



# **LIVING FIREBREAKS**

## **FOR THE**

# **SAN JUAN ISLANDS**



A **thumbnail guide** brought to you by

**KWIAHT**

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## **Are wildfires natural in the islands?**

No. Our climate has been relatively moist, even in summer, for several thousand years. Wildfires were relatively infrequent prior to the arrival of European farmers. Clearing fires extending for thousands of acres were documented in the 1850s. By the 1880s, loggers were also setting large-area fires to clear away stumps, slash and commercially worthless tree species. As the islands' forests gradually re-grew following the Great Depression and the decline of farming, there have been few ignitions and nearly all of them have been due to careless humans, rather than natural causes such as lightning strikes. Even during our high-fire-risk season (late summer and early fall) there has usually been enough moisture in trees and shrubs to resist burning. Wind storms, slides, and floods are more frequently responsible for recycling forests than wildfires.



## Didn't Native Americans set fires here?

Coast Salish villagers in the islands set small, “flashy” fires in their camas gardens to help control weeds. Garden fires appear to have been just a few hundred square feet, fueled only by the dry weeds and brush pulled up by gardeners. Larger understory fires were sometimes set to improve berry crops and keep trails open through woodlands, but barely scorched the trees. Older forests were valuable and were logged selectively. Cedar was used to build great plank-houses and sailing canoes, Douglas fir for fuel. As a result of selective logging and light burning of weeds and brush, the pre-European landscape was more like urban parkland than forests in the islands today, with more space between trees. It was certainly not a “natural” landscape, however; but rather an intensively managed, manicured landscape in which frequent but very small, carefully controlled fires played a role.



## Shouldn't we restore Native burning practices?

We can't. Too much has changed, so that the results of controlled burning are significantly different than they were centuries ago, before Europeans brought their sheep, cattle, grasses and weeds to the islands. Most of the agricultural grasses introduced in the late 19<sup>th</sup> century are “pyrophilic” (fire-tolerant) species originating in the steppes of eastern Europe and central Asia, where annual wildfires helped recycle nutrients and renew standing grass crops upon which big herbivores and humans (with their cattle, sheep and horses) depended—much like the tall-grass prairies of the North American Great Plains with their bison and bison-hunters. Eurasian grasses thrive in the islands. They have become invasive and difficult to control. Burning just helps them spread at the expense of native Salish Sea grasses and wildflowers.





## Will wildfire risk increase in the future?

Yes. The climate of the Salish Sea appears to be changing in the direction of stormier winters with more violent winds and heavy downpours, combined with longer, drier summers. Two or three months without appreciable precipitation is becoming “normal”. Our wetlands and streams were mostly seasonal to begin with, and in the future they will dry out earlier and for longer. The islands’ thin soils lose moisture quickly each year when the rains stop. Native plants have already adapted to our arid summers by doing most of their growth and reproduction in the spring, going dormant by June – the time when most people’s gardens are just beginning to produce (and demanding a lot of watering). Native plants that are dry and brittle by August do not burn only because of humid maritime air, usually including fog and a few rain drops. But with longer, drier summers and a growing number of homes, hikers and campers, the risk of careless ignitions increases greatly.



## What about building fire ponds?

Land managers considered fire ponds a good idea in the 1950s and in some parts of the West, this may still be true. But in the relatively dry rain shadow islands, building ponds usually involves sacrificing streams and seasonal wetlands, and replaces critical habitat for amphibians, birds and small mammals (such as bats and shrews) for something that attracts bullfrogs and Canada geese and will probably never be used in a wildfire. Drafting water from a pond to fight a fire requires access to the pond edge for a water tender (a big heavy truck) and water that's clean enough and deep enough for rapid mechanical filtration. A swimming pool is far more useful than a pond full of mud, aquatic plants, and frogs, at least from a firefighting perspective! But a major wildfire will probably need to be fought from the air; and it would be better for homes to have adequate firebreaks to keep a moving fire at a distance, than to rely on a pond or pool to fight the fire.



## What is a Living Firebreak?

We often think of landscaping as serving only a single function: aesthetics, a beautiful view. But our choice of species to plant around our homes and fields can serve other important functions as well such as attracting pollinators or birds; managing drainage; reducing contaminants going into streams, ponds, and seashores, and reducing the risk of destructive fires. A well-designed multi-functional landscape should be relatively easy to maintain, and it can be edible as well as attractive. Using native plant species can help ensure compatibility with local soils and climate; but there is no reason to avoid non-native species as long as they do not spread uncontrollably. To be effective, a living firebreak must be constructed of plant species that retain water without requiring irrigation, and that *remain sappy and moist at least until October or the first rains of autumn*. By remaining moist, they resist ignition.





## Tips for building a Living Firebreak

The key to building a living firebreak is choosing plants that stay green, moist and sappy in the late summer and early fall when the risk of an accidental ignition is greatest. Flowering evergreens in the Ericaceae such as rhododendrons and salal are relatively fire-resistant, and many of them are attractive as well as important late summer sources of food for birds.

Other native shrubs that remain moist and leafy into the fall include honeysuckles (*Lonicera* including twinberry); Pacific crabapple (*Malus fusca*) and serviceberry (*Amelanchier alnifolia*) in the Rose family; ocean spray (*Holodiscus discolor*); and the currants and-gooseberries (*Ribes* spp), of which several species are native to our area, attractive, and tasty. Domestic currants and gooseberries and domestic crabapples are easily integrated into a living firebreak as well.

Berry brush of the *Rubus* (Rosaceae) group, which includes native salmonberries and blackcaps as well as the invasive Himalayan and Evergreen blackberries, often remains leafy and moist all winter in our climate but has the distinct disadvantage of producing dense accumulations of dead canes that ignite easily. These plants are also difficult to manage and contain, making them poor choices for a living firebreak near homes, gardens, or sensitive wildlands. Other native Rosaceae, such as the ever-abundant Nootka rose, are relatively fire-resistant but also resist management, and can become invasive in gardens and wildflower meadows.

While native conifers remain green and continue to grow year-round, they should be avoided in a living firebreak because they produce flammable resins containing turpentine that ignite readily, apparently as a defense against insects. Leaf litter rich in conifer needles is often the first rung in the fuel ladder around a carelessly managed campfire or smoldering cigarette.

Woody deciduous species such as willows and alders should be avoided, similarly, because their trunks and branches break easily and accumulate in dense piles that attract birds, small mammals and reptiles, but ignite readily and provide a “ladder” from ground fires to tree crowns. Amongst our native trees, maples are perhaps the most fire-resistant, but for practical reasons, a firebreak should begin with faster-growing shrubs that prevent colonization of bare soils by fire-prone plant species. Native Douglas or Big-Leafed maples can be added later.

Grasses should also be avoided. While some native grasses, such as Red Fescue, are drought tolerant and remain green and moist in late summer when Eurasian grasses have already seeded, they are too easily displaced over time by Eurasian grasses and shrubs that spread rapidly and form dense tillers that ignite readily.

## What about our public lands?

Most of the islands' plant-species diversity is associated with dry, fragile coastal meadows and parkland (open-canopy woodlands with wildflower understories) because conifers quickly colonize and dominate moister landscapes. Meadows and parkland ignite easily, and when they burn, tend to grow back as weeds such as thistles, Scotch broom, and lawn grasses, whose seeds are spread widely by wind, birds, and hikers. These precious habitats are also often adjacent to mature forests that have been protected from logging for over a century, and have accumulated big fuel loads. Public land managers should consider building living firebreaks along the edges of native meadows and parkland, and between publicly owned woodlands and our homes and roads. This would reduce the risk of, and potential damage of wildfires without the need to remove forest fuel loads by hand, or proactive burning.



## Island plant species for Living Firebreaks

These shrubs can form the backbone of your living firebreak. All of them share five key characteristics: (1) They are native to the San Juan Islands, although some are also available from nurseries as ornamental hybrids. (2) They spread easily but can easily be managed by aggressive pruning. (3) They retain a significant amount of moisture in their stems and leaves until the autumn when rains resume. (4) They have attractive flowers and/or fruit, and (5) they make good nesting and/or feeding habitat for birds. And they are all relatively easy to grow!

Botanical family	Common name	Scientific name	Propagation
Ericaceae	<b>Salal</b>	<i>Gaultheria shallon</i>	Rhizome cuttings
	<b>Pacific rhododendron</b>	<i>R. macrophyllum</i>	Seeds sown in flats*
	<b>Ocean spray</b>	<i>Holodiscus discolor</i>	Seeds sown in fall
Adoxaceae	<b>Red or blue elderberry</b>	<i>Sambucus racemosa</i> or <i>Sambucus nigra</i>	Live stakes
Rosaceae	<b>Pacific crabapple</b>	<i>Malus fusca</i>	Root cuttings
	<b>Serviceberry</b>	<i>Amelanchier alnifolia</i>	Seeds sown in fall
Caprifoliaceae	<b>Orange honeysuckle</b>	<i>Lonicera ciliosa</i>	Seeds or cuttings
	<b>Pink honeysuckle</b>	<i>Lonicera hispidula</i>	Seeds or cuttings
	<b>Twinberry</b>	<i>Lonicera involucrata</i>	Live stakes
Grossularaceae	<b>Gooseberries</b>	<i>Ribes spp</i>	Layering or cuttings

\*Seeds should not be covered; they require light to germinate! Germination takes three weeks.

Firebreak species profile:

## **Salal**

***Gaultheria shallon***

This evergreen shrub prefers partial shade and is commonly seen in the understory of coniferous woodlands in the islands. Salal spreads by rhizomes once established. The flowers attract wild bees and birds (as well as many people) are fond of the purple berries, which ripen in late summer. Pruning back salal promotes fresh growth and more berries. Salal produces dense thickets 5-8 feet tall if it has sufficient sun and rainfall.



Firebreak species profile:

## **Pacific rhododendron**

***Rhododendron macrophyllum***

A native evergreen of the islands, this is the ancestor of many colorful hybrids for sale in nurseries and garden stores. It prefers acidic soil, so grows well where conifers have been, and can form dense thickets 5-8 feet tall. Its relative, *Rhododendron groenlandicum*, also known as Labrador tea, only grows in some of our bogs. It's pictured on the cover of this booklet, and has fragrant white blooms.





Firebreak species profile:

## **Oceanspray**

***Holodiscus discolor***

This hardy fast-growing native shrub spreads from its root crown and windblown seeds. It is deer-resistant and produces dense thickets as much as 15 feet tall even in partial shade. Pendulous sprays of fragrant creamy flowers attract bees, butterflies and hummingbirds. The larger stems were prized by Coast Salish people for making tough harpoons, bows and fishing poles. Once established this shrub can tolerate very aggressive pruning.



Firebreak species profile:

## **Red and Blue elderberry**

***Sambucus racemosa***

***Sambucus nigra var. caerulea***



This fast-growing, deer-resistant native shrub's large sprays of late summer ripening dark blue berries are tasty to people as well as birds, who help it spread. Elderberries thrive in partial to full shade, and tolerates both wet winters and drought summers, growing up to 15 feet tall in just a few years. Stems can form dense, gnarly thickets that provide excellent nest and refuge habitat for birds and other wildlife. Pruning will stimulate growth and berry production. The red species is native to the islands, the blue to mainland Washington and British Columbia.

Firebreak species profile:

## **Pacific crabapple**

*Malus fusca*

An important food resource for Coast Salish peoples, who enjoyed the bean-sized fruits mashed and dried, our native crabapple can grow in wetlands and meadows, spreads by root sprouts, and can form dense thickets. Ripens in autumn, best after the first frost. Excellent songbird habitat. Can be pruned, but if left untended, will attain 10-15 feet. Bright yellow to red fall foliage.



Firebreak species profile:

## **Serviceberry**

*Amelanchier alnifolia*

A fast growing tall spreading shrub with small leaves and abundant small, somewhat mealy blue berries. Birds are very fond of the berries, and some commercial varieties ("Saskatoon" berries) are used in preserves and pies. Leaves of wild serviceberry in the San Juan Islands are smaller and rounder. Berries ripen in late summer, leaves turn a bright yellow in autumn. Useful for filling open spaces rapidly with good bird habitat. Produces very little leaf litter.

Firebreak species profile:

## **Orange honeysuckle**

*Lonicera ciliosa*

Honeysuckles are a widespread understory shrub in the islands' drier woodlands, and a favorite browse for deer because they stay leafy and tasty to the end of summer. They can form dense blankets on the forest floor as well as climb trees. Orange honeysuckle has the largest and most colorful blooms of our native species, attracts hummingbirds, and is least hampered by deer browsing.



Firebreak species profile:

## **Pink honeysuckle**

*Lonicera hispidula*

This shrub is another native honeysuckle, but smaller and less conspicuous, usually growing lower to the ground where it often produces a nearly continuous understory protecting the seedlings of conifers and Garry oaks. Deer are fond of it, unfortunately, but it grows quickly and spreads where it is protected by thickets of deer-resistant shrubs. Shade tolerant, and associated with creeping herbs such as yerba buena and strawberry.



Firebreak species profile:

## **Twinberry**

***Lonicera involucrata***

Often overlooked as a functional shrub, this native honeysuckle grows and spreads very quickly, and produces yellow flowers as well as dark colored berries that birds find tasty. Twinberry is easy to establish and produces more dense shrubby thickets than our other native honeysuckles. Hardy, shade tolerant, relatively deer resistant, and can be pruned aggressively .



Firebreak species profile:

## **Gooseberries and currants**

***Ribes spp***

This is a large group of small shrubs, including wild and cultivated varieties, that all tolerate damp, shady conditions and produce clusters of red, green or dark blue berries. Our native species are quite thorny and the berries rather tart, although birds literally flock to them. Cultivated garden varieties behave much the same way ecologically, but are more palatable to humans. Consider a mix of wild and garden types. Berries ripen in late summer. Our native Red Flowering Currant (*Ribes sanguineum*) has fragrant flowers that attract hummingbirds.





# What's your wildfire risk?

## Take the test and find out!

We've developed an algorithm for evaluating wildfire risk in the San Juan Islands that's based on three factors: microclimate (humidity), vegetation (fuel availability), and human activities that could result in some kind of an accidental ignition. Here's how it works. Add your score on questions One, Two (the average of two numbers), and Three. The highest possible total score is 15, which is very dry, with lots of potential fuel, and close to homes or roads where people might be careless. The likelihood of a fire starting is high, and the likelihood of its spreading and growing is high, too. There is no "zero" fire risk, however, except on bare, inaccessible rock.

### One: What is the average annual rainfall, slope, and aspect of your property?

If your annual rainfall is...	And you face...	And your land is...	Your score =
Less than 20 inches	Any direction	Any slope	<b>5</b>
Between 20 and 39 inches	Windward	Steep (over 15°)	<b>5</b>
		Moderate (under 15°)	<b>4</b>
	Leeward	Steep (over 15°)	<b>3</b>
		Moderate (under 15°)	<b>2</b>
40 inches or greater	Windward	Steep (over 15°)	<b>3</b>
	Leeward	Moderate (under 15°)	<b>2</b>
		Level (level, under 5°)	<b>1</b>

These factors influence the overall dryness of vegetation, soils, and air. At less than 20 inches per year rainfall, plants and soils dry out in early summer. This is limited to the southernmost parts of Lopez and San Juan Islands. From 40 to 55 inches can fall on the highest elevations of Mt. Dallas, Cady Mountain, the Turtleback and Mt. Constitution; but where slopes are very steep, and/or face southward into the sun and prevailing winds, vegetation can still dry out completely by midsummer.

Slope and aspect also influence how fast and far a wildfire can spread once it has ignited. Steep windward slopes are most likely to produce very hot, fast-moving fire fronts.

Regardless of dryness, the types of fuel available to feed a fire determine how hot and how long a fire can burn. Most BTUs are stored in the wood of trees and shrubs so the woodiness of a place—including both standing and dead timber—is a major factor in fire intensity and destructiveness. So our second question is:

## Two: What kinds of plants make up most of the canopy and understory?

Landscape is...	Most trees are...	Score A =	The understory is...	Score B =
<b>Mature forest</b> Over 75 years old	Shore pines	<b>5</b>	Dead brush, snags	<b>5</b>
	Other conifers	<b>4</b>	Deciduous shrubs	<b>4</b>
	Deciduous trees	<b>3</b>	Grasses, herbaceous	<b>3</b>
	Arbutus (madrone)	<b>2</b>	Evergreen shrubs	<b>2</b>
<b>Young re-growth</b>	Shore pines	<b>4</b>	Leaf litter only	<b>1</b>
	Other conifers	<b>3</b>	Mosses, lichens	<b>0</b>
	Deciduous trees	<b>2</b>	Bare soil, rock	<b>0</b>
<b>Parkland/meadow</b>	Any species	<b>1</b>		
<b>Moss, lichen, rock</b>	Not applicable	<b>0</b>		

Average the two fuel scores (add Score A + Score B then divide by 2). Round up any fractions. This is your composite fuel score. The highest composite fuel scores (4 to 5) describe conditions where fires can spread from the ground to the tree-tops and back again. Low scores (0 to 2) describe conditions where fires are “flashy,” move quickly close to the ground and can clear away underbrush without consuming trees.

The third and last factor to consider is the likelihood of an accidental ignition. Here in the islands, lightning is rare, and fires are usually started by careless people. Thus the proximity of fuel to homes and motor vehicles is a significant risk factor, as well as a factor in how much damage a wildfire can do to people’s property and health.

Ignitions are also associated with campsites and trails, where cooking fires may be left unattended or inadequately extinguished, and people are sometimes careless with matches, lighters, cigarettes, and other smoking materials. Firearm discharges in dry autumn conditions have started fires in our area. Fireworks are of particular concern, of course, and while they are prohibited by county ordinances, people still import them and light them from boats, trails, and campsites.

### Three: How close are potential fuels to likely points of ignition?

If there are:	Within 150 feet, score =	150 to 500 feet, score =
Homes	5	4
Campsites	4	3
Parking areas	3	2
Public road, power line	2	1
Public trail or beach	1	1
None of the above	0	0

Choose the *highest* score that's applicable to your parcel. If there is a home on it, a road or driveway, and a power line within 500 feet, the highest score applicable to the parcel is 5.

Combine your weather, composite fuel, and source-of-ignition scores. The total will be a number between 1 and 15. Scores between 1 and 5 describe locations with high humidity and/or low fuel loading and relatively low risk of accidental ignition. These are conditions where a fire, if started, is likely to be flashy and relatively easy to put out or control. Scores from 11 to 15 describe locations where there are ladder fuels and high potential for ignition, as well as relatively dry summer and fall conditions. Once again, a low score does not mean "safe". It means "less likely".

**Consider planting a living firebreak between your home and high-risk areas!**

## ABOUT THIS BOOKLET

The concept of **Living Firebreaks** is not ours; it has been developing for a number of years in the western states and provinces where wildfire risk has been increasing. A variety of planting prescriptions are now available from conservation organizations and state universities. But none of them is quite right for prevailing conditions and needs in the San Juan Islands. Nor do we think they adequately address the relationship between wildfire management and the widespread use of prescribed burns in the west as a tool for habitat enhancement. Hence this booklet. It is not the final word on island firebreak design, but (we hope) the beginning of a practical conversation that will lead to the identification of additional functional native plant species, and further guidance as to placement, dimensions, density, and maintenance.