

8.9 Fire Facts – What are? Types of Fires.



What are? **TYPES OF FIRE**

There are three basic types of forest fires: ground, surface, and crown.

FIRE FACTS

During a wildfire, it's not uncommon to have all three types of fire. The proportion of each type, however, can vary greatly day to day or even minute to minute depending on fuel, topography, and weather conditions. Fuel, topography, and weather drive a fire's behavior, and changes to any of three may cause a ground fire to emerge as a surface fire or a surface fire to escalate into a crown fire, or vice versa.

Ground fires

Ground fires burn mostly in decayed roots below ground and in the duff layer. The duff layer is made up of compacted dead plant materials such as leaves, bark, needles, and twigs. Ground fires are sustained by glowing combustion (without flames) and can go undetected for a long time because they produce little to no smoke and spread slowly.



Photo Credit: Deschutes Land Trust

Surface fires

Surface fires burn loose needles, moss, lichen, herbaceous vegetation, shrubs, small trees, and saplings that are at or near the surface of the ground, mostly by flaming combustion. Surface fires spreading in surface fuels dictate much of a fire's expansion. They can grow in intensity to scorch or even consume the forest canopy, a characteristic that is seen in crown fires, depending on: the amount of surface fuel (is high), fuel moisture content (is low); slope and/or wind



Photo Credit: United States Forest Service

speed (is high), the resultant surface flame length (is high); the height to the base of tree crowns (is small); and the density and compactness of tree crowns (is tight).

Crown fires

Crown fires burn forest canopy fuels, which include live and dead foliage/ branches, lichens in trees, and tall shrubs that lie well above the surface fuels. They are usually ignited by a surface fire.

Crown fires can be passive or active. Passive crown fires involve the burning of individual trees or small groups of trees (often called torching). Active crown fires, or also referred to as running crown fires, present a solid wall of flame from the surface through the canopy fuel layers as seen in the photo below. Active crown fires spread from one tree crown to the next through the canopy.



Photo Credit: United States Forest Service

For more information:

Bennett, M., S.A. Fitzgerald, B. Parker, M. Main, A. Perleberg, C.C. Schnepf, and R. Mahoney. 2010. Reducing Fire Risk on Your Forest Property. PNW 618: 40 p.

[Fire Science Core Curriculum](#). 2017. OSU Extension Service, EM 9172: 197p.

[Fire Words](#). Glossary of Fire Science Terminology. Date accessed, April 10, 2019

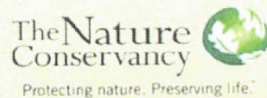
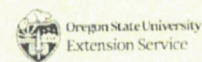
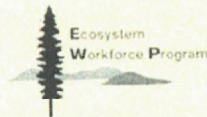
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8.10 Fire-Resistant Plants for Oregon Home Landscapes

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Fire-Resistant Plants for Oregon Home Landscapes

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Introduction

When landscaping around a home, most homeowners are interested in creating a landscape that is aesthetically pleasing, complements their home, and has variations in color, texture, flowers, and foliage. If your home is located in or adjacent to forests or rangeland, you also should consider the flammability of plants within your home landscape.

Flammable plant material in your landscape can increase the fire-risk around your home. The 1991 Oakland Hills Fire in California is a prime example of how flammable plant material (Eucalyptus trees) can act as fuel and contribute to the intensity of a wildfire. Over 3,000 homes were destroyed in that devastating wildfire.

Therefore, homeowners should take active steps to minimize or reduce the fuel and fire-hazard around their homes, *including* planting fire-resistant plants. Good placement of fire-resistant trees, for example, can, in fact, help protect your home by blocking intense heat.

There is a wide array of trees and other plants to choose for your landscape that are both attractive (Figure 1) and fire-safe. This publication provides a diverse list of plant material divided into perennials, groundcovers, trees, and shrubs.

What are fire-resistant plants?

Fire resistant plants are plants that don't readily ignite from a flame or other ignition sources. Although fire-resistant plants can be damaged or even killed by fire, their foliage and stems don't



Figure 1. Basket-of-Gold beneath Quaking Aspen; both are fire-resistant.

contribute significantly to the fuel and, therefore, the fire's intensity.

Plants that are fire-resistant have the following characteristics:

- Leaves are moist and supple.
- Plants that have little dead wood and tend not to accumulate dry, dead material within the plant.
- Sap is water-like and does not have a strong odor.

Most deciduous trees and shrubs are fire-resistant. However, it's important to remember that even fire-resistant plants can burn, particularly if they are not maintained in a healthy condition.

In contrast, plants that are highly flammable have these general characteristics:

- Contain fine, dry or dead material within the plant such as twigs, needles, and leaves.

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Fire-Resistant Plant Materials for Oregon

Groundcovers 18" and lower

<u>Scientific Name</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Common Name</u>
<i>Ajuga reptans</i>	Carpet bugle	<i>Echeveria species</i>	Hens and chicks
<i>Arctostaphylos uva-ursi</i>	Kinnikinnick	<i>Fragaria species</i>	Wild strawberry
<i>Ceanothus prostratus</i>	Squaw carpet (C,E,S)	<i>Pachysandra terminalis</i>	Japanese pachysandra (W,S)
<i>Cerastium tomentosum</i>	Snow -in-summer	<i>Phlox subulata</i>	Creeping phlox
<i>Delosperma nubigenum</i>	Yellow iceplant	<i>Sedum species</i>	Sedum or stonecrops
<i>Delosperma cooperi</i>	Purple/Pink iceplant	<i>Thymus praecox</i>	Creeping thyme
<i>Duchesnea indica</i>	Mock strawberry	<i>Vinca minor</i>	Periwinkle

Perennials 18" or taller

<u>Scientific Name</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Common Name</u>
<i>Achillea species</i>	Yarrow	<i>Hemerocallis hybrids</i>	Daylilies
<i>Allium schoenoprasum</i>	Chives	<i>Heuchera species</i>	Coral bells
<i>Armeria maritima</i>	Sea thrift	<i>Hosta species</i>	Hosta lilies
<i>Aurinia saxatile</i>	Basket-of-Gold	<i>Iris species</i>	Iris
<i>Bergenia cordifolia</i>	Heartleaf bergenia	<i>Kniphofia uvuria</i>	Red-hot poker
<i>Carex species</i>	Sedges	<i>Linum perenne</i>	Blue flax
<i>Coreopsis species</i>	Coreopsis	<i>Lupinus species</i>	Lupine
<i>Epilobium angustifolium</i>	Fireweed	<i>Oenothera missouriensis</i>	Evening primrose
<i>Geranium species</i>	Hardy geraniums	<i>Penstemon species</i>	Penstemon
<i>Helianthemum nummularium</i>	Sun rose	<i>Stachys byzantina</i>	Lamb's ear

Shrubs—broadleaf evergreen

<u>Scientific Name</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Common Name</u>
<i>Cotoneaster species</i>	Cotoneaster	<i>Mahonia repens</i>	Creeping holly
<i>Daphne x burkwoodii</i> var. 'Carol Mackie'	Carol Mackie daphne	<i>Pachystima myrsinites</i>	Oregon boxwood
<i>Gaultheria shallon</i>	Salal (S,W)	<i>Rhododendron macrophyllum</i>	Pacific rhododendron (S,W)
<i>Ligustrum species</i>	Privet	<i>Rhododendron occidentale</i>	Western azalea (S,W)
<i>Mahonia aquifolium</i>	Oregon grapeholly	<i>Yucca species</i>	Yucca

C= Central Oregon

E= Eastern Oregon

S= Southern Oregon

W= Western Oregon

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Shrubs—deciduous

<u>Scientific Name</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Common Name</u>
<i>Acer circinatum</i>	Vine maple	<i>Philadelphus species</i>	Mockorange
<i>Acer glabrum</i>	Rocky Mountain maple	<i>Rhus species</i>	Sumac
<i>Amelanchier alnifolia</i>	Pacific serviceberry	<i>Ribes species</i>	Currant
<i>Buddleia davidii</i>	Butterfly bush	<i>Rosa woodsii</i>	Wood's rose
<i>Caryopteris x clandonensis</i>	Blue-mist spirea	<i>Spiraea x bumalda 'Goldflame'</i>	Goldflame spirea
<i>Cornus stolonifera</i>	Redtwig dogwood	<i>Spiraea douglasii</i>	Western spirea
<i>Euonymus alatus</i>	Burning bush	<i>Symphoricarpos albus</i>	Snowberry
<i>Holodiscus discolor</i>	Oceanspray	<i>Syringa species</i>	Lilac

Trees—evergreens

<u>Scientific Name</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Common Name</u>
<i>Larix occidentalis</i>	Western larch (C,E)	<i>Pinus lambertiana</i>	Sugar pine (C,S)
<i>Pinus contorta var. contorta and var. murrayana</i>	Lodgepole pine	<i>Pinus ponderosa</i>	Ponderosa pine

Trees—deciduous

<u>Scientific Name</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Common Name</u>
<i>Acer macrophyllum</i>	Bigleaf maple (S,W)	<i>Gleditsia triacanthos</i>	Honeylocust
<i>Acer platanoides</i>	Norway maple	<i>Gymnocladus dioica</i>	Kentucky coffee tree
<i>Acer rubra var. Sunset</i>	Sunset maple	<i>Juglans species</i>	Walnut
<i>Aesculus hippocastanum</i>	Horsechestnut	<i>Liquidambar styraciflua</i>	American sweetgum (S,W)
<i>Alnus rubra</i>	Red alder (S,W)	<i>Malus species</i>	Crabapple
<i>Alnus tenuifolia</i>	Mountain alder (C,E)	<i>Populus species</i>	Aspen/cottonwoods
<i>Betula species</i>	Birch	<i>Prunus virginiana</i>	Chokecherry
<i>Catalpa speciosa</i>	Western catalpa	<i>Quercus garryana</i>	Oregon white oak (S,W)
<i>Celtis occidentalis</i>	Common hackberry	<i>Quercus palustris</i>	Pin oak
<i>Cercis canadensis</i>	Eastern redbud	<i>Quercus rubra</i>	Red oak
<i>Cornus florida</i>	Flowering dogwood (S,W)	<i>Robinia pseudoacacia</i>	Black locust
<i>Fagus species</i>	Beech	<i>Salix species</i>	Willow
<i>Fraxinus species</i>	Ash	<i>Sorbus aucuparia</i>	Mountain ash

C= Central Oregon

E= Eastern Oregon

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- Leaves, twigs, and stems contain volatile waxes, terpenes, or oils.
- Leaves are aromatic (strong smell when crushed)
- Sap is gummy, resinous and has a strong odor.
- May have loose or papery bark.

Both ornamental and native plants can be highly flammable. An example of a highly flammable ornamental shrub often planted in home landscapes is ornamental juniper. Examples of highly flammable native shrubs include bitterbrush, manzanita, sagebrush, and ceanothus. Avoid planting these plants around your home.

-Adapted from University of California Cooperative Extension Hortscript, 1996, No. 18.

How this list was developed

This list was developed by evaluating fire-resistant plant lists developed for other regions and screening the scientific literature on plant flammability. Included in this list are plants adapted to grow in Oregon in either irrigated or non-irrigated landscapes. However, most of the plants on this list require some level of irrigation to survive during the dry summer months, particularly in central and eastern Oregon.

All of these plants are adaptable in Oregon unless specified by a C, E, S, or W. Plants indicated by these letters are suitable only for the regions listed below:

C = Central Oregon E = Eastern Oregon
S = Southern Oregon W = Western Oregon

Plant descriptions and availability

For a detailed description of the plants on this list, consult local nurseries or refer to the *Sunset Western Garden Book* and the *A-Z Encyclopedia*

Figure 2.

Purple Iceplant



of Garden Plants. These publications can be obtained at local bookstores or nurseries. If you are unable to find some of these plants locally, check out the Oregon Nurseryman's Association website for plant availability at:

<http://www.nurseryguide.com>

Scroll down to "Search For..." and click on Plants by Name. Type in the name of the plant your interested in and the search will give you a list of nurseries that carry the plant.

Help us identify other fire-resistant plants

If you know of other fire-resistant plants suitable for Oregon, let us know. You can contact the authors by phone, letter, or email. We will then research your plant and, if it fits the criteria, we will add it to the list.

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Appendix B – Noxious, Invasive and Poisonous Plants

APPENDIX B: NOXIOUS INVASIVE AND POISONOUS PLANTS Use of these plants is prohibited

Common Name	Genus	Species	Common Name	Genus	Species
absinth wormwood	Artemisia	absinthium	jointed goatgrass	Aegilops	cylindrica
barbed goatgrass	Aegilops	truncialis	kochia	Kochia	scoparia
black henbane	Hyoscyamus	niger	kudzu	Pueraria	montana
black twitch	Alopecurus	myosuroides	lawn burweed	Soliva	sessilis
brown knapweed	Centaurea	jacea	meadow hawkweed	Hieracium	pratense
buffalobur	Solanum	rostratum	meadow knapweed	Centaurea	pratensis
bull thistle	Cirsium	vulgare	Mediterranean sage	Salvia	aethiops
Canada thistle	Cirsium	arvense	medusahead	Taeniatherum	caput-medusae
clary sage	Salvia	sciarea	myrtle spurge	Euphorbia	myrsinites
common bugloss	Anchusa	officinalis	oxeye daisy	Chrysanthemum	leucanthemum
common burdock	Arctium	minus	parrotfeather	Myriophyllum	brasiliense
common crupina	Crupina	vulgaris	perennial pepperweed	Lepidium	latifolium
common ragweed	Ambrosia	artemisiifolia	plumeless thistle	Carduus	acanthoides
cow parsley	Anthriscus	sylvestris	poison hemlock	Conium	maculatum
cultivated rye	Secale	cereale	puncturevine	Tribulus	terrestris
denseflower cordgrass	Spartina	densiflora	purple loosestrife	Lythrum	salicaria
diffuse knapweed	Centaurea	diffusa	purple nutsedge	Cyperus	rotundus
dyer's woad	Isatis	tinctoria	quackgrass	Agropyron	repens
English ivy	Hedera	helix	reed canarygrass	Phalaris	arundinacea
Eurasian watermilfoil	Myriophyllum	spicatum	rush skeletonweed	Chondrilla	juncea
field bindweed	Convolvulus	arvensis	Russian knapweed	Centaurea	repens
field hedge-parsley	Torilis	arvensis	Scotch broom	Cytisus	scoparius
field horsetail	Equisetum	arvense	spotted cats ear	Hypochaeris	radicata
garlic mustard	Alliaria	petiolata	squarrose knapweed	Centaurea	triumfettii
giant horsetail	Equisetum	telmateia	St. Johnswort	Hypericum	perforatum
giant knotweed	Polygonum	sachalinense	striated broom	Cytisus	striatus
hairy whitetop	Cardaria	pubescens	sulfur cinquefoil	Potentilla	recta
herb Robert	Geranium	robertianum	Tamarix complex	Tamarix	spp.
hoary cress	Cardaria	draba	(combined)	Senecio	jacobaea
houndstongue	Cynoglossum	officinale	tansy ragwort	Abutilon	theophrasti
Italian thistle	Carduus	pycnocephalus	velvetleaf	Daucus	carota
Japanese knotweed	Polygonum	cuspidatum	wild carrot	Panicum	millaceum
			wild proso millet		



Appendix C – Rainfall Records for Little Whale Cove

Rainfall Records for Little Whale Cove*

Through 4/30/2019

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOT
2005	---	---	---	---	---	---	---	0.06	2.41	5.90	7.10	14.56	30.03
2006	16.34	2.15	7.95	3.58	2.52	2.35	0.45	0.10	1.32	2.41	17.05	7.12	63.34
2007	4.68	9.89	5.81	2.58	1.46	1.91	1.24	1.41	2.08	5.78	6.60	10.68	54.12
2008	10.34	3.56	8.22	6.11	0.94	2.06	0.51	3.15	0.30	4.24	10.52	8.93	58.88
2009	8.07	3.49	5.88	3.84	4.32	1.46	0.29	1.23	2.53	5.71	8.43	6.93	52.18
2010	14.70	7.58	6.80	7.63	5.05	5.46	0.69	1.13	5.22	5.67	10.13	13.44	83.50
2011	10.70	5.33	12.51	6.71	3.63	1.70	1.42	0.19	1.60	5.00	7.65	4.61	61.05
2012	12.18	5.81	11.45	5.82	3.86	3.09	0.78	0.34	0.18	17.76	11.37	15.71	88.35
2013	7.80	5.57	3.01	3.97	4.71	2.18	0.03	2.75	6.88	1.38	6.30	3.30	47.88
2014	4.06	8.84	9.37	4.25	3.10	2.40	1.30	0.54	2.80	9.48	7.38	12.00	65.52
2015	5.75	8.86	6.63	4.83	1.51	0.49	0.16	1.23	1.57	5.54	9.52	24.81	70.90
2016	13.06	6.14	11.12	2.50	1.48	2.40	1.60	0.46	2.20	15.43	16.36	8.62	81.37
2017	7.37	15.06	14.77	8.77	4.22	2.60	0.20	0.48	3.24	6.80	11.48	7.37	82.36
2018	10.07	4.26	5.82	6.95	0.52	2.10	0.22	0.57	1.70	5.96	6.39	8.15	52.71
2019	6.10	7.65	2.36	6.37	---	---	---	---	---	---	---	---	22.48
MIN	4.06	2.15	2.36	2.50	0.52	0.49	0.03	0.06	0.18	1.38	6.30	3.30	47.88
MAX	16.34	15.06	14.77	8.77	5.05	5.46	1.60	3.15	6.88	17.76	17.05	24.81	88.35
AVG	9.37	6.73	7.98	5.28	2.87	2.32	0.68	0.97	2.43	6.93	9.73	10.44	66.32

*Records are for the Gall Weather Station corrected each month with a standard rain gage

