# NONPOINT SOURCE SUCCESS STORY

Nebraska

# Conservation Work Leads to Atrazine Delisting of Shell Creek

## Waterbody Improved

High levels of agricultural runoff led to Shell Creek being listed as impaired for atrazine on the Nebraska state Clean Water Act section 303(d) list of impaired waters in 2006. Prior to this listing, in 1999, a group of landowners formed the Shell Creek Watershed Improvement Group (SCWIG) to address chronic flooding, poor water quality, poor fishery and instability of Shell Creek. With the help of conservation agencies, they developed and implemented a watershed management plan (2005–2015) to resolve these issues. A decade of dedicated conservation work in the watershed significantly reduced the number of exceedances of the aquatic life standard for atrazine, allowing one segment of Shell Creek, LP1-20700, to be delisted in 2018 for aquatic life impairment due to atrazine.

## Problem

Shell Creek is a 110-mile-long stream in northeastern Nebraska flowing into the Platte River near the city of Schuyler. It drains a 304,897-acre watershed dominated by row crop production (primarily corn and soybeans) and pastureland. The main channel is composed of four segments: LP1-20600, LP1-20700, LP1-20800 and L12-20900 (Figure 1).

Very low levels of conservation practices on croplands in the watershed led to high runoff rates and elevated levels of atrazine in Shell Creek. Numerous exceedances of the aquatic life standard for atrazine (12 micrograms per liter [µg/L]) prompted the Nebraska Department of Environmental Quality (NDEQ) to list Shell Creek stream segment LP1-20700 as impaired for aquatic life use due to atrazine in 2006.

## Story Highlights

A series of projects conducted under the Shell Creek Watershed Management Plan incorporated traditional cropland treatment and near and in-stream treatments to abate atrazine contamination within the Shell Creek watershed and enhance aquatic life habitat. The project also reduced runoff of nitrogen, phosphorus and sediment. The watershed was divided into 10 subwatersheds for implementation of conservation practices. Cost share for conservation practices was offered in the subwatersheds for 2 years on a rotational basis until the entire watershed was covered. Lands within a 3,000-foot corridor along the stream channel were continuously eligible for cost share.

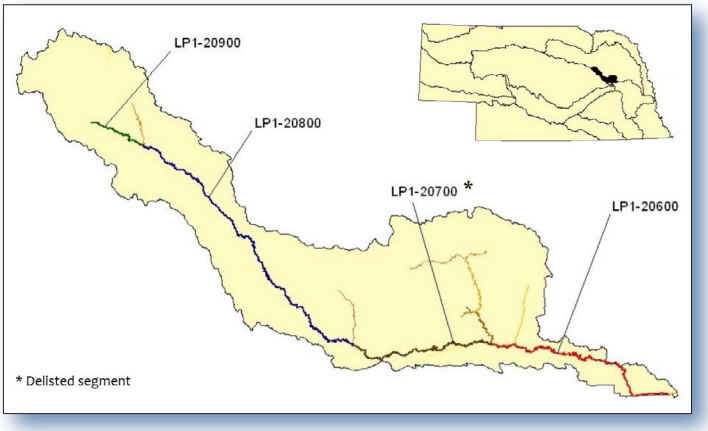


Figure 1. Shell Creek flows through eastern Nebraska.

The Natural Resources Conservation Service (NRCS) extended dedicated Environmental Quality Incentives Program (EQIP) funding through the Nebraska State Water Quality Initiative. Participants in cost share programs for agricultural practices were determined through a screening tool designed to target the most effective best management practices (BMPs) for atrazine management in priority subwatersheds and the stream corridor. Priority practices for cropland included crop rotation, integrated pest management, water and sediment control basins, no till, grass waterways, cover crops, riparian buffers and filter strips.

Stream stabilization practices were prioritized to protect public infrastructure such as roads, bridges and utility lines. Priority practices included streambank stabilization, floodplain benches, aquatic habitat enhancement, riparian buffers and filter strips.

Septic system upgrades and well decommissioning were eligible for cost share in the watershed, but preference was given to applications within priority areas. These were considered special priority practices designed to address a specific local issue and to directly engage property owners in promoting the project.

SCWIG and partner agencies worked with operators and landowners to help them enroll in conservation programs and implement BMPs. Information and education on nonpoint source pollution management was disseminated through meetings, tours and demonstrations. Volunteer stream monitoring by area schools continues to engage students and the public in learning about and responding to water quality issues.

Many BMPs were implemented through Shell Creek watershed projects, including no till (8,043 acres [ac]), no-till consultant (3,132 ac), nutrient management (841 ac), non-invasive nitrogen application (2,749 ac), contour buffer (17 ac), habitat buffer (97 ac), field windbreak (6 ac), filter strip (175 ac), grassed waterway (45 ac), riparian buffer (6 ac), cover crop (2,571 ac), pond (1), sediment basins (75), wastewater treatment system inspections (7) and upgrades (88), and well decommissioning (58).

Nebraska Educational Television produced a segment featuring the Newman Grove Student's volunteer monitoring program as part of its series, *I Love Public Schools*. In addition, NDEQ, Nebraska Extension, and NRCS produced a 90-second video featuring the Shell Creek project for the Environmental Council of States (ECOS). The ECOS video was used for presentations.

## Results

The number of exceedances of the atrazine aquatic life standard declined after implementation of the Shell Creek Watershed Management Plan began in 2005 (Figure 2). Out of 48 water samples collected from Shell Creek between 2007 and 2016, only seven samples out of a permissible eight samples exceeded the water quality standard of 12 µg/L atrazine. As a result, Shell Creek segment LP1-20700was delisted for atrazine impairment in 2018. In addition, phosphorous loads decreased by 9,788 pounds (lbs) per year (yr), nitrogen loads decreased by 36,455 lbs/yr and sediment loads decreased by 6,398 tons/yr.

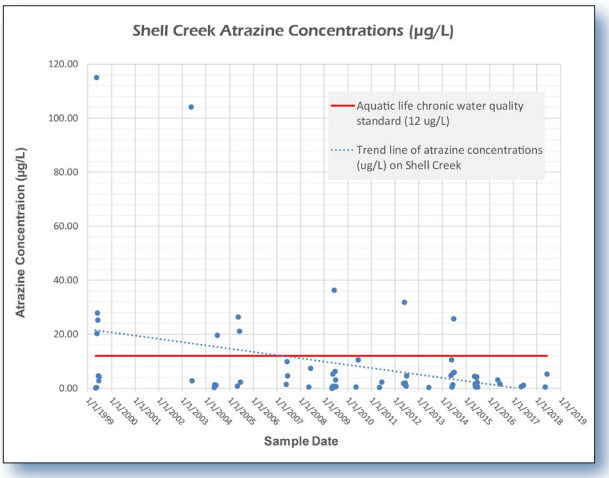


Figure 2. Atrazine concentrations declined after project implementation began in 2005.

Implementing the first management plan yielded significant progress in getting effective management practices implemented on agricultural lands throughout the watershed. For example, the use of no till applied to cropland increased from approximately 14% to 67% over the life of the first management plan.

## Partners and Funding

Lower Platte North Natural Resources District administered external grants and coordinated selection and implementation of conservation practices among available programs. The District also provided funding and technical assistance to install BMPs ($194,330). Landowners contributed $471,822 toward practices.

SCWIG provided leadership in contacting producers and landowners and encouraging their participation in conservation programs and project activities. SCWIG organized watershed outreach activities and advised partner agencies on opportunities to work with interested stakeholders.

NRCS provided funding and technical assistance through EQIP ($1,121,359) and other U.S. Department of Agriculture programs. Nebraska Environmental Trust provided funding for installation of BMPs ($1,310,000). NDEQ (now the Nebraska Department of Environment and Energy) provided funding and technical assistance through the CWA Section 319 Program ($658,280).

U.S. Environmental Protection Agency
Office of Water
Washington, DC

EPA 841-F-20-001PP
December 2020

## For additional information contact:

**Tom Mountford**
Lower Platte North Natural Resources District
402-443-4665 • tmountford@lpnnrd.org
**Elbert Traylor**
Nebraska Department of Environment and Energy
402-471-2585 • Elbert.Traylor@nebraska.gov