

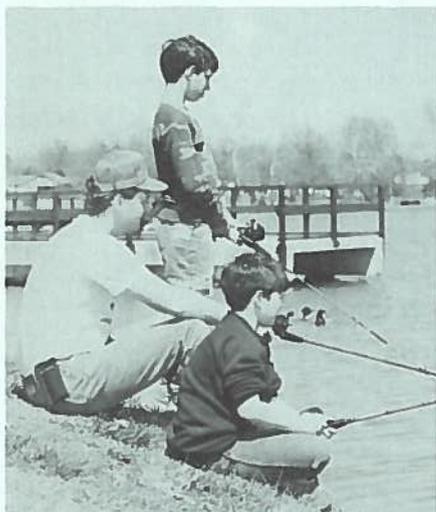
OK

## Water

NEWS

## Wow! Look at Ada City Lake Cleaner, Deeper, More Scenic

*An Oklahoma success story made possible by Ada's citizens, the Water Resources Board and the EPA*



It's easy to see that the people of Ada take pride in their lake in Wintersmith Park. When the earliest blush of crimson colors the redbuds, the park's people turn out for seasonal rituals.

The rites are observed by children coaxing ducks with offerings of bread, East Central collegians sprawling on blankets spread on the slope, kids and dads fishing from the dock, joggers thud-thumping in soft cadence on park paths and oldsters sunning on the

benches simply watching the youngsters in their seasonal ceremonies.

Likely, it is the bench denizens who remember the first heydays early in the century, when Wintersmith Park and Ada City Lake were new. The lake was built by Ideal Cement Company to provide a backup water supply to its plant. Once finished, the lake's small yield precluded the waters from that use, so the owners deeded it to the town. Wintersmith Park bloomed around the lake, and soon the park and its lake hosted gala picnics and swimming and canoe excursions.

In the mid-1930's, the Works Progress Administration (WPA) enhanced the park with picnic tables, road and foot bridges, an amphitheater and a lodge. Later, the Heritage Conservation Service encircled the lake with a trail.

But time and "progress" had begun to exact their toll. Not Ada City Lake alone, but all lakes mature naturally, as rains on the watershed carry nutrients (phosphorus and nitrogen) and sedi-

*Continued on page 2*



Ada residents of all ages enjoy the lake and Wintersmith Park. ABOVE: Mark Hill fishes with Bryan Hill (standing) and Jack Hilton. LEFT: Kimberly Hudson and son, Jordan, frequently visit to feed the ducks.

*Ada, continued from page 1*

ments into their waters. However, the activities of people often hasten this evolution and eutrophication. Nutrients promote the growth of weeds and algae which steal oxygen and eventually die, decomposing and settling on the bottom with the sediments.

It was the very beauty of Ada City Lake that accelerated this aging process. Indeed, the lake was so attractive that the gentle sandstone hills above it provided prime building sites for homes and a golf course. From the mid-1950's through the early 1970's new housing developments clustered along the watershed to the north, northeast and west. East Central University, adjacent to the lake, built major additions to the campus.

All the while, rains carried the soil displaced by construction down the slopes. Thick blankets of sediment settled on the lake bottom. Nitrogen fertilizers applied to the new lawns enhanced the growth of aquatic macrophytes in the lake waters. Soon algae and water weeds choked the lake and its tributaries.

***It seemed Ada City Lake was lost to the sediments and weeds that threatened to entomb it.***

The handsome stone diving tower stood as a ghost in the shallows. Canoes mired in the water shrunk to a depth of only six inches in the center.



Over the lake's 80-year lifespan, rainwater runoff washed into Ada City Lake the soil and nitrate fertilizers which nourished dense growths of algae and water weeds.

The 12-acre lake once had boasted depths greater than 20 feet. The city's attempts in the 1960's to dredge the lake failed.

Then, heightened concern for the nation's environment produced the Federal Water Pollution Control Act of 1972 (Clean Water Act). The Act spelled out the EPA's responsibility in protecting the quality of the country's publicly owned freshwater lakes by controlling sources of pollution and restoring lakes which had deteriorated in quality. EPA offered cost-sharing incentives, and required the states to classify publicly owned lakes, then rank them according to the degree of pollution. The Clean Water Act encouraged restoration of lakes near cities—waters which the people could use and enjoy the most.

As the state's water agency, the OWRB was selected to administer the Clean Lakes Program of the Clean Water Act in Oklahoma. It was apparent to Dr. Jim Grimshaw of the Board's Water Quality Division that the federal program promised rescue for Ada City Lake.

And the enthusiasm of Ada's citizens and their bonds to the lake were enormous advantages. In 1981, the city established the lake restoration as a priority in its budget. The City of Ada pledged \$80,000 as its share of the cleanup costs.

With assistance from the City Council and Ada Parks Director Randy McFarlin, the OWRB Water Quality

Division set the plan in motion. Grimshaw and other OWRB specialists completed preliminary studies and laid out the Ada City Lake restoration plan for approval by the EPA.

Dredging began in February 1984, after pipelines and pumps were installed and pits prepared for storing and dewatering the thick, black slurry. July 4 was the targeted completion date, but the first dredge simply was not suited to the task, and dense growths of cattails further bogged it down. A bigger replacement dredge still was able to excavate only 1,000 to 2,000 cubic yards of sediment per month from the lake instead of the 10,000 cubic yards per month promised in the contract. Finally, the dredge completed the task intended to take four months in 14 months, after a crane cleared the shallows of cattails.

Attempts by the city in the 1960's had failed because the dredges were



TOP: Jim Grimshaw (left) of the OWRB coordinated the project with Ada Parks Superintendent Randy McFarlin. BOTTOM: This dredge excavated 40,000 cubic yards of sediment from the lake.

unable to maneuver in the center of the lake. In that effort, shoreline areas were only slightly deepened, and much of the sediment was merely churned by the dredge to resettle on the lake bottom.

***Tons of black slurry as thick as pudding were suctioned from the lake bottom.***

The enormous floating dredge suctioned the materials from the lake hydraulically, minimizing the resuspension of sediment. The front-mounted cylindrical cutter and auger excavated the material, cut it into smaller pieces and drove it into a vacuum intake. The 8-inch pipelines moved the sludge nearly a quarter mile to two pairs of ponds constructed north and east of the lake to settle out the sediments. Water drained from the sediments was returned to the lake.

Jim Grimshaw, of the OWRB who supervised the restoration, estimated that some 40,000 cubic yards of the nutrient-rich sediments were removed from the lake. Once the sediments were dry, backhoes broke the earthen dams of the storage pits and covered the sludge with soil.



Darla Holloway enjoys a sunny morning on the lake trail with son, Eric, and daughter, Halley.

Grimshaw also pointed out that water sampling begun at the outset and continued one year beyond completion of the project shows lake water much improved in quality. There is only sparkling, clear water where vast stains of algae and weed thatches had once veiled the lake. "It's clearer and

cleaner with plenty of oxygen to support the stock of fish we've put in," he said.

***Oh, you beautiful lake!***

When summer comes, the Oklahoma Water Resources Board and the City of Ada plan a celebration in the park around the lake. The citizens of Ada, who have been enthusiastic backers all the while, will be invited to celebrate the success of the partnership between the Water Resources Board, the City of Ada and the U.S. Environmental Protection Agency in restoring the lake to its former beauty.

If you thought Ada City Lake's "good old days" of the early 1900's were good, come take a look at it now!



**1987 Lake Camp Fees Same**

Col. Frank M. Patete, Tulsa district engineer of the U.S. Army Corps of Engineers, announced that camping fees at all Corps-operated campgrounds will remain unchanged from the 1986 season.

Fees will range from \$3 to \$6 with an additional \$2 charge for electrical hookups. The fee schedule applies to 125 lakeside areas at 28 Corps lake and navigation projects in Kansas, Oklahoma and Texas. Patete pointed out that one free campground exists at each lake. Fees are collected during the season by roving rangers and gate keepers.

Exempt from Corps charges are Broken Bow, Great Salt Plains and Wister lakes, where the campgrounds are state-operated, and the two parks at the W. D. Mayo Lock and Dam. Patete said advance reservations are required for group campsites at Birch, Canton, Fort Supply, Heyburn, Hugo, Kaw, Oologah, Pine Creek, Texoma and Waurika lakes.

**Revive Cistern, Says Expert**

Housing developers in the arid Southwest should revert to the ancient technology of the cistern, says Lloyd V. Urban, director of the Texas Tech Water Resources Center at Lubbock.

Urban says stormwater has been regarded as a nuisance, but water in any form is a valuable resource. Cities must recognize it as such, he says.

He points out that a city of 180,000 population, a surface area of 50 square miles and an annual rainfall of 18 inches could save two-thirds of its total annual rainfall. That city could satisfy an average per-capita water consumption of 150 gallons per day. To capture runoff water, Urban suggests subdivision builders consider a modified version of the cistern. In new areas, he suggests builders install a 6,000- to 10,000-gallon storage tank under the house or driveway, equip it with a pump and connect it to a lawn sprinkler system.

Then, by sloping the ground surface and providing roof gutters, stormwater could drain into the tank to be used for lawn watering. Urban claims the technology has been proven feasible and he points out that stormwater is the only supplemental water available to many cities in the Southwest. "The sooner cities incorporate it into their total water management plan, the better off they'll be," says Urban.

**Bacteria Fight Nitrates**

Growing concern with nitrate pollution has prompted a two-year study of the problem by the city of Laverne, California and a local water district. Officials of the Three Valleys Municipal Water District estimate that 20 percent of the local groundwater supply is contaminated by nitrates.

Researchers plan to study bacterial denitrification—a process commonly used in wastewater treatment—for its potential in cleaning up nitrate-polluted drinking water supplies. Agricultural fertilizers and household septic tanks have been identified as major contributors to the pollution problem.

The testing procedure involves the introduction of bacteria, commonly found in soil, to an oxygen-free environment, similar to that which often exists in groundwater basins. With a steady diet of methanol, bacteria thrive and consume nitrates in well water flowing through the test chamber. Harmless nitrogen gas is released into the atmosphere as a byproduct of the

*Continued on page 4*

*Mainstream, continued from page 3*

process. The test unit is capable of treating 50 gallons of water per minute. When fully operable, the system will be able to treat wells with a capacity of 500 to 2000 gallons per minute.

Nitrates in drinking water are of par-

ticular danger to the very young. When present in the intestinal tract of infants, they are reduced to nitrites which oxidize hemoglobin in the blood, making it unable to carry oxygen. The resulting condition is known as methemoglobinemia, or "blue baby" syn-

drome, which often results in brain damage or death. Epidemiological studies have also shown a link between high nitrate levels and human stomach cancer. In addition, nitrites and nitrates can also form nitrosamines which are toxic to animals.

**ACTIVE CONSERVATION STORAGE IN SELECTED OKLAHOMA LAKES AND RESERVOIRS  
AS OF MARCH 24, 1987**

PLANNING REGION LAKE/RESERVOIR	CONSERVATION STORAGE (AF)	PERCENT OF CAPACITY	PLANNING REGION LAKE/RESERVOIR	CONSERVATION STORAGE (AF)	PERCENT OF CAPACITY
<b>SOUTHEAST</b>			<b>NORTHEAST</b>		
Atoka	106,549	100.0	Eucha	79,567	100.0
Broken Bow	918,100	100.0	Grand	1,491,800	100.0
Pine Creek	77,700	100.0	Oologah	544,240	100.0
Hugo	157,600	100.0	Hulah	30,594	100.0
<b>CENTRAL</b>			Fort Gibson	365,200	100.0
Thunderbird	105,925	100.0	Heyburn	6,600	100.0
Hefner	75,355	100.0	Birch	19,200	100.0
Overholser	15,782	99.2	Hudson	200,300	100.0
Draper	86,685	86.6	Spavinaw	30,000	100.0
<b>SOUTH CENTRAL</b>			Copan	43,400	100.0
Arbuckle	62,571	100.0	Skiatook	295,900	100.0
Texoma	2,637,700	100.0	<b>NORTH CENTRAL</b>		
Waurika	203,100	100.0	Kaw	428,600	100.0
<b>SOUTHWEST</b>			Keystone	616,000	100.0
Altus	132,886	100.0	<b>NORTHWEST</b>		
Fort Cobb	78,307	99.8	Canton	97,500	100.0
Foss	189,106	77.6 <sup>2</sup>	Optima	3,000	100.0 <sup>1</sup>
Tom Steed	88,907	99.9	Fort Supply	13,900	100.0
<b>EAST CENTRAL</b>			Great Salt Plains	31,400	100.0
Eufaula	2,329,700	100.0			
Tenkiller	627,500	100.0			
Wister	27,100	100.0			
Sardis	302,500	100.0			
			<b>STATE TOTALS</b>	<b>12,494,795</b>	<b>96.6<sup>3</sup></b>

1. In initial filling stage
2. Temporarily lowered for maintenance
3. Conservation storage for Lake Optima not included in state total

Data courtesy of U.S. Army Corps of Engineers, Bureau of Reclamation, Oklahoma City Water Resources Department, and City of Tulsa Water Superintendent's Office.

This monthly newsletter, printed by the Central Printing Division of the Office of Public Affairs, Oklahoma City, Oklahoma, is published by the Oklahoma Water Resources Board as authorized by James R. Barnett, executive director. Ten thousand copies are printed and distributed monthly at an approximate cost of 20 cents each.

MARY E. WHITLOW, Editor

BRIAN VANCE, Writer

BARRY FOGERTY, Photographer

MARIE WELTZHEIMER, Design

**OKLAHOMA WATER NEWS**

Monthly Newsletter of the  
Oklahoma Water Resources Board  
1000 N.E. Tenth, P.O. Box 53585  
Oklahoma City, Okla. 73152

- Gerald E. Borelli, Chairman
- Earl Walker
- Ervin Mitchell
- Bill Secrest
- Ralph G. McPherson
- Gary W. Smith
- Ernest R. Tucker
- Robert S. Kerr, Jr.
- R. G. Johnson

**BULK RATE**  
U.S. POSTAGE  
**PAID**  
Oklahoma City, Okla.  
Permit No. 310