



RED PINE IN ITASCA STATE PARK BY RICHARD HAMILTON SMITH

By Mary Hoff

Tree GUARDIANS

Foresters help trees and forests grow strong and stay healthy. Would you like to have a job taking care of trees? Here's a look at the daily work of some Minnesota foresters.



TROMP, SQUISH, TROMP, SQUISH ... carrying a drawer-sized Styrofoam box full of 150 tiny red-pine seedlings, Jana Albers hikes through a forest in Itasca State Park. Far from the road, so park visitors won't disturb it, she sets the box of baby red pines in a plastic container filled partway with water beneath a towering stand of adult red pines.

These little pines are tree-disease detectors. Albers is a Department of Natural Resources forest health specialist. She is helping park managers figure out why red pines are having a hard time regenerating—making new pine seedlings—in the state park.

Albers suspects the problem could be a seedling-killing fungus called *Diplodia pinea*. In eight weeks she will take these little trees back

to her laboratory at the DNR Forestry office in Grand Rapids. There she will look at them under a microscope to see if they show signs of the fungus. If they do, she will know the adult pines carry the infection, and she will help park managers find a safer place to plant pines.

Driving around northwestern Minnesota in her white truck, Albers looks for trees that are losing leaves, trees with dying branches, trees that have blown over, trees with brown or yellow where green foliage should be. When she finds sick trees, she studies them closely to figure out what's wrong.

All over Minnesota, hundreds of foresters work hard to care for the state's 10 billion trees. They do everything from plant seedlings to plan harvests, in which loggers cut trees to make wood products.

Foresters keep forests standing strong—free of too many pests, filled with plants and animals, and healthy through the cycle of growth, death, decay, and regrowth.

Fighter of Wildfires

It's a dry, windy Sunday in April. Jeremy Fauskee has a feeling it's going to be a busy one. An assistant supervisor with the DNR Forestry office at Sandstone, Fauskee fights forest fires. And this is a forest-fire kind of day.

At 10 a.m., Fauskee checks in at the helibase, headquarters for a DNR firefighting helicopter. He greets his coworkers, who are talking about the weather. The high winds and dry air are making the firefighters edgy. They are standing around in their green flame-resistant pants, yellow flame-resistant shirts, and tall leather boots as though something is about to happen. And it is.

About 11 a.m. the helibase radio crackles to life. Someone has spotted a fire in a swamp just west of Hinckley. Two firefighters grab their flight helmets, strap on two-way radios, and pile into a Hughes 500 helicopter.

Fauskee takes a phone call from the dispatcher,

who tells him more about the fire. He dons his gear, puts on his flight helmet, checks the helicopter doors to make sure everything is working OK, climbs aboard, and buckles his seat belt. Soon Fauskee and the other firefighters are in the air.

The crew flies to the fire. From the sky, Fauskee can see where the big flames are, which way they're traveling, and what objects are in the fire's path. Fauskee talks on his radio, giving firefighters on the ground advice.

The helicopter touches down and lets one of the firefighters out to work the fire from the ground. The firefighter helps clip

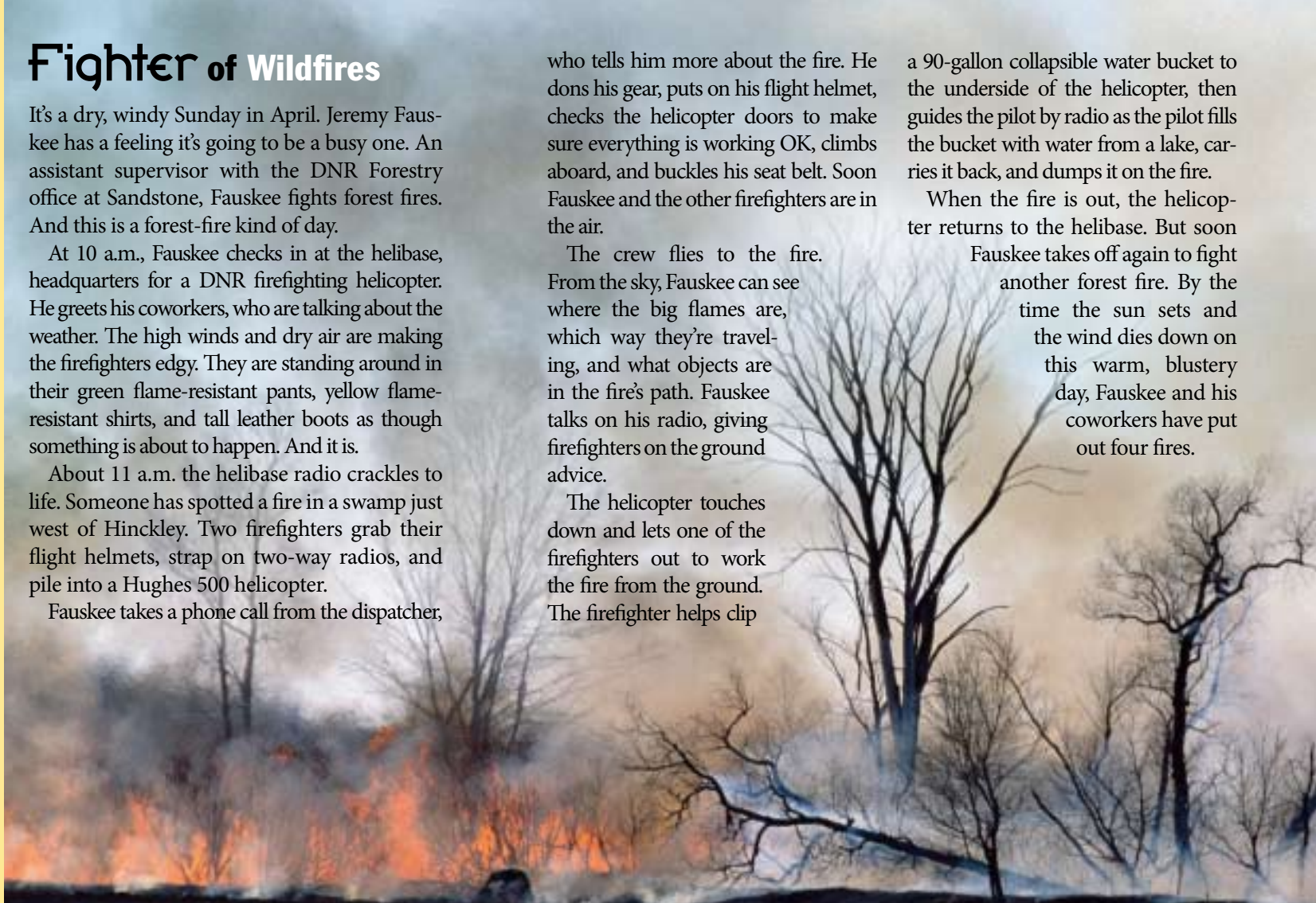
a 90-gallon collapsible water bucket to the underside of the helicopter, then guides the pilot by radio as the pilot fills the bucket with water from a lake, carries it back, and dumps it on the fire.

When the fire is out, the helicopter returns to the helibase. But soon Fauskee takes off again to fight another forest fire. By the time the sun sets and the wind dies down on this warm, blustery day, Fauskee and his coworkers have put out four fires.

TOP AND RIGHT-HAND PAGE PHOTOGRAPH, DNR; PHOTOGRAPH AT RIGHT, STAR TRIBUNE/MINNEAPOLIS-ST. PAUL, 2008



A CL 215 airplane (bottom left) scoops up over 1,000 gallons of water to drop on the fire line (above). A ground crew (right) uses pump cans mounted on their backs to suppress a blaze.





Fire Doctor

Not every fire day is a fire-fighting day for assistant supervisor Jeremy Fauskee. Sometimes he's in charge of starting fires instead. These fires are called *prescribed burns*. Like a doctor prescribing medicine, a land manager prescribes fire in certain areas to help keep the forest healthy. By burning dead plant material, the fire releases nutrients into the soil and makes room for new plants. It prepares the ground so seeds can sprout and grow.

A long time ago, lightning and American Indians started the fires that kept forests healthy, but now foresters like Fauskee do the job. Fauskee uses a *drip torch*—a handheld canister that drips flaming fuel onto the ground—to make a ring of fire around the area to be burned. The ring creates a *draft* (a

A drip torch (left) is used to carefully set a controlled fire (center) to improve the long-term health of a forest. A crew (top right) uses planting bars to plant pines in an area where trees have been harvested.

small rush of wind) that draws flames toward the center, instead of escaping beyond the edge. Fauskee and other firefighters in his crew work quickly to control a prescribed burn. They watch the fire closely to make sure it stays in the intended area.

When he's not working on fires, Fauskee has other work to do. He figures out what kind and how many trees grow in various forests. He tells loggers how they can harvest trees from state forests without harm-



ing the land. He helps new trees grow after harvest by making sure seeds have the right conditions to grow.

"It's a good job," he says. "The diversity of work always keeps you on your toes."

DNR PHOTOGRAPHS



Grower of New Woods

On a crisp day in May, DNR Baudette area forest supervisor Patty Thielen is surrounded by thousands of jack-pine seedlings. She is supervising a work crew that is planting them to take the place of trees that loggers harvested last winter to make paper and other wood products.

Each worker wears a planting bag—a backpack with two big pockets. The pockets are stuffed with foot-tall seedlings, which were grown at the DNR tree nursery near Akeley. Each worker carries a *planting bar*—a thin, long-handled metal shovel made just for planting trees like these.

A crew member plunges a planting bar into the ground. He wiggles it back and forth, making a wedge-shaped hole. He gently pulls a tree from his planting bag and slips it into the hole, being careful to make sure the roots are all pointing down. Stomping, he forces the soil tight against the roots to hold the seedling in place.

Step, step, step, shovel, wiggle, stomp ... in the space of a minute, the worker plants nine trees. By quitting time, he and his coworkers will have planted 13,000 young jack pines. Seedling by seedling, the forest finds a new beginning.

Harvest Planner

Before planting comes harvesting. Area forest supervisor Patty Thielen helps with that too. She and the dozen foresters she supervises sell trees on state forest land that's ready for harvest. Then they make sure harvesting happens when, where, and how it should.

On a winter day, a logger calls Thielen on the phone. She had sold him trees on two tracts of state forest land. He tells her he finished cutting tamarack trees from one tract, but he isn't sure how to find the other one. Thielen grabs her wool coat and thick chopper mittens and climbs into her truck. After 50 miles of driving on state highways, then on bumpy logging roads, then on packed snow, she arrives at the logging site. There she sees big logging machines such as a feller buncher, skidder, delimeter, and slasher—which harvest trees, drag them to a gathering place, remove their limbs, and cut them into 8-foot lengths. She also sees



two big stacks of tamarack logs.

First, Thielen looks at the logger's work to make sure he has followed the DNR rules for protecting land and water. Then she measures the stacks of log and calculates how much wood

A skidder (left) moves aspen logs from the forest. The aspen from the clear-cut (center) will be used to make paper. Trees started at this red-pine seedling bed (right) will be transplanted to state and private lands.

was harvested. Finally, with a GPS in her hand and a compass in her vest pocket, she snowshoes across a frozen swamp to find the other tract.

As she snowshoes along, Thielen checks her directions with her GPS and compass. She ties bright pink flagging to trees to mark the way. She works hard to find a route the logger can take his machines through without cutting down a lot of trees along the way.

"My favorite part of my job is the



variety of different things that I do," Thielen says. "We get to spend our winters snowmobiling and snowshoeing. We ride four-wheelers in the summer. We get to do a lot of the things people do for fun." Once, while she was helping a school plant trees, some third graders asked her whether you have to pay to be a forester. "When I told them they pay me to do this job, their jaws all dropped," she says.

DNR PHOTOGRAPHS



How to Become a Forester

Spend time with trees. A good place to start is by spending time around trees. Spend time studying the trees in your yard or near your home. Ask a grownup to tell you about them. Go for a hike in a state park and look at the trees there. Learn about forestry through groups such as 4-H or scouts, or at a summer camp.

Study science and math. In school, work hard at science and math. Do a science fair project on trees. Learn how to write well, speak in public, and get along with different kinds of people. Foresters spend a lot of time talking with landowners about how and why to take care of trees.

Plan to go to college. The University of Minnesota has one of the oldest forestry programs in the country. To learn how to be foresters, students take classes in soil science, silviculture (tree-growing), communication, plant identification, and more.

Gain experience. Volunteer to help plant trees in your community. Help with yard work or get a job with a nursery or landscaping company. If you are between age 15 and 18, consider applying to the Minnesota Conservation Corps summer youth program (see www.conservationcorps.org).

What do foresters do?

Foresters help keep forest plant and animal communities healthy ... make sure people have wood to make houses, furniture, paper, boxes, books, pencils ... take care of city trees ... help to maintain trails and recreation areas in forests ... grow new forests ... decide which trees are ready for harvest ... create habitat for wildlife ... fight tree diseases and insect pests ... help landowners care for their forests ... fight forest fires ... teach others about trees and forests ... do research to learn better ways to care for trees and use their products.





TOM THULEN

Foresters can help landowners earn money and make room for new trees by selecting trees to be harvested (left).

outfit for a day like this: four layers on top, long underwear and warm pants, Sorel pack boots, a hat, and gloves. His vest pockets are filled with pencils, maps, a compass, flagging, and other forestry tools.

Talking about the trees and animal tracks they see along the way, Gatzlaff and the farmer walk through the forest. Gatzlaff spots lots of buckthorn, an invasive nonnative tree. He also sees some beautiful maples and basswoods. The farmer would like to harvest some trees to help his land earn money and make room for young trees to grow tall. But he doesn't want to destroy the beauty of the forest or the habitat for deer, raccoons, wood ducks, and squirrels. Gatzlaff listens to what the farmer says and thinks about how he can help him meet his goals.

Gatzlaff walks like this in a forest just about every other week. Then he goes back to his office and writes up a plan to help the landowner

manage the forest. Each plan is different, because each forest is different. And each plan depends on the landowner's goals and what Gatzlaff sees on his hike. For example, he might recommend planting white spruce to shelter a house from wind. To provide wood for making furniture, he might write a plan for harvesting maple trees. To kill nonnative buckthorn invading a forest, he might call for spraying herbicide on the buckthorn.

Life as a consulting forester is not always easy. He's had unpleasant encounters with bee nests and unfriendly farmyard dogs. But he loves helping people and helping forests. He loves being able to drive down the highway with his young son, Joe, and point out some of the 7 million trees he's planted in his lifetime.

"It is fun to watch them getting older," Gatzlaff says. 🍎

RIGHT-HAND PAGE, DNR PHOTOGRAPHS

A NOTE TO TEACHERS

Find teachers guides to this and other Young Naturalists stories online at www.mndnr.gov/young_naturalists.

Tools of the Trade



Hoedad: sharp tool with a handle used to make a hole in which to plant young trees.



Increment borer: tube-shaped tool used to remove a piece of a tree's trunk so the age can be estimated by counting rings.



Clinometer: instrument used to measure the height of trees and other objects.

Data recorder: handheld computer device, like a BlackBerry, with GPS capability for measuring locations in forests.

Caliper: F-shaped measuring stick used to measure tree diameter.

Diameter tape: measuring tape that when wrapped around a tree gives the diameter of the tree.

Hypsometer: stick or other device used to measure the height of a tree.

Scale stick: measuring stick used to estimate the amount of wood in a tree.

Flagging: nonsticky plastic tape used to mark certain trees for special treatment or to mark trails.

Pulaski: tool that looks like a cross between an ax and a hoe, used to clear brush, remove fuel from the path of a fire, or make a trail.