

WOOD STORKS

Wading Through The Nuclear Age

DRIVING ON TOP of a narrow dirt embankment in his mud-spattered pickup truck, Dan Connelly makes his early-morning rounds of a large, man-made pond hidden deep in the backwoods of South Carolina. A thunderstorm the night before has left the unpaved track slick and treacherous, but Connelly is perfectly at ease as he dodges the rain-filled potholes, while skillfully avoiding the slippery drop-off into the pond below. Suddenly, his vehicle skids to a halt and Connelly steps out into the goopy mire, the mud squishing loudly beneath his rubber boots.

Grabbing a large pail of commercial fish food from the back of his truck, Connelly walks to the edge of the pond and tosses a few handfuls of dry pellets into the murky depths. A satisfied grin crosses his face when the placid water erupts in a boiling mass of fins, whiskers, and tails, as dozens of supermarket-size catfish rise to the surface, snapping greedily at the hail of tasty morsels. It's a sight to warm the heart of any pisciculturalist who truly enjoys his work.

But Connelly is no ordinary fish farmer. As manager of the Audubon Society's Silver Bluff Plantation Sanctuary near Jackson, South Carolina, he supervises the 40 acres of artificial ponds that

grace the refuge. But the fish he nurtures with such care are not destined for the dinner table. Rather, they are grown solely for the benefit of the endangered Wood Storks that glide into the sanctuary each summer looking for food.

National Audubon dove into the fish-farming business—with the Wood Stork as its primary customer—as an indirect result of Cold War politics. It all started back in 1981, when the newly-elected Reagan administration decided that in order to maintain a strategic edge over the Russians, the United States needed to expand its nuclear arsenal. The plan called for doubling the production of plutonium 239 in less than five years. To meet this demand, a 28-year-old nuclear reactor—which had been "mothballed" for more than a decade at the U.S. Department of Energy's (DOE) Savannah River Plant near Aiken, South Carolina—would have to be reactivated as soon as possible.

But the plan to reactivate "L-Reactor," as it was called, provoked alarm among local environmentalists. Once operating, the reactor's discharge of cooling water—more than 176,000 gallons per minute at full power—would be dumped into the meandering drainage of Steel Creek, and carried

seven miles downstream before emptying into the Savannah River. During the years of its previous operation, from 1953-68, the reactor's flood of scalding hot discharge had completely destroyed the Steel Creek swamp forest along with its many fish and other wildlife.

Since the reactor had been out of commission, this life had partially recovered. Of special interest to biologists and birders, the extensive marshes and swamplands along Steel Creek had become important feeding habitat for the local Wood Stork population, which breeds at a colony near Birdsville, Georgia, about 30 miles away.

Also in the intervening years, South Carolina had passed a law that required thermal effluent from nuclear installations to be cooled to no more than 90°F before it could be flushed into a natural drainage. Environmentalists who had lobbied unsuccessfully to block L-Reactor's rebirth favored the construction of cooling towers, which would eliminate the need to dump more water into the Savannah River. But the DOE claimed the time required to build the towers would delay the production of the new plutonium for at least two years. The energy department opted to construct a 1,000-acre reservoir adjacent to the reactor in 1985 in which the hot

Photography and Text by David Manry

discharge could cool down to the permissible level before flowing into Steel Creek. Although this solved the heat problem, the wetlands would still be flooded, raising the water level too high for storks to wade in. Shallow wading water is crucial to the survival of the Wood Stork. Unlike herons or egrets, Wood Storks are not visual feeders. They hunt by "tactile location." Sweeping their open bills through the water, they snap them shut the instant they feel a fish inside. Deprived of their crucial feeding area, these Wood Storks were going to have to look elsewhere for food in a region where wetlands were rapidly giving way to human development.

The DOE could easily have ignored the fate of the Wood Stork except for one major catch: the U.S. Fish and Wildlife Service was preparing to list the bird—whose population had been declining for many years—as an endangered species, a ruling which was passed in 1984. Under the provisions of the Endangered Species Act, the DOE was legally obligated to replace the storks' doomed habitat before the agency could carry out its plan to restart L-Reactor.

After lengthy consultations with biologists from National Audubon, the U.S. Fish and Wildlife Service,



and the University of Georgia, the DOE agreed to mitigate the loss of Steel Creek by financing the construction of four fish-rearing ponds at the Silver Bluff Plantation Sanctuary, located just outside the nuclear plant's boundary. The ponds would be stocked with bluegills and catfish, and managed in such a way to provide abundant food for Wood Storks during the summer, when the birds normally use the imperiled wetlands on the Savannah River Plant.

The plan looked good on paper, but would the storks take advantage of the offer? An earlier project suggested that they would. In 1969, National Audubon developed a similar stork-feeding program at its Corkscrew Swamp Sanctuary in South Florida. A series of shallow ponds was constructed and stocked with fish on which the local nesting storks feasted when water levels were drawn down to suitable depths for them to wade through. Though this pioneering experiment was discontinued in 1978 due to water-level control problems, it proved beyond a doubt that Wood Storks could be enticed to an artificial food source.

The Wood Stork used to be fairly common in wetland areas across much of the southeastern United States with Florida serving as its stronghold. At least 20,000 pairs of the stately birds nested in several huge colonies during the 1930s; the greatest concentration was in the Everglades Basin. But human encroachment on South Florida's wetlands (specifically the disruption of water flow throughout the region) wreaked havoc with the stork population, and the tremendous colonies of the past have all but disappeared. Some of the birds may have relocated to

Despite increased federal protection Wood Storks are still losing ground: In 1991 only 4,086 pairs could be found across their entire U.S. range. The stork's continuing decline is blamed partly on the severe drought that has gripped the Florida region during the past five years, causing several key colonies to abandon. Only time will tell whether the Wood Stork can hold out into the 21st century.

northern Florida, Georgia, and South Carolina, where a number of small stork colonies have popped up during the past two decades. In 1984, when the Wood Stork was officially classified as an endangered species, its breeding population was estimated to be 6,040 pairs.

Construction of the ponds at Silver Bluff Plantation began in August, 1985. An old, dried-up mill pond on the refuge was dredged out and subdivided into four separate impoundments, using a series of internal levees. Water from a natural stream was fed into the ponds separately, so that the depth of each pond could be controlled independently. Once completed and filled, the ponds were stocked with more than 300,000 bluegill and catfish fingerlings

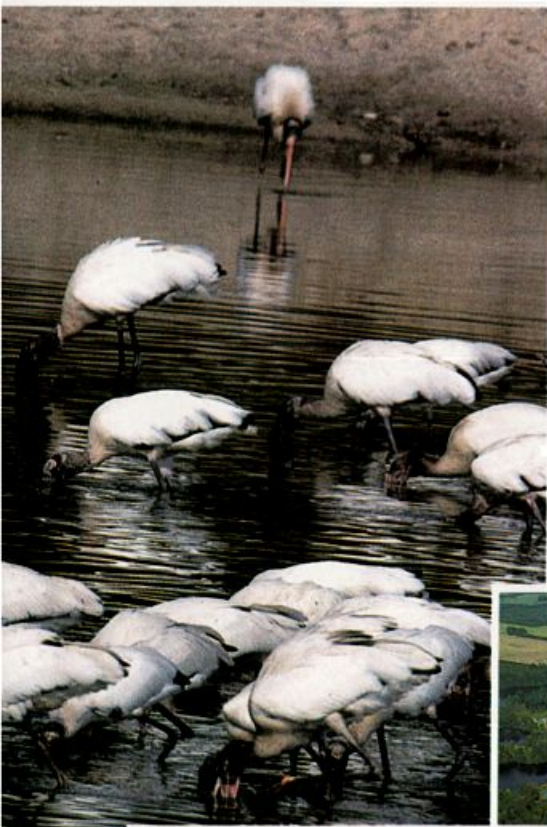


Above, Wood Storks wade in shallow water trying to catch their next meal by way of tactile sensation. Below, Malcolm Coulter (left) and David Young band Wood Storks at the Birdsville colony in Georgia. On the far right is an aerial view of the Kathwood Ponds at the Silver Bluff Plantation Sanctuary in Jackson, SC.

obtained from a nearby hatchery. Fertilizer applied to the ponds triggered a lush phytoplankton bloom, which would set the food chain in motion to yield fat, stork-ready fish.

A team of biologists from the University of Georgia's Savannah River Ecology Laboratory (SREL), led by avian ecologist Malcolm Coulter, supervised the manipulation of pond depths that would make the fish available to hungry storks. "The ponds should be drawn down starting in mid-summer," said Coulter, "when dispersing Wood Storks from the Birdsville colony are likely to converge on the area looking for food."

Early in July of 1986, the first pond was lowered to about 14 inches—an ideal depth for feeding



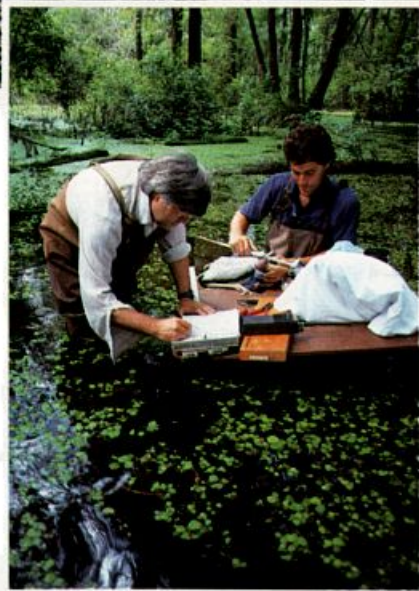
began feeding on the concentrated fish. In the following weeks, the number of storks taking advantage of the catering service grew by leaps and bounds. By mid-August, nearly 100 Wood Storks—including two color-banded fledglings from the Birdsville colony—were stuffing themselves on the lavish feast organized especially in their honor. Sharing the banquet with them were large numbers of Great Egret, Little Blue Herons, and other fish-eating birds.

During that initial trial, Wood Storks continued to feed at Silver Bluff through the remainder of

who has helped manage the Wood Stork project for more than eight years, is cautious about drawing a connection between the two upward trends. "We suspect that many of the storks visiting the feeding ponds are not of the local population," says Bryan. "Our counts of fledglings indicate that many are transients wandering in from other colonies at the end of the breeding season." Scientists at SREL are now analyzing the DNA extracted from molted feathers gathered from around the ponds, in an effort to determine the precise origins of the Wood Storks visiting Silver Bluff.



In addition to managing the Silver Bluff feeding program, biologists at the Savannah River Ecology Laboratory—with full support from the DOE—are conducting the most in-depth study of Wood Stork biology ever, including foraging, breeding, and competition with other wading birds.



summer and well into early autumn. "By late September, prey abundance in the ponds was drastically reduced by bird predation," said Malcolm Coulter, "and we decided it was no longer necessary to continue feeding the storks that year." The ponds were refilled to their normal capacities, allowing the fish a chance to spawn.

Since its inaugural season, the Silver Bluff feeding program has attracted large numbers of storks each year. In 1987 a high count of 151 birds was tallied in the ponds, followed by 212 in 1988, 223 in 1989, 250 in 1990, 189 in 1991 and 207 storks in the summer of 1992. At the same time, the Birdsville stork colony—whose members benefit directly from the artificial provisioning—has climbed steadily, from 160 pairs in 1986, to more than 240 pairs last year. Even so, SREL biologist Larry Bryan,

"Hopefully, the knowledge and expertise gained from this research can be used to help other struggling stork populations—both in the U.S. and abroad—in years to come," says Malcolm Coulter.

Meanwhile, back at the Savannah River Plant, L-Reactor has yet to be turned on for more than a few brief experimental runs. The main problem can be traced to the holding lake which has proven ineffective at cooling the reactor's discharge to the permissible level. A cooling tower may well have worked better.

Critics of the U.S. Endangered Species Act accuse the Wood Stork, and its supporters, of jeopardizing the nation's defense capabilities. But in the final analysis, it all boils down to your definition of "national security." Personally, I rest easier at night knowing that in the battle between Wood Storks and weaponry, the birds seem to be ahead.

storks. But not a single bird showed up, and the pond was soon refilled. Almost a week later, the biologists released water from a second pond, and crude, stork-like decoys were propped up in the shallows, in hopes of luring the great-winged birds that might come soaring by.

After waiting for more than two weeks, the SREL biologists were rewarded when four fledgling Wood Storks splashed down into the beckoning pond, where they promptly