps limit structural ignition by radiant heat or direct flame contact by modifying fuels in close proximity to the structure. Firescaping cannot, however, prevent embers from landing on and around the structure. Limiting ember ignition entails a combination of home structural maintenance/ modification and firescaping.

Replacing a structure's building materials with less flammable materials can be expensive. Firescaping is a cost-effective means of helping protect the structure from igniting by reducing risk around it. Understanding which parts of a residential or other structure are most vulnerable to wildfire, however, can assist in reducing wildfire risk alongside firescaping. Seasonal and annual maintenance to the exterior of the structure plays a crucial role in minimizing risk (IIBHS, 2020). Learn more ways to reduce structural ignition at the Insurance Institute for Business and Home Safety wildfire resources webpage at https://ibhs.org/risk-research/wildfire/.

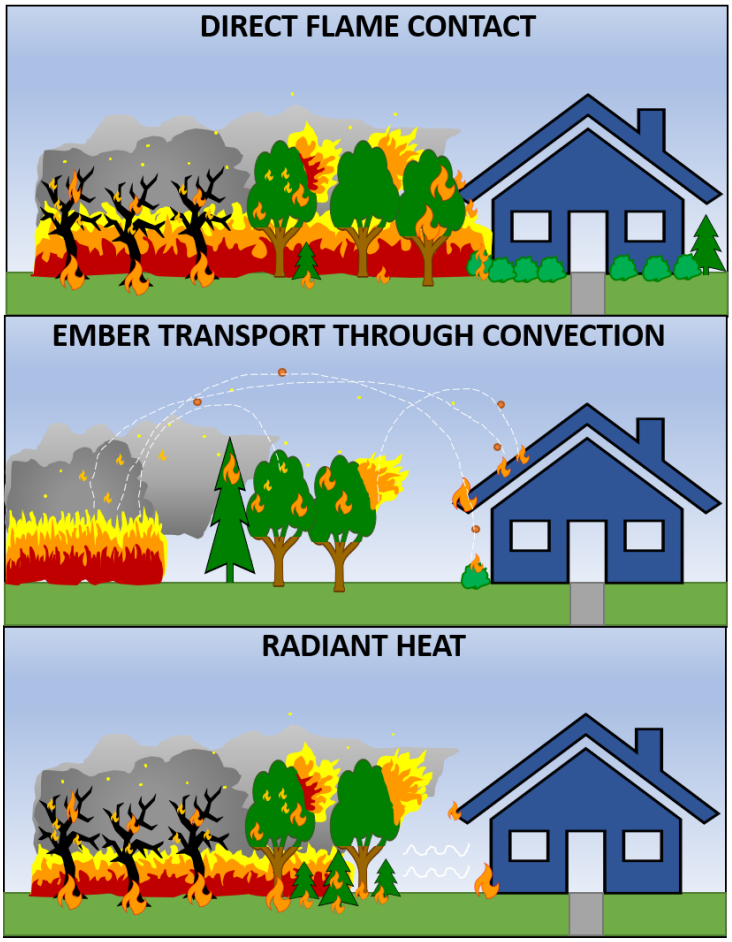


Figure 6: *Homes ignite from wildfires in three primary ways: direct flame contact, convective lifting of embers, and radiant heat.*

Some of the most vulnerable parts of a structure:

ROOF, DECK, GUTTERS, ATTIC VENTS, AND EAVES

This vulnerability originates from:

- **Embers igniting fuels on the structure** (ex., leaves on a deck or roof)
- **Embers blowing into the structure** (ex., embers blowing into attic vents)
- **Adjacent fuels igniting the structure through direct flame contact** (ex., shrubs igniting siding)
- **Adjacent fuels igniting the structure through radiant heat ignition** (ex., one burning structure igniting an adjacent structure)

Source: IIBHS, 2020

LANDSCAPE FUELS

All fuels will ignite if dry enough, but some fuels ignite easier than others. We will briefly discuss plant flammability, mulch, and landscape structure flammability. This information assists in planning and maintaining a firescape.

Plant Flammability. Understanding key plant characteristics (Table 1) that increase a fuel's flammability in dry weather conditions is helpful for assessing a plant's flammability. **It is recommended to use low flammability plants in a firescape.** To learn more about plant flammability and recommended low flammability species, see publications listed in the Additional Resources.

Mulch. Common landscape mulches can be classified as non-flammable or flammable (Table 2). Non-flammable mulches such as gravel do not ignite in wildfires. Mulches made from organic materials such as pine

TABLE 1: GENERAL PLANT FLAMMABILITY CHARACTERISTICS (DORAN ET AL., 2004; HERMANSEN-BAEZ ET AL., 2011).

CHARACTERISTIC	HIGHER FLAMMABILITY	LOWER FLAMMABILITY
Moisture	Low moisture	High moisture
Chemical components	Volatile oils, waxes, or resins (high concentrations in leaves, bark, fruit or other plant parts)	Lacks/contains minor amount of volatile oils, waxes and resins
Leaves	Thin or narrow leaves	Wide, flat leaves
Plant type	Evergreen conifer species	Deciduous
Branching pattern of shrub or tree	Dense	Loose, open
Bark	Peeling or shredding bark	Bark not peeling or shredding
Retention of dead plant parts	Retains dead branches and/ or leaves	Sheds dead branches and/ or leaves

straw or wood mulch are flammable, but some organic mulches are more flammable than others. Landscape mulch flammability research results suggest that low-flammability mulches lay flat and form a dense layer with minimal air space (less available oxygen), ignite less easily, have a shorter burn time, and contain a lower volume of fuel consumed than mulches without these characteristics (Zipperer et al., 2007; Rogstad et al., 2014). Moderate flammability mulches exhibited moderate flame lengths and a higher volume of fuel consumed (Zipperer et al., 2007; Rogstad et al., 2014). High flammability mulches were found to ignite quickly, have tall flame lengths, and consume all available fuel in a short amount of time (Zipperer et al., 2007; Quarles and Smith, 2011; Rogstad, 2014). Firescaping recommends using non-flammable or low flammability mulches, especially within thirty feet of a structure.

Landscape Structures. Fences, sheds, arbors, children's play structures, recreational vehicles, firewood, firepits, fences, and propane/ natural gas tanks are common in residential landscapes, yet they can also be flam-

TABLE 2: COMMON LANDSCAPE MULCHES, THEIR FLAMMABILITY AND RECOMMENDED LOCATION AND ZONE IN A FIRESCAPE (ZIPPERER ET AL., 2007; QUARLES AND SMITH, 2011; ROGSTAD, 2014).

MULCH TYPE	RECOMMENDED ZONE
NON-FLAMMABLE	
gravel river rock lava rock decomposed granite pavers	0-5 feet from structure/Immediate Zone
FLAMMABLE/ ORGANIC	
Low flammability	
garden compost composted wood chips shredded bark*	5-30 feet from structure/Intermediate Zone
Moderate flammability	
pine bark nuggets wood chips	> 30 feet from structure/ Extended Zone
High flammability	
pine straw wheat straw shredded evergreen mulch rubber mulch	Not recommended or as far from structure as possible/ far edge of Extended Zone

* One exception to this is shredded Western redcedar mulch, which was found to exhibit high flammability in a study by Quarles and Smith (2011) due to the significant air space created in the ground mulch.

mable. For this reason, it is recommended to place landscape structures greater than 30 feet from a residential structure where possible and manage fuels around them (NFPA, 2020). In a residential landscape, for example, not all landscape structures can be located greater than 30 feet from a residence. This could be due to a small lot size, Homeowners Association (HOA) rules, or the type of landscape structure. A fence is one example. Because fences typically attach to the side of a residential structure and are usually made of flammable materials (wood or vinyl), they can ignite the residence.

FIRESCAPING

Firescaping reduces the risk of a residential or other community structure igniting from wildfire by modifying all fuels 100 feet or more from all sides of the structure. To help prevent structural ignition, the main objectives of firescaping include:

- Modifying landscape fuels: Firescaping recommends specific pruning, thinning, and spacing of landscape vegetation; modifying the amount and type of mulch used; and careful placement of flammable landscape structures.
- Using low-flammability fuels: Ideally, low-flammability plants, mulch, and landscape structures are used in a firescaping.
- Creating space between fuels (fuel breaks): Firescaping recommends creating space between fuels to slow or stop the spread of fire towards a structure. This can be achieved by developing areas of the landscape with minimal or no fuels, known as fuel breaks. Examples of fuel breaks include a maintained lawn, walkway, driveway, dry riverbed, trail, and mulched area.
- Maintaining the firescape: Without annual and seasonal maintenance, a firescape cannot continue to help reduce wildfire risk.

Firescape design and maintenance guidelines are centered around three zones based on their location from the structure (NFPA, 2020).

- Immediate Zone (0 -5 feet from all sides of the structure)
- Intermediate Zone (5 – 30 feet)
- Extended Zone (30 – 100 feet)

The Immediate Zone begins at a structure or its attachment (ex., patio or deck) and extends out to five feet. For example, the Immediate Zone begins at a structure's exterior walls or, if a deck is attached to the home, the Immediate Zone begins at the outside edge of the deck and extends out five feet into the landscape on all sides of the structure. **The Immediate Zone is the most vulnerable location for home ignition. As a result, very few or no landscape fuels recommended for this zone.** The Intermediate Zone begins five feet from the structure and covers the area on all sides of the structure out to thirty feet into the landscape. Lastly, the Extended Zone covers the area thirty to one hundred feet on all sides of the structure.

The following pages provide detailed recommendations and two-dimensional diagrams for the three zones. For each zone, recommendations are made on plant spacing, mulch, landscape structure placement, maintenance, and more. Most of the recommendations included below were developed by the National Fire Protection Association Firewise USA program. Additional information is based on other wildfire programs or research (Zipperer et al., 2007; Quarles and Smith, 2011; Smith et al., 2011; Rogstad, 2014; UNCE, 2020).

IMMEDIATE ZONE (0 – 5 FEET FROM STRUCTURE)

The Immediate Zone is the most vulnerable area around a structure to wildfire ignition. There should be little to no fuels located in this zone.

Vegetation:

- Foundation shrubs and trees should not be planted in or overhang this zone
- No vegetation is recommended but low-growing, low-flammability succulents (ex., Sedum spp., Senecio spp.), annual or perennial herbaceous plants (ex., Phlox spp., Iris spp., Viola spp.), and lawn can grow in this area if carefully maintained and limited in quantity

Mulch:

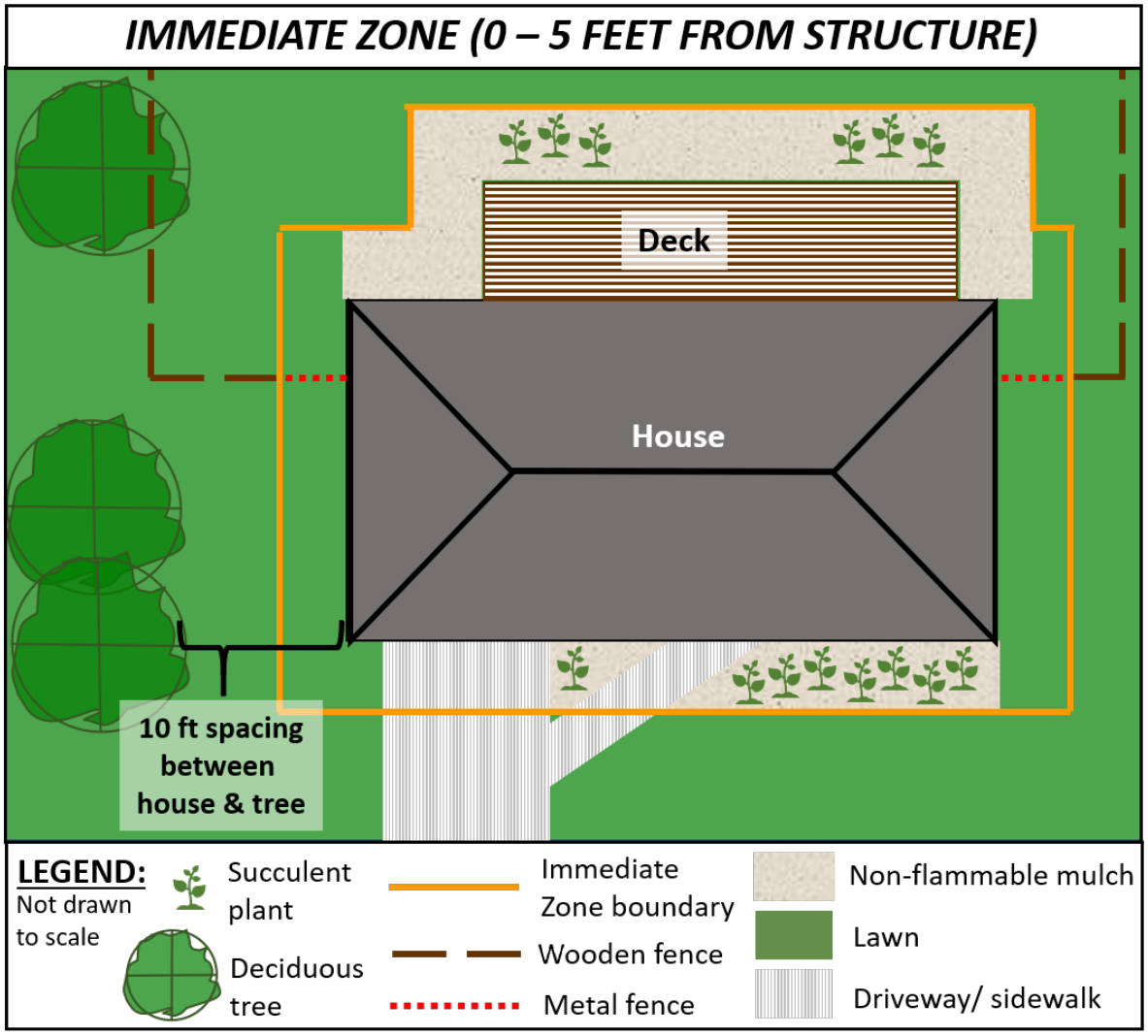
- Non-flammable mulch only

Landscape structures:

- Only non-flammable landscape structures are recommended in this zone, such as metal fencing

Essential maintenance:

- Trim back any dead plant material from succulents and herbaceous plants
- Maintain a moist and mowed lawn (less than 4 inches in height since grass is very flammable)
- Regularly remove flammable materials from mulch (i.e., dead leaves)
- Trim tree branches overhanging this area



INTERMEDIATE ZONE (5 – 30 FEET FROM STRUCTURE)

Vegetation:

- Space individual trees or groups of trees 18 feet apart
- Space individual shrubs/ groups of shrubs 2X the height of the average shrub (ex., if the average height of a shrub is 3 feet, then it should be spaced 6 feet apart from another shrub). Also, space shrubs 10 feet away from/below tree limbs to prevent ladder fuels
- Plant low-flammability vegetation
- Ensure canopy edge, or "drip line," of trees is 10 feet or greater from the structure (consider the mature width of young trees and the distance from the structure when determining their planting location)

Mulch:

- Non-flammable mulch is ideal, however low flammability mulch can also be used
- Apply mulch in a thin layer (organic mulches), maintaining slight moisture from irrigation

Space between fuels (fuel breaks):

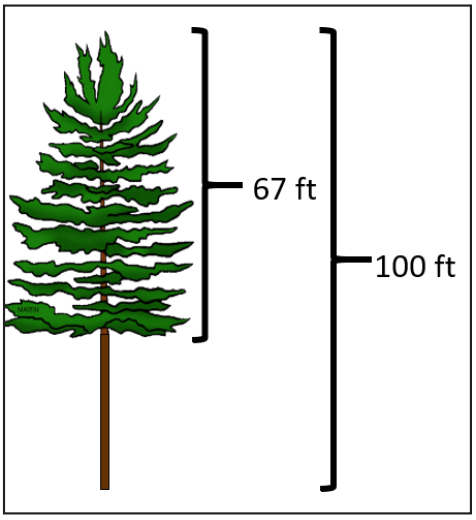
- Create areas with no fuels/ few fuels between landscape beds and individual/ groups of trees and shrubs. Examples include a lawn, mulched area (non-flammable or low flammability types), sidewalk or pathway, driveway, or dry riverbed

Landscape structures:

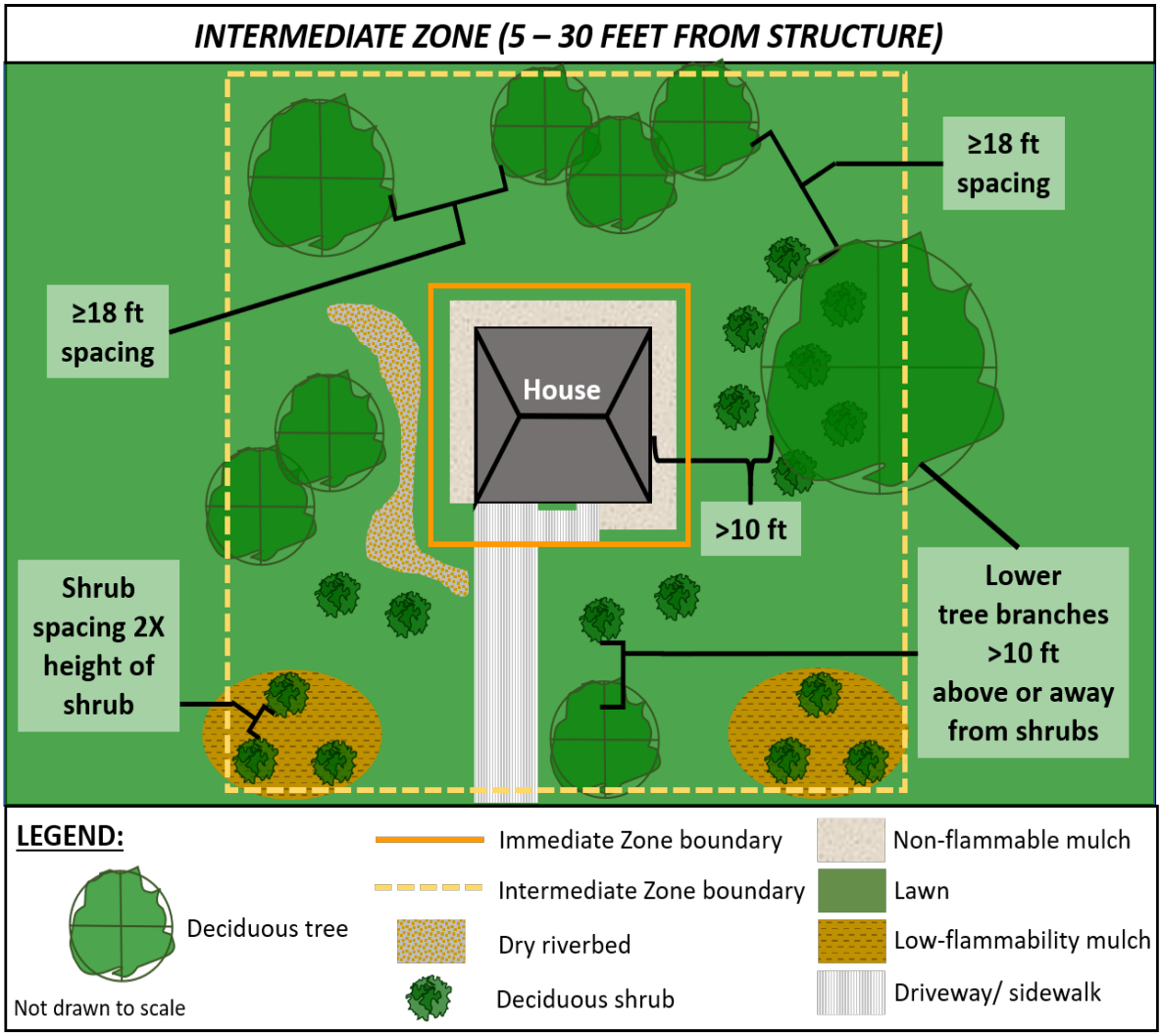
- No landscape structures are recommended in this zone, except fencing. Flammable fence material (i.e., wood or vinyl) can be used in this zone if the part of the fence attached to the home in the Immediate Zone is non-flammable (metal). Non-flammable fence material is also recommended to be used between residences/ other structures less than or equal to 20 feet apart (Only used where the structures are 20 feet apart. Wood or vinyl fencing can be used for other parts of the fence where structures are not in close proximity)

Essential maintenance:

- Trim back dead plant material and maintain tree and shrub spacings mentioned above
- Prune branches of large trees to 10 feet above the ground or 10 feet above vegetation below*
- Mow lawns ≤ 4 inches in height and maintain sufficient moisture
- Remove dead leaves or other flammable materials from fuel breaks
- Remove large quantities of fuel accumulations under vegetation or on lawns (ex., leaves)



*To maintain optimal tree health and structure, limit excessive pruning of a tree canopy. For most urban or suburban trees, it is recommended that two-thirds of the total height of a tree be left as tree canopy, if possible. This is referred to as a 2/3 live crown ratio. For example, if a tree is approximately 100 feet tall, then leaving about 67 feet of the total height of the tree in canopy is recommended. Note: In a forest setting the canopy height will naturally be less due to shading.



EXTENDED ZONE (30 - 100 FEET FROM STRUCTURE)

Vegetation:

- Space individual trees or groups of trees 12 feet apart (30-60 feet from the structure) and 6 feet apart (60-100 feet from structure)
- Shrub to shrub and shrub to tree spacing same as Intermediate Zone
- Low-flammability vegetation recommended. Any higher flammability vegetation should be planted at far edge of this zone (close to 100 feet from structure) and isolated by fuel breaks
- Locate any wildlife habitat areas (ex., dead standing tree/ snag, small brush pile, etc.) at far edge of this zone (close to 100 feet from structure)

Mulch:

- Non-flammable or low flammability mulch recommended, but moderate to high flammability mulch can be used in this zone if carefully managed and located (High flammability mulch, especially, used as far from the structure as possible or close to 100 feet from structure)
- Apply mulch in a thin layer (organic mulches), maintaining slight moisture from irrigation

Fuel breaks:

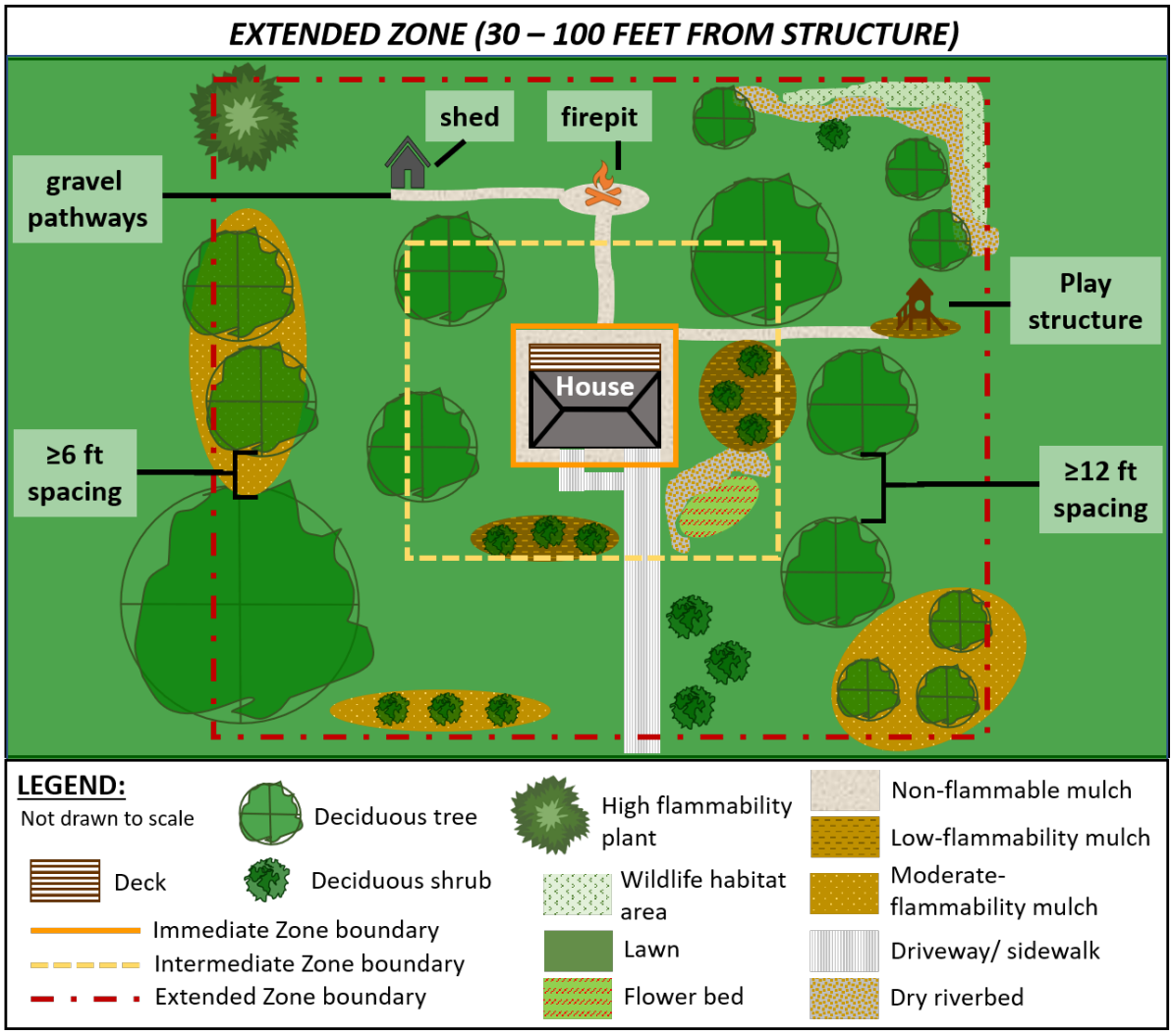
- Create wide fuel breaks between landscape beds and individual/ groups of trees and shrubs, as well as around landscape structures, wildlife habitat (i.e., snags or brush piles), and other flammable fuels

Landscape structures:

- All landscape structures can be placed in this zone (i.e., fire pits, fuel tanks, play structures, etc.), but care should be taken to manage fuels around them and prevent ignition (similar to fuels management around a residential structure)

Essential maintenance:

- Same as Intermediate Zone



OTHER FIRESCAPING CONSIDERATIONS

SLOPE

As mentioned earlier in the publication, slope is one environmental factor that affects fire behavior. Fire moves faster uphill than downhill. The severity of a wildfire can depend on the percent slope and the vegetation type and density on the slope. For this reason, homes built on slopes greater than 20% can be at greater risk to more extreme wildfire behavior than homes on slopes less than 20%. Residences and structures constructed on slopes greater than 20% should consider firescaping out to 200 feet (instead of 100 feet) on the slope side of the structure (Smith et al., 2011). The only exception to this is when grass or herbaceous plants are the only vegetation growing on the slope. Under these circumstances, only 100 feet of firescaping is recommended (Smith et al., 2011). As well, shrubs and trees are recommended to be spaced further apart on slopes greater than 20% .

EMERGENCY ACCESS AND VISIBILITY

Firefighters may not be able to protect all structures in the event of a wildfire, especially if the fire department cannot locate or access the structure. Developing a relationship with your local fire department is a great way to relay any specific information about the structure, in the way of emergency instructions or even providing a key to your security gate. Improving access to your home or business is facilitated by establishing proper emergency vehicle clearance and having a clearly marked address. Table 3 lists recommendations for improving property location and access (UNCE, 2020).

TABLE 3: EMERGENCY VEHICLE ACCESS RECOMMENDATIONS (UNCE, 2020).

Location	Recommendation
VISIBILITY	
Neighborhood	visible street signs
House/Other structure	4 inch reflective letters on mailbox. Clear house number (from street)
ACCESSIBILITY	
Driveway width	≥ 12 feet wide
Driveway slope	≤ 12%
Overhead clearance	≥ 13.5 feet overhead
Driveway clearance (both sides of driveway)	10 feet

EXPANDING AREA OF RISK REDUCTION

The greater the area of risk reduction, the more beneficial firescaping can be. Working with neighbors, a neighborhood, Homeowner Association (HOA), or the broader community to expand firescaping beyond a single residence or business enhances overall risk reduction. The Fire-Adapted Communities model is one approach to a community-level collaborative effort. Additionally, Firewise USA developed a program called Firewise USA Sites that is a group of neighborhood or community members that unite to reduce their collective wildfire risk. The US currently has approximately 1,500 Firewise USA Sites, with 110 in Georgia alone. See Additional Resources for more information about Fire Adapted Communities and Firewise USA sites.

Conclusion

Firescaping is a type of landscape design and maintenance that creates an attractive landscape while also helping reduce a home's risk to wildfire. WUI communities and/or residences, in particular, benefit from firescaping because WUI communities are at greatest risk to wildfire. Firescaping risk reduction is enhanced when used in combination with maintenance and/or modification of structural materials, improved emergency access to a property, and expanding the area of risk reduction at a neighborhood or community scale.

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CONTACTS

Georgia Forestry Commission Firewise Communities Coordinator: georgiafirewise@gfc.state.ga.us, (706) 897-1676

UGA Warnell School of Forestry & Natural Resources- Holly Campbell: hollycam@uga.edu

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