Repairing the impaired: Two Iowa success stories

More than 200 lakes, streams and rivers are on Iowa's impaired waters list. Pollutants prevent these waters from supporting aquatic life, or from being used for drinking water or for full body recreational contact, like swimming. While improving Iowa's water quality may seem a daunting task, two southern Iowa lakes show that it can be done.

Nine Eagles Lake

Nine Eagles Lake, a Decatur County lake located just a few miles north of the Iowa-Missouri border in Nine Eagles State Park, was losing surface area and water clarity from excess sediment draining into it, placing it on the state's list of impaired water bodies. Thanks to a recent watershed project, the lake is cleaner, park use is up and the lake was removed from the impaired waters list.

Quick Facts

The 60-acre lake is just a small part of the entire watershed, which covers 1,185 acres. The state park, a mostly timbered area, accounts for most of the watershed.

Approximately 60,000 visits are made to the park yearly, where visitors enjoy boating, swimming, fishing, camping, picnicking, hiking, horseback riding and snowmobiling. Beyond primary contact recreation use – like swimming – and maintaining aquatic life, Iowa's water quality standards also designate Nine Eagles Lake as a drinking water source. The lake is also used by waterfowl, other wildlife and for secondary contact recreation, like boating.

Slip Bluff Lake

Erosion problems were sending excess sediment into Slip Bluff Lake, just off Interstate 35 in Decatur County. Through the work of a watershed project within Slip Bluff Park, the amount of sediment reaching the lake has been reduced and the lake has been removed from the state's impaired waters list.

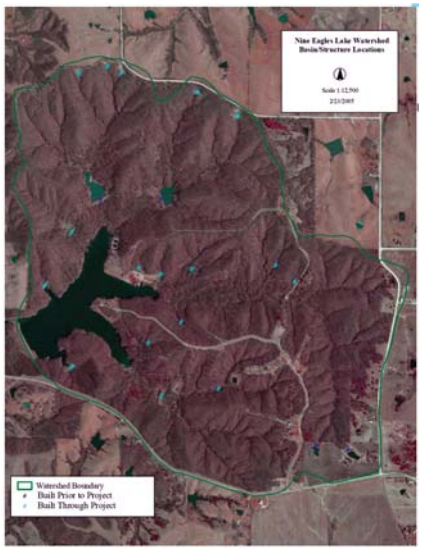
Quick Facts

The county park makes up 70 percent of the lake's 240-acre wooded watershed. About 5,000 park visits are made yearly where visitors enjoy fishing, camping, boating, picnicking and hiking. The Iowa Water Quality Standards list the designated uses for Slip Bluff Lake as primary contact recreation and maintaining aquatic life. The lake is also used for secondary contact recreation and by waterfowl and other wildlife.

Inside the watershed projects

Nine Eagles Lake

Water Quality Problem: Nine Eagles Lake was included on the state's impaired water list due to turbidity, or cloudy water caused by sediment suspended in the water. A detailed watershed assessment found several failing sediment ponds as well as severe gully erosion within the timbered area of the watershed. A forestry management plan identified trails that were not properly contoured, surfaced or managed. At least three field and ditch drainage pipes emptied directly into the watershed from adjoining property. These pipes were not properly maintained or were improperly constructed, causing severe erosion problems. A water quality improvement plan (also known as a total maximum daily load, or TMDL) for turbidity was created in 2001 and established two goals: a 50 percent reduction in sediment delivery to the lake and a Secchi disk depth of 4.1 feet (1.25 meters), which indicates the level of water clarity.



Watershed project structures, like sediment basins, within the Nine Eagles Lake watershed.

Finding Solutions

To reduce the amount of sediment draining into Nine Eagles Lake (also known as sediment delivery), a watershed project coordinated across different sections of the DNR was needed. Water quality, fisheries, parks and forestry staff from the DNR worked to bring Nine Eagles Lake off the state's impaired waters list with the following activities:

- Water quality improvement plan (TMDL) written by DNR (2001)
- Construction of 17 sediment retention basins, which catch excess sediment from gully erosion, funded by the DNR's nonpoint source pollution program from Section 319 of the Clean Water Act (2001)
- Forestry management plan developed by DNR forestry bureau (2001)
- Aquatic life assessment completed by DNR fisheries bureau (2002)
- Trails rerouted, erosion control devices installed and trails reworked to reduce impacts to watershed by DNR parks bureau (2003). When possible, the trails were aligned to pass over the tops of new sediment retention basins.


One of Nine Eagles State Park's many sediment retention basins.

In addition, mapping of the lake bottom to determine water depth was completed by the U.S. Geological Survey, under contract to the DNR, in 2004. Water monitoring of Nine Eagles Lake was conducted from 2000 to 2004 as part of the Iowa Lakes Survey.


Nine Eagles Lake exceeded its goals for improving water clarity by reducing sediment delivery to the lake.

Results at Nine Eagles Lake:

Sediment:
Reduced sediment delivery to the lake by 85 percent, which surpassed the original goal of a 50 percent reduction.

Water clarity:
Exceeded targets for Secchi disk depth by achieving a disk depth of 5.6 feet (1.7 meters), improving on the goal of 4.1 feet (1.25 meters). Secchi disk testing determines the level of water clarity. The higher the number, the better the clarity.

Impairment removed:
Nine Eagles Lake is *not* listed as impaired on the state's 2004 impaired waters list.

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Slip Bluff Lake

Water Quality Problems: Siltation problems landed Slip Bluff Lake on the 1998 impaired waters list. The main source of sediment delivery in Slip Bluff Lake was naturally occurring gully and streambank erosion within the forested areas of the watershed. Shoreline erosion also sent sediment to the lake. A water quality improvement plan, or TMDL, for siltation was approved by the EPA in 2001. The plan established a goal of reducing sediment delivery to the lake by 50 percent.

This map shows the placement of watershed project structures, like sediment basins, within the Slip Bluff Lake watershed.


Reducing the amount of sediment reaching Slip Bluff Lake led to clearer water, as shown above.

Finding Solutions

A number of organizations came together to improve water quality at Slip Bluff Lake. The watershed project included construction of two large sediment basins and seven smaller structures to trap sediment from gully erosion. The smaller structures were funded by the DNR's nonpoint source pollution program with funding from Section 319 of the Clean Water Act.

Rip rap was installed on portions of the shoreline to minimize shoreline erosion. DNR fisheries staff conducted an aquatic life assessment in 2002, and cover seeding was replanted on some sediment basins in 2003, since the first seeding did not establish itself well.

Partners with the DNR in the Slip Bluff watershed project included:

- Decatur County Conservation Board
- Decatur Soil and Water Conservation District
- Iowa Department of Agriculture and Land Stewardship-Division of Soil Conservation
- Iowa Department of Transportation
- U.S. Environmental Protection Agency
- Natural Resources Conservation Service

Results at Slip Bluff Lake:

Sediment:
Reduced sediment delivery to the lake by 64 percent, exceeding the original target of a 50 percent reduction.

Water clarity:
Reducing sediment delivery to the lake resulted in a 50 percent improvement in water transparency.

Impairment removed:
Slip Bluff Lake is *not* listed as impaired on the state's 2004 impaired waters list.


A sediment retention structure in Slip Bluff Lake Park.

"It's becoming a well-known and respected lake."

– Bob McLain, who fishes weekly at Nine Eagles Lake

Improved water quality draws more park visitors

Nine Eagles Lake and Slip Bluff Lake are two prime examples of how Iowans choose a lake.

The biggest factor for Iowans in selecting a lake for recreation is water quality, according to a recent Iowa State University study looking at how Iowans value water quality.

Since water quality improvements took place, both parks have seen an increase in use, especially in fishing.

Bob McLain (right) and friend Eldon Cowles

At Nine Eagles State Park, Bud Taylor has witnessed the change in water quality during his five years as park manager.

"Heavy rains would muddy up the water with silt and it would take weeks to clear up," Taylor said. "Now, the water quality is really great – you can see six to eight feet down and the water plants really benefit from it."

With improved water quality, Taylor has seen more people coming through the park's gates. Park use has almost doubled in a few short years, he said.

"It seems like we get more people to come out swimming and the fishing has gotten better, too," Taylor said.

Bob McLain was there when Nine Eagles Lake was built and now farms about two miles away from the park. He finds his way over to the lake at least once a week to fish.

Bud Taylor

"It's pretty and peaceful, and it's gotten better all the time," McLain said. "Once they got those improvements in, I thought it was excellent. The last three or four years, the water has been very, very good. It's becoming a well-known and respected lake."

McLain's children and grandchildren travel from around central and southern Iowa – even as far as Minneapolis – to camp at Nine Eagles.

To keep people like the extended McLain family coming to Nine Eagles, McLain says there's a responsibility to maintain the lake's improved water quality and aquatic life habitat.

"Once we let it go and not try to keep it the way it should be, that's the beginning of the end for the lake," he said. "It seems a shame to throw that money (used on improvements) away."

Slip Bluff Park has noticed similar results from water quality improvements. In his 23 years of working with Slip Bluff Park, Richard Erke has watched the muddy waters of Slip Bluff Lake give way to clearer water and improved habitat for wildlife and aquatic life.

Richard Erke

"It was terrible. With a half-inch of rain, you couldn't see more than six inches in the water," said Erke, director of the Decatur County Conservation Board. "There's really no comparison. Now we could take two to four inches of rain, and without rain we can see 10 feet or better now. It's amazing, the turnaround."

Wildlife, fish and even plants have reaped the benefits of improvements in the watershed. Three river otters have made a home of one of the park's new sediment retention ponds and visitors have noticed more wood ducks. Aquatic plants have sprouted up around the lake. The healthier lake and sediment ponds – some of them stocked with fish – have helped increase fishing at the park. Bass that at one time were undersized and lacking color are now fat and looking good, Erke said.

Ron and Donna Tellier with grandson Taylor Wadell

"The fishing is getting back to normal," said Ron Tellier, who farms just a few miles away and visits the park a few times every month to camp, fish and hunt. The fish are bigger and healthier. And with improved water quality, they even taste better, Tellier said.

Keeping the lake's water quality high is important to Tellier for better fishing, conservation reasons and for public health reasons.

"It's real important. I have a grandchild that goes fishing with me," he said.

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