

Brushy Creek Lake

Improving our lake for the future



Leading Iowans in caring for our natural resources

Preserving water quality for the future

Nearby residents and visitors to Brushy Creek Lake enjoy a relatively clean lake with good water quality. The lake is not included on the state's list of impaired waters. So why make so many changes?



Brushy Creek Lake

While the quality of water in Brushy Creek Lake is currently adequate, a number of factors in the watershed (the surrounding area that drains into the lake) could put that water quality at risk. Sediment from the large watershed could fill in the lake and affect water clarity. Nutrients, like nitrogen and phosphorus, could cause algae blooms and other problems. Without preventative measures, potential manure and chemical spills could harm aquatic life in the lake.

Using conservation farming practices and building structures like wetlands will work to maintain and even improve the lake's water quality. Taking steps now to implement these critical practices will help prevent water quality problems, preserving water quality for future generations.

Communities profit from good water quality

Preserving the lake's water quality is also critical in maintaining economic vitality in the area.

More than 520,000 people visit Brushy Creek State Recreation Area every year. With most people spending almost \$13 on each visit, more than \$6 million is spent annually at the park.

Brushy Creek is one of Webster County's largest draws, according to Dan Payne, director of the Fort Dodge

Convention and Visitors Bureau.

"We know and realize the impact of Brushy in the area. It's very critical," he said.

Clean water is essential in drawing in visitors who use the park's four boat ramps, eight fishing jetties, two campgrounds, beach and fishing pier.

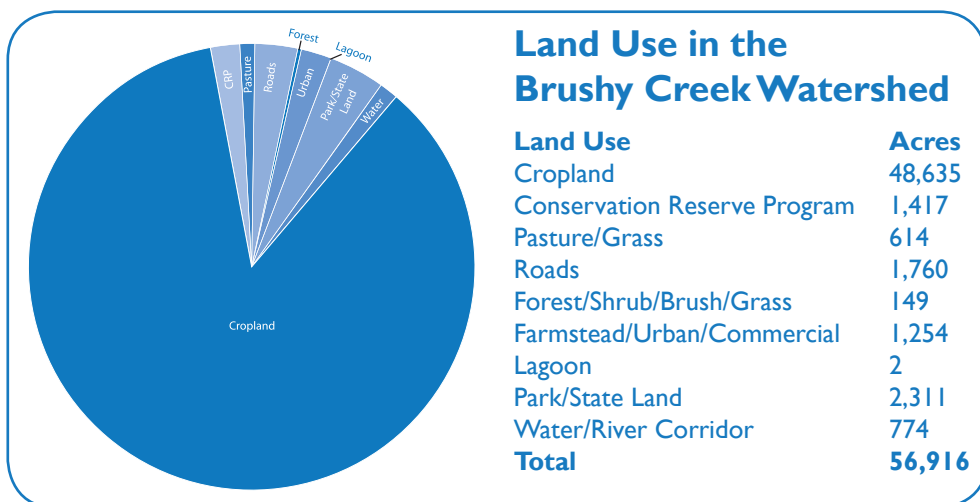
When Iowans choose a lake to visit, water quality is the factor they look at most, according to a study by Iowa State University¹. The study also

found that the most important characteristics in a lake for Iowans were safety from bacteria contamination, water clarity and lack of water odor.

The state-owned beach at Brushy Creek Lake provides safe water for swimming, having only four swimming advisories posted in the six-season history of the DNR's beach monitoring program.

Maintaining the lake's popularity as a fishing spot also requires good water quality to preserve the habitat of the lake's fish population.

"The project will leave a well-protected watershed and provide an area for recreation that people can use and feel good about going to," said T.J. Lynn, Brushy Creek Lake watershed coordinator. "It benefits everybody in the end, whether you're connected with the lake or not."



¹Azevedo, C.D., Egan, K.J., Herriges, J.A., & Kling, C.L. (2003). The Iowa Lakes Valuation Project: Summary and Findings from Year One.

Keeping Brushy Creek one of Iowa's top fishing lakes

Stop by Brushy Creek Lake on any given weekend in the summer, and you're bound to find top anglers vying for the biggest bass at a fishing tournament.



Fishing at Brushy Creek Lake

The lake is so popular that DNR fisheries biologist Lannie Miller turns down as many requests for fishing tournaments as he approves.

"The word has gotten out on our bass fishing," Miller said. "And the pan fishing is excellent – bluegill, crappie. The walleye are great, too."

Considered one of the top fishing lakes in Iowa by many anglers, the key to being a top spot is the quality of the water.

You can see seven to 10 feet down in the lake, which is considered good visibility. However, if that water became cloudy from excess sediment washing in from the surrounding land or from algae blooms caused by fertilizer run-off, problems would start to build for fishing.

Sight-feeding fish would have trouble finding bluegill to feed on, which would allow the bluegill population to grow and throw the lake out of balance. That could drive anglers to other lakes and streams.

"If you take the anglers out of that lake, the park would definitely suffer and the surrounding communities would too," Miller said. "Anglers buy pop, gas, bait. It's a very important part to the local economy."

But the quality of the water – and the fishing – doesn't have to decline. Anglers can do their part by realizing they have an important political voice, Miller said.

"Anglers should watch legislation to see that their interests are being looked out for, such as the water quality in our streams and lakes," he said. "Anglers need to talk to their legislators. Politically, anglers can be a very effective voice."

What's a watershed?

A watershed is an area of land that drains water into the lowest point – a body of water, such as a stream, lake or marsh.

Watersheds can be as small as a city block, draining into a creek, or very large.

The Brushy Creek watershed covers 57,000 acres in Webster County and a small portion of Hamilton County.

During a rainfall, water either travels over the surface or seeps into the ground.

Water traveling over the surface or through the soil may pick up contaminants like sediment, chemicals and waste and deposit them in a body of water.



The Brushy Creek Lake watershed in relation to surrounding counties.

Brushy Creek: The Basics

The lake:

- Built in 1998
- Surface area of 690 acres
- Average depth of 29 feet
- Maximum depth of 80 feet

The watershed includes:

- Towns of Duncombe and Vincent
- 6,500-acre Brushy Creek State Recreation Area

Land use in the watershed:

- 86 percent cropland
- 90 percent of crops in corn-bean rotation
- About 20 percent of cropland areas have active conservation plans
- About 50 landowners with livestock; includes six confinement feeding operations, some within three miles of the lake

Fishing:

- An agricultural anhydrous ammonia plant is located in the center of the watershed
- Four multi-lane boat ramps
- One accessible fishing pier
- Eight fishing jetties
- Known for bluegill, bass, channel catfish, crappie and muskie fishing

Preserving water quality begins

Throughout the watershed, a number of threats exist that could harm the water quality in Brushy Creek Lake if no action is taken.

Sediment can fill in the lake and reduce water clarity. Excessive nutrients like nitrogen and phosphorus can cause algae blooms and harm the habitat of aquatic life.

Sediment

As rain falls on the watershed, it runs off fields, taking valuable topsoil with it. This sediment then ends up in streams and is eventually delivered to Brushy Creek Lake.



The excess sediment can:

- reduce water clarity
- damage the habitat of aquatic life
- fill in lakes
- clog drainageways
- deliver phosphorus to streams

An estimated 16,194 tons of sediment from sheet and rill erosion travel from fields in the watershed into Brushy Creek Lake annually.

Sediment lost from wind erosion, or soil that is blown off of fields and settles in streams or the lake, is not included in this number. However, wind erosion has the potential to be a serious problem in the watershed unless practices are installed to help control it.

Nutrients

Nitrogen and phosphorus are the most common nutrients in Iowa, and they often come from manure and chemical fertilizers used for agriculture and in urban areas.

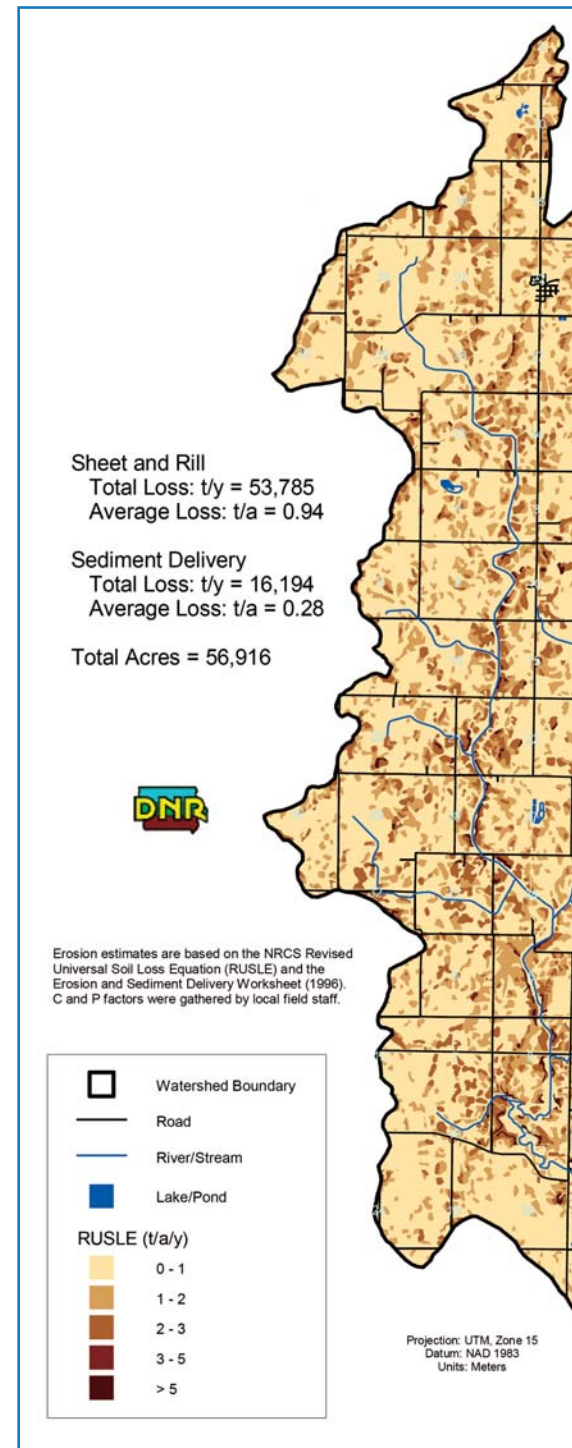


High levels of nutrients can:

- cloud the water
- create low oxygen, high ammonia levels
- lead to poor aquatic life diversity
- lead to nuisance levels of algae and aquatic plants that interfere with recreation
- lead to potentially toxic algae blooms
- speed up natural aging process of lakes

Phosphorus is generally delivered to water bodies by attaching to sediment, which is carried by runoff into streams and lakes.

Water intakes in the watershed's extensive tile drainage systems drain water with nutrients from fields directly to streams. Nutrients can also arrive in water bodies from runoff water, attached to organic particles or in a dissolved state.



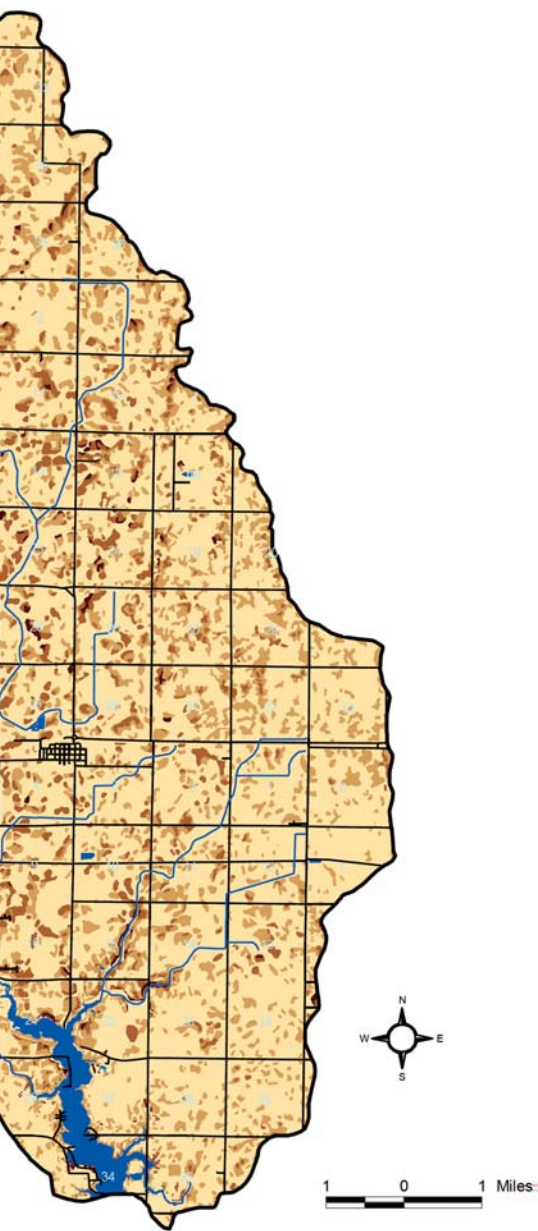
The above map shows where erosion comes from in the watershed. An estimated 53,785 tons of sediment are lost per year to sheet and rill erosion into the lake every year.

with understanding problems

Potential spills from a number of sources could send bacteria, nutrients and other pollutants to streams and the lake, creating health threats to aquatic life and humans.

Understanding these threats is key to determining what farming practices and other activities can be used to help preserve and improve the water quality in Brushy Creek Lake.

**Brushy Creek Watershed
2004 Erosion Estimates**



Lake to watershed ratio

A large amount of land drains into Brushy Creek Lake, which could cause future problems with the amount of sediment and nutrients delivered to the lake.

About 57,000 acres drain into the 690-acre lake, creating a land-to-lake ratio of 82 to 1. That means for every acre of lake, there's 82 acres of land draining into it.

Maintaining good water quality generally requires a land to lake ratio of no more than 20 to 1. The more land that drains to the lake means more sediment and nutrients that can end up in the lake.

Also, the watershed is very flat, and nitrates travel more through tile drainage lines than over the surface of the land, according to T.J. Lynn, watershed coordinator.



Potential sources of pollution

While not ongoing problems, water quality could be threatened by a number of sources in the case of a spill or accident, which would also affect the recreational use of the lake.

Improper manure land application or manure spills can send nutrients and bacteria to surface and groundwater and lead to fish kills.

An agricultural anhydrous ammonia plant is located in the center of the watershed, and if a spill would occur, the chemical fertilizer could also cause fish kills.

Large-scale bypasses or spills of wastewater, otherwise known as sewage, could pollute surface and groundwater with bacteria and nutrients. Outdated or failing household septic systems in the watershed allow untreated sewage to enter streams, lakes and groundwater. The municipal wastewater treatment plans in the communities of Vincent and Duncombe are currently in compliance with state wastewater regulations.



in the Brushy Creek Lake watershed. About 53,000 tons of sediment reach the lake, while about 16,000 tons of sediment reach

Being prepared for possible spills can help reduce a spill's impact on water quality and aquatic life.

Land management practices help preserve and

Photo by USDA NRCS



Filter Strips

Filter strips work to slow water running off fields, and in doing so, filter out sediment, fertilizers and other chemicals before the water reaches a stream, river or lake. Filter strips are normally made of a strip of grass, trees, shrubs or a combination of the three. Riparian buffers, located next to a water body, also work to filter runoff water while helping to reduce erosion and provide a habitat for wildlife.

The watershed project plans to install filter strips or riparian buffers along 75 percent of stream segments in the watershed, covering approximately 1,500 acres.

Photo by USDA NRCS



Wetlands

Wetlands were once widespread across Iowa, but many of them were drained to make way for agricultural uses. Wetlands are being restored today to help filter out nutrients, chemicals and sediment.

Approximately 2,000 acres of cropland will be controlled in the watershed with 21 planned wetlands. The wetlands, each about 20 acres in size, will be installed in priority areas, such as areas near creeks, drainage ditches and tile intakes.

Photo by USDA NRCS



Timber Stand Improvement and Conservation Cover

Tree plantings can provide a number of benefits, from reducing erosion caused by wind to providing wildlife habitat. Tree plantings can also work as a windbreak to help protect livestock, plants and farm buildings.

The watershed project is planning tree and shrub plantings on 20 acres to help control wind erosion, and conservation cover and vegetative demonstrations on 20 acres near tile intake areas.

Forest stand improvement is also planned on 200 acres in the watershed.

Wastewater treatment and water quality



Currently, wastewater from household septic systems and municipal treatment facilities does not seem to be a large problem in the watershed.

However, installing preventative measures will help maintain water quality and help protect the lake from any possible future problems.

Proper treatment of household wastewater helps keep bacteria and nitrates from polluting streams, lakes and groundwater.

The Webster County Soil and Water Conservation District plans to work with the Webster County sanitarian to identify any failing and outdated household septic systems in the watershed.

Financial assistance may be available for creditworthy homeowners who need to replace their

inadequate or failing onsite septic system through the DNR's Onsite Wastewater Systems Assistance Program (OSWAP), which offers low-interest loans through participating local lenders.

For more information, visit www.iowadnr.gov/water/septic/

improve water quality

Photo by USDA NRCS



Streambank Stabilization

Stabilizing streambanks with rocks (rip rap), grass, trees or other cover works reduce erosion, filter out nutrients and minimize flooding.

The watershed project plans to install 1,000 feet of streambank stabilization, which will help prevent 19 tons of sediment from entering Brushy Creek Lake.

Photo by USDA NRCS



Conservation tillage is part of whole farm planning.

Whole Farm Planning

Whole farm planning includes a number of conservation practices. Minimum tillage helps reduce soil erosion by disturbing only enough soil as necessary for crop production and leaves crop residue on the ground surface. Minimum tillage works to conserve soil and water resources by reducing the effects of erosion from wind and water on soil.

Tree and plant windbreaks help reduce erosion from wind and protect farm buildings, young plants and livestock from wind and snow.

With nutrient and pest management, farmers monitor soil and plant needs and use only the necessary amount and types of fertilizer and other chemicals. Nutrient and pest management works to reduce the amount of nutrients and chemicals entering surface water and groundwater. The practice also saves money, as excess nutrients and chemicals are not wasted.

The watershed project plans to implement whole farm planning on 18,000 acres of the watershed.

Additional conservation practices planned to be installed:

Animal waste facilities

- Replaces outdated systems
- 2 to 3 to be installed

Targeted waterways

- 18 acres to be installed
- Will control 2,000 acres of cropland runoff

Grade stabilization structures

- 6 structures to be installed
- Will control 1,200 acres of cropland runoff

Water and sediment control basins

- 6 basins to be installed
- Will control 1,200 acres of cropland runoff

Pasture management

- Rotational grazing and pasture management on 75 acres

Local residents work to help Brushy Creek Lake

Residents of the Brushy Creek Lake watershed are taking water quality into their own hands by volunteering.

Some volunteers are equipped with a test kit, venturing to their chosen points throughout the watershed to test water quality. As part of the DNR volunteer program IOWATER, monitors collect information on the levels of nitrates, nitrites, dissolved oxygen, pH, chloride and phosphate in

creeks, streams and the lake.

Some monitors also report on the water's temperature and color, and on biological life in the monitoring area, which is often an indicator of water quality.

Monitors report their data to the IOWATER online database, where the public can view water monitoring results from across the state.

Other volunteers have joined a local group, Friends

of Brushy Creek, that works to improve Brushy Creek State Recreation Area.

For more information:

www.iowater.net
www.brushycreekfriends.com



Preserving the family farm *and* Brushy Creek Lake

Brian Wagner is making sure that the farm that's been in his family for 100 years will stay around for another hundred.



Wagner has used conservation practices to address erosion issues for years, as the terraces on the farm were put in place even before Brushy Creek Lake was built.

"We just felt real strongly that we needed to preserve the farm for future generations," Wagner said.

Located in the northeast corner of the watershed, the farm raises corn and beans, with some land in pasture. In addition to terraces, grassed waterways work to slow runoff and a number of acres are enrolled in the Conservation Reserve Program.

Wagner is currently working with Brushy Creek Watershed Coordinator T.J. Lynn to install more conservation practices. Wagner and Lynn will meet to discuss options before Lynn heads to the field to

find the best locations for conservation practices. Finally, Lynn will determine what financial assistance is available for installing the practices.

"These meetings give me a chance to explain options to landowners," said Lynn. "In the end, I hope they feel they have gotten a good deal and that they enjoy the benefits gained from installing the practices."

Wagner has already seen the benefits of conservation practices. Erosion on the farm has decreased, benefitting both the farm and the lake.

"It's very important to protect the lake; it's a wonderful resource," Wagner said. "It's just the right thing to do. We have to take care of our resources."



Watershed Coordinator T.J. Lynn (left) and landowner Brian Wagner scout out sites for possible conservation practices on Wagner's property in the Brushy Creek watershed.

Financial incentives for conservation practices

Funding assistance from a number of cost-share, low-interest loan and other programs is available to landowners considering installing conservation practices and management techniques on their land.

For more information on these programs, contact the Webster County NRCS/FSA office in Fort Dodge at (515) 573-1097.

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