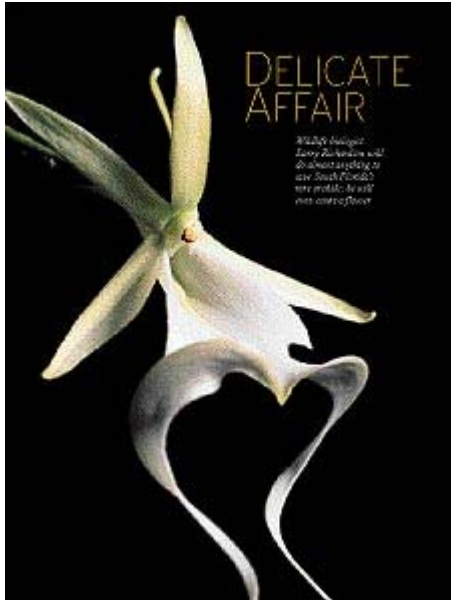


Delicate Affair

By Rene Ebersole

Wildlife biologist Larry Richardson will do almost anything to save South Florida's rare orchids; he will even court a flower



IN THE SHADOWS of pond apple and pop ash trees, a canoe slips quietly through tannin-tinged waters, past the stumps of 600-year-old cypresses, across an alligator's bubble trail and into a cove scented with rotting fish. There, Larry Richardson pulls his paddle out of the water and points at a low-hanging branch adorned with a wad of roots and spiky leaves—the signature of the rare cigar orchid.

"I put that one there when it was just a baby," says Richardson above the sound of a pileated woodpecker drumming on a dead cypress. When it blooms in the coming weeks, this plant will unfurl ruffled petals in a rich palette of gold and crimson polka-dotted patterns in preparation for a visit from a pollinator that no longer exists here.

In the absence of the orchid's pollinator, in a swamp denuded by logging decades ago and increasingly threatened by modern-day development and plant poachers, Richardson, a U.S. Fish and Wildlife Service biologist, is trying to help orchids hang on in South Florida. At the same time, he also must keep tabs on other imperiled species that share the orchids' habitat, especially the critically endangered Florida panther.

Richardson's orchid work is largely a covert operation to prevent poachers from discovering the locations of the state's stash of rare plants. Yet the refuge where most of his efforts are concentrated is surrounded by people, and their impacts on the orchids are severe.

The 26,400-acre Florida Panther National Wildlife Refuge lies in the heart of Collier County, one of the fastest-growing regions in the nation. Tucked within this increasingly urbanized landscape, the reserve conceals panthers, more than 100 bird species, unique hardwood forests, alligators and more than 40 species of orchids. But a century of people meddling with the waters that crawl a southwesterly route across the state's limestone mantle has drastically altered the region's hydrology and threatened its diverse flora and fauna.

Most U.S. states shelter wild orchids. But Florida's subtropical climate and the ease with which orchid seeds can be transported from the tropics by hurricanes makes this state especially rich in these unusual plants. Sheltered within Florida's borders are 118 species, roughly half of all the orchids known to exist in the United States and Canada.

Branches overhanging the deepest, darkest sloughs are bejeweled with rare epiphytes (species that grow on trees rather than in soil), including the cigar orchid and the celebrated ghost orchid, made famous by Susan Orlean's best-selling book *The Orchid Thief* and the Nicholas Cage movie *Adaptation*. These plants demand water-filled swamps, which store the sun's warmth during the day and release it after dusk, to survive the cold winter months.

In the shadows of pond apple and pop ash trees, a canoe slips quietly through tannin-tinged waters past the stumps of 100-year-old cypresses, across an alligator's bubble trail and into a cove scented with rotting fish. There, Larry Richardson pulls his paddle out of the water and points at a low-hanging branch adorned with a wad of cream and spiky leaves—the signature of the rare cigar orchid.

"I just thought there when it was just a bud," says Richardson about the sound of a picketed woodpecker drumming on a dead cypress. When a flame in the coming works, the plant will send out leafy growth in rich patches of gold and orange. The pop ash trees in preparation for a next time a pollinator that no longer exists here.

In the absence of the orchid's pollinator, in a swamp already lit by logging decades ago and increasingly obscured by modern-day development and

plant growth, Richardson, a U.S. Fish and Wildlife Service biologist, is trying to help an orchid hang on in South Florida. At the same time, he also must keep tabs on other imperiled species that share the orchid's habitat, especially the critically endangered Florida panther.

Richardson's orchid work is largely a recent operation to preserve orchards from destruction by the removal of the

water's main food source. For the orchid, which most of its life cycle is spent in a dormant state, the orchid is surrounded by people, and their impacts on the orchid are growing.

The 20,000-acre Florida Panther National Wildlife Refuge lies in the heart of Golden County, one of the fastest-growing regions in the nation. To help restore the swampy habitat, the refuge recently purchased more than 100 land parcels.



THICK BRANCHES overhang the deepest swamps in the Florida Panther National Wildlife Refuge, often harbor rare orchids, such as the giant (orange, top) and the (right) and yellow (below) orchids. In the area, 19 of the 20,000 acres are currently open to the public. Florida has 110 species of orchids, half of which are in the United States and Florida.

PHOTOGRAPH BY LARRY W. RICHARDSON



If lower water levels created by development induce droughts that coincide with cold temperatures, it could spell the end of such species. "Some of these orchids can grow 50, 60, even 100 years," says Richardson. "Then one night you get two hours of freezing temperatures and they turn to mush."

As he shows a visitor around the panther refuge—first by canoe, then on a chunky-tired vehicle called a "swamp buggy" and lastly on soggy feet—Richardson points out the identifying characteristics of a handful of endemic epiphytes: the distinctive, alternating leaves of the night-fragrant epidendrum (*Epidendrum nocturnum*), the spidery veins of the leafless, froglike ghost (*Dendrophyllax lindenii*) and the diminutive, lime green pom-pom flowers of the dingy-flowered star (*Epidendrum amphistomum*). Then he zeroes in again on the one he's currently trying to save.

Wading through cool, thigh-high water coated with duckweed, Richardson approaches a cigar orchid (*Cyrtopodium punctatum*) budding atop a 5-foot-high cypress stump. A water moccasin skirts the edge of the tree, then zigzags away, taking cover in some high grasses. Being mindful of the snake, Richardson fingers the plant's long, slender leaves. "This orchid does not belong here," he says, touching a young bud. "Historically, it would have grown much higher up." Shielding his eyes from the sun, he motions toward the bald cypress trees overhead.

More than a century ago an unknown quantity of cigar orchids was hauled out of this swamp on the trunks of cypress trees headed for the nation's lumberyards. Coveted for their long, straight, knot-free and rot-resistant boards, those trees supplied the materials to build Navy battleships for World War II. Later, the tall, wooden sentinels were fashioned into all sorts of post-war commodities, from pickle barrels and stadium seats to roof shingles, coffins and Coke bottle crates. The few remaining old cypress trees left standing in the refuge were probably deemed too hollow or too crooked, undesirable for logging. Today, surviving cigar orchids exist almost entirely on cut stumps.



PLAYING THE BIRD'S A young pollinator biologist, Larry Richardson, visits a new colony of yellow cigar orchids. He will later transfer the plants to the region of swamps that once thrived along a well-worn alligator trail in the swampy forest.

Richardson found that, although all were less than 40 years old, the plants were in various stages of maturity. The young plants were a mix of sizes, from a few inches tall to a foot or more. The plants were in various stages of maturity, from a few inches tall to a foot or more.

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YELLOW BELLS *Psychotria carolinensis* is a common orchid in the region of swamps that once thrived along a well-worn alligator trail in the swampy forest. The plants were in various stages of maturity, from a few inches tall to a foot or more.



A POLLINATOR DOING The young pollinator biologist, Larry Richardson, visits a new colony of yellow cigar orchids. He will later transfer the plants to the region of swamps that once thrived along a well-worn alligator trail in the swampy forest.



Until recently, the cigar orchid's future in this region looked bleak without its pollinator. No one knows what happened to the insect, which is believed to be a bee, but some suspect it may have been wiped out by pesticides used on nearby agricultural fields dotted with tomato and pepper plants. With cigar orchids failing to reproduce year after year and the dead cypress stumps becoming increasingly rotted, Richardson decided to take matters into his own hands; by performing the duties of that missing pollinator.

"Here's this male bee," says the tall, blonde-gray biologist, wagging his index finger toward an orchid bud that will soon feature a bumblebeelike yellow bloom. "He thinks he can mate with this 'bee.' Only it's not a female; he's been ripped off." As the bee backs out of the flower, he unknowingly picks up a waxy cluster of pollen, or a pollinia, like a Post-it Note on the back of his head. "The pollen has enough stickum for the bee to carry it to the next orchid, where he gets duped again," says Richardson, "leaving the pollinia attached to the stigma, pollinating the plant."

Richardson then trudges east down a well-worn alligator trail to find another cigar orchid. This one is in full bloom. The mass of yellow and ruby-colored flowers glow in the sunlight like a lavishly wrapped present against the drab brown and green of the swamp and the surrounding forest. Arching his neck to see into a flower, he plucks a pinhead-sized pollinia from a bloom with a pair of small forceps. He plans to implant the waxy cluster of pollen on a stigma of another flower about a mile away.

"After I pollinate the flower," he says, "it shrivels and the stem swells. Over time—roughly a year—the swell becomes a seedpod." When the pod bursts open, it disseminates a million seeds that drift in the breeze. The problem is that seed caches dispersed from a 5-foot-high stump—rather than from 30 feet up in the canopy—can't travel far. Richardson offers some assistance there, too, by shimmying up sturdy, young cypresses and fastening seedpods to the bark with thumbtacks. "A seed has to land where it will find the right habitat and take hold," he says. "When they float from these historic heights, they increase their odds. They could go from here to Cuba."

A seed with any chance of sprouting must land in a crevice on a tree trunk that's not too wet, not too dry, not too bright and not too shady, and then become infected by precisely the right species of fungus. "There are hundreds of types of fungi," says Richardson. Some will digest the orchid seed, killing its chances of becoming a plant. One will nuture it, helping the seed develop further.

In the hopes of eventually achieving a full-scale orchid restoration in the heart of the Big Cypress Basin, where the refuge is located, Richardson and Scott Stewart, a colleague at the University of Florida, are trying to cultivate native orchids in a laboratory on the panther refuge. Once the method for reproducing and reestablishing cigar orchids is perfected, they plan to tackle the cultivation of other imperiled native species.

Saving the panther is a large part of Richardson's job, but he tries to devote as much time to orchids as possible. "What's good for orchids is good for panthers," he says—and everything else that lives in South Florida's shady swamps. Right now, several developments are afoot that could give a boost to Richardson's orchid offensive. The biggest is the \$8 billion Everglades restoration project, an attempt to re-establish more natural water flows to South Florida. If this epic project succeeds, it will buy Richardson and Stewart some valuable time to perfect their cultivation techniques.

But another major threat still lingers: poaching. Plant pilferers come in all shapes and sizes: tourists on a guided afternoon swamp walk; fanatical collectors driven by the hunt for something rare, something valuable, something forbidden; even the occasional rogue member of a group that works to protect orchids.



Mike Owen, the biologist at the nearby Fakahatchee Strand State Preserve, was witness to one of the biggest orchid heists in Florida history. He had only been working in the Fakahatchee—the orchid capital of the United States—for three months when on December 21, 1993, a local orchid collector named John Laroche and three Seminole Indians were caught hauling garbage bags and pillow cases full of rare plants out of the park. The Indians and Laroche—star of *The Orchid Thief* book—were arrested on the spot and Owen was asked to document the 136 plants they had collected. Of the 92 wild orchids poached, many were so new to Owen that Laroche had to tell him what they were. Included in the large haul were several specimens of the highly prized ghost, and despite Owen's best efforts to put the plants back in the swamp, every one died.

Richardson shares Owen's frustration about the incident. "That guy Laroche wanted to collect them all," he says. "But the demise of certain orchids is not going to be from such arrogance. It will be from apathy."

Steering his silvery blue truck into a Naples parking lot rimmed with what appears to be nothing more than a trivial scrap of swampland, Richardson warns, "This location must remain top secret." He dons a pair of

waders and a hefty backpack, then ambles across the cement, scales a chain-link fence and strides down an overgrown path until he is wading in knee-deep mud. The song of an ice cream truck hums in the distance. Children laugh and shriek in a nearby yard.

Seconds later, Richardson finds the first signs of a ghost—it's spidery, chlorophyll-pumped veins running up a pond apple tree. On the same tree, he discovers five others. "There are more ghost orchids on this one tree than on two or three acres in the refuge," he whispers. "Anyone could come in here, cut a limb and have a ghost."

In fact, somebody already has. "See there," Richardson says, pointing at a severed branch on a neighboring tree. "It's been cut in two places. They took out a big chunk with a ghost orchid on it. Now that orchid is doomed to die because the dead wood will release chemicals that kill the plant."

Still, Richardson finds many of the trees in this section of the swamp untouched. All told, he counts 17 ghosts in less than an acre. "It's one of the largest concentrations of ghost orchids in the state," he says. "But there are no seedpods. So there's no reproduction, no future. I'm going to pollinate the heck out of them this year."

Senior Editor Rene Ebersole got hip deep into her work while reporting this story, spending several days wading through Florida swamps with orchid scientists.

NWF Priority

Small Plants for Big Cats

What's good for orchids is good for panthers and other wildlife species that share their habitat. The National Wildlife Federation has a long history of fighting for protection of that habitat, and when the agencies charged with looking after it make bad calls, NWF often takes them to court.

Recently, for example, a federal judge sided with NWF in a case against the U.S. Fish and Wildlife Service (FWS), ruling that the agency failed to consider the collective impact of a 5,200-acre limestone mine on habitat deemed essential for the panther's survival when it approved a construction permit issued by the U.S. Army Corps of Engineers.

"The Corps and FWS have been acting in concert for years by basically rubber stamping development permits in critical panther habitat," says NWF attorney John Kostyack. "The court has sent a clear message to these agencies, telling them they must take off the blinders and look honestly at what their cumulative decisions mean for panther survival."

A second panther suit is currently underway. This suit cites the Corps' abuse of its Nationwide Permitting Program, which regulates the filling of wetlands for certain activities such as residential and commercial development. NWF contends that the Corps violated environmental laws when it issued these permits without adequately analyzing their impacts on panthers and without consulting with FWS.

For more about NWF's efforts to protect panthers and other endangered species, see www.nwf.org/ourprograms. Take a free online course on panthers at www.nwf.org/wildlifeuniversity.

Web Exclusive

Orchid Fever: Bad for Mosses

Potted orchids currently represent the fastest-growing slice of the potted plant industry, fetching more

than \$100 million in sales each year, according to the U.S. Department of Agriculture. While most orchids sold today in U.S. nurseries and garden centers are cultured, helping to reduce poaching pressures on the wild orchid populations from which they are derived, commercial orchids do pose a threat to a less conspicuous group of wild plants: the mosses.

Mosses harvested from woodlands in the Appalachian Mountains, temperate rain forests in the Pacific Northwest and as faraway as the swamps of New Zealand are often used to provide a protective and attractive coverlet inside the pots of ornate orchids. According to some estimates, up to 40,000 tons of mosses are hauled out of U.S. forests every year to fill the demand for dried moss used in orchid pots, crafts, flower arrangements, Christmas wreaths and nativity scenes.

Many people in the Pacific Northwest have historically supplemented their income from logging and fishing by harvesting armloads of liverworts dripping from trees and vacuuming up carpets of moss for sale. In the last decade, however, the locals have been supplanted by teams of poorly paid immigrant workers hired by contractors to strip-mine the forest.

Conservationists say the unsustainable harvest of moss poses a serious threat to the careful balance of the ecosystems where they are found. In a forest, for example, moss behaves like a sponge, buffering the flow of water and nutrients. It also shelters reptiles such as salamanders and acts as a seedbed for new plants.

The market for sustainable flowers and greens is growing (see "[Making Sure a Rose Still Smells as Sweet](#)"), but as of yet the U.S. government has made little effort to wrangle industrial moss harvesters and balance forest conservation with local livelihoods.—*Rene Ebersole*

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