

## **Choked: Chemicals, overabundance of plant life among factors contributing to decline**

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Caddo Lake is dying a long, slow death.

It may take Caddo hundreds of years to totally die, but the conditions that destroy aquatic life are already present and working in the state's only natural lake, according to some scientists.

Mercury pollution has made eating large amounts of large-mouth bass unsafe and the amount of acid — which eventually kills fish and plant life — may be increasing.

Mercury is also invading wildlife, according to a U.S. Fish and Wildlife Service report released in the early '90s. Researchers found mercury in macroinvertebrates and great blue herons. The herons also had elevated zinc levels.

Macroinvertebrates include aquatic insects, worms, clams, snails and crustaceans, such as crawdads.

Aquatic plants are filling the lake, resulting in a "depressed" oxygen level for about 7,000 water acres each year, from June through November, a condition that could worsen with time, according to Mike Ryan, an inland fisheries biologist with the Texas Parks and Wildlife Department.

Because fish need oxygen to survive, they cannot live in those depressed oxygen areas while the condition persists, he said.

Sediment is also filling the lake, which Ryan believes has accelerated the lake's aging process.

"A lake like Caddo, with time, thousands of years, it's going to fill in," Ryan said. "That's the way things work naturally.

"I would say that the aging process has increased."

Caddo is filling with sediment — meaning soil and organic matter — because hardwood has been clear-cut from the lake's bottoms and slopes. That hardwood helped stabilize the soil.

Therefore, erosion has made its way to the lake, particularly the lake's north end.

When the sediment is washed into the water, Ryan said Caddo's over-abundant plant life acts as a barrier and the sediment drifts to the bottom of the lake, where it builds up over time.

Before Lake O' the Pines dam was built in 1955, Ryan said flooding helped sweep sediment from the lake. But the dam now controls water traveling downstream toward Caddo.

Texas Forest Service Forester Jacob Donellan said he agrees that poor land use practices have contributed to soil erosion, but added "you can say that about any body of water at any time."

Most lake experts do agree on one problem — that the lake has been contaminated with cadmium, lead, zinc and mercury. Most of the metals have been covered by sediment and "are not as available to the lake's aquatic organisms," Ryan said, an opinion shared by Art Crowe, an aquatic biologist who works for the Texas Commission on Environmental Quality.

Crowe said the metals are not showing up in fish tissue.

But the lake's mercury level is so high that the Harrison County Health Department has advised residents not to eat large-mouth bass more than twice a month, and not to eat more than 8 ounces of that fish per meal.

Children should only eat half that amount.

Mercury has not affected all the lake's fish, said Crowe. "You can still eat catfish and sunfish and it will be good for you," he said.

But mercury could also, eventually, effect wildlife since it travels up the food chain, by way of "anything that feeds off fish," said Ryan, who also pointed out that 70 percent of the anglers who visit Caddo fish for large-mouth bass.

Scientists have discovered that mercury contamination is a world-wide problem, and Crowe said most believe that power plants are the major culprit.

Several power plants, some of the state's largest, are in East Texas: Included are Monticello, near Mount Pleasant, Martin Creek, south of Longview, Big Brown, near Limestone, east of Waco and the H.W. Pirky Power Plant, near Hallsville.

Caddo's decreasing oxygen level is another major problem, because fish need oxygen to survive, Crowe said, adding that the lake is not meeting the state oxygen standard.

Ryan believes two things cause the oxygen problem, a huge amount of aquatic plants living in the lake and the lack of fresh water entering the lake during the summer months.

Native aquatic plant life is part of the problem, but hydrilla and the water hyacinth, two non-native plants, are also filling portions of the lake with growth, said Ryan, adding aquatic plants could eventually cover most of the lake.

Water hyacinth now covers 400 water acres on the (Texas side) of Caddo Lake's roughly 13,000 (Texas-side) water acres, but Ryan said in the summer of 2000 water hyacinth covered 3,000 to 3,500 water acres.

During an average growing season, June through November, about 7,000 water acres lack enough oxygen to support fish, he said, adding "you can almost walk across" Caddo due to the aquatic plants.

In July, 2004, from 2,000 to 4,000 fish died in Clinton Lake (part of Caddo Lake, on the northwest side of the lake, on the Texas side) and Ryan said he believes that the fish died from lack of oxygen.

Water hyacinth are from South America and hydrilla is an African native. Ryan said water hyacinth were introduced into American waterways in the late 19th century, perhaps because they produce beautiful purple flowers.

Ryan said hydrilla was first introduced in the early 1960s, maybe by the aquarium trade.

His department sprays the plants with herbicides, Ryan said, but parks and wildlife has a limited budget.

Also, water hyacinth grow in cypress breaks and shallow water where state employees cannot reach them, thus allowing the plants to reseed and spread.

If the department does not spray for one or more seasons — such as in the late 90s, when Parks and Wildlife was testing its herbicides for safety — Ryan said the hyacinths can double and triple.

Caddo needs floods and more water flowing downstream, Ryan said, because when the water is turbid, sunlight cannot penetrate, thus retarding plant growth.

Flooding also sweeps away nutrients — most of which come from decayed plant life —

that help new plant life flourish.

But the Lake O' the Pines dam prevents downstream flooding, he said, and "it's not feasible to restore historic flows of water."

Another control on burgeoning aquatic plant life is sustained freezing temperatures, Ryan said, but "We don't get winters like those we used to get."

An exception to that rule occurred in the winter of 2000-2001, he said, when freezing temperatures killed a vast amount of the lake's aquatic plant life.

Acidity is a problem in many of the nation's lakes, but not every expert believes that Caddo has a problem.

National Atmospheric Deposition Program literature says that the amount of acid falling on East Texas equals the amount falling on many areas in the nation's Northeast. More acid falls on East Texas than anywhere else west of the Mississippi River.

But Crowe believes that the lake's water is neutralizing the acid, and said he doesn't believe that the lake is more acidic than it was in the 1970s.

Most lakes have the capacity, at different levels, to neutralize acid, depending on the alkalinity of their water. Some of that difference depends on the type of soil in and around a lake. Crowe said that lakes located in Texas' blackland prairie, such as around Lake Wright Patman, have more ability to neutralize acid than do Piney Woods lakes, "hence the concern for Caddo."

East Texas Baptist University Biologist Roy Darville, however, does believe that Caddo is becoming more acidic.

So far, he has seen only small changes in the lake, due to acidity, but said "What the lake will look like in 50 years, I can't answer that."