



2023

ANNUAL REPORT | 2023

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Location

Located in the center of the Red River Watershed in Northwest Minnesota, the Sand Hill River Watershed is one of the 10 major watersheds in the Red River Basin serving areas of Polk, Norman and Mahnomen Counties.

Mission

The mission of the Sand Hill River Watershed District (SHRWD) is to serve the residents of the District by wisely and judiciously managing water resources in a manner which sustains and enhances the local community and economic resources while being mindful of the natural resources of the District.





SH River Ecosystem Restoration

A PROJECT TEAM IS BORN

The Sand Hill ditch was part of a comprehensive plan for the Red River drainage basin authorized by the Flood Control Acts approved in 1948 and 1950. The project was constructed under one contract from 1955 and 1958 and it enlarged an existing state ditch and channelized the upstream and downstream portions of the Sand Hill River connecting to the state ditch. More than 18 miles of the Sand Hill River was straightened or abandoned. The straightened channel decreased channel length, increased channel grade and conveyance, and reduced the flood levels in the lower Sand Hill River watershed. In addition to the realignment of the river channel a series of four concrete drop structures were installed in the new Sand Hill River alignment for the purpose of providing grade control through steeper regions of the project east of Beltrami, MN.

These concrete drop structures provided a 4- to 6.5-foot vertical drop in channel bed grade. A concrete “pool” was provided at the bottom of each vertical drop to dissipate energy before releasing flows into the downstream channel. The drop structures also included wing walls to force all flows into the center of the channel, and into the concrete stilling basin at the base of the drop structure to dissipate energy before releasing discharges back into the earthen channel. The wing walls were not intended to provide flood storage (IE... hold back) upstream, as the storage available within the channel is relatively insignificant compared to the amount of flow coming from the watershed.

While the intended purpose of the drop structures was to ensure a stable channel, an unfortunate side effect was impassable conditions for fish and other aquatic life that prevented biologic connection to upstream reaches. Scour and bed incision had deepened the river channel since 1958 and further exacerbated fish passage issues.

The US Army Corps of Engineers (USACE) provided all design and technical oversight on the development and construction of the recently completed drop structure removal project. Several alternatives were studied by the (USACE) to address fish and other aquatic ecosystem connectivity in the Sand Hill River were evaluated. Ultimately, rock arch rapids at all four of the drop structures was selected. Rock arch rapids consists of placement of large rock riprap below each the prior concrete drop structures at a gradient of 0.04% slope. The existing concrete wingwalls were removed to reduce velocities caused from “pinching”, or constricting, the flow previously experienced at the prior concrete drop structures.

The USACE intended to minimize velocities to meet fish passage requirements. Other control features along the channel, primarily the box culverts at road crossings, would remain in place and continue to regulate discharges in the Sand Hill Ditch. Large rock boulders were then placed in an arch shape, with arches staggered throughout the length of the riffle. These rock arches provided for some “slack water”, or small pools of low velocity to enhance fish passage upstream through each of the four structures. These rock arches provided for some “slack water”, or small pools of low velocity to enhance fish passage upstream through each of the four structures.



The intent of the project was to facilitate fish and aquatic ecosystem connectivity without causing adverse impacts to downstream flooding. The USACE analyzed the Sand Hill River with the prior concrete drop structures and with the rock arch rapids at the four locations to assess potential changes to flows and velocities upstream and downstream of the channel. The analysis generally found that, while velocities are increased immediately downstream of the drop structures where the rock arch rapids were installed, flood levels and flow rates downstream did not increase. Impacts to flooding due to varied channel melting in the spring was not analyzed by the USACE.

Over the past several years, landowners west of Beltrami have been closely monitoring flows and spring outbreaks along the Sand Hill River channel. They have asked the watershed district investigate outbreaks that they have noted as unusual during spring events. The events noted by landowners appear to occur after the installation of the rock arch rapids (after 2018). Since 2018, several severe spring floods along the Sand Hill River have resulted in breakout flows west of Beltrami. Several of these events, including the spring 2023 flood, appear to have been exacerbated due to significant snow and ice plugging in Scandia and Hubbard Townships as flood flows arrived.

The Sand Hill River Watershed District has implemented the Sand Hill River Ecosystem Restoration Project Team. The Sand Hill River Watershed District (District) Board of Managers has tasked the Project Team to develop and analyze alternatives to address the flood issues along the Sand Hill River.

The Project Team consists of local landowners, townships, the county, state agencies, and federal agencies. The goal of the Project Team is to identify an alternative that addresses local flood damages related channel erosion and flooding. Ultimately, the District will determine if the identified alternative will be carried forward, and how implementation could be funded. Another goal of the District is to maximize opportunities to leverage available outside funding opportunities. The Project Team is currently studying the existing conditions of the channel and flooding to understand the underlying conditions that lead to the flood issues experienced. The District hopes to have an alternative identified for consideration by the end of 2024.

Why form this project team?

The Sand Hill River Watershed District has invoked the project team to evaluate the following landowner and district concerns along the straightened portions of the Sand Hill River (the Sand Hill Ditch) :

- Encroachment on adjacent private lands
- Diminished public safety of adjacent infrastructure
- Increased downstream flooding
- Sediment deposition in downstream channels (Sand Hill River and Red River)
- Increased nutrient loading



WATER WONDERS

OF THE SAND HILL RIVER



EDUCATION

Water scorpions, predaceous diving beetles, dragonflies, crayfish, and caddisflies were just some of the many “critters” that the Fertile-Beltrami 4th grade classes discovered in the Sand Hill River and a nearby wetland as part of a “Water Wonders of the Sand Hill River” program. With waders and nets, students collected and identified these macroinvertebrates as a way to assess water quality. Students noted that many of the bugs they collected are not very tolerant of pollution, thus they concluded that the water quality of the Sand Hill River in the Fertile area is good.

Students also visited Death Valley in the Fertile Sand Hills as they learned that the area was once a large beach along glacial Lake Agassiz. Digging down in the sand they discovered it was wet below the surface and how rainfall will filter through the sand and soil as groundwater as it makes its way to the Sand Hill River. Animal tracks showed evidence of life in Death Valley. Wolf spider holes were observed with depths of up to two feet.



It was noted that prairie plants can have roots that go down 10-15 feet, with 70% of prairie plants being the root system. Tallgrass prairie plants can absorb up to 9 inches of rain per hour—making for very effective erosion control and filtering. Students also conducted and observed experiments to see how water moves via transpiration, evaporation, and condensation.

SPONSORSHIP

These outdoor learning opportunities are being made possible through the sponsorship of the Sand Hill River Watershed District as part of their mission to promote watershed education. The SHRWD is covering costs for the fourth grade classes from all four schools in the Sand Hill River Watershed to experience this hands-on experience provided by the Agassiz Environmental Learning Center at the Fertile Sand Hills. Fosston, Win-E-Mac, and Climax-Shelly 4th grade classes will also be coming this fall to explore the “Water Wonders of the Sand Hill River.” Sand Hill River Watershed



District Administrator April Swenby is excited about the new partnership with the AELC. “The Sand Hill River Watershed District has been looking for ways to support watershed education for our youth, recognizing that our youth is the future of our watershed. This is an opportunity to engage children and meet them at their level. Who knows? Maybe one of these students will be a future Watershed District manager, or the next leader for water management! It all starts with a basic understanding learning how your environment functions as a whole. I am looking forward to seeing how this partnership evolves and grows.”

The Fertile-Beltrami Area Community Fund also provided financial support to purchase the waders, nets, field identification guides, and related supplies to help provide the “tools” for kids to explore the outdoors and learn about their local watershed. As could be seen by the enthusiasm of the kids throughout the day and their recall of watershed connections, the day was a huge success.



Sand Hill River Watershed One Watershed One Plan

CREATED FROM A SMALL SINUOUS CHANNEL POURING OVER SAND HILLS, THE SAND HILL RIVER WATERSHED PROVIDES FARMING AND RECREATIONAL OPPORTUNITIES THAT PRESERVE AND PROMOTE ECONOMIC SUSTAINABILITY WHILE MAINTAINING NATURAL RESOURCES FOR FUTURE GENERATIONS.

The Sand Hill River Watershed District formally adopted the Sand Hill River Watershed (SHRW) One Watershed One plan. This is a voluntary program that provides a plan to guide watershed managers as they work to protect and restore the watershed resources. Planning partners included Polk, Norman, & Mahnomon County and East Polk West Polk, Norman and Mahnomon County SWCD's. All partners collaborated for water planning along watershed boundaries with local priorities that were locally driven. In 2024, implementation funding from the state of Minnesota in the amount of \$705,526.70 (for the next biennium) will be received through a non-competitive process to implement prioritized goals.

All watershed issues facing the SHRW were compiled, then prioritized to narrow down the total number of issues this plan will address. Each issue was prioritized by planning region for targeted implementation. Goals were developed to address all high priority issues.



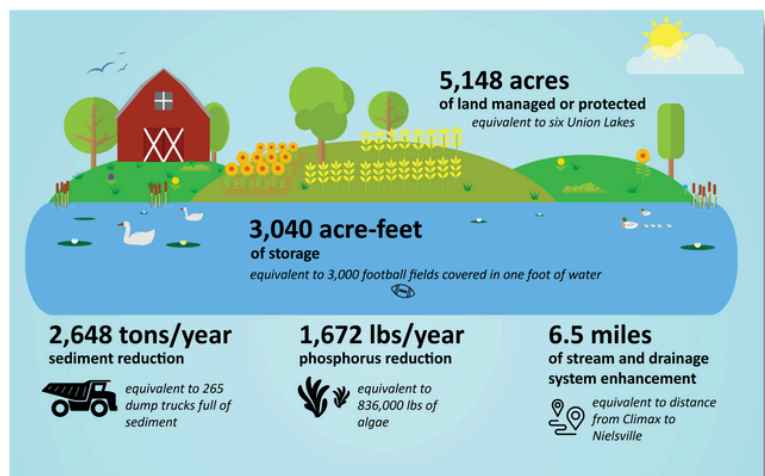
Action items

A variety of actions including structural agricultural best management practices (BMPs), conservation practices, education and outreach actions, and capital improvement projects (CIP) will take place in the watershed over the course of the 10-year plan.

- Structural agricultural practices (grade stabilizations, grassed waterways, sediment basins, etc.)
- Non-structural agricultural practices (conservation tillage, cover/perennial crops, etc.)
- Bacteria management projects
- Lake enhancement projects
- Land retirement programs
- Ditch/stream stabilization projects
- Seal unused wells
- Well testing and soil health workshops

Steering Team

- April Swenby, Sand Hill River Watershed District
- Jacob Snyder, Polk County
- Nicole Bernd, West Polk SWCD
- Rachel Klein, East Polk SWCD
- Aaron Neubert, Mahnomon SWCD
- Lori Thronson, Norman SWCD
- Brett Arne, Board of Water and Soil Resources
- Henry Van Offelen, Board of Water and Soil Resources





New Software for internal and external use!

The Sand Hill River Watershed District is excited to announce the launching of their new, upgraded software that manages all of the district permits. In addition to the upgrade, they have adopted and implemented this software for managing all ditch and project inspections. District staff says that this software will provide a permanent record of all systems that will help them better record problem areas, areas that have had maintenance, and allow for a permanent record of areas that are being monitored by staff. Historically, the district

did not have access to a digital means for tracking maintenance on legal systems and this software has filled that gap.

MS4Front is a comprehensive, MS4 permit software solution designed with MS4 permittees in mind. Built-in configuration settings and options lets staff tailor their interface to meet specific permit requirements and integrate with the watershed's existing data infrastructure. The district is excited to take advantage of the new workflow automation and digital technology!

State Disaster Declaration

Initial Damage Assessments were identified for any flooding that occurred after April 11, 2023. A state disaster declaration was announced at a reimbursable rate of 75/25. Damages that were identified that were unable to be repaired in 2023, will be repaired in 2024. The following sites are earmarked for disaster declaration classification.

- Project # 17: 290th Avenue erosion
- Ditch 9: Side inlet pipe
- Ditch 9: Bank failure - Hammond Twp.
- Project #20: channel erosion
- Sand Hill Ditch: Scandia Twp. - Erosion resulting from ice loading
- Sand Hill Ditch: Liberty Twp. - Bank Sloughing compromising road and safety conditions

New Board Manager



SHAWN BREKKE Secretary

Shawn Brekke joined the Sand Hill River Watershed District board January 2023. He is a 4th generation Brekke to farm on the family farm near Nielsville where they produce soy beans, sugar beets, and spring wheat. Before serving on the Sand Hill River Watershed District, he served as a Township Officer for Hubbard Township for ten years.

He spends his spare time watching his son Logan play sports, and enjoys snowmobiling with him in the winter.

RED RIVER BASIN LIDAR DATA



In 2021, the Sand Hill River Watershed District approved a contract with the Red River Watershed Management Board (RRWMB) to acquire Light Detecting and Ranging (LiDAR) data and develop LiDAR derived products for the Sand Hill River Watershed District. The Red River Watershed Management board will facilitated the collection with the LiDAR vendor and the International Water Institute (IWI) of the entire 480.30 square miles within the Sand Hill River Watershed District's jurisdiction. This effort was completed in 2023!

Project deliverables include the raw LiDAR point cloud, 0.5 meter Digital Elevation Model (DEM), building footprints, farmstead ring dikes, 1-foot contours, hydro-conditioned DEM, data storage for 4 years on the Sanborn Geodatabase Explorer, and updated data layers. The IWI Map Portal allows users to access the LiDAR-derived bare-earth digital elevation model, 1 and 5-foot contours, and a number of other LiDAR products such as shaded relief and water flow pathways. Elevation profile data can also be generated anywhere on a field by "snapping a line" on the map. The IWI Map Portal projects the horizontal elevation profile which can be downloaded to a spreadsheet.

No special software is needed to view data in the IWI Map Portal, there is no fee, and there is no login and password required. For power GIS users that have specialized GIS software and are wanting to work with the new LiDAR data, download imagery and other products, the data is housed at the Sanborn Geodatabase Explorer website. The data is free at this website but permission to access the data here is granted by the RRWMB. The RRWMB requires a license agreement for accessing the Sanborn Geodatabase Explorer and the RRWMB reserves the right to refuse access to the system.

The original (2009) Red River Basin LiDAR data had accuracy of approximately 6 inches while the new LiDAR data is less than 4 inches. The new data were collected according to federal standards developed by the United States Geological Survey, which did not exist at the time of the original LiDAR data collection.

The contract included a total payment of \$64,840.50 corresponding to a price of \$135.00 per square mile. The pricing includes data hosting and dissemination (using the selected vendor's web platform) for a period of three (3) years. The Sand Hill River Watershed District will have a perpetual, nonexclusive license to hold, use and distribute the LiDAR data and derived products. The Red River Watershed Management board asserts no ownership in any such derivative works.

The LiDAR vendor will provided raw DEM's (1,000 x 1,000- meter tiles). The International Water Institute took the task of mosaicing the DEM tiles together to create a continuous surface for the Sand Hill River Watershed.

The updated ISI map portal is displayed on the IWI Map Portal and is available to the public at: [Map Portal \(iwinst.org\)](http://Map Portal (iwinst.org)).

RETROSPECT: A LOOK BACK AT 2023

Highlights of 2023 Activities

- Forty-five permits were brought before the board.
- The district entered into a three year contract with the East Polk SWCD for monitoring phosphorus, chlorophyll and clarity for Union Lake, Lake Sarah, Uff Lake and Maltrud Lake
- The district has been learning about the process for the redetermination of benefits for the Sand Hill Ditch.
- New inspection software was purchased and implemented for ditch and project inspections. Full inspections were performed as usual by staff, and written reports are now available to the managers and the public by request.
- New permit applications were adopted by the board, complete with an upgrade to the online permit database.
- Staff assisted Reis and Liberty townships in an application for Protect (Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation) Funds and LRIP (Local Road Improvement) funds for funding assistance along the Sand Hill Ditch.
- The district continues coordinating with the Red Lake Watershed District to investigate the watershed boundaries on the Northern end along MN 102. A resolution for a boundary change was approved in December 2023, and will be submitted to the Board of Soil and Water Resources in 2024.
- The district solicited bids for the district building, aiming to meet the goal of handicap accessibility for the public office. The district is working with the lowest bidder to refine the plans and specifications, in hopes for a more attainable cost that still achieves the districts goals and project construction in 2024.
- Maintenance work was performed on various systems such as Project #27, Ditch 9, Project # 20, and Project #24. Spraying via helicopter was performed on all systems as determined applicable.

Our Team

Board managers are appointed by the Polk County Board of Commissioners annually. Managers serving in 2023 include:

- Stuart Christian, Chairman
- Don Andringa - Vice Chairman
- Shawn Brekke - Secretary
- Clayton Bartz - Treasurer
- Craig Engelstad - Manager

The Sand Hill River Watershed employs one full-time employee and one part-time employee

- April Swenby, Administrator
- Donna Bjerke- Admin. Assistant

Approved 2023 Operating Budget

Income

REIMBURSED EXPENSE 650.00
 HOMESTEAD/AG CREDIT (HACA) 3,500.00
 INTEREST INCOME 25,000.00
 TAX LEVY INCOME 250,000.00
 Total Income 279,150.00

Expense

MISC 200.00
 PUBLICITY 1,000.00
 MEETING EXPENSE 2,100.00
 WEB-SITE 3,000.00
 DUES-MEMBERSHIP 3,000.00
 EDUCATION 4,000.00
 PAYROLL TAXES 7,000.00
 EMPLOYEE TRAVEL EXPENSES 8,000.00
 COMPUTER EXPENSE 10,000.00
 BUILDING MAINTENANCE/OCCUPANCY 13,000.00
 FURNITURE-EQUIP 15,000.00
 OFFICE OPERATIONS 18,000.00
 PROF SERVICES 20,000.00
 MANAGER EXPENSE 20,000.00
 CAPITAL IMPROVEMENTS 41,850.00
 PAYROLL EXPENSES 113,000.00
 Total Expense 279,150.00