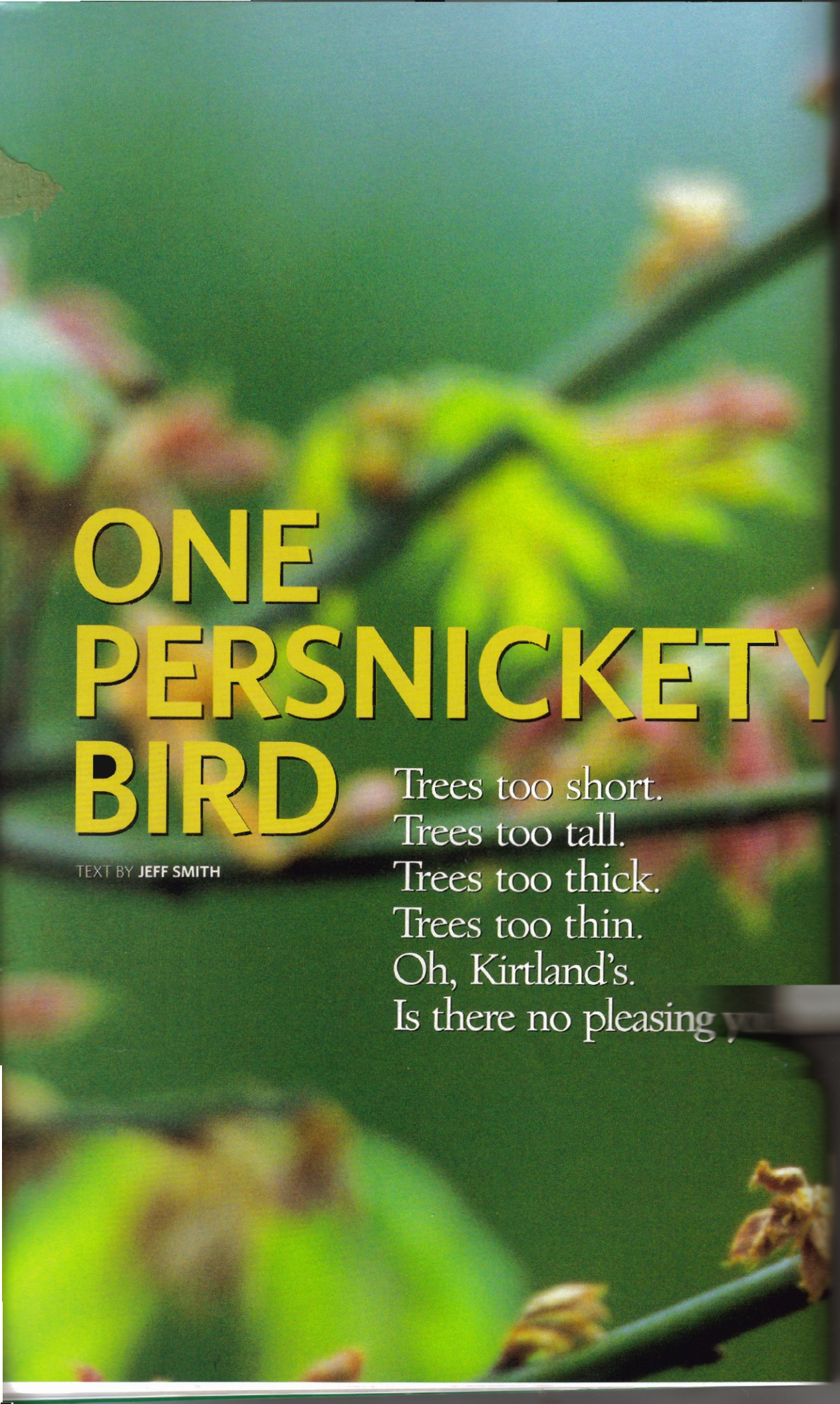

ONE PERSNICKETY BIRD

TEXT BY **JEFF SMITH**

Trees too short.
Trees too tall.
Trees too thick.
Trees too thin.
Oh, Kirtland's.
Is there no pleasing y

THIS STORY IS ABOUT A BIRD,

but it begins by asking you to first picture a squirrel. Perhaps you envision it sitting on a tree branch, tail unfurled along its back, fresh acorn poised in its paws. But if you live in an urban area, as 80 percent of us Americans do, you might have pictured the squirrel crawling into its home through a hole in your vinyl siding or popping up from a dumpster with a donut in its mouth. Likewise, perhaps you've seen a raccoon waddling down a midnight alley with a Cheerios box clenched in its teeth, witnessed a seagull eating a Quarter Pounder bun in a Home Depot parking lot. Even whitetail deer, icons of the wild, kick back in suburban gardens munching hostas like they were born to it.

Are you to blame if you think of wildlife as able to live pretty much anywhere? Aren't environmentalists being extreme when they say animals need specific habitat to survive?

But unlike habitat generalists—the term for animals able to thrive in a wide range of habitats—most animals don't do well living in dumpsters eating donuts. Quite the opposite: many animals need surprisingly specific habitat to survive. Biologists call these animals habitat specialists, and the Kirtland's warbler provides a shining example. The half-ounce bird that makes a 3,000-mile round trip to the Bahamas each year has traditionally nested in just a half-dozen counties of Northern Michigan and only amid a certain tree, at a certain stage of its life.

Habitat specialization, however, is not necessarily a good thing for the survival of a species, as the Kirtland's spot on the Endangered Species list attests. It is one of the few warblers listed and qualifies as one of the rarest birds on the planet. At some point along its evolutionary track, the bird hitched its nesting fortunes to the ecology of the jack pine forest—and none other. Ask a Kirtland's to nest in those millions of acres of deciduous forest that blanket the North? You might as well ask a fish to go live in a desert.

For nearly 50 years, ornithologists, scientists, government officials and locals have worked to sort out and re-create the maddingly nuanced formula of the Kirtland's habitat. And the work goes on, as it must, forever and ever and ever and ever, if we want this life form known as the Kirtland's warbler to remain a part of our world.

About 10 miles outside of Mio, wildlife biologist Phil Huber pulls his United States Forest Service pickup truck over to the side of a gravel road in a scrubby flatland at the north end of Mack Lake Basin. The place, still recovering from an 800-acre fire in 1999, feels more prairie than forest. Yellow sedge and blueberry cover the ground. Sternum-high jack pine sparsely intersperse with spindly saplings of pin oak. Beside them rise the burnt skeletons of their predecessors.

The basin lies in the heart of the Kirtland's breeding range, and today is May 25, the height of breeding time. Huber cups his hand to his ear and listens. "I hear a

brown thrasher, a chipping sparrow, but no Kirtland's," he says.

But why not? The bird's most important habitat pieces appear to be here. The jack pines are what the birds need for cover, and the trees attract the right insects for food—most notably the jack pine budworm. The sandy soil drains quickly so the ground nests won't flood. Kirtland's also like caterpillars drawn to pin oak, and they like the tree for perching, singing and scouting for intruders. The blueberries and other shrubby plants provide food and cover for ground nests. Even the black flies that swarm in a thick cloud around Huber's head are just more protein for the warblers and their babies.

"The conditions aren't suitable here," Huber says. His eyes scan the landscape. The jack pines at sternum height are maybe 6 inches or a foot too short for the Kirtland's liking, and they're spaced a little too far apart to provide adequate cover.

Huber climbs back in his truck and heads down the road again. Turning a corner, he drives past an area of lush jack pines that addresses both the height and density issues. The trees grow tall and thick, running right to the road in a 20-foot-high wall of green. Perfect Kirtland's habitat here? Huber doesn't even slow down. "After jack pines are 15 feet tall the Kirtland's aren't interested," he says. Some researchers speculate there are fewer budworms as the trees age and less cover close to the ground. "We haven't found a bird in these since 2000." How, you might wonder, did this picky bird survive evolution?

To understand the Kirtland's habitat needs, you first must understand the jack pine and what foresters call fire ecology. Contrary to 50 years of Smokey Bear admonishments, jack pines thrive by burning and regenerating after a fire. The needles of a jack pine contain nearly half the energy content, or BTU's, of gasoline. So a mature jack pine forest, to anthropomorphize a bit, is standing there praying for a lightning strike or a match. When the spark comes, the forest bursts into flames, and, fanned by spring winds—the forest is most combustible in late April and early May, coincidentally just days before the Kirtland's arrives North—it wipes out any competing species that have sprouted during the jack pine forest's few decades of growth. Then before other species can get established, the tree rapidly reseeds and swiftly matures. It's among the fastest maturing of native pines.

Expanding on the survival strategy at his next stop, Huber spreads the supple limb of a young jack pine to reveal a rose-purple bud with the size and suppleness of a gummy bear. He rolls it gently between his thumb and forefinger. "Most pines don't produce cones until 25 years or even more," he says. "But the jack pine produces cones at three years." What's more, the cone holds the seeds safe for decades (half are still viable after 20 years in the cone), not opening until temperatures of about 140 F melt the resin that holds the cone closed.

At some point after the last ice age the jack pines became established in Northern Michigan, and the Kirtland's warbler established its remarkable synchronicity. The forest burned with regularity, though not all at once, so there were always stands of jack pine in various stages of maturity—most importantly in the range of 5 to 15 years.

So what was it that took the Kirtland's—first described in 1851—to the brink of extinction, with just 167 pairs at the lowest points in 1974 and 1987? Perhaps the mention of Smokey Bear above tipped you off. When the policy of fire suppression took hold in the 1930's, the number of acres of jack pine that burned each year plummeted. With far fewer acres burning, far fewer jack pines existed in that magical 5-to-15-year age range. As implausible as it sounds, even though jack pines grew by the millions, the remarkably specific habitat that the Kirtland's needed was vanishing simply because

ABOVE: To create habitat for the Kirtland's warbler, the government clearcuts forests, sometimes a thousand acres at a time, and then replants with jack pine. Thick stands of jack pine in a narrow age range—about 5 to 15 years old—are where the bird nests, so constant replanting is needed. **OPPOSITE:** During the Kirtland's warbler nesting season, about 20 percent of the habitat is closed to the public to protect the ground nests, which are notoriously difficult to see—and easy to step on.

PHOTOS: TODD ZAWISTOWSKI

FROM FAR LEFT: A 6,000-acre fire near Mio in April 2006 burned thousands of jack pines and every other tree species that stood in its path, including these red pines. "By summer you will be able to stand here and hear the pine bark beetles chewing," says wildlife biologist Phil Huber. Young jack pines of this size and density provide perfect habitat for Kirtland's warbler nesting.

the trees became too old. The bird was like a fish in a desert.

The lack of fire and resulting dearth of young jack pines was recognized as a key problem in the first Kirtland's management plan, which the United States Forest Service put out back in 1962. Biologists reported that in the 15 years from 1911 through 1925, 146,000 acres of jack pine burned, but from 1946 though 1961 only 3,000 acres burned.

The state and federal governments began planting jack pines, but did so based on hunches and rudimentary research, and the results were strictly okay. Then a tragic fire in 1980 ended up greatly furthering the understanding of the Kirtland's needs. On May 5 of that year, the Forest Service set out to burn some jack pine slash—residuals from logging to prepare to replant more jack pine for Kirtland's habitat. But a strong wind suddenly rose, and the fire surged out of control. Within just three and a half hours, the blaze had raced 75 miles. Before firefighters stopped the burn, it killed a firefighter, destroyed 44 homes and burned 24,000 acres. The amount of energy released by the high-BTU trees was equal to nine times the energy released by the atom bomb dropped on Hiroshima.

Biologists, most notably Dr. Burton Barnes at the University of Michigan, saw in the tragedy an opportunity to study Kirtland's populations in a natural environment as the vast burn area regenerated. Barnes and his research colleagues wanted the answers to basic questions: How old were the trees when the Kirtland's began to nest among them? What other conditions existed in the forest at that same time? When did the Kirtland's stop using the trees? Dr. Carol Bocetti, who heads the Kirtland's Warbler Recovery Team from her office at California University of Pennsylvania, spent three years of dissertation research looking at differences

Curious Kirtland's Facts

1. The males are extremely "site tenacious," meaning they return to the same 10- to 30-acre territory each spring—but never use the same nest twice.
2. Fledglings are the first to head back to the Bahamas, so it's thought they're genetically coded with migratory directions.
3. Biologists still don't know the precise route the Kirtland's take between Northern Michigan and the Bahamas.
4. Dr. Jared P. Kirtland first described the Kirtland's warbler in 1851, but its nesting habitat wasn't discovered until 1903.
5. The male's song can be heard up to a quarter mile away.
6. Hatchlings leave the nest within just 9 or 10 days.

SOURCE: MACATAWA NATURAL HISTORY PAGE, WWW.MACATAWA.ORG/~OIAS/KIRTLAND.HTM

ABOVE, FROM LEFT: Wildlife biologist Phil Huber manages the federal portion of the Kirtland's warbler recovery program from his office in the Mio ranger station. Huber shows off the dramatic new growth of a young jack pine—rapid growth to out-compete other tree species is part of the jack pine survival strategy. Twenty-five percent of timber revenue from Kirtland's habitat clearcuts goes to county government.

between planted jack pine stands and naturally regenerated stands. One example: did it matter if the lowest branch of the tree was more than 20 inches off the ground. And if it did matter, why?

Slowly but steadily, the research findings zeroed in on the habitat demands of the fussy bird. Previously, foresters managed Kirtland's habitat in 200-acre blocks sprinkled around the landscape. But the research showed the birds needed far larger stands of same-age trees. Now, on national forest lands, trees are planted in up to 550-acre blocks, and state-land plantings can cover 1,000 acres or more. Also early stands incorporated 1-acre-square openings, because biologists knew the birds liked openings near their nests. But Bocetti's research showed that opening edge was critical—she found 47 of 51 nests were within one meter of the edge. Managers changed the shape of the openings to hourglass, made them one-quarter acre and increased their number to one per acre.

The 1980 Mack Lake Fire research also provided clear evidence about the age of trees the birds needed. "We found the first birds in there in 1986, a peak in population in 1994 and just two birds in 2000," Huber says. The lesson: a stand of jack pines provides prime habitat for only 10 years. Today, to keep enough jack pine in prime Kirtland's habitat, foresters manage nearly 200,000 acres in the jack pine plains of Northern Lower Michigan. As the recovery team revises the warbler's recovery plan in coming years, the number of acres is likely to increase based on what science has discovered.

Stopping his truck again, Huber stands in the middle of a gravel-road intersection and again cups his hand to his ear. Listening for another bird? "No, listening for a machine," he says. He cocks his head. "There it is."

He hops back behind the wheel and steers to a clear cut in the making. Three-inch-round stumps run for half a mile, and tire tread marks emboss the ground. The opening will eventually grow to 550 acres, but it now stands at about 80. In the open space, a mini industrial complex is fast at work: three semi-trailers, a giant claw, a massive chipper. A skidder hauls a pile of small trees to the chipper. The buncher—the name of the claw—grabs 10 of them and feeds them all at once into the chipper. The chipper revs and roars with the resistance. Diesel exhaust blows thick out the stack. The trees become a stream of chips, a yellow-brown blur jetting into the back of a semi. When the truck fills, it pulls ahead—soon headed to wood-fired power plants in nearby Hillman and Grayling. Another semi wheels around, then backs up to the chipper.

This is how the Forest Service and state Department of Natural Resources create Kirtland's habitat today. Shouting over the roar, Huber says, "It's designed to mimic fire, that's why we leave strips of standing trees, but it's not perfect." One concern is that all of the biomass is removed—unlike a fire, where the dead debris would stay to replenish nutrients in the soil. Will foresters eventually have to fertilize jack pine stands? Research is underway.

The crew boss stops the operation and wanders

er to talk—orange hardhat, a 32-ounce spill-proof ug in hand. His work here exemplifies a key ece of the Kirtland's habitat recovery strategy. alled multiple use, it allows for many activities, cluding logging, which translates to jobs for com-nies like the one here today, Tulgestka and Sons orest Products, in Rogers City. The way I look at it, I'm working," says. "I open the fridge and there's gallon of milk and a tub of butter, d I'm okay."

And he's well aware of the con-ction between his work and the warbler. "This is iny little bird and it flies to the Bahamas in win-?" He pauses to consider the miracle and perhaps w nice it would be to do the same. He laughs. Vell all right."

Huber offers to take him on a Kirtland's tour, t the man stays quiet. "Well, better get back to ork," he says. He walks back to the crane, climbs o the cab, and the claw swings to grab another nch of jack pines. Much of the money from this nber sale will pay to plant more jack pines; 25 per-nt will go to the county.

Picture yourself as a retiree. You move to a little place in the North amid a lush jack pine forest.

A year later, the Forest Service sends in a log-g crew and, across the road from your home, lays e a clear cut. Despite efforts by the state and feds keep the public aware of pending cuts, this can ppen, and the resulting outcry—"people lose it," Huber says—explains why the politics of Kirtland's warbler habitat is as important as the science. Multiple use is a boring bureaucratic term, but within it lies the key to getting people to accept what must be done to help the Kirtland's thrive. To ensure support, people are allowed to hunt the habitat, pick blueberries, hike, and earn money by logging. Just 20 percent is closed from May 1 through August 15 each year. Eco-tourists—that is, birdwatchers who travel here to check the Kirtland's off their life list—also bring dollars and earn the allegiance of hotel and restaurant owners. Although locals grumble that birders don't spend nearly as much as snowmobilers do on gasoline and beer.

"THIS IS A TINY LITTLE BIRD AND IT FLIES TO THE BAHAMAS IN WINTER?" HE PAUSES TO CONSIDER THE MIRACLE AND PERHAPS HOW NICE IT WOULD BE TO DO THE SAME.

When Bruce Babbitt, then secretary of the interior under Bill Clinton, came to Mio in 1994, he called the Kirtland's recovery plan "the Mio model," and held it up as an example to be studied and replicated: America can merge species protection with economic stability.

But America is where the bird lives only a third of its life, which is why Bahamian Everton Joseph is spending the spring and summer of 2006 in Mio. He's a 20-year-old college student here to learn about the Kirtland's nesting range and to spread word of the research being done in his homeland with Dr.

Killing the Kirtland's Killers

As biologists have been working to expand native habitat for the Kirtland's, they've also been working to reduce a non-native Kirtland's killer. The brown-headed cowbird is a parasitic bird that invaded from the Plains as farming opened Michigan's landscape. It lays its eggs in other species' nests, including the Kirtland's, and the cowbird young out-compete the Kirtland's hatchlings. By the time rehab efforts began back in the 60's, cowbirds had reduced annual Kirtland's fledgling rates to 0.8 per nest. In 1972, biologists began trapping cowbirds and destroying them—an average of 4,000 a year—and the Kirtland's annual fledgling rate has climbed to 3.2 birds per nest.

Joseph Wunder of the Forest Service and Dr. David Ewert of The Nature Conservancy. The Nature Conservancy is funding some of Joseph's college tuition. The program is ongoing, with new students each year. One goal is to raise the profile of the Kirtland's in the Bahamas, encouraging people to embrace the bird and preserve habitat as Michiganians have done.

Over a diner breakfast of eggs, bacon and hash browns, Joseph pops open his laptop to click through a PowerPoint show of island photographs and pie charts. "In the Bahamas, the research job is far, far more complicated," Joseph explains.

For starters, biologists still aren't sure exactly where the bird winters among the 700 islands that comprise the Bahamas—are they evenly spread out or secretly clustered somewhere? Compare to Michigan, where the birds have until recently congregated in just three Northern Michigan counties (although they are now spotted in 14 counties, including some in the Upper Peninsula) and are relatively easy to see as they perch and sing in the jack pine forests. It wasn't until 2002 that enough birds (four) were found in a single locale on a single island, Eleuthera—which measures about 120 miles by 5 miles—to justify a sizeable study effort.

And even when biologists find Bahamas birds, they have an extremely difficult time spotting the Kirtland's. For one, it doesn't sing, just chirps, in the Bahamas, so clear sound clues are scarce. And the bird's territory is larger than in Michigan—about 50 acres compared to 10 to 30 acres. Also the bird flits low through the thickest, thorniest part of the island bush. "People think of the Bahamas as all beach and sand," says Joseph, "but the bush is so thick you can only see five feet into it. It has strong, sharp 4-inch-long thorns that tear your clothes, even your boots." Joseph went through three pairs of leather boots in seven months. In one study, Joseph's team spent 6 hours a day for 21 days on a site where they knew Kirtland's lived and yet saw only three birds the entire time.

Recent advances in miniscule radio transmitters that attach to a bird's neck—but fall off prior to migration north—have begun to unlock many of the habitat secrets in the Bahamas. Researchers monitored the bird as it hung out in patches of black torch, snowberry and sage grown shoulder high. They pieced together a picture of its diet. "What the research shows so far," Joseph says, in the precise diction of a longtime British colony, "is that the bird is a species of disturbance habitat." Up North it lives in a habitat disturbed by fire. In the Bahamas, the Kirtland's lives in areas regenerating from disturbance as well—slash and burn farming, hurricanes.

Later that summer, Joseph presents the research to 40 people at the recovery team meeting near St. Ignace. After he spoke, Eric Carey, director of the Bahamas National Trust explained that the research was central to the bird's future in the Bahamas, where people, for the most part, are not aware of its plight. The recovery team voted unanimously to endorse the research for three years—which helps secure money, but doesn't provide any.

It might seem obvious that if you wanted to ensure a bird's survival, you would make sure its habitat was secure in both of its homelands, and that the tie between winter and summer habitat was well understood. But outside of a couple of species—Kirtland's being one of them—"that idea is just not gaining ground," says Smithsonian migratory bird researcher Dr. Peter Marra.

To change that, the Smithsonian has supported Marra and other researchers in conducting intricate tissue studies comparing Kirtland's tissue from its wintering grounds to tissues from plants and insects in the wintering grounds to see if what the bird is eating affects how early it arrives Up North. The tissue study is a global first in ornithological endangered species research.

Among other things, Marra hopes to determine where the healthiest birds are spending their final weeks in the Bahamas prior to flying northward. The idea being that if you can identify the habitat that's producing the healthiest birds, you can work to preserve or plant that habitat. "If we don't protect the wintering grounds, it doesn't matter how much you do in your own backyard," Marra says.

Beginning in spring 2006, Marra and his team trapped the early arrivers—an indication that they are strongest—and plucked tiny feathers, drew blood and clipped toenails before releasing the birds. Back in the lab, researchers analyzed the samples for isotopes of carbon, hydrogen and nitrogen. What do they hope to learn? Take carbon as an example. As

a plant produces tissue, the tissues have a specific carbon fingerprint that can be read through isotope analysis. The remarkable thing is that this fingerprint transfers to the tissues of insects and animals that eat the plant. So, say an insect eats a snowberry in the Bahamas, and then a Kirtland's eats the insect. The snowberry's carbon fingerprint ends up in the Kirtland's tissues. Analyze the Kirtland's toenail and you can determine the plants growing where he's been living. At least that's the theory. The work is delicate and the carbon fingerprints not always as distinct as one might hope.

Huber rolls down yet another forest road. Gravel bangs off the bottom of the truck. A cloud of dust billows behind. He passes birders in cars with license plates from Minnesota, Wyoming and Alaska. Where he stops, one side of the road opens upon a vast clear cut, mowed to the duff and waiting for jack pine planting this fall. On the other side of the road, head-high jack pine grow thick for acres and acres and acres. Finally, a habitat that meets the finicky Kirtland's stipulations.

Huber lays a tripod and spotting scope across his shoulder like a rifle and carefully picks his way about 30 feet into the pines. "The nests are so tucked into the weave of grass they are very easy to step on," he says—which explains why birders must watch from the roadside.

Within moments he spots a small bird about 50 feet away sitting on a pin oak branch. Huber makes the classic birding call, pish-pish-pish, and the bird responds with a chip, chip, chip. "We have almost 100 percent success viewing on the tours," he says.

A Kirtland's behind him answers too. Then another to his left. But none sits still long enough to scope. "They are saying, 'stay away from my territory.' They probably have their females already."

Rain begins to fall and wet circles dot Huber's shirt. Water beads on the scope. The birds still sing.

Phil hears yet another chip, chip, chip and aims the scope in the direction of the call. He focuses, and there, about 75 feet away, the Kirtland's sits on a thin bare branch staring Huber's way. With each call he raises his beak, his yellow breast feathers ruffle with the effort. He looks to the east, and the wind blows the small blue-gray feathers on the back of his neck. Of course, he's oblivious to the fact that he's one of the rarest warblers in the world and that a small army is needed to keep his kind alive. "That's about as good a view as you can get," Huber says. The bird stays in the scope for minutes. The 2006 census that will happen in a couple of weeks will show that this bird is one of 1,479 singing males in Michigan's jack pines.

The original recovery goal was 1,000 singing males (analogous to mating pairs), self-sustaining for five years. But as long as fire suppression remains forest policy, self-sustaining is impossible. "This is now a manscape, not a landscape," Bocetti says. "We will have to manage it into perpetuity."

Despite the best of fire suppression efforts, when thousands of acres of jack pine are spread across the landscape, some of them will fulfill their genetic imperative to burn. And on April 30, 2006, that's what happened. A fire blazed through 6,000 acres southwest of Mio. Today, May 25, green shoots of bracken fern already sprout, but otherwise, the ground and the trees are charred black.

Huber steps into a grove of jack pines. Their needles are gone. Their black skeletons rise as a forest of dark and twisted sculpture. He plucks a cone from a black branch. "See how the wings of the cone are flared open," he says. Inside are tiny black seeds, the translucent membrane of the wing, the nub of the seed itself. He flicks the cone with his finger and three seeds helicopter down, drifting in the breeze to the ground.

As they land, hundreds more seeds come into focus, flecks of bronze littered across the black. Each one waiting to germinate, grow and eventually burn. And along the way, they will provide habitat—at least for a short while—for the Kirtland's.

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SEE THE KIRTLAND'S

The annual Kirtland's festival happens May 19 at Kirtland Community College in Roscommon. Research presentations and Kirtland's warbler tours, natch, but also free kid stuff like birdhouse building and a fishpond (poles provided or byo). Details at warbler.kirtland.edu.

Can't make the festival? You can still take a tour: the U.S. Fish and Wildlife Service and Michigan Audubon Society offer free daily guided tours May 15 through July 4 from Grayling. 517-351-2555, ext. 316; and the U.S. Forest Service offers $5 tours daily (except Memorial Day) May 15 through July 2 from Mio. 989-826-3252, ext. 3364.