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Wildfire Hazard Areas: Residential Structures and Landscaping



Bureau of
Development
Services
FROM CONCEPT
TO CONSTRUCTION



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www.Portland.gov/BDS

One and Two-Family Residential Dwellings

In the Pacific Northwest, fires have historically been a natural part of the changing landscape. If you build next to a fire-prone area, you must take special precautions to protect your life, home and property.

You can create a defensible space around your home. You do this by changing, reducing or clearing potential wildfire fuel materials or vegetation to create a barrier. The barrier slows the spread of wildfire toward your home.

A defensible space also allows room for firefighters to fight fire safely. Three critical steps in creating a defensible space include:

1. using fire-resistant building materials
2. landscaping with fire-resistant plants
3. reducing flammable materials or fuels, such as invasive trees and shrubs, plant trimmings, firewood, fiberglass boats and recreational vehicles around the home

These actions **don't guarantee that your home will survive a wildfire**. They can make your landscape and home more wildfire resistant. They may also slow the advance of a wildfire. Several factors affect the chances of your home surviving a wildfire like the:

- expanse of an approaching fire
- number of homes threatened
- number of fire engines deployed to each neighborhood

Whether a home survives a fire depends on the fire-resistant characteristics of the building. By using fire-resistant materials when building or remodeling, you can greatly increase the chances of your home surviving a wildfire.

FIRE RESISTANT CONSTRUCTION RECOMMENDATIONS

Roof coverings and design fire safety tips

Studies show the roof is the most vulnerable to wildfire. A couple of things you can do:

- Roof your home with nonflammable roofing materials. This is the strongest line of defense in wildfire protection. A treated wood shake roof provides the least protection.
- Use a simple hip or straight gable roof design when building in a wildfire area. Roofs with intersecting planes and valleys form dead air pockets and eddy currents that help fan the flames of a fire.

These materials are especially resistant to foliage-borne fires that rain hot embers:

Aluminum, Steel, Concrete, Clay, Slate, Composition, Asphalt

Outside walls- safer siding options

Use non-combustible siding. Many siding products made from cement and gypsum won't ignite. Use stucco, stone, masonry and other materials instead of wood to prevent fire from going into the walls. These materials cost the most, but they give walls a higher fire resistance rating.

Redwood and cedar siding are harvested from trees in mature forests. You can save habitat by buying nonflammable materials. Also, back the siding that you use with gypsum board rated for exterior use. Especially do this if you use exterior siding made of wood, vinyl, steel or aluminum. It provides a nonflammable membrane. Gypsum

breaks the heat conduction sometimes transferred by steel and aluminum.

Heat-resistant windows

- Consider installing dual- or triple-glazed windows. The exterior panes of energy-efficient, dual-glazed windows can crack when exposed to the heat of a wildfire, but the interior panes might stay intact.
- Increase heat resistance by using tempered glass. Tempered glass costs about 50% more than regular glass.
- Use glass block where you need natural lighting, don't care about the view (or want privacy), and the window faces a very high fire hazard area.

- Choose functional metal shutters. This can add another 10 to 20 minutes of protection to a window, which is all that a window might need to survive a fire. You must close the metal shutters before the fire reaches the home.

Eaves, fascias, soffits and vents fire safety guidelines

- Protect the underside of eaves and overhang areas with nonflammable siding.
- Construct fascias of nonflammable material or, at a minimum, two-inch nominal dimensional lumber.
- Do not locate attic ventilation openings in soffits, fascias, or anywhere in the eave overhang.
- Screen attic ventilation openings, foundation or under-floor vents, and vents through roofs with wire mesh screen. Openings should be less than ¼ inch to stop airborne embers. Ventilation openings provide a natural air flow into the structure and can allow embers, flames, and fire gases to enter the building and start a fire.

Decks and fire safety

The typical deck design can easily catch fire. The components of a deck, such as joists, decking and railings are made of two-inch thick wood. This gives the deck a high surface-to-volume ratio. As a fire approaches, hot gases can get trapped underneath and ignite the deck structure. To help prevent deck fires:

- Choose fire resistant materials or larger heavy timber components for deck construction.
- Create fire barriers by wrapping decks higher than 24 inches from the ground with nonflammable siding.
- Screen all vents and crawl space openings to ward off burning embers.
- Do not store flammable items underneath the deck.

Fire-rated outside doors you can buy

Best choice	Fire-rated door
	Metal door
	Solid wood door
Worst choice	Hollow wood door (AVOID)
	Plastic composite door (AVOID)

- Check for adequate weather stripping. A good seal can prevent hot gases or burning embers from entering your home.
- Choose overhead garage doors made of metal.
- Use multi-paned entry windows and garage doors. Or, use windows and doors made of tempered glass.

Fire safety for detached buildings

Detached buildings, such as tool sheds and garages, located less than 30 feet from the home should have outside walls and roofs made of nonflammable materials.

Interior walls, ceilings, and floors and fire-resistant gypsum

Building codes typically require fire-resistant gypsum wallboard in certain areas of a home, including between a garage and the main house.

- Consider using fire-resistant gypsum wallboard in walls, floors and ceilings to create fire barriers.

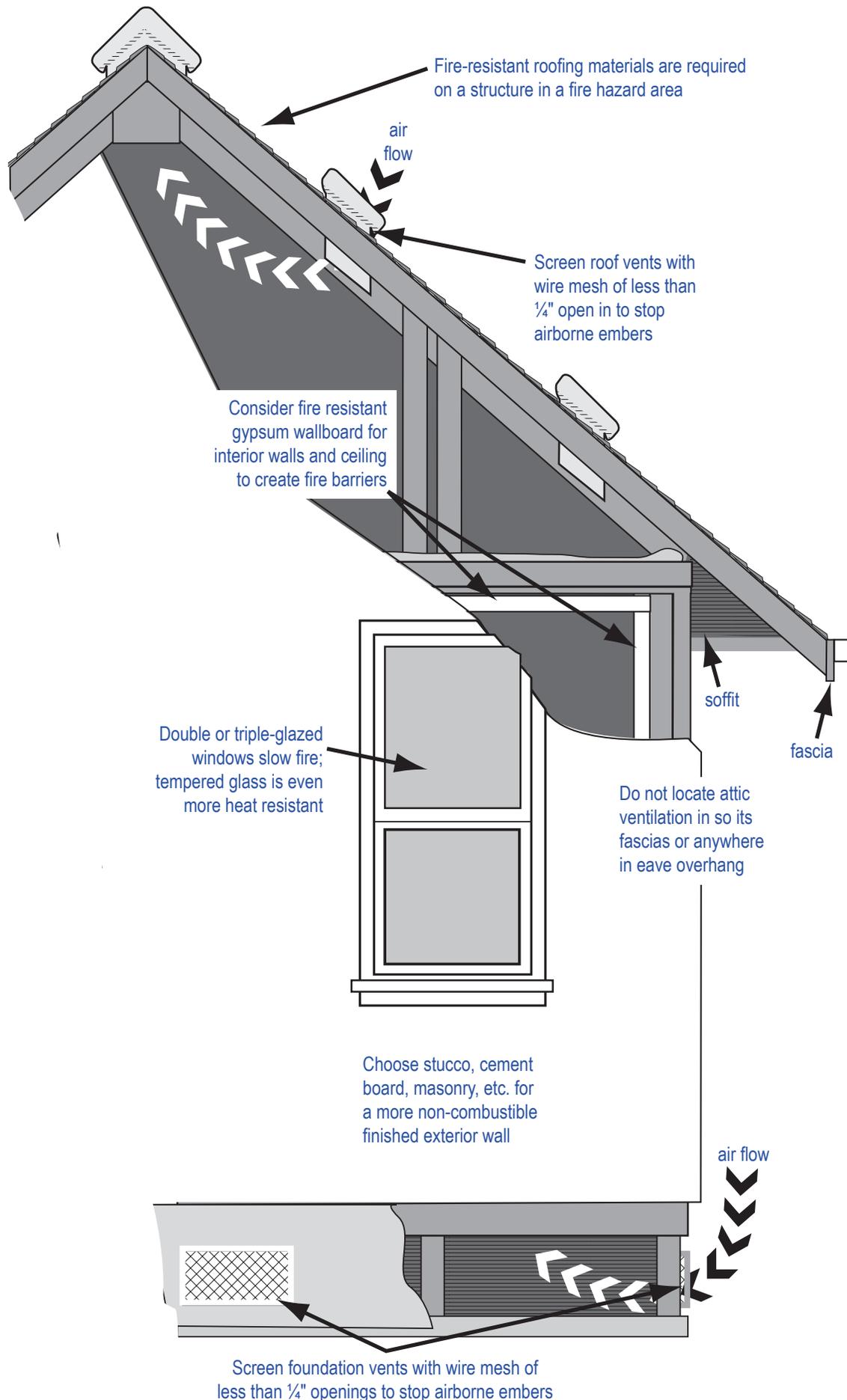
Interior automatic fire sprinklers

Residential fire sprinklers have become much more affordable in recent years. You install sprinklers to protect the interior of the home, but they may not stop a wildfire that has broken through your home's outside protection.

But, sprinklers may reduce significant fire damage inside your home. Sprinklers may also stop a fire from spreading to nearby trees and plants. Best of all, sprinklers reduce the risk of fire deaths by 75% when combined with smoke alarms.



MAKING STRUCTURES MORE FIRE RESISTANT





How to manage your landscape

The most important action a homeowner can take is to create a wildfire-resistant landscape. You can do this through proper plant placement, plant spacing and ongoing plant maintenance. Some of the following wildfire-resistant landscaping activities may require a permit.

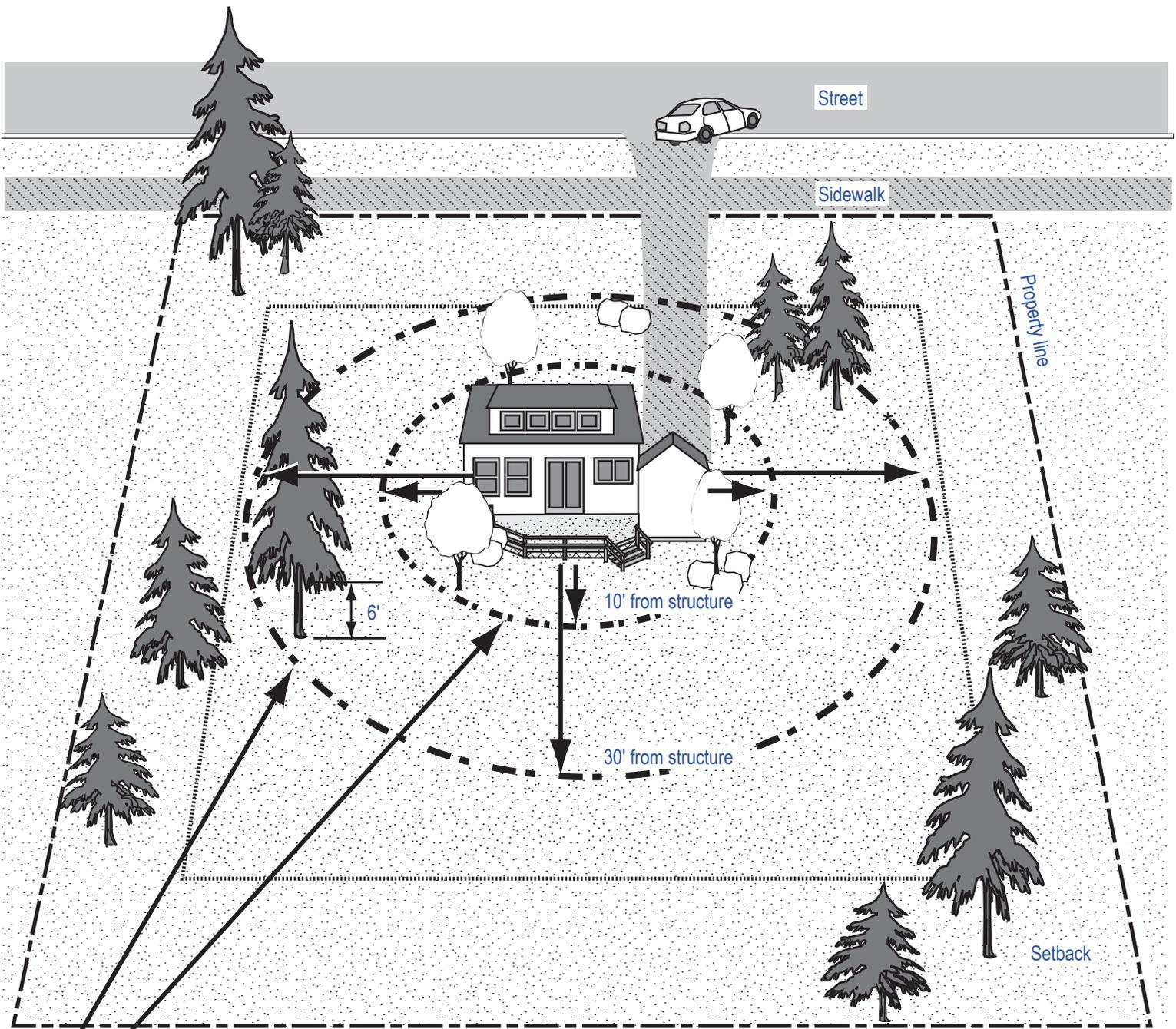
Prior to trimming trees or removing native vegetation, check with the Planning and Zoning staff in the Development Services Center (DSC) to find out if you need a permit.

- ❑ Space groupings of plants so that at their expected mature height, the crowns of the groupings provide at least 10 feet of clear space from each other and from structures. This will prevent fire from spreading across planting groups.
- ❑ Prune back tree branches within 10 feet of walls and roofs. If your property is in an environmental zone, check with Planning and Zoning at 503-823-7526.
- ❑ Trim limbs of coniferous trees within 30 feet of structures so that none of the limbs are closer than 6 feet from the ground. This reduces the chances that a ground fire can “ladder” up into the tree.
- ❑ Water the vegetation near the house to keep moisture levels high and reduce fuel.
- ❑ Cut grasses and other ground covers to a height of less than four inches within established disturbance areas or within landscaped perimeter areas.
- ❑ Rake ground covers such as bark mulch, wood chips, compost, and tree litter away from flammable structural components of your home (decks, siding). Even though ground covers generally only smolder, homes can be damaged by a creeping fire which can ignite structural components.
- ❑ Remove invasive, nuisance plants or prohibited plants from your landscape because they can be highly flammable and can serve as “ladder” fuels. This includes European hawthorn, Himalayan blackberry, Scot’s broom, English holly and English ivy. A full list of invasive, nuisance and prohibited plants you can remove without a permit can be found online in the Portland Plant List at www.portland.gov/bps/environ-planning/portland-plant-list.
- ❑ Maintain plants so that they are free of deadwood and litter. Remove plants that are diseased or infested.
- ❑ Dispose of yard debris away from structures. Compost yard debris or put in curbside yard debris containers to be picked up and recycled. Do not dump yard debris into natural areas as debris piles can provide fuel to an approaching wildfire.
- ❑ Refuel garden equipment carefully. Never refill a gas tank in tall grass or other tall vegetation.
- ❑ If you do not water the lawn through the summer season, or if seasonal water shortages call for a temporary end to irrigation, let your lawn turn brown and then cut your grass as low to the ground as possible.
- ❑ Make sure emergency vehicles can get into driveways over 100 feet in length. Access improvements may require a permit from the Bureau of Development Services (BDS), 1900 SW 4th, first floor. Note: Homes accessed by long driveways should have the address posted near the street.

Include clearance between vegetation and your home for added wildfire safety. Only native plant species should be planted in environmental and greenway zones. The Portland Plant List is available online at:

www.portland.gov/bps/environ-planning/portland-plant-list

LANDSCAPE MAINTENANCE IN WILDFIRE AREAS



- Prune trees and shrubs within 10 feet of structures
- Prune conifers within 30 feet of structures to remove branches up to 6 feet above the ground
- Choose fire-resistant native plants for landscaping
- Remove any plant listed on the City's Nuisance or Prohibited Plant List
- Keep areas near structures irrigated and moist, avoid using bark mulch and if you do, keep it moist
- Maintain landscaped areas
- See the Portland Zoning Code, Ch. 33.430.080, Zoning Code Environmental Zone Exemptions or call 503-823-7526 for more information. The Zoning Code is online at www.portland.gov/code/33

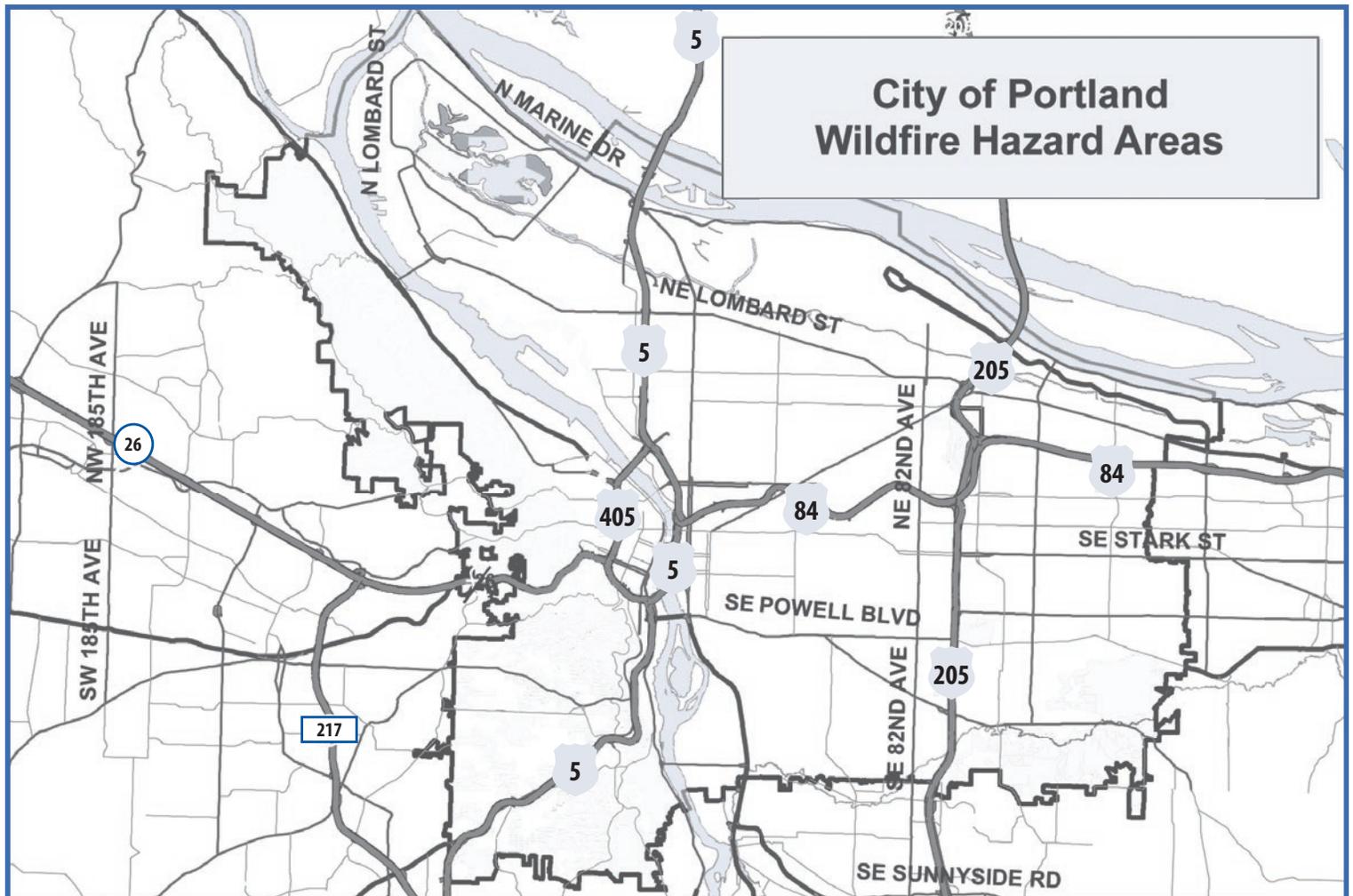
Characteristics of fire-resistant plants

Most plants will burn. The degree of flammability depends upon the type of plants and how dry the season is. Fire-resistant plants do not readily ignite from a flame or other ignition sources. These plants can be damaged or even killed by fire. However, their foliage and stems do not significantly contribute to the fuel, and therefore, don't add to the wildfire's intensity.

GENERAL CHARACTERISTICS OF PLANTS THAT ARE:	
FIRE RESISTANT	NOT FIRE RESISTANT / HIGHLY FLAMMABLE
Moist, supple leaves	Leaves, twigs and stems contain volatile waxes or oils
Little dead wood and tend not to accumulate dry/dead material within the plant	Traps fine, dry or dead materials (twigs, needles and leaves) within the plant and may have papery or loose bark
Water-like sap without a strong odor	Gummy, resinous sap with strong odor
Low levels of sap or resin materials	Aromatic leaves or leaves that have a strong odor when crushed

Most deciduous trees and shrubs (that shed their leaves every year) are fire resistant. However, both native and ornamental plants can be highly flammable. An example of a highly flammable shrub often planted in Portland landscapes is spreading or upright juniper.

Select native plant species that are naturally fire resistant. These plants require little maintenance and provide a relatively low volume of total vegetative fuel load. Choose plants that have **low aromatic oil content, high moisture content, deep roots** and **drought tolerance**.



In the neighborhood

- Develop a neighborhood emergency plan that includes a notification and alert system, a carpool plan and the identification of neighbors with special needs.
- Practice at least two escape routes from your home/neighborhood by car and by foot (remember that evacuation by foot can be extremely hazardous).
- Identify zones in your neighborhood, such as schoolyards, which are safe from wildfire. These open areas can serve as a default evacuation center if roads are blocked and escape from the neighborhood is not possible.
- Prune street trees to allow passage of emergency vehicles. The City of Portland Urban Forestry area offers a no-cost permit for pruning street trees and provides street tree inspection. Call 503-823-4489 for more information.

In your home

- Develop a family evacuation plan.
- Prepare a small “grab and go” kit of essentials that you may need, such as cash, personal items, and medicines – plus items you may need for the care and transportation of pets.
- Use non-combustible siding and roofing materials.
- Enclose eaves with non-combustible materials.
- Do not place attic vents under the eaves or overhangs.
- Wrap decks with non-combustible siding.
- Screen foundation vents and locate them as close to grade as practical.
- Keep gutters and roof free of leaves, fir needles or debris. (Firebrands can travel on air currents for up to a half-mile.)
- Store firewood, picnic tables, recreational vehicles, and other burnable items away from buildings.
- Be mindful when cooking outdoors.
- Avoid using fireworks near vegetated areas. Do not purchase or use illegal fireworks!

After a fire starts

- Implement your family evacuation plan.
- Implement your neighborhood emergency plan.
- Keep roads clear for emergency vehicle access.
- And if you are **positive** you have enough time...
 - Close all windows and doors.
 - Remove lightweight curtains/drapes from your windows; they may catch fire from the radiant heat of a wildfire.
 - Shut off natural gas at the home meter.

You can find more wildfire safety tips at www.ready.gov/wildfires.

Website resources

- Building, Land Use, and Permit Information
www.portland.gov/bds
- Portland Plant List
www.portland.gov/bps/envirom-planning/portland-plant-list
- Wildfire Risk Reduction Project
www.portlandoregon.gov/parks/43167
- Chapter 24.51 Wildfire Hazard Zones
www.portland.gov/code/24/51
- Disaster Preparedness
www.publicalerts.org/get-ready
- Portland Hazard Mitigation Plan
www.portland.gov/pbem/map-2021
- Is your property vulnerable to wildfire? Enter your address in: www.portlandmaps.com to find out.
- Oregon Department of Forestry
www.oregon.gov/ODF
- Firewise Communities, part of National Wildland/Urban Interface Fire Program
www.firewise.org

BDS Residential Handouts

- [Guide to Permits and Inspections](#)
- [Do I Need a Permit for My Project?](#)
- [Fences, Decks and Outdoor Projects](#)
- [Wood Stoves, Fireplace Inserts and Chimneys](#)
- [What Plans Do I Need for A Building Permit?](#)
- [Stairs](#)
- [Converting Attics, Basements and Garages to Living Space](#)
- [Windows](#)

Scheduling an inspection

- Call 503-823-7000, the BDS 24 hour inspection request line
- Enter your IVR or permit number
- Enter the three-digit inspection code for the type of inspection you are requesting
- Enter a phone number where you can be reached during weekdays and if you want the inspection in the morning or afternoon
- There must be an adult over age 18 to allow the inspector entry

For more detailed information regarding the bureau's hours of operation and available services:

**VISIT OUR WEBSITE:
WWW.PORTLAND.GOV/BDS**

Reminders for fire safety

- ◇ **Be safe, keep your landscaping under control.**
- ◇ **Consult Portland plant lists of prohibited and nuisance plants to make sure the fire resistant plants you select are acceptable in the City of Portland.**
- ◇ **Depending on your location and the specifications of your project, building and/or zoning permits may be required.**
- ◇ **Some zones have special requirements which could affect your project or landscape maintenance.**
- ◇ **Choose building materials with fire resistance and safety in mind. Maintain accessibility for fire trucks to your home.**
- ◇ **Be prepared, have a family safety plan in place and a disaster preparedness kit on hand.**

Contact Us

Bureau of Development Services
City of Portland, Oregon
1900 SW 4th Avenue, Portland, OR 97201
www.portland.gov/bds

Office Hours:

Monday through Friday, 8 a.m. to 5 p.m.
BDS main number: 503-823-7300

Permit Information is available at the following location:

- Development Services Center (First Floor)
For Hours Call 503-823-7310 or visit www.portland.gov/bds
- Permitting Services (Second Floor)
For Hours Call 503-823-7310 or visit www.portland.gov/bds

Important Telephone Numbers

BDS main number	503-823-7300
Fire and Rescue general information.....	503-823-3700
Reporting non-emergency fire risks.....	503-823-3333
DSC automated information line.....	503-823-7310
Building code information	503-823-1456
Zoning code information.....	503-823-7526
Urban Forestry	503-823-4489
Oregon Relay Service	711

Traducción e interpretación | Chuyển Ngữ hoặc Phiên Dịch | 翻译或传译
Turjumada ama Fasiraadda | 翻訳または通訳 | Письменный или устный перевод
الترجمة التحريرية أو الشفوية | 번역 및 통역 | Письмовий або усний переклад
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503-823-7300



BDS@PortlandOregon.gov



www.portland.gov/bds/brochures-forms/translated-brochures-forms

The City of Portland is committed to providing meaningful access.
For accommodations, modifications, translation, interpretation, or other services,
please call **503-823-7300** or the **Oregon Relay Service** at **711**.