

Firewise Landscaping

A Guide to
Protecting Your Home
from Wildfire



Defensible space in a front yard, well-spaced plants close to the home, and a lean, clean, and green backyard are Firewise landscaping techniques.



Every year, many homes in the Great Lakes region are damaged or destroyed by wildfire, yet nearly all of these homes could have been saved if owners had followed a few simple rules.

This guide is designed to provide homeowners with the information they need to protect their homes from wildfires through appropriate landscaping techniques. The guide also includes information on what and where the risks from wildfires are, and how individual homeowners can manage their property to minimize the risk of wildfire damage.

“...HAVING
UNDEVELOPED
WOODLANDS AND
FIELDS IN AND
AROUND A
NEIGHBORHOOD
MEANS THAT
RESIDENTS SHOULD
KNOW HOW TO
PREPARE THEIR
HOMES...”

Recognizing Wildfire Risk

How do you know if you're at risk from wildfire? It is easy to see that a home is at risk from wildfire if it sits in the middle of a woodlot or on the edge of an overgrown field. Additionally, homes are also at risk in what fire experts call the Wildland-Urban Interface (WUI).

The WUI can be anywhere along the suburban fringe. Many densely-developed suburban neighborhoods with four-lane streets and stoplights are at significant risk from wildfire. The WUI can also be small, developed lots around a lake, or small tracts in a forested area. It's hard to say exactly where the risk ends, but having undeveloped woodlands and fields in and around a neighborhood means that residents should know how to prepare their homes for wildfire.

Two types of wildfire

Two types of wildfires – surface and crown fires – can affect homes. Surface fires burn materials laying on or immediately above the ground, including pine needles, leaves, grass, downed logs, stumps, tree limbs and low shrubs. This type of wildfire can surround a home and slowly find vulnerable spots to ignite.

Crown fires move through the canopy of a forest stand, burning from one treetop to the next. They can have extremely high flame lengths, which



A crown fire in the tree canopy.

often start spot fires far ahead of the fire front. Surface fires throw embers as well, although typically not as far as crown fires.

Crown fires can catapult burning embers onto your property, including your home. Crown fires are the most destructive of all wildfires, able to kill mature trees and shrubs, and can move over large areas in short periods of time. Some surface fires, especially grass or marsh fires, can move very fast and cause great injury or even death when they are underestimated. Surface fires can become crown fires in stands where there are “ladder fuels” (i.e. branches that extend to the ground and allow a fire to climb up a tree to its crown).



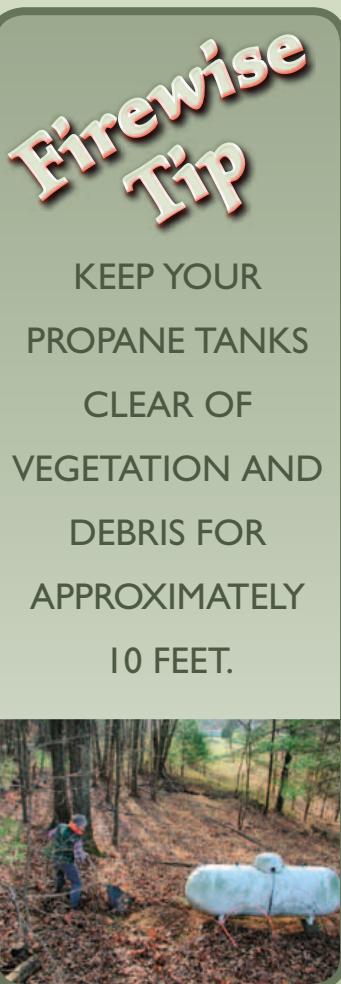
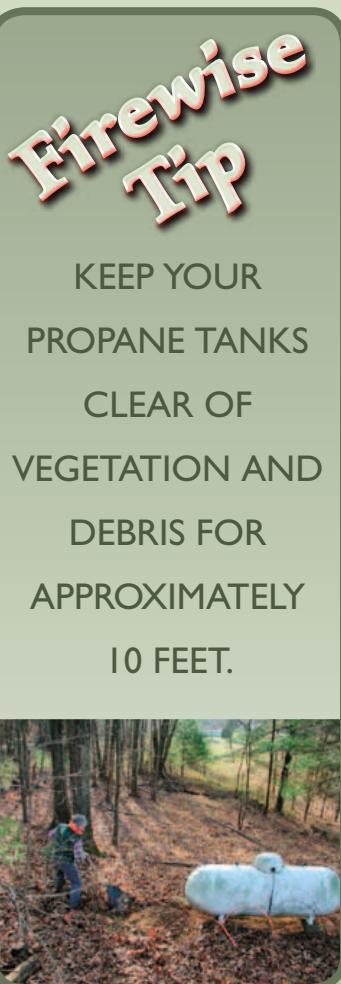
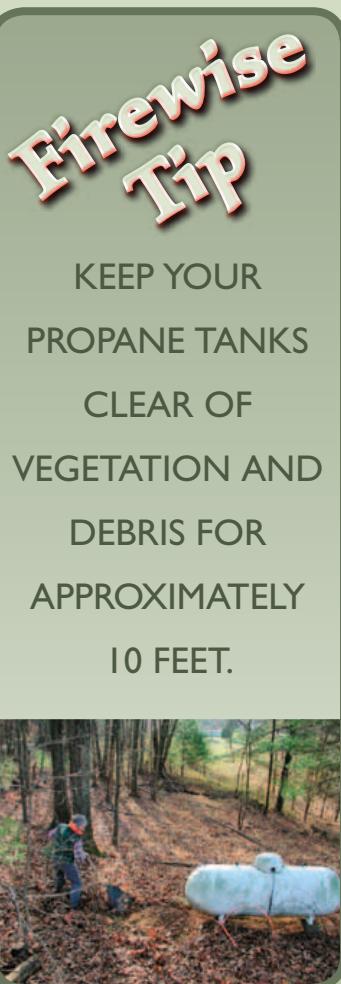
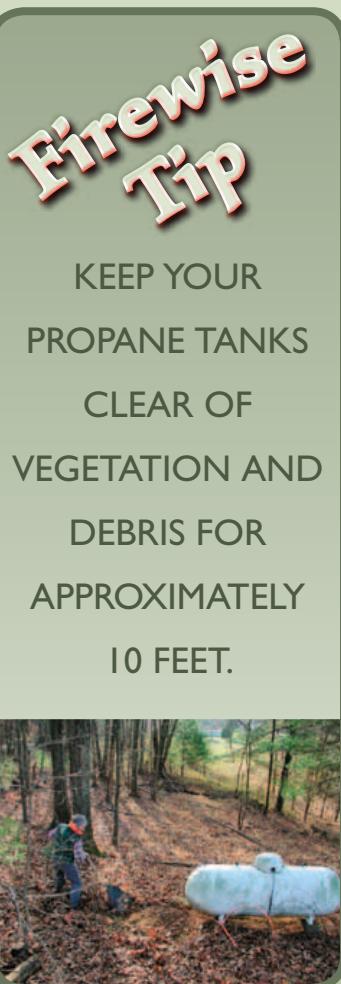
A well-managed Home Ignition Zone helps keep wildfire away.

The Home Ignition Zone

Homeowners in the WUI should be paying the most attention to producing a safety zone immediately surrounding the home. Wildfire researchers have created the term Home Ignition Zone (HIZ) to describe the area 100-200 feet around a home. Characteristics of the HIZ determine a home's potential for being ignited by a wildfire.

A well-managed HIZ will cause a crown fire that is approaching the property to decline in intensity due to reduced fuels. As the fire continues to get closer to a home, it will move from the crowns of the trees to the ground and slowly diminish due to a lack of flammable materials. The fire might continue to burn around the HIZ, but the home can remain intact with minimal damage.

It is unlikely that we can prevent wildfires from occurring. The goal of a Firewise approach is to improve a home's chance of surviving a wildfire with little or no damage.



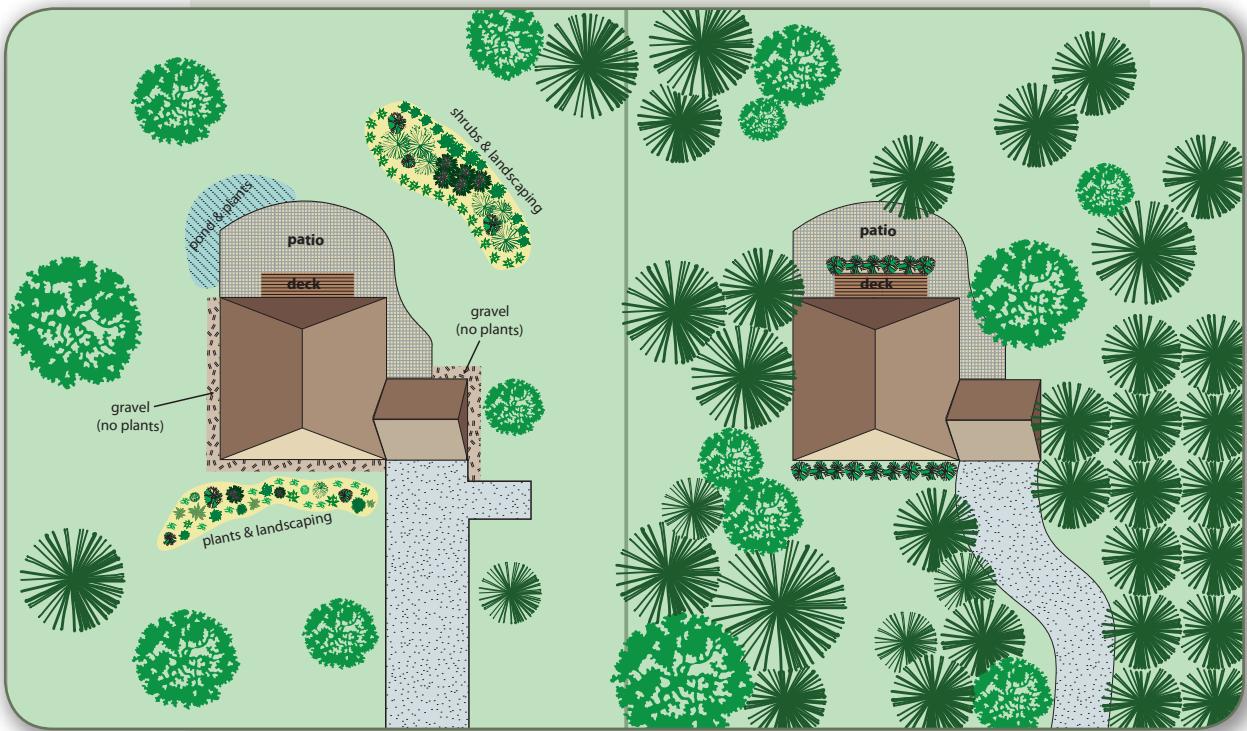


Illustration by Annika Sergeant, UW-Extension Environmental Resources Center

Well-designed landscaping (left) can be attractive and will also help keep fire away. Landscaping that is not Firewise (right) could allow crown fires and surface fires to reach the house.

Landscaping to Protect Your Home

Foundation to Immediate Landscaped Area

“...A HIGH PERCENTAGE OF HOMES LOST TO WILDFIRE IGNITE WELL AFTER THE MOST INTENSE PORTIONS OF THE WILDFIRE HAVE PASSED.”

Experts recommend keeping the first 3-to-5 feet around the base of the house and any outbuildings completely free of any fuel for a fire. It's easy to understand why tall grasses or evergreen shrubs near the house are risky – when ignited, they could put hot flames directly against the siding and eaves. However, other materials can ignite when dry and should also be kept away from buildings. These include things such as leaves, pine needles, straw bales, and organic landscaping mulch. These materials can host a smoldering fire long after the main fire has completely passed. In fact, a high percentage of homes lost to wildfire ignite well after the most intense portions of the wildfire have passed.

Moving farther away from the house, landscape trees, shrubs and plants should be managed to ensure that any fire in this area remains on the ground and burns quickly (i.e. no smoldering) and with low intensity. That means keeping the lawn clean of fallen pine needles and leaves. All vegetation should be well manicured, green, and healthy.



A 3-to-5-foot “fuel free zone” keeps flames away from siding.

Keep the lawn mowed and foliage well watered. In the overall landscaping plan, use plants that are not highly flammable. Low-growing plants with thick, succulent leaves tend to resist fire and are less likely to carry a fire to a building. A number of these plants are highlighted throughout this publication.

Landscaping within 30 feet of your home should not include more than a few scattered evergreens (trees and shrubs that hold their needles all year). Deciduous trees and shrubs that drop their leaves every fall typically burn with much less intensity than evergreens, and are a better choice to plant close to your house. Keep trees and shrubs in this area well pruned and manicured. Tree branches should be pruned to a height of at least 6-to-10 feet from the ground, kept free of dead wood, and pruned away from the roof.

Take care to arrange landscape plants so they are well spaced to prevent fire from moving from one plant to the next.

Try to maintain a space of at least 30 feet between the branches of adjacent trees and shrubs. Avoid planting directly beneath trees, because plants burning in a surface fire might then spread the fire to the tops (crowns) of the trees. Fire burning in the crowns of trees, especially pines, can move rapidly and quickly become very intense.

Managing this area closest to the house represents a significant step in protecting your home. However, the chance that a home can survive a wildfire increases if additional steps are taken for the remainder Home Ignition Zone.

FIREWISE PLANT

NANNYBERRY

Viburnum lentago



A common native shrub with white flowers in May and fruit that change from blue to black in fall. The shrub tolerates shade and its fall color is often a vivid combination of oranges and reds. The fruit is sweet and eaten by an array of birds and wildlife.

Beyond the Landscaped Area

Landscaping practices for the remainder of the HIZ (beyond 30 feet) should be designed to take away enough fuel from a fast-moving crown fire to slow the fire down, reduce its intensity, and move the fire out of the tree crowns and onto the ground. Simply put, the goals are to:

- leaf prevent fire in this area from moving into the crowns of trees, and
- leaf prevent any fire that does happen to reach the crown of a tree or shrub from spreading to the crowns of neighboring trees or shrubs.

To reduce the possibility of a crown fire, thin trees (and remove some if necessary) to keep them well spaced. This is particularly true for evergreens, which should have at least 30 feet between crowns.

**Firewise
Tip**
REDUCE
COMBUSTIBLE
MATERIALS NEAR
YOUR HOME BY
CHIPPING
BRANCHES AND
SMALL TREES AND
COMPOSTING
LIGHTER
VEGETATION.



Firewise Tip

MAKE SURE YOUR
DRIVEWAY IS AT
LEAST 12 FEET
WIDE WITH A
VERTICAL
CLEARANCE OF
14 FEET FOR FIRE
DEPARTMENT
VEHICLE ACCESS.



Fire burns faster uphill, making the removal of vegetation farther out essential to slow the fire down.

Under most conditions, protective measures in a 100-foot zone around a home are sufficient to protect the home from wildfire damage. Fire scientists have shown that large flames of a high-intensity wildland fire typically do not ignite homes at distances greater than 100 feet. A home's materials and design in relation to the vegetation within 100 feet is what determines the potential for a home to ignite.

In some cases, however, the HIZ should be maintained out to 200 feet. This is true for homes built in areas surrounded by steep topography, or if the trees on and around the property are mostly pines.

Topography and Slope

Wildfires are typically most intense on sloped ground, particularly at the top edge of a hill, because fire burning uphill heats and dries the fuel in its path, causing those fuels to burn more rapidly and intensely. Because of this, the tops of slopes are dangerous places to build a house. People tend to think the Great Lakes region is flat, but even small changes in topography can have significant impacts on fire behavior.

If your house is built on, next to, or closer than 30 feet to the edge of a slope, the HIZ will need to be wider and extend farther down hill, away from your home. This will create a larger, reduced fuel area that the fire will have to move through as it burns uphill toward your house. The longer and steeper the slope around your house, the more the landscaped safety zone should be expanded.

FIREWISE PLANT

COLUMBINE
Aquilegia canadensis



This plant blooms from March to July and sets fruit in mid-to-late summer (June to August). Red columbine is pollinated by hummingbirds, hawk moths, and at least four bee species.

Pine Trees

In the Great Lakes region, red pine and jack pine are the most flammable tree species and are known to carry burning embers up to a mile ahead of the fire front. If your home is surrounded by a pine forest or is built in the middle of a pine plantation, thin the trees and keep them pruned and free of dead wood out to 200 feet from your home. Remove any dead standing trees. These trees can turn into “chimneys,” spewing hot firebrands (e.g. burning pine cones or leaves) high into the air. A home fire is possible if firebrands land on areas where leaves, pine needles, or other debris can accumulate. These areas include roofs, rain gutters, under a deck, or along the house foundation.

Leaf Piles

Raking leaves into the woods can also be dangerous. Leaves in large, deep piles do not decompose as quickly as a natural accumulation of leaves on the forest floor. Dry, burning leaves in a pile can easily be picked up and carried by the wind, and can also accumulate against vulnerable spaces on a house. Instead of piles, spread leaves throughout your forest, take them to a brush collection area, or compost them. Keep in mind that most significant wildfires in the Great Lakes region occur on days with intense winds.

Outside the HIZ, fire can essentially burn unabated without causing a home to ignite. However, it is important to note that most homes do not burn from high intensity fires. Most of the homes lost to wildfire in the Great Lakes region burn either from surface fires in the wake of the main fire front, or from the accumulation of windblown firebrands in advance of the fire. Simply put, Firewise landscaping and maintenance is critical.



Pine trees need to be kept well spaced and pruned high.

FIREWISE PLANT

Moss phlox
Phlox subulata



A perennial forming evergreen mats of needle-like foliage covered by masses of flowers in various shades of pink, purple, or white that bloom from March to June. Great for rock gardens.

“DRY, BURNING LEAVES
IN A PILE CAN EASILY
BE PICKED UP AND
CARRIED BY THE WIND,
AND CAN ALSO
ACCUMULATE AGAINST
VULNERABLE SPACES
ON A HOUSE.”

Conflicting Values, Desires, and Laws

Some of the Firewise recommendations presented here conflict with other values or desires that people have when living in the country or planning for that dream vacation cottage. These include a sense of privacy, the feeling of living or vacationing in a natural landscape, the sense of “getting away from it all,” and not spending a lot of time maintaining the yard and surrounding areas. Common questions include:

- leaf *If the house is near a lake, is it possible to cut down trees and still maintain a natural and healthy shoreland buffer?*
(See table of suggested plants below.)
- leaf *What happens if the property borders on or includes a native prairie with grasses naturally prone to fire?*
- leaf *Is it O.K. to keep some trees on the property if they are highly flammable evergreens?*
- leaf *Does cutting down trees interfere with energy conservation goals?*

FIREWISE PLANT

Wintergreen
Gaultheria procumbens



A low, woody ground cover with shiny dark green leaves that turn reddish with the advent of cold weather. Small bell-shaped white to pink flowers are produced from June to August, followed by red berries in the fall that may persist through the winter. This leathery perennial has creeping underground stems, thus forming small colonies of plants.

FIREWISE PLANT

BEARBERRY
Arctostaphylos uva-ursi



A popular ground cover whose name comes from the grape-like fruit it produces. It produces clusters of small, white-to-pink, urn-shaped flowers that bloom from May to June. The fruit is bright red to pink that will persist on the plant into early winter. The fruit is eaten by a few species of songbirds and game animals.

A SAMPLING OF SUGGESTED FIREWISE PLANTS ALSO SUITABLE FOR SHORELAND BUFFERS

PLANT NAME: Common – Scientific	CHARACTERISTICS (orange italics are Firewise Characteristics)
Swamp Aster – <i>Aster puniceus</i>	1-5 feet tall; showy lavender flowers; <i>low volume of total vegetation</i>
Swamp milkweed – <i>Asclepias incarnata</i>	3-4 feet tall; showy pink flowers; attracts monarch butterflies; <i>grows in a variety of wet habitats</i>
Sedges – <i>Carex retrorsa</i> , <i>C. comosa</i> , <i>C. vulpinoidea</i>	<i>low growing; compact</i> ; stabilizes soil; interesting seed heads
Shooting star – <i>Dodecatheon meadia</i>	8-24" tall; pink flowers with swept-back petals in spring; <i>low volume of total vegetation</i>
Boneset – <i>Eupatorium perfoliatum</i>	2-3 feet tall; showy white flowers; <i>grows in a variety of wet habitats</i>
Joe Pye weed – <i>Eupatorium maculatum</i>	3-5 feet tall; showy rose-pink flowers; <i>grows in a variety of wet habitats</i>
Virginia bluebells – <i>Mertensia virginica</i>	1-2 feet tall; grows in shade; blue flowers in spring; <i>succulent stems</i>
Sensitive fern – <i>Onoclea sensibilis</i>	1-2 feet tall; <i>grows in a variety of wet habitats</i> ; <i>does not form clumps</i>
Bulrushes – <i>Scirpus atrovirens</i> , <i>S. cyperinus</i>	3-5 feet tall; stabilizes soil; <i>adaptable</i>
Meadowsweet – <i>Spiraea alba</i>	short shrub; <i>deciduous</i> ; showy flowers
Blue vervain – <i>Verbena hastata</i>	2-4 feet tall; showy purple flowers; <i>low volume of total vegetation</i> ; <i>tolerates disturbance</i>

References:

- Shaw, D. and R. Schmidt. 2003. *Plants for Stormwater Design – Species Selection for the Upper Midwest*. Minnesota Pollution Control Agency.
- Eggers, S. and D. Reed. 1997. *Wetland Plant Communities of Minnesota and Wisconsin*. US Army Corps of Engineers.
- UW-Extension/WDNR. 1999. *Shoreline Plants and Landscaping*.

Efforts to protect your home from wildfires can also conflict with local ordinances, neighborhood covenants, or state laws. Examples of these include weed ordinances and shoreland buffer laws. A discussion with the town, city, or county zoning office is a good place to ask questions as to what can and cannot legally be done on your property. Additionally, county Land and Water Conservation Departments, University Extension offices, and Department of Natural Resources foresters can help identify the best ways to manage your property.

Working with prairies

For those living among native ecosystems that are adapted to occasional wildfires, there are ways to maintain these systems and still protect a home. Restoring prairies has become popular in the region, but landowners need to keep in mind that this is a fire-prone ecosystem. Breaking up large blocks of prairie around a home into smaller blocks will minimize very damaging surface fires. Additionally, focusing on wildflower plantings over grasses, the small blocks of prairie around the house will be even less hazardous and more like gardens. Finally, seeding prairies with species that leave a smaller fuel load on the ground in the fall and spring will reduce the severity of prairie fires.

Managing pine forests

Many new homeowners build within pine forests and then struggle with maintaining the aesthetic nature of the forest while protecting their homes.



A Firewise yard in a pine forest.

Reducing the number of trees around your house and pruning the remaining to reduce ladder fuels is recommended for fire protection, but changes the habitat for wildlife and the overall character of the property. However, pruning a few select trees and leaving scattered full trees will still provide cover and screening while reducing the danger. Felling trees around your house helps keep large fires from burning right up to the foundation and above the roof. Removing most of the trees very close to the house

Firewise Tip

**KEEP YOUR ROOF
AND RAIN
GUTTERS FREE
OF FLAMMABLE
LEAVES, PINE
NEEDLES, AND
OTHER DEBRIS
THAT CAN BE
IGNITED BY
WIND-BLOWN
FIREBRANDS.**





This raised garden bed is an attractive, low-maintenance, and fire-resistant landscaping choice.

Firewise Tip

KEEP ALL
FIREWOOD AT
LEAST 30 FEET
FROM ALL
STRUCTURES,
INCLUDING
DECKS.



and gradually removing fewer and fewer trees as you move away from the house will help maintain a natural look while reducing the fire threat.

To reduce the visual impact of tree removals, a staggered pattern of felling (rather than removing blocks of trees) will leave enough trees to maintain a forest character. Further, replacing some evergreen trees with deciduous trees will increase the visual and biological diversity of the stand and reduce the risk of wildfire danger.

Energy conservation issues

Planting trees near homes has long been advocated for energy conservation reasons. Deciduous trees provide shade in the summer and allow sunlight to filter through in the winter, and are less flammable than evergreens. Maples are a preferred species for this task because their crowns are very dense and provide the best shade. Energy conservation does not have to conflict with wildfire protection if some simple guidelines are followed:

- leaf *If planting close to your house seems necessary, plant on the south side of the home because trees planted there will help retain moisture in an otherwise dry area.*
- leaf *Plant deciduous trees, not evergreens.*
- leaf *Prune any sprouts from the base of the trees.*
- leaf *Rake and remove fallen leaves away from the home.*

Remember, with a little thought and effort, protecting your home from wildfire does not have to conflict with other goals, and can enhance the beauty and diversity of your property.

Looking beyond the property line

When considering wildfire danger, it is also important to consider how the community as a whole fits into the surrounding landscape.

- leaf *Is there a history of wildfire in the area, and what causes them?*
- leaf *If a wildfire were to start, in which direction would the prevailing winds likely push the fire?*

- leaf Are there large areas of forests or pine plantations located around your community?
- leaf What is the nature of the surrounding topography?
- leaf Would firefighters be limited in their ability to reach your home due to weight limits on bridges, dead-end roads, or a narrow driveway?

Consider the management of the surrounding lands. Are the forests, grasslands, and marshlands in your area actively managed to keep the landscape healthy and productive? If not, you might want to contact neighboring landowners to encourage them to use fuel reduction techniques to reduce wildfire risk.

Cooperation between neighbors

Residential developments within the wildland-urban interface often include a higher density of housing than typically found in more rural areas. In these cases, an individual's Home Ignition Zone might overlap that of a neighbor's. In these developments, if one property owner does everything possible to improve the condition of their property and the neighbor does nothing, the neighbor's fuel load might be enough to cause the loss of both homes. Talk

to neighbors about wildfire safety and make a plan to work together to reduce the wildfire risk. Wildfire does not pay attention to property lines!

Some housing developments include areas of wildland vegetation commonly owned by everyone in the development. These could



In many localities, good fire prevention requires cooperation among neighbors.

be wooded areas between houses or "greenbelts" on the outskirts of a neighborhood. These greenbelts are kept open around a community to create a boundary for development while preserving natural, agricultural, recreational, and scenic values beyond the developed area.

Work with neighbors or a neighborhood association to keep these common areas thinned, pruned, and healthy. If these areas are left unmanaged and fill in with dense vegetation or down and dead wood, the overall wildfire hazard of the community greatly increases. Ideally, fuel reduction practices are built into subdivision covenants.

“TALK TO NEIGHBORS ABOUT WILDFIRE SAFETY AND MAKE A PLAN TO WORK TOGETHER TO REDUCE THE WILDFIRE RISK.”

FIREWISE PLANT

Ninebark

Physocarpus opulifolius



A common native shrub that produces flowers and fruit from May to July. The clusters of white flowers in the spring are an excellent nectar source, and the red fruits in the autumn are eaten by many species of birds.

FIREWISE PLANT

Wild Geranium

Geranium maculatum



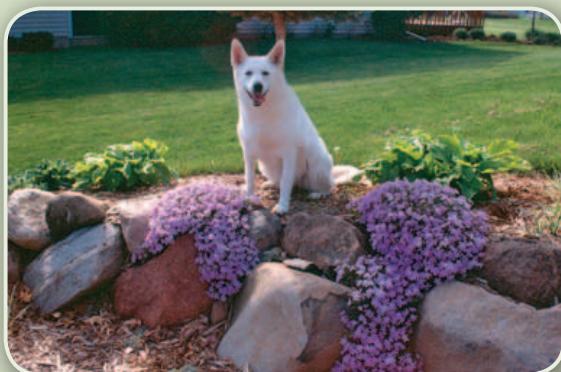
This plant blooms from April to July, and the nectar and pollen of the flowers attract a variety of bee species, small butterflies, and other insects.

**A Guide to
Protecting Your
Home from
Wildfire**

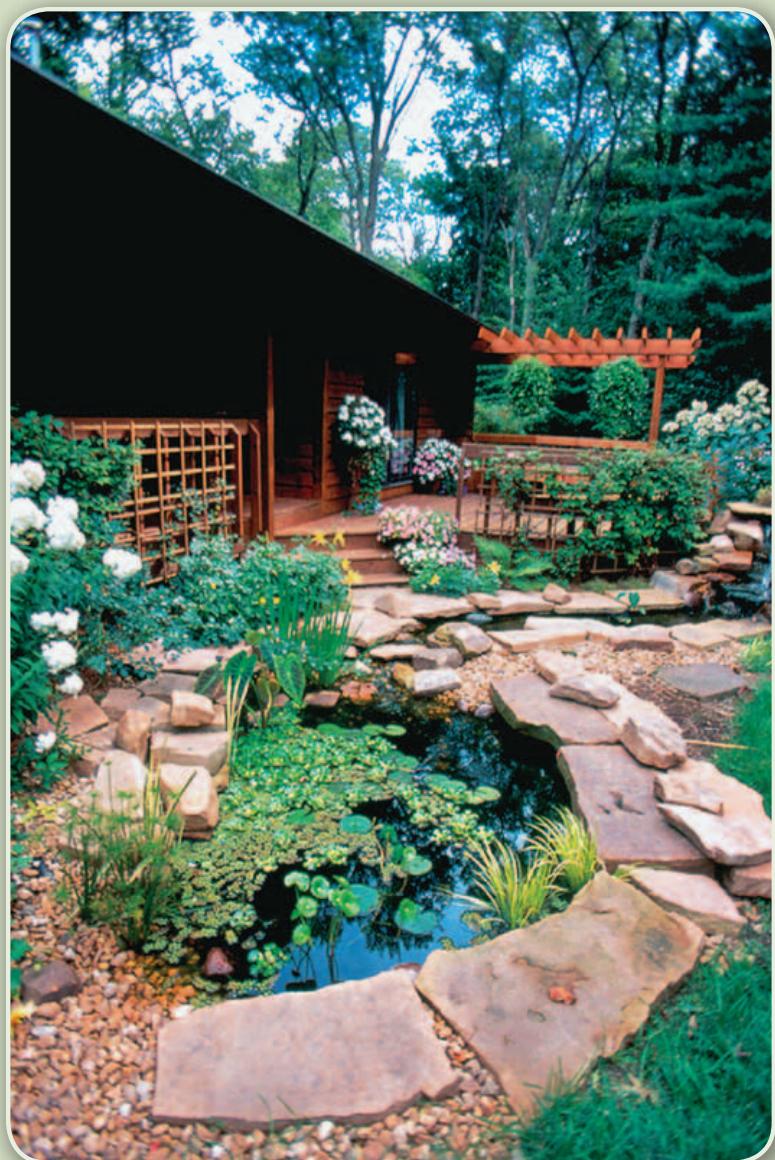
Firewise Landscaping



Garden "islands" keep plants isolated and away from your home's siding.



Rock walls are another creative, Firewise landscaping choice.



Firewise landscaping can be both effective and attractive. This pond beautifies the lawn and provides additional fire protection.

This publication is available from county UW-Extension offices, Cooperative Extension Publications – 1-877-947-7827, and from DNR Service Centers.

©2008 by the Board of Regents of the University of Wisconsin System. University of Wisconsin-Extension is an EEO/Affirmative Action employer and provides equal opportunities in employment and programming, including Title IX and ADA requirements.

Firewise Landscaping – A Guide to Protecting Your Home from Wildfire

DNR PUB-FR-417-2008

UW-Extension publication number GWQ 049

February 2009

 **recycled paper**



Editorial assistance by Bruce Webendorfer and graphic design by Jeffrey J. Strobel, UW-Extension Environmental Resources Center