



Minnesota Pollution
Control Agency

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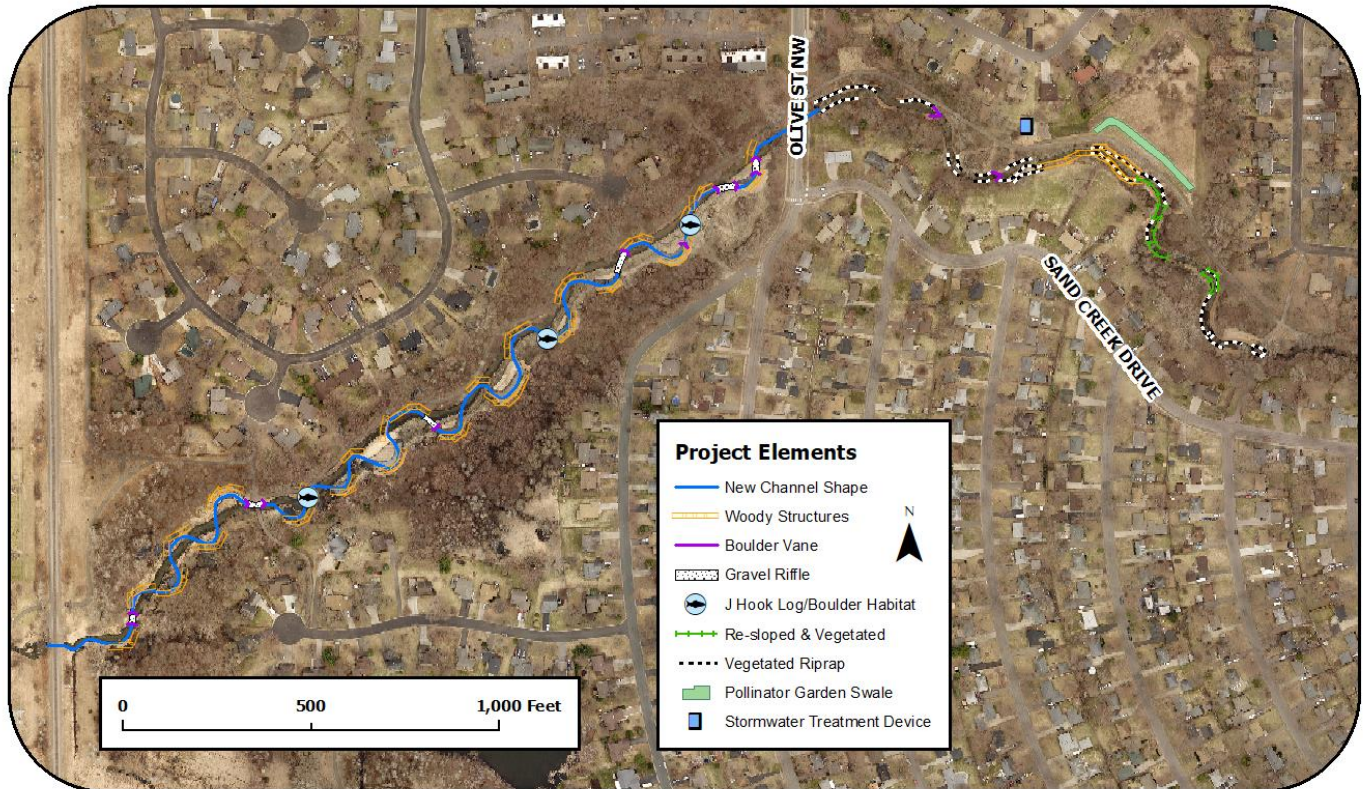
Final Report Format

Section 319 and Clean Water Partnership Projects or Final Progress Report for TMDL/WRAPS Development and TMDL/WRAPS Implementation Projects

Doc Type: Reporting/Final Report

Middle Sand Creek Corridor Restoration Project

FY18 319 Grant #150049: Final Report



Coon Creek Watershed District

13632 Van Buren St NE Ham Lake, MN 55304

www.cooncreekwd.org/MiddleSandCreekResto

October 2021



Executive summary

The Sand Creek subwatershed drains 15.7 square miles of suburban land use in Blaine and Coon Rapids, MN. The headwaters consist of a series of ditched stormwater conveyance channels which coalesce to form the main stem of Sand Creek, a 2.2 mile reach that outflows to Coon Creek and then to the Mississippi River near the Coon Rapids Dam Regional Park. The main stem of Sand Creek (AUID 07010206-558) was added to Minnesota's 303(d) list of impaired waters for aquatic life impairments in 2006 due to macroinvertebrate bioassessments and for aquatic recreation impairments in 2016 due to elevated levels of *E. coli*. Sand Creek also failed to meet standards for fish biotic condition, but this impairment was deferred pending reassessment under the new Tiered Aquatic Life Use (TALU) standards for modified reaches. Excess total phosphorus (TP), total suspended solids (TSS), poor habitat, and altered hydrology were identified as the primary stressors to Sand Creek's biota as part of the US EPA's Causal Analysis/Diagnosis Decision Information System framework. The primary sources of excess TSS and TP were determined to be stream bank erosion during high flow events (Hydromodification; Channel Erosion/Incision) and urban stormwater inputs (Urban Runoff; Residential). To meet pollution standards and reduce stress on biota, the 2016 Coon Creek Watershed TMDL study calls for annual load reductions of 10% of TSS and 33% of TP during the highest 10% of flows in Sand Creek which corresponds to approximately 36 tons of TSS and 813 pounds of TP per year. The 2016 Coon Creek WRAPS report identified streambank stabilization and riparian buffer enhancement as implementation strategies for meeting TSS and TP load reductions during high flows.

A comprehensive inventory of all active erosion sites within the Sand Creek subwatershed using the NRCS direct volume method identified the downstream-most 1.25 miles of Sand Creek as a TSS-loading hotspot. The first phase of bank stabilization and habitat restoration work, the Lower Sand Creek Corridor Restoration project, was implemented in 2018-19. This project stabilized 16 eroding banks (2900 LF) along the downstream-most ½-mile reach, with estimated cumulative annual load reductions of 372 tons TSS and 316 lbs of TP. The 2/3-mile reach just upstream, Middle Sand Creek, was identified as the target reach for the 2nd phase of stream restoration work. The Middle Sand Creek Corridor Restoration Project, the subject of this report, stabilized 16 additional actively eroding banks (1850 LF) with cumulative annual load reductions of 141 tons TSS and 120 lbs of TP. Specifically, eroding banks were stabilized with vegetated riprap, root wads, toe wood with soil encapsulated lifts, or via regrading and vegetating using native seed mixes, live stakes, and native trees. Additionally, this project established or enhanced vegetative buffers along both banks of 2500 LF of channel by thinning trees and clearing invasive buckthorn, added 625 feet of stream length via meandering the formerly straightened channel using Natural Channel Design methodology, and reconnected the floodplain along a 2300 ft reach via mass excavation. In-stream and riparian habitat was also improved via installation of cross vanes, riffles, coarse woody debris, J-hooks, riffle-pool-run sequencing, and pollinator plantings. Furthermore, these practices also reduced soil-bound bacteria loading to Sand and Coon Creeks.

From 2009 through 2020, water quality in Sand Creek has been monitored annually at up to four sites. During baseflow, average concentrations of TSS and TP generally meet state standards (mean = 6 mg/L and 64 ug/L, respectively) and vary little between sampling locations. During storm events, both TSS and TP increase from upstream to downstream with 5% and 22% of samples exceeding state standards at the downstream-most site. This is down from an exceedance rate of 14% for TSS and 40% for TP prior to the start of stream restoration work in 2018. Continued annual water quality monitoring and biomonitoring (2020-22 assessment by MPCA) will verify modeled pollutant load reductions and quantify biotic improvements towards the eventual delisting of Sand Creek by 2045. It should be noted that additional work in the watershed is required to address phosphorus and *E. coli* loading attributable to urban stormwater inputs. Several water quality improvement projects have been completed in the drainage area since 2009 including construction of 25 rain gardens, a new ¼-ac stormwater pond, and modifications to existing pond outlet structures to increase storage volume and reduce peak flows. All new development and redevelopment is now subject to local stormwater management rules that were not in effect when this area was originally developed prior to the 1980s.

Successful implementation of this project was a result of strong existing partnerships between the Coon Creek Watershed District (project manager) and City of Coon Rapids (landowner/cooperator) with technical assistance from Stantec (project engineer) and the Minnesota Department of Natural Resources and financial support from the Federal 319 Grant Program and the Minnesota Clean Water Fund. Additionally, this project helped build and foster relationships with local residents. Overall, public engagement activities related to this project reached over 26,200 households, raising awareness and understanding of local water quality impairments and promoting responsible stewardship of our water resources.

Project Implementation

Section I - Work plan review

The original work plan/ budget was fully implemented with 3 minor amendments: 1) extending project end date from 2020 to 2022 to accommodate phased, multi-year construction, 2) adjusting engineering budget line items from hourly rates to lump sums per task and updating contact information, and 3) simplifying the project budget format, adding \$21,230 in surplus FY17 319 grant funds, and expanding scope of work accordingly (additional channel re-meandering/ lengthening, toe wood installation, and floodplain excavation outcomes). A summary of progress for each objective and task is outlined below. All activities and tasks were completed with no major issues, delays, or deviations from the amended work plan:

Objective 1: Project Development

Task A: Partners coordination meetings: Regular communication between all project partners and adjacent landowners occurred throughout the project. A Joint Powers Agreement was executed between CCWD and the City of Coon Rapids (landowner/ cooperator). Several progress meetings were held to coordinate design, bidding, and project implementation. A final site walkthrough was held for sign off on project completion.

Task B: Develop and finalize design plans: The project engineer, Stantec (formally Wenck), completed survey work and final design plans with input and revisions from CCWD, MN DNR, and City of Coon Rapids staff. A project manual was prepared for the public bidding process.

Task C: Secure applicable permits and contractor: District staff worked to secure DNR Waters and USACE permits for work to stabilize banks, realign the channel, and excavate the floodplain. The project required a mandatory EAW which entailed a phase I archeology survey, sign off by SHPO, and a Blanding's turtle avoidance plan. District staff prepared the EAW, responded to all public comments including conducting a native mussel survey, and determined an EIS was not needed. The project was advertised for public bid, an onsite pre-bid meeting was held on 12/17/19, and a bid opening was held on 1/3/20. The project was awarded to the lowest competent bidder, Sunram Construction. A construction contract was executed with Sunram Construction. Acquiring the necessary permits was a challenging process which was more time-intensive than anticipated and led to some budget overruns for staff time and engineering services.

Objective 2: Construction

Construction activities were split into 2 phases, the first occurring from January 2020 to April 2020 to and the second occurring from December 2020 to May 2021. This phased construction approach allowed for the majority of the new meandered channel to be constructed off-line with a summer to revegetate/stabilize prior to diverting stream flow into the new channel. A breakdown of activities as follows:

Task A: Mobilization and Site Preparation: Construction signage was posted, safety fence was erected, erosion control BMPs were installed and maintained, construction equipment was mobilized, and the site was marked for tree removal and BMP placement. Construction equipment was remobilized for phase 2 construction.

Task B: Installation of stream restoration BMPs: All project elements were constructed according to the design plans (tree removal and disposal, bank resloping, root wads, toe wood, vegetated riprap, cross vanes, rock riffles, j-hooks, construction of a new meandered channel and fill of the former channel, floodplain excavation, seeding and planting). This work went very well and benefited from extending it over 2 phases to allow vulnerable disturbed areas to heal for a growing season before bringing the new channel on-line.

Task C: Site restoration and demobilization: The site was temporarily stabilized and all equipment was demobilized following phase 1 construction in spring of 2020. The site was left inactive over the summer-fall of 2020 to allow revegetation of disturbed areas and newly constructed project elements. The temporary stockpiles of excavated materials were trucked off site during winter 2020-21. Permanent site restoration occurred in spring-summer of 2021 following the 2nd phase of construction. Despite drought conditions in 2021, there were no issues with vegetation establishment although some mortality of planted trees was observed. Undesirable invasive species have not yet re-established within the project area, but are present on adjacent parcels. Ongoing vegetation maintenance including invasive species control is planned.

Task D: Construction Oversight: CCWD staff was onsite every day during active construction and held weekly progress meetings with the contractor, engineer, and project partners. MN DNR staff was also on site almost every day to assist with overseeing construction of the new meandered channel and lowered floodplain. MN DNR staff went above-and-beyond in providing technical assistance including staking and surveying project elements which resulted in tremendous cost savings. Progress photos were taken regularly, construction progress reports were written daily and posted to the project web page each week, and an as-built survey was completed to verify the project was constructed according to plans. Stantec staff was also onsite regularly to stake and survey project elements, oversee work, verify quantities, process pay apps and any necessary change orders, and provide final sign off. Stantec signed off on substantial completion in March 2021 and final completion on 6/21/21 after a final walk-through attended by all project partners on 6/18/21.

Objective 3: Public involvement, education, and outreach

Task A: Host public open house: On September 24th, 2019, CCWD hosted a public open house at the Coon Rapids City Hall. Invitations were prepared and mailed to 96 households in the neighborhoods adjacent to the project area and notices were posted along the trail corridor at the project site. At least 28 members of the public attended along with 1 city councilmember. A PowerPoint presentation was given by CCWD staff to provide the context and rationale for the project and to introduce specific design elements. This presentation was also posted to the project web page. A forum for open discussion followed the presentation. Overall, the project was well-received, but concerns were raised about the extent of tree removal, amount of construction disturbance, impacts on resident wildlife, interruptions to trail use, and future maintenance responsibility.

Task B: Design and install interpretive signage. 2 permanent interpretive signs were designed and installed in April 2021. One sign is a project overview sign designed by CCWD staff and the other is about stream shape, highlighting the new meandering channel with riffle, pool, run habitats. This sign was designed in collaboration with Anoka-Ramsey Community College students. 2 pollinator habitat signs were also purchased from Pollinator Partnership, customized with logos from local partners, and installed adjacent to the large pollinator garden planted as part of the project. City of Coon Rapids staff installed all signs.

Task C: Publish project updates: CCWD staff created and regularly updated a dedicated project webpage (<https://www.cooncreekwd.org/middlesandcreekresto>). From April 2019 through September 2021, this webpage has had 2,652 views! Elements of the project were also shared on District social media accounts; 16 posts reached over 1,447 people, generating 293 interactions (likes, shares, comments, video views). The most popular post was a timelapse video of construction. Two message centers were also installed on-site and updated regularly throughout construction. Brochure holders were attached to these message centers and kept stocked with project-specific handouts; 2,362 brochures were distributed to trail users! Additionally, four articles were drafted and published in the Coon Rapids Connection Quarterly newsletter between Winter 2020 and Summer 2021; this newsletter is circulated to approximately 26,200 households.

Task D: Host public outreach events: Several outreach events were held including 3 guided tours for the general public on 9/22/21 and 9/25/21 as part of CCWD's "Watershed Walks" series and 2 guided tours for local government staff and agency partners on 1/29/21 and 9/22/21. These walks were attended by 53 individuals in total. The agency partners tour also served as a ribbon-cutting event and was filmed by the Coon Rapids Television Network (CTN) and broadcasted locally. District staff also hosted 2 events at the project site on 9/25/20 and 10/8/21 to teach 45 UMN undergraduate students about erosion, stream restoration, and to demonstrate biomonitoring and habitat evaluation methods. Staff also contracted a local artist, Sleeping Dragon Studios LLC, to produce project-specific outreach displays including an interactive 3D-printed model of a channelized vs re-meandered reach of Middle Sand Creek and hand-crafted models of 4 species of fish native to Sand Creek that span a range of pollutant/habitat tolerances. These models were used at outreach events to discuss Sand Creek's biota, impairments, and the benefits of the project, reaching 87 individuals to date. Lastly, staff presented the project at the UMN Water Resources Conference on 10/20/21 to engage water resource practitioners.

Objective 4: Grant administration, semiannual reporting, and final reporting:

Task A: Administration and Reporting: CCWD Staff communicated with MPCA project managers, organized and maintained project files, tracked expenditures and in-kind match, paid invoices, and submitted all required quarterly invoices, semi-annual, and final reports to MPCA.

Section II – Grant Results

Measurable Outcomes & Progress

The stated measurable outcomes compared against the actual results of the project are outlined below:

- 1) The stabilization of 1850 linear feet of actively eroding streambanks along a 2/3-mile reach of Middle Sand Creek via installation of ~300 LF hard armoring (vegetated riprap) and ~1550 LF bioengineering; re-meandering/ lengthening of existing channel by 700 LF and lowering/reconnecting floodplain along 1600 LF of project reach

Actual Result: stabilization of 1850 LF of actively eroding streambanks along a 2/3 -mile reach via 500 LF of hard-armoring and 2640 LF of bioengineering (root wads, log toe, toe wood w/ soil lifts, re-grading/ blanket/ seed/ live stakes) including the newly constructed meanders which added channel length. 625 LF of additional channel length and lowered/reconnected floodplain along 2300 LF of the project reach. One planned meander had to be shorted by ~75' due to conflicts with underground utilities.

- 2) TSS load reductions of 141 tons per year in both Sand and Coon Creeks (as measured by field surveys for erosion using the WI NRCS Direct Volume Method)

Actual Result: TSS load reductions of 141 tons per year for Sand and Coon Creeks as measured by field surveys for erosion using the WI NRCS Direct Volume Method (all actively eroding banks were stabilized).

- 3) TP load reductions of 120 pounds per year in both Sand and Coon Creeks (as calculated using the MN Board of Soil and Water Resources' Pollutant Reduction Calculator; 0.85 lbs of TP per ton of TSS for sandy soils)

Actual Result: TP load reductions of 120 pounds per year for Sand and Coon Creeks calculated using the MN BWSR's Water Erosion Pollution Reduction Estimator for streambank erosion with sandy soils.

- 4) Improved instream and riparian habitat as measured by increased MPCA Stream Habitat Assessment scores

Actual Result: TBD during next MPCA assessment cycle; draft MSHA scores calculated by UMN students in Oct 2021 indicate an increase from 48 to 60 (out of 100) for the re-meandered reach. In addition to 2640 LF of banks stabilized via bioengineering practices with added habitat value, several other in-stream habitat elements were installed: 3 J-hooks, 9 boulder vanes, 6 engineered rock riffles. Riparian habitat was enhanced via 5 acres of buckthorn control, native seeding, and planting of 3850 dogwood live stakes, 1500 plant bands, 2200 perennial pollinator plugs, and 42 trees (6 native species).

- 5) Improved biological integrity as measured by increased macroinvertebrate and fish IBI scores

Actual Result: TBD during next MPCA assessment cycle

- 6) Increased public awareness and understanding of local aquatic life impairments as measured by circulation of educational materials to over 26,000 people and tracking attendance at public outreach events

Actual Result: Increased public awareness and understanding of local aquatic life impairments as measured by circulating educational materials to over 26,200 households in the Watershed District via the community newsletter, 2,652 people via project webpage, 1,447 via social media posts, 2,362 brochures taken by trail users, 98 people attending 7 outreach events, and an unknown number of people via the on-site interpretive signage, CTN broadcast, and presentation at the 2021 UMN Water Resources Conference.

In our proposed evaluation plan, project success was to be defined as progress towards meeting the goals and interim milestones outlined in the Coon Creek Watershed WRAPS implementation table. Relevant goals and milestones for Sand Creek include the completion of 2-3 streambank stabilization projects, establishment of vegetated buffers along 20% of the stream channel, TSS concentrations below 30 mg/L in 90% of samples, and growing season TP concentrations below 100 ug/L. Progress was to be measured by comparing the percent improvement since project implementation to the percent improvement necessary over that same time period to be on track to meet TMDL goals by 2045.

Combined with the Lower Sand Creek Corridor Restoration Project that was completed in 2019 (FY17 319 grant), completion of this Middle Sand Creek Corridor Restoration Project in 2021 resulted in stabilization of 32 actively eroding banks (4750 LF) and establishment of vegetated buffers along 45% of the stream channel (1 mile reach of 2.2-mile stream), meeting and exceeding the bank stabilization and buffer enhancement goals outlined in the WRAPS. Due to interannual variability and because construction was just completed in June 2021, we have not yet been able to compare post-project water quality monitoring results to pre-project conditions. Success at achieving pollutant load reductions will be verified by continuing the annual routine water quality monitoring program at established sites upstream, downstream, and within the project reach and comparing future results to past results to quantify percent improvement. Specifically, average growing season concentrations and the percent of samples that exceed state standards will be calculated. Preliminary data from the outlet of Sand Creek from 2018-2020 suggests that exceedance rates have dropped from 14% of samples to 5% of samples for TSS and 40% to 22% of samples for TP when compared against baseline conditions prior to the onset of stream corridor restoration work. Additionally, the results of MPCA stream habitat, macroinvertebrate, and fish assessments in 2020-2022 will be compared to pre-project 2010 results. With completion of this project, we are ahead of schedule for delisting by 2045. Some additional work addressing regulated urban stormwater pollution and barriers to fish passage is needed for Sand Creek to be fully supportive of aquatic life.

Project Products

- Web page content: www.cooncreekwd.org/middlesandcreekresto
- PowerPoint presentation for public open house meeting:
[https://www.cooncreekwd.org/vertical/Sites/%7B5C6B0F6F-9658-418B-9297-E0413AF79517%7D/uploads/MSCCR_Presentation_Meeting_September_24_2019_PDF\(1\).pdf](https://www.cooncreekwd.org/vertical/Sites/%7B5C6B0F6F-9658-418B-9297-E0413AF79517%7D/uploads/MSCCR_Presentation_Meeting_September_24_2019_PDF(1).pdf)
- 2 interpretive signs, 1 pollinator garden sign (image files attached)
- 4 Coon Rapids Connection newsletter articles (winter 2020, winter 2021, spring 2021, summer 2021):
<https://www.coonrapidsmn.gov/Archive.aspx?AMID=78>
- MN DNR Water Talk newsletter article, Nov 2020:
<https://content.govdelivery.com/accounts/MNDNR/bulletins/2a9ecf2>
- Coon Rapids Community TV Network news coverage video clip:
<https://www.youtube.com/watch?v=aKZaoH6k84M>
- Timelapse video of construction: <https://www.youtube.com/watch?v=2fUgg-Ckxj0&t=2s>.
- PowerPoint presentation/recording for UMN Water Resources Conference (43:27- 1:01:00):
https://umn.zoom.us/rec/play/GYk8i5wk1dGi0ZMN9Y-MLmJAKYIISEpD4wpFD0QHmbqQFFjNoQRu04Eaj_M7uiXDKQWqyyGlxcH1L181.EPQGIMpIGq0ASe-?startTime=1634752824000&x_zm_rtaid=i6yJmViUTKi5s2hshsc9Zw.1635367026768.8795de9f0b0a8756af0401ce3c939b8d&x_zm_rhtaid=118
- 3D-printed interactive stream shape model
- 3D-printed models of native fish species
- Project overview brochure, construction update flyer (attached)
- Engineering plans (attached)
- Project photos including drone imagery (some included in report, more available upon request)

Public Education and Outreach

In order to inform residents about the project and solicit feedback, City of Coon Rapids and CCWD staff held a public open house on September 24th, 2019, at Coon Rapids City Hall. 96 households located adjacent to the project area were sent invitations by mail and notices were also posted along the adjacent trail corridor. 28 residents and 1 councilmember attended the open house. A PowerPoint presentation was given by CCWD staff to provide context and rationale for the project and to introduce specific design elements. A forum for open discussion followed the presentation. Overall, the project was well-received, but concerns were raised about the extent of tree removal, amount of construction disturbance, impacts on resident wildlife, interruptions to trail use, and future maintenance responsibility.

To keep residents informed about the project while in progress, a dedicated project webpage was created and hosted on the CCWD website. This webpage had 2,652 views between April 2019 and September 2021. Two message centers were also installed on-site and updated regularly throughout construction. Brochure holders were attached to these message centers and kept stocked with project-specific handouts; 2,362 brochures were taken by trail users. Elements of the project were also shared on District social media accounts: 16 posts reached 1,447 people, generating 293 interactions (likes, shares, comments, video views). Additionally, four articles were drafted and published in the Coon Rapids Connection quarterly newsletter between Winter 2020 and Summer 2021; this newsletter is circulated to 26,200 households.

To continue engagement with trail users after construction, two permanent, customized interpretive signs were designed and installed in April 2021. One sign is a project overview sign designed by CCWD staff and the other is about stream shape to highlight the new meandering channel with riffle, pool, run habitats. This sign was designed in collaboration with Anoka-Ramsey Community College students. Also, two pollinator habitat signs were purchased from Pollinator Partnership and customized with logos from local partners, then installed adjacent to a large pollinator garden planted as part of the project. City of Coon Rapids staff installed all signs as an in-kind contribution. Additionally, CCWD also contracted a local artist, Sleeping Dragon Studios LLC, to produce project-specific outreach displays: an interactive, 3D-printed model of a channelized vs re-meandered reach of Middle Sand Creek, and hand-crafted, life-size models of four species of fish native to Sand Creek that span a range of pollutant and habitat quality tolerances. These models have been, and will continue to be, used at outreach events to discuss Sand Creek's biota, impairments, and benefits of stream restoration projects. So far, 87 people have been reached with these models.

Several project-specific outreach events were held including three guided tours for the general public on 9/22/21 and 9/25/21 as part of CCWD's "Watershed Walks" series and two guided project tours for local government staff and agency partners on 1/29/21 and 9/22/21. Combined, these walks were attended by 53 individuals. The public Watershed Walks were advertised through city newsletter articles and social media. The agency partners tour also served as a ribbon-cutting event and was filmed by the Coon Rapids Television Network (CTN) and broadcasted locally. District staff also hosted two events at the project site on 9/25/20 and 10/8/21 to teach 45 UMN undergraduate students about erosion, stream restoration, and to demonstrate biomonitoring and habitat evaluation methods. Lastly, staff presented on the project at the UMN Water Resources Conference on 10/20/21 to engage local water resource professionals.

Overall, we feel the public outreach and education activities were highly successful, reaching over 26,200 households in the Watershed District via the community newsletter, 2,652 people via project webpage, 1,447 via social media posts, 2,362 brochures taken by trail users, 98 people attending our 7 outreach events and interacting with project-specific displays, and an unknown number of people via the onsite interpretive signage, CTN broadcast, and presentation at the 2021 UMN Water Resources Conference.

Long-term Results

In addition to the tangible water quality, habitat, and public awareness benefits, the Lower and Middle Sand Creek Corridor Restoration projects also served as important demonstration projects to illustrate the benefits of a holistic corridor restoration approach compared to individual bank stabilization projects (the status quo in our area). Successful implementation of these large-scale corridor projects opened the eyes of public officials and citizens to the complex work needed to address our aquatic life impairments and the multiple benefits that can be achieved via restoration projects. The Middle Sand Creek Corridor Restoration project was the first time we utilized a Natural Channel Design (NCD) approach and serves as one of the very first examples of NCD being implemented in an urban area in MN. This project helps to dispel the notion that NCD cannot be employed in urban areas due to the constraints of a built environment. NCD is a favorable approach because it addresses the root cause of stream instability/pollutant loading by using a stable reference reach to design an appropriately sized/patterned channel to accommodate existing volumes and sediment loads. We hope to build on the successes of this project to implement NCD elsewhere in the Coon Creek Watershed District and to share our successes with area practitioners to garner wider adoption. We could not have accomplished this project without assistance from the MN DNR, specifically Nick Proulx, Clean Water Specialist. The strong partnership with MN DNR that resulted from this project will be invaluable as we continue stream assessment and restoration work in our area. We are also very grateful for federal and state grant funding to support this type of work, expanding the reach and impact of our water management activities.

Section III – Final Expenditures

See attached spreadsheet for a detailed breakdown by cost category (grant, cash match, in-kind match).

PROJECT: Middle Sand Creek Corridor Restoration GRANTEE: Coon Creek Watershed District ITEMIZED PROJECT BUDGET AND EXPENDITURES (CO2; Jan 2021)	Budget Total	Cumulative Total Expended	Budget Balance Cumulative
OBJECTIVE 1: PROJECT DEVELOPMENT			
Salaries	\$ 49,242.00	\$ 91,214.47	\$ (41,972.47)
Permit Fee	\$ 1,000.00	\$ 11,846.85	\$ (10,846.85)
OBJECTIVE 1 - TOTAL	\$ 50,242.00	\$ 103,061.32	\$ (52,819.32)
OBJECTIVE 2: CONSTRUCTION			
Construction	\$ 437,660.00	\$ 759,333.58	\$ (321,673.58)
Salaries	\$ 6,200.00	\$ 14,323.25	\$ (8,123.25)
OBJECTIVE 2 - TOTAL	\$ 443,860.00	\$ 773,656.83	\$ (329,796.83)
OBJECTIVE 3: PUBLIC INVOLVEMENT, EDUCATION, AND OUTREACH			
Public engagement/ sign fabrication and outreach supplies	\$ 10,000.00	\$ 8,147.49	\$ 1,852.51
Salaries	\$ 10,162.00	\$ 17,772.50	\$ (7,610.50)
OBJECTIVE 3 - TOTAL	\$ 20,162.00	\$ 25,919.99	\$ (5,757.99)
OBJECTIVE 4: ADMINISTRATION & REPORTING			
Salaries	\$ 13,196.00	\$ 13,199.71	\$ (3.71)
OBJECTIVE 4 TOTAL	\$ 13,196.00	\$ 13,199.71	\$ (3.71)
	\$ 527,460.00	\$ 915,837.85	\$ (388,377.85)

Note: After execution of the FY18 319 grant agreement, Coon Creek WD was awarded a FY19 MN Clean Water Fund Grant in the amount of \$382,722 for the Middle Sand Creek Corridor Restoration work. These additional funds were leveraged to expand the project scope to extend and re-meander the channel and reconnect the floodplain via mass excavation. The large discrepancy in planned versus actual cumulative expenditures is due to expansion of the project scope, not unplanned budget overruns.

Grant project summary

Project title: Middle Sand Creek Corridor Restoration Project

Organization (Grantee): Coon Creek Watershed District

Project start date: 4/1/2019 Project end date: 10/29/21 (contract: 8/31/2022) Report submittal date: 10/29/2021

Grantee contact name: Tim Kelly Title: District Administrator

Address: 13632 Van Buren St NE

City: Ham Lake State: MN Zip: 55304

Phone number: 763-755-0975 Fax: _____ Email: tkelly@cooncreekwd.org (cc jdauphinais@cooncreekwd.org)

Basin (Red, Minnesota, St. Croix, etc.) /Watershed & 8 digit HUC: Mississippi River- Twin Cities; 07010206 County: Anoka

Project type (check one):

- ☐ Clean Water Partnership
- ☐ Total Maximum Daily Load (TMDL)/Watershed Restoration or Protection Strategy (WRAPS) Development
- ☒ 319 Implementation
- ☐ 319 Demonstration, Education, Research
- ☐ TMDL/WRAPS Implementation

Grant funding

Final grant amount: \$312,230 Final total project costs: \$915,837.85

Matching funds: Final cash: \$548,973.89 Final in-kind: \$54,633.96 Final Loan: \$0

MPCA project manager: Jordan Donatell

Executive summary of project

Problem

Sand Creek was added to Minnesota's 303(d) list of impaired waters for aquatic life impairments in 2006 due to macroinvertebrate bioassessments and for aquatic recreation in 2016 due to elevated levels of E. coli. Excess total phosphorus, total suspended solids, habitat alterations, and altered hydrology were identified as the primary stressors to Sand Creek's biota. The primary sources of excess TSS and TP were determined to be stream bank erosion during high flow events and urban stormwater inputs. In-channel restoration work is required to address the pollutant and non-pollutant stressors impacting Sand Creek's biota.

Waterbody improved

Sand Creek is a 2.2-mile long stream located in Anoka County, MN. Sand creek and its headwater ditches serve as a stormwater conveyance for a 16 sq mile suburban watershed before joining with Coon Creek and discharging to the Mississippi River.

Project highlights

This 2019-21 project stabilized 1850 LF of actively eroding banks along a 2/3-mile reach of Middle Sand Creek via toe wood with soil encapsulated lifts, root wads, log toe, re-grading w/ blanket and seed, and vegetated riprap. This project also added 625 ft of additional channel length via remeandering the formerly straightened channel. Furthermore, the floodplain was lowered and reconnected to the channel and vegetative buffers were established along 2300 ft of the project reach. Lastly, in addition to incorporating woody debris into bank stabilization practices, in-channel habitat was improved via installation of 3 J-hooks, 9 boulder vanes, and 6 engineered rock riffles. Riparian habitat was enhanced via 5 acres of buckthorn control, native seeding, and planting of 3850 dogwood live stakes, 1500 plant bands, 2200 perennial pollinator plugs, and 42 trees.

Results

This project reduced annual sediment and phosphorus loads by an estimated 141 tons and 120 pounds, respectively and improved in-stream and riparian habitat. Additionally, these practices also reduced soil-bound bacteria loading to Sand Creek and downstream Coon Creek. Furthermore, over 26,200 households were reached via various public engagement efforts. Future planned water quality monitoring and biomonitoring will confirm pollutant load reductions and biotic improvements.

Partnerships

Coon Creek Watershed District; Grantee, project manager, in-kind support

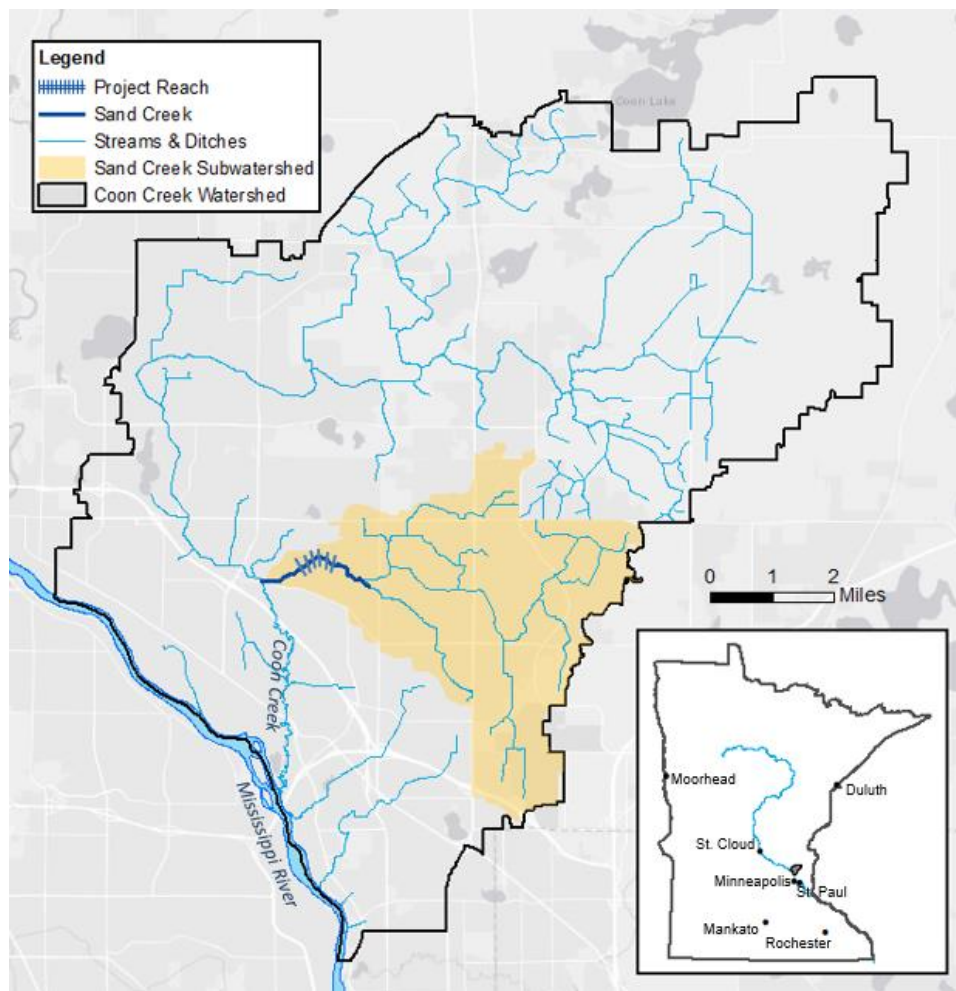
City of Coon Rapids; landowner, cooperator, in-kind support

MN Department of Natural Resources; technical assistance with planning, design, and construction oversight

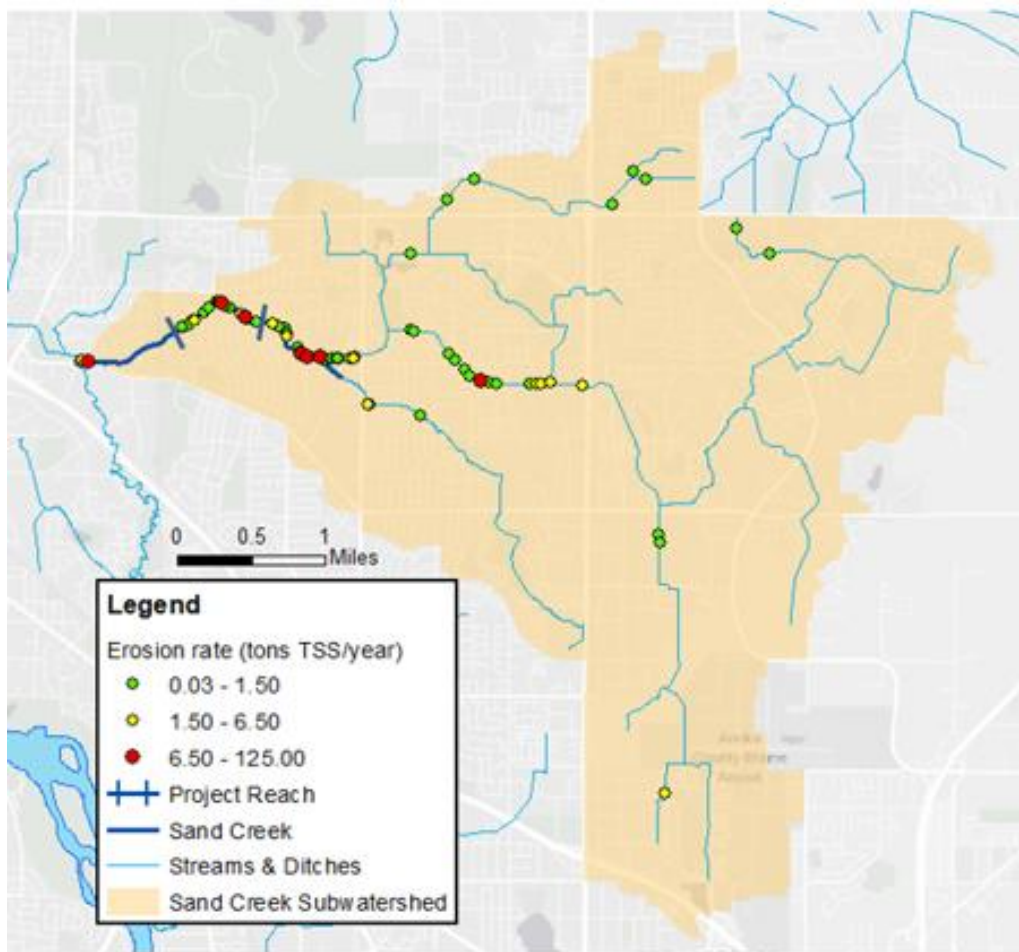
Stantec (formally Wenck); project engineer

Anoka-Ramsey Community College; interpretive sign design

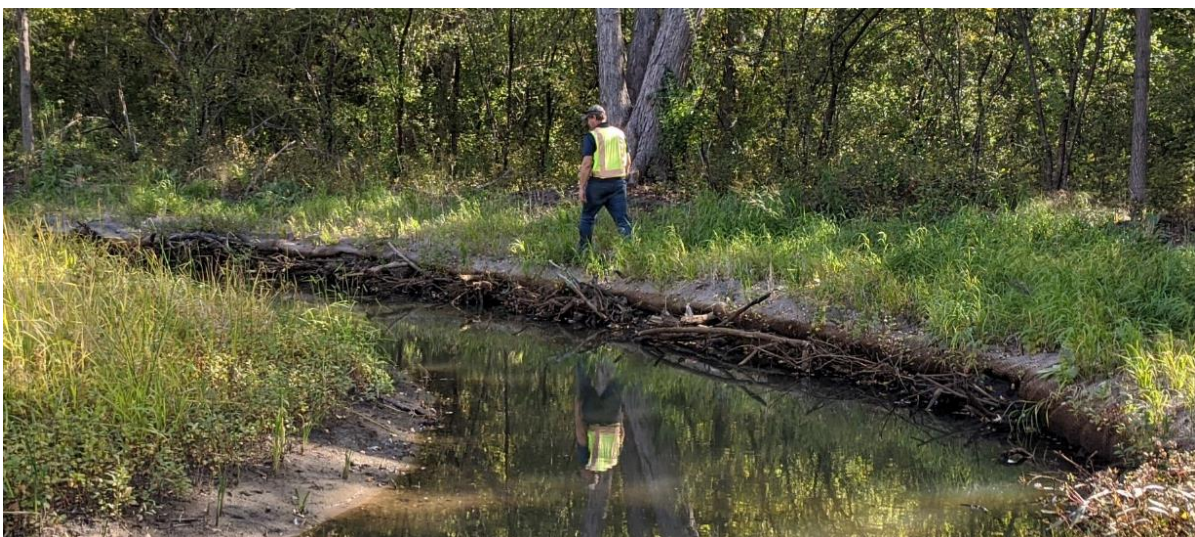
Pictures *(additional pictures attached)*



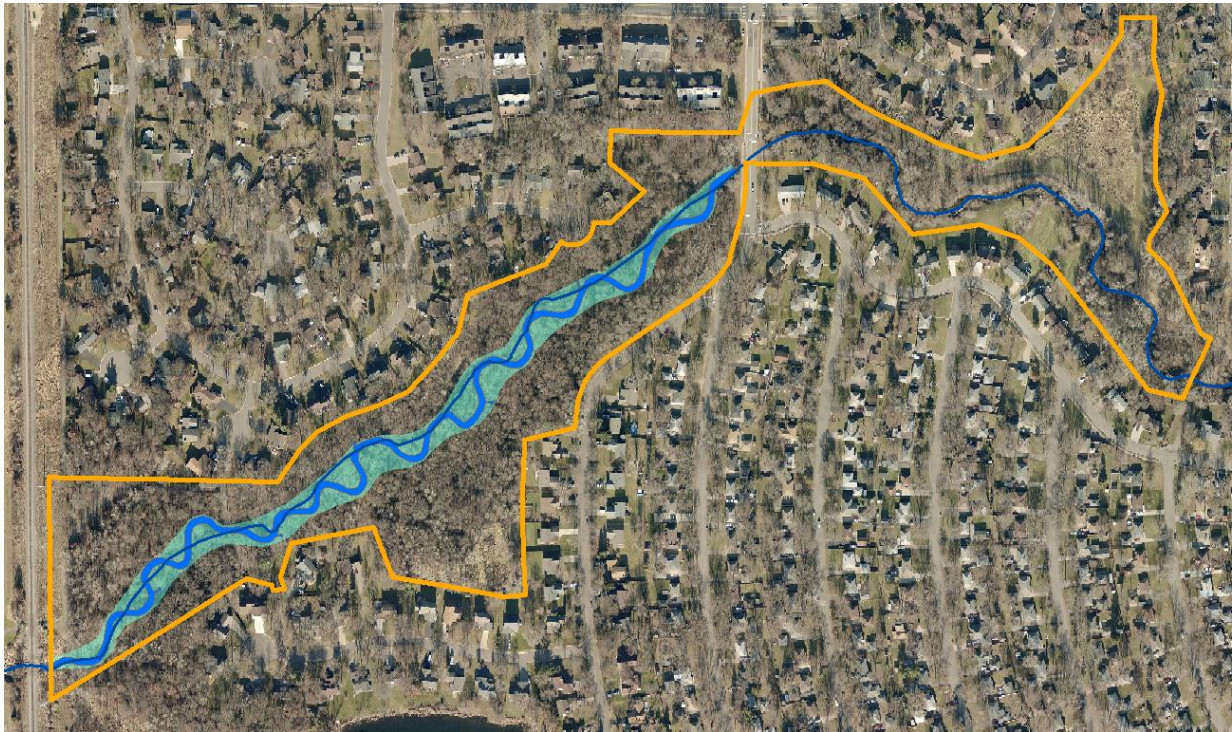
Location of project reach in Coon Rapids, MN within the Sand Creek Subwatershed



Map of all active erosion sites within the Sand Creek subwatershed prior to the project. The 2/3-mile project reach encompassed 16 erosion sites with an estimated total suspended sediment load of 141 tons per year, 28% of the annual cumulative TSS load attributable to streambank erosion within the subwatershed.



One of many newly constructed meanders stabilized via bioengineering practices (toe wood and a soil-encapsulated lift planted with dogwood live stakes).



The Middle Sand Creek project area (orange) showing the former channel alignment (dark blue) overlaid with the proposed meandering channel (light blue) and lowered floodplain (shaded). A Natural Channel Design approach was employed to design the new channel dimensions, pattern, and profile based on a stable reference reach nearby.



An engineered gravel riffle paired with a boulder cross vane to halt stream bed incision and create riffle-pool sequencing for improved in-channel habitat. Six gravel riffles and nine cross vanes were installed within the project reach.



Construction of a new meander stabilized with toe wood shown on the right during the first phase of construction in Winter 2019-20. Partial meanders were constructed off-line with stream flow still routed down the former channel (left).



Drone imagery of the project reach after the first phase of construction. Several newly constructed partial meanders are shown on the left with Sand Creek continuing to flow in its former alignment on the right. The site was left inactive for the 2020 growing season to promote revegetation/stabilization of the constructed meanders before excavating the rest of the new channel and diverting flow into it during winter 2020-2021.



Drone imagery of the newly constructed meandered channel in Spring 2021.



One of the interpretive signs designed by biology students at Anoka-Ramsey Community College highlighting the benefits provided by the new meandered channel.



View of newly constructed channel from the same vantage point in April 2021 (upper) versus August 2021 (lower) showing revegetation progress. Despite drought conditions in 2021, native seed and planted live stakes and trees flourished, enhancing riparian habitat and helping to stabilize banks.



One of the public ‘Watershed Walk’ outreach events where local residents accompanied District staff on a guided tour of the project.

The interactive, 3D-printed stream shape model of a portion of the project reach before-and-after re-meandering fabricated by Sleeping Dragon Studios LLC. Marbles are released to demonstrate how re-meandering a formerly straightened channel can dissipate energy, reducing erosive forces and pollutant loading.

