

# LAKE ALICE

## COMMUNITY WILDFIRE PROTECTION PLAN

September 2012



**Prepared by Madden & McNamara**

with assistance from:

King County Department of Natural Resources and Parks

Washington State Department of Natural Resources

King County Fire District 27

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*King County Fire District 27 based in Fall City, in a joint effort with Firewise, King County agencies and the Washington State DNR is eager to work together to increase community awareness of wildfire and encourage risk reduction efforts. This partnership will provide citizens with valuable tools, materials, knowledge, and advice to make their homes safer and their properties more resistant to the threat of wildfire.*


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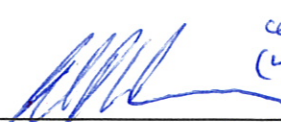
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Cover photo by Jonathan Dennis. Helicopter performing bucket work out of Lake Alice for a nearby fire. September 9, 2011.

# About The Plan

## What This Plan Includes

The Lake Alice Community Wildfire Protection Plan is designed to educate community members about the risks of wildland fire in the Lake Alice area near Fall City, Washington. The plan includes general information about wildfire, specific wildland fire threats to Lake Alice, how these threats can be mitigated, and how the community can participate in the voluntary Firewise program (including getting recognition as a National Firewise Community). This plan was sponsored by King County's Department of Natural Resources and Parks using federal Firewise grant funds allocated under the Secure Rural Schools and Community Self-Determination Act, Title III.

## Who This Plan Is For

The plan was developed primarily for Lake Alice residents. Residents in other nearby neighborhoods may use this information to develop their own plans. Elected officials and agency representatives may also find the content useful.

## How To Use This Plan

You don't need to read this document from cover-to-cover to get the most out of it. The following roadmap should help you effectively navigate through the plan.

- To learn about the **Firewise** program, read **Chapter 1** (page 3).
- To understand **how wildland fire behaves**, and **what you can do to reduce your risks** read **Chapter 2** (page 5) and **Chapter 3** (page 9).
- To get a **profile of Lake Alice** (including fire-related environmental characteristics), read **Chapter 4** (page 13).
- To find out about potential **wildland fire threats in Lake Alice**, read **Chapter 5** (page 18).
- To read about ways to **mitigate wildland fire threats in Lake Alice**, refer to **Chapter 6** (page 34).
- To see how **Lake Alice** can gain **Firewise Communities USA recognition**, read **Chapter 7** (page 44).

A companion resource kit is also included with this plan. The CD-ROM resource kit contains a number of references, information sources and forms. To learn more about the kit, and what comes with it, refer to the README file on the CD-ROM.

# Chapter 1

## Firewise, Dollar and Sense-Smart

### About Firewise

During the past hundred years, America's population has nearly tripled. Much of this growth has occurred in traditionally natural areas such as forests and grasslands. These areas are all subject to the natural process of wildfire. Wildland fires can be difficult to control. As a result, in places where development has encroached into natural areas (dubbed the *wildland/urban interface or WUI*) property, lives and natural resources are all at risk from wildfire.

Following the catastrophic fire season of 1985, government representatives met to discuss the increasing trend of wind-driven fires in populated areas. They formed the National Wildland/Urban Interface Fire Program. In 1992, the program's advisory group began to use the term *Firewise* to describe being knowledgeable and prepared for wildfire in residential or urban settings.

In 1996 a Firewise Web site ([www.firewise.org](http://www.firewise.org)) was launched. It was followed by national and regional workshops, public education efforts, and a community recognition project. Today the Firewise program is viewed as a successful example of partnering among communities, homeowners, private industry, tribes, and public agencies and officials to develop and implement local solutions for wildfire preparedness – before a fire starts.

### Firewise Fundamentals

Wildland fires are a natural part of the environment. Despite the best efforts of government agencies, they will occur. The Firewise vision is that with adequate planning and cooperation among varying interests, wildfires can occur without disastrous loss of life, property, and resources.

The best approach to wildfire preparedness involves utilizing the wide range of Firewise practices. The Firewise program offers a series of practical steps (such as landscaping, home construction and design, and community planning) that individuals and communities can take to reduce their vulnerability to wildfire.

Firewise doesn't mean cutting down all of the surrounding trees and creating a sterile environment to prevent a wildfire from spreading. People want to live close to nature for a reason, and aesthetics is a cornerstone of the Firewise program.

Examples of Firewise techniques for property owners include creating a defensible space around residential structures by thinning trees and brush, choosing fire-resistant plants, selecting ignition-resistant building materials, positioning structures away from slopes, and working with firefighters to develop emergency plans.

It's important to understand that Firewise is a voluntary program. Firewise offers proven, common-sense ways of reducing the risks of wildfire. It is ultimately up to community members whether they want to put these practices in place. It is also important to recognize all of the Firewise practices don't necessarily need to be implemented at once. A single practice reduces fire risk, and other practices can be added over time if desired. Relatively small investments of time and effort can produce great rewards when it comes to wildfire safety.

Community members can participate in Firewise Communities/USA. This program recognizes communities for working together to protect residents and property from fire in the wildland/urban interface. To receive Firewise Communities/USA recognition, communities must create and implement a local plan with cooperative assistance from state forestry agencies and local fire staff. In addition, communities are required to continue regular maintenance and education to retain recognition status. (The steps for gaining recognition are laid out in this plan.)

## **Benefits**

Applying Firewise practices have a number of benefits, including:

- Saving homeowner lives during a wildfire
- Increasing firefighter safety by reducing risks
- Saving homes and possessions from damage or destruction
- Preserving community aesthetics (both before and after a fire)

## **To Learn More**

The Firewise Web site ([www.firewise.org](http://www.firewise.org)) provides homeowners and agency staff with educational information about wildland/urban interface fires. The interactive site details how to mitigate wildfire risks at the homeowner and community levels. You can view streaming videos, download documents, browse an extensive list of helpful links, and access a searchable library of national, state, and local documents on a wide range of wildfire safety issues.

## Chapter 2

# Wildland Fire Behavior Basics

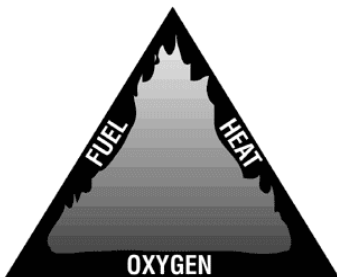
As a homeowner, if you want to reduce the risks of wildfire, you need to know a little about how fire behaves. This chapter presents the basics and tells you what you need to know about wildland fire behavior.

## Understanding The Fire Triangle

To begin with, three components are required for a fire to start and keep burning.

- Heat
- Fuel
- Oxygen

These components form what is called the fire triangle (as shown in Figure 2-1).



**Figure 2-1:** The fire triangle consists of heat, fuel and oxygen.

When there's not enough heat generated, when the fuel is exhausted, removed, or isolated, or when the oxygen supply is limited, then a side of the triangle is broken and the fire goes out. Firefighters try to manage one or more of these three elements to control a fire.

## Zeroing In On Heat

The heat part of the fire triangle is critical. Some type of a heat source is required to ignite a fire (lightning, matches, cigarette butt, fireworks, etc.) and heat is needed to maintain the fire and cause it to spread.

Fire is constantly producing heat and the transfer of heat to the surrounding environment is what makes a fire spread. Heat removes the moisture from surrounding combustible materials (grasses, trees, wood, paper, etc.) making it more prone to burn - the dryer the fuel, the more combustible. (Fuels are discussed in the next section.)

When it comes to fire, heat can be transferred three ways:

- **Convection** is heat transfer through the air, such as when hot air rises through a chimney. Convection air currents can preheat leaves and branches carrying a ground fire upwards into a tree or shrub.
- **Radiation** transmits heat by the proximity to flame. Radiation accounts for most of the preheating of fuels surrounding a fire. The temperature of these fuels can sometimes grow so high that the fuels ignite before they even come in contact with the flames, spreading the fire.
- **Conduction** is direct transfer of heat from one fuel source to the next; such as when a stove burner heats a pan and its contents. Conduction allows the heat to be transferred inside and throughout the fuel, rather than only heating the surface. Conduction is usually not the primary mechanism of heat transfer in a wildfire since wood is a poor heat conductor.

How and how fast heat is transferred plays a large role in wildland fire behavior. Each of the three heat transfer methods can cause a fire to behave differently, depending on the fuel, wind speed, and slope of the terrain.

## Focusing On Fuel

The fuel side of the fire triangle refers anything that can burn. Fuel types include:

- Living vegetation
- Dead vegetation (duff, twigs, needles, standing dead snags, leaves, and moss)
- Organic subsurface material (peat and coal)
- Combustible human-made materials and structures

Fine fuels (grasses, leaves, pine needles) ignite more easily and spread faster with higher intensities than coarser fuels (tree trunks, branches, logs). Generally, the more fuel there is and the more continuous it is, the faster the fire spreads and the higher the intensities.

Several other factors determine how a fuel will burn, including:

- **Moisture content** Determines how easily a fuel will burn. For example live trees usually contain a great deal of moisture and are more difficult to combust while dead logs burn easier because they contain very little moisture. Before a wet fuel can burn, the moisture must be converted to vapor through the heating process. The greater the moisture content, the higher the heat temperatures required to dry the fuel. The presence of moist fuel can affect the rate and direction that a wildland fire spreads. High moisture content slows the burning process since heat from the fire must first expel moisture.
- **Size and shape** in part determine a fuel's moisture content. Lighter fuels (often called *fine fuels*) such as grasses, leaves, and needles quickly expel moisture, and burn rapidly. Heavier fuels, such as tree branches, logs, and trunks, take longer to heat up and ignite. In areas of light fuel, the temperature required for ignition is lower than in areas of heavier fuel. The oxygen surrounds lighter fuels and allows the fuel to burn with greater intensity, quickly exhausting the fuel supply.

- **Quantity** - How much combustible fuel there is in a given area is known as *fuel loading*. Fuels may be arranged in a uniform pattern and distributed continuously across the ground, allowing a wildland fire to travel uninterrupted. Or, the fuel may be distributed unevenly in a patchy network, forcing the fire to find ways around rocks and other barriers. .
- **Vertical arrangement** - Whether fuels are positioned high or low is another important factor in wildfires. For example intense fires known as *crown fires* occur when fire spreads from the ground into the tops of trees - these fires burn independently of surface fires, with flames moving through the treetops. This type of fire is not very common in Western Washington. *Ground fuels* are all of the combustible materials found below the ground surface, and include tree roots, duff, and organic material. *Surface fuels* are found at the ground level, including twigs, grass, needles, wood, and other vegetation. *Aerial fuels* are standing vegetation including tree crowns, branches, leaves, snags, and hanging moss.

## Taking in Oxygen

The third component of the fire triangle is oxygen. Oxygen is required for combustion, or fire, to occur. Oxygen is in the air you breathe. Anywhere air can reach, oxygen can reach. Firefighters use dirt and other methods to smother burning fuels. The dirt replaces the air so no oxygen is available for the fire.

Densely packed fuels have less air available than loosely packed fuels. Less air means less oxygen and that makes it more difficult for the fire to spread. Loosely packed fuels have more air space, and thus more oxygen, which makes it easier for the fire to spread.

## Watching Out For Weather and Terrain

In addition to the components of the fire triangle, how intense a fire burns and how fast it spreads depends on weather and terrain. Here are some general rules of thumb:

- The combination of current or forecasted high temperatures, low humidity and strong winds can produce potentially dangerous fire conditions.
- Weather affects the moisture content of dead and live vegetation. Dead fine fuel moisture content is highly dependent on the relative humidity and the amount of sun exposure. The lower the relative humidity (RH) and the greater the sun exposure, the lower the fuel moisture content. Relative humidity tends to increase at night. Lower fuel moistures produce faster spread rates and higher fire intensities. This is why wildfires are prevalent in the summer months when rainfall is light and relative humidity is low.
- Fire typically follows wind direction. It's possible for the wind to carry embers (*firebrands*) ahead of the main fire and start new fires (known as *spot fires*).
- Wind speed significantly influences the rate of fire spread and fire intensity. The higher the wind speed, the greater the spread rate and intensity. This is due, in part, to the increased amount of oxygen (more air) and the wind driving heat into adjacent fuels. Strong dry winds originating from the east side of the state carry an even greater threat.
- Thunderstorms produce lightning, which is a source of ignition, and strong and often erratic winds.



- Large fires may generate enough heat to create their own weather. Called *plume dominated fires*, from the giant smoke plume that rises thousands of feet into the air, these fires are dangerous because of their erratic behavior.
- Terrain influences fire behavior by the steepness of the slope. Fires tend to burn uphill. In general, the steeper the slope, the faster a fire will spread and the more intense it will burn.
- The direction a slope faces (*aspect*) contributes to how a fire burns. Fuels on a south facing slope tend to be drier and will burn faster and more intensely than fuels on a shaded north slope.
- Narrow and box canyons can produce a chimney effect that creates strong upslope winds which can rapidly spread a fire.

*Terrain and weather considerations for Lake Alice are discussed in Chapter 4.*

# Chapter 3

## Getting In The Zone

Two factors generally determine the survivability of a house during a wildfire; the construction of the house itself and the area surrounding the house.

Depending on the construction, one house may be more likely to survive a wildland fire than another. For example because there is no source of exterior combustible fuel, a concrete structure with a metal roof will fare better than a house with a shake roof and wooden siding.

From a construction standpoint, you can make a house more fire survivable by using:

- Class A, B or C rated, fire-resistant roofing material
- Fire-resistant building materials on exterior walls, overhangs and attachments
- Double-paned or tempered glass in windows, skylights and doors
- Enclosed eaves, fascias, soffits and vents

See [www.firewise.org](http://www.firewise.org) for more tips on making your home safer.

Due to the cost and effort, it might not be practical to make structural modifications to your home. However you can still greatly reduce the risks of wildfire by focusing on the second factor that determines house fire survivability - the area surrounding the home.

It's important to understand that wildland fires aren't like avalanches or tsunamis. They don't spread by flowing over the landscape, engulfing whatever is in their path. Fires need fuel, heat and oxygen to burn and spread (see Chapter 2 for more details). If you can limit heat and fuel sources, you reduce the potential for the fire to grow. One way to do this is by knowing about the *home ignition zone*.

A *home ignition zone* includes the house and everything within 100 to 200 feet of the structure. While the wooden frame construction of a house is combustible, it takes a significant amount of heat to ignite. A mere 30 feet of distance from a crown fire is all that's required to reduce the radiated heat to low enough levels that the house will not catch on fire. See Figure 3-1 to get a better idea of Firewise zones.



**Figure 3-1: Example Firewise Zones.** (King County GIS)

If you reduce amount and type of fuels around a house, you decrease the amount of heat that is generated adjacent to the structure during a wildfire. This increases the home's survivability.



**Figure 3-2: Simple steps for turning a house into a Firewise home.**

The first zone is 30 feet from the house. Figure 3-2 gives some ideas for managing this zone. In addition:

- Think lean, clean and green: Mow the lawn regularly.
- Plant fire-resistant vegetation (see the list in the Resource Kit) and keep plants, grass and trees regularly watered and healthy; especially during fire season.
- Remove dead vegetation (leaves and pine needles) from gutters, under decks and within 10 feet of the house.
- Prune back shrubs and tree branches – the lowest branches should be at least 6-10 feet from the ground and shouldn't overhang any part of the house.
- Take out *ladder fuels* (material on or near the ground that will carry fire into a tree) and provide fuel breaks (such as gravel walkways) to prevent fire from traveling along the ground to the house.
- Ensure firewood stacks are at least 30 feet from the house

The next zone is 30 to 100 (or even 200) feet from the house. In this zone you should consider the type and number of trees. There can be more plantings, but continue to prune the trees and ensure there's separation between the branches of adjacent trees. The idea is to gradually reduce the amount of fuel sources as you get closer to your home.

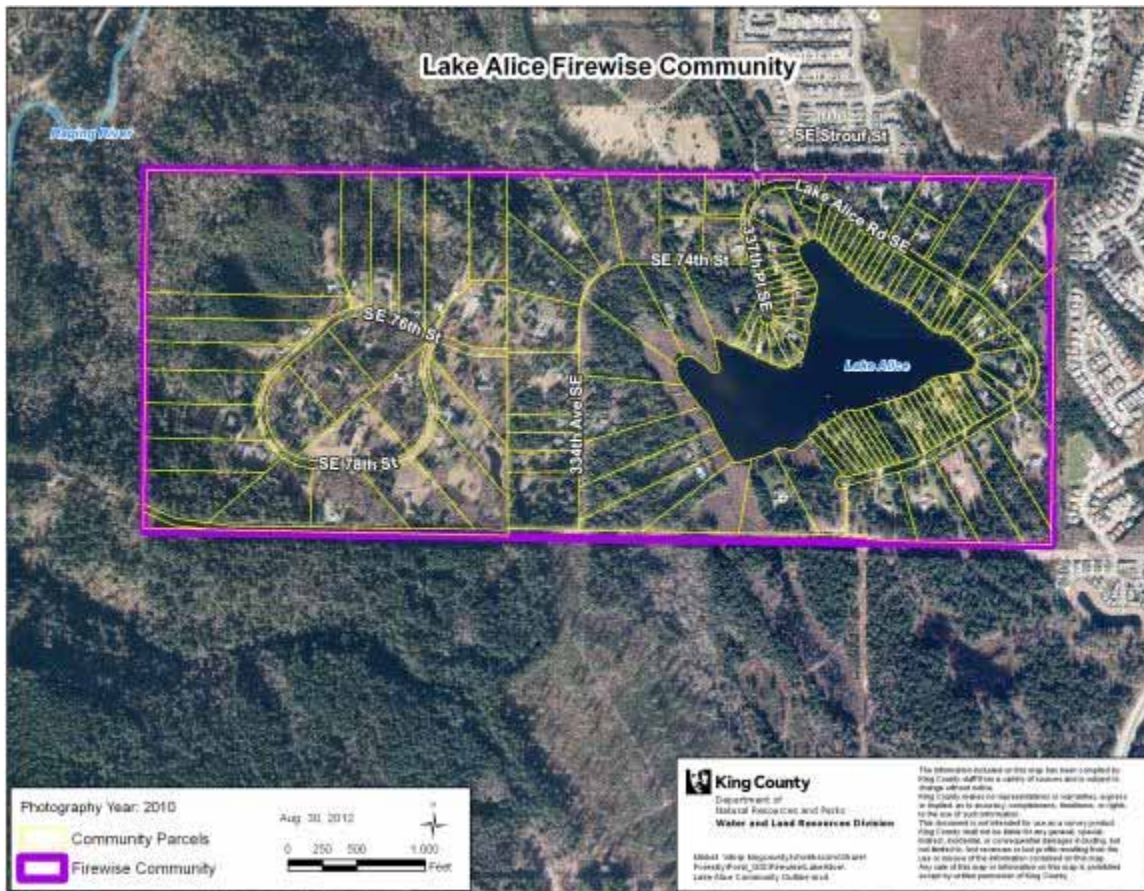
For more information on the home ignition zone and ways to make your home and your property more fire safe, visit these Web sites:

- <http://www.firewise.org>
- <http://your.kingcounty.gov/ddes/fire/pdfs/FirewiseBrochure.pdf>

# Chapter 4

## Lake Alice Profile

This chapter presents a brief profile of the Lake Alice Firewise planning area (see Figure 4-1). General demographic, public safety and environmental features are discussed.



**Figure 4-1: Lake Alice Firewise planning area (outlined in purple) is west of Snoqualmie Ridge and south of Fall City off Preston-Fall City Road. (King County GIS)**

## Community

The Lake Alice Firewise planning area is located approximately 3 miles south of Fall City, Washington off the Southeast Preston-Fall City Road. Lake Alice is on a plateau above the Raging River Natural Area with an elevation of about 880 feet above sea level. It is accessed by Lake Alice Road, a fairly steep, winding, 2.3 mile paved road.

The freshwater lake that the community is centered around is approximately 33 acres in area. Residences are organized into three different homeowners associations. Homes on smaller lots around the lake are part of the Lake Alice HOA, larger lots on the west side of the lake are the West Lake Alice HOA, with the furthest west properties part of the Lake Alice West HOA.

There are 111 parcels with structures in the area with 117 dwellings (see Figure 4-2). According to 2010 census figures, 277 residents live in the area. Residences are a mix of older homes and larger, newer houses. The total taxable assessed land value in the area is \$26,403,096 with improvements valued at \$28,551,800.

There are no commercial services in the planning area. While adjacent to the large Snoqualmie Ridge development to the east, there is no direct access to the community.

## Fire Protection

King County Fire District 27 provides fire protection for the Lake Alice area. The fire station for the district is located at 4301 334th Place SE in Fall City, approximately 3.4 miles away from the entrance to Lake Alice (homes may be another mile away from the entrance). The station is staffed by ten career Firefighter/EMTs and seventeen volunteer Firefighter/EMTs.

The community has no fire hydrants. The nearest hydrant is at the intersection of SE Sorenson Street and Lake Alice Road, approximately ½ mile before the entrance to Lake Alice (see Figure 4-2).

Most of the homes in the Lake Alice planning area are on individual or shared wells. Homes in Lake Alice West share a well with a 35,000-gallon water storage tank.

Lake Alice has a public fishing access and ramp that could provide access for a tanker truck (see Figure 4-3). The lake could also be used for helicopter bucket work (see cover).



**Figure 4-2: Fire hydrant at Sorenson Street (with vandal resistant lock).**



Additional nearby water sources that could be used for water supply during a wildfire include the Snoqualmie River and Fall City municipal fire hydrants.

**Figure 4-3: Public access boat ramp at the east end of Lake Alice.**

## Fuels

The Lake Alice area community is classic wildland urban interface. The community is surrounded on all three sides by forest land and to the east by the community of Snoqualmie Ridge. The surrounding area varies between heavily forested natural areas, wetlands and built-up suburban communities (see Figure 4-4 for an aerial view).



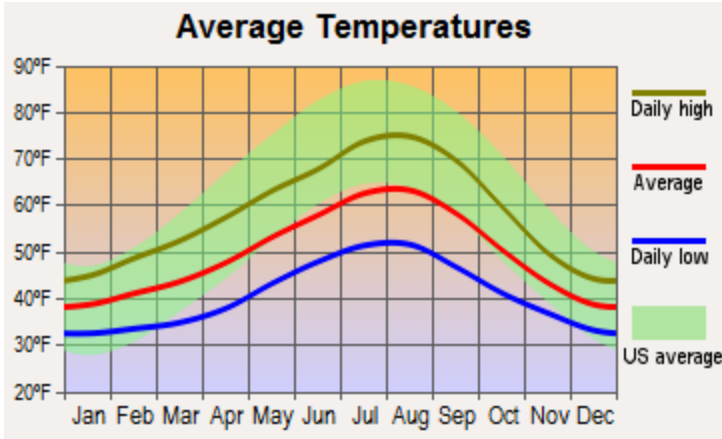
**Figure 4-4: 2009 aerial photo showing surrounding forested land in the Lake Alice planning area (in red).** (Google Earth)

The forested timberland in the Lake Alice area primarily consists of mature stands of evergreens with minimal ladder fuel concentrations (NFDR model H and NWCG type 8). Many lots in the community are partially cleared and have a mix of deciduous and conifer trees and native underbrush. There is a fair amount of downed fuel from storm events in the ravines on the northern and western sides of the planning area.

## Weather

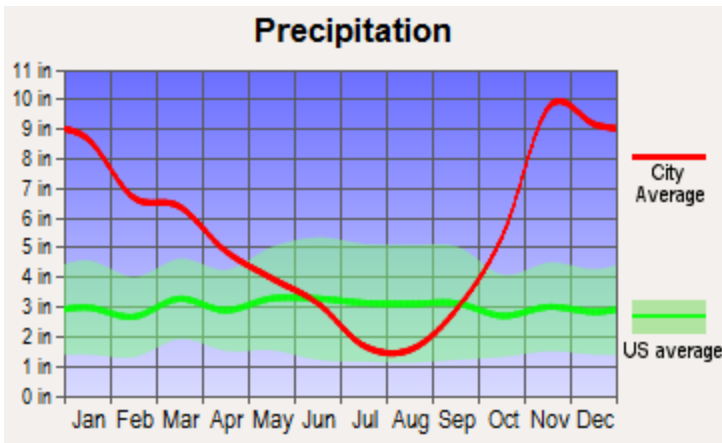
Located off the I-90 corridor, west of North Bend, the Lake Alice area typically receives higher rain and snowfall accumulations than many other parts of the Puget Sound Basin. This additional precipitation tends to delay the start of fire season, with the driest and warmest times of the year occurring in July and August. (See Figures 4-5 and 4-6.)





**Figure 4-5: Fall City average temperatures.**

During the summer months temperatures may exceed 80 degrees for several days in a row; accelerating fuel drying.



**Figure 4-6: Fall City average precipitation.**

Local wind conditions can have a significant impact on fire behavior. As with many Cascades foothill communities, the Lake Alice area is subject to east wind events. These occur when high pressure builds east of the Cascades range and warm air is forced to the west through Snoqualmie Pass. Because the air is compressed as it is pushed westward, high winds can form. 70 mile per hour plus wind events are not uncommon.

East winds depend on certain weather conditions, but it's normal for afternoon upslope winds to occur in the area. These winds can be strong and cause fires to burn more intensely and rapidly spread uphill.

## Topography

The Lake Alice planning area is located on a plateau between I-90 and the Snoqualmie River. Elevation ranges from approximately 850 to 900 feet above sea level (the Snoqualmie River is 90 feet above sea level at Fall City). While most of the residences are built on flat or rolling terrain, fairly steep slopes border the west side of the planning area on the north, west and south (see Figure 4-7).

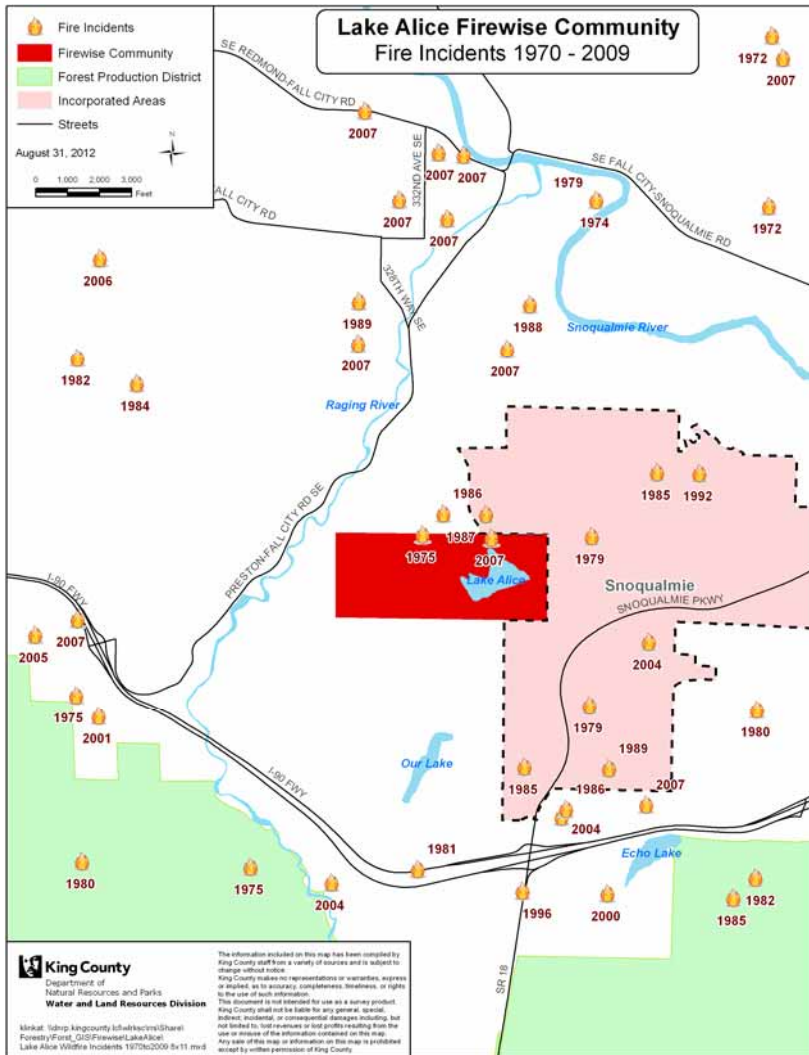


Figure 4-7: Topography of the Lake Alice area. (Google Earth)

# Chapter 5

## Lake Alice Issues & Threats

In evaluating wildland fire threats, it's useful to first look at fire incident history. As Figure 5-1 shows, there have been several fires inside and outside the Lake Alice planning area, any of which could have possibly spread into homes. Heavy concentrations of timber, East winds and a steep, single road for access increase the risk potential of a significant fire incident.

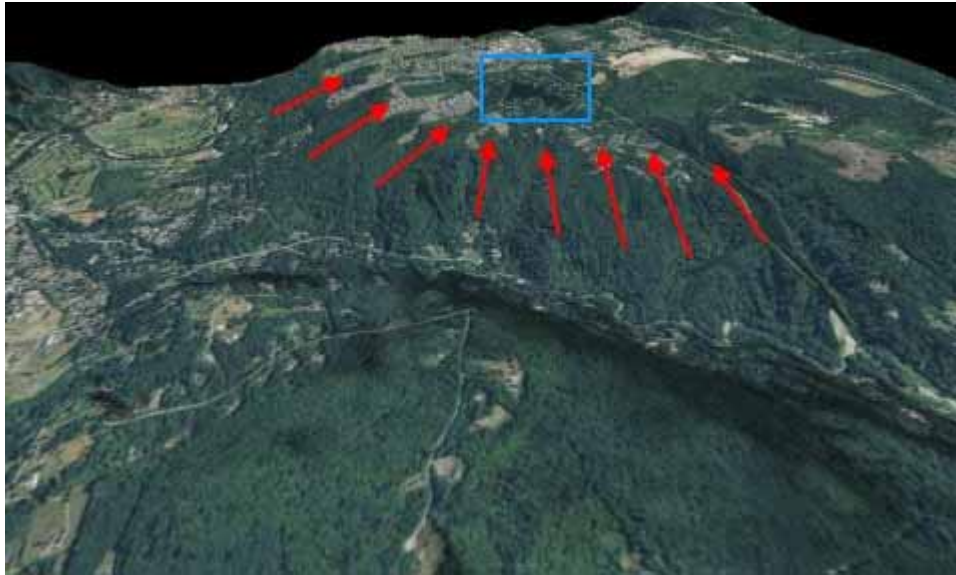


**Figure 5-1: Lake Alice Area Fire Incidents - 1970 to 2009.** (A larger version of this map is included with the accompanying Resource Kit.) *King County GIS*

In August 2012 the consulting team evaluated the Lake Alice Firewise planning area, noting potential wildfire threats and completing a Washington State Department of Natural Resources evaluation form (included at the end of this chapter and in the Resource Kit). The community scored 120, solidly in the range of the High Risk rating. Specific issues are discussed in this chapter.

## Topography

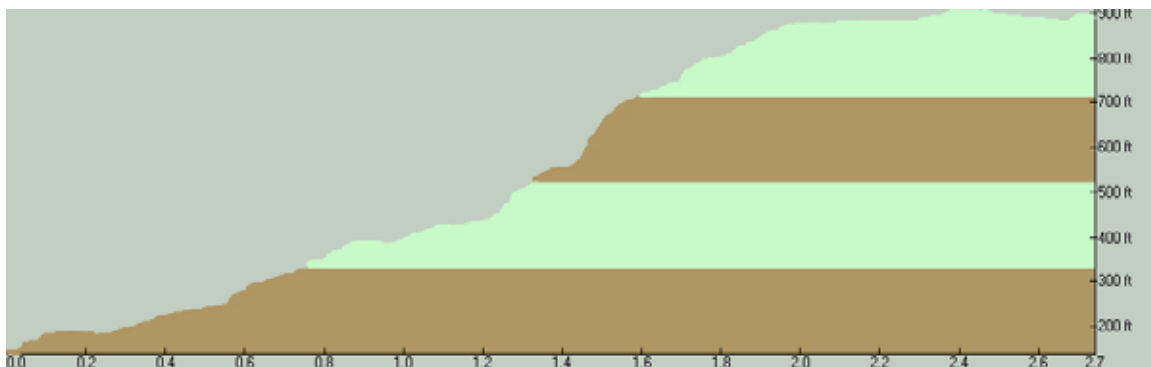
As mentioned in Chapter 4, the steep hills and ravines to the north and west of the Lake Alice planning area increase the chances of a fire that quickly travels uphill (see Figure 5-2). An accidental, human-caused fire could start on either the Preston-Fall City Road or the Preston-Snoqualmie Trail, both downhill of Lake Alice, from a carelessly tossed cigarette. Extended drought conditions coupled with downed fuel from storm events compounds wildfire risk.



**Figure 5-2:** The sloping terrain to the north and west of Lake Alice (in blue) increases the risk of a fast spreading fire that starts downhill of the community. (*TopoFusion*)

## Access and Evacuation Routes

The only access to Lake Alice is Lake Alice Road. This road is fairly winding, steep (Figure 5-3 shows the road elevation profile) and is subject to trees falling across the road during high winds and other extreme weather events. In an emergency, a single entrance into any community is a vulnerability; both for residents attempting to evacuate or emergency response personnel entering the area. Narrow roads and steep grades can further impact quick and safe access.



**Figure 5-3:** Lake Alice Road elevation profile in distance (miles) and elevation (feet) from Preston-Fall City Road. (*TopoFusion*)

## Inadequate Turnarounds

There are several dead end roads in the community that end in cul-de-sacs which are too small for large fire trucks to quickly and safely turn around (see figure 5-4).



**Figure 5-4: Dead end roads with insufficient turnaround space.**

The standard for cul-de-sacs is an 80-foot diameter turning space. If the diameter is less than 80-feet, some types of fire apparatus may not be able to turn around and would be forced to back out. This can potentially be time-consuming for firefighters. Depending on fire conditions, firefighters may elect not to access a road with a limited turnaround due to the risk.

## Green Belt

The green belt that surrounds Snoqualmie Ridge and abuts part of the Lake Alice planning area (north of Lake Alice Road) is beginning to become overgrown and is collecting a large amount of downed limbs and other fuels (see Figure 5-5). This creates greater fire risk to residents on Lake Alice as well as Snoqualmie Ridge.



**Figure 5-5: Green belt at Lake Alice Road and SE Sorenson Street.**

## Power Line Right-of-Way

The southern portion of the Lake Alice planning area is bordered by a power line right-of-way road (see Figure 5-6). In the event of a wildfire, this road could be a potential threat due to vegetation fuel load on both sides of the road. During the summer months, the area is vulnerable to fires accidentally started by unauthorized recreational motorized vehicle use; deficient exhaust systems on off-road vehicles are a common cause of fires.



**Figure 5-6: Power line right-of-way road south of Lake Alice.**

As the right-of-way is aligned east/west, it is especially vulnerable to fire spread driven by East Wind events spilling over the Cascades. A large fire in the right-of-way could spread rapidly and threaten residences and power lines.

The right-of-way is gated. While this limits unauthorized vehicle use, it also restricts property owner access during an emergency.

## Scotch Broom

Scotch Broom is an invasive plant that seems to thrive in the full sun conditions of most right of ways and roadsides. Scotch broom is also highly flammable. It spreads very rapidly and is difficult to remove, so any infestation should be removed as soon as it is detected.

Scotch Broom was noted in areas around the power lines and other areas (see Figure 5-7). Left untreated, this invasive plant can spread like wildfire in a sunny area like the power line right-of-way. With the east-west aspect of the right-of-way, this can become a very dangerous combination.



**Figure 5-7: Scotch Broom is a flammable, invasive plant.**

## Wind Driven Embers

One of the biggest threats Lake Alice faces is a wildland fire started outside of the area, accompanied by high winds (a common summer afternoon occurrence). Wind blown, burning embers (also called *firebrands*) such as those shown in Figure 5-8, can spread a fire far in advance of the main flame front.



During strong winds it's also possible for firebrands from a structure fire to spread flames to other structures or nearby vegetation. A carelessly thrown cigarette from a car along I-90, an unwatched campfire from a nearby park or even a vehicle fire along Preston-Fall City Road could easily start a fire that could spread into in the heavily forested lands surrounding Lake Alice and could send embers all throughout the community.

East Wind events common down the I-90 corridor additionally put the community at risk.

**Figure 5-8: Wind driven burning embers (*firebrands*) can quickly spread a fire.**

## Fuels

Wildfire fuels are anything that may burn. All trees, brush, homes, structures and other flammable items are considered fuel. However, some types of vegetation and structures are more combustible than others.



**Figures 5-9: Heavily wooded areas that aren't maintained present a greater risk of fire.**

The types and amount of fuel in a specified area will determine the fuel density. A higher fuel density usually means a higher risk factor. Much of the area surrounding Lake Alice is heavily wooded (as shown in Figures 5-9). Of particular concern are wooded areas with large concentrations of downed branches, which are easier to ignite. Vegetation in sunny open areas and on south and west facing slopes tend to be more combustible because of low moisture content; especially during the dry summer months.

Firewood stacks in close proximity to a residence or adjacent to flammable vegetation can also pose a threat to a home in case of ignition. Dry firewood readily ignites during a wildfire, and a burning stack can generate a considerable amount of heat, setting other nearby fuel on fire.

## Home Construction

The majority of homes in Lake Alice have combustible siding and decks. Residents should be aware that their homes are as much of a fuel source during a fire as trees or downed branches. This is why the concept of *defensible space* is so important.



Most residences and structures in Lake Alice have composite or other fire-resistant roofs. However some cedar shake roofs were noted (such as shown in Figure 5-10). Homes and buildings with composite roofs stand a better chance of surviving a wildland fire compared to those with cedar roofs.

**Figure 5-10: Cedar shake roofs are more combustible than composite roofs.**



Unless pressure treated by the manufacturer, cedar shake roofs are not fire resistant. In different studies, buildings with Class A fire resistant material roof such as asphalt or metal are 95% more likely to survive a wildfire. Because of the flammability of cedar roofs, a home may rapidly burn to the ground. If a number of homes are threatened by a wildfire, firefighters with limited resources may elect to protect homes with composite roofs versus those of cedar because of the greater likelihood of saving them. Embers are also produced as a cedar roof burns and given the right wind conditions can quickly spread a fire to other residences.

One common issue observed was the lack of screening under decks and porches (such as shown in Figures 5-11). Wind-blown, dead vegetation such as leaves, pine needles and small branches can easily gather under raised wooden decks and porches. These accumulations can be ignited by embers, potentially setting the structure on fire.



**Figures 5-11: Lack of screening under porches and decks.**

Another way fire can spread to a house is when a firebrand blows against a wooden fence and starts the fence on fire. If the fence is directly connected to the house (see Figure 5-12), fire can spread from the fence to the house.



While wooden fences are not especially common in this community, owners should be aware of the risk this type of fences can pose.

**Figure 5-12: Fences connected to houses can spread fire.**

## Confusing Street Signs

During an emergency, local responders usually know an area and have map books to help them locate street addresses. However during a large fire incident, out-of-area responders not familiar with Lake Alice may be used. Several locations were noted where street signs could possibly confuse emergency responders delaying their arrival. Figures 5-13 shows a sign with multiple streets and an older, non-standard street sign in Lake Alice West that is partially obscured by vegetation.



**Figures 5-13: Confusing street signs can delay emergency responders.**

## Difficult to See Street Address Numbers

Along with street signs, readily seen house numbers are critical for emergency response personnel. The numbers should be located on the street, need to contrast with their background and be large enough so they can be easily read day or night.



As seen in Figure 5-14, many of the homes did not have easy to read street address numbers. In many locations, especially when there were group mailboxes, there was no indication of the address visible from the street. Even when an address was on a mailbox, it was often only on one side. The numbers need to be visible from both directions.

**Figure 5-14: Difficult to read street address signs are a vulnerability.**

## Flammable Landscaping

Trees, shrubs and grasses planted in close proximity to a residence can be a fire hazard if they are ignited. They can expose combustible siding and structural features to flames.

Some plants are more flammable than others. For example ornamental junipers tend to be quite flammable and are often called "green gas cans" by firefighters. When planted in a row a fire will follow each shrub until the entire row is on fire. If the row does not connect with the house or is outside a 30' defensible space zone, the threat is reduced; although burning plants may still produce embers that can spread a fire. The Resource Kit included with this plan contains a list of less flammable, Firewise safe plants.

In Figure 5-15, flammable plantings commonly used for privacy hedges follow along a fence. If an ember lands in a shrub, it could readily start on fire, potentially igniting the fence, and then other connected structures.



**Figure 5-15: Flammable plantings can ignite structures, fences, and poles.**

It's also worth noting that cedar beauty bark, depending on the size of the chips and age, can rapidly spread fire on the ground. Depending on the situation, a safer alternative could be compost or gravel. Unused piles of beauty bark and mulch left to dry out over the summer months can also be fire hazards.

## Above Ground Utilities

Aboveground telephone and electric utilities (shown in Figure 5-16) can be impacted by wildland fires. Poles can burn causing them to fall and lines to breaks. Lines can also be destroyed by a hot burning fire. Low hanging lines may also impede emergency vehicles.



**Figure 5-16: Above ground utilities are vulnerable to fire.**

Locations in Lake Alice were noted where trees and vegetation was growing around and in utility lines. If these plants caught fire, they could potentially burn through the lines disrupting power and telephone service. This could be critical during an emergency.

## Gated Properties

A number of gated properties were observed in the Lake Alice area (see Figure 5-17). During a fire, a locked gate can delay firefighters and emergency responders or even prevent them from responding.



**Figure 5-17: Locked gates can prevent responders from accessing a fire.**

## Narrow Driveways

A number of narrow, overgrown driveways are present in the Lake Alice Firewise planning area (see Figure 5-18). These driveways can pose a problem for larger emergency vehicles.



Fire trucks must have safe access to roads and driveways. In fact, firefighters may choose not to take a truck down a driveway if they can't determine if an adequate turnaround is present or are concerned with not being able to make a quick exit. Additionally, when limbs and brush overhang the road, they can damage emergency vehicles and equipment.

**Figure 5-18: Narrow, overgrown drives can hide risks from firefighters.**

## Outdoor Fire/Barbeque Pits

Outdoor barbeque and fire pits (see Figure 5-19) are common on Lake Alice properties. Some residents reported large bonfires being set on undeveloped lots during parties.



Often, owners of undeveloped lots will use their land for recreation purposes before or during building construction. In some cases, these recreational fires may be started by trespassers or others who may not take appropriate efforts to build a proper pit or guarantee the fire is completely extinguished before leaving the area.

Any outdoor burning during the summer months increases the chance of the fire accidentally touching off a larger blaze.

**Figure 5-19: Outdoor burning during fire season increases risk.**

# Neighborhood Wildfire Hazard Evaluation Form

This form is based on 2006 International Wildland-Urban Interface Code Appendix C and 2002 NFPA 1144 Annex A

<b>Community Name</b> Lake Alice	<b>Community Location</b> Fall City, WA
<b>Primary Access Road Name</b> Lake Alice Road	<b>Evaluator(s)</b> Madden/McNamara
<b>Evaluation Date</b> August 24, 2012	

<b>A: Neighborhood Design</b>	<b>Score</b>	<b>Rating</b>	<b>Notes</b>	
<b>Access</b>				
Two or more primary roads	0	5		
One road through	3			
One road in and out (entrance & exit are the same)	5			
<b>Gate</b>				
Not gated	0	0		
Locked gate	5			
<b>Bridges</b>				
No bridges or bridges with no weight and width restrictions	0	2		
Low weight or narrow bridge restricting emergency vehicle access	5			
<b>Road Width</b>				
20' or more	1	1		
Less than 20'	3			
<b>Road Grade</b>				
5% or less	1	2		
Greater than 5%	3			
<b>Road Type</b>				
All weather, paved	0	0		
All weather, gravel	3			
Limited access or unmaintained	5			
<b>Secondary Road Terminus</b>				
Loop roads or cul-de-sacs, outside turning radius of 45' or more	1	5		
Cul-de-sac, outside turning radius of less than 45'	2			
Dead-end road, less than 200' long	3			
Dead-end road, more than 200' long	5			
<b>Street Signs</b>				
Present, with ≥4" reflective letters	1	3		
Missing, or present with <4" letters or non-reflective letters	3			
	<b>Sum:</b>	18		

**Notes:**

Lake Alice Road only access, possible emergency routes via Sorenson and power line right-of-way.

Some properties are gated.  
 The Lake Alice West HOA roads have a posted weight limit of 24,000 lbs, due to thin asphalt. But this should not prevent emergency vehicles from accessing area.  
 The community roads are flat; the access road is steep.  
 Lake Alice Rd SE and 334<sup>th</sup> Ave SE are dead end with minimal turnaround radius.  
 Address numbers either not posted or only on one side of post.  
 Narrow drives with limited sightlines, some slightly overgrown, could use pruning.

<b>B: Vegetation / Fuels</b>		<b>Score</b>	<b>Rating</b>	<b>Notes</b>	
<b>Fuel Type</b>					
Light (e.g., grasses <6", deciduous leaf litter)		1	7		
Medium (e.g., grasses >6", conifer litter, light brush, small trees)		5			
Heavy (e.g., dense brush, timber)		10			
Very heavy (e.g., logging slash, high volume of dead and down)		15			
<b>Ladder Fuels</b>					
Most tree branches pruned up >6' above ground or understory fuels		0	4		
Most tree branches close to ground or understory fuels		5			
<b>Defensible Space</b>					
70% or more of neighborhood		1	10		
30 - 70% of neighborhood		10			
Less than 30% of neighborhood		20			
		<b>Sum:</b>	21		

**Notes:**  
 Homes around lake on smaller lots have intersecting defensible space zones. Neighbors will need to cooperate for best results.  
 Larger lots have better defensible space around homes.

<b>C: Topography and Weather</b>		<b>Score</b>	<b>Rating</b>	<b>Notes</b>	
<b>Weather</b>					
History of high fire occurrence		0 - 5	2		
Exposed to unusually severe fire weather and strong, dry winds		0 - 5	3		
Local weather conditions and prevailing winds		0 - 5	3		
<b>Slope</b>					
8% or less		1	4		
8 - 19%		4			
20 - 29%		7			
More than 30%		10			
<b>Topographic features*</b>					
Topography that adversely affects fire behavior		0 - 5	4		

* Consider attributes like ridges, saddles, steep slopes, steep narrow draws, small canyons, etc.	<b>Sum:</b>	15
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**Notes:**

Narrow, steep gorges and draws around western half of planning area (South, West and North sides), but appear to be well irrigated due to high ground water level  
 West and Southwest facing slopes heat up during day  
 Strong easterly winds in area.  
 Wind speeds reported over 70 mph.

<b>D: Building and Property Construction</b>	<b>Score</b>	<b>Rating</b>	<b>Notes</b>
<b>Roofing</b>			
More than 75% of homes have metal, tile, class A asphalt or fiberglass shingles	0	10	
50 - 70% of homes have metal, tile, class A asphalt or fiberglass shingles	10		
Less than 50% of homes have metal, tile, class A asphalt or fiberglass shingles	15		
More than 50% of homes have wood roofs	20		
<b>D: Building/Property Construction (con't)</b>			
<b>Siding and Decks</b>			
More than 75% of homes have noncombustible siding/deck	0	20	
50 - 70% of homes have noncombustible siding/deck	5		
50 - 70% of homes have noncombustible siding and combustible deck	10		
Less than 50% of homes have noncombustible siding and combustible deck	15		
More than 50% of homes have combustible siding/deck	20		
<b>Foundations / Crawlspace</b>			
More than 75% of homes have enclosed foundations with vents covered by ≤1/4" metal mesh	0	0	
50 - 70% of homes have enclosed foundations with with vents covered by ≤1/4" metal mesh	5	5	
Less than 50% of homes have enclosed foundations with vents covered by ≤1/4" metal mesh	15		
More than 50% of homes have open foundations	20		
		<b>Sum:</b>	35

**Notes:**

Some cedar shake roofs present  
 Decks and combustible siding common.  
 Vents have mesh.



<b>E: Fire Protection - Water Source</b>	<b>Score</b>	<b>Rating</b>	<b>Notes</b>
500 GPM hydrants spaced within 1,000'	0	5	
Hydrants spaced >1,000' apart or < 500 GPM hydrants	2		
Other water source available within community (tanks, pools, lakes, etc.)	5		
Water source located within 20 minute or less round trip	7		
Water source located farther than 20 minute but less than 45 minute round trip	10		
Water source farther than 45 minute round trip	15		
	<b>Sum:</b>	5	

**Notes:**

Lake Alice public fishing access a good point to access lake water, flat with concrete boat ramp.  
 Fire hydrant located at intersection of Sorenson Street and Lake Alice road, ½ mile from entrance to Lake Alice.  
 Possible access to Lake Alice West HOA 35,000 gallon storage tank.

<b>F: Utilities</b>	<b>Score</b>	<b>Rating</b>	<b>Notes</b>
<b>Electric</b>			
Underground, clearly marked	0	5	
Underground, not clearly marked	1		
Overhead, with adequate right of way (>20')	2		
Overhead, with right of way not maintained	5		
<b>F: Utilities (con't)</b>			
<b>Gas</b>			
Underground, clearly marked	0	1	
Underground, not clearly marked	1		
Aboveground, with 15' of brush clearance and >30' from structures	2		
Aboveground, with no brush clearance or <30' from structures	5		
	<b>Sum:</b>	6	

**Notes:**

Lake Alice HOA has above ground utilities. West Lake Alice HOA and Lake Alice West HOA have below ground utilities. All utilities coming into the area are above ground.

<b>G: Surrounding Landscape</b>	<b>Score</b>	<b>Rating</b>	<b>Notes</b>
Neighborhood is predominately within low fire hazard mapping area	0		
Neighborhood is predominately within moderate fire hazard mapping area	10		

Neighborhood is predominately within high fire hazard mapping area	15	
Neighborhood is predominately within extreme fire hazard mapping area	20	20
	<b>Sum:</b>	20

**Notes:**

<b>Neighborhood Hazard Ratings</b>	<b>Sum</b>
<b>A: Neighborhood Design</b>	18
<b>B: Vegetation / Fuels</b>	21
<b>C: Topography and Weather</b>	15
<b>D: Building and Property Construction</b>	35
<b>E: Fire Protection - Water Source</b>	5
<b>F: Utilities</b>	6
<b>G: Surrounding Landscape</b>	20
<b>Total:</b>	120

<b>Neighborhood Hazard from Wildfire Rating Scale</b>	
<b>Low</b>	< 70
<b>Moderate</b>	71 - 110
<b>High</b>	111 - 135
<b>Extreme</b>	> 135

**ADDITIONAL NOTES:**

- Slopes on western side are heavy with fuel. Easterly winds could easily spread embers into area.
- Snoqualmie Ridge abuts eastern side of planning area.
- Greenbelt around Snoqualmie Ridge needs management plan and care.
- High-use trail below planning area (Preston Trail) increases risk of accidental fire from careless visitor.
- Lake Alice road has history of being blocked by fallen trees on a regular basis.
- Sorenson Street not currently usable as emergency exit due to berm and rocks in front of locked gate (3 different locks present).
- Power line right-of-way to south of planning area is illegally used by off-road vehicles, increasing risk of fire start.
- Scotch broom starting to make it's way into area, especially around power line right-of-way.
- Shoreline setback regulations may affect allowable fire mitigation techniques.

# Chapter 6

## Recommendations

Chapter 5 lists some of the threats to the Lake Alice area from a wildfire. This chapter provides recommendations for addressing vulnerabilities to decrease the risk of loss of life and property during a large fire incident.

The recommendations include:

- Educate property owners about Firewise principles
- Establish emergency evacuation routes
- Develop a formal community evacuation plan
- Ensure roads are maintained for emergency vehicle use
- Reduce green belt and power line right-of-way fire risks
- Monitor invasive, flammable vegetation
- Reduce fuel sources
- Review home construction
- Improve house/address numbers and street signage
- Review landscaping choices
- Locate propane tanks away from structures
- Keep utility poles and lines clear of vegetation
- Install Knox Boxes on gated properties
- Keep driveways clear of encroaching vegetation and ensure adequate turnarounds
- Use proper fire pits and make sure all recreational fires are put out
- Emphasize the dangers of fireworks
- Explore the use of emergency communication systems
- Consider forming a Community Emergency Response Team (CERT)

It's important to note that these recommendations can be phased in over time (a suggested plan is included at the end of this chapter). For example some communities focus on public education the first year and then move on to projects the second year. Much depends on the community and level of involvement. The key is to make forward progress on reducing fire risk, no matter how gradual that progress is.

### Firewise Landscaping and Public Education

Education is one of the strongest tools for reducing the risk of harm or loss from wildfire. The Firewise program is primarily educational, and seeks to create a sustainable balance that allows communities to live safely in natural settings.

Educating community members about 30' defensible space zones, 100' home ignition zones, fire-resistant plants for landscaping (and where to locate them, such as interspersed in a row of flammable shrubs), the dangers of legal and illegal fireworks, and other Firewise principles should be a priority.

To reach the greatest possible number of people, a variety of methods should be used such as offering presentations by knowledgeable authorities, distributing readily available Firewise educational material, and partnering with state, county, and local agencies in fire risk reduction efforts.

Some specific public outreach ideas include:

**Walk-arounds** – An effective way to demonstrate Firewise landscaping and defensible space principles is to take a walk around adjacent properties, pointing out good and not so good examples of Firewise practices. A walk could begin at a home with a short presentation on Firewise principles. After a discussion, the attendees would walk from house to house, identifying and learning about fire vulnerabilities.

**Firewise Literature** – King County and Washington State DNR both have Firewise brochures and educational materials. The community should approach the county to make sure the brochures are mailed to all current homeowners.

**Spreading the Word** – While individual Firewise practices in Lake Alice will help reduce wild fire risk on a single property, the entire area is at risk due to the large amount of wildland-urban interface land. The more property owners that employ Firewise practices the better. Getting the word out by simple word of mouth or suggesting Firewise presentations in the schools can help. Beyond that, Firewise communities have used a number of different techniques to inform others about the program, including:

- Articles in local newspapers
- Information booths at local events
- "Give-away" items with tips, hints and other Firewise-related information.
- Plantings of fire resistant plants at local fire stations
- Social networks – Facebook, web sites and other media are great ways to both get new information out to neighbors and to archive information for future use. Refer to the Resource Kit CD-ROM for more information.

## Access and Evacuation Routes

Currently, Lake Alice Road is the only access into the planning area. This is a large vulnerability if the road is blocked or becomes impassable during an emergency.

There are two alternate routes that could be used during an emergency evacuation if Lake Alice Road is not available.

Sorenson Street (see Figures 6-1) is a paved road that connects Lake Alice Road with the Snoqualmie Ridge development. The road is currently gated with further access blocked by large boulders and a dirt berm. These obstructions prevent the road from being used during an emergency. The Lake Alice community should work with appropriate authorities to ensure Sorenson Street is available as an emergency exit. The road should continue to be gated and locked, with access to the gate's Knox Box only made available to emergency responders.



**Figures 6-1: Sorenson Street location (in orange) on left and street detail on right. (Google Earth)**

The other potential emergency evacuation route is the power line right-of-way road to the south of the community. This is a relatively narrow, primitive, gravel road that runs east/west. The west end of this road is a dead end (above a large bluff). The east end leads into Snoqualmie Ridge (see Figures 6-2). It is unknown whether the road is maintained sufficiently throughout the year to accommodate passenger cars. There are two gated access points to the road (as shown in Figures 6-2). The community should investigate the possibility of using the road as an emergency exit with the property and easement owner and local government agencies. Gates should remain locked to prevent unauthorized vehicle access and have Knox Boxes installed to allow access during an emergency. (Note: The east/west nature of the road does increase its vulnerability to fires driven by east winds. If the road is used during an evacuation, community members and agencies must ensure it is safe from fire to avoid a potential entrapment.)



**Figures 6-2: Power line right-of-way access points (in orange) on left. Snoqualmie Ridge exit point (in orange) on right.**

## Evacuation Plan

Appropriate emergency routes should be part of an evacuation plan. Fire can be an unpredictable and powerful force. Despite the best efforts of federal, state and local fire agencies a fire may burn out of control and threaten residents and homes in an area. As a contingency both Fire District 27 and the Washington State Department of Natural Resources should have an evacuation plan in place for Lake Alice residents. Residents should educate themselves on how to prepare for an evacuation, when to evacuate, how to leave their homes in a fast and efficient way, and when they can return once the area is safe.

Because of the single road access to Lake Alice and the surrounding fuel loads, a quick moving fire could prevent residents from evacuating. Part of an emergency fire plan should be designated *safe zones*. These are large, cleared areas where residents could gather and safely wait out a fire, as an absolute worst case scenario, last resort.

Criteria for appropriate safety zones include:

- Areas where there is little or no fuel (mowed pastures, large lawns, etc.)
- Places where the fire has already burned
- Natural features such as rock areas, water, or meadows
- Constructed sites such as clear cuts or roads

The general rule of thumb for distance separation from people to the fire should be at least 4 times the flame height. For example if the flames were 10 feet high, you would need 40 feet distance separation from the edges of the safety zone to the nearest fuels; for this example, 40 feet on all sides. Larger areas may be required depending on wind, slope, and fuel loads.

One possible Firewise project could be to work with Fire District 27 and WA-DNR to conduct a wildfire drill for the Lake Alice area. This could be a simple tabletop exercise where the community tests its communications and evacuation procedures.

## Turnarounds on Dead Ends/Road Maintenance

The community should consider working with the property owners and the county to expand turnaround space at end of dead end roads. If a turnaround is not possible, they may be able to install a “hammerhead” (a t-shaped intersection that allows emergency vehicles to turn around at the end of a road). Additionally, roadside vegetation should be trimmed back to prevent overhanging branches from damaging fire and emergency vehicles. Emergency equipment must have good access to areas to effectively fight wildfires.

## Green Belt

While not part of any Lake Alice home owner association, the green belt between Lake Alice Road and the Snoqualmie Ridge development does present a fire risk if not properly maintained. Fuel from storm events can accumulate, and if ignited, fire could spread to residences; especially if it is wind driven. The community should work with the green belt property owner to ensure that an appropriate management and maintenance plan is put in place. A healthy green belt will be safer for both the Lake Alice and Snoqualmie Ridge residents.

## Power Line Right-of-Way

In addition to potentially serving as an emergency evacuation route, the power line right-of-way could also act as a fire break, potentially preventing a fire to the south from entering the Lake Alice community. Residents should work with the right-of-way property owner and easement

holder to ensure vegetation adjoining the road is managed and the road is kept passable. Unauthorized off-road vehicles should be discouraged from using the right-of-way.

## Monitor Invasive/Flammable Vegetation

Patches of Scotch broom are present in the Lake Alice community; especially around the power line right-of-way. Because of the plant's rapid growth and flammability, these patches should be removed. The entire community should be monitored for invasive flammable species so they do not become established and increase fire risk.

## Wind Driven Embers

Wind-driven embers can start fires over a mile away or greater from the main fire. If an ember lands in dry fuel, it can start a fire in a matter of seconds.

The best protection from wind borne embers and firebrands is to make sure there is no fuel to catch fire. Some proven methods include:

- Cleaning out gutters
- Using gravel, compost and other non-flammable materials for mulch in planting beds (avoiding the use of decorative bark)
- Enclosing the bottoms of decks and porches with 1/8 inch metal screening
- Making sure attic and crawlspace vents are covered with 1/8 inch metal screening

## Fuels

Identifying land that contains vegetation and other fuel types that increases fire danger can help to mitigate risk. Once hazardous fuel sources are identified, the community can work with the landowners and the county to: reduce fuel loads, make certain vegetation on road right-of-ways is managed, establish natural firebreaks, and ensure healthy forest practices are in place. Other fuel measures include:

**Chipper Day** – One proven Firewise activity is for the community to have a wood chipper day. Participating residents would drag unwanted brush from their properties to the roadside where a volunteer or professional crew would chip and dispose of the brush. The community could share the costs of a renting an appropriate sized chipper or work with the county (and the King Conservation District) to get the use of a chipper. The chips are hauled off to an appropriate disposal site or offered to farms in the area as livestock bedding.

**Firewood** – Dry firewood can quickly spread a wildfire. A wind-blown ember can readily start smaller pieces and kindling on fire and soon an entire stack of wood becomes a potentially dangerous bonfire. Firewood should never be kept next to the house. Ideally, firewood would be kept in a covered structure at least 30 feet from the main residence.

**Forest Plans** – Property owners with a significant amount of forested land should ensure they have (and follow) a forest management plan that promotes the health and safety of their forest. The plan can be tailored to the owner's desires, whether that is to maximize timber production, provide wildlife habitat, increase the diversity of the forest, or any combination thereof. Plans should take into consideration home ignition zones (as explained in Chapter 3) to help protect residences or structures. A healthy forest is a safe forest, regardless of the owner's long term goals for the land. As an added bonus, with an approved forest management plan the property owner may qualify for various incentive programs that may reduce their property tax.

## Home Construction

Simple steps can be taken to reduce the ignition risks of residences in Lake Alice. Here are some options to consider.

**Flammable roofs (cedar shake)** – Cedar shake roofs greatly increase a home's chance of burning down during a wildfire. A single ember blown in from a distant fire can start a cedar shake roof on fire. While it may be impractical to immediately change roof materials, when a cedar shake roof requires replacing, the homeowner is best advised to use a Class A fire resistant roofing material such as architectural composites, metal, ceramic or other less flammable materials.

**Metal screening** - Dead vegetation is notorious for building up under decks and porches. This dry vegetation can be extremely flammable and if an ember should reach them, it could easily ignite the deck or porch and spread the fire to the house.

An easy way to reduce this risk is to screen in the undersides of decks/porches with 1/8-inch (or smaller) metal mesh. This type of screening reduces the amount of flammable material that builds up under these structures and helps prevent embers from reaching any vegetation that may be present. A wooden lattice or other structure may be added for aesthetic reasons if desired.

In addition to screening underneath decks and porches, any crawl space or attic vent should also be screened for the same reason. Houses tend to “breathe” throughout the day as they heat up and cool down. Air is drawn through attic and crawlspace vents. This same airflow can draw embers into a house and start insulation or other materials on fire. Screens prevent the embers from entering the house plus have the added benefit of keeping out unwanted rodents and other unwanted forms of wildlife.

**Wooden Fences** - Wooden fences should not be connected directly to the house. If an ember lands against a fence and starts it on fire, the fire can easily spread to the house. There are several easy fixes to this problem. A simple gate at the connection point allows the homeowner to open the gate and interrupt the path of the fire. The fence could also be terminated with a stone or metal post next to the house. If the fence must be connected to a residence, use metal connectors and avoid direct wood-to-wood contact.

## Difficult to See Street Address Numbers

If there is an emergency, fire and emergency personnel need to be able to quickly locate individual homes in the community; including in darkness and low visibility conditions. Street numbers should be clear and easily read at a distance during both day and night.

Placing clear, easily read, non-combustible markers on the street in front of each home makes it much easier for emergency responders to locate a specific house. These numbers could be placed on a mailbox or on a separate post near the drive. The numbers should be clear and easily read from both directions. If desired, the community may be able to work with Fire District 27 to come up with a similar address marker for everyone to use.

Street signs should also be standardized (reflective letters at least 4” high) and easily read. Street signs should be kept clear of vegetation and any other obstructions that prevent them from being easily seen.



## Flammable Landscaping

Flammable plants (usually resinous ones, such as decorative cedars, yews, junipers) should only be grown 30' or more from a house. In addition, fire resistant plantings should be used around aboveground propane tanks. The Resource Kit CD-ROM included with this plan contains a list of less-flammable, Firewise safe plants.

## Propane Tanks

Propane tanks (large and small) should be sited away from a residence or structure in case of fire. Even small barbeque tanks should be kept away from buildings to reduce the chance of fire spreading in the event of combustion. Propane tanks typically won't explode under high heat, but will bleed off gas, which may ignite. Because of this, fire resistant plantings should be used around above ground propane tanks.

## Above Ground Utilities

While it is usually impractical to move all utility lines underground, residents should work with utility companies to make sure tree limbs and other plants are pruned at least 3 feet from the lines. Poles should be kept clear of flammable vegetation. Proper maintenance of the surrounding vegetation may prevent the utilities from failing during a wildfire.

## Gated Properties

A locked gate provides security for a property, but it can also delay or prevent fire personnel from responding to an emergency. Residents with gated property should consider installing a Knox Box or lock; a secure key box or special lock that allows fire personnel to quickly gain access to a locked gate without damaging it. Refer to the Resource Kit CD-ROM for more information on Knox Boxes.

## Narrow Drives

While a winding, narrow drive may have a nice, rural appearance, it can create problems for or prevent emergency vehicles from accessing a property. Even if your car or truck can easily fit down the drive, a much larger vehicle such as a fire truck may have to push through brush and limbs. If the drive is long and narrow, firefighters unfamiliar with the area may not know if they can turn around at the end.

Brush and limbs should be pruned to a minimum width of 12-feet and up to a minimum height of around 14-feet to ensure fire fighting vehicles can access the drive without damaging equipment.

In addition, there should be adequate space for a large vehicle to turn around at the end of a drive (40 - 80 feet is recommended depending on the type of turnaround). If the drive is very long, consider putting in pull-outs so two vehicles can pass each other without forcing one vehicle to back out the full length of the drive.

## Fire/Barbeque Pits

If a property owner uses an outdoor fire or barbeque pit, it should be built according to these Washington State Department of Natural Resources specifications:

- Located at least 25 feet away from any structure,
- Dug deep enough to reach mineral soil (no leaf litter or other organic material),
- Backfilled with at least four inches of cement,
- Lined with a metal or other non-combustible ring no more than three feet in diameter, and
- Surrounded by rocks at least 1.5 feet around the ring.

Large bonfires and illegal campfires on vacant lots that pose a fire risk should be reported to authorities; especially during dry conditions.

See the Campfire Brochure file included on the Firewise Resource Kit CD-ROM for more details on safe outdoor fires.

## Fireworks

In 2009, fireworks and explosives in Washington state started 790 fires and caused over \$5.4 million in loss. It's worth noting that 85% of all wildfires are caused by man-made activities. The use of fireworks is a major contributor of fire starts. Educating residents and others about the dangers of using fireworks in heavily forested areas and the surrounding lands should be an ongoing effort.

## Emergency Communications

Residents should consider establishing a phone tree system for contacting each other. In the event that landline or cell phone service is available during an emergency, this is a fast and efficient way of providing the latest information about a wildfire or other emergency. A phone tree could be easily expanded outside of the area by adding contacts for other neighborhoods. In addition to a phone tree, email addresses should be exchanged as part of an emergency communication plan. (A free Yahoo! account and group has been set up for Lake Alice Firewise use. Information is included in the CD-ROM Resource Kit.)

**Reverse 911:** Fire District 27 uses the Reverse 911 service to notify residents of emergencies. During certain emergencies, an automated phone call is placed to residences in the affected area with information. However, only landlines are automatically registered with this service. If you wish to receive Reverse 911 on your cell phone or Voice Over Internet Protocol (VOIP) phone, you need to register your phone number with the emergency 911 dispatch center. More information on registering your phone can be found at <http://www.norcom.org/reverse911.cfm>.

**Amateur Radio:** Aboveground utilities can be disrupted during a wildland fire. Cell phone service can also be interrupted during an emergency when circuits are overloaded or transmission facilities damaged. Because of this, the community should examine alternative emergency communication methods in case phone service is not available. This could consist of handheld FRS (Family Radio Service) radios, which are relatively inexpensive, don't require a license and work over distances of around a mile. Amateur (HAM) radio is another option, although radios are more expensive and require training and a license to operate. Local ARRL (American Radio Relay League) or the Snoqualmie Valley Amateur Radio Club (<http://snovalleyarc.org/>) should be contacted for more information.

## CERT

Another all-hazards way to reduce risk from fires and natural and human-caused disasters is to consider starting or joining an existing Citizen's Corp that offers Community Emergency Response Training (CERT). CERT is a U.S. government sponsored program that educates people about disaster preparedness for hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. Using the training learned in the classroom and during exercises, CERT members can assist others in their neighborhood or workplace following an event when professional responders are not immediately available to help. CERT members also support emergency response agencies by taking a more active role in emergency preparedness projects in their community.

CERT training is usually coordinated by the local fire department. Lake Alice residents interested in CERT training should contact Fire District 27 or get more information at: <https://www.citizencorps.gov/cert/>.

## A Suggested Plan

### First six months

- Distribute Firewise literature to community residents
- Conduct a Firewise neighborhood tour
- Start working with county and other agencies on emergency evacuation routes
- Implement simple Firewise risk reduction measures (cleaning gutters, trimming shrubs, relocating wood piles, etc.) on individual properties
- Create emergency contact phone tree
- Remove Scotch broom
- Clear obstructing vegetation from narrow roadways (before summer or before winter)
- Apply for Firewise Community status

### Year one

- Hold a neighborhood cleanup event (work with county to have “Chipper Day”)
- Participate in a fire evacuation drill and have individual and/or neighborhood emergency plans in place
- Work with Fire District 27 to designate properties as potential safety zones
- Develop an alternative communications (FRS or Amateur Radios) plan
- Conduct an annual Firewise audit to measure fire risk reduction and identify areas of improvement
- Monitor invasive, flammable vegetation
- Clear obstructing vegetation from narrow roadways (spring and fall)
- Work with property owners and the county on a plan to improve roads (pullouts, hammerheads)
- Renew Firewise Community status

### Year two

- Monitor invasive, flammable vegetation
- Clear obstructing vegetation from narrow roadways (spring and fall)
- Implement more labor intensive Firewise risk reduction measures
- Work with surrounding neighborhoods to implement Firewise practices
- Conduct the annual Firewise audit and renew Firewise Community Status

### Year three

- Monitor invasive, flammable vegetation
- Clear obstructing vegetation from narrow roadways (spring and fall)
- Implement more costly Firewise risk reduction measures
- Conduct the annual Firewise audit and renew Firewise Community Status

# Chapter 7

## Getting Firewise Communities/USA Recognition

While any homeowner can implement Firewise practices it's important to note that fire doesn't recognize property boundaries. By working together, a community can increase the safety for all the homes in the area. The Firewise Communities/USA program grants special recognition to communities that come together to create a more fire-safe place to live.

Getting Firewise Communities/USA recognition is a readily achievable goal that demonstrates a community's commitment to reducing the risks of wildfire. This chapter outlines the requirements and what Lake Alice needs to do to be awarded this distinction.

### Why Become Recognized?

Why should a community apply for national Firewise recognition? Here are some good reasons:

- Helps create a sense of community, of belonging. People who work together for a common goal tend to build stronger neighborhoods. The program opens up communications between neighbors.
- Engages more neighbors in preparing for wildfire safety. The more Firewise homes, the less chance that a home may catch fire and spread to other homes in the neighborhood.
- Encourages attractive and welcoming landscapes. Firewise landscaping is aesthetically pleasing.
- Increases possible grant sources for common projects.
- Provides access to national Firewise organizations resources including:
  - Quarterly publications
  - Online Learning Center
  - National biannual Convention
- Establishes relationships with local fire agencies.

### What's Involved?

The Lake Alice area as a whole may apply for Firewise Communities/USA status or subsections, such as the smaller HOAs or a group of adjacent properties, can apply. It's possible to have multiple Firewise Communities if there's a lack of interest at the larger scale.

Here are the steps involved in getting Firewise Communities/USA recognition:

1. Establish a Lake Alice (or subsection) Firewise Board. The board consists of neighborhood members who are interested in helping the development become more fire-safe.
2. Complete a community assessment and create a plan that identifies agreed-upon achievable solutions to be implemented by the community. State, county and local agency representatives must approve the assessment and plan. (The plan and assessment in this document fulfills both of these requirements and has been approved.)

3. Observe a Firewise Communities/USA Day each year that is dedicated to a local Firewise project. Projects can include yard debris cleanup days, public education events, or any community project designed to reduce the risks of wildfire. Your first Firewise Day may be getting together to review this plan and complete the forms to receive Firewise recognition.
4. Invest a minimum of \$2 per capita annually in local Firewise projects. Most communities meet this requirement through volunteer time. See the "How Much Does It Cost?" section below for details.
5. Complete and submit a Firewise Communities/USA application form. A copy of the form (Firewise Community Application.doc) is included with the CD\_ROM Resource Kit that comes with this plan. The form should be submitted to the WA-DNR contact listed in Appendix A of this document.

It's up to the Firewise Board, in cooperation with King County Fire District 27, to pursue Firewise Communities/USA status. (The application is included on the CD-ROM Resource Kit that comes with this plan.) When approved, Lake Alice (or a subsection) achieves recognition and is included among a select group of communities in the United States; at present only a handful of communities in King County have received this distinction. (See: [http://submissions.nfpa.org/firewise/fw\\_communities\\_list.php](http://submissions.nfpa.org/firewise/fw_communities_list.php) for a nationwide list of communities.)

Each year the Firewise Board submits an application and documentation to renew Firewise Communities/USA recognition. The annual requirements include holding a Firewise day event and investing a minimum of \$2 (usually as "in-kind dollars", see below) per community member in Firewise activities.

## How Much Does It Cost?

It doesn't cost anything to apply for Firewise Communities/USA status (or renew annually, once your community is recognized).

The program does stipulate that the community must invest a minimum of \$2.00 per capita annually in local Firewise projects if they want to maintain their recognition status.

For example, with about XXX residents within the Lake Alice planning area, that means each year \$XXX needs to be invested in Firewise projects. Keep in mind that doesn't mean the community needs to raise that much money or spend out-of-pocket dollars each year. First, volunteer time counts. The current rate for volunteer compensation is a bit over \$20 an hour (\$20.85 in 2011). So if a single person volunteers an hour of time on a Firewise project, he or she has met the annual \$2.00 per capita requirement for 10 people. **INSERT NUMBERS BASED ON CENSUS**

Based on XXX residents, only a total of XX volunteer hours must be logged each year on Firewise projects. It doesn't matter how many people are logging the hours (although the more the better), just that they are recorded. (Volunteer forms are included in the Resource Kit CD-ROM included with this report.)

Second, individual efforts count toward the community. Let's say you added a gate on a fence to mitigate the risk of fire spreading to your home as per Firewise recommendations. The total cost could be applied to the community's annual Firewise investment.

As you can see, it's easy to meet this requirement.

Some examples of Firewise projects include:

- Providing public education (presentations or information booths on Firewise concepts)
- Cleaning your gutters
- Creating defensible space around your house
- Attending Firewise meetings (local board meetings or national conferences)
- Participating in community projects (such as removing overhanging limbs from streets, creating fuel breaks, or improving emergency road access)

*Note: The time and fees involved in preparing this plan can be applied to the \$2 per capita annual investment.*

## **How Long Does The Process Take?**

On a national level, most communities take 12 to 24 months to complete all of the Firewise Communities/USA requirements. However, in the case of Lake Alice the process will be accelerated since a Firewise board has been established, the assessment and plan have been completed and the fees involved in creating this report can be applied to the annual \$2 per capita investment. The primary requirements are holding a Firewise Day event and submitting an application. Once these tasks are completed, the approval process should take 6 to 8 weeks.

## **Is There Grant Money Available for Projects?**

The Lake Alice Firewise Board may identify large-scale projects such as fuels reduction, road projects and other projects that could significantly reduce wildfire risk. These projects may be too costly for the community to undertake. However it is possible there may be funding available for certain projects through federal, state and county grants. The Resource Kit CD-ROM contains information on potential funding sources.

## **For More Information**

Check out the official Firewise Communities/USA Web site at:

<http://www.firewise.org/usa/index.htm>

You'll find stories and photos from a number of communities that have received the distinction.

# Appendix A

## Firewise Contacts

King County Department of Natural Resources and Parks  
Kristi McClelland, Forester  
201 South Jackson Street, Suite 600  
Seattle WA 98104-3855  
Kristi.McClelland@kingcounty.gov  
206-296-7820

King County Fire District 27  
Chris Connor, Fire Chief  
4301 334th Place SE  
Fall City, WA 98024

Washington State Department of Natural Resources  
Charley Burns, Wildlands Fuel Specialist  
950 Farman Ave. N.  
Enumclaw WA 98022  
charley.burns@dnr.wa.gov  
360-802-7005

Sarah Foster, State Firewise Coordinator  
Olympia, WA  
sarah.foster@dnr.wa.gov

National Firewise Communities  
[www.Firewise.org](http://www.Firewise.org)

### Other Useful Contacts

Washington State Patrol 425.649.4370  
2803 156th Ave. SE  
Bellevue, WA 98007  
King County Office of Emergency Mgmt. 206.296.3830

King County Dept of Transportation 206.296.6590  
Road Services Division 1.800.527.6237  
201 S. Jackson St.  
Seattle, WA 98104

Washington State Dept of Transportation 206.440.4000  
NW Region Office  
15700 Dayton Ave.  
Shoreline, WA  
P.O. Box 330310 Seattle, WA 98133

Puget Sound Energy 888.225.5773  
P.O. Box 97034  
Bellevue, Wa 98009



Red Cross (King County Chapter) 206.323.2345  
1900 25th Ave. South  
P.O. Box 3097  
Seattle, WA 98114  
Metro Transit 206.684.1162  
201 S. Jackson St.  
Seattle, WA 98104

# Appendix B

## Contents of Lake Alice Firewise Resource Kit

The Lake Alice Firewise Resource Kit is a CD-ROM that contains a number of different information sources designed to help you create and maintain a Firewise Community. This document lists the contents of the CD-ROM and describes each file on it.

Most of the files are in Adobe Acrobat (PDF) format and can be viewed and printed with Adobe Reader. (If you don't have a copy of the program you can download it from [www.adobe.com](http://www.adobe.com).) Firewise Community application forms are in Microsoft Word (.DOC) format and can be opened by many different word processors. Click on a link to open a document.

### What's On The CD-ROM

**2009 Fire in Washington.pdf** - The Washington State Fire Marshall's annual report of emergency responses in the state. Full of data on fires, their causes and costs.

**2010 Fire in Washington.pdf** - The latest Washington State Fire Marshall's report.

**Campfires.pdf** - DNR information about campfire and fire pit safety.

**CERT FAQ.pdf** - Frequently asked questions about the U.S. government's Citizen Emergency Response Team program.

**Citizens Corps Volunteer Liability Guide.pdf** - An overview of legal issues and approaches to address liability for volunteers.

**DNR Fireworks Safety.pdf** - A Firewise Safety poster produced by the Washington State Department of Natural Resources. It may be freely copied and distributed.

**Firewise Community Application.doc** - A Microsoft Word document that contains the application for becoming a Firewise Community.

**Firewise Community Renewal.doc** - An application for annually renewing your Firewise Community status once you have achieved the distinction.

**Firewise Contacts.doc** - A list of state and county Firewise contacts.

**Firewise Funding Sources.pdf** - Information about funding sources for Firewise projects and how to apply for grants.

**Firewise Matching Funds for Homeowners.pdf** - A form for recording Firewise activities for matching fund grants.

**Firewise Plant List 2009.pdf** - A list of fire resistant landscape plants for the Puget Sound Basin.

**Firewise Volunteer In-Kind Tracking.pdf** - A form for tracking in-kind volunteer Firewise hours.

**Firewise Volunteer Signup Sheet.pdf** - A volunteer signup form for Firewise projects.

**Firewise Volunteer Time Sheet.pdf** - A form for tracking hours spent volunteering on Firewise activities.

**Internet Communication Resources.pdf** - Information about using the Internet for Firewise communications including Yahoo! accounts that have been created for your community.

**Knox Box Information.pdf** - Information about lock boxes used to provide emergency fire department access to locked gates.

**Lake Alice Firewise Assessment.pdf** - Assessment form completed by Madden & McNamara during an August 2012 fire assessment of the Lake Alice area.

**Lake Alice Community Wildfire Protection Plan.pdf** - An electronic version of the September 2012 Lake Alice Firewise plan.

**Wildfire Evacuation Process.pdf** - Information about community fire evacuations.