

TRAGEDY OF THE MACK LAKE FIRE

A small prescribed burn, aimed at helping an endangered bird, exploded into a ravenous wildfire that raises some tough questions about managing our natural resources

by Louis Borie

ON MONDAY MORNING, May 5, 1980, there was scant warning of the disaster that was to hit the Huron National Forest. The winter of 1980, like that of 1981, had been an almost snowless one in the upper Midwest. But steady rains arrived in April, and by the end of the month moisture levels in the pine barrens of north-central Michigan were near normal. On Monday morning, May 5, the temperature was 74°, higher than usual for that time of year. According to the fore-

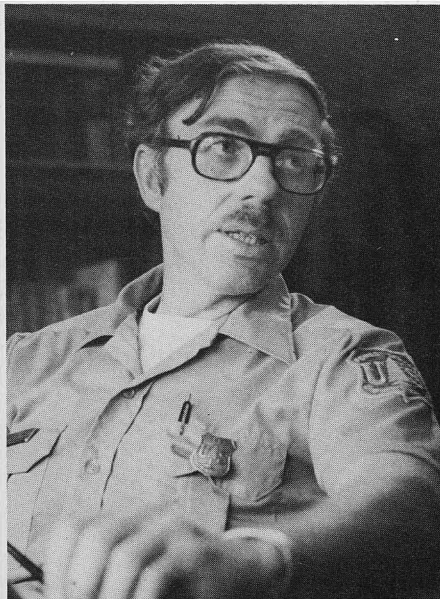
cast, it would reach into the 80s by midday. Relative humidity was low, 24 percent, and winds were light, six to 10 miles per hour from the southwest; but a cold front predicted to move through that afternoon would bring higher winds and gusts of 25 miles per hour out of the northwest.

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The front would cool things off and raise the humidity, but little, if any, rain was expected.

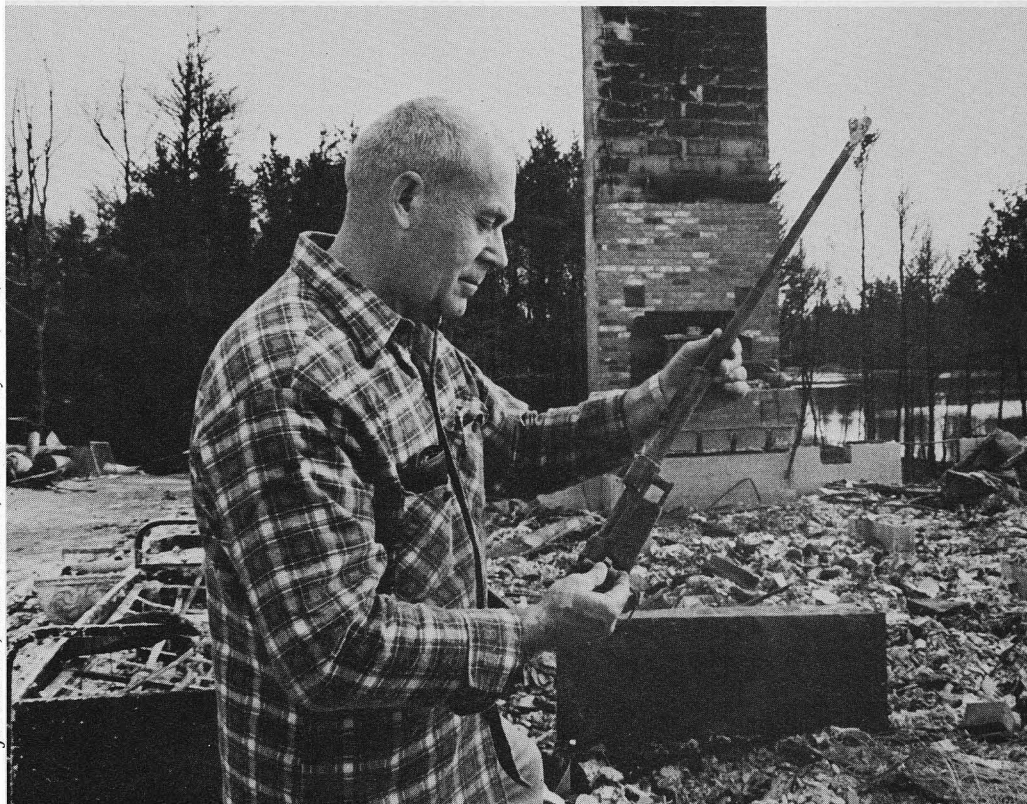
At 9:45, District Ranger Ven Bosman told his fire boss, Tom Bates, to go ahead with a prescribed burn of the Crane Lake unit, a 210-acre clearcut just west of Highway 33 in southern Oscoda County.

At 10:26, after topping off the extra water tanks that would act as backup for the 1,000-gallon tanker truck, Bates and his three-man crew set their drip torches to the sedges,



Mio District Ranger Ven Bosman gave the green light to the burn on the Huron National Forest. Fire conditions weren't perfect, but they seemed better than they had been

"I hope that warbler enjoys his nest—my nest is burned," said Joe Walker, shown examining the remains of his custom-made rifle while sifting through the ruins of his home. More than 44 homes and summer cottages were destroyed in the fire; Walker never even got to use a brand-new woodstove he had had installed two days before (background)



Jim Davisson, Editor-Publisher, Oscoda County News, Mio, MI

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(continued)

bracken fern, and piles of jack-pine slash on the eastern edge of the cutover. The plan was to use a "backing fire"—letting the fire back itself into the wind until a burned-out zone had been created to act as a fire break. Then the rest of the Crane Lake unit could be burned piece by piece; the tanker and a tractor-plow would assist the ground crew if any spot fires broke out in the jack-pine stands surrounding the clearcut.

The cutover site, harvested the year before, would be burned, replanted to jack pine, and in eight to 10 years would provide critical nesting habitat for the endangered Kirtland's warbler, a rare member of the wood warbler family. The yellow and gray, surprisingly tame, tail-wagging bird is named for Ohio naturalist Jared P. Kirtland, near whose farm the first identifiable specimen was collected in 1851.

The Crane Lake unit is one of several such areas being managed through the use of prescribed fire by the U.S. Forest Service and the Michigan Department of Natural Resources for Kirtland's-warbler habitat under the federal Endangered Species Act. The goal of the program is to create some 3,000 acres of habitat each year until 1990, but a scarcity of suitable days for burning the previous several years had set the burning program behind schedule. The Crane Lake burn had already been cancelled twice previous to May 5; high winds and low humidity had made burning too risky.

The burning proceeded as planned for the first 45 minutes. Then several small spot fires were noticed along the eastern edge of the cutover. The spots were quickly con-

tained and extinguished, and the team continued to ignite blazes. A short time later, a fourth spot fire broke out in a ridge of standing timber that had been left for aesthetic purposes to shield the clearcut from Highway 33, a heavily travelled road that bisects Oscoda County from north to south. The spot proved to be more difficult than the previous ones to control. Several plow lines were needed before the fire was suppressed and the crew could resume the prescribed burning.

Before long several more fires sprang up in a portion of the cutover that, according to the fire prescription, was to be left unburned. These were easily controlled, but the interruption of the spot fires had now put the prescribed burn behind schedule. It was questionable whether the entire 210 acres could be burned before the afternoon change in weather, as Ven Bosman had hoped. With marginal conditions to begin with, any increase in wind speed would make it too dangerous to continue burning in an area surrounded by dense stands of young jack pine.

Just after noon, a seventh spot fire broke out in the aesthetics strip to the north, upslope of the cutover. Again the crew halted the prescription and focused its attention on extinguishing the spot fire. The men quickly realized that this spot was going to be more troublesome than the others had been. Fueled by gusty winds on the hillside, it had spread to several acres in a few minutes and was moving steadily toward the highway.

At about 12:15, the fire leaped into the crowns of the jack pine on the western edge of the highway.

Almost immediately windblown embers carried across the 100 feet of open space and ignited several blazes in the woods across the road. The tanker and tractor-plow, alerted on the radio by the fire boss, crossed the highway and contained one of the spots, but the fires had already started other blazes just to the north. "At this point," Ven Bosman recalls, "I thought we had something we weren't going to be able to control."

Within minutes one of the secondary spot fires torched skyward and spread into the crowns of dense, pole-size jack pines. At 12:20, Tom Bates radioed for the Mio-Tri Town Volunteer Fire Department, the first of what was to be many calls for assistance. By late afternoon, firefighters from five volunteer fire departments, the Michigan Department of Natural Resources, and the U.S. Forest Service were battling an extraordinarily aggressive wildfire, and more help was on the way from firefighting teams in Minnesota, Wisconsin, and Missouri. The fire, fanned by the expected gusty winds, had spread eastward across the pine barrens for more than three hours at an almost unbelievable sustained pace of two miles per hour, sending 50-foot flames and towering clouds of black smoke into the sky.

By 7 p.m. almost 25,000 acres of jack pine lay smoldering; 44 homes and summer cottages were partly or totally destroyed, most of them in a small community on Mack Lake. One Forest Service fire technician, the operator of the tractor-plow on the original prescribed burn, had died fighting the ensuing blaze. The Mack Lake fire, as it came to be called, was declared under control at

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These photos were taken by fire boss Tom Bates before and after the burn got out of hand.

Right: technician holding a drip torch watches blazing piles of jack-pine slash. Burned-out zone was to act as a fire break.

Below: the burn turns wild and approaches Mack Lake from the west, threatening several homes.

One house was burned here

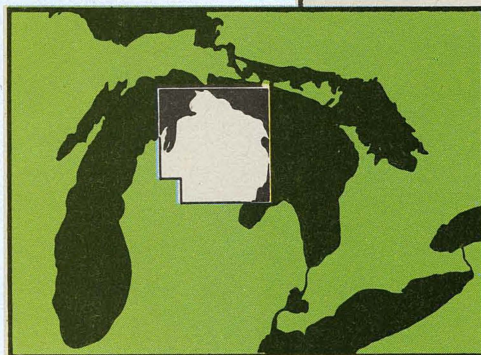
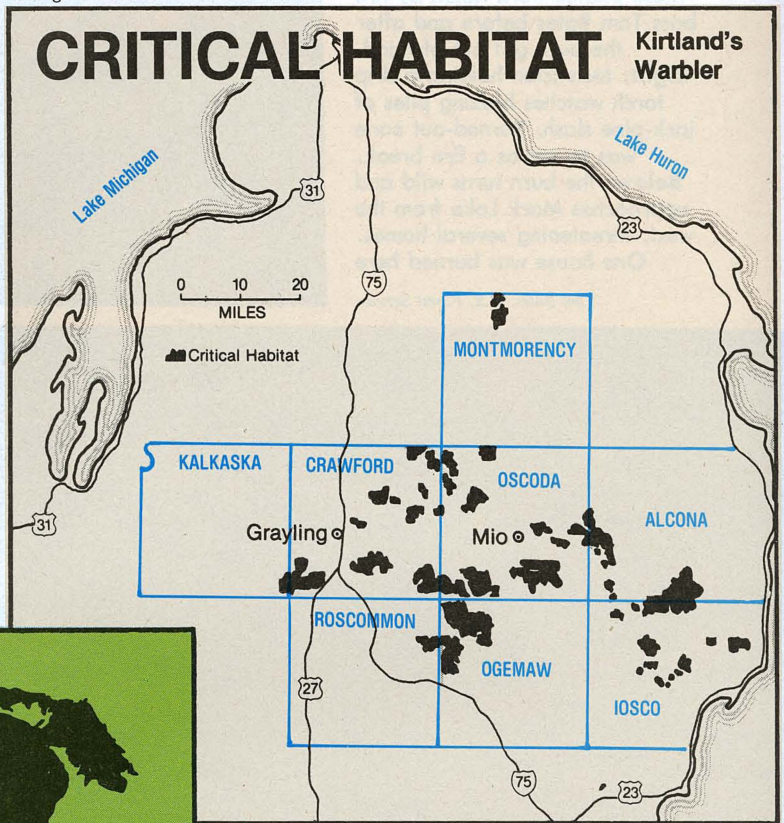
Tom Bates, U.S. Forest Service





Kirtland's Warbler

Michigan DNR



Every nest of the Kirtland's warbler has been found on Grayling Sand and 90% of them are located in the watershed of the Au Sable River.

Jack pine can be found throughout the northern forests on this continent, from Nova Scotia to British Columbia. But the rare Kirtland's warbler, a member of the wood-warbler family, nests only within jack-pine forests that grow out of Grayling sand in northern lower Michigan. Ninety percent of the nests are located in the watershed of the Au Sable River.

The Kirtland's warbler does not actually nest in the trees; the pines and ground cover conceal the nests, which are embedded in the sandy soil. Once the trees grow large enough for the lower branches to die off, and the ground cover is shaded out, the bird moves.

Scientists used to believe that the Kirtland's warbler would dwell only among pines regenerated by forest fire. But experiment proved that the bird didn't mind if the trees were planted in straight rows on burned-over lands. The warbler may even accept forests that have been clearcut and replanted without intermediate fire. But, says ornithologist Harold Mayfield, "Without the intervening agency of fire, there may be unacceptable transformations in the soil quality and ground cover." Mayfield is on the Kirtland's Warbler Recovery Team, which is studying the effects of management on the bird. Any changes in forestry work in the Kirtland's warbler management area will be conducted with caution. When you have a species that picky, you can't be too careful.

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Jim Davisson, Editor-Publisher, Oscoda County News

noon on Wednesday, May 7, although, according to one Forest Service official, "It was all over by seven o'clock" on Monday night.

How could a 210-acre prescribed burn explode so suddenly into a ravaging wildfire? What caused the fire to spread at such an incredible pace? Could the entire incident have been avoided by more careful planning and judgment?

Even before the fire was declared under control, Huron-Manistee National Forests Supervisor Wayne Mann had ordered a full investigation and analysis of the fire, and had named a nine-person study team headed by Dale Gorman, Deputy Forest Supervisor of the White Mountain National Forest in New Hampshire. The 100-page Mack Lake Fire Analysis released by the Forest Service in late July was a systematic, thorough, and remarkably frank summary of the disaster.

The report points to a number of errors in judgment and planning that contributed to the devastating fire. According to the analysis, adequate personnel and equipment were not in place before the prescribed burn began. A key burning index, which would have warned the district ranger that conditions were not suitable for prescribed burning that day, was not even calculated. The report also found shortcomings in communications in the hours immediately after the fire escaped, and there was a lack of adequate coordination between the Michigan DNR, the Forest Service, and local firefighters.

The analysis team made a number of recommendations in its report. It called for an extensive training program for Forest Service prescribed-burning personnel, the development of a program for creating fuel breaks in the extensive tracts of jack pine that are so abundant throughout the lakes states, and more research into Kirtland's-warbler habitat needs. The team wanted specifically to see if habitat for the endangered songbird can be created in



Charred snowmobile stands as a reminder of the almost-snowless 1980 winter that helped make fire conditions disastrous

sufficient amounts without the use of prescribed fire.

The Mack Lake fire was a tragedy, from both the human and resource-management perspectives. A human life was lost, personal property destroyed, and thousands of acres of timber killed (some wood may be salvaged for fuel, however). Immediately following the fire, local residents reacted with sorrow over the death of Forest Service employee Jim Swiderski. Feelings of outrage soon followed.

"People couldn't believe that the Forest Service would take a risk like that when they didn't have to," recalls Oscoda County News publisher James Davisson.

Mack Lake resident Joe Walker summed up the feelings of many. "I hope that warbler enjoys his nest—my nest is burned," Walker said as he sifted through the smoldering ruins of his home.

The tragedy of the Mack Lake fire was compounded by the fact that it started out as a planned fire, set by an agency charged with managing millions of acres of the country's valuable forests and grasslands. In the aftermath of the fire and the subsequent analysis, lingering questions remained about whether the Forest Service would be the final victim of its own mistakes. Mack Lake comes at a time when the Forest Service and other land-management agencies are increasingly using prescribed fire as a management tool. But public understanding and acceptance of the intentional use of fire is still tentative—understandably so, given 35 years of stern cautions from Smokey Bear.

As a result of the fire, the Forest Service has undertaken an extensive review of its prescribed-burning policies and practices at all levels,

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planting at Highlands, North Carolina. This torreya is growing at an elevation about 4,000 feet higher than its native bluffs, but it is apparently doing quite well. Seed from the tree has been collected and may prove valuable in establishing pathogen-free plants.

Time is slipping away, though. Florida and Georgia already list the torreya as an endangered species, and federal registration is likely this year if the Administration approves funding. No one knows how much longer the root systems of the diseased torreyas will produce basal

sprouts. The blight has yet to be identified, and even when it is known, there is no guarantee a cure will be found immediately.

It is entirely possible that the Florida torreya may join the Carolina parakeet, the passenger pigeon, and the host of other plants and animals that have become extinct in the past century. But public awareness is increasing and research to save endangered species has become more intensive. With luck, scientists may soon isolate the cause of the blight and save the Florida torreya before its time runs out. ■

Tragedy of the Mack Lake Fire *(From page 19)*

from the ranger districts on up to the decisionmakers in Washington. The agency has decided to go ahead with the use of prescribed fire. But with the eyes of the public and other resource-management agencies fixed upon them, the policymakers in Washington felt it necessary to send a clear message to the lower echelons: "Proceed with the use of prescribed fire, but proceed with caution."

Michigan Route 72 from Grayling to Mio is a straight and bumpy highway that cuts through the forest to the distant horizon. A slight rise in the road offers a view that extends for miles across an unbroken expanse of pine lands. Clusters of well-kept summer cottages and year-round homes are visible from the highway, modest but proud dwellings tucked in the woods as if they had simply grown up beneath the jack pines. It is a somewhat precarious existence; jack pine and fire are old and certain friends.

Jack pine is one of several tree species that depend on fire to complete their reproductive cycle. The 1½-inch cones, normally sealed shut by a resinous bonding material, open only when ambient temperatures reach 125° F—as they do, several times over, during a forest fire. Within hours, the winged seeds are released from the cones and quickly take root in the mineral soil exposed by the fire. For thousands of years, fires have swept through the sandy plains of Michigan, Minnesota, and Wisconsin, burning crowded, over-mature stands of the short-lived jack pine, making way for new stands.

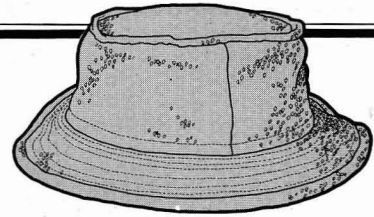
In the Mack Lake area, major fires have occurred every 20 years on the

average, according to tree-ring data. A fire history in the area was compiled just after the Mack Lake fire. It showed that some trees had been scarred by a 16,000-acre fire that covered much of the same area in 1946, and some showed scarring from a major fire that occurred in 1913.

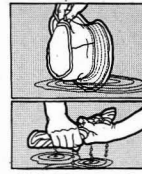
The jack pine/fire story is evidently a time-worn one. But in a nine-county area around Mio, in the northeastern corner of Michigan's lower peninsula, a third player is engaged in the drama. Every spring, the entire known population of Kirtland's warblers—less than 500 individuals in 1980—arrives in this small region from wintering grounds in the Bahamas. (The birds were still in migration at the time of the fire.) Research had shed some light on why the "jack-pine bird" is so particular in its choice of nesting habitat, but all of the questions have not been answered.

The colorful warbler, whose song has been variously described as "liquid" and "wild and clear," will not use just any clump of scrubby jack pine as cover for its ground nest. It requires stands at least 80 acres in size with trees from eight to 21 years old. As if these requirements weren't stringent enough, the pines evidently must be growing on a particular soil type, called Grayling sand, for the bird to colonize the stands. These factors combine to form a rather narrow niche that the Kirtland's warbler has evolved to fill. But areas where these environmental conditions occur together are not very common. So Kirtland's warbler breeding habitat is not common either.

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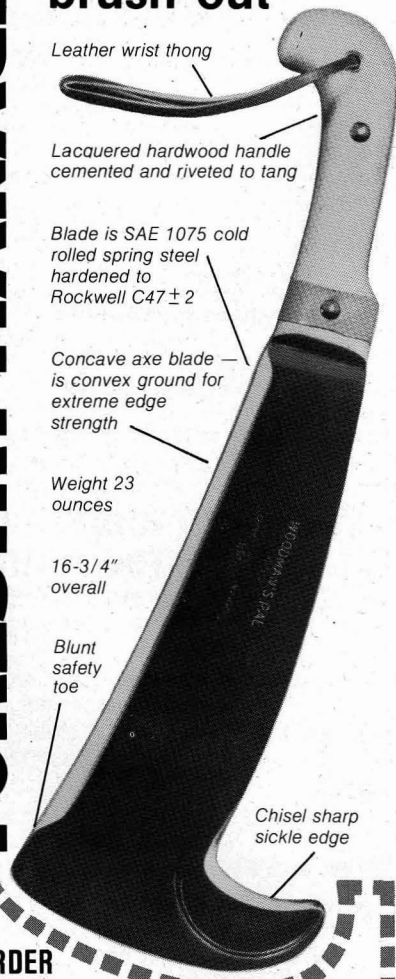


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bird's habitat began in 1957, when it was recognized that the exclusion of fire from the pine barrens, brought about by Smokey Bear and more-effective firefighting techniques, was having a devastating effect on the warblers' population. With the passage of the Endangered Species Act in 1973, the Kirtland's warbler was given protected status. A Kirtland's Warbler Recovery Plan was prepared, with the objective of re-establishing "a self-sustaining wild Kirtland's warbler population throughout its known former range at a minimum level of 1,000 pairs." Guided by the Kirtland's Warbler Recovery Team—which includes representatives from the Michigan DNR, the U.S. Forest Service, the U.S. Fish and Wildlife Service, and some interested citizens—the Forest Service and the Michigan DNR began their cooperative program of creating habitat for the warbler on some 135,000 acres of state and federal land.

The beauty of Kirtland's warbler management is that it is also sound forest management. Mature stands of jack pine in areas identified as potential warbler habitat are whole-tree-logged, with slash left as fuel for a subsequent prescribed burn. Then the tracts are hand- or machine-planted to jack pine, which the warbler, with some luck, will begin to utilize in eight to 10 years.

The reason for the intermediate burning step is twofold: the burn is excellent site preparation for jack-pine seedlings; and, for reasons not yet fully understood, the Kirtland's warbler seems to prefer areas that have a past history of fire. The bird has been observed in jack-pine stands that don't have a recent fire history; but according to John Byelich, a retired Michigan DNR biologist and head of the Kirtland's Warbler Recovery Team, "The best warbler habitat occurs in areas that fire has created." Byelich says that natural regeneration without fire "apparently encourages other plant associations which are detrimental to the warbler. When you have a fire, it eliminates any competition, sets succession back, and allows only jack pine and blueberry and grasses to grow. This is very conducive to warbler-nesting habitat."

In more than 55 prescribed burns conducted by the Forest Service and the Michigan DNR since 1964, the largest escape prior to the Mack

Lake fire had been 30 acres—also on an early May burn, in 1978. How did the Mack Lake fire get out of control so quickly? High winds and the low moisture content of the "fine fuels" in the forest that day were perhaps the most critical factors, says Al Simard, fire-management researcher at the Forest Service's North Central Forest Experiment Station Field Unit in East Lansing, Michigan, and a member of the team that analyzed the Mack Lake fire. Five days before the fire, .68 inches of rain had fallen in the area, but there had been no precipitation since then.

"We measured the fuel moisture of a 'punk' log three inches in diameter soon after the fire, and it was 400 percent," Simard said. That means the log weighed five times what it would if it were dry. "Yet," he added, "the grasses would have been down to five percent at the time of the fire." Simard noted that the moisture content of jack-pine needles is at its lowest in early spring, just before bud flushing. Add to these factors the flammable extractives exuded by jack pine, and the tendency for young jack pine to develop a pattern of "continuous fuels"—branches and needles that extend from the crown all the way down to the ground—and you have a formula for the type of explosive flash fire that engulfed the Mack Lake area.

"The intensity of the fire was tremendous, but the residence time [at any one spot in the forest] was very brief," Simard said. "Three or four minutes and it was gone. It only burned about a quarter-inch of duff and no twigs bigger than a half-inch in diameter. It was almost as if someone had painted the ground black." The fire researcher's characterization belies the enormous energy of the fire, calculated later by the Forest Service to have been 2½ trillion BTUs, or seven times the force of the Hiroshima bomb.

In the light of the analysis, the question that comes quickly to mind is whether or not Forest Service officials should have realized that fine fuels were so critically dry that Monday morning. Ven Bosman says that the fire technicians in the Mio Ranger District had little experience with the use of prescribed burning in jack-pine fuel types. Turnover on his district has been unusually high in the past several years.

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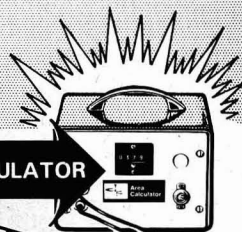
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hind schedule "entered a lot" into his decision to go ahead with the burn, Bosman says. "There wasn't any direct pressure, but our organization has become very target- and accomplishment-oriented." The two previous cancellations and the possibility that the crew wouldn't be able to burn at all—as was the case the previous spring—tipped the balance. "Based on all the knowledge and experience we had at the time, we did what we thought was right," says Bosman.

He explains that the reason the crew ignored Forest Service regulations and failed to calculate the Burning Index is simply that "we just didn't have confidence in the predictions of the Burning Index." In fact, the Mio District was in the process of switching from the old Fire Load Index system to the new Burning Index system, both complicated formulas for predicting whether conditions on a given day are suitable for a prescribed burn.

The Forest Service, faced with such a disturbing lack of confidence by its own on-the-ground personnel in established fire procedure, took steps to regain that confidence. Last winter the agency required all district rangers to attend a series of training workshops on prescribed burning; the rangers in turn held training sessions for fire technicians this spring. The Huron-Manistee National Forests went a step farther. The Mack Lake study team called for a special prescribed-burning team, made up of Forest Service and Michigan DNR personnel, which will plan and execute all of the prescribed burns on the forest—a job that, until now, has been done on a district-by-district basis.

The study team also recommended developing better radio-communications procedures for working with volunteer fire departments. And the new plan calls for a system of fuel breaks in the Huron-Manistee. The Mack Lake fire could have been even more devastating had it not made its way into hardwood stands that were much less flammable than the jack pines. Bands of hardwoods or open spaces that break up the large, continuous jack-pine stands could be the most effective long-term method of minimizing the harm of future fires.

There will be no burning for Kirtland's-warbler habitat on the Mio Ranger District, or on any other

ranger district in the Huron-Manistee National Forests, this spring. One small burn may be attempted this fall, says Ven Bosman, "if we get our people trained and have all the pieces in place by then." Before that burn, however, several public hearings will be held to hear what area residents have to say about the Forest Service's plans to continue using prescribed burning as a key tool in the Kirtland's-warbler man-



Forest Service sign stands in low scrub characteristic of much of the area. As the sign says, the agency still plans to manage the site, but with more care

Jim Davison, Editor-Publisher, Oscoda County News

agement effort. Another result of the policy review following the Mack Lake fire: public involvement will now be required before any prescribed burning can take place in the National Forest System.

To be fair, it should be noted that the record of the Forest Service with respect to prescribed burning is not typified by Mack Lake. The agency has used planned fires to manage its forest and grassland resources for more than 25 years—particularly in the South, where more than a million acres are burned safely each year. It is unfortunate that it took a major fire like Mack Lake to make the Forest Service aware of the inadequacies of its prescribed burning program in other parts of the country.

It is clear that fire will continue to be an important resource-management tool. But it's a tool as delicate to manipulate as a surgeon's scalpel. Fire is also a ruthless and unpredictable teacher, as the lessons of Mack Lake demonstrate. We can only hope that future lessons will be learned in less-destructive ways, and will help us understand better how we can use a capricious natural phenomenon to our best advantage—and that of our planet. ■