

Wildfire
prevention and
control in Wisconsin.

FACING Fire!

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GREAT LAKES FOREST
FIRE COMPACT



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JEFF MARTIN

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JEFF MARTIN

ON A MISSION

To protect life, property and natural resources.

Karen Ecklund and Natasha Kassulke

Trent Marty thinks of his career, not so much in terms of years of service, but in numbers of fire seasons he's experienced. He's been the Wisconsin DNR's director for forest protection for nearly 13 seasons and has seen some of the state's most memorable fires including the Four Corners Fire in 2000, the Crystal Lake Fire in 2003 and the Cottonville Fire in 2005.

"Our mission," Marty says, "is to protect life, property and natural resources from wildfires."

The DNR's Wildland Fire Management Program accomplishes its mission by using ground based resources, partnerships with fire departments and other agencies, early detection and aggressive initial attack when a fire strikes.

Wildland fire numbers in Wisconsin vary annually depending on weather, fuel conditions and human activity. Periodic drought cycles drastically affect the number of fires and acres burned. Based on a 35-year average, approximately 1,700 fires burn 6,000 acres each year within the areas protected by the Department of Natural Resources.

Fuel loads

Marty says one concern for the 2012 spring fire season is below average snowfall statewide and the fuel load resulting from numerous tornadoes, wind events and storms that caused widespread damage to forestlands across the state. Northwest Wisconsin was hit especially hard by a July 1, 2011 windstorm that left about 130,000 acres of damaged timber, the most



Wildfires are most common in the spring when the snow melts until foliage fully appears. Fall can also be a time of heightened wildfire concern when foliage begins to drop. However, fires can occur anytime the ground is not completely snow-covered.

- Forests are at risk from wildfires, as are people, their homes and other structures.
- Between 2000 and 2010, around 59 structures were lost to wildland fire each year; during that same time, an average of 429 additional structures were threatened, yet ultimately saved.
- In Wisconsin, people cause 98 percent of all wildfires.
- Most ignitions are accidental and caused by debris burning, equipment use, improper ash disposal and warming fires.

A windstorm in 2011 caused a major blowdown in northwestern Wisconsin, making more fuel for wildland fires.

extensive damage due to storms since 1976.

While each wildfire season is different based on snow cover, weather and more, one thing Marty says doesn't waiver is the need to educate people about what they can do to prevent fires in the first place. The need is greater, now more than ever, as more people build in the wildland-urban interface.

Wildland-urban interface

Housing development continues to move deeper into rural areas, creating a condition called the wildland-urban interface (WUI) where people, homes and property are intermingled with wildland vegetation and are at greater risk from wildfire.

Fire officials are concerned when homes are built in areas of highly flammable vegetation, especially when the structures themselves are made of flammable materials. The concern increases when we build homes in remote areas or when roads and driveways are narrow or sandy, creating situations that can make it impossible for emergency vehicles to get to homes or turn around to exit.

Although housing in the WUI is increasing, the number of available firefighters and equipment is not growing at the same rate.

Partnerships

The Department of Natural Resources uses an interagency approach to prevent, detect, and suppress wildfires in a coordinated, efficient and effective manner. Agencies such as the U.S. Forest Service, Fish and Wildlife Service, Bureau of Indian Affairs, and local fire departments are critical partners.

During a wildfire, the primary responsibility of DNR fire department partners is to protect structures, while department fire control personnel work to put out the wildfire. Local fire department capabilities are enhanced with periodic wildland fire training and DNR forest fire protection grants.

Some 860 local fire departments provide fire protection in Wisconsin and over 90 percent are staffed by volunteers.

Wisconsin is part of the Great Lakes Forest Fire Compact (GLFFC), which includes Michigan, Minnesota, Ontario and Manitoba. GLFFC promotes sharing ideas, new technology, tools, personnel and resources throughout its member agencies. Resource sharing includes equipment, fire crews, incident command teams, fire specialists and

air tankers.

DNR's fire control workforce also supports managing other state and national emergencies when asked. In 2011, the Department assisted in storm recovery efforts across the state and also sent equipment and personnel to help fight wildfires in Texas, Georgia, Montana, Minnesota and North Carolina.

Strategic Planning

The DNR's Division of Forestry recently developed a strategic direction for its various programs. Fire protection resources are planned to be distributed according to fire landscapes. Wildfire prevention and wildland-urban interface programs will be strengthened, and local fire department capacities enhanced.

Sixteen fire landscapes have been identified, each with unique vegetation, landscape, soil, and development characteristics. Division equipment and staff will be allocated according to the level of fire risk in each of the various fire landscapes.

Some fire landscapes have portions of their area not in DNR protection. In those areas, the division supports efforts to adjust boundaries between DNR-organized protection and cooperative areas, if requested by local government.

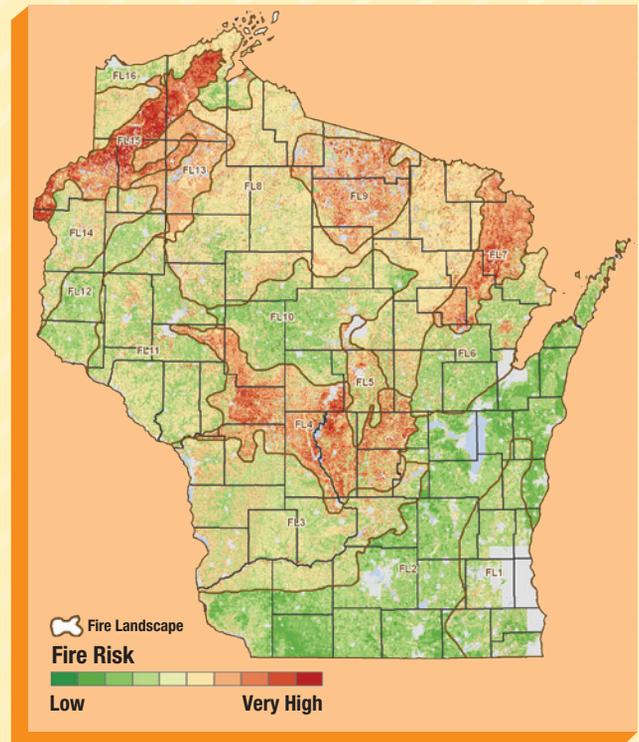
Finding and fighting fire

When an operator in a fire tower spots a wildfire, he or she issues reports to air and ground patrols. Airplane pilots help pinpoint the location, direct ground forces to the wildfire and provide valuable information on fire size, intensity and spread.

Planes, tractor plows (John Deere 450 bulldozers with fire plows attached to the back) and fire engines are part of Wisconsin's fire fighting cache along with hand tools and equipment specifically designed for marshy conditions (ATVs and Muskeg and Bombardier units).

"Our staff goes through extensive training in order to do their job safely and efficiently," says Ralph Sheffer, a forest fire operations specialist in Dodgeville. "DNR tractor plow operators

Fire Landscapes



COURTNEY KLAUS, DNR FORESTRY GIS SPECIALIST

must operate their machine a minimum of 30 hours per year to maintain proficiency."

"We also send our employees out across the nation as the Wisconsin forestry workload permits so they can hone their skills fighting fires in other areas," Sheffer says.

All DNR wildland fire training meets national standards and includes additional material specific to Wisconsin. Training occurs in the classroom, with simulations and on-the-ground practice.

"We stress protecting life, property and natural resources while fighting fires safely," Sheffer says.

Training also emphasizes working as a team with ground resources, aerial resources and incident command system structure.

"By building team relationships when there's no smoke in the air, we work together better when feeling the heat from the flames," Sheffer says.

Making of the LeMay Center

When a 60,000-acre fire occurred in 1934, an absence of modern forest fire fighting equipment and lack of hand tools, fire hoses or pumper parts forced the Wisconsin Conservation Department (today's DNR equivalent) to establish a central warehouse



This photo shows plows manufactured at the LeMay Center (Forest Protection Headquarters) in Tomahawk as early as 1938.

DNR FILE



Tractor plows are effective firefighting tools.

SPONGER/DNR



Heavy units and tractor plows are important tools in the DNR's fire fighting cache.

AMY LUEBKE

and equipment shop.

Located in Tomahawk, this warehouse and shop became the state's fire control center to receive and distribute equipment.

In 1998, the warehouse and shop were named the Neil H. LeMay Forestry Center in honor of Chief Forest Ranger Neil LeMay who served from 1942 to 1969.

Today the facility mainly experiments with mechanized equipment, adapting it for fire control and distributing sufficient quantities to the field. The center purchases standard trucks and bulldozers and then modifies them with water tanks, pumps, large toolboxes, trailer hitches, special lights, radio communications and other features.

As the LeMay Center heads into a new millennium and more than 75 years of operation, it continues to produce the latest equipment including joystick-controlled hydrostatic drive crawler tractors with mounted fire plows and huge water tanks to protect operators with "shower systems." Fire resistant "curtains" also protect tractor plow operators.

The center also provides wildfire control equipment to local fire departments and maintains a fire fighting tool cache for statewide distribution.



Karen Ecklund is the business manager and Natasha Kassulke is editor of Wisconsin Natural Resources magazine.

Wisconsin WILDFIRES

2000-2010

Cause	%
Debris Burning	32
Equipment	18
Miscellaneous	11
Arson	9
Power lines	7
Fireworks	5
Ash disposal	5
Campfires	4
Railroads	3
Children	2
Lightning	2
Smoking	2
Total	100%

See how one Wisconsin homeowner made his home more Firewise and how his home survived a wildfire while many others were not spared. To view the video, *Wildfire in Wisconsin, Would YOUR Home Survive?*, visit dnr.wi.gov and search "Firewise" or go to dnr.wi.gov/wnrmag/media/wildfire.htm

Earth, Wind & **FIRE**

The weather connection.

Jolene Ackerman

As early as the 1920s, we became aware of the connections between wildfire hazard, weather and forest conditions. Scientists studied the effects of weather conditions on fire behavior in various types of forests in northern Wisconsin during the spring and fall fire seasons.

The results of this early research still hold true today — wildfires in the lake states primarily feed on the dead vegetation that accumulates on the ground. Surface fires burn dead grass, fallen leaves and needles, brush, and the outer surface of logs. They spread quickly and intensely and tend to burn out fast. Only in dry and windy weather and in certain types of forests are fires likely to spread through the tops of the trees — the crown fire, which is the most intense and difficult type of fire to control.

Weather conditions have the greatest influence on how a fire will behave on a given day, so much so that two of the basic rules which all wildland firefighters live by are, “Keep informed on fire weather conditions and forecasts,” and “Base all actions on current and expected fire behavior.” The most influential weather factors are precipitation, humidity, temperature and wind speed.

When precipitation is lacking, fires are more severe and burn more rapidly, especially when dead and dry vegetation is abundant. A drop in relative humidity can make it easier for a forest fire to ignite and burn hotter and faster. Even a slight increase in wind speed can significantly increase the flame length and rate of spread of a fire.

In 1936, the Bureau of

Only two percent of Wisconsin wildfires are caused by lightning.

Fire Control began keeping daily weather records to classify the severity of burning conditions. This awareness early in Wisconsin’s fire control history helped officials determine how to lay out protection districts so personnel and equipment could be distributed for maximum protection. The bureau established a year-round organization to handle administration, planning, training and maintenance. Seasonal and temporary employees were hired as needed to meet routine and critical conditions, a fire preparedness technique that continues today.

Today, the Department

of Natural Resources uses the Canadian Forest Fire Danger Rating System to analyze wildfire potential on any given day and to determine staffing levels. The weather indices are based on fuel and environmental conditions gathered from 26 Wisconsin weather stations plus two in Minnesota and help set the fire danger levels on the Smokey Bear signs you see along Wisconsin roads.

Jolene Ackerman is the DNR wildland-urban interface coordinator.



Smokey Bear signs are an outreach tool used to keep the public informed about local fire danger.



Dead grass in the spring provides ample fuel for surface fires and may lead to tree torching or even crown fires if the conditions are right.

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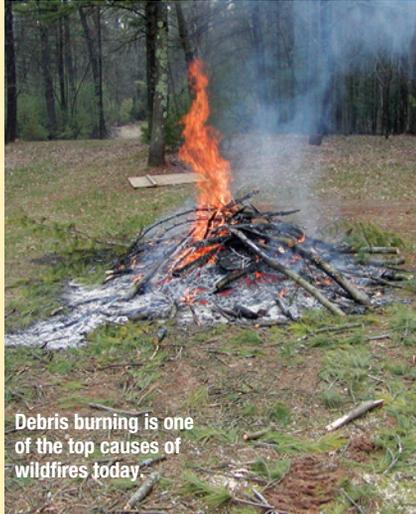
Prevent WILDFIRES Be Firewise.

Amy Luebke

Wildfires are a part of Wisconsin's history. Lightning caused some "prehistoric" fires. Other fires were intentionally set to drive game, harass enemies and open forest cover to grow crops.

Human-caused fires became more destructive and commonplace by the late 1800s. Logging slash fires, often ignited by settlers when they cleared land, burned out of control. Railroads became the main cause of wildfires by the early 1900s as sparks thrown from smokestacks and coals dropped from ash pans ignited debris along the tracks. Railroads remained the main cause of fire until 1980, when debris

The Cottonville Fire of 2005 burned 30 homes in less than six hours.



Debris burning is one of the top causes of wildfires today.

DNR FILE

BRIAN LUEBKE

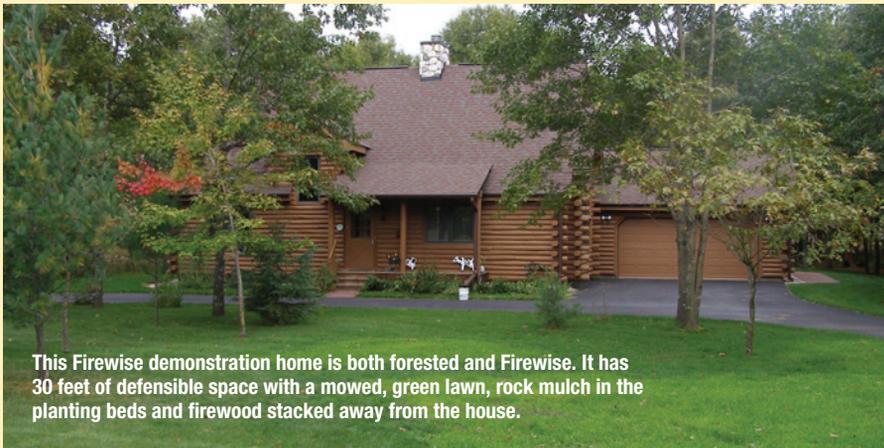
burning took the top spot.

The large fires of the late 1800s demonstrated the need for a prevention program. In 1925, a Wisconsin law passed requiring a written permit prior to setting a fire in a protection district when the ground was not snow-covered. This law made locals more aware of wildfire danger. The burning permit system continues to be a key component of the DNR Division of Forestry's fire prevention program.

"We've evolved from handwritten permits to an automated system which allows us to shut off burning as fire conditions change," says Catherine Koele, a DNR fire prevention specialist.

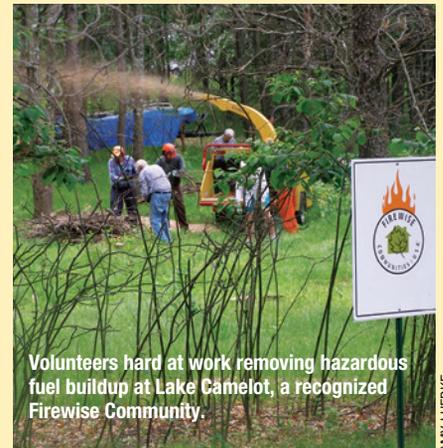
When people follow the burning restrictions, they burn during times when their fire is least likely to escape control. Koele reminds us to take advantage of the many recycling options and alternatives to burning that exist today and to avoid the risk of igniting a fire to begin with.

Fire prevention requires people to take personal responsibility. Smokey Bear has



This Firewise demonstration home is both forested and Firewise. It has 30 feet of defensible space with a mowed, green lawn, rock mulch in the planting beds and firewood stacked away from the house.

AMY LUEBKE



Volunteers hard at work removing hazardous fuel buildup at Lake Camelot, a recognized Firewise Community.

AMY LUEBKE

Burning permits

By only allowing open burning when conditions are appropriate, burning permits are an important tool in wildfire prevention. The department has developed an automated system to issue permits and has expanded online fire danger information.

About 9,000 burning permits were issued electronically in 2011. To further improve customer service, online fire danger information was expanded to show the current fire danger for the entire state.

To get a burning permit, visit dnr.wi.gov and search "burning permit" or call 1-888-WIS-BURN (947-2876) to have a permit mailed or emailed. Local ranger stations and emergency fire wardens also issue permits. On the day of the burn, check online or over the phone after 11 a.m. for the daily fire restrictions in the county where you wish to burn.

been the main spokesperson on this theme since he began his work in 1944.

"Smokey Bear is a symbol of fire prevention," Koele says. "He is one of the most recognized characters of all time and his message resonates with kids and adults." Although his appearance has changed slightly over the years, his message "only you can prevent wildfires" continues to ring true.

The growing wildland-urban interface continues to be a challenge. According to Jim Gobel, a DNR wildland-urban interface specialist, there are many more homes in the woods than in the past. In some areas, the number of homes has



Managing VEGETATION

Fuel breaks make a difference.

AMY LUEBKE

doubled in recent years.

“We’ve come a long way in the last 15 years in understanding what really causes homes to burn in a wildfire incident,” Gobel says, “and that’s changed our tactics and how we attempt to protect a structure from fire. It’s also changed how we educate people.”

The DNR’s Division of Forestry focuses on empowering local communities that are in the areas of highest wildfire risk. The division educates people on the risks associated with certain vegetation types and fire causes as well as human development. The division also offers tools to resolve local issues, such as fuel reduction strategies or alternatives to burning. Then it’s up to the local community to make an informed decision about what will work for them.

Local communities are creating community wildfire protection plans to address local risks. On a smaller scale, homeowners associations are creating Firewise plans to make their neighborhoods safer and they are recognized by the national Firewise Communities/USA program for their efforts. The division is partnering with these local communities and neighborhoods to find solutions and provide assistance, like cost sharing and other resources, whenever possible.

Motivating people to plan ahead is the biggest challenge in preventing and preparing for wildfires.

“When the smoke is in the air, people are asking what they can do to prepare,” Gobel says. “But if the smoke is in the air, it’s too late.”

A proactive approach is the best way to prevent fires and the losses that can result when they do occur.

Amy Luebke is a DNR wildland-urban interface specialist.

Jolene Ackerman

In 1910, the third in a series of Lakes States Forestry Conferences, explored the problem of forest fires. Clearing fire lines around standing timber and near settled communities was one recommendation from the proceedings. Thereafter, burning slash left after harvesting trees became a recommended hazard reduction practice, as did cutting dead stumps left after logging.

Today, the Department of Natural Resources routinely recommends that land managers and property owners in high hazard areas practice hazardous fuel reduction strategies, such as creating fuel breaks along roads and between large blocks of pine forest plantations. Using machines to crush or chip brush and small trees, large tillers to turn over the soil or prescribed burns are standard methods to create fuel breaks.

The idea is to remove or reduce the amount of vegetation present so that if a fire should occur along a road or within a forest, it will either run out of fuel or be slowed enough to allow fire control personnel to quickly extinguish the fire. Fuel breaks can also

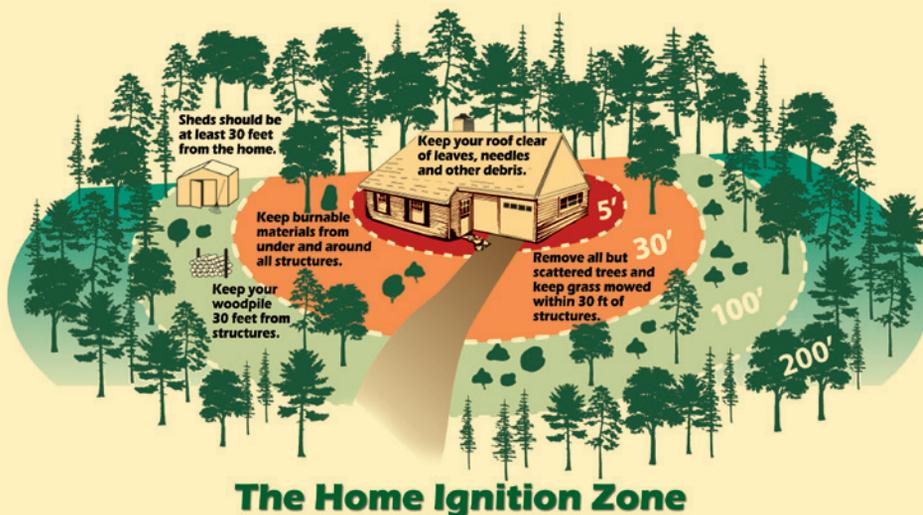
protect individual homes and housing developments, although the methods are more likely to require rakes, chain saws and wood chippers than large machinery. Research conducted around the country after wildfires burned through home settings has shown that managing vegetation within 100 to 200 feet of homes may make the difference between them surviving a wildfire and succumbing to flames. This realization has been turned into a national wildfire preparedness concept called “the home ignition zone.”

Jolene Ackerman is the DNR wildland-urban interface coordinator.



A community chipping effort might include a dump truck, chipper and “sweat equity” from volunteers.

AMY LUEBKE



Firewise
WISCONSIN

For more information on Firewise Wisconsin visit dnr.wi.gov and search “firewise” or visit firewise.org to take a virtual tour of a Firewise home and learn about Firewise plants for landscaping.

Wisconsin wildland FIRES through time

1850s-1910

Fueled by slash left from the intensive logging of the era, large catastrophic fires were a common annual occurrence. It was not uncommon during this era for fires to exceed 100,000 acres and burn entire communities. The most deadly of these was the Peshtigo Fire in 1872, which killed between 1,200 and 1,500 people and burned over 1.5 million acres.

1911

First forest rangers hired. From this point through the late 1920s, organized protection spread across the state as ranger stations and lookout towers were constructed.

1914

National Fire Prevention Day inaugurated.

1915

Jack Vilas made the first recorded forest fire patrol flight from Trout Lake on June 29.

1920s

Between 1924 and 1929, an average of 420 fires burned 99,000 acres each year.

1930-34

Severe drought ravaged the state during the dust bowl era. An average of 2,950 fires burned 336,000 acres annually during this time period in Wisconsin.

1933

The Civilian Conservation Corps (CCC) provided an increased fire suppression force and completed essential improvements to the protection effort such as building standard lookout towers and building fire lanes and bridges.

1935

The tractor plow was established as standard suppression equipment. Large wildfire occurrence decreased dramatically.

1948

Aldo Leopold, author of *A Sand County Almanac*, died April 28 while fighting a grass fire between Portage and Baraboo.

1951

Smokey Bear made his first public appearance at the fireman's convention parade in Hurley.

STABER, W. REESE

1959

On May 1, a running crown fire in Burnett County burned 17,560 acres, causing \$201,889 damage.

1960s

An average of 1,880 fires burned 8,700 acres each year. Railroads were the leading wildfire cause.

1977

In the second year of a severe drought, nearly 49,000 acres burned and over 170 homes were destroyed or damaged. Areas worst hit were Jackson, Washburn, Douglas and Wood counties.

1980

Over two days in April, the Ekdall Church Fire in Burnett County and the Oak Lake Fire in Washburn County burned over 16,000 acres and destroyed more than 200 buildings.

1982

DNR firefighter Donald Eisberner died in the line of duty on April 24 at the Canoe Landing Fire in Eau Claire County.



Eisberner memorial.

DNR FILE

1988

Deer Print Fire, Douglas County, burned 817 acres. Lyndon Station Fire, Juneau County, burned 911 acres and three buildings.

1989

The Great Lakes Forest Fire Compact was formed by Wisconsin, Michigan, Minnesota and Ontario. In 1998, Manitoba joined the compact.

Aldo Leopold

1990s

An average of 1,600 fires burned 3,400 acres each year. Debris burning was the leading cause of forest fires.

1998

A front with high winds passing through Wisconsin on April 12 started 83 wildfires over a five-hour period in the northwest corner of the state. The majority of these fires were started by downed power lines or by trees that fell into power lines.

2003

The Crystal Lake Fire in Marquette and Waushara counties burned 572 acres. Several buildings were destroyed and nearly 200 threatened.

2005

On May 5, an illegal debris fire started what will be known as the Cottonville Fire and burned 3,410 acres and 30 homes in a little less than six hours.



Van Handel memorial.

DNR FILE

2009

On April 8, Heath Van Handel died in an airplane crash while performing duties as an air attack pilot helping to direct firefighters on the ground at a wildland fire east of the Town of Pittsville in Wood County.

The Wisconsin Department of Natural Resources provides equal opportunity in its employment, programs, services and functions under an Affirmative Action Plan. If you have any questions, please write to the Equal Opportunity Office, Department of Interior, Washington, D.C. 20240.

The Department of Natural Resources is committed to serving people with disabilities. If you need this information in an alternative format, please call (608) 266-8204.

For more information on forestry issues in Wisconsin call (608) 267-7494.



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