



Restoring the Little Lemonweir

Farmer Revitalizes Stream Habitat

Above: (L to R) Jon Field, USDA-NRCS Juneau County District Conservationist; Nate Bell, Juneau County Farmer; and Lucy Bell, Nate's daughter; by the restored stream on the Bell farm.

Nate Bell, of Juneau County, Wis., is a third generation crop farmer who's been riding in a combine since he was three years old. Bell's grandpa bought the farm in the 1940s, and Nate always knew he wanted to continue the family tradition. "I've always wanted to be a farmer; I've got the farming bug; I'm a soil nut too; I like fixing it and making it better, balancing it, building water retention; I love it," said Bell. While attending college, Nate bought his first farm in 2003. After graduating in 2004, he started farming full time. In 2007, he took over his family's farm, renting the property from his parents, and in 2008, purchased it.

"I started realizing the importance of conservation as a teenager, and once I had kids, it clicked even more; I want to leave this land better than I received it," said Bell. Nate's first endeavor as a conservation farmer was practicing no-till. "When I was a kid, we chisel plowed everything and worked the ground a lot, then in the mid-1990s, we started no-tilling," explained Bell. The Bell family saw a neighboring farmer's success in no-tilling soybeans. "My dad liked the idea, so we tried it ourselves, by no-tilling 10 acres. We planted into some 200 bushels of cornstalk and we were thinking, oh yeah right, we're going to get beans out of here?" said Bell. The soybeans ended up doing great and they started using no-till on many more acres from there. Nate farms and manages 3,000 acres in

partnership with his father, Sam, and neighbor, Vern. His wife, Lisa, helps by maintaining the farm books, while also caring for their children, Lily (age 8), Lucy (age 7), and Lucas (age 3), who always want to help dad in the shop.

"Erosion was our biggest concern; we weren't building any organic matter; much of our soil is highly variable around here, some good and some sandy knolls," said Bell. "In 2011, we took one 35-acre parcel and planted a radish cover crop in the sandy soil. We thought we could try and get some tap roots down and do something to help the sandy soil there," said Bell. The landlord called Nate in the hottest part of summer and said, "I don't know what you guys did up here, but you've got to come and see this." "Everyone's corn in the area was done and this 35 acre parcel of sandy soil corn was still going strong; the cover crop bought that corn over two weeks extra time to get it ready due to increased water retention; we saw the benefits first-hand and are still seeing them with cover crops on that field," explains Bell. Nate has seen better soil health and water retention after implementing no-till and cover crops.

Nate worked with the USDA-Natural Resources Conservation Service (NRCS) through the Environmental Quality Incentives Program and the Conservation Stewardship Program to put



Left: (L to R) Lucy Bell, Nate Bell, and Jon Field assess the restored streambank plant establishment. Middle: Jon Field displays brown trout being stocked in the stream by Wisconsin DNR partners. Right: Brown trout close-up.

conservation to work on his farm through drainage water management, cover crops, and more. He recently partnered with NRCS to complete a streambank restoration project.

Bell's property has a prominent stream running through it, where he witnessed erosion on the streambanks. "Erosion was the biggest problem on the banks; beavers also complicated the problem by plugging up the stream and subsequently flooding out my fields, which was very frustrating," said Bell. Streambanks were covered in overgrown woody biomass and invasive species like box elder and honeysuckle. "In the 1980s, the stream used to be beautiful and fishing was immaculate. I remember fishing the streams when I was a kid; over the years it was much harder to get around all the invasives. In 2012, it was impossible to navigate, so people stopped fishing there. It was really disappointing to see what was happening to the stream," said Nate.

"When Jon Field, my local NRCS District Conservationist, contacted me with a plan to restore the stream, I was all over it," said Bell. "Having local NRCS staff in each county gives us an opportunity to evaluate land, and enables farmers, like Nate, to receive direct technical assistance on the farm," said Jon Field, NRCS Juneau County District Conservationist. Tony Pillow, NRCS Soil Conservation Technician, spearheaded the project by surveying, designing, and helping install the restoration. The local Juneau County Land & Water Resources Department also provided financial assistance to make this project possible.

The streambank restoration consisted of installing 24 lunkers or artificial overhanging banks that give trout a place to hide, grading streambanks, installing 150 quad-axle loads of riprap, adding cross logs, and placing boulders to move water

current. Over 1,700 feet of stream were repaired through the streambank restoration project. In partnership with the U.S. Fish and Wildlife Service, large trees were left for wildlife habitat, and invasive species were shredded and cut back. "Before, there were several spots where the water was ten inches deep; it wasn't cool or running, now, there's cool, deep, running water," said Bell. The restoration includes a pool, riffle, run system. Water pools in an area of the stream characterized by deep depths and slow current, then riffles to shallow depths with fast current, then runs with moderate current and depths greater than riffles. The mixture of flows and depths provide habitat variety to support fish and invertebrate life. "The day we visited the successful restoration, the Wisconsin Department of Natural Resources was stocking the successfully restored stream with brown trout; Bell and his family can't wait to fish the restored stream this year," said Field.

Nate also smoothed the surrounding banks and seeded down the areas with winter wheat, clover, perennial rye, and other species. The plantings act as a buffer between the stream and the adjacent cropland to reduce non-point pollution into the stream. "In December, the restoration was tested; water levels were the highest I've ever seen and all the banks held up great; I was amazed there was no washing," said Bell.

Nate is enthusiastic about the repaired stream and habitat for fish. "I am so proud of the streambank restoration; it's really nice to have the streambank next to a major highway so people can see their tax dollars at work; everyone can see the benefits first-hand and subsequently, be supportive of future projects downstream," explains Bell.