100 Hills Assessment Narrative

Infrastructure

One Hundred Hills lies at the base of the McDowell Mountain Range in Scottsdale. The majority of the community are full time residents. 100 Hills has one primary ingress/egress road (E Paradise Lane). All roads are at least 20 feet wide with mini cul-de-sacs with adequate turning available. The street signs are larger than four inches, but not reflective. Lot sizes vary from less than an acre to 2+ acres. The predominant home construction consists of non-combustible siding/decking with Class A roofs. There are a few vacant lots that are currently being developed. There are numerous hydrants located in the community and the closest Fire Station is less than 10 minutes away. All utilities are underground and properly identified.

Aerial of the community

Topography

100 Hills is nestled at the base of the McDowell Mountain Range and has numerous micro/macro drainages and washes within and adjacent to the community. Multiple peaks tower above the McDowell Preserve, (Thompson, Sunrise, McDowell, Drinkwater). The drainages contain narrow, box canyons, and

chimneys. These topographic features will, likely, significantly influence fire behavior, growth, and direction. Chimneys and box canyons compress and funnel heat accelerating rate of spread. Thus the washes within 100 Hills are gentle and gradually become steeper as fire moves up drainage. Fires igniting at the bottom of slopes tend to become large because they have the ability to gain a head of steam. Slopes can have a heavy influence on diurnal wind patterns. Winds typically flow upslope/upvalley during the daytime and reverse, downslope/downvalley, after dark with the natural heating of the Earth's surface. Red flag warnings in MMR will, likely, add a compounding factor to wind.

Looking East

Looking West

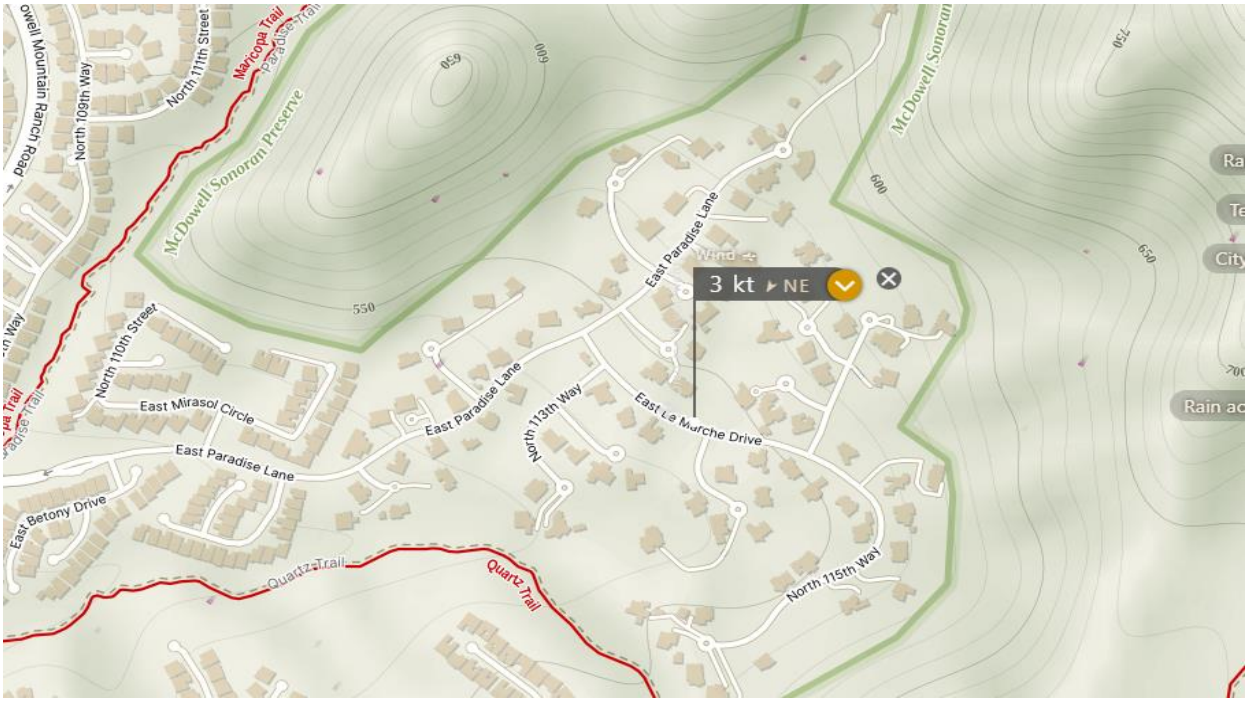
Vegetation

Vegetation in 100 Hills consists of native Sonoran Desert species such as: mesquite, cacti, palo verde, creosote, brush and grass. Brittlebush was observed in the community. This is a volatile invasive species. The majority of the vegetation appears to be healthy, and lush. While some appeared to be dormant due to seasonality.

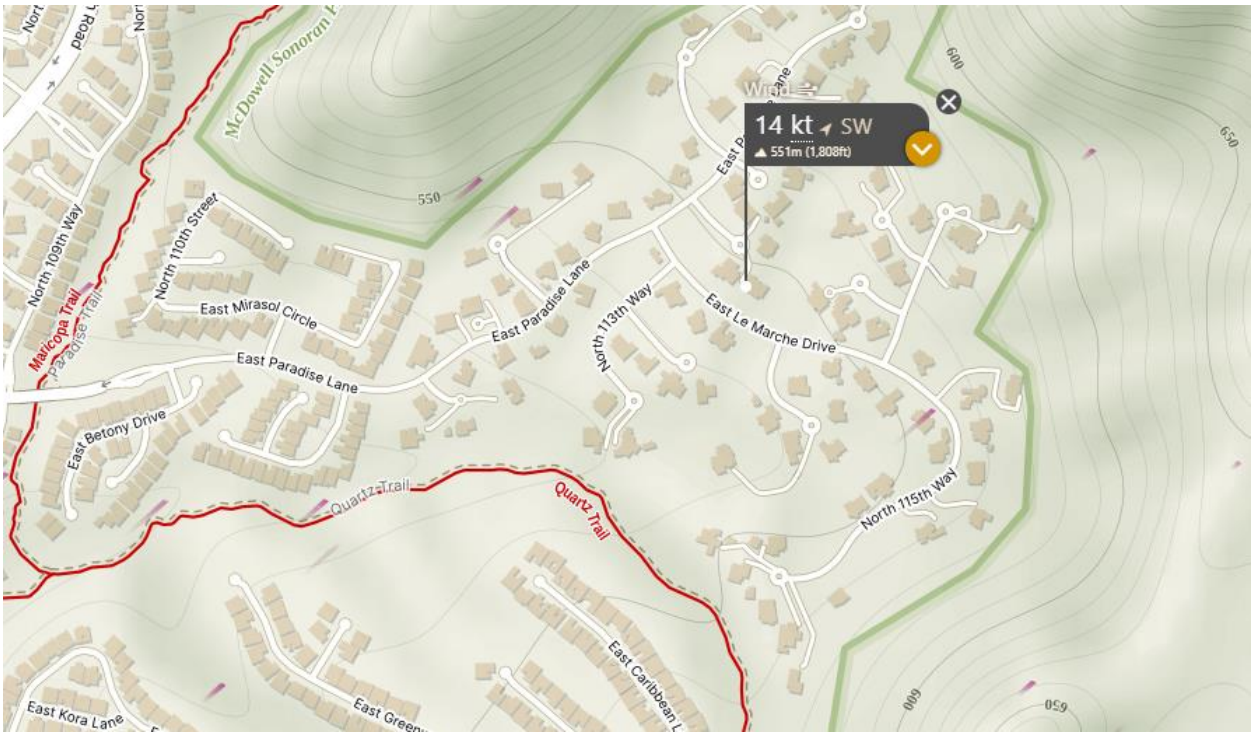
The vegetation along most roadways satisfy extended zone recommendations. However, the majority of the washes contain heavy fuel loading and continuity. This can support very active fire behavior and wind driven runs. Drainages contain a fair amount of dead or stressed vegetation. This vegetation is increasing the energy release component (ERC) of that area. Loading is consistent across the drainages with no areas having higher concentrations. Vegetation management in the wash is heavily restricted due to local City Policy and Ordinance, so more education and focus on homeowner engagement and empowerment to perform work within private property lots is paramount.

Weather

100 Hills is located within the Sonoran Desert of the Southwestern United States. As such, it is subject to periods of strong, very hot/dry pre-monsoonal weather between the months of April-August each year. As a result, 100 Hills is at risk of critical and sometimes extreme fire behavior. Usually starting in early to mid-July, typical weather will include periods of monsoonal activity with varying amounts of possible rain and at times heavy lightning activity. Additional periods of wet and/or extremely dry and hot weather will have an impact on the fire risk and fire behavior of the community. With the variable rain levels, the presence (or lack) of excessive flash fuels will also have an impact on fire spread and intensity. Furthermore, outflow winds from developing thunder cells could create high velocity wind that flows up slope, or down slope into the community.



Northeast winds at 9am-typical diurnal wind pattern



Southwest winds at 2pm-typical diurnal wind pattern.

These snippets represent the typical diurnal wind patterns that occur on most slopes across the west. The increase in wind amplifies the fire's ability to loft fire brands further ahead of the flaming front, and accelerate fire growth. Furthermore, this shift in wind can present the community with multiple fire

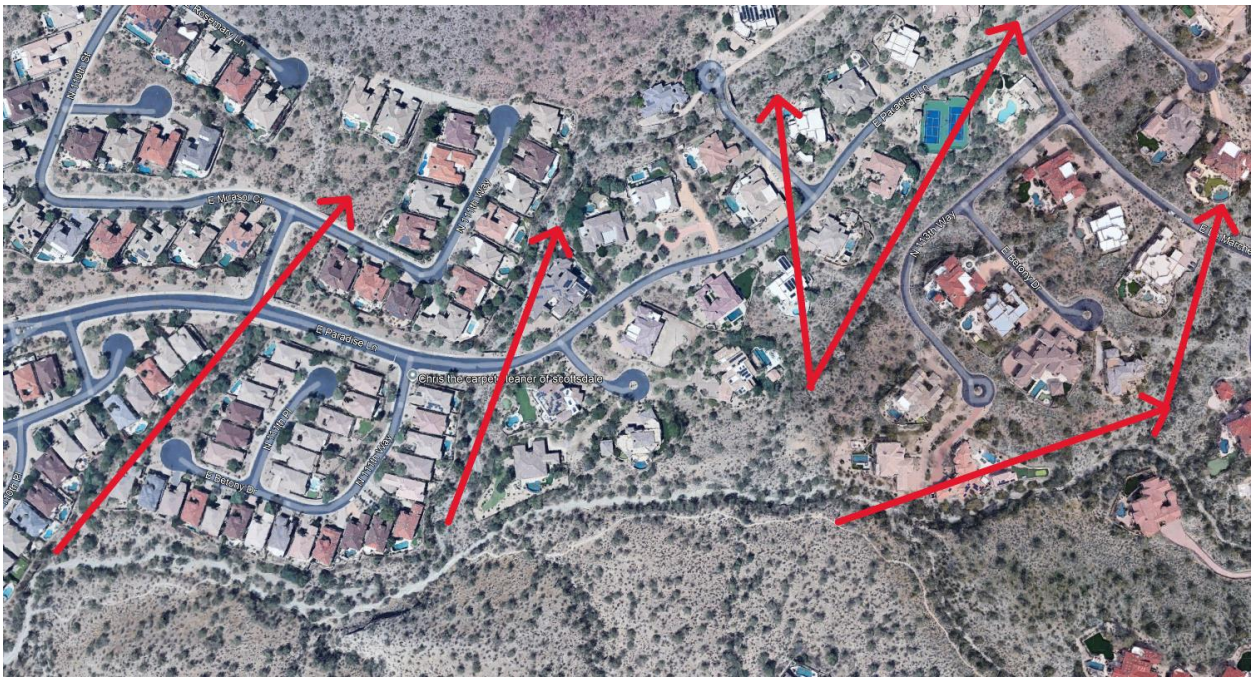
fronts in a given burn period. Shifting and combatting winds can make it difficult for firefighting resources to engage in suppression tactics including aircraft.

Fire History

Since 2015, multiple wildfires on state, city, and federal lands have been near the McDowell Mountain Range. Fire frequency varies from year to year. The predominant cause is humans. The highest concern for ignition sources would be lightning and new construction. The winter of 2024 into 2025 experienced less than normal precipitation with above normal temperatures. This environmental condition is restricting the landscape from recovering. The Southwest Geographical Area Coordination Center (GACC) released their early 2025 outlooks through their predictive service. Feb-May 2025 is shaping up to experience, above normal temperatures, below normal precipitation, with some wind anomalies. This may support an early and active onset to fire “season”.

Anticipated Fire Behavior

If fire ignites at the base of the community or in between Cimarron Hills and One Hundred Hills, the red arrow depicts the anticipated burn path for a fire on a typical day. Fires igniting at the base of slopes tend to react to topography and move faster uphill utilizing both conduction and convective heat transfer methods. The fire will loft fire brands and land upslope in The Retreat or above. This can create a spot fire above the community in the Preserve. As the spot fire increases in size and intensity, that fire can overpower the fire below causing the downslope fire to intensify and combine with the larger upslope fire. Moreover, this increase in intensity will overpower most fire suppression tactics including aviation. Residents above the drainages must be provided accurate “ember awareness” information.

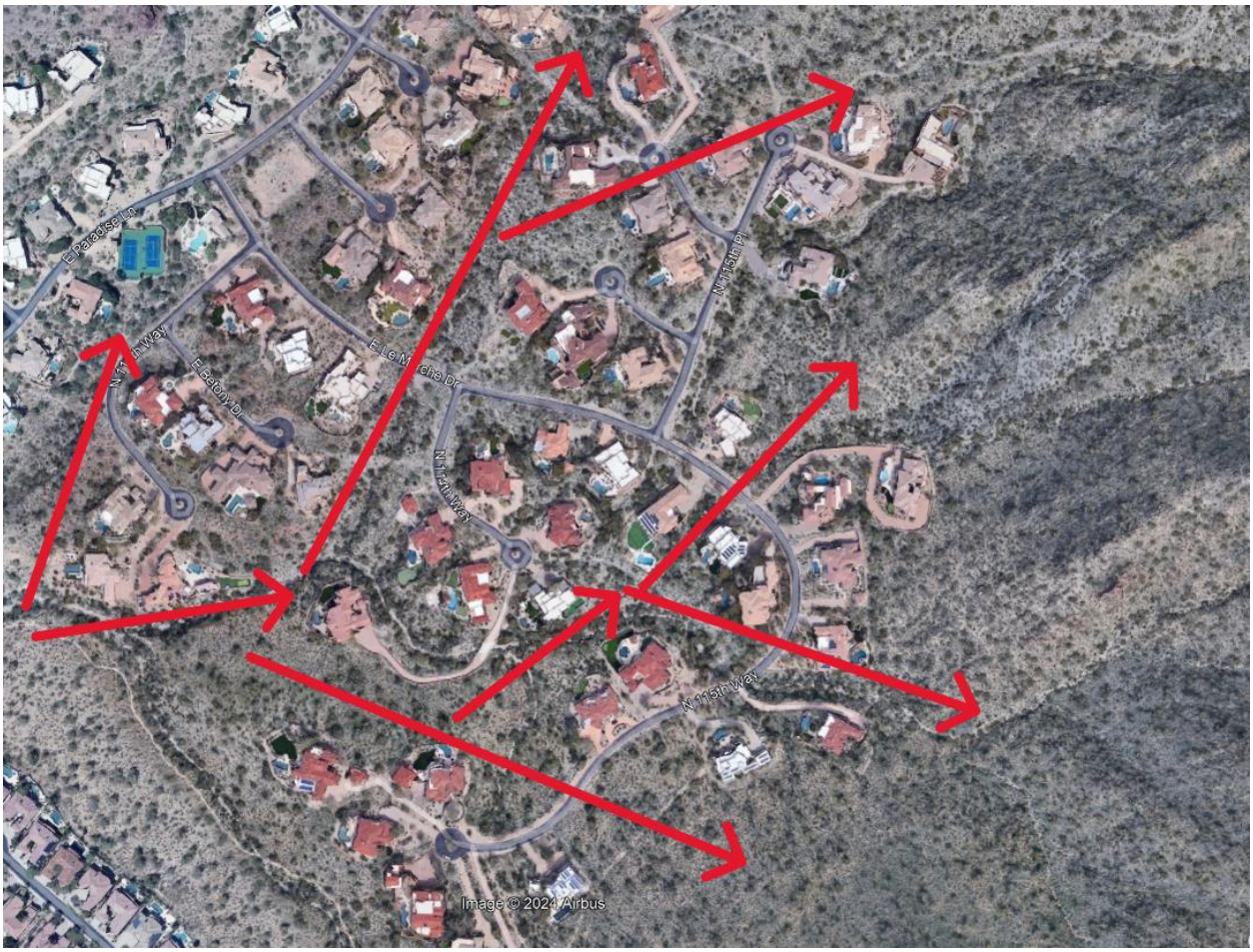


- Discussion Point: (Photo Above)

A fire below 100 Hills will burn upslope intensifying as it burns. A fire in this direction will sock the community in smoke and may potentially cut off the only means of escape for residents (E Paradise Rd). As fire intensifies, it begins to create micro weather patterns including heavy in-drafts to supply the fire. The red arrows depict potential burn paths if fire is established in the drainages with typical upslope/upvalley winds.

- Recommendation:

The Firewise Board, HOA, and local emergency officials NEED to collaborate, develop and disseminate an evacuation plan. If the escape route is cut off, residents will need to be prepared to shelter in place. MCDEM offers a free emergency text alert for Ready, set, go. This text alert can provide residents with enough time to grab important belongings and evacuate the community. Further consideration must be had for smoke impact on the road. Heavy smoke may lay across the road heavily reducing, if not, eliminating the driver's ability to see the road.



Anticipated burn path given typical diurnal wind, fuel loading, and drainage/slope alignment. (All residents above the arrows will receive ember fallout). Fire follows the path of least resistance. If fire environment conditions align, fire can move very quickly stretching any fire suppression efforts thin.

- Discussion Point:

Given the same burn path as above. When fire is established in the drainages/washes, the properties adjacent to drainages/washes must be properly educated on how to harden their home from heavy fire brand fallout. There are numerous paths where fuel from the drainages is contacting fuel on the private property side of the fence. This creates a pathway for fire to carry from the drainages through the intermediate, immediate zone (0-5 ft from STRUCTURE), and subsequently, impact directly on structures. Both photos above display how slope, topography, and wind can align and support extreme fire behavior.

- Recommendation:

Firewise USA's primary goal is community engagement and education. Thirty years of post Fire Investigations and after action reviews have found that fire embers are the leading cause of structural damage or loss from wildfires. Fire embers are flaming material that travels, with the wind, and can land on a receptive fuel bed (grass, patio furniture, boat cover, penetrate a gable vent, poorly screen window, etc). The perception that a wave of fire from the flaming front is igniting homes is false. The Waldo Canyon Case Study provides ample evidence to support that ember fallout should be the primary focus for residents. DFFM hosts “Home Ignition Zone” courses throughout the year around the State.

This scenario depicts the possibility that fire is pushed west with East winds. While fire typically tends to burn slower downhill, it is possible to move fast if fire environment factors align. Nighttime diurnal wind patterns, outflows from storm cells to the east can cause east winds. Factor in the numerous peaks and the fire environment can experience erratic and unpredictable wind patterns. Fire can burn on the eastern slope and with east winds throw fire brands over the ridgeline and down into the One Hundred Hills Community and MMR. A downhill burn can also burn with low intensity just enough to burn the surface fuel while pretreating the canopy, so when the wind shifts or slope reversal, fire can align with topographic features and run uphill. Eddy effects at the ridgeline will create combatting and rolling

winds that will influence ember fallout. Again, proper education and focus to residents should be home hardening.

- Discussion Point:

Fire can impact the community from 360 degrees. With that being said, fuels reduction projects will be large, timely, and very expensive. Fuels management can influence fire behavior, however focusing on the macro does not prepare the structure for fire brands.

- Recommendation:

Remind the resident that their focus shall remain on the micro. Home hardening and working in the Immediate Zone is paramount. IF possible, create horizontal and vertical separation for fuel out to a minimum of 30 feet (Intermediate Zone). Completing the DFFM Home Ignition Zone Course will provide residents with baseline knowledge on how to begin hardening their structures.

NFPA

HOME IGNITION ZONE STRUCTURE ASSESSMENT GUIDE

Note: The assessment is designed to help determine "how vulnerable the structure" will be during the wildfire and to convey recommendations that should be taken so that the home will have a better chance to survive a wildfire.
Remember, the following assessment items are for prevention/mitigation measures to be done well in advance of wildfire season.

Date of Assessment: Property Address: Resident Name: Property Owner:

	Assessment Items	Mitigation Recommendations
1.	OVERVIEW OF SURROUNDINGS	
	How is the structure positioned in relationship to severe fire behavior?	
	Type of Construction.	
2.	CHIMNEY TO EAVES	
	Inspect the roof – noncombustible? Shingles missing? Shingles flat with no gaps?	
	Gutters – present? Noncombustible?	
	Litter on roof, in gutters and crevices.	
3.	TOP OF THE EXTERIOR WALL TO FOUNDATION	
	Attic, eave, soffit vents and crawl spaces.	
	Inspect windows and screens – metal screens? Multi-paned windows? Picture windows facing vegetation?	

- Discussion Point:

Above is the “home assessment form”. This assessment is utilized by a certified assessor to walk around the home with the owner. This assessment allows the assessor to assist in identifying positive areas, areas of concern, and offer reasonable and multiple mitigation recommendations. The assessor can be accompanied by DFFM to provide fire experience and knowledge. The assessor should perform assessment with the homeowner for open dialogue.

- Recommendations:

Discuss with Firewise Board hosting a Home Ignition Zone Course in the community. This is a free class that shares NFPA and expert recommendations on home hardening actions. At a minimum, I recommend the Firewise Board complete the course. It teaches students on the challenges, myths of wildfire, Firewise USA, and ways homeowners can assess their property for firebrand vulnerabilities.

Action Plan “Goal” Recommendations

1) 100 Hills scores in the Low Hazard.
    a) Community centric goals:
        i) What does 100 Hills want to achieve with NFPA Firewise USA?
        ii) How does 100 Hills plan to achieve those wants?
    b) With topographic and environmental influences, Firewise Board must saturate residents with accurate information and Firewise USA recommendations. Topography influences fire behavior, therefore residents may need to take more aggressive actions on their properties to disrupt fuel continuity.
        i) Home assessments performed by DFFM.
        ii) Provide additional information webinar/meetings for residents.
        iii) Understand fire brands (embers) are the leading cause of damage or loss of structure from wildfire, not a wall of fire encroaching the community.
2) Introduce Firewise USA to residents. Distribute Home Ignition Zone poster and brochures, website, and Q&A opportunity with DFFM. The primary focus with Firewise is to increase community engagement through education, and opportunities for community members to share thoughts. Home hardening is primary focus with NFPA Firewise USA.
    a) Collaboration cultivates powerful relationships. Opportunity to identify some areas of concern and share with DFFM. We can collaborate on ideas for outreach, fuels reduction, Firewise event day, home assessments, etc.
        i) Coordinate with Cimarron Hills for joint Firewise Event Day IE: webinar for residents, town hall, or neighborhood barbecue. (Whatever community desires).
    b) Action plan goals:
        i) Host 1 Home Ignition Zone Course in McDowell Mountain Ranch & invite neighboring communities. (2025).
        ii) Consider planning a fuels reduction day to support The Retreat. Consult NAOS maps prior to work.

iii) Consider an evacuation plan to share with residents and appropriate authorities. Incorporate MCSO, SFD, SPD, MCDEM, DFFM.

3) Reference the 2019 Maricopa County CWPP (Community Wildfire Protection Plan). One Hundred Hills (gray circle) is in a moderate risk area. The vegetation loading and stress level has increased since the 2019 CWPP. The vegetation today may be more mature, stressed, and dense. This supports active fire behavior and will produce fire brands. Discuss this with homeowners. Ensure accurate information is provided so residents can make the best informed decisions.

4) Per Maricopa County CWPP (2019), MCDEM (Maricopa County Department of Emergency Management), and local fire departments developed and implemented evacuation plans for high-risk areas. Inquire if there is a plan developed for moderate risk areas. If so, how to retrieve that information to share with residents prior to fire season.

- Additional Firewise communities certified

MCDEM and local fire departments and districts developed and implemented evacuation plans for identified high-risk areas

- Ready-Set-Go! is being implemented

Additional evacuation plans developed and implemented

- AFMA to increase community outreach utilizing Ready, Set, Go!
- Goodyear to test and implemented IPAWS
- Scottsdale to expand their Ready, Set, Go! program

5) Assess the community's vulnerability. Embers from wildfires often land on roofs, where they can ignite and smolder long enough to envelop the home. Education to homeowners on the importance of removing dead vegetation from the immediate zone will need to be an annual priority. Regular maintenance and spot checks should focus on roof tops, gutters, skylights, chimneys and eaves. Roofs can be vulnerable to fire embers because of their large surface area and the accumulation of flammable debris.

6) Continue to improve defensible space (Immediate & intermediate Zone)

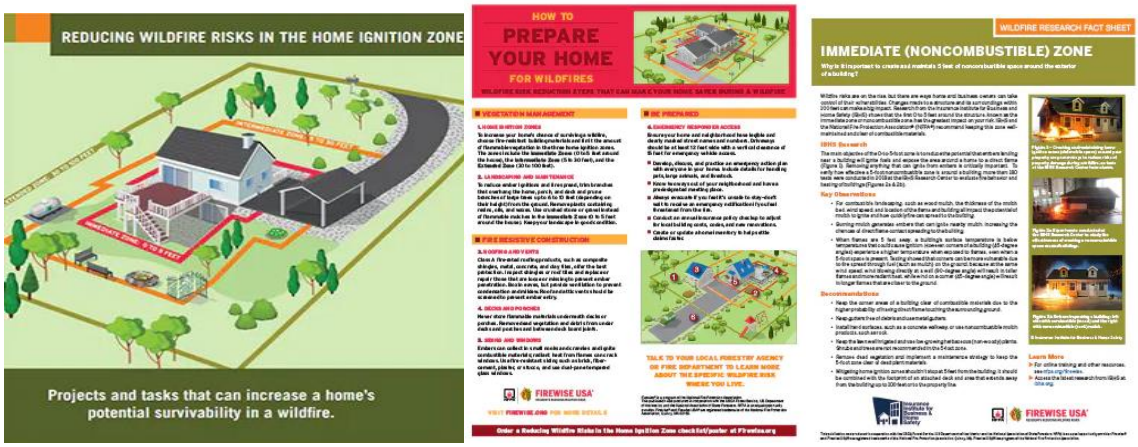
Embers can access garage space through separating jamb

Inspect and install 1/16 micron metal mesh screens to prevent ember penetration

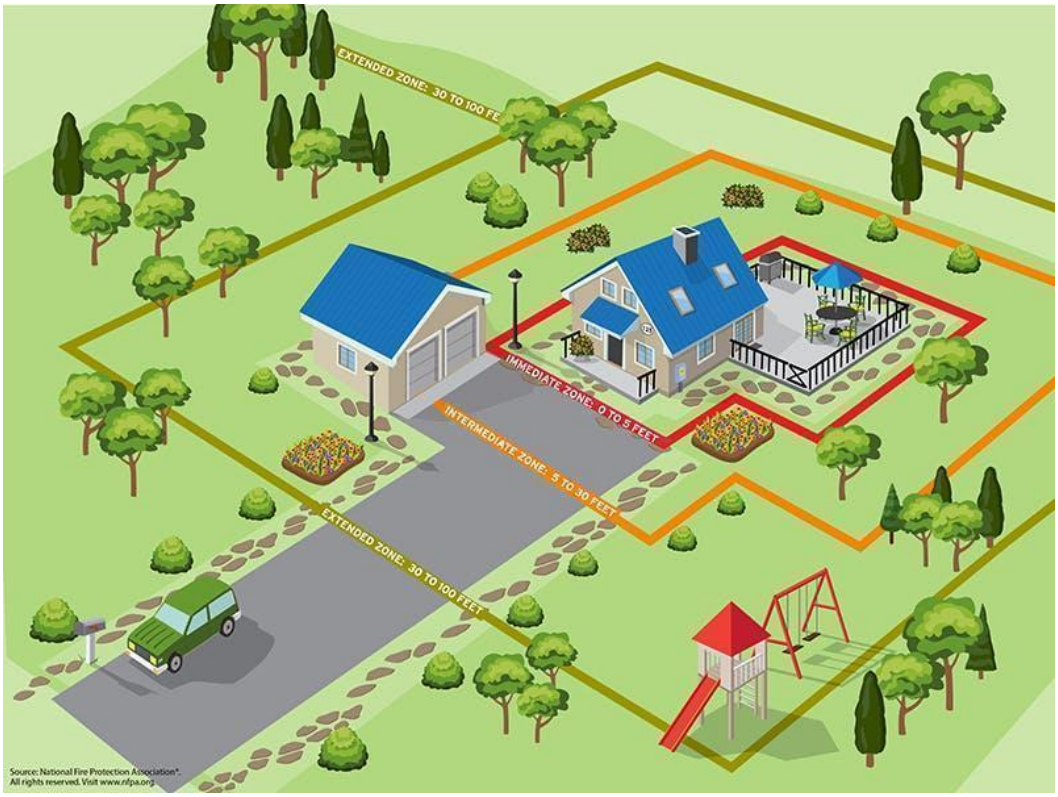
Inspect and install 1/16 micron metal mesh screen to prevent ember penetration through rooftop entry points

How do Homes Burn in a Wildfire?

Contrary to popular belief, most homes do not burn down from direct contact with wildfire flames or radiant heat. Misconceptions about wildfires are too often perpetuated in the media as massive walls of flame that scorch everything in their path. In fact, most structures lost in a wildfire are destroyed by wildfire embers. These embers are usually small burning pieces of debris that are spit away from the wildfire. Embers land on your property, pile up, smolder, and then ignite. These small ignitions on roofs, decks, porches, and other areas of your property are often the main cause of a home being lost to wildfire.



To increase your home's chance of surviving a wildfire, choose fire-resistant building materials and limit the amount of flammable vegetation in the three home ignition zones. The zones include the Immediate Zone: (0 to 5 feet around the house), the Intermediate Zone (5 to 30 feet), and the Extended Zone (30 to 100 feet).



Immediate zone

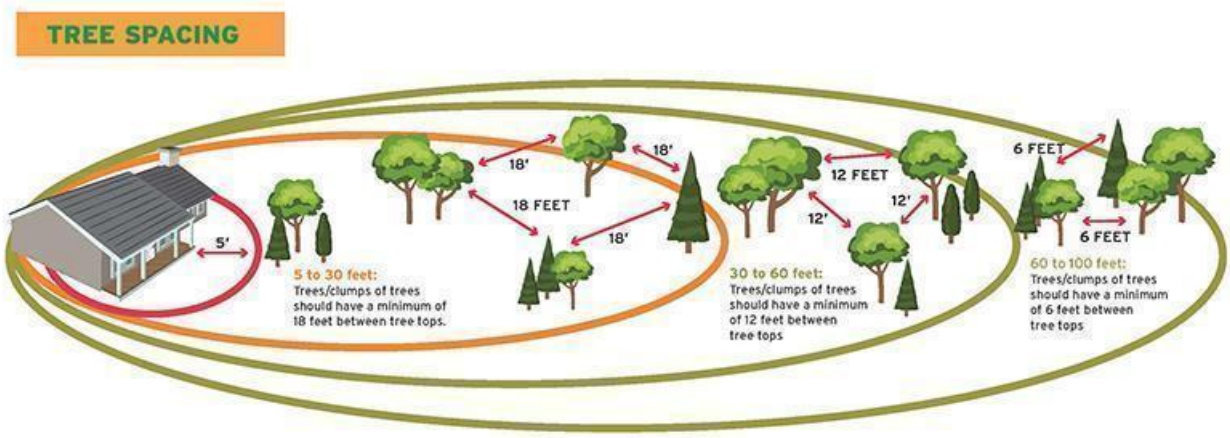
The home and the area 0-5' from the furthest attached exterior point of the home; defined as a non-combustible area. Science tells us this is the most important zone to take immediate action on as it is the most vulnerable to embers. START WITH THE HOUSE ITSELF then move into the landscaping section of the Immediate Zone.

- Clean roofs and gutters of dead leaves, debris and pine needles that could catch embers.
- Replace or repair any loose or missing shingles or roof tiles to prevent ember penetration.
- Reduce embers that could pass through vents in the eaves by installing 1/16 inch metal mesh screening.
- Clean debris from exterior attic vents and install 1/8 inch metal mesh screening to reduce embers.
- Repair or replace damaged or loose window screens and any broken windows Screen or box-in areas below patios and decks with wire mesh to prevent debris and combustible materials from accumulating.
- Move any flammable material away from wall exteriors – mulch, flammable plants, leaves and needles, firewood piles – anything that can burn. Remove anything stored underneath decks or porches.

Intermediate zone

5-30’ from the furthest exterior point of the home. Landscaping/hardscaping- employing careful landscaping or creating breaks that can help influence and decrease fire behavior

- Clear vegetation from under large stationary propane tanks.
- Create fuel breaks with driveways, walkways/paths, patios, and decks.
- Keep lawns and native grasses mowed to a height of four inches.
- Remove ladder fuels (vegetation under trees) so a surface fire cannot reach the crowns. Prune trees up to six to ten feet from the ground; for shorter trees do not exceed 1/3 of the overall tree height.
- Space trees to have a minimum of eighteen feet between crowns with the distance increasing with the percentage of slope.
- Tree placement should be planned to ensure the mature canopy is no closer than ten feet to the edge of the structure.
- Tree and shrubs in this zone should be limited to small clusters of a few each to break up the continuity of the vegetation across the landscape.



Extended zone

30-100 feet, out to 200 feet. Landscaping – the goal here is not to eliminate fire but to interrupt fire's path and keep flames smaller and on the ground.

- Dispose of heavy accumulations of ground litter/debris.
- Remove dead plant and tree material.
- Remove small conifers growing between mature trees.
- Remove vegetation adjacent to storage sheds or other outbuildings within this area.
- Trees 30 to 60 feet from the home should have at least 12 feet between canopy tops.*
- Trees 60 to 100 feet from the home should have at least 6 feet between the canopy tops.