CLEAN WATER ACT SECTION 319 NONPOINT POLLUTION CONTROL PROGRAM

FINAL REPORT

SOUTH CENTRAL WATERSHED IMPLEMENTATION PROJECT SEGMENT 1

SPONSOR JAMES RIVER WATER DEVELOPMENT DISTRICT

Project Coordinators Rocky Knippling, Shane Deranleau, Matt Cavenee JAN 2021

This project was conducted in cooperation with the State of South Dakota and the United States Environmental Protection Agency, Region VIII

Grants: C998185-12, C998185-14, C998185-15, C998185-16, C998185-17, C998185-18, C998185-19, and C998185-20.

EXECUTIVE SUMMARY

PROJECT TITLE: South Central Watershed Implementation Project

PROJECT START DATE: June 15, 2016

PROJECT COMPLETION DATE: Aug 31, 2021

FUNDING:

Funding Sources

Fund Source	**Grant Code**	**Amount**
EPA – 319	C998185-12	$ 45,451.92
	C998185-14	$ 62,023.58
	C998185-15	$ 83,704.79
	C998185-16	$1,036,575.30
	C998185-17	$ 518,321.86
	C998185-18 C998185-19 C998185-20	$1,099,949.77 $ 141,000.00 $ 201,759.70 ==========
	Total 319	**$3,188,786.92**
Fund Source	**Projected Budget**	**Actual Expenditures**
Section 319 Funds	$ 2,210,500.00	$ 3,185,716.80
Other State Funds	$ 500,000.00	$ 87,363.65
Consolidated Funds	$ 1,032,500.00	$ 1,325,000.00
CWSRF	$ 300,000.00	$ 818,000.00
EQIP/CRP	$ 2,683,627.00	$ 1,038,117.18
Local Other Federal (RCPP) JRWDD (TA/FA) CWSRF-NPS(Firesteel)	$ 2,652,806.00 $ 2,383,297.00 $ 1,554,800.00 $ 0.00	$11,612,203.25 $ 2,486,962.40 $ 259,845.40 $ 547,488.23
Totals:	**$ 13,317,530.00**	**$21,360,696.91**

This project, the South Central Watershed Implementation Project, was carefully designed around our mission "Clean Water, Made Simple" and possible only through the support and opportunity of the 319 program. Our coordinators collectively have over 50 years of experience in agriculture and understood this mission to be critical to reach the decision makers that have the greatest influences on our waterbodies, we must help make it *easy to make the right decisions*. Additionally, our streamlined approach enables quick results that reach unserved needs in landowner assistance. Our South Dakota landowners are experiencing "program fatigue", distrust, as well as a diminished trust in "government assistance". Our success cultivates from developing grassroots relationships and facilitating common ground methods to reach critical landowners.

The Project's goal is to restore and maintain beneficial uses of the Lower James River, Lewis and Clark Watersheds as well as supporting the Vermillion River Watershed through the installation of Best Management Practices (BMPs) via targeting sources of sediment, nutrients, and fecal coliform bacteria.

These goals are too complex to be effectively accomplished alone. Thankfully, in cooperation with EPAs 319 program, we have been fortunate to be sponsored by an impressive organization of people, the James River Water Development District. Since July 14, 2015, James River Water Development District provides guidance and support that allows our coordinators to make progress in our watersheds while ensuring we are utilizing funding effectively. Together, we have worked to maintain and foster partnerships with many South Dakota agricultural organizations, federal and state agencies, and local government entities to facilitate success of the project. The previously merged Lewis and Clark and Lower James watersheds, that comprise South Central Project contains more than five million acres. This merger has leveraged staff and resources to better target assisting landowners and water impairments and more efficiently achieve project goals. Project success has allowed us to conditionally assist the Vermillion watershed for several years as well.

South Central Project Waterbodies and streams currently include: Academy Lake, Andes Creek, Antelope Creek, Beaver Lake, Burke Lake, Choteau Creek, Corsica Lake, Dante Lake, Dawson Creek, Emmanuel Creek, Fairfax Lake, Firesteel Creek, Geddes Lake, James River, Keya Paha River, Lake Andes, Lake Hanson, Lake Mitchell, Lewis and Clark Lake, Menno Lake, Mud Creek, Pierre Creek, Platte Creek, Platte Lake, Ponca Creek, Rahn Lake, Roosevelt Dam, Sand Creek, Slaughter Creek, Twin Lakes, Wilmarth Lake, Wolf Creek.

South Central goals were established using water sampling data collected from lake and stream assessments. Initial data indicated high levels of Total Suspended Solids (TSS) and *E. coli* bacteria. Project goals were set to target these loadings. USDA dollars and programs were available to treat the cropland Best Management Practices (BMP's), so this Project concentrated its funds on practices that addressed livestock grazing in degraded riparian areas and for concentrated livestock feeding areas. Studies identified over 900 feeding sites that had the potential to introduce nutrient loading into receiving waters of streams and tributaries in the

project area. Ag Waste Practice implementations were initiated as a tool to reduce *E. coli* loadings into the waters of the project area. Individual practices and BMPs used in this segment are presented in detail in the Project Goals, Objectives, and Activities, and Monitoring sections of this report respectively.

In 2016, this project received a USDA grant through the Regional Conservation Partner Program (RCPP), in the amount of 2.7 million dollars, to help with funding of the larger clean water projects. This program was well received by producers and the funds were quickly exhausted in 2018. An application was submitted to renew the funds up to the original amount which was accepted by the USDA in 2020. These funds will be instrumental in funding large projects into Segment II of this project.

Producer meetings, tours of completed projects, direct mailings, and print media were used to promote information awareness on how producers might access BMP design and installation from the Project. Partner agencies and one-on-one producer contacts were equally as important for practices installed.

Success of this segment was demonstrated by strong producer participation in installing the practices targeted for improving water quality. Tables showing milestones and load reductions from installed practices can be found later in this report; although it was a five-year segment, we were satisfied with the number of practices completed and amounts of load reductions achieved.

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INTRODUCTION

Figure 1. Full ag waste containment system abutting Snatch creek and Missouri River.

The South Central Watershed Project began in 2016, driven by local landowner demand for expansion of the existing Lewis and Clark Project. Several unserved watersheds were absorbed creating new project boundaries, a team of experienced ag professionals was formed, and a new project sponsor, James River Water Development District, stepped forward. South Centrals success is founded in the grassroots relationships and support from a number of conservation districts, USDA offices, and landowners' groups who have had project success with clean water projects.

South Central's project footprint is substantial allowing our coordinators to target specific stream segments and areas of concern where water sampling indicates impairments. Our project scope was developed with activities with the best known results in protection and reduction of specific impairments in South Dakota waters. We have maintained a great working relationship with South Dakota Department of Agriculture and Natural Resources (DANR) to hone our scope and impacts to best utilize 319 and other grant dollars. South Central receives continuous requests for assistance. We consider all projects but have found the biggest success in containing animal feeding operations, stream access control and water development in grazing operations, one-on-one consultation in grazing/feeding strategies, and sediment control projects in sensitive areas. South Central is also staffed with a lead water sampler that coordinates and collects regular water samples from strategic segments in sub watersheds to assess nonpoint source loads. This quality data is instrumental in regular strategic planning on both where and what to implement to address impairment trends.

Segment 1 of the implementation phase of the South-Central Project began in 6-15-2016. Coordinators began having listening sessions and meetings with conservation and landowner groups in areas with impaired segments in our project area. It did not take long to begin planning with landowners with longstanding operational issues that impacted local waters. Within weeks we were able to begin implementing best management practices (BMPs) and more importantly building relationships and local trust. Within months of segment 1 we had begun building on a strategic relationship and regularly sought out by local landowners with project assistance needs.

Our initial work focused on maintaining and improving Choteau Creek, Dawson Creek, Pierre Creek, Emanuel Creek and James River. Our footprint grew over time as well as building trust and confidence with local landowner groups. Our mutual understanding is that our goals overlap. Addressing non-point source pollution and sediment was not only critical for water quality but also to enable sustained, profitable operations in South Dakota livestock/ farming industries.

As our project grew, we sought out opportunities for expanded partnerships, funding sources, and collaborations on critical impaired segments. In 2016 South Central accepted a collaborative grant with the USDA-RCPP (Regional Conservation Partnership Program). The RCPP was utilized to reduce pressure on 319 funding sources as demand grew, as well as leveraging project dollars and match. Additionally, in 2018 the city of Mitchell applied and accepted a low interest loan through South Dakota DANR State Revolving Fund (SRF) for drinking water infrastructure projects. The SRF program allows a municipality to use a low interest loan but also provides for conservation funds to be used in the area. South Central held several meetings with the city of Mitchell to determine how we could cooperatively address impairments to Firesteel creek in the local watershed. Following a number of working meetings we began to administer SRF funding to implement BMPs along Firesteel creek to alleviate impairments from local ag operations.

Figure 2. Youth BMP field tour

Figure 3. Landowner/municipal tour

In addition to implementation of BMPs, cooperative entity project, and individual consultations South Central committed time to promote, attend and participate in several landowner meetings and field tours focused on environmental concerns and water quality. These included BMP tours showcasing implementation effectiveness to landowners and municipalities, field tours and classroom presentations for high school students, presentations to local Conservation District

board of directors, and working and presenting with interagency groups such as the Mid Missouri Burn Association.

Project Area

The South Central Watershed Implementation Project is a five year project that is a combination of the Lewis and Clark Watershed, the Lower James River Watershed Implementation Project, and now expanded to the Vermillion Watershed Project. Through the installation of BMPs in the watersheds, this project will restore or protect the water quality of targeted watersheds.

Similar to the previous projects, this Project will continue providing assistance for BMP installation in the priority project areas and complete an information campaign to keep stakeholders informed of project activities and progress.

The beneficial uses for waterbodies in this project's watershed are shown in Table 1 on page 6. Attainment of the beneficial uses in the watersheds allows continued use of the water bodies for drinking water, livestock water, swimming, boating, recreation, irrigation, commerce, wildlife, and residential living. This project will continue to build on the successes reached by the previous projects for successful restoration of the Lewis and Clark Lake Watershed, Lower James Watershed, and Vermillion River Watershed to its intended beneficial uses.

This project will also benefit Lewis and Clark Lake, which is threatened by sediment to the level that its life span is estimated by the Corps of Engineers to be 75 to 135 years. Lewis and Clark Lake is the source of drinking water for many Nebraska and South Dakota communities, and is part of the Missouri River main stem dam system that provides flood control and hydroelectric power. Located near Yankton, the lake is a major residential area (20-25,000 population), has over 1,000,000 visitors to its recreation areas, and has an annual recreational economic impact in excess of $12 million.

The Project includes South Dakota portion of seven Hydrologic Unit Codes (HUCs). The HUCs with the main waterbody associated with each the HUC are listed below. An outline map showing boundaries of the major drainages in the project area is located in Figure 4.

- HUC 10150006 - Keya Paha,
- HUC 10170101 - Lewis and Clark Lake,
- HUC 10150001 - Ponca
- HUC 10140101 - Lake Andes, Platte, Geddes, Dante
- HUC 10160010 – James River
- HUC 10170102-Vermillion River
- HUC 10170103-Vermillion River

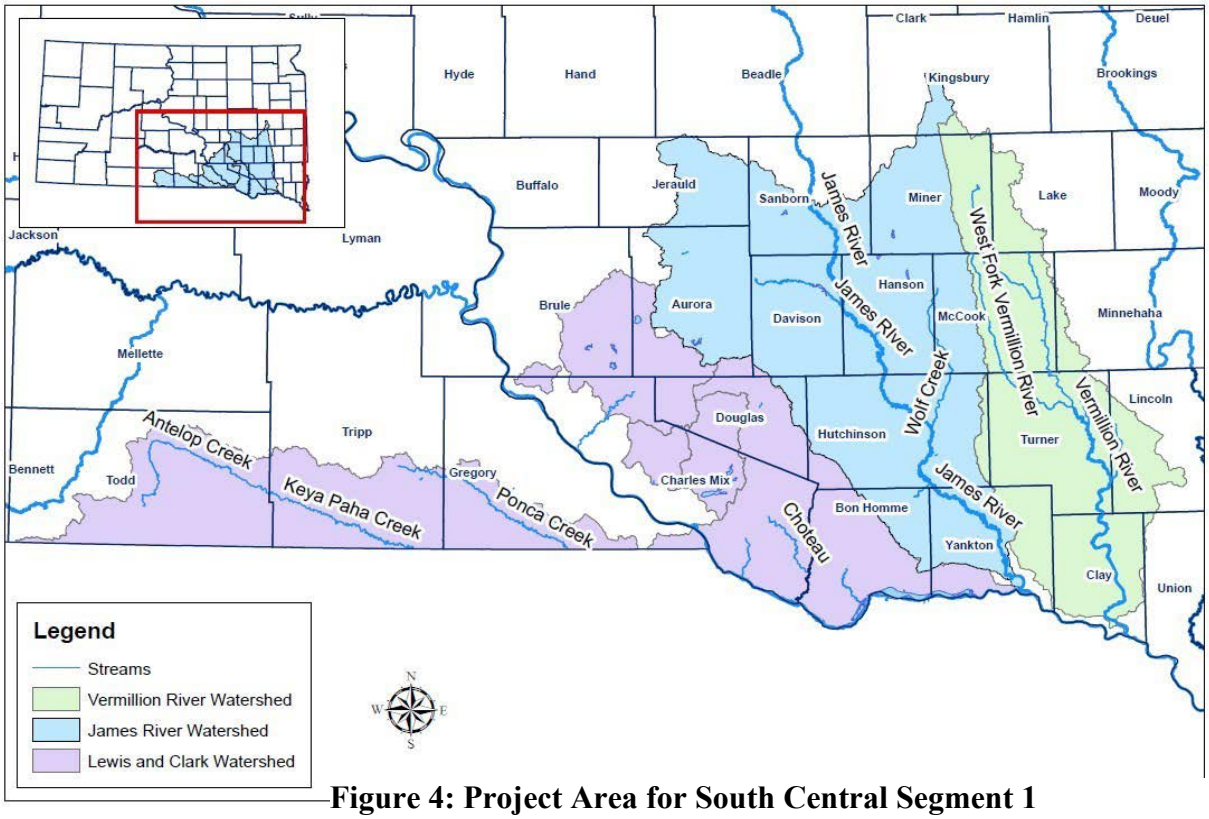


Figure 4: Project Area for South Central Segment 1

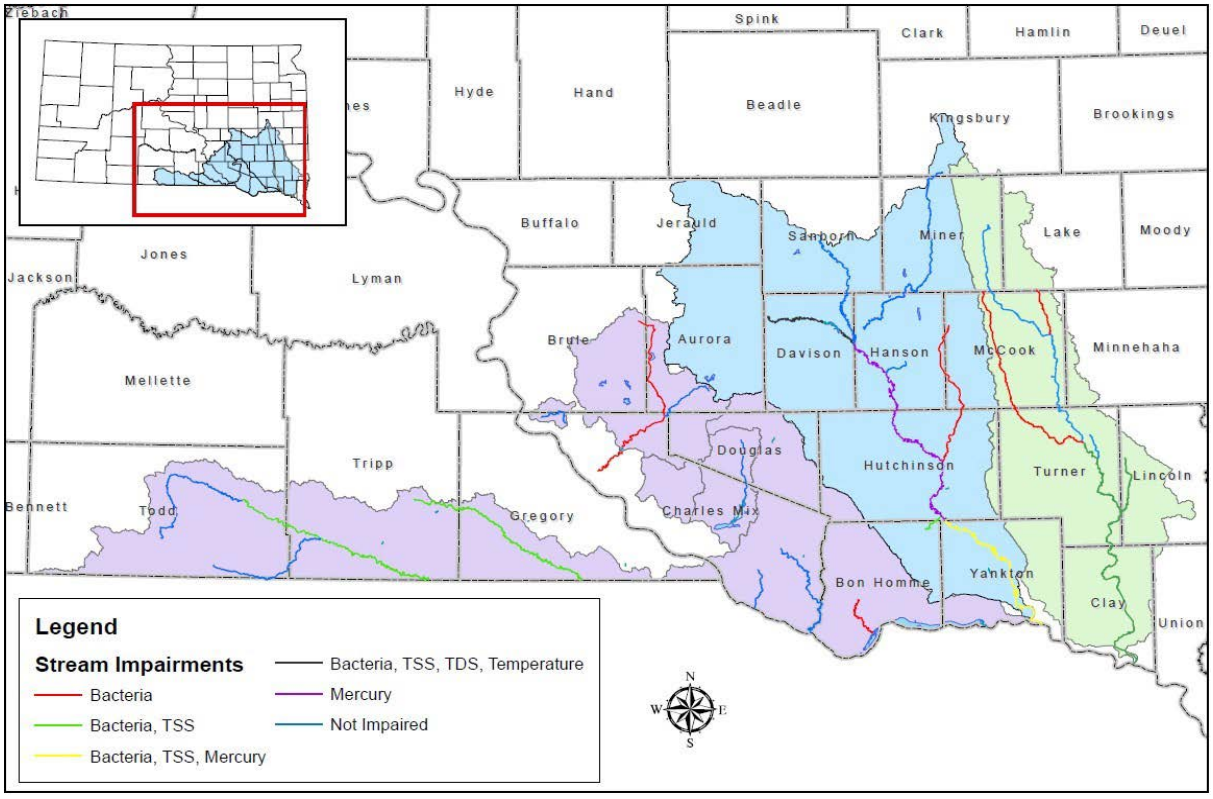


Figure 5: Impaired Reaches for South Central Project Area

Lewis and Clark Lake has a drainage area of approximately 10,000,000 acres, with 1,900,000 acres of the total in South Dakota. Of the total, 750,000 acres are located within the portion of the Project located east of the Missouri River; 1,150,000 acres west of the Missouri River. The Lake Andes watershed and the combined Geddes, Academy and Platte Lake watersheds added 95,000 and 465,000 acres respectively to the Project bringing the total project area to nearly 2.5 million acres.

Lower James River watershed encompasses an additional 2,558,800 acres bordering on the East side of the Lewis and Clark original Project. It covers portions of 12 counties many which many have area inside the Lewis and Clark coverage area. The lower James watershed begins just south of Huron and flows southward, converging with the Missouri River near Yankton. The James River is a perennial stream with its headwaters beginning near Fessenden, North Dakota crossing the state line into South Dakota and flows southward near Aberdeen and Huron, entering the lower James watershed.

The Vermillion River drains approximately 1.43 million acres (2,233 Sq. Miles) covering portions of fourteen eastern South Dakota counties. The basin is about 150 miles north to south, and varies in width from 12 miles in the north to 36 in the south. Much of the lower 22 miles of the river is channelized.

An estimated 96 percent of the total surface area is devoted to agriculture. Cropland accounts for sixty-seven percent of the land use. The primary crops are corn, soybeans, alfalfa, and small grain. The basin has 330,000 acres (= 23 percent) of grasslands which are used primarily for livestock grazing. Grasslands are mostly concentrated on the steeper sloping lands adjacent to the Vermillion River and its tributaries.

Land use in the total project area is primarily cropland and grazing. Row crops and hay are the main commodities produced on cultivated lands. Land use transitions from 70 percent cropland east of the Missouri River to 80 percent grasslands used primarily for livestock grazing and small grains west of the river. The dominant land use is cultivated cropland comprised of corn, soybeans, and sunflowers. Areas not tillable for these row crops are used as pasture, range, and hay land.

Average annual precipitation in the project area varies from 18 inches in the west to 26 inches in the east. Approximately 75 percent of the total is from rainfall during the months of April through September. The remainder is from melt water from the 36 inches of snow that falls on the area each winter. Tornadoes and severe thunderstorms are localized events, of short duration and occasionally produce heavy rainfall events.

Table 1: Beneficial Uses for Targeted Water Bodies.

Water Body	Basin	Beneficial Uses
Beaver Lake	Lower James River Basin	6,7,8,9
Dawson Creek	Lower James River Basin	6,8,9,10
Firesteel Creek	Lower James River Basin	1,5,8,9,10
James River	Lower James River Basin	5,8,9,10
Lake Hanson	Lower James River Basin	6,7,8,9
Lake Mitchell	Lower James River Basin	1,4,7,8,10
Menno Lake -	Lower James River Basin	5,7,8,9
Mud Creek (Yankton County)	Lower James River Basin	6,8,9,10
Pierre Creek	Lower James River Basin	5,8,9,10
Twin Lakes	Lower James River Basin	5,7,8,9
Wilmarth Lake	Lower James River Basin	4,7,8,9
Wolf Creek	Lower James River Basin	6,8,9,10
Academy Lake	Lower Missouri River Basin	1,4,7,8,9,10,11
Andes Creek	Lower Missouri River Basin	5,7,8,9
Burke Lake	Lower Missouri River Basin	4,7,8,9
Choteau Creek	Lower Missouri River Basin	5,8,9,10
Corsica Lake	Lower Missouri River Basin	6,7,8,9
Dante Lake	Lower Missouri River Basin	9,10
Emmanuel Creek	Lower Missouri River Basin	5,8,9,10
Fairfax Lake	Lower Missouri River Basin	4,7,8,9
Geddes Lake	Lower Missouri River Basin	5,7,8,9
Lake Andes	Lower Missouri River Basin	5,7,8,9
Lewis and Clark Lake	Lower Missouri River Basin	5,8,9,10
Platte Creek	Lower Missouri River Basin	1,5,8,9,10
Platte Lake	Lower Missouri River Basin	4,7,8,9
Ponca Creek	Lower Missouri River Basin	4,7,8,9
Roosevelt Dam	Lower Missouri River Basin	9,10
Sand Creek	Lower Missouri River Basin	5,8,9,10
Slaughter Creek	Lower Missouri River Basin	9,10
Antelope Creek	Niobrara River Basin	6,9,10
Keya Paha River	Niobrara River Basin	6,7,8,9
Rahn Lake	Niobrara River Basin	5,9
Long Creek	Vermillion River Basin	5,8,9,10
Vermillion River	Vermillion River Basin	5,8,9,10
East Fork Vermillion River	Vermillion River Basin	5,8,9,10
West Fork Vermillion River	Vermillion River Basin	5,8,9,10

Numerical Key to Beneficial Uses listed in Table 2:

(1) Domestic water supply waters;
(4) Warm water permanent fish life propagation waters;
(5) Warm water semi-permanent fish life propagation waters;
(6) Warm water marginal fish life propagation waters;
(7) Immersion recreation waters;
(8) Limited contact recreation waters;
(9) Fish and wildlife propagation, recreation, and stock watering waters;
(10) Irrigation waters; and
(11) Commerce and industry waters

Waterbody Description

Corsica Lake

Corsica Lake is a man-made impoundment created by an earthen dam across the upper section of Choteau Creek. The 56,038-acre watershed is located in south eastern Aurora County, extreme south western Davison County, and north central Douglas County, South Dakota. Agricultural lands compose the watershed with 70% being cropland and the remaining 30% being rangeland. A sediment survey for Corsica Lake was completed during the winter of 2000. Water and sediment depths were determined throughout the lake to estimate/calculate the total amount of deposited material in the lake. A mean sediment depth of 3 feet and a mean water depth of 5.7 feet were recorded during the assessment, with a maximum depth of 11 feet. Figure 6 shows the drainage area of the lake and it was the focus of the beginning of the Project Segment 1 implementation effort.

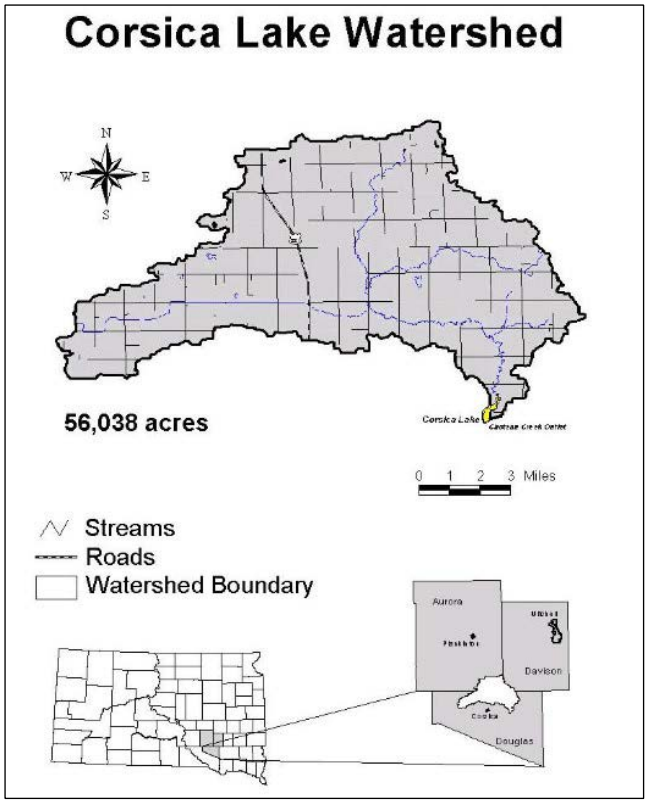


Figure 6: Corsica Lake Watershed

Lake Andes

Lake Andes is a shallow prairie lake located in northern Charles Mix County, SD. Historically, Lake Andes was a natural lake in a bedrock valley buried by mostly glacial till. The 141,000-acre watershed consists of mainly agricultural lands which 70% is cropland and 30% rangeland. Two county roadway dikes were constructed during 1938-39 that divide the lake into three units: North Unit, Center Unit, and South Unit. The North Unit receives most of its inflow from Andes Creek and an unnamed tributary. The North Unit has a maximum depth of approximately 7 ft. at which the North Unit spills into the Center Unit through a culvert in the roadway dike. The Center Unit receives a majority of it's inflow from the North Unit and two of the monitored unnamed tributaries. The Center Unit has a maximum depth of approximately 8 foot at which the Center Unit spills into the South Unit through the second roadway dike culvert. A majority of the South Unit inflow originates from the Center Unit and three monitored drainages.

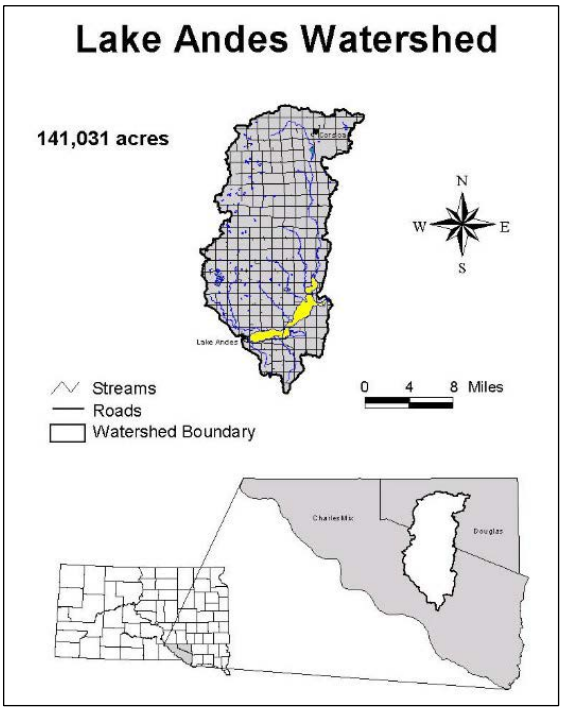


Figure 7: Lake Andes Watershed

Keya Paha River

The Keya Paha River drains over 1 million acres in south central South Dakota and discharges to the Niobrara River in Nebraska. The river receives runoff from agricultural operations and experiences periods of degraded water quality due to total suspended solids concentrations. The land use in the watershed is predominately agricultural consisting of cropland (42%) and grazing (57%), with the remaining 1% of the watershed composed of water and wetlands, roads and housing, and forested lands. These percentages are considered representative of both the watershed as a whole, as well as the drainage area immediately surrounding the listed segment. The contributing drainage area is composed of 17% Nebraska lands, 50% Tripp County Lands, and 33% Todd County Lands.

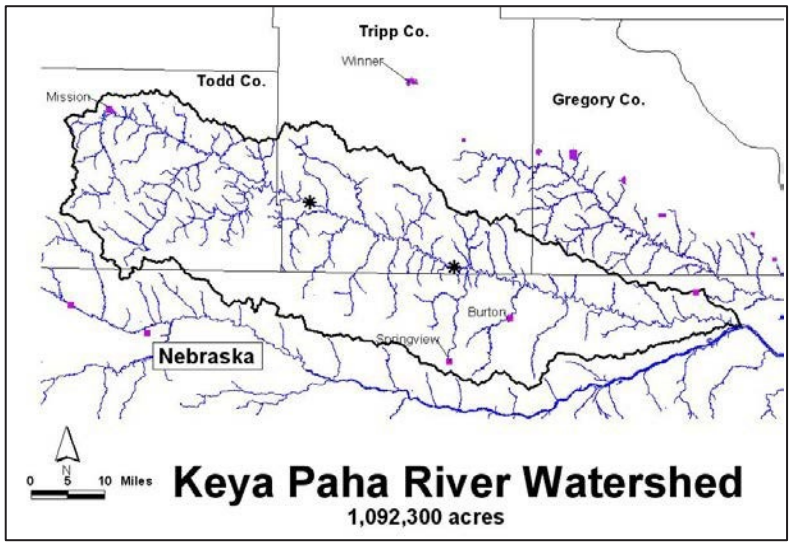


Figure 8: Keya Paha Watershed

Platte Creek

Platte Creek drains 370,000 acres in central South Dakota and discharges into the Missouri River below Platte Lake. Its drainage includes portions of four different counties: Aurora, Brule, Charles Mix, and Douglas. The land use in this watershed is mainly agricultural with 59% being cropland and 40% consisting of pasture and rangeland. Kimball and Platte are two small communities included in the drainage area. Support from local groups and producers were the basis for adding the Platte Creek into the Lewis and Clark Implementation Project as a protective measure for the watershed.

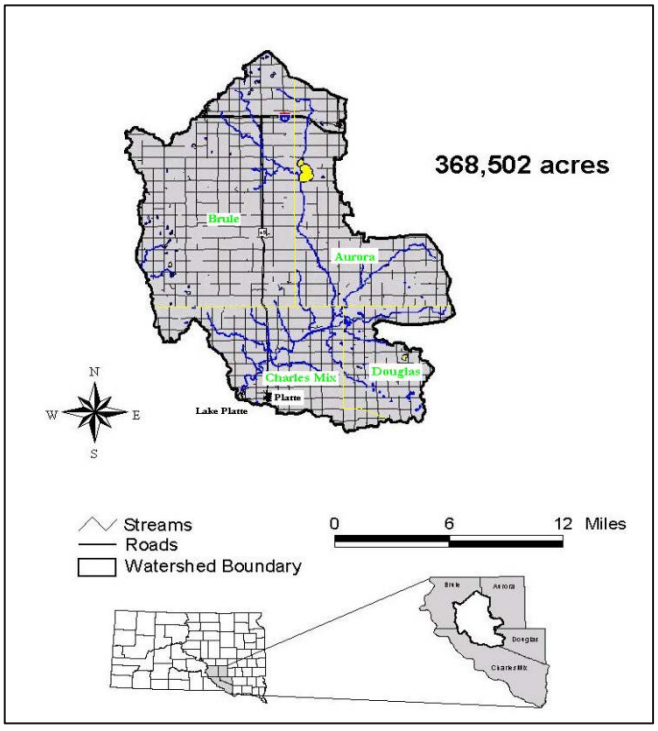


Figure 9: Platte Creek Watershed Map.

Choteau Creek

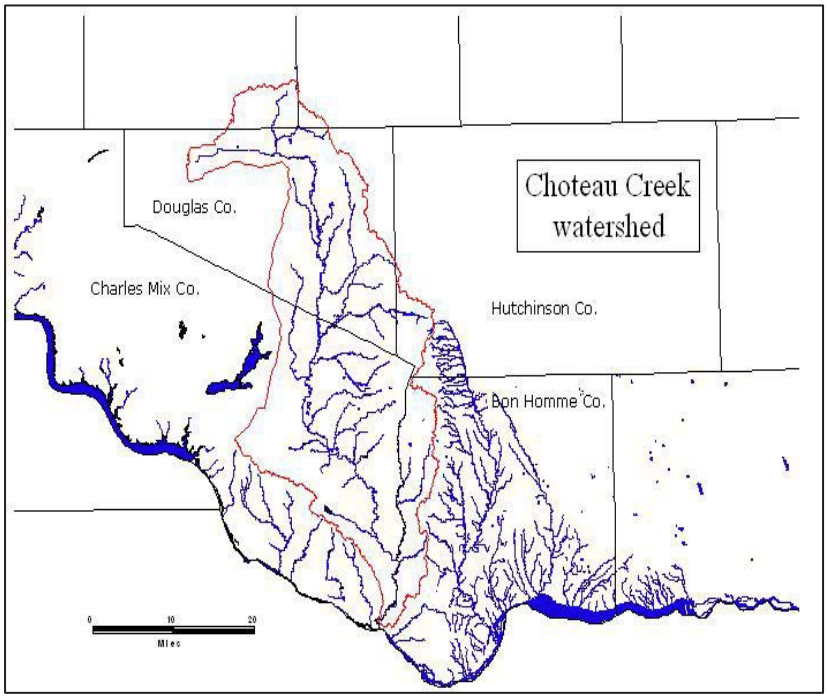


Figure 10: Choteau Creek Watershed.

Choteau Creek drains 375,000 acres in southeast South Dakota (Figure 10) and discharges to Lewis and Clark Lake on the Bon Homme and Charles Mix County line. The stream receives runoff from agricultural operations. During the assessment, data were collected indicating the creek experiences periods of degraded water quality as a result of TSS loads. The land use in the watershed is predominately agricultural consisting of 45% grass, 40% row crops, 7% small grains, 6% developed (including farmsteads, roads, and small communities), 1% forestland and wetlands. There are four small communities within the watershed they include Wagner, Delmont, Avon and Armour. Corsica Lake is an impoundment on the upper reaches of this stream.

Emanuel Creek

Emanuel Creek drains 120,000 acres in southeast South Dakota and discharges to Lewis and Clark Lake in Bon Homme County. The stream receives runoff from agricultural operations. During the Lewis and Clark Watershed Assessment, it was determined that the creek experiences periods of degraded water quality due to total suspended solids concentrations. The land use in the watershed is predominately agricultural consisting of cropland (61%) and grazing (32%), with the remaining portions of the composed of water and wetlands (2%), roads and housing (4%), and forested lands (1%). These percentages are considered representative of both the watershed as a whole, as well as the drainage area immediately surrounding the listed segment.

Emanuel Creek was assessed as an individual portion of the larger Lewis and Clark Watershed Assessment which assessed individual streams such as Emanuel Creek as well as the entire drainage basin and the cumulative effects of the individual waterbodies. Livestock feeding

area analysis was conducted basin wide, with over 500 individual feeding areas examined. Ninety-seven of these feeding areas were located in the Emanuel Creek drainage.

Ponca Creek

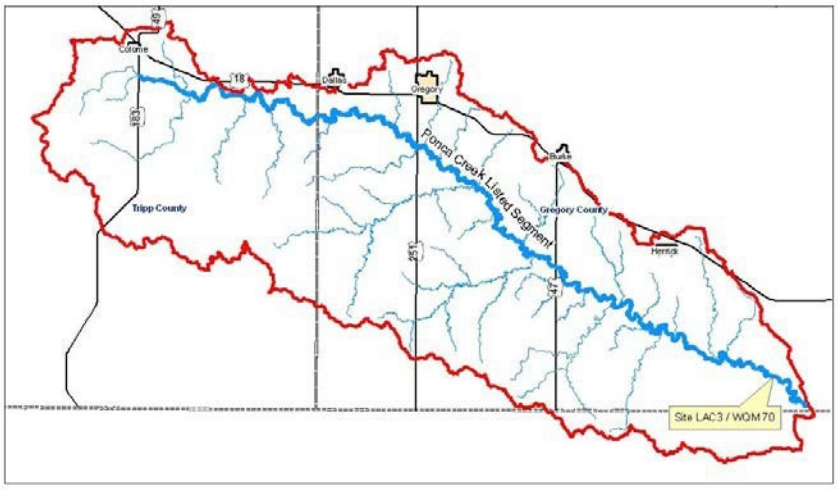


Figure 11: Ponca Creek Watershed

The entire Ponca Creek watershed drains 520,000 acres in South Dakota and Nebraska and discharges to Lewis and Clark Lake near Verdel, Nebraska. The 303(d) listed segment that this project addresses drains approximately 240,000 acres of Gregory and Tripp Counties in south central South Dakota. The communities of Burke, Colome, Dallas, Gregory and Herrick all reside within the listed segments drainage. The population of the watershed is approximately 2,900 with nearly half residing in and around the community of Gregory. Land use in the watershed is predominately agricultural in nature. Major land use categories are 78% native rangelands, 8% row crops, 6% developed (this includes road right of ways), 3% small grains, 2% hay ground, 1% forested, and 1% water and wetlands. Ponca Creek was assessed as an individual portion of the larger Lewis and Clark Watershed Assessment, which assessed individual streams as well as the entire drainage basin and the cumulative effects of the individual waterbodies on Lewis and Clark Lake.

Dante Lake

Dante Lake is a small impoundment on Dante Creek, a tributary of Choteau Creek, near the southeastern boundary of Charles Mix County, South Dakota. The reservoir has an average depth of 11 feet and a maximum depth of 23 feet. Dante Creek is the primary tributary to Dante Lake which drains a small 2,884-acre watershed of 80% cropland and 20% grazing lands. It was listed as a degraded waterbody during 2004.

Geddes Lake

Geddes Lake is a man-made impoundment located on Pease Creek in southwest Charles Mix County. The lake has an average depth of 3.2 feet and a maximum depth of 12 feet with a drainage area of 76,000 acres. The drainage consists of agricultural lands with 79% being cropland and 21% rangeland. The outlet drains into Pease Creek and eventually empties into the Missouri River. Approximately 47 feedlots have been identified in the watershed.

Platte Lake, Burke Lake, Roosevelt Lake, Rahn Dam, Antelope Creek, Slaughter Creek and Snatch Creek.

These streams and waterbodies are listed but do not have assessments or TMDL's completed at this time. They are being treated with the same BMPs that are used on the above listed water bodies which deal with sedimentation and nutrient loading to protect the watersheds from further degradation from nonpoint sources.

Firesteel Creek/Lake Mitchell

The overall sediment loading to Lake Mitchell appears to be low. The AGNPS model predicted an annual load of 39,370 tons of sediment to Lake Mitchell which would reduce the depth of Lake Mitchell 1 foot every 61 years. Analysis of the 1993 water quality data estimated even less suspended solids entering the lake per year (14,053 tons). When a detailed subwatershed analysis was performed by AGNPS, 7 of the 40 subwatersheds analyzed appeared to have above average sediment deliverability rates. The seven subwatersheds with elevated sediment yields were found to contain 34.3% of the critical erosion cells and occupy 8.3% of the watershed area. The suspected source of elevated sedimentation is from agricultural croplands that have land slopes of 5% and greater. Water quality samples collected found elevated suspended sediment loads in the locations as the AGNPS model. The total nutrient loadings to Lake Mitchell are high. The model estimated the annual loadings to Lake Mitchell at 166 tons of nitrogen and 63.3 tons of phosphorus. Water quality monitoring in 1993 estimated annual loadings of 197 tons of nitrogen and 67.1 tons of phosphorus. It was not possible to pinpoint the sources of the nutrients with the water quality monitoring since the sites were so widely spread throughout the watershed. With the low sedimentation rate to Lake Mitchell, the most likely source of the high nutrients is from animal feeding operations within

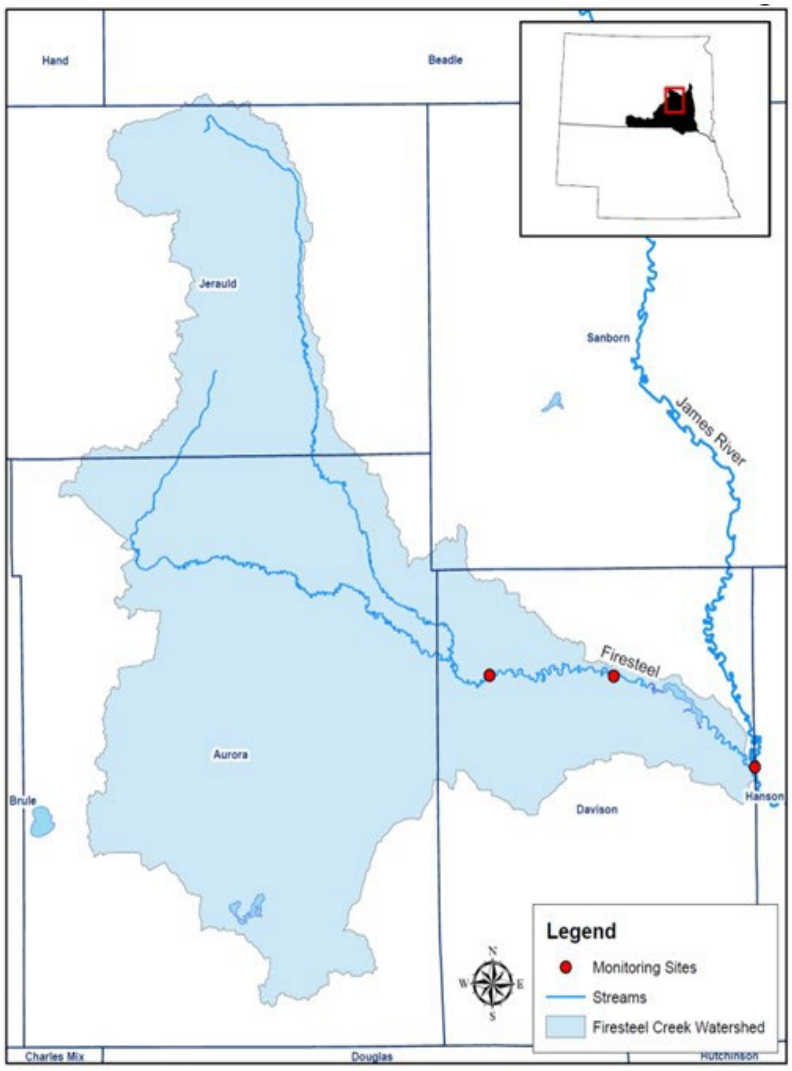


Figure 12: Firesteel Creek Watershed

the watershed. Water quality samples did contain large concentrations of fecal coliform in many of the samples; again, pointing to animal waste as a probable source.

Dawson Creek

The entire Dawson Creek watershed drains 44,768 acres in South Dakota and discharges to the James River. The stream drains portions of Hutchinson and Bon Homme Counties in southeast South Dakota. The communities of Tripp and Scotland reside upstream of the listed segments drainage. Over half of the population (1,500) within the watershed resides within these communities. The total population of the watershed is approximately 2,500. Approximately 36% of the population resides in rural agricultural areas of the watershed.

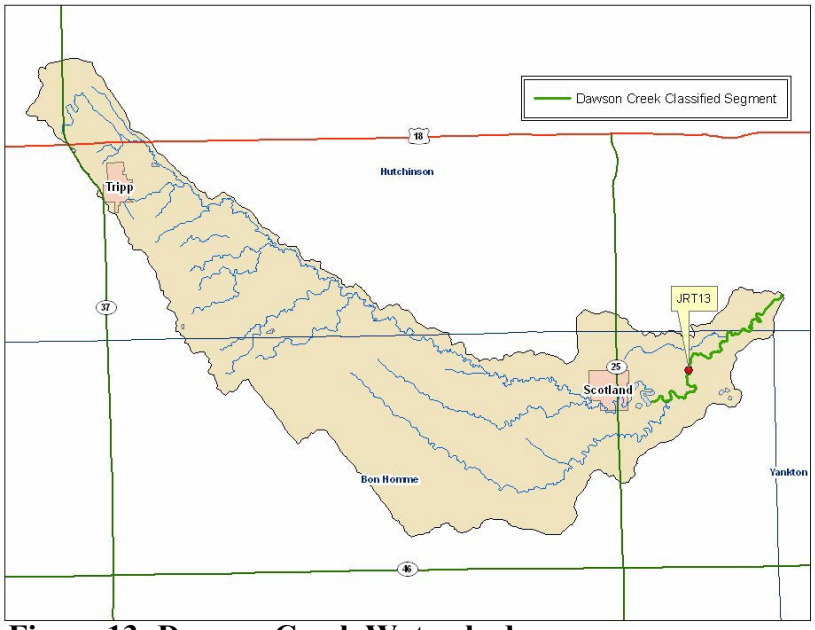


Figure 13: Dawson Creek Watershed.

The major crops in Bon Homme County are Alfalfa, corn, soybeans, oats and grain sorghum. About 75% of the Ethan-Bon association supports native grasses and is used for grazing (USDA, 1984). Land use in the watershed is predominately agricultural. Major land use categories include; 64% row crops, 25% native rangelands, 6% urban or developed, 3% hay ground, 1% small grains, and just over 1% forest-shrub and water.

Dawson Creek was assessed as an individual portion of the larger Lower James River Watershed Assessment, which focused on individual streams such as Dawson Creek as well as the entire drainage basin and the cumulative effects of the individual waterbodies on the lower portion of the James River.

Pierre Creek

Pierre Creek drains 78 square miles in central eastern South Dakota and discharges to the James River in Hanson County (Figure 14). The stream receives runoff from agricultural operations. The watershed is composed of 54% cropland, 37% grasslands (including pastures and hay ground), 7% developed (farmsteads and the town of Alexandria), 2% water and wetlands, and the remaining 1% trees and shelterbelts. The impaired segment of stream starts at the James River and stretches approximately two miles upstream of Lake Hanson. The watershed of the impaired section drains approximately 30 square miles. The community of Alexandria is the largest municipality located within the watershed and has a zero-discharge waste treatment permit. Lake Hanson is located within the impaired reach of stream. The portions of the watershed located upstream of Lake Hanson were the target of an EPA Section 319 watershed implementation project with a goal of reducing nutrient loadings to the lake.

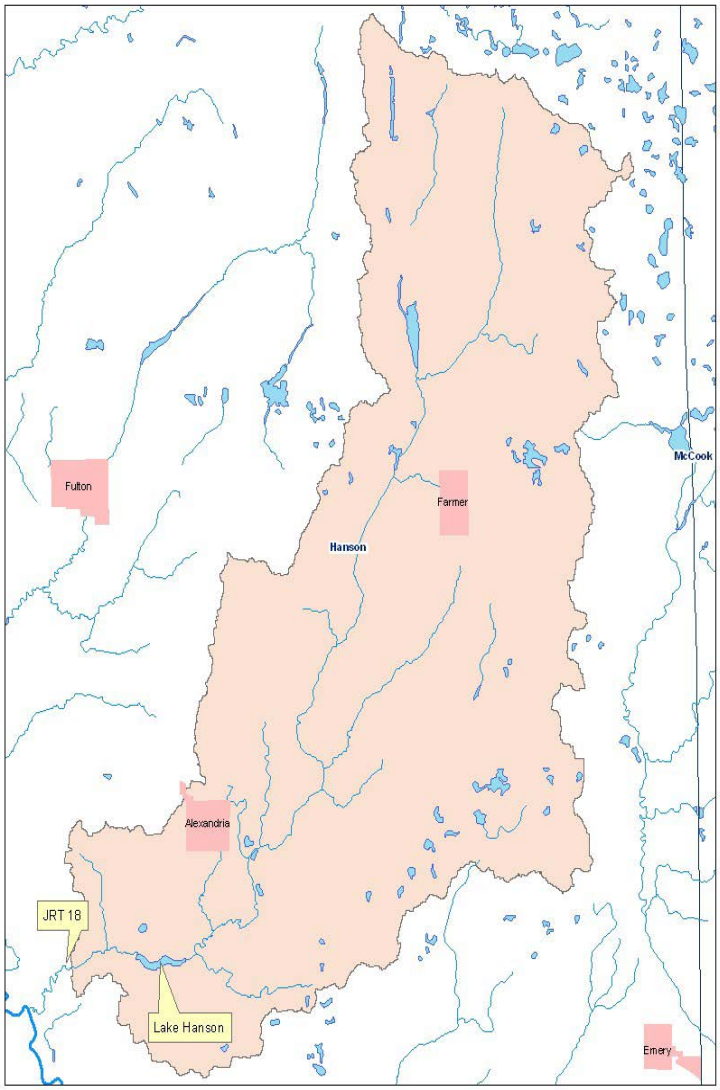


Figure 14: Pierre Creek Watershed.

Wolf Creek

Wolf Creek drains about 255,600 acres in southeast South Dakota (Figure 15) and discharges to the James River southwest of the community of Bridgewater. The stream receives runoff from agricultural operations. During the watershed assessment, data was collected indicating the creek experiences periods of degraded water quality as a result of TSS loads. The land use in the watershed is predominantly agricultural consisting of 59% row crops, 23% grass, 6% developed (including farmsteads, roads, and small communities), 4% herbaceous, 4% close seeded/small grain, and 3% water and wetlands. There are four small communities within the watershed that have permitted wastewater treatment facilities: Canova, Spencer, Emery and Bridgewater. None of these communities lie within the impaired reach of Wolf Creek. The impaired reach of the Wolf Creek drainage lies within Hutchinson County.

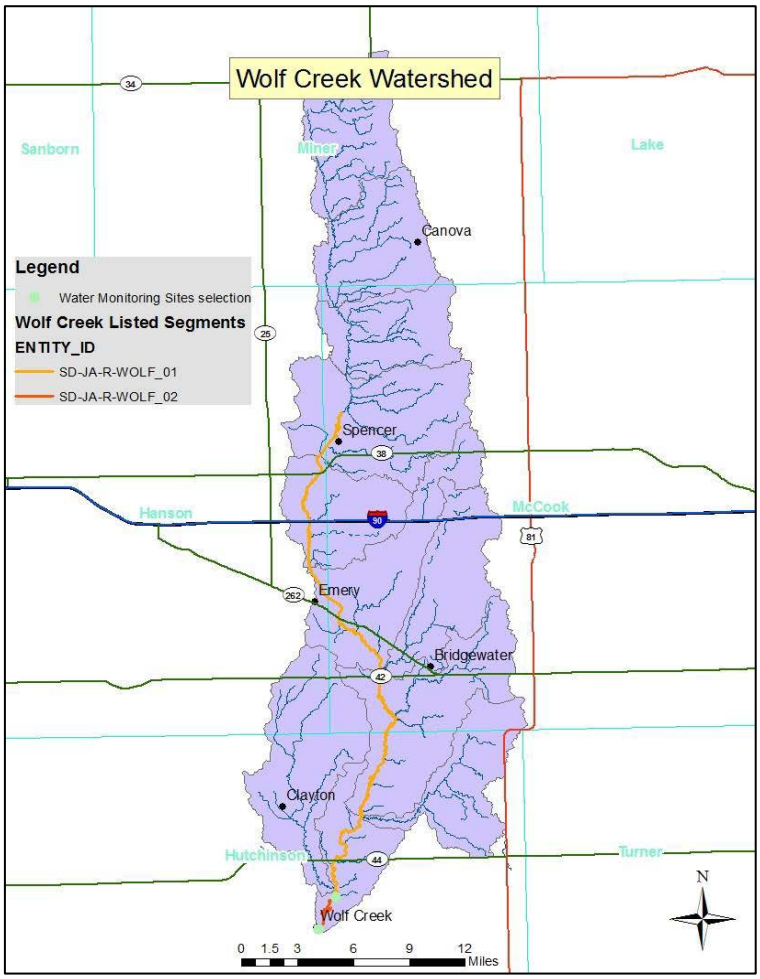


Figure 15: Wolf Creek Watershed

Wolf Creek was assessed as an individual portion of the larger Lower James River Watershed Assessment. The Lower James Watershed Assessment assessed the entire drainage basin as well as individual streams and the cumulative effects of these waterbodies. There are also two ambient water quality monitoring stations located on Wolf Creek.

Nonpoint Source Pollutants

Fecal Coliform Bacteria

The data indicated that animal feeding operations contribute fecal contamination to the tributaries of the impaired reaches of this watershed. In many cases, the concentrations of fecal coliform bacteria and *E. coli* were too high for human recreation. TMDLs for fecal coliform bacteria have been developed for Keya Paha, Ponca, Choteau, Emmanuel, Dawson, Pierre, Wolf, James River and Vermillion River. High fecal coliform counts were also detected in the Snatch Creek drainage; however, no standards for bacteria exist for this water body. Data from the feedlot survey completed during the watershed assessments are available and have been used to prioritize feedlots in the project area

.

Sedimentation

1. Sheet and Rill Erosion

   Modeling indicates that in western portion of the watershed cropland erosion is not critical to the sediment load, mainly due to lower percentages of cropping land in the watershed. Modeling indicated that many tributaries of the Keya Paha and Niobrara Rivers were found not to generate significant sediment loads. Some eastern South Dakota watershed areas, particularly in Bon Homme County, may benefit from activities aimed at cropping practices such as reduced tillage, no till, and buffering systems. To a larger extent, managed grazing systems, which would improve range condition and reduce runoff, will benefit the the project area.

2. Riparian Areas

   The AGNPS model indicated concerns regarding riparian conditions. Data indicated that degraded riparian areas and channel erosion were a significant source for sediment entering the waterbodies. Complexities of some of the degraded areas will require additional site-specific analysis before any BMP designs. Eroded channels appear to be the result of several different causes, and in some cases a combination of causes in various locations in the watershed. Causes of degradation are listed below:

   - Season long grazing, overstocking, and unmanaged grazing of stream banks may be one of the larger contributors to degraded channels.
   - Improper sizing and placement of culverts has resulted in channel erosion downstream from where water carried by the culvert empties into the stream and degraded ecological site.

3. Channel Erosion

   Data gained using the Annualized Agricultural Nonpoint Source (AnnAGNPS) Model and Rapid Geomorphic Assessments (RGAs) identified degraded riparian areas and channel erosion as significant sources for sediment entering the waterbodies. Eroded channels appear to be related to management practices, and in some cases, a combination of practices. These include:

   - season long grazing, overstocking and grazing along streambanks appear to be associated with much of the degraded channels identified,
   - culvert sizing and placement has created some localized erosion problems downstream from their placement
   - Poor ecological range condition on some of the uplands has created increased runoff that has led to channel erosion

Table 2 below identifies water bodies in the Project Area listed in the "2020 South Dakota Integrated Report for Surface Water Quality Assessment" as not meeting their designated beneficial use(s).

Table 2: South Central Watersheds Implementation Project Water bodies and their designated beneficial uses listed as not being met or threatened.

Designated Beneficial Uses Not Being Met or threatened							
Water body	Immersion Recreation	Limited Contact Recreation	Warm Water Marginal Fish Life	Warm Water Permanent Fish Life	Warm Water Semi-Permanent Fish Life	Fish/Wildlife Prop, Rec, Stock	Irrigation Waters
Beaver Lake					X		
Burke Lake					X		
Dante Lake				X			
Dawson Creek		X					
Emmanuel Creek		X			X		
Geddes Lake					X		
James River					X		
Keya Paha River		X			X		
Lake Andes	X	X	X				
Lake Carthage				X			
Pierre Creek		X					
Ponca Creek		X					
Rahn Lake				X			
Roosevelt Lake						X	
Slaughter Creek						X	X
Wolf Creek			X				
Long Creek		X					
Vermillion River		X			X		
East Fork Vermillion River		X					
West Fork Vermillion River		X					

Project Segment 1 Accomplishments

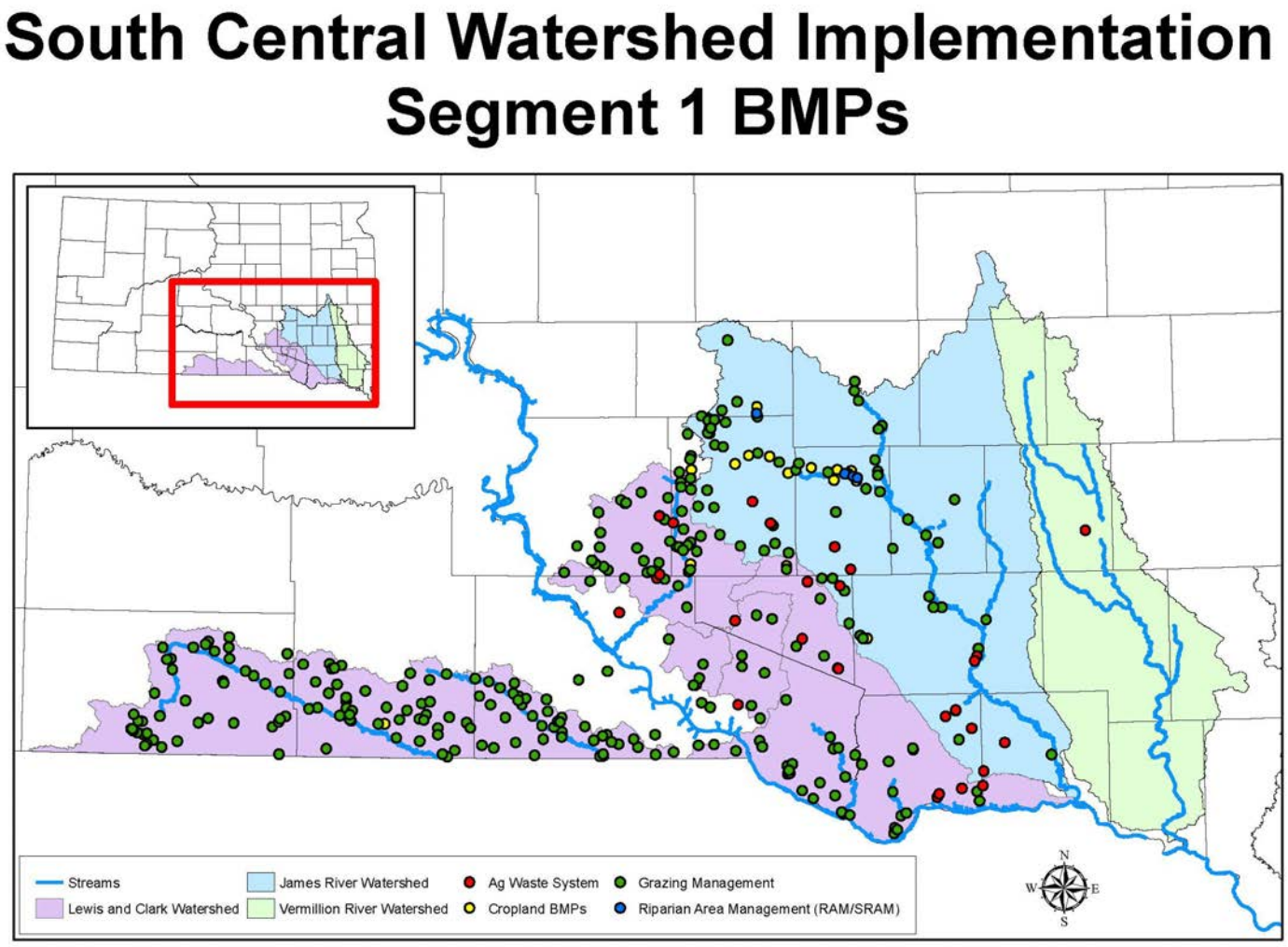


Figure 16: BMPs Installed During Project Segment 1

South Central Project Segment I initiated on June 15, 2016 and ended on September 30, 2021. This five year segment met the goals laid out for it at the beginning of the segment. Figure 16 shows the location of the BMPs installed in this portion of the project, demonstrating the active producer interest in practices offered by the project. An expansion of the project area was done in 2017 with the inclusion of the Vermillion River Watershed. James River Water Development Board remained the lead sponsor for this project and was crucial in its support and assistance in installing BMPs in the project area. A Success Story was written during this segment on the Pierre Creek drainage. The 2020 SD Integrated Report shows that Pierre Creek was in full support of its intended beneficial uses. A copy of the story can be found in the Appendix portion of this report.

This report will indicate benchmarks set by the original Project Implementation Plan were met for this segment of the Project. The tasks completed during this segment to install BMPs that reduce NPS pollution from the watershed are described in the Project Goals, Objectives and Activities and Monitoring section.

Project Goals

The goal of the South Central Watershed Implementation Project is to restore or protect the beneficial uses in the Lower James River Watershed, Lewis and Clark Lake Watershed, Vermillion River Watershed, and the watersheds of Geddes Lake, Academy Lake, Platte Lake, and Lake Andes. This will be accomplished through the installation of Best Management Practices (BMPs) in the watersheds that target sources of sediment, nutrient loading, and fecal coliform bacteria loadings. This project, Segment I, will address and target BMP installation in the entire South Dakota portion of the Lewis and Clark Lake Watershed (1.9 million acres), the Lower James watershed and its tributaries (2.6 million acres), Vermillion River Watershed (1.43 million acres). It will also provide technical and financial assistance to the watershed activities in the Lake Andes, Geddes, Academy, and Platte Lake Watersheds. These additional four watersheds add up to 560,000 additional acres and are tributaries of the Missouri River. The total project area acreage is 6.483,800 acres.

This project segment (Segment I) will:

- Continue BMP implementation in the Lewis and Clark Watershed, Geddes, Academy, Platte Lake watersheds, and impaired reaches of the Lower James River Watershed targeted towards installation of high priority BMPs identified in the Watershed Assessment.
- Conduct a public education and outreach campaign to educate and inform landowners, stakeholders, and area residents on water quality issues and BMPs associated with this project.

Project Objectives and Accomplishments by Task

Objective 1: Reduce nutrient, sediment and fecal coliform loadings in the South Central Watershed project area through the installation of Best Management Practices.

Task 1: Plan and implement cropland and grassland Best Management Practices.

Provide assistance to landowners with installation of BMPs on cultivated cropland and grassland that reduce fecal coliform bacteria, nutrient, and sediment loadings originating on these lands. BMPs will primarily be installed with landowner investments along with USDA programs (EQIP and CRP), as well as Wildlife agency programs (USF&WL and SD GFP). Project funds for technical assistance on grassland and/or cropland BMP implementation will be targeted towards critical cells in riparian areas identified in the watershed assessments.

Figure 17. Cows grazing cover crop

Product 1: 10,000 acres of cropland benefited from BMP installation by landowners.

BMPs installed by landowner will include filter strips, riparian buffers, tree plantings, conservation cropping systems, and grassed waterways on 10,000 of cultivated cropland to reduce nutrient and sediment loading. BMPs using 319 funds will only be located in riparian areas.

Figure 18. Moving to new cover crop field

Milestones:	Planned:	Completed:
Cropland Practices	10,000 acres	7,713 acres

Accomplishments:

Direct funding of cropland BMPs were restricted with 319 dollars to riparian areas, so primary funding for these BMPs were provided by USDA agencies from their CRP and EQIP programs. Data from those individual practices were not available at the time this report was written. Funding of cropland practices with 319 dollars accounted for 77% of the goals needed. Preliminary USDA estimates show that when their program acreages were totaled in with the 319 projects, it sufficiently met the goal of 10,000 acres.

Figure 19. Aerial seeded cover crop in corn

Figure 20. Newly seeded grass on crop field

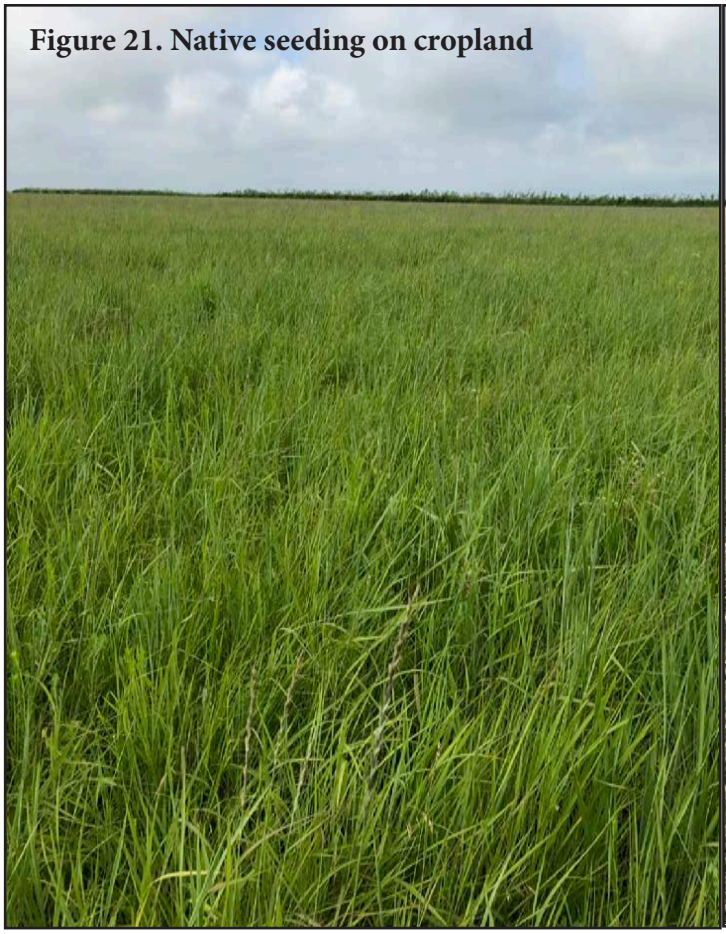


Figure 21. Native seeding on cropland

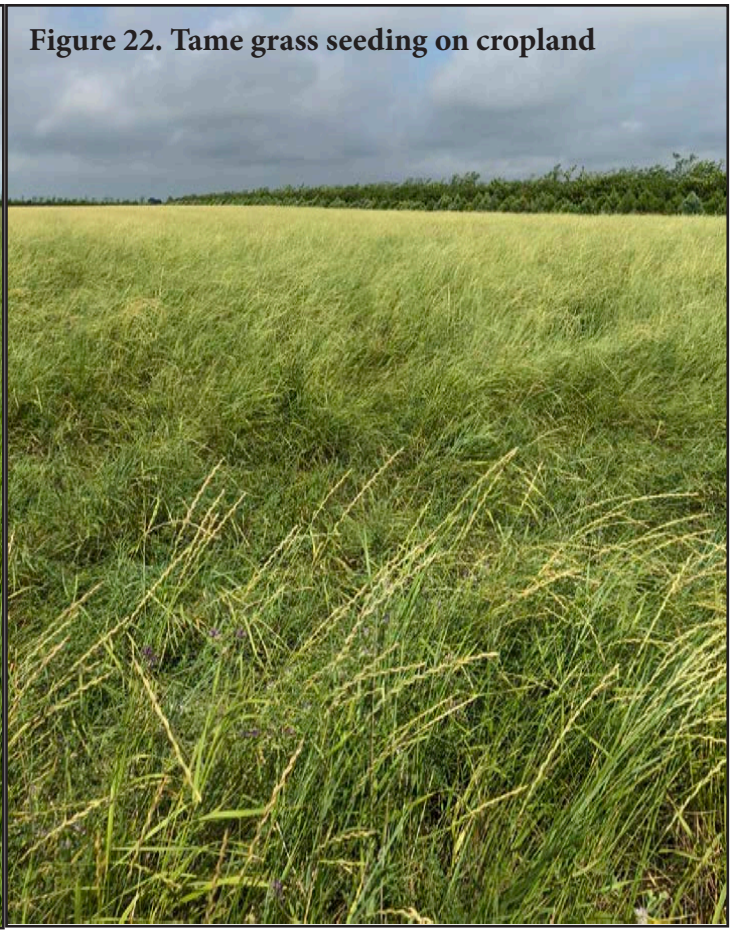


Figure 22. Tame grass seeding on cropland

Product 2: Grassland Managements Systems installed on 75,000 acres

Grassland management systems will be designed and installed on 75,000 acres of grassland to reduce fecal coliform, nutrient and sediment loading. Technical assistance will be provided by the coordinators of this project to write designs and implement them on the landscape. NRCS staff will assist on projects that include funds from their agency as well. BMPs planned to be installed include planned grazing systems, fencing, livestock exclusion, grass seeding, pipelines, tanks, ponds, rural water hookups, alternative water sources, and riparian buffers. Use of 319 funds to implement grazing management systems, will be for riparian grasslands along major tributaries that have been identified as critical cells, and where other sources of cost share is not available.

Figure 23. Pipeline being trenched in

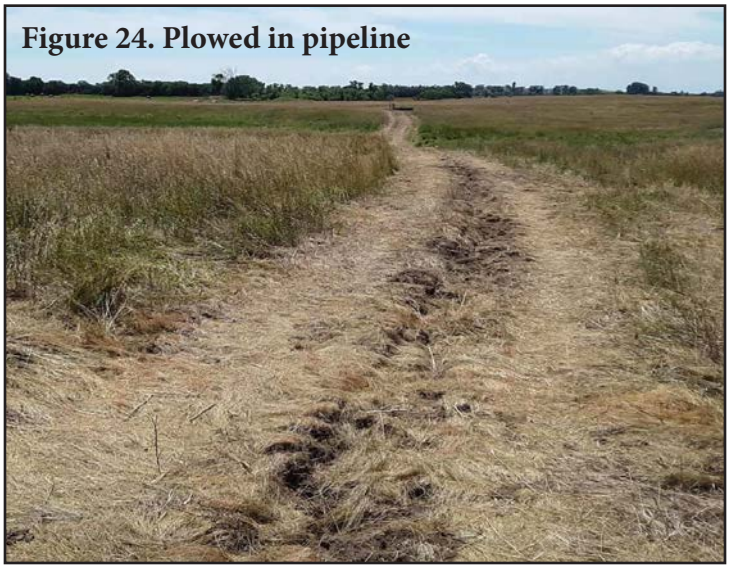


Figure 24. Plowed in pipeline

Figure 25. Plowing in pipeline

Milestones:	Planned:	Completed:
Cover Crop	0	4338 acres
Grazing Planned Systems	75,000 acres	73,220 acres
Livestock Pipeline	0	288,744 feet
Tanks	0	88 Tanks
Tree/shrub establishment	0	315 acres

Figure 26. Solar pump system replacing broken down windmill

Figure 27. Tire tank split with cross fence so can be used in two pastures

Figure 28 & 29. Cross fenced pasture to better distribute grazing

Figure 30. Tree plantings in sod for winter protection

Accomplishments:

Grazing BMPs offered by this Project segment still show great demand from livestock producers. Practices offered simply try to reduce or eliminate grazing pressure on fragile riparian areas. Providing cost share on pipelines to supply fresh drinking water for livestock and fencing to exclude or ease grazing impact on riparian areas were the backbone of this practice. Demand for these BMPs far exceeded funds available to fund them all, thus funded projects were based on gaining the highest level of impact for the least amount of dollars. A large majority of producers didn't elect to use RAM dollars for excluded areas, which kept the dollars spent to a minimum. Producers are realizing that the best path for putting pounds on livestock is by offering fresh drinking water instead of relying upon stagnant waters from ponds or seasonal streams.

Figure 31. Tree plantings in sod for winter protection

Product 3: Riparian Area Management (RAM) will be installed on 325 acres.

The RAM Program is a livestock exclusion set aside type program for riparian lands. It is designed to reduce phosphorus, suspended solids, and fecal coliform bacteria loading by ensuring that tracts of land not eligible for the USDA Continuous Conservation Reserve Program become protected as riparian buffers. DANR RAM Program guidelines issued in 2020 are to be followed.

Milestones:	Planned:	Completed:
RAM acres	325	240

RAM is used as a tool to help producers obtain funds for idled riparian grazing acres. As mentioned earlier in the report, many producers opted not to be paid for these acres and kept the focus of this offering to the bottom stretches of Firesteel Creek in Davison and Aurora Counties. Installations in this watershed were paid with a non 319 sources of funds, which is why it was only offered in this area.

Project costs for this practice can add to a moderate amount of dollars and we are saving the 319 dollars for other BMPs.

Task 2: Reduce fecal coliform loadings originating from animal feeding operations.

Assist livestock producers with construction of eleven (11) animal waste management systems to include seven nutrient management plans to reduce loading of fecal coliform bacteria, nutrients, and total suspended solids.

Product 4: 11 Animal Waste Management Systems (AWMS)

Eleven animal waste systems, to include nutrient management plans and engineered designs, will be installed by producers. NRCS Nutrient Management Team has designed most of the feedlots in this segment as well as writing the nutrient plans. Funding sources for AWMS practice include 319, SD SRF Consolidated Funds, Landowners, RCPP, and the NRCS EQIP program. All of these systems will be full containment. Three systems will be expected to be relocations in anticipation of cost saving mechanics. Components of this practice will include fencing, water development, concrete, along with fabricated and/or tree windbreaks for livestock protection.

Figure 32. Completed monoslope deep pit cattle barn, steel frame

Milestones:	Planned:	Completed:
Engineering Designs	11	23
Nutrient Management Plans	7	19
Relocated Feeding Systems	3	15
System Constructions	11	21

Figure 33. Completed monoslope cattle barn, wood frame

Figure 34. Hoop barn with cow calf pairs

Figure 35 & 36. Construction of steel frame monoslope cattle barn

Accomplishments:

All facilities installed through this segment were on a prioritized list, formed during the assessment, Participation in the NRCS EQIP program or the South Central RCPP were critical for these projects' involvement in the segment. This practice can be very costly to complete so the more funding sources available the better we can assist more producers. Traditional dirt feedlots are still being installed but a shift has begun to more concentrated feeding buildings. Some producers cannot afford to give up the twenty acres needed to accommodate traditional feeding systems and are going with confinement build-ings to ease the acreage situation. These barns can run from $1.5 to $1.8 million to construct in the multiple funding sources to facilitate the construction. Livestock will gain more pounds per day in these facilities and use less feed to gain than in the traditional dirt feedlots. Along with the manure credit can offset the costs that producers have in operating them. Of the twenty-one systems installed in this segment about forty percent of the installed practices were the confinement build-ings. Costly they may be, but this practice does more for water quality than any other practice offered by this project. Funding from this project came equally from 319 sources, SRF Consolidated funds, and the RCPP program sponsored by this project.

Figure 37. Feedlot prior to installing AWMS

Figure 38. After construction of AWMS

Objective 2: Provide project and BMP information to a minimum of 100 watershed landowners, 20 watershed organizations, and 2,500 area citizens to inform them of this project's need and/or progress.

Task 3: Implement an Information and Education campaign to inform the public and stakeholders on project need and progress, results, and recommendations of the Watershed Assessment Final Report.

Figure 39. Before Buffer Strip

Removed cattle and feeding from creek and installed fence and seeded grass

Figure 40. After Buffer Strip

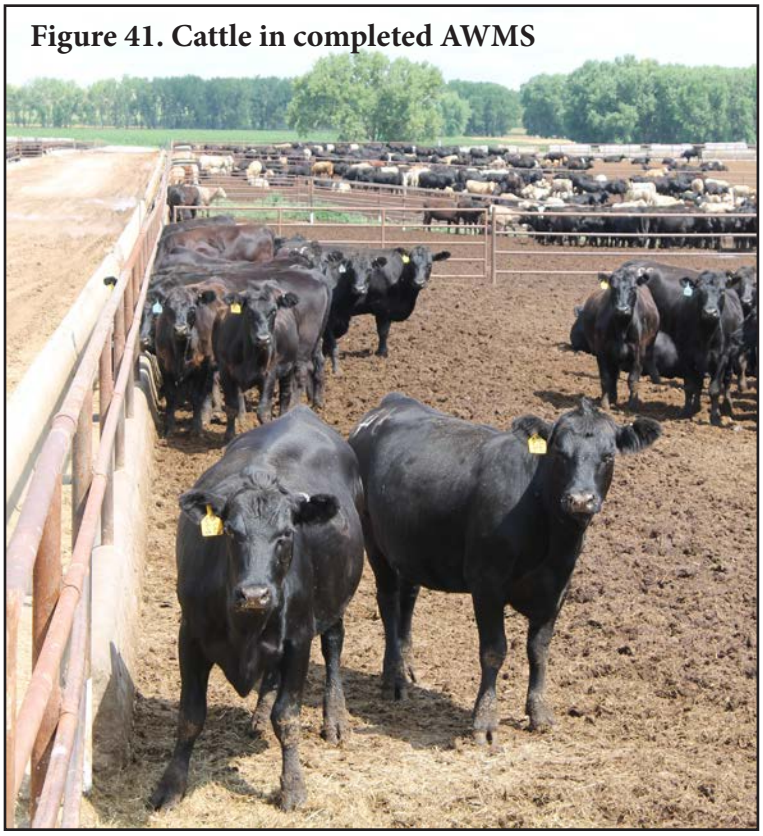


Figure 41. Cattle in completed AWMS

Figure 42. Continuous poured bunks, poured on site

Figure 43. Cattle in completed AWMS

Figure 44, 45, 46 .Photos from feedlot prior to construction, site was on a creek that when flooded would flood the feedlot pens.

Figure 47. Before construction

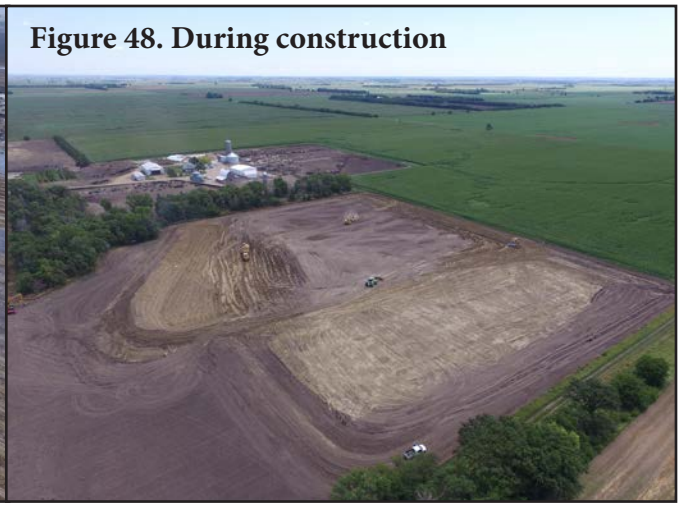


Figure 48. During construction

Figure 49. Finishing construction

Figure 50. AWMS completed and in use

Product 5: Information and Education Campaign of informational meetings (2), tours (2), newsletters (3), steering committee meetings (5), and press releases (4) completed.

Figure 51. Tour of a deep pit monoslope cattle barn

The project coordinator will provide assistance to James River Water Development Board to complete an information and education campaign that includes on-farm tours, news releases, presentations to area stakeholder organizations, and an annual meeting of the project steering committee. The cost of information activities, including supplies and postage, will be provided to this 319 project and James River Water Development and their partners.

Figure 52. Youth BMP field tour

Accomplishments:

South Central hosted four on farm tours of livestock confinement facilities and an alternative cropping system. No meetings were held for steering committee meetings, due to the large size of the project area, it was very difficult to get everyone together in the same facility. Numerous meetings were held throughout the segment with individual or groups of stakeholders to inform them of the current situations regarding the project. This project and the sponsors were very satisfied with attendance and public participation at the informational events.

Figure 53. Touring a hoop barn

Objective 3: Completion of water quality monitoring, monitor project progress, and complete project administration and management to document project progress towards objectives and meet grant administration policy and guidelines.

Task 4: Monitoring water quality through water sampling related to BMP installation to assess changes in water quality from PMP installation and from the initial watershed assessment sampling. Project staff will collect water samples to evaluate before and after water quality changes at the outlets of creeks for testing at the State Health Lab. Testing will be completed utilizing technical assistance from the SD DANR and following procedures established in "Standard Operating Procedures for Field Samplers".

Product 6: Water Quality Monitoring to monitor project impacts;

120 water samples @$65/test

Figure 54. Ponca Creak low flow

Figure 55. Ponca Creek high flow

Milestone:

120 water samples taken, tested, and water quality changes evaluated.

Figure 56. Emanuel Creek sample site, high flow event near Springfield

Product 6 Cost: $10,700

Product 6 Completion: 152 samples @ $9,880

Accomplishments:

This segment saw the project coordinators assemble a water sampling regime to test the waters of the Lewis and Clark Lake drainages and the impaired creeks in the Lower James River Basin. Samples were collected at established Water Quality Monitoring sites so flows could be determined without further effort and maintain consistency with other ongoing monitoring. Samples were tested for Total Suspended Solids and E coli Bacteria by the SD State Health Lab. A good base set of samples is being assembled by this undertaking for future use and comparisons. Analysis of the collected samples can be found in Monitoring section of this report.

Figure 57. Lake Hanson on Pierre Creek dam break, high run off event in 2019

Figure 58. Lake Mitchell on Firesteel Creek, spill way running full

Figure 59. James River sample site near Mitchell, out of bank flow

Figure 60. Firesteel sample sight near Mount Vernon

Figure 61. Wolf Creek sample site

Figure 62. Platte Lake dam washed out during high flow event

Figure 63: Sampling at Emanual Creek

Task 5: Monitor progress and complete progress reports and complete grant administration to project requirements and guidelines.

Product 7: Annual (5), final (1) reports according to grant guidelines and requirements.

Product 7 Cost: $0

The cost of these products is included in personnel costs.

Milestones:

1. 5 annual reports
2. 1 Final Report

Responsible Agencies:

Technical Assistance Coordination:

1. Project Coordinator/Project Staff
2. James River Water Development District
3. Project Area Conservation Districts

Information Transfer:

1. Project Coordinator/ Project Staff
2. James River Water Development District
3. Natural Resources Conservation Service
4. Landowners

Implementation:

1. Project Coordinator/Project Staff
2. James River Water Development District
3. Project Area Conservation Districts
4. Landowners
5. SD Department of Agriculture and Natural Resources

Financial Assistance:

1. Water Quality 319 Projects
2. James River Water Development District
3. Project Area Conservation Districts
4. SD State Revolving Fund Programs

Summary of Project Goals and Objectives

Planned and completed milestones from Segment l of the South Central project can be found in Table 3. Overall, the project met or exceeded most BMPs planned for the project.

Table 3. Milestones Planned Versus Accomplished Comparison.

BMP/Practice	Planned	Completed
Cropland BMPs		
Total Acres Benefited	10,000 Acres	4,175 Acres
Grazing Management		
Planned Grazing (Acres)	80,000 Acres	73,077 Acres
Riparian Area Management (RAM Acres)	325 Acres	239 Acres
Ag Waste Systems		
Engineering Designs	11	23
Nutrient Management Plans	4	19
Relocated Feedlots	3	15
System Constructions	11	21
Water Quality Monitoring (Samples)	120	341
Information and Education		
Informational Meetings	10	30
Press Releases	4	5
Newsletters	2	1
Steering Committee Meetings	2	0
Tours	4	5
Step L Load Reduction/segment		
Nitrogen (lbs)		711,111
Phosphorous (lbs)		156,062
Sediment (tons)		26,724

Monitoring and Evaluation

Financial information, milestones and load reductions were monitored using SD DANR's Tracker Database through the internet. Water quality monitoring was conducted through the SD DANR's ambient water quality monitoring stations and through extra samples collected by the project. Samples taken from 2007 through 2015 are considered as "Earlier Samples" and those collected between 2016 and 2021 were called "Last Five Years" for comparison purposes in the following segment. Samples were collected at the following locations:

- Choteau Creek
- Emanuel Creek
- Dawson Creek
- Pierre Creek
- Wolf Creek
- Ponca Creek
- Firesteel Creek (5 sites)
- Keya Paha River
- James River (6 sites)

Keya Paha River

Keya Paha River is impaired for Total Suspended Solids (TSS) and *E.coli* Bacteria in the SD DANR's Integrated Report (IR). Water samples were collected at LEWISCLARAC2 or ambient water quality monitoring site 460815 (same location) shown in Figure 64.

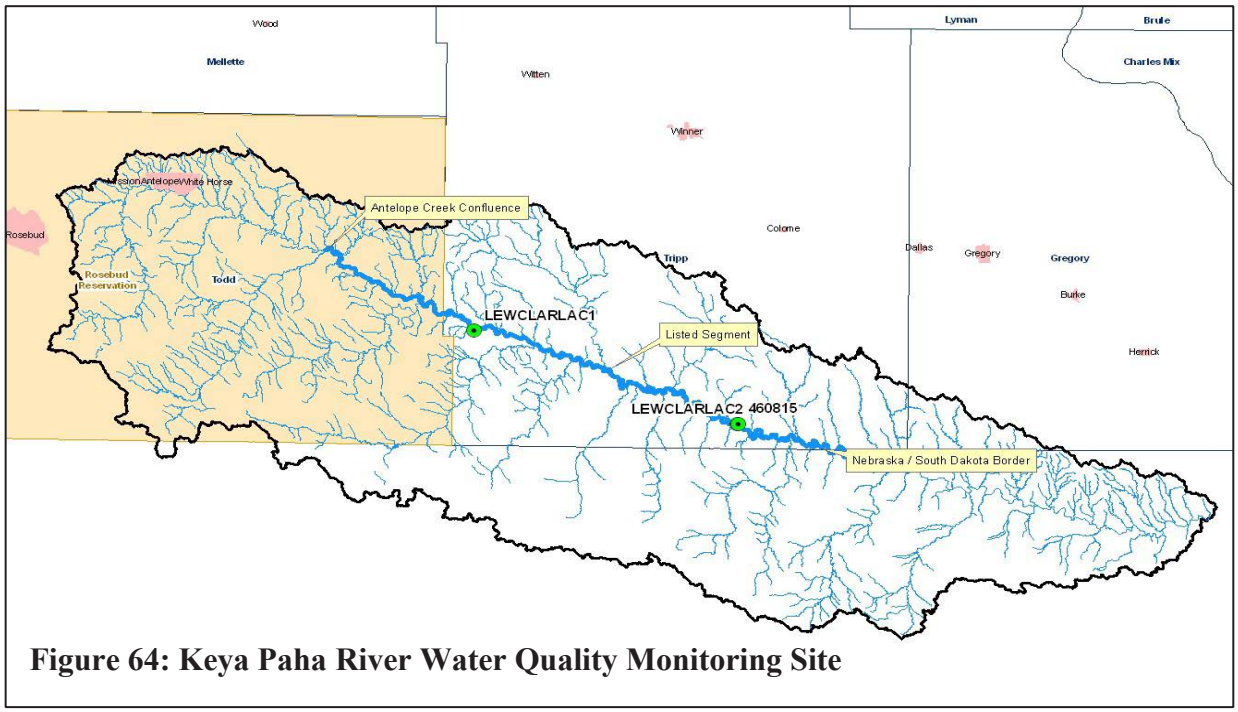


Figure 64: Keya Paha River Water Quality Monitoring Site

There is an upward trend in *E.coli* between the two time periods for Keya Paha with regards to *E.coli* sampling (Figure 65). Here the median value increased from 203 to 273 CFU/100mL in comparing the Earlier Samples to the Last Five Years data set. The standard for *E.coli* on the Keya Paha River is 1178 CFU/100mL.

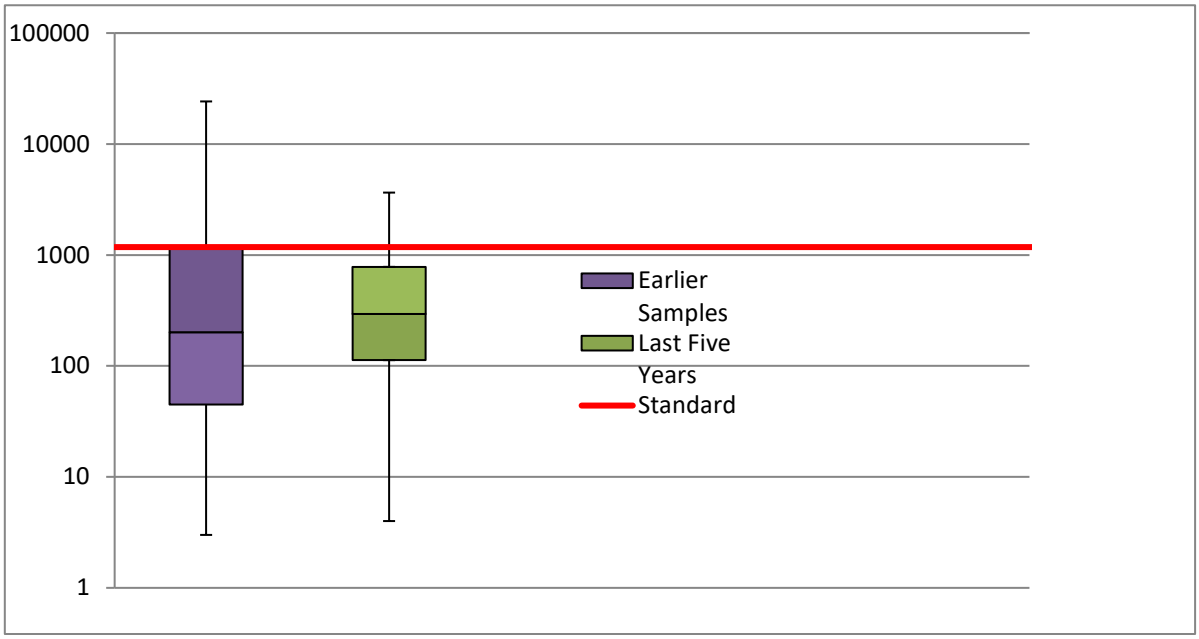


Figure 65: Keya Paha River E-coli Box and Whisker Plot

All E-coli samples from 2016 to 2021 taken at the Keya Paha WQM site are displayed below on Figure 66. There is a 22% excedance rate for the Last Five Years data set compared to a 26% for the Earlier Samples data set.

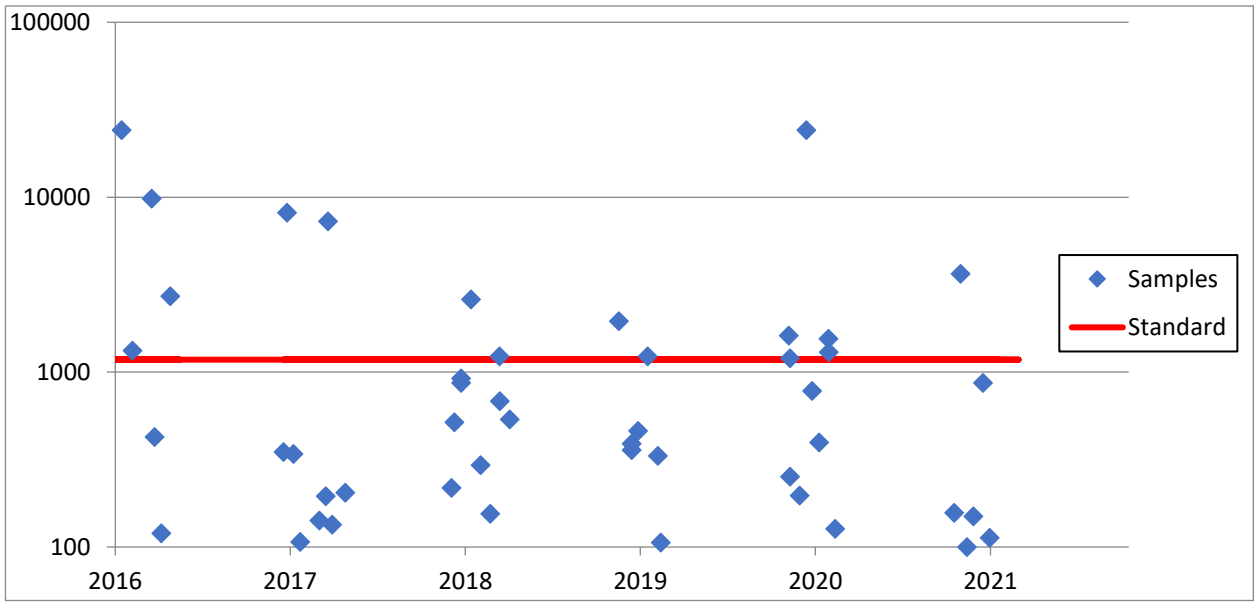


Figure 66: Keya Paha River E-coli Samples

TSS samples show a slight increase in the median values from 72mg/l to 75mg/l in comparing Earlier Samples to the Last Five Years samples. The Total Suspended Solids standard on the Keya Paha River is 158mg/l. Even with a more intense sampling regime in the Last Five Years' time frame there was a decrease in this category.

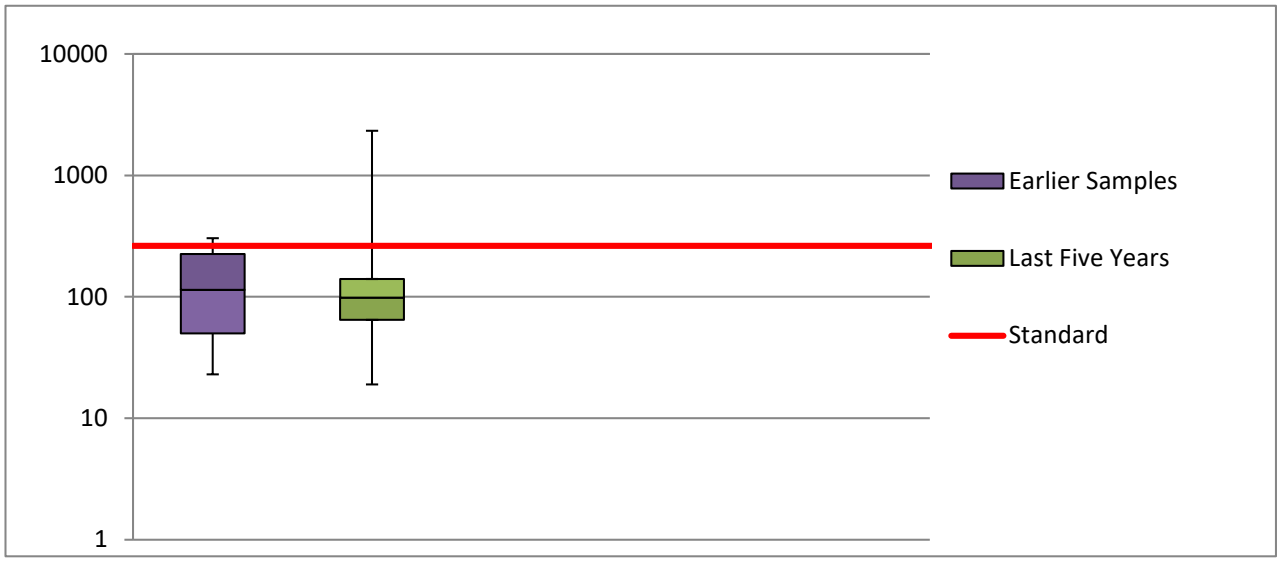


Figure 67: Keya Paha River TSS Box and Whisker Plot

All TSS samples from 2016 to 2021 collected at the Keya Paha WQM site are displayed below in Figure 68. There is an 11% exceedance for the Last Five Years data set compared to a 28% exceedance for the Earlier Samples.

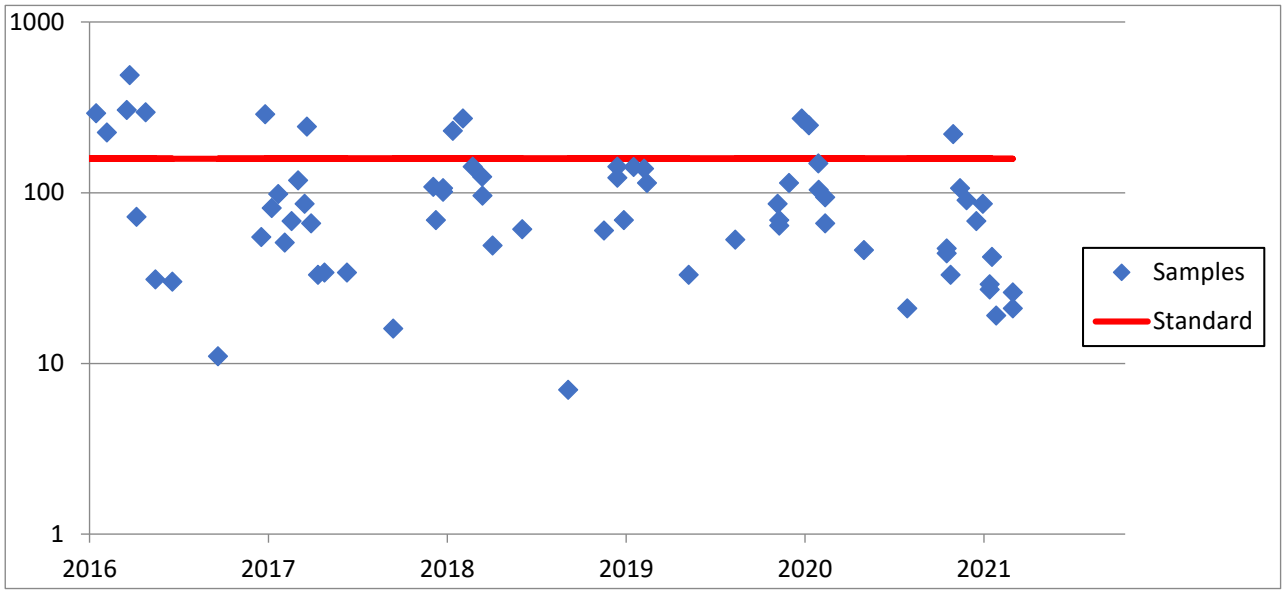


Figure 68: Keya Paha River TSS Samples

Choteau Creek WQM:

Choteau Creek was listed originally in DANR Integrated Report as threatened for TSS. The 2012 Integrated Report delisted this stream as threatened for TSS and it continues to remain in full support of beneficial uses as stated in the 2020 SD DANR Integrated Report. Water quality monitoring samples were taken at LAC5 (Figure 69) near Avon, South Dakota and results are displayed on the following four graphs; Figures 70 to Figure 71.

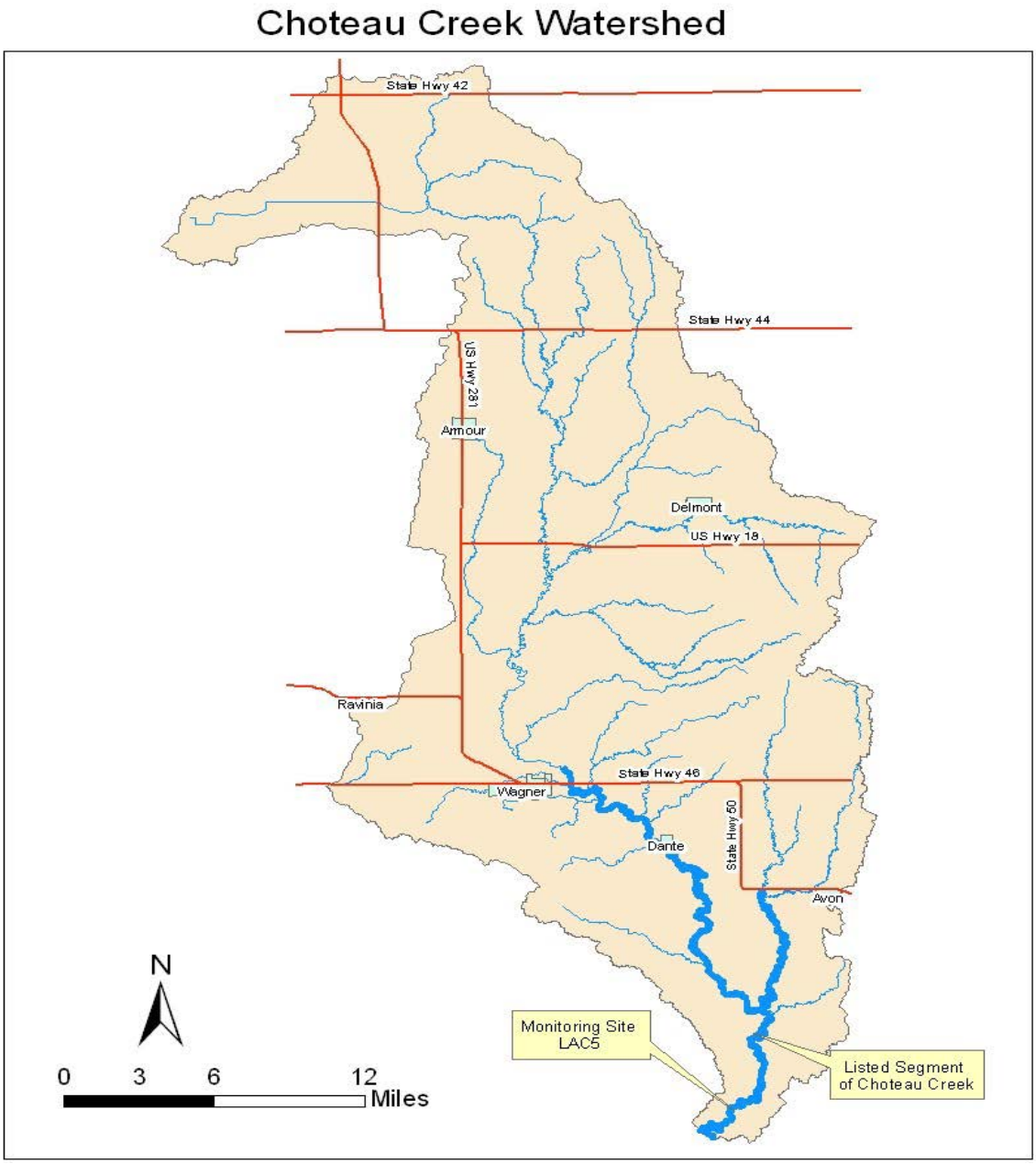


Figure 69: Choteau Creek Watershed and WQM site

Figure 70 shows that median values for TSS samples increased from 36mg/l for the Earlier Samples to 49mg/l for the Last Five Years data set. Standard for Choteau Creek TSS is 158mg/l.

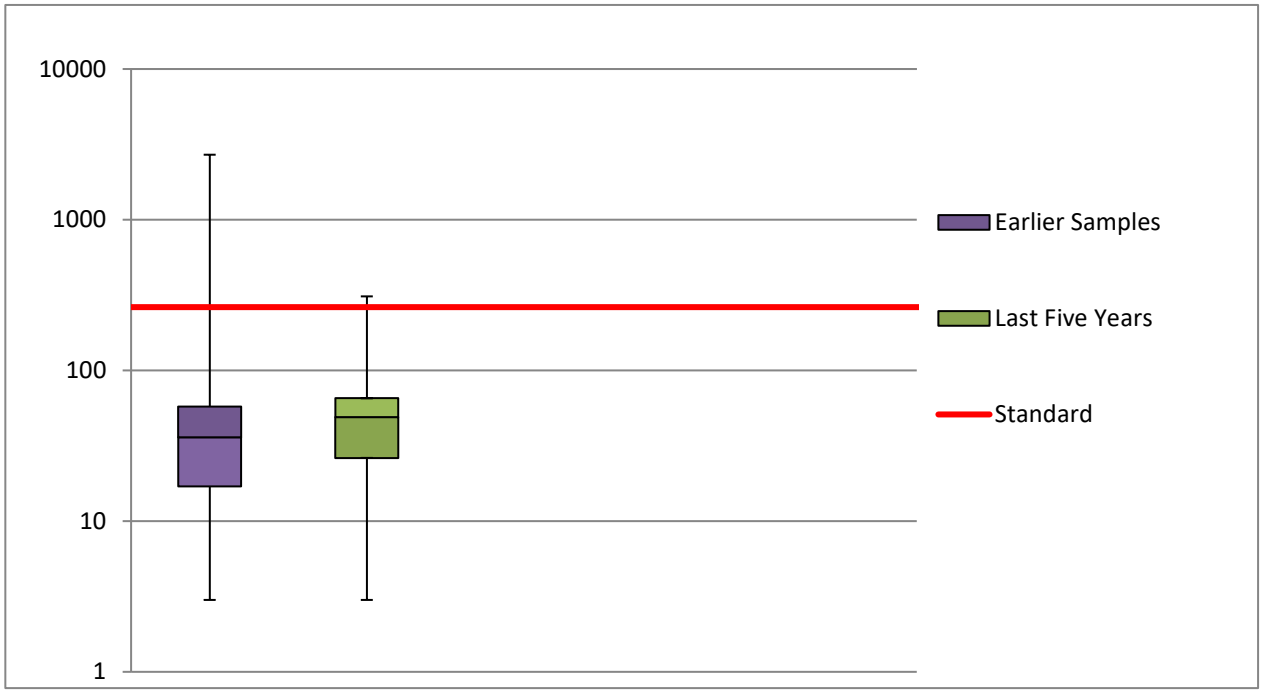


Figure 70: Choteau Creek TSS Box and Whisker Plot

All TSS samples from 2016 to 2021 are displayed on the graph below as Figure 71. Exceedances decreased for the Last Five Years at 5.5% in comparison to the Earlier Samples which exhibited an exceedance rate of 7%.

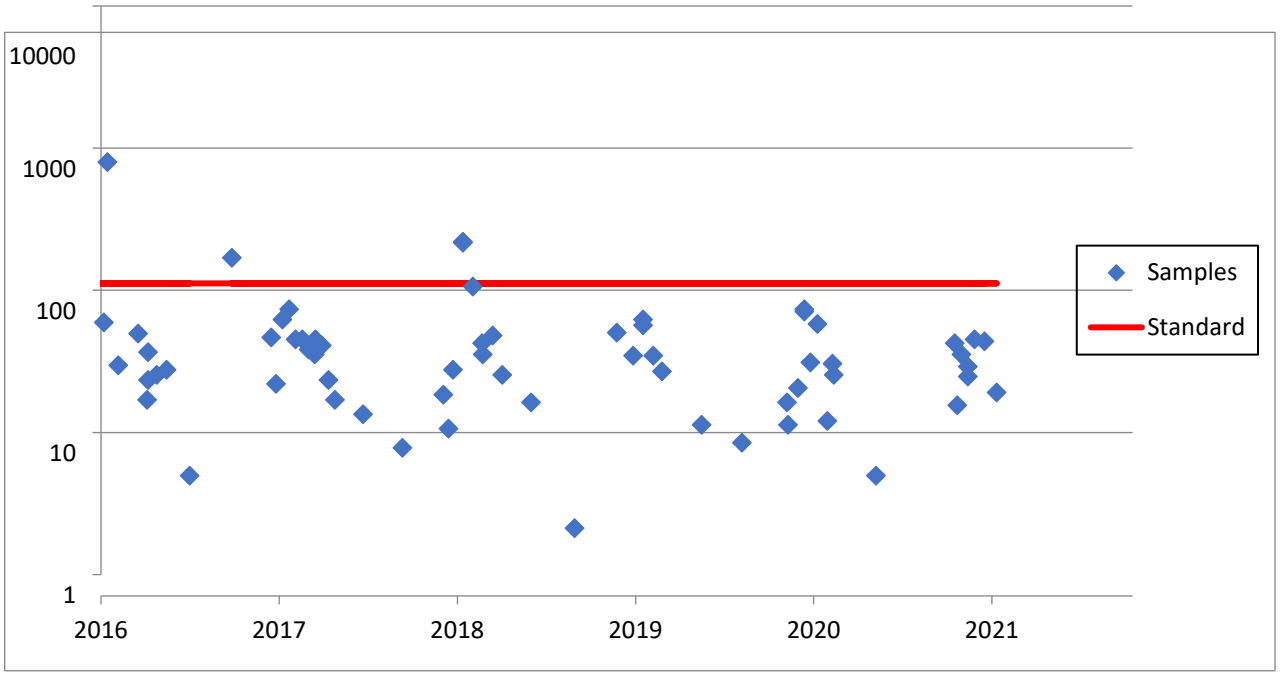


Figure 71: Choteau Creek TSS Samples

Ponca Creek WQM:

Ponca Creek is listed on the SD DANR's IR for TSS and E-coli. Water samples were collected at LAC3/WQM 70 on Ponca Creek (Figure 72). Results from the water samples are displayed in Figure 73 through Figure 76.

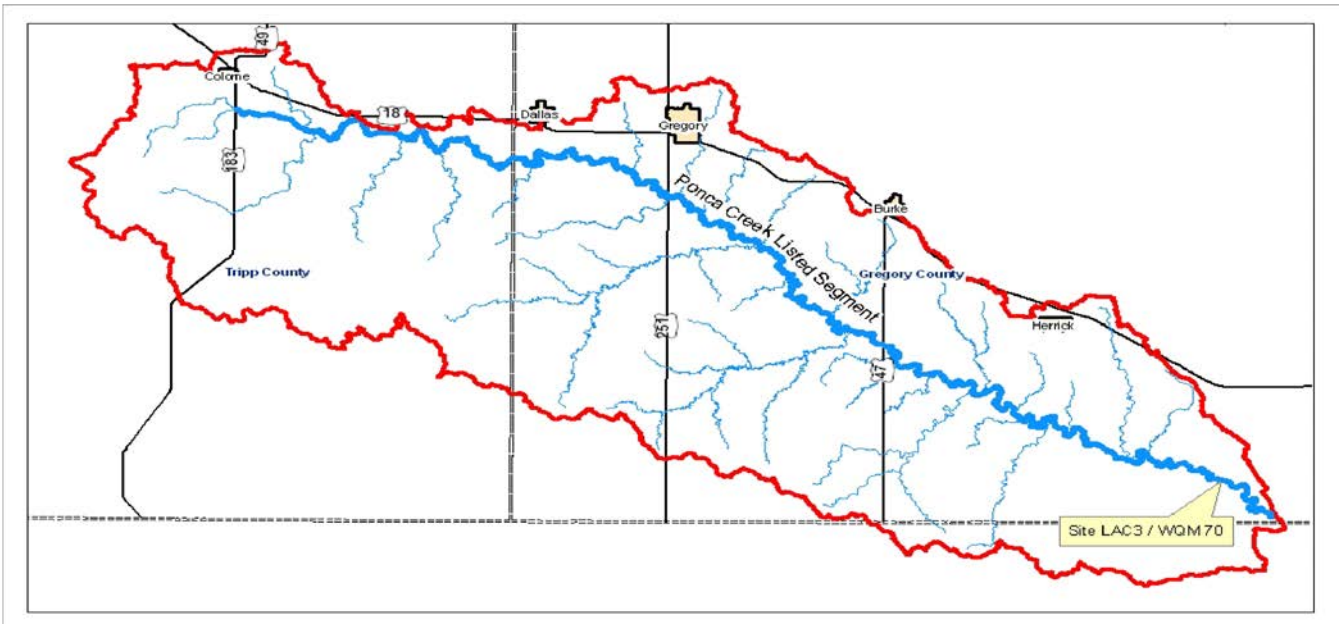


Figure 72: Ponca Creek Water Quality Monitoring Site

E-coli median values decreased from 576.5 CFU/100mL to 440 CFU/mL when comparing data sets from Earlier Samples to Last Five Years samples. The E-coli standard for Ponca Creek is 1178 CFU/mL. There was a 34% exceedance for the Earlier Samples in comparison to a 16.5% rate for the Last Five Year's data set.

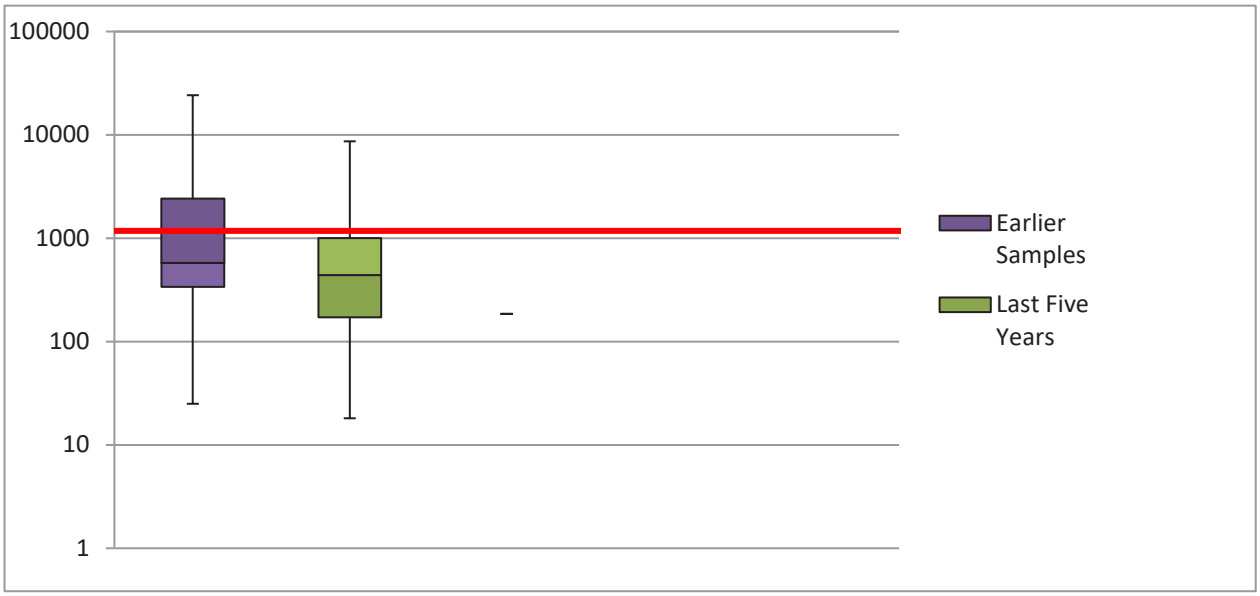


Figure 73: Ponca Creek Ecoli Box and Whisker Plot

All E-coli samples taken from 2016 to 2021 are displayed in the graph below (Figure 74).

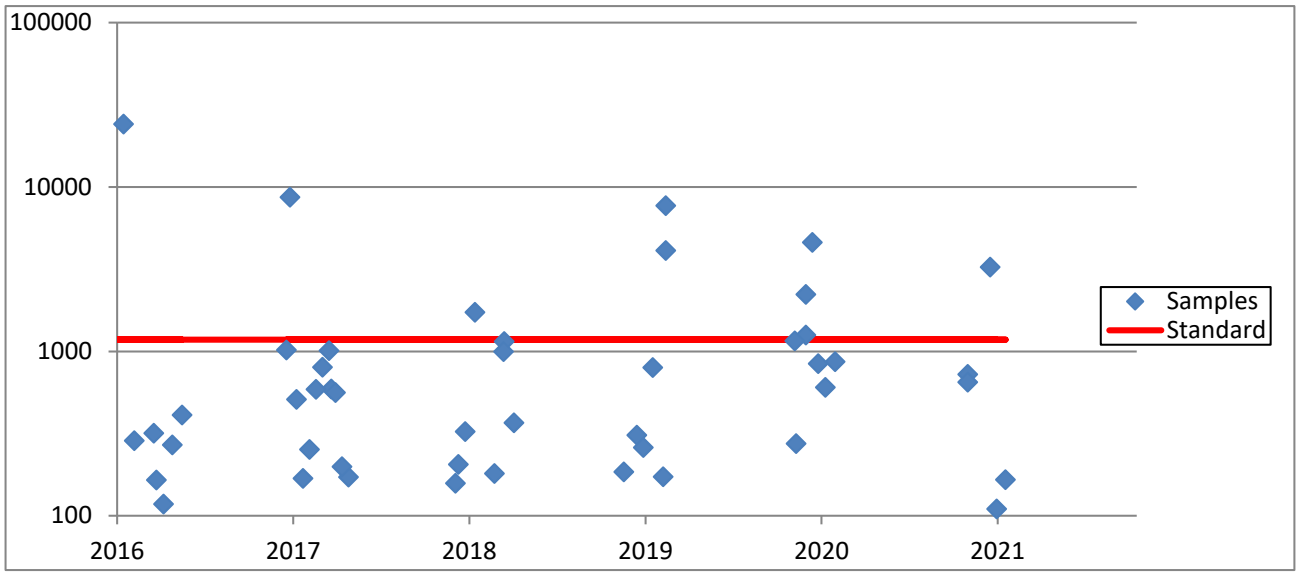


Figure 74: Ponca Creek E-coli Samples

Figure 75 shows that Ponca Creek Total Suspended Solids (TSS) median values increased for the Last Five Years from 27 to 71mg/l. The standard for TSS on Ponca Creek is 158mg.l. There is an exceedance of 6% for the Earlier Samples compared to a 15% for the Last Five Years data set.

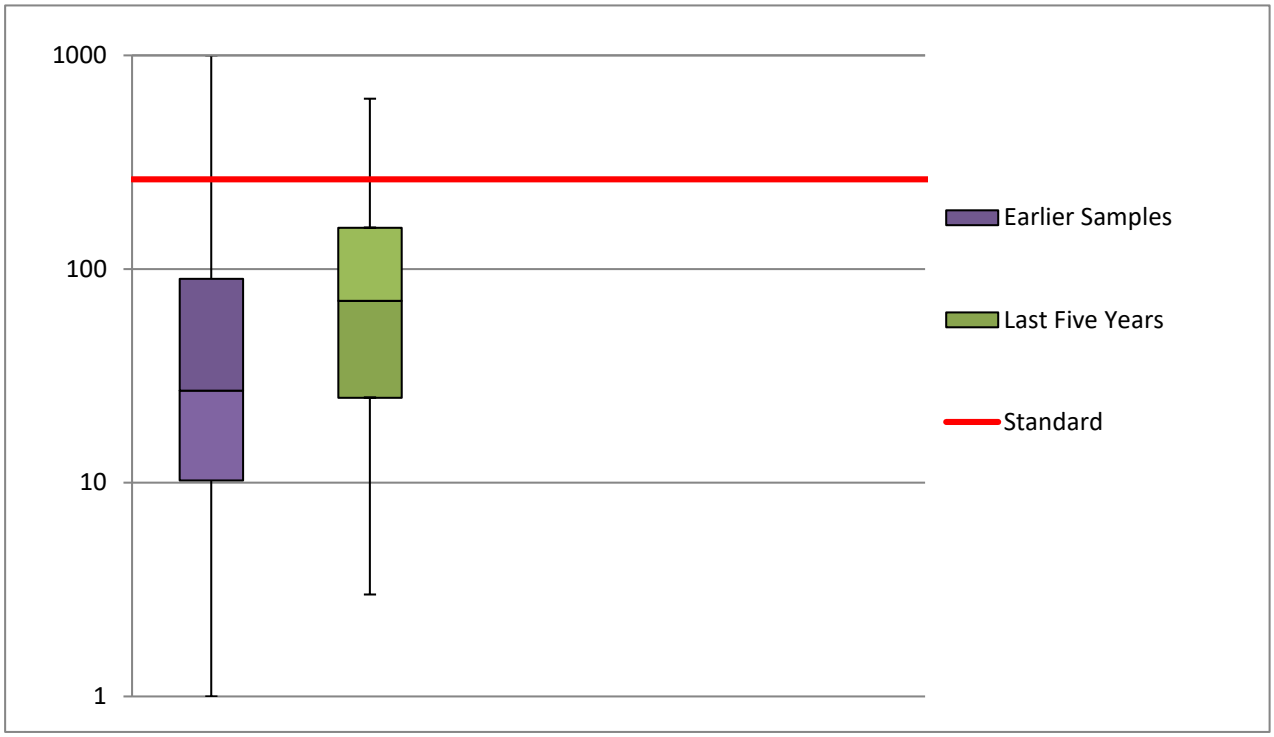


Figure 75: Ponca Creek TSS Box and Whisker Plot

All TSS samples from 2016 to 2021 at the Ponca Creek WQM site are displayed below on Figure 76.

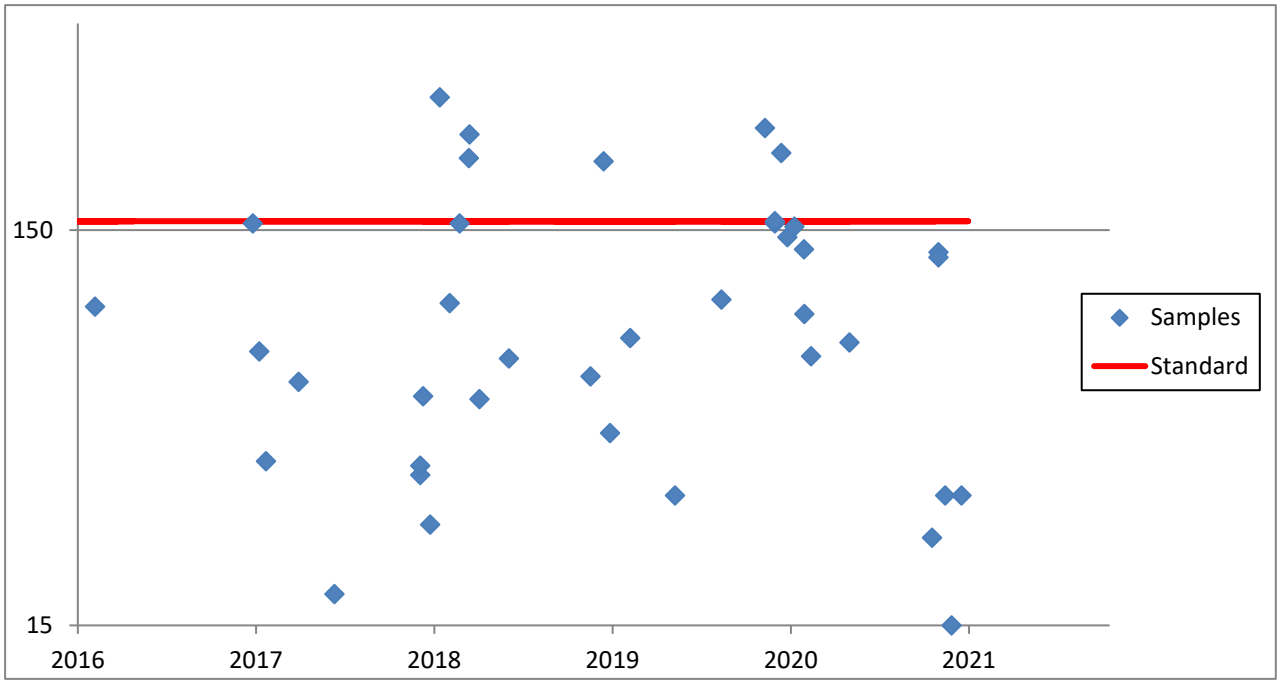


Figure 76: Ponca Creek TSS Samples

Emanuel Creek WQM:

Emanuel Creek is listed for TSS and *E.coli* in the 2020 SD DANR's IR. Samples were collected near the outlet of Emanuel Creek (Figure 77). Results from the TSS, and *E.coli* water samples are to be displayed in Figures 78 through Figures 81.

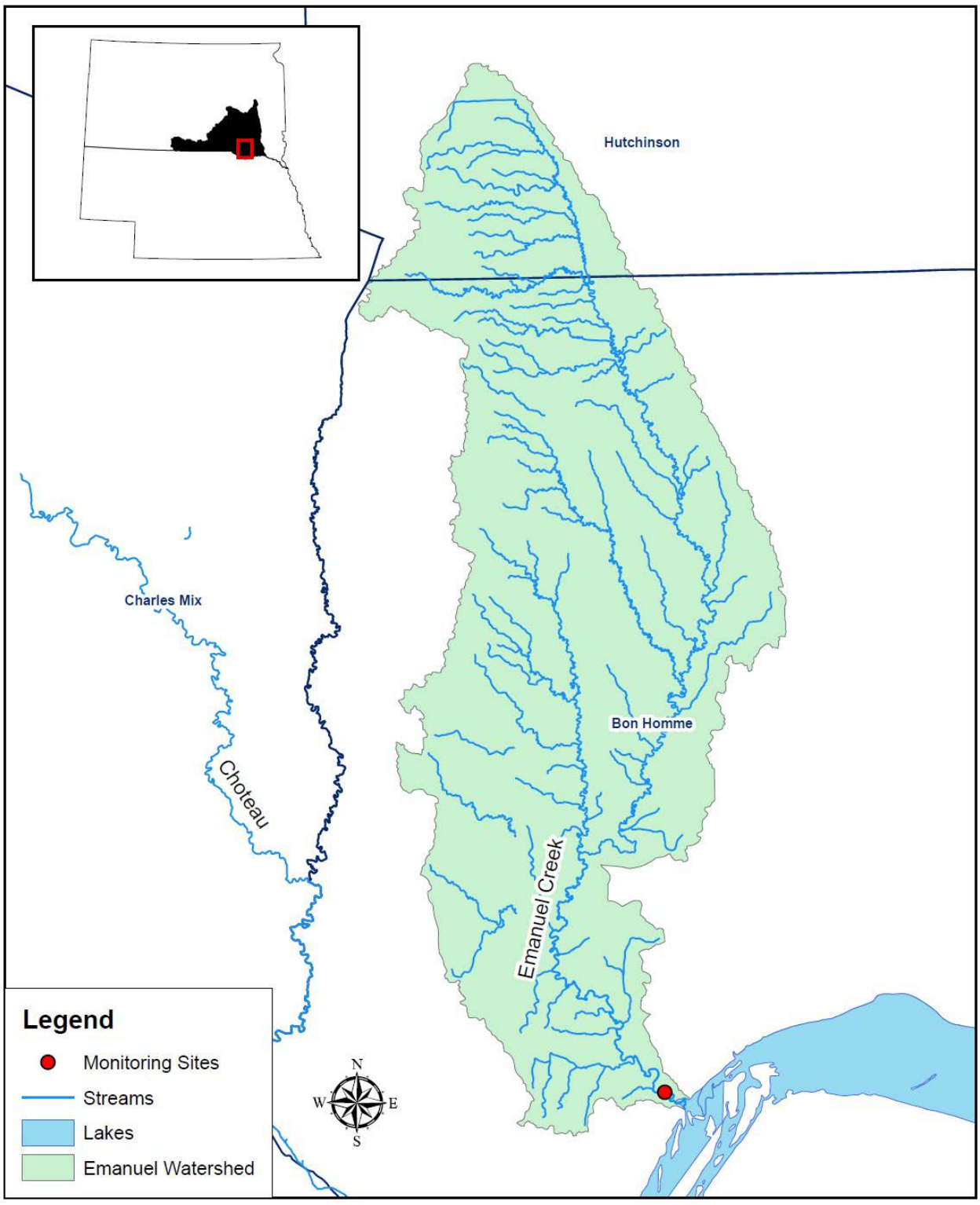


Figure 77: Emanuel Creek Water Quality Monitoring Site

There is a nine-year gap, from 2005 to 2014, without samples so that is reflected in the Earlier Samples data set. The Last Five-Year data set is complete for data. E-coli samples show that a decrease from 717 for the Earlier samples, to 438 for the Last Five-Year data set. The E-coli standard is 1178 CFU/100mL for Emanuel Creek. Exceedances are 31% for the Earlier Samples in comparison to 19% exceedance for the Last Five-Year data set.

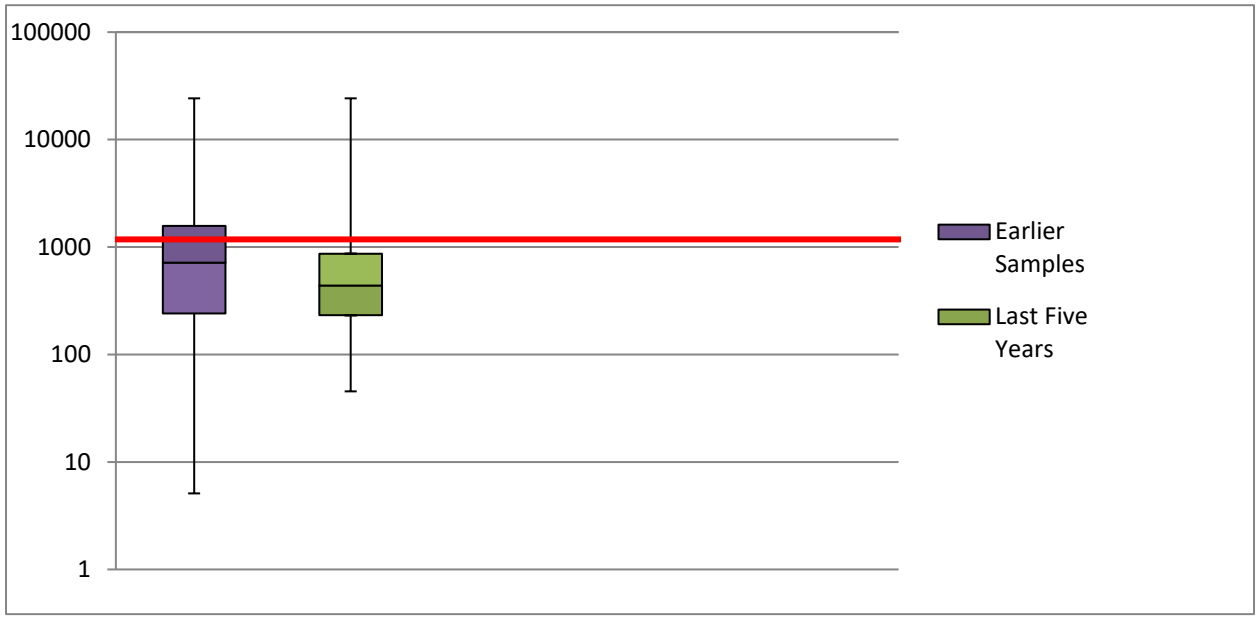


Figure 78: Emanuel Creek E-coli Box and Whisker Plot

All E-coli samples for Emanuel Creek from 2016 to 2021 are displayed in Figure 79.

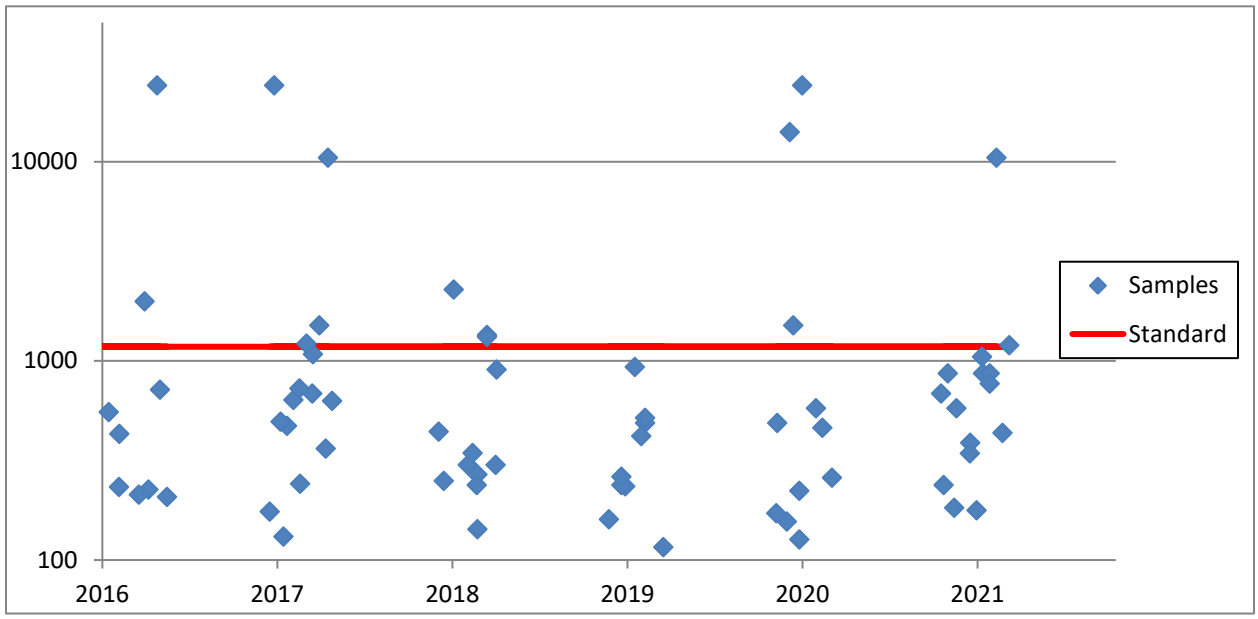


Figure 79: E-coli Samples on Emanuel Creek

Figure 80 shows that Emanuel Creek Total Suspended Solids (TSS) median value increased slightly from 21.5 to 23mg/l for the Last Five Years data set. The standard for TSS for Emanuel Creek is 158mg/l. Exceedance for the Earlier Samples TSS samples were at 7% compared to a 3% exceedance for the Last Five Years data set.

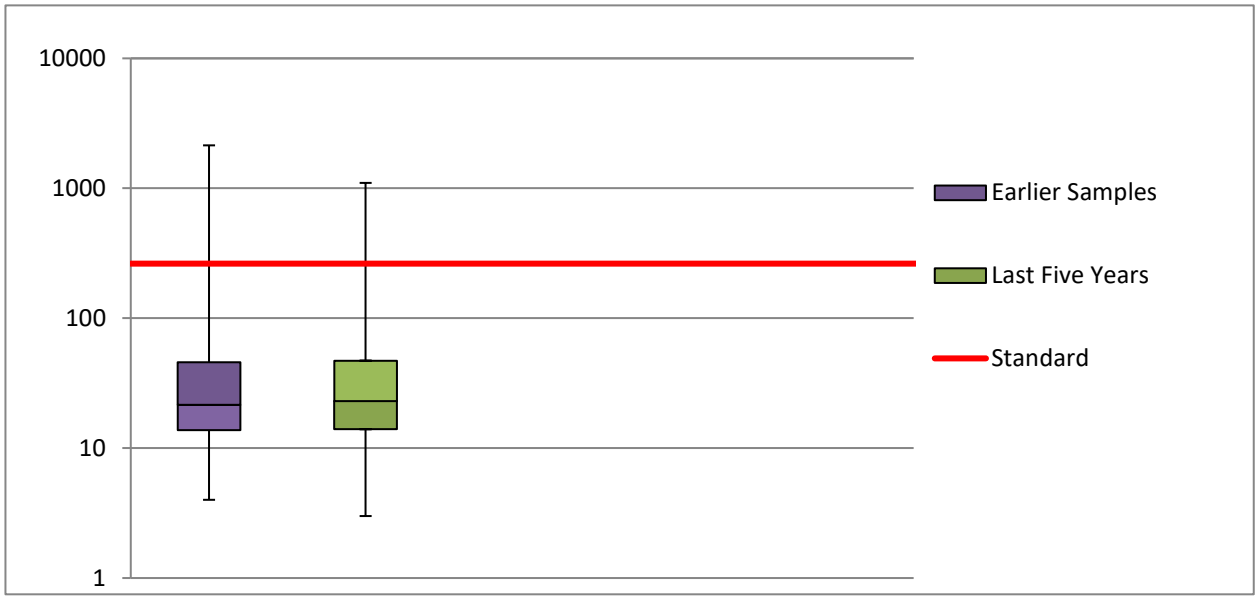


Figure 80: Emanuel Creek TSS Box and Whisker Plot

All TSS samples collected on Emanuel Creek from 2016 to 2021 are displayed below in Figure 81.

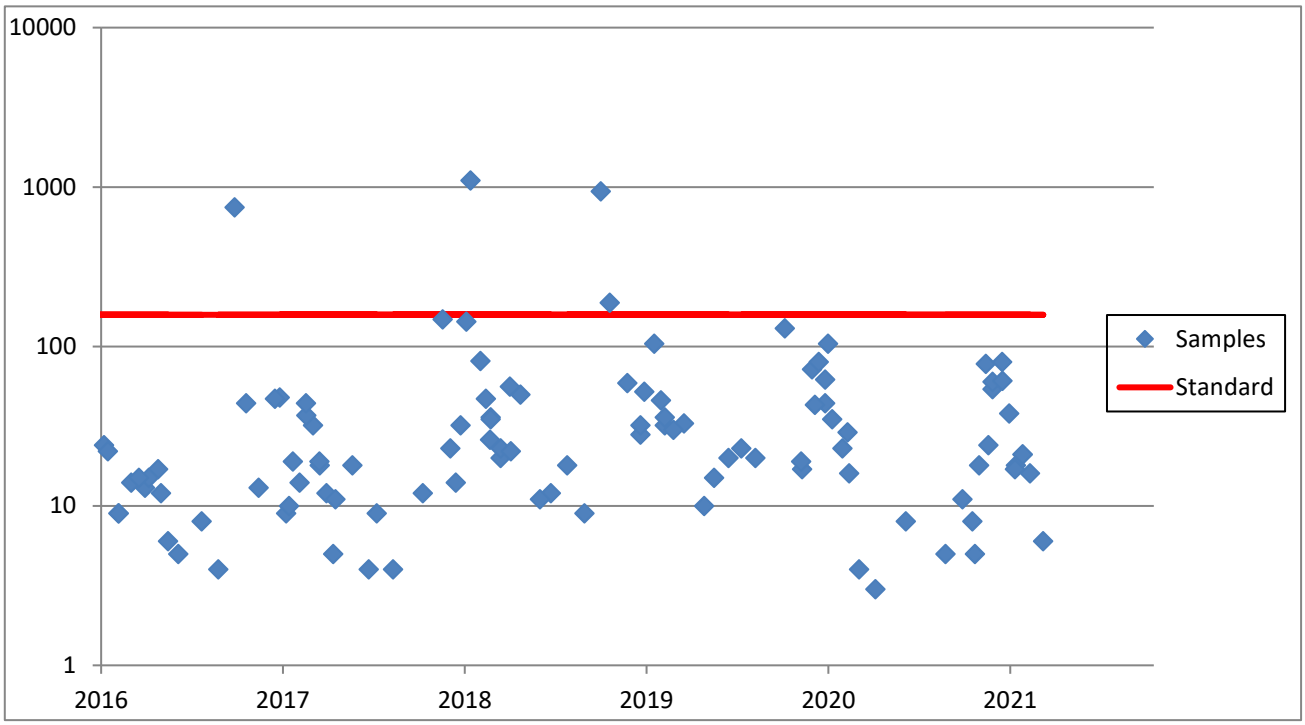


Figure 81: Emanuel Creek TSS samples

Wolf Creek

Wolf Creek water sampling site is on the lower end of the stream as demonstrated on Figure 82. The upper site is the widely used sample site, as the lower site was discontinued in 2016 due to possible backwater influence from the James River. Wolf Creek is listed on the 2020 SD DANR's IR for E-coli.

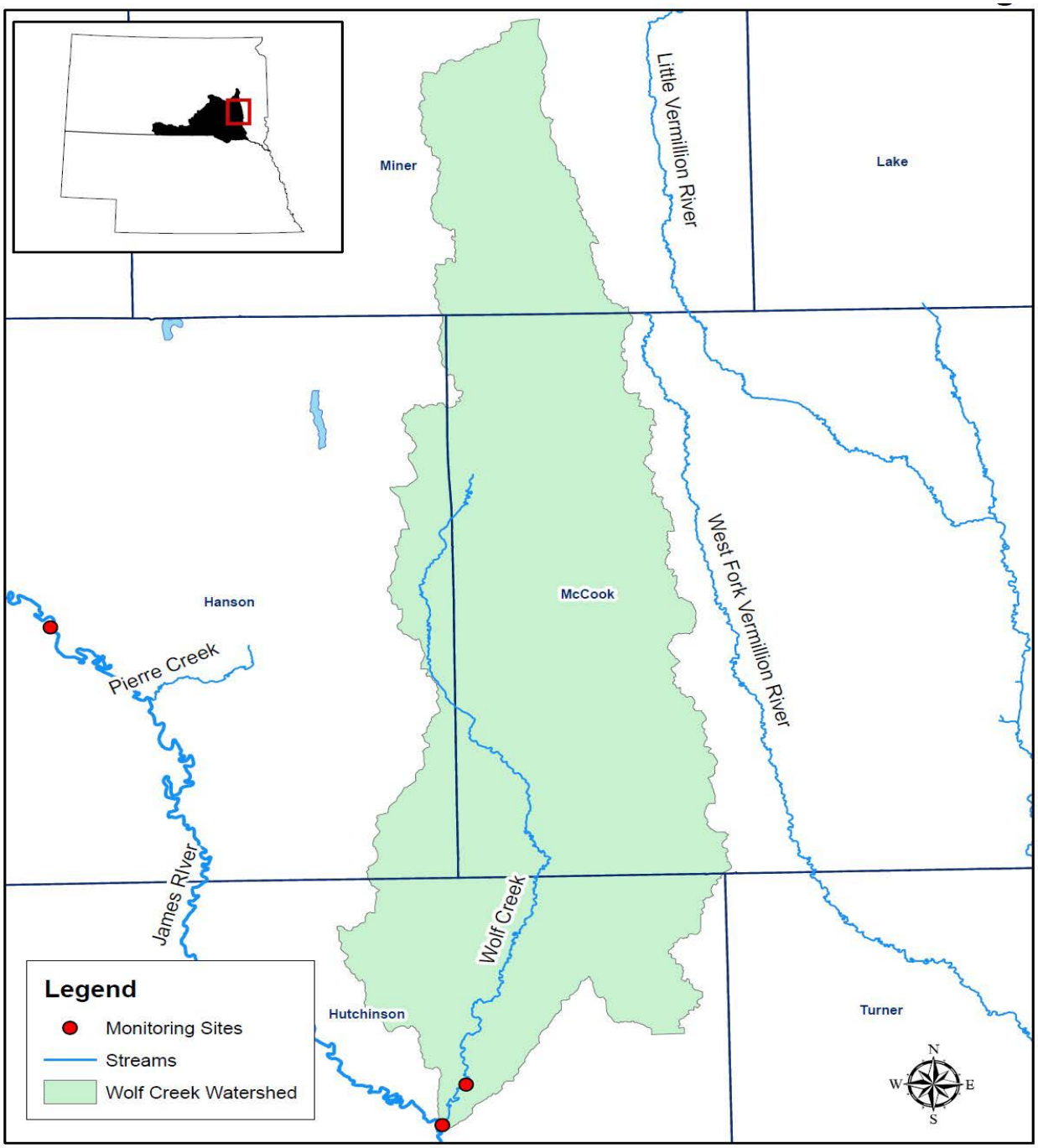


Figure 82: Wolf Creek Water Sample Sites

Figure 83 shows that the upstream WQM site on Wolf Creek E-coli median values increased slightly for the Last Five Years data set from 147 to 157 CFU/100mL. The standard for E-coli on Wolf Creek is 1178 CFU/100mL. There is a 7% excedance for samples in the Last Five Years compared to a 11.5% excedance for the Earlier Samples data set.

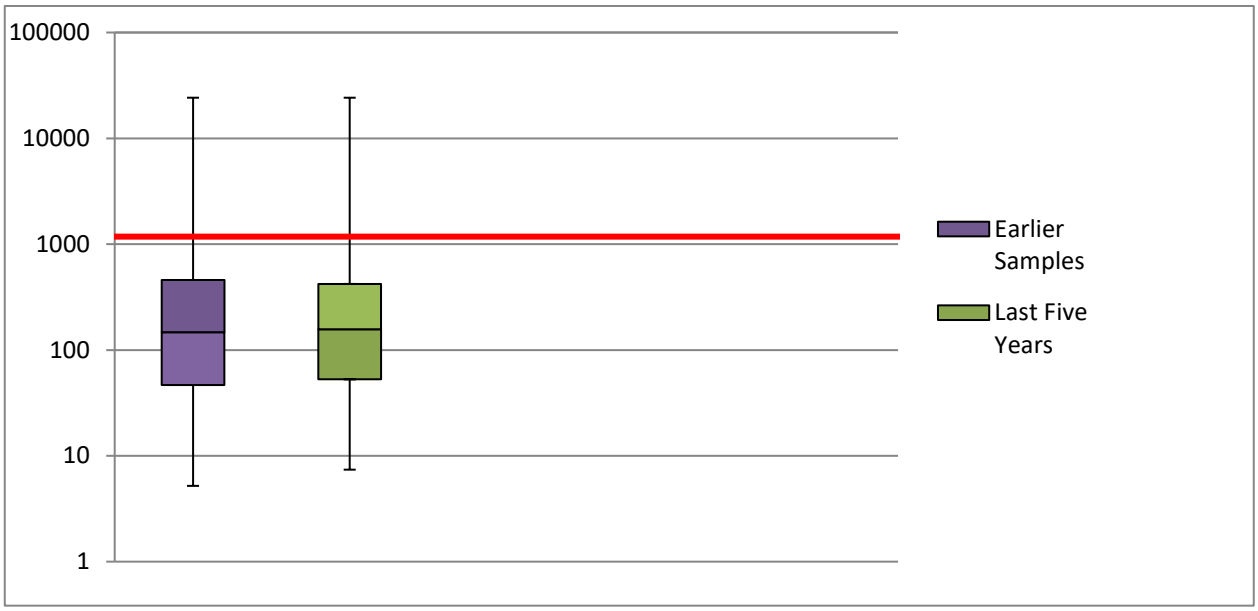


Figure 83: Wolf Creek E-coli Box and Whisker Plot

All E-coli samples collected on upstream WQM site for Wolf Creek are displayed below on Figure 84.

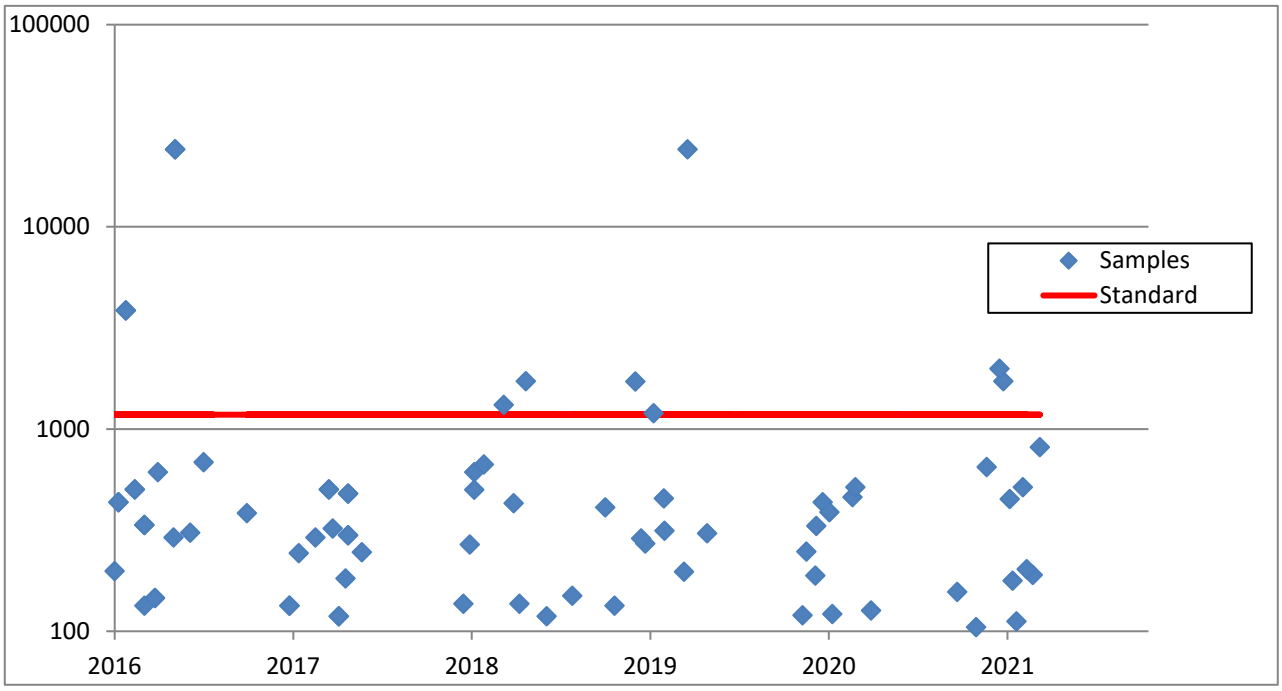


Figure 84: Wolf Creek E-coli samples

Firesteel Creek

Firesteel Creek has three monitoring site above Lake Mitchell. Firesteel Creek is currently listed on the SD DANR IR for Total Suspended Solids (TSS), Total Dissolved Solids (TDS), *E.coli*, and Temperature.

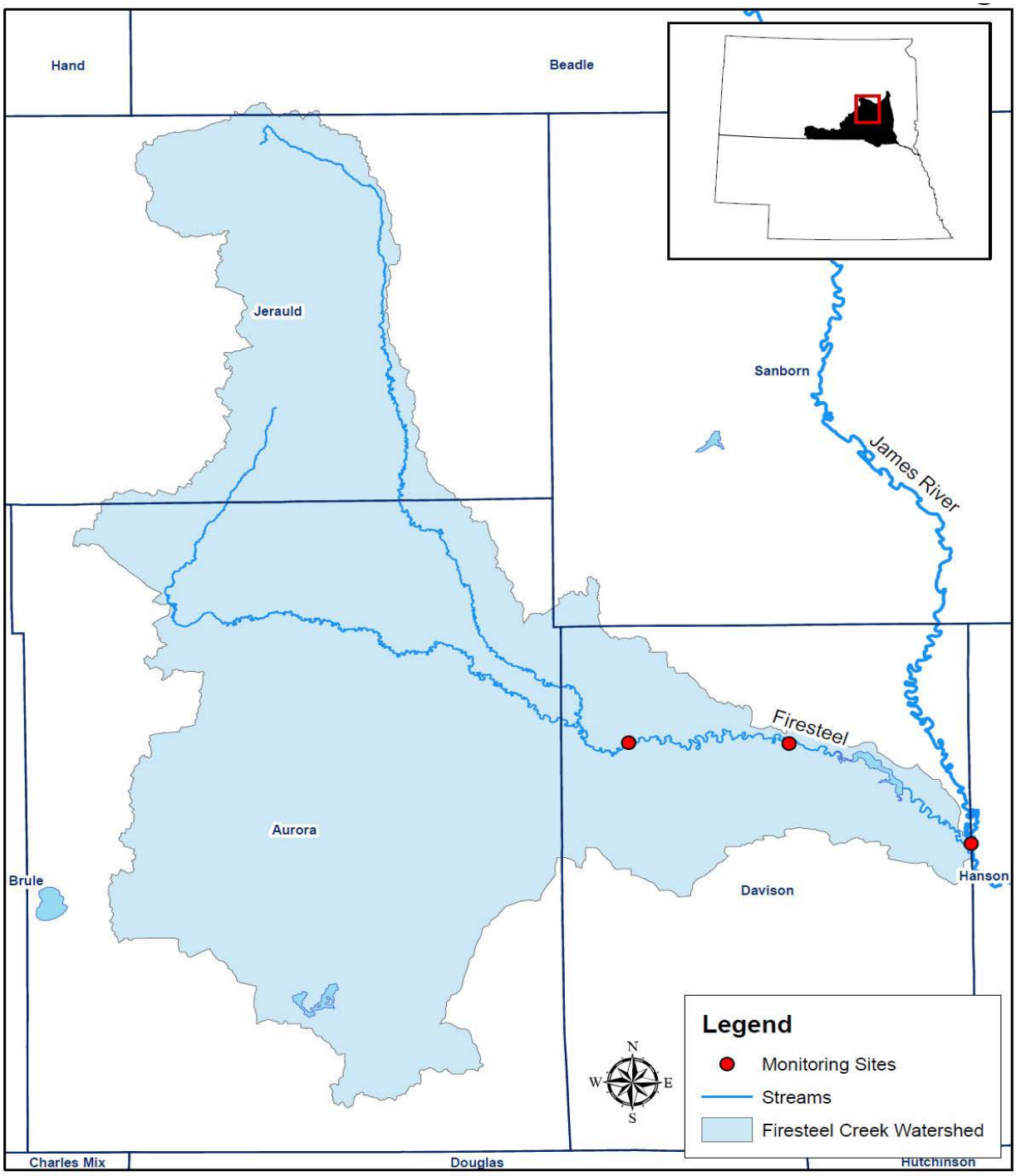


Figure 85: Firesteel Creek Monitoring Sites

Figure 86 shows that Firesteel Creek median value for the Last Five Years increased from 143.5 to 236 CFU/100mL. The E-coli standard for Firesteel Creek is 1178 CFU/100mL. There is a 14% exceedance for the Earlier Samples compared to a 10% exceedance for the Last Five Years data set.

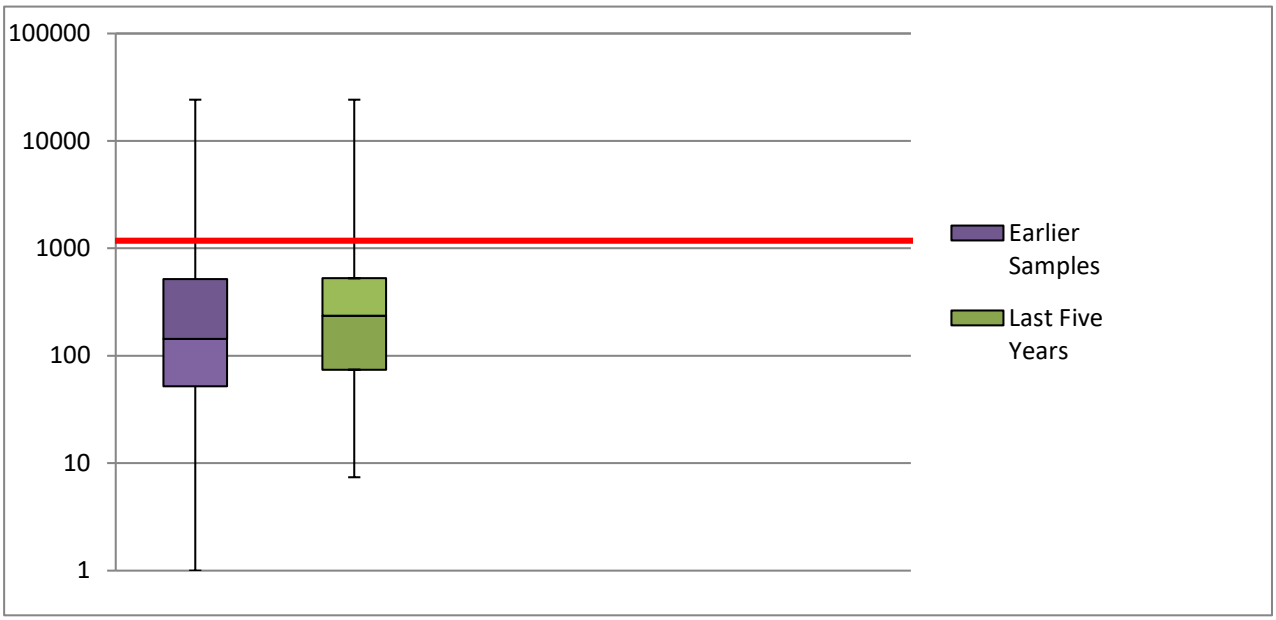


Figure 86: Firesteel Creek E-coli Box and Whisker Plot

All E-coli samples collected from 2016 to 2021 at Firesteel Creek WQM sites are displayed in Figure 87 below.

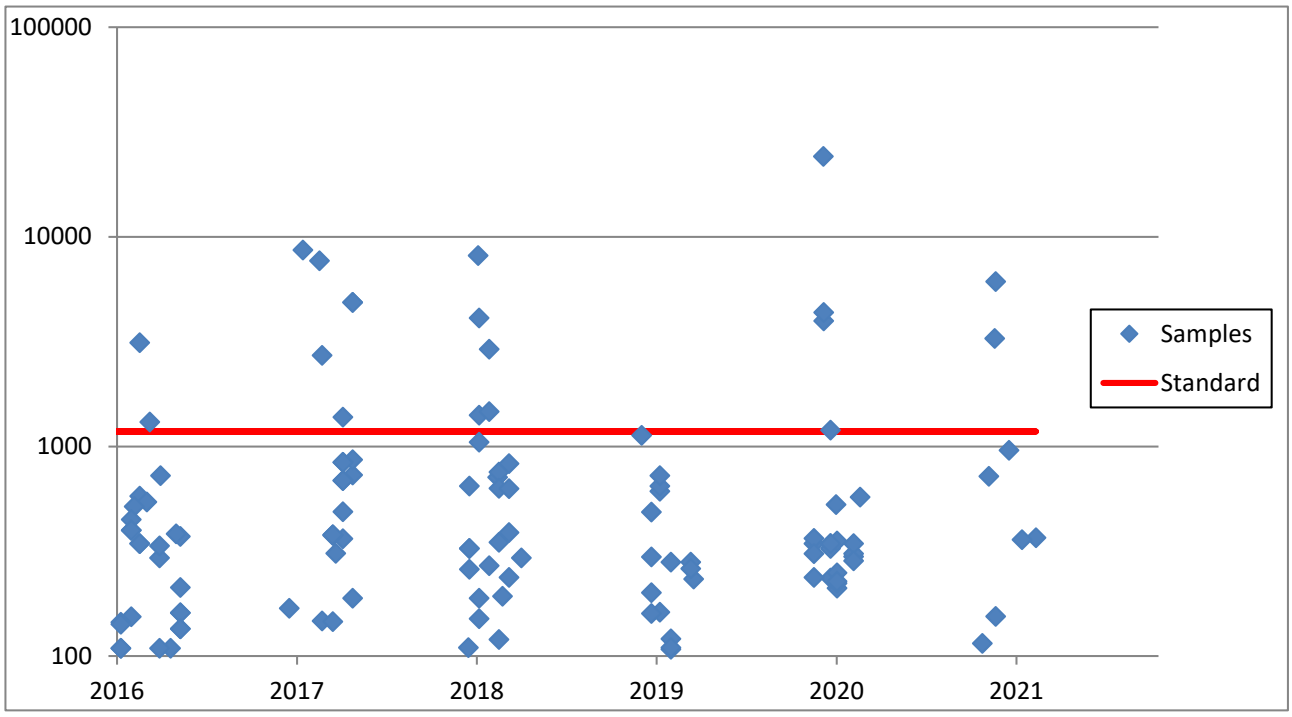


Figure 87: Firesteel Creek Ecoli Samples

Figure 88 shows that Total suspended Solids (TSS) median values increased in Last Five Years samples from 36 to 49mg/l when compared to the Earlier Samples data set. Firesteel Creek standard for TSS is 158mg/l. Exceedances decreased from 4% in Earlier Samples in comparison to 3% for the Last Five Years data set.

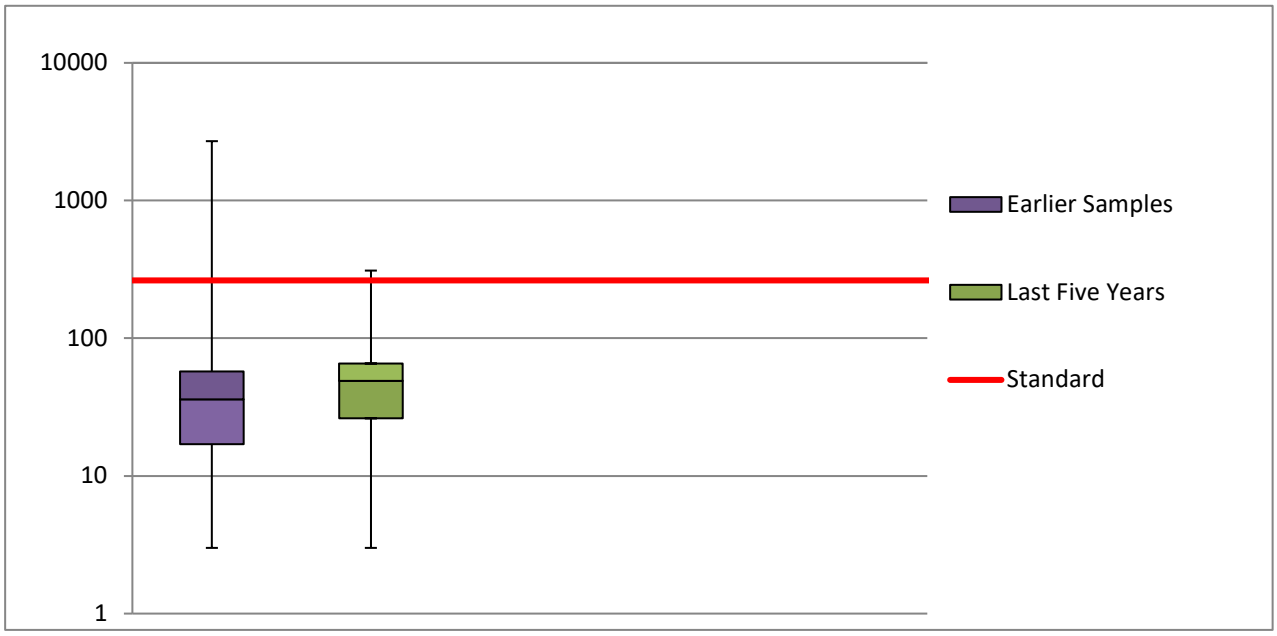


Figure 88: Firesteel Creek TSS Box and Whisker Plot

All TSS samples collected from 2016 to 2021 are displayed below in Figure 89.

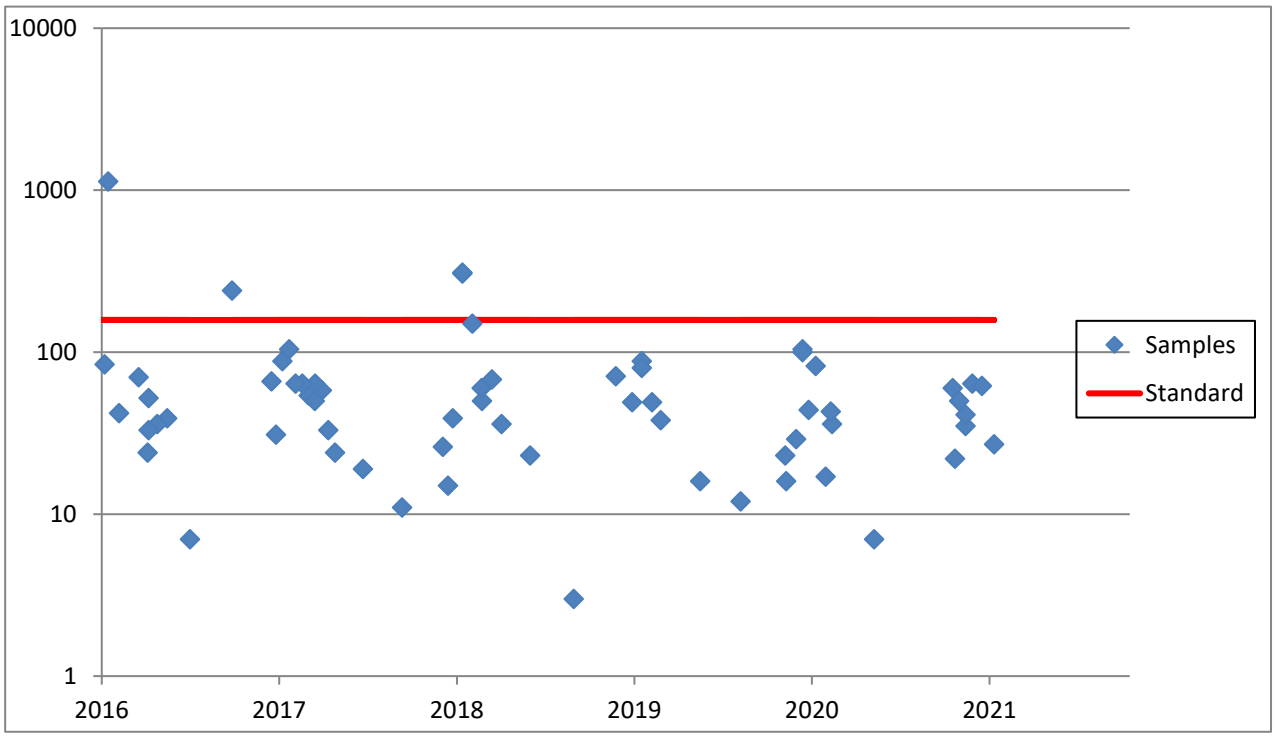


Figure 89: Firesteel Creek TSS Samples

Dawson Creek

Dawson Creek has one water quality monitoring site downstream from Scotland, SD. It is listed on the 2020 SD DANR's IR for both Total Suspended Solids (TSS) and E-coli.

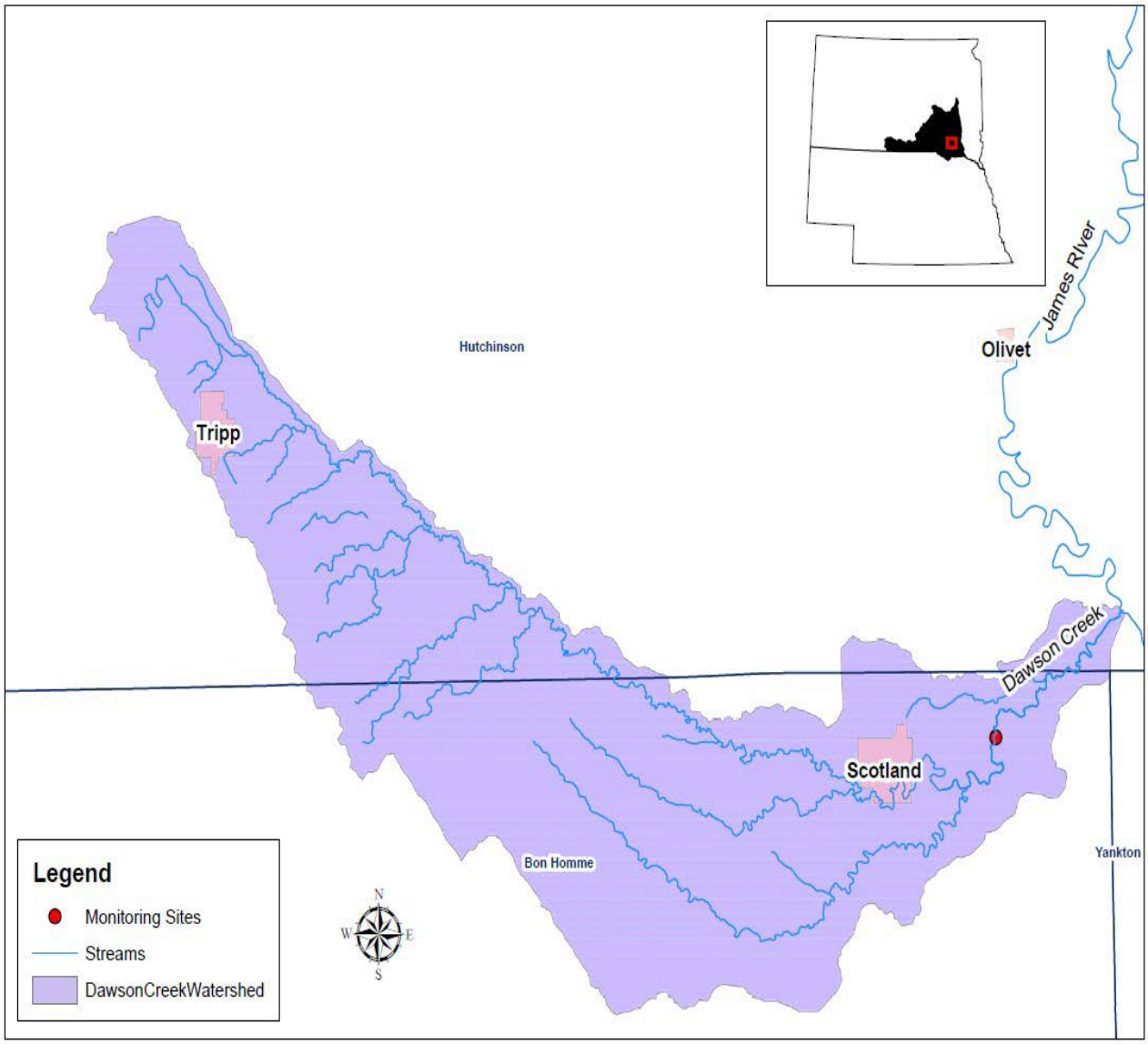


Figure 90: Dawson Creek Water Quality Monitoring Site

Figure 91 shows that Ecoli median values decreased in the Last Five Years samples from 2420 to 1840 CFU/100mL. Ecoli standard for Dawson Creek is 1178 CFU/100mL. Excedances for the Last Five Years was 65.5% and 76% for the Earlier Samples data set.

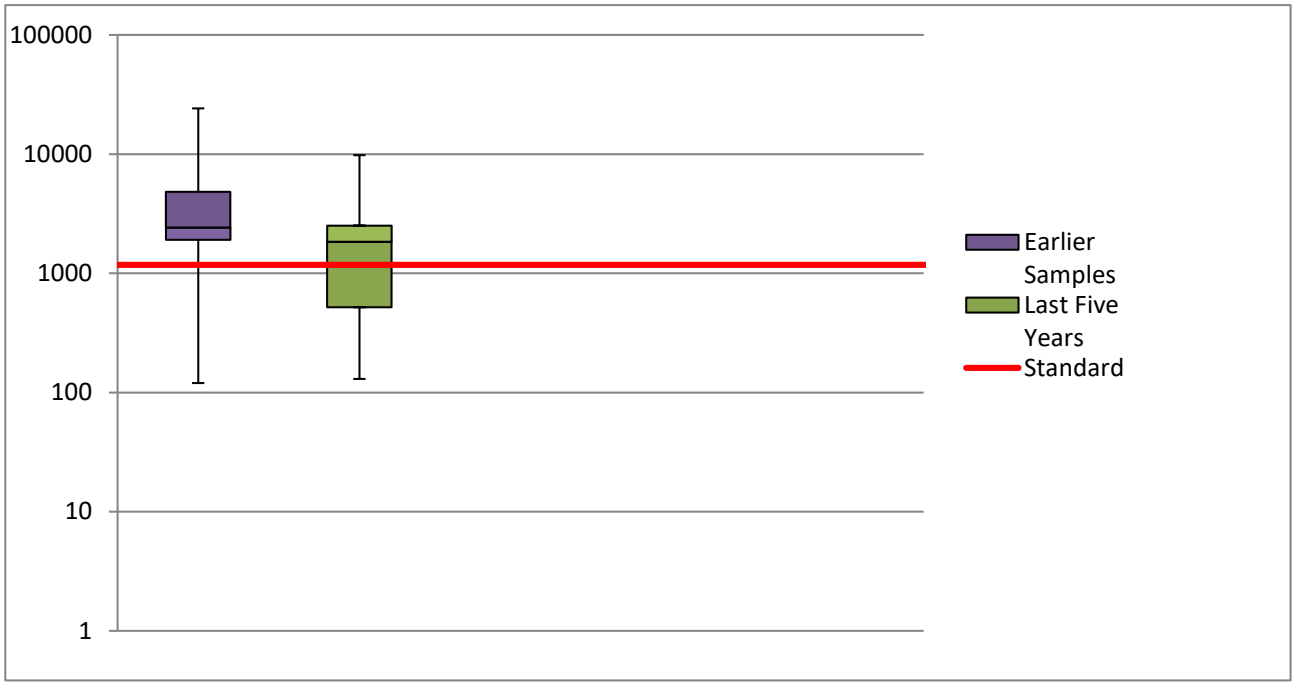


Figure 91: Dawson Creek E-coli Box and Whisker Plot

All E-coli samples collected on Dawson Creek from 2016 to 2021 are displayed below in Figure 92.

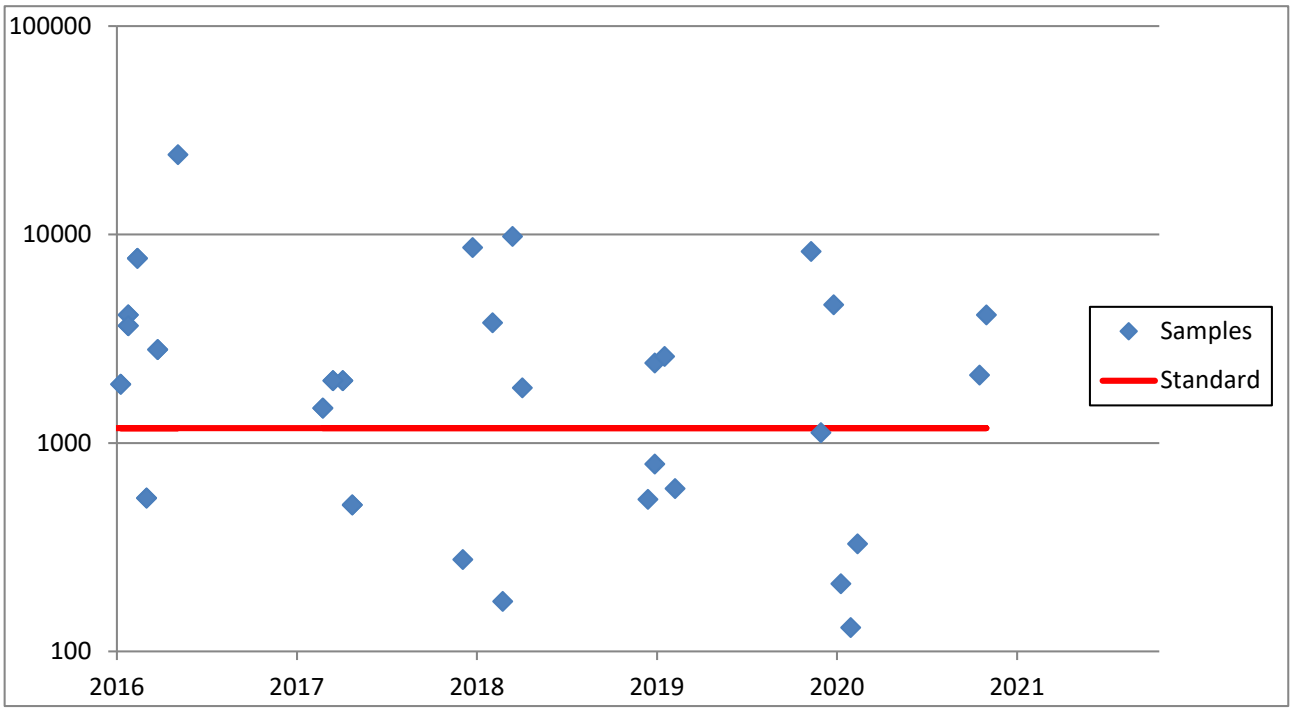


Figure 92: Dawson Creek Ecoli Samples

Figure 93 shows that Total Suspended Solids (TSS) median values decreased for the Last Five Years from 45 to 26.5mg/l when compared to the Earlier Samples data set. TSS standard for Dawson Creek is 158mg/l. Exceedance for the Last Five Years 8% and 15% for the Earlier Samples data set of samples.

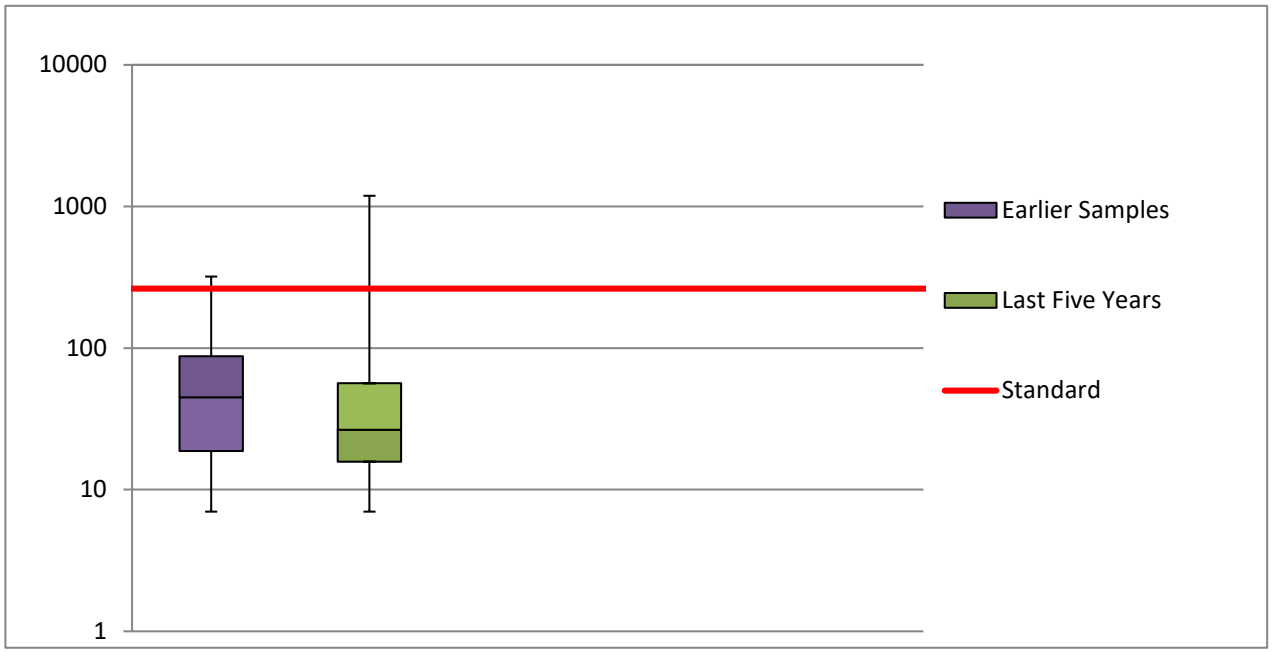


Figure 93: Dawson Creek Total Suspended Solids Box and Whisker Plot

All collected samples from the Dawson Creek WQM are displayed below in Figure 94.

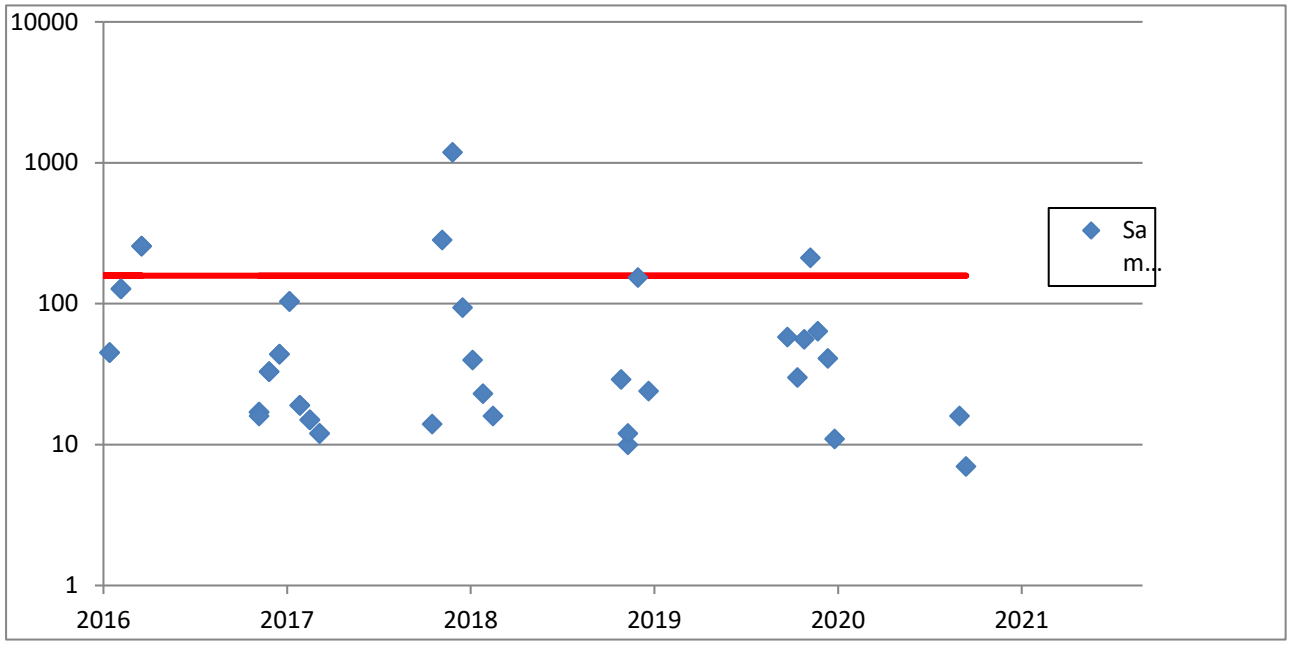


Figure 94: Dawson Creek Total Suspended Solids Samples

Pierre Creek

Pierre Creek has one monitoring site below Lake Hanson, there was a gap for several years that no samples were collected which falls in the Earlier Samples category. Pierre Creek was found to be in full support on the SD DANR IR for 2020. Samples are listed later in this report to show trends for this action.

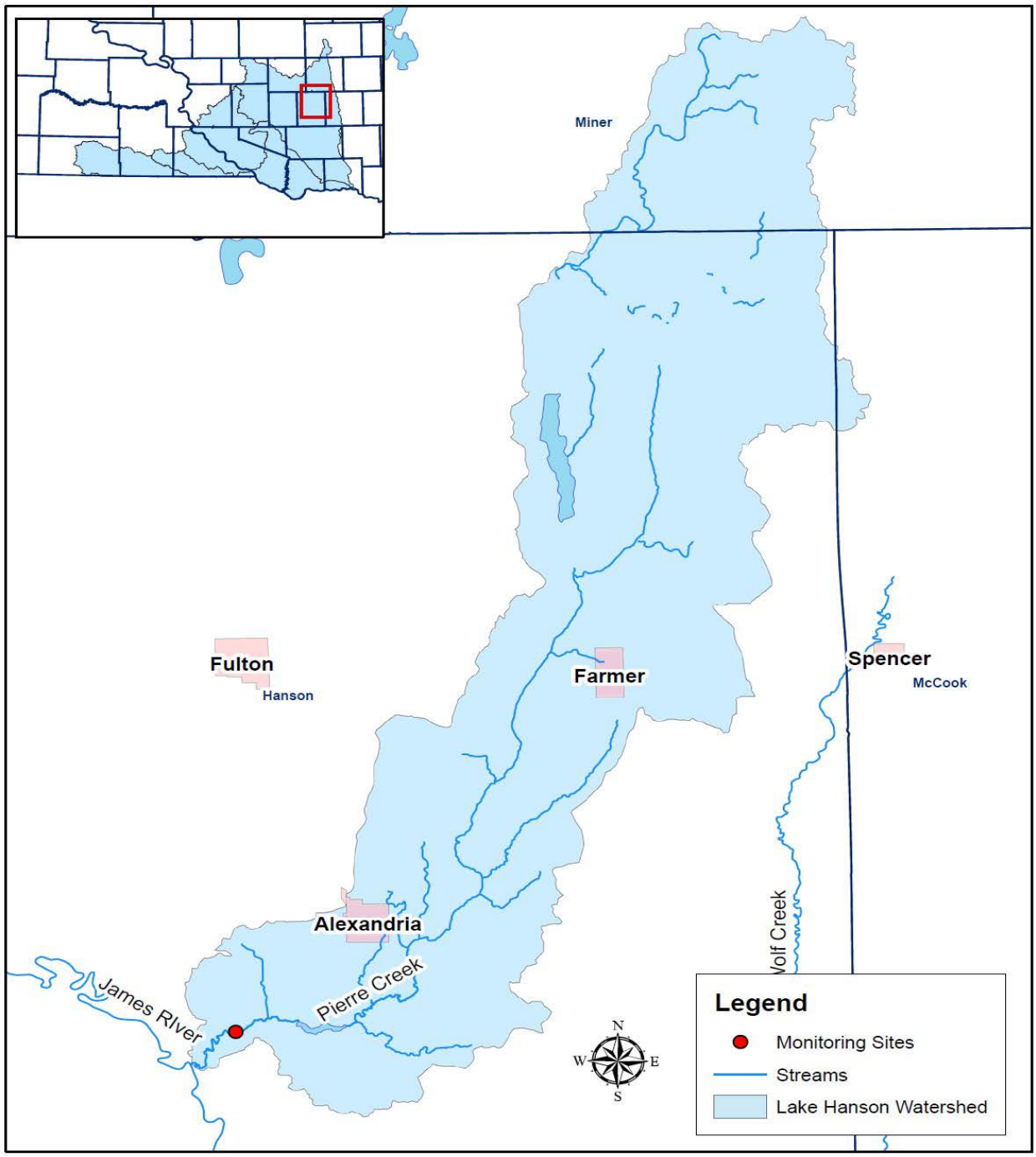


Figure 95: Pierre Creek Water Quality Monitoring Sites

Figure 96 shows Ecoli median values increased slightly during the Last Five Years from 74 to 91.5 CFU/100mL in comparison to the Earlier Samples dataset. Ecoli standard for Pierre Creek is 1178 CFU/100mL. Exceedance rate for Earlier Samples was 17% and 8% for the Last Five Years dataset.

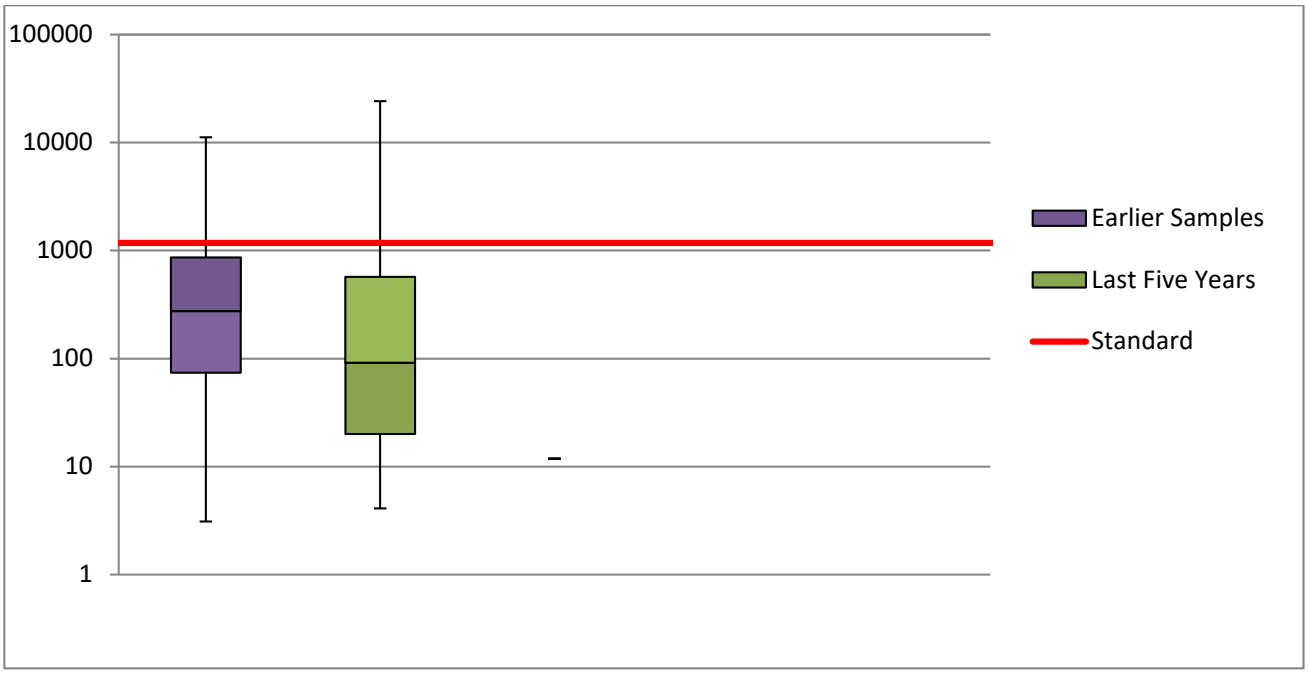


Figure 96: Pierre Creek Ecoli Box and Whisker Plot

All E-coli samples taken from 2016 to 2021 on Dawson Creek can be found below in Figure 97.

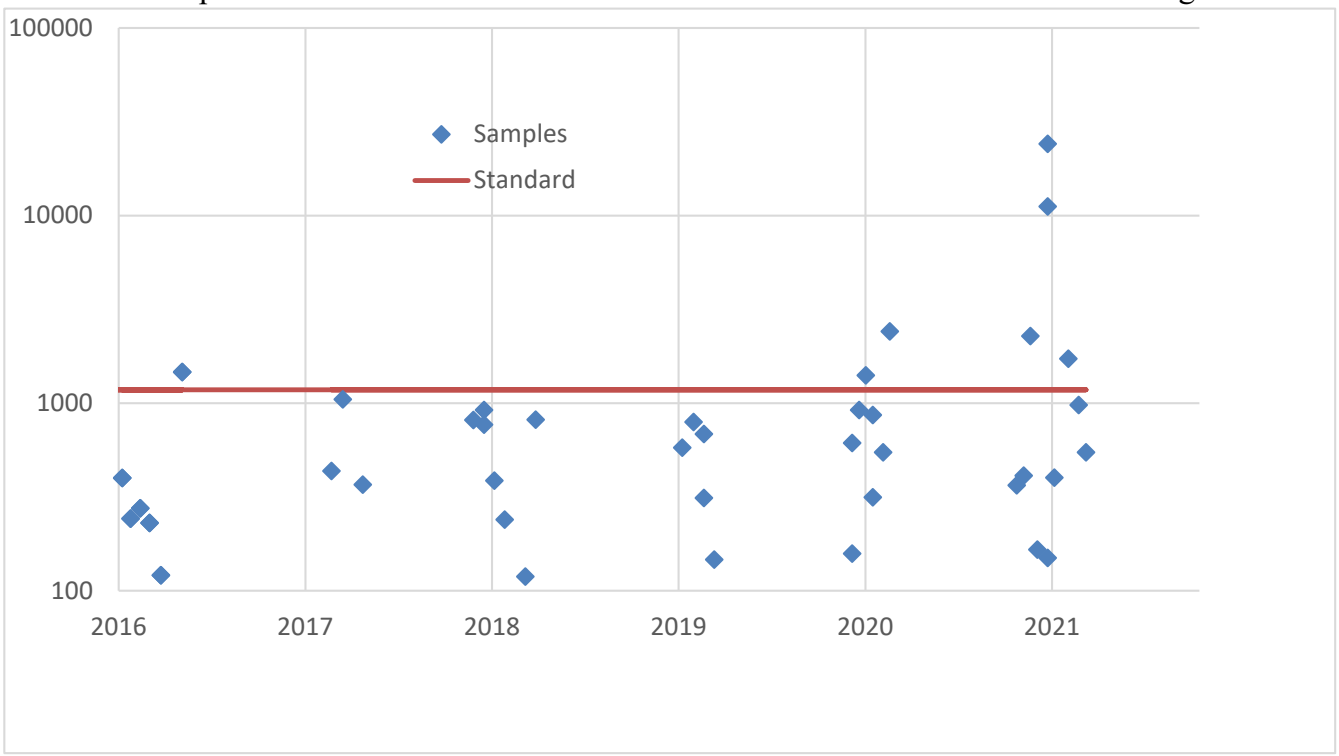


Figure 97: E-coli Samples Pierre Creek

Figure 98 shows Total Suspended Solids shows median values remained relatively equal for the two date range comparisons. Earlier Samples recorded a median value of 24mg/l in comparison to a value of 25mg/l for the Last Five Years dataset. TSS standard is 158mg/l for Pierre Creek. Exceedances for the two groups were equal as well with 3.5% rate for both Earlier Samples and Last Five Years datasets.

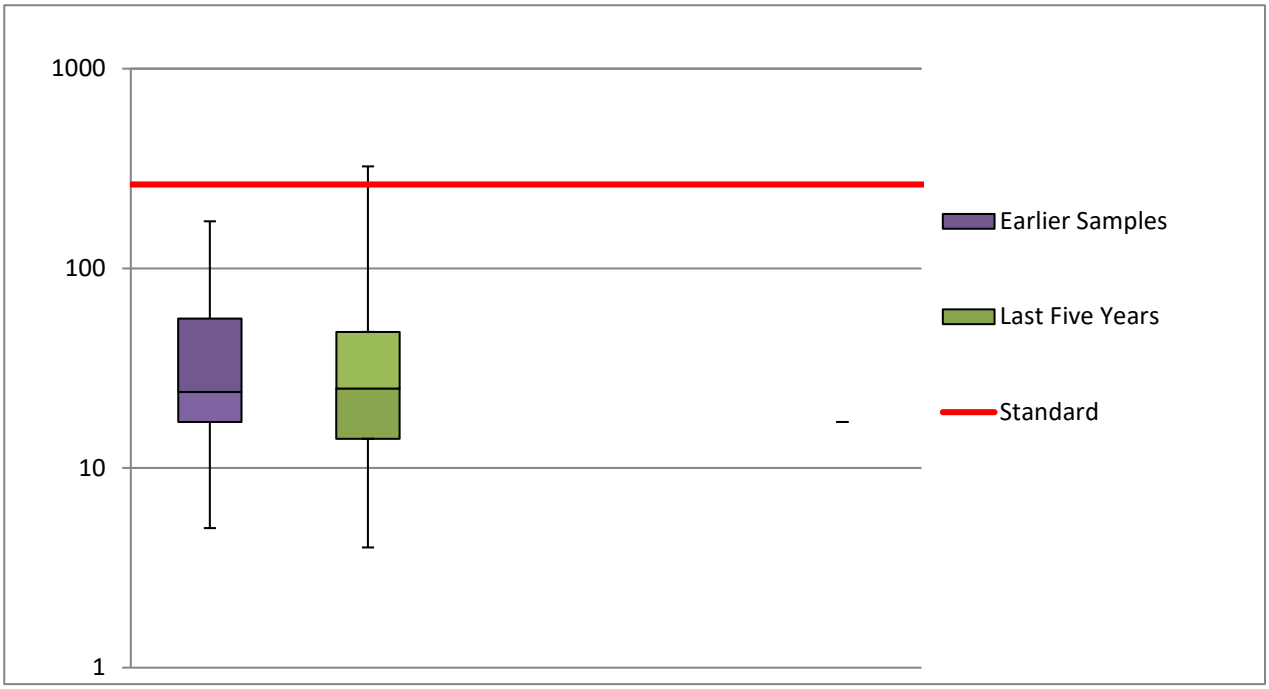


Figure 98: Total Suspended Solids Box and Whisker Plot for Pierre Creek. All samples recorded from 2016 to 2021 are displayed below in Figure 99.

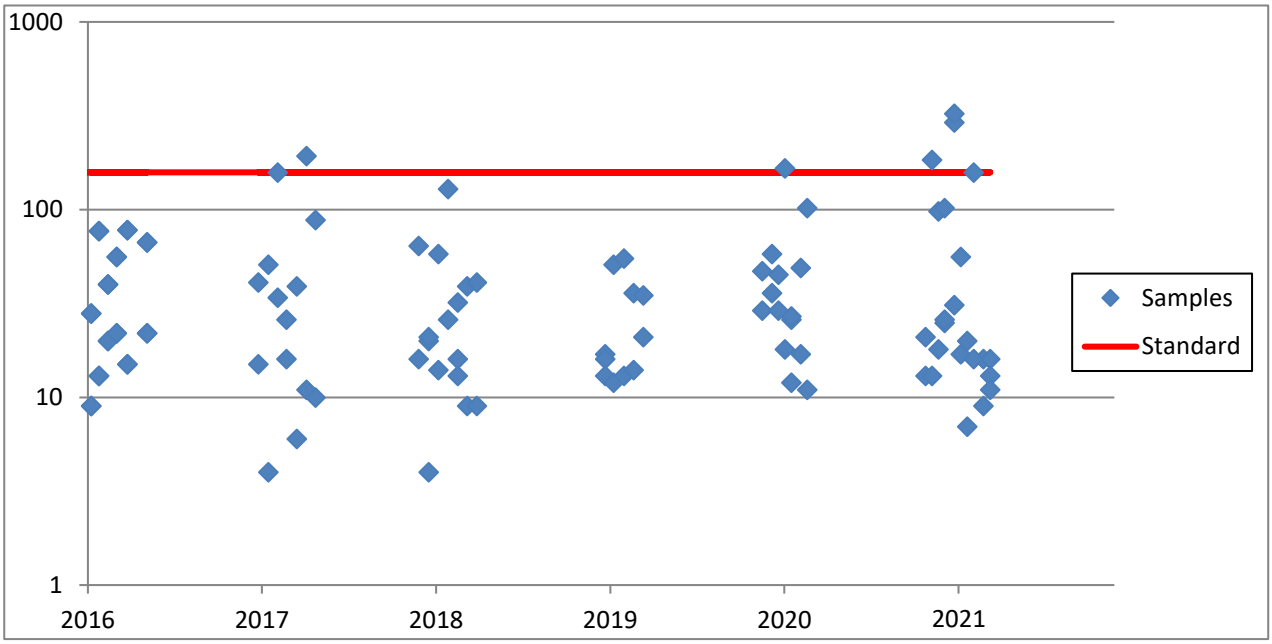


Figure 99: Total Suspend Solids Samples for Pierre Creek.

James River Segment 9

There is one monitoring site for Segment 9 on the James River, it is located near the confluence of Firesteel Creek. Figure 100 shows the monitoring site for Segment 9.

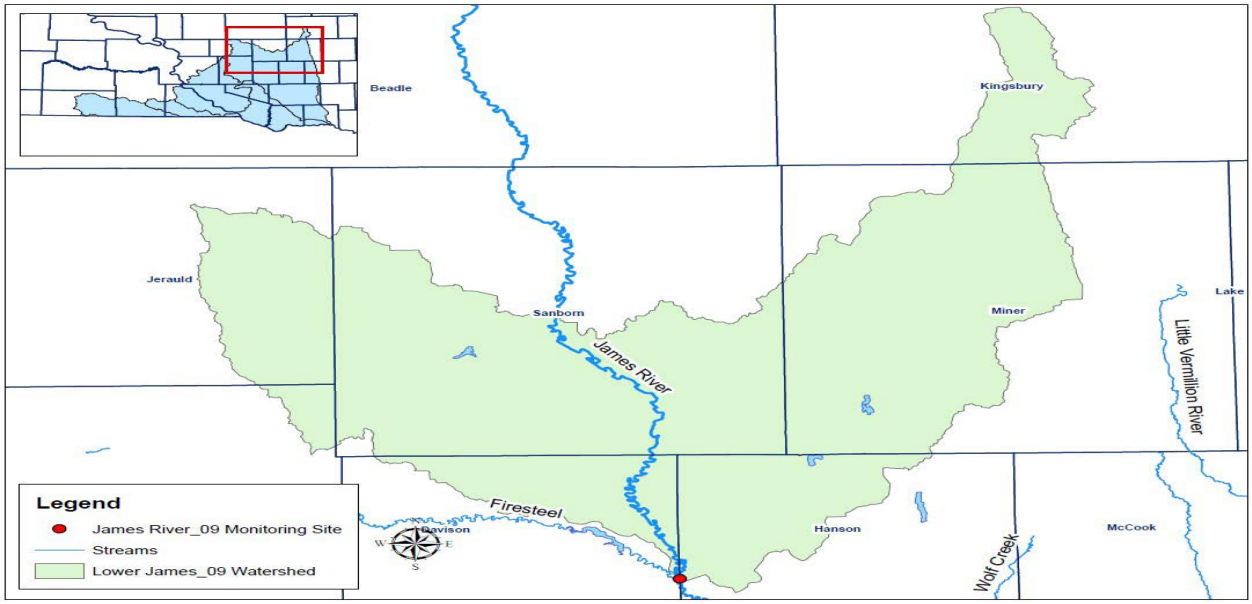


Figure 100: Monitoring site for Segment 9 on the James River

Segment 9 is described in the 2020 SD DANR IR as being in full support. In earlier reports it was listed for Total Suspended Solids (TSS). Figure 101 shows TSS median values increased from 68.5 to 80mg/l for the Last Five Years dataset. Excedances were 5.5% for the Earlier Samples and 10% for the Last Five Years dataset. Figure 102 shows the comparison.

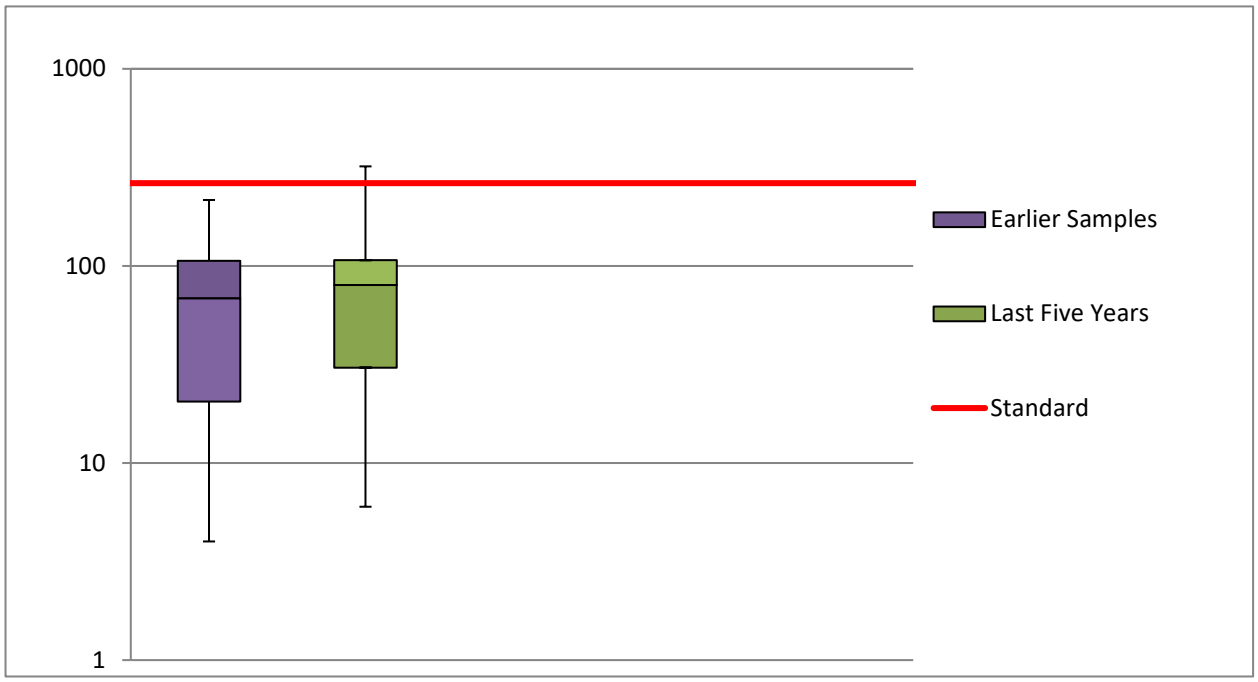


Figure 101: James River Total Suspended Solids Box and Whisker Plot

All samples for Total Suspended Solids for Segment 9 from 2016 to 2021 are demonstrated on Figure 102.

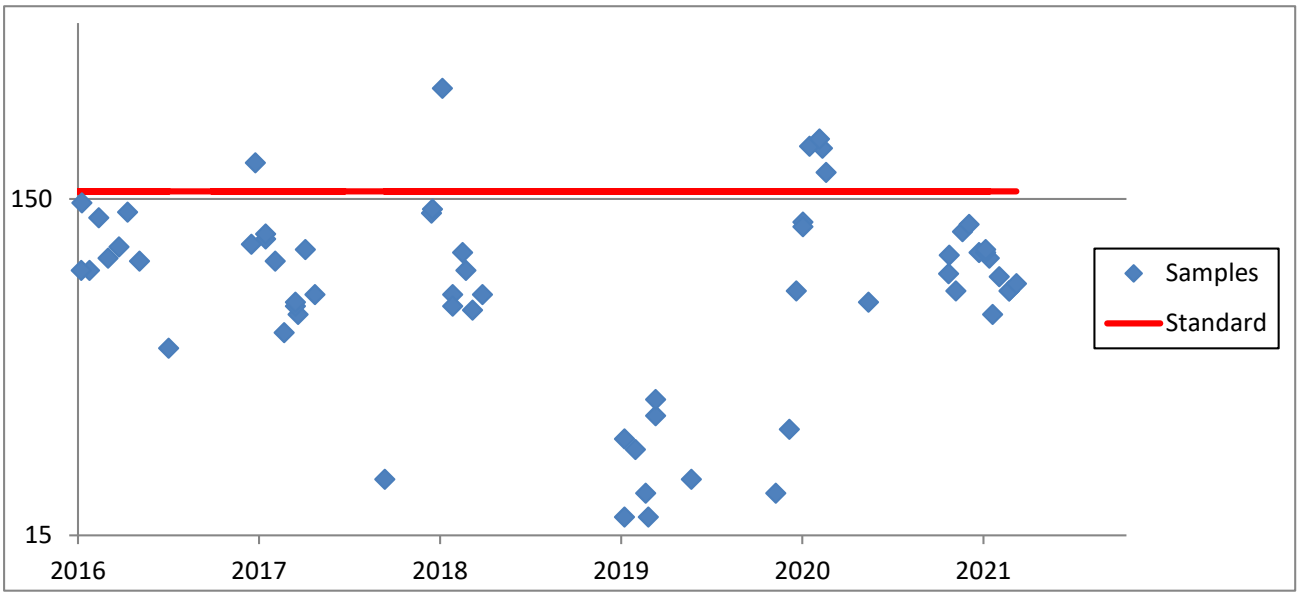


Figure 102: Total Suspended Solid Samples for Segment 9 James River

Segment 10 of the James River

James River 10 has one monitoring site down stream of its confluence with Firesteel Creek and upstream of its confluence with Pierre Creek. Figure 103 shows the monitoring site for this segment of the James River. This segment of the James River is in full support of its beneficial uses according to the 2020 Integrated Report.

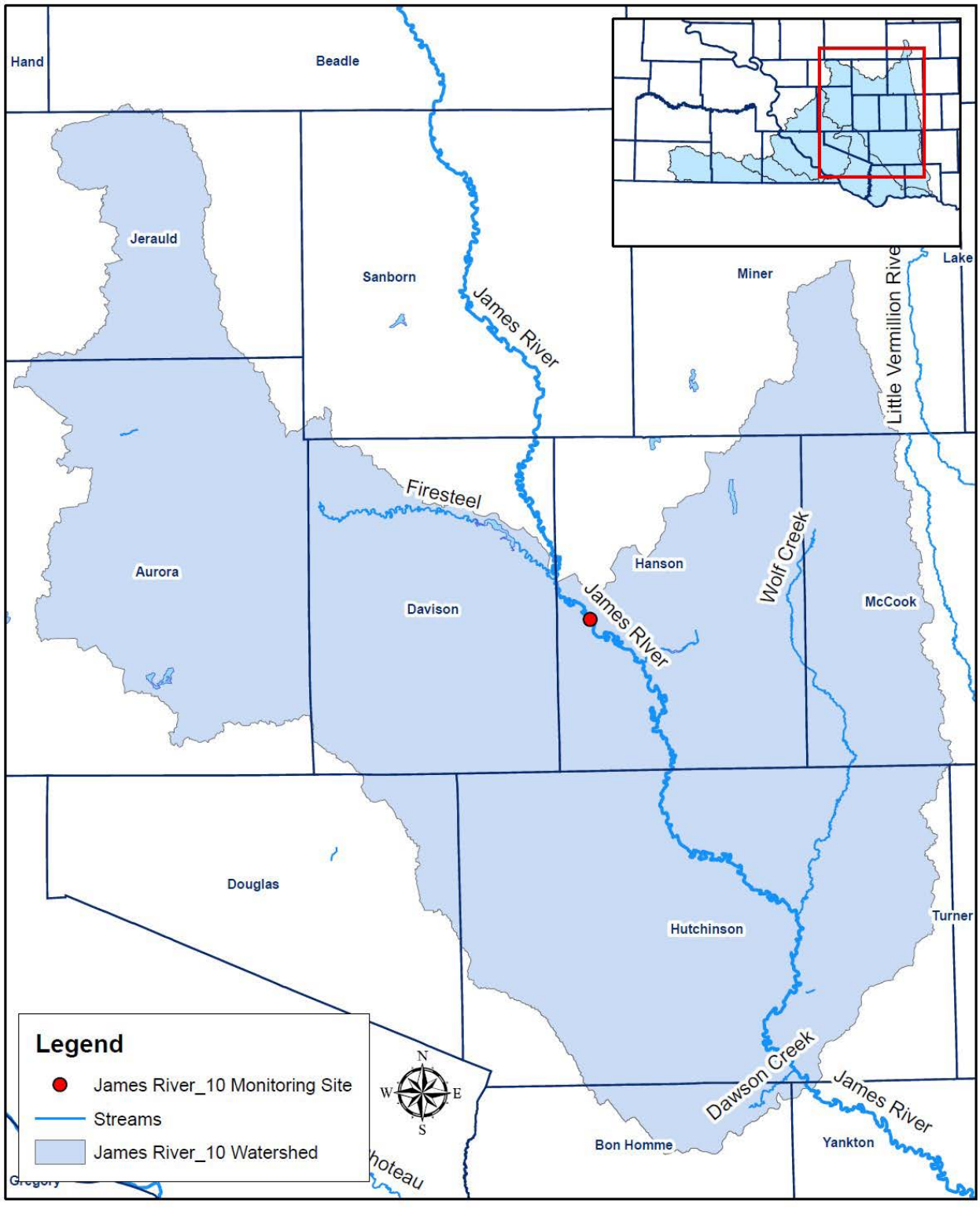


Figure 103: Monitoring Site for Segment 10 on the James River

Segment 11 James River

James River 11 has one monitoring site as seen in the figure below. This segment of the James River has consistently been listed for TSS and occasionally listed for bacteria in the Integrated Report through the years, and is currently listed for both in the 2020 Integrated Report.

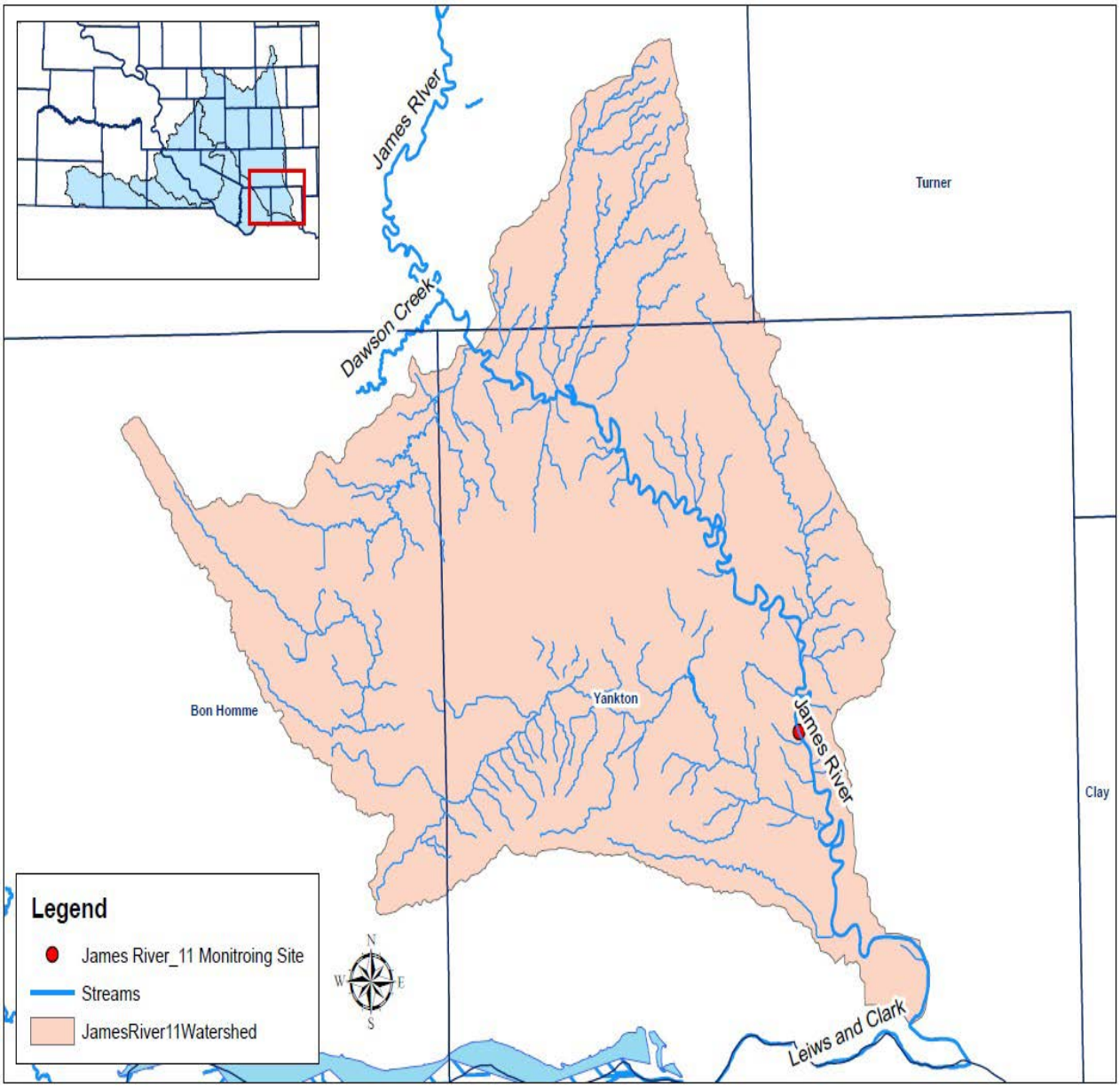


Figure 104: Monitoring Site for Segment 11 James River

Figure 105 shows that Segment 11 *E.coli* median values decreased for the Last Five Years from 89 to 22 CFU/100mL compared to the Earlier Samples dataset, *E.coli* standard for Segment 11 is 1178 CFU/100mL. Excedances were 10% for the Earlier Samples compared to 7% for the Last Five Years datasets.

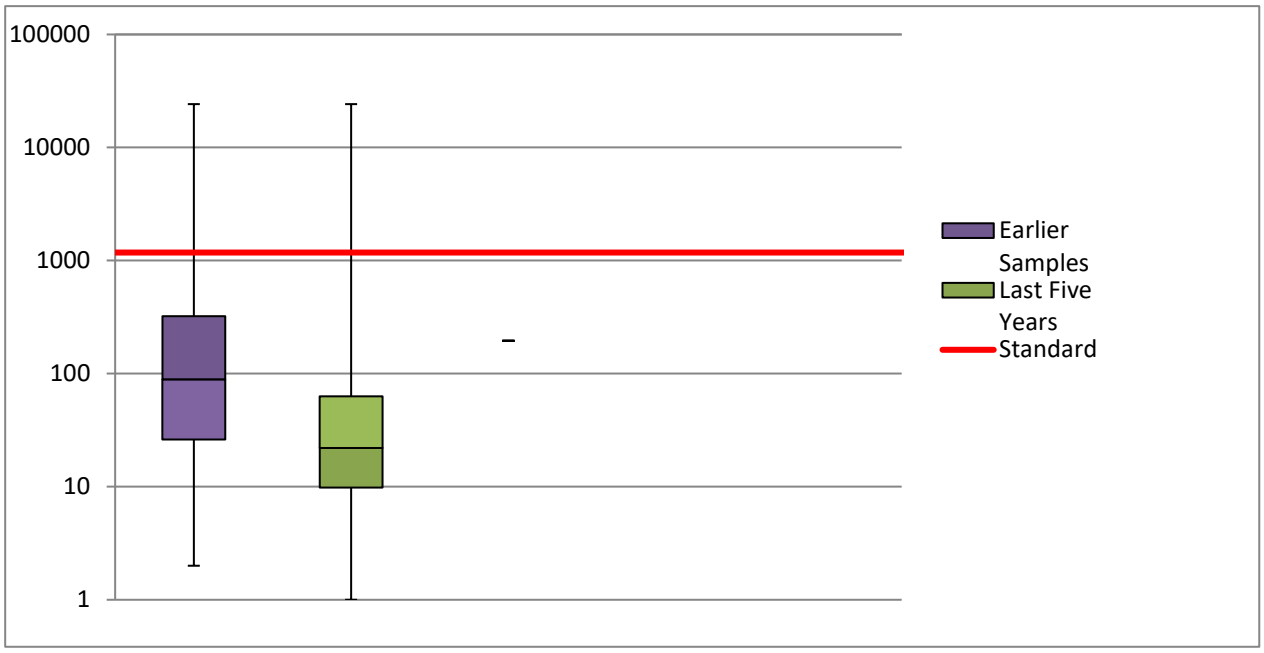


Figure 105: E-coli Samples for Segment 11 Box and Whisker Plot

All E-coli samples collected from 2016 to 2021 are displayed on Figure 106.

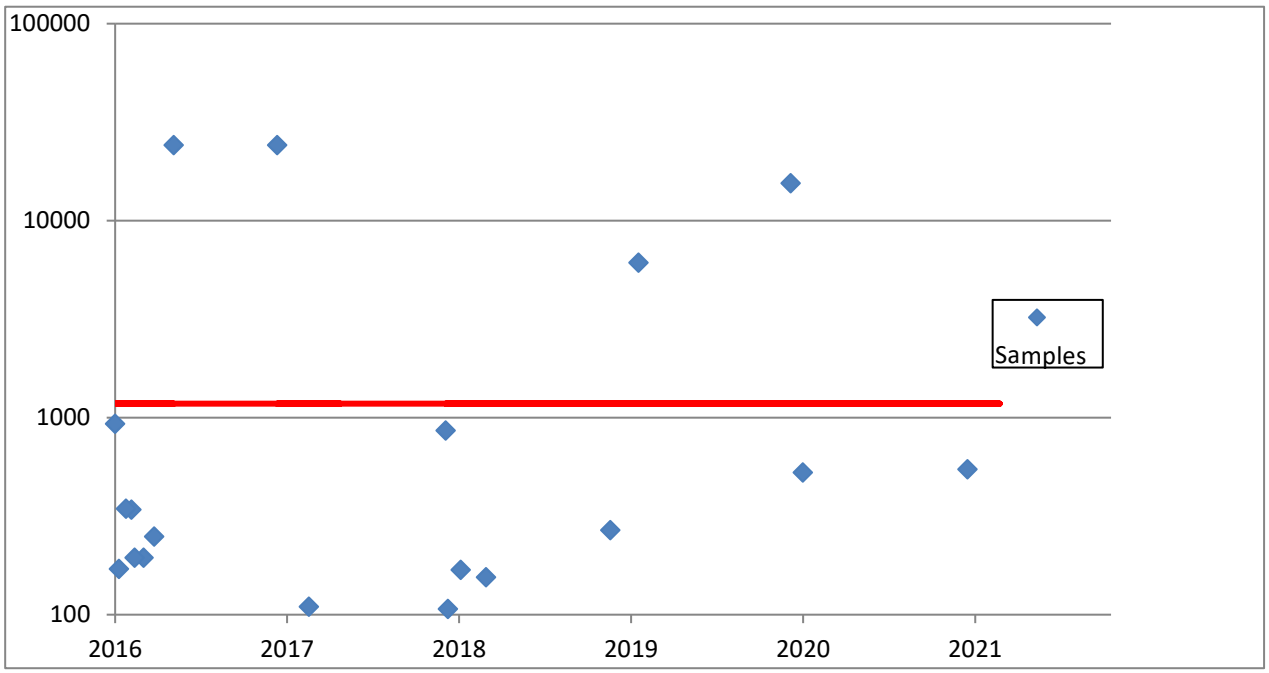


Figure 106: E-coli Sample for Segment 11 James River

Figure 107 shows that Total Suspended Solids median values for Segment 11 from 110 mg/l for Earlier Samples to an 86 mg/l for the Last Five Years datasets. TSS standard for Segment 11 James River is 158 mg/l. Excedances were 34% for the Earlier Samples and 29% for the Last Five Years datasets.

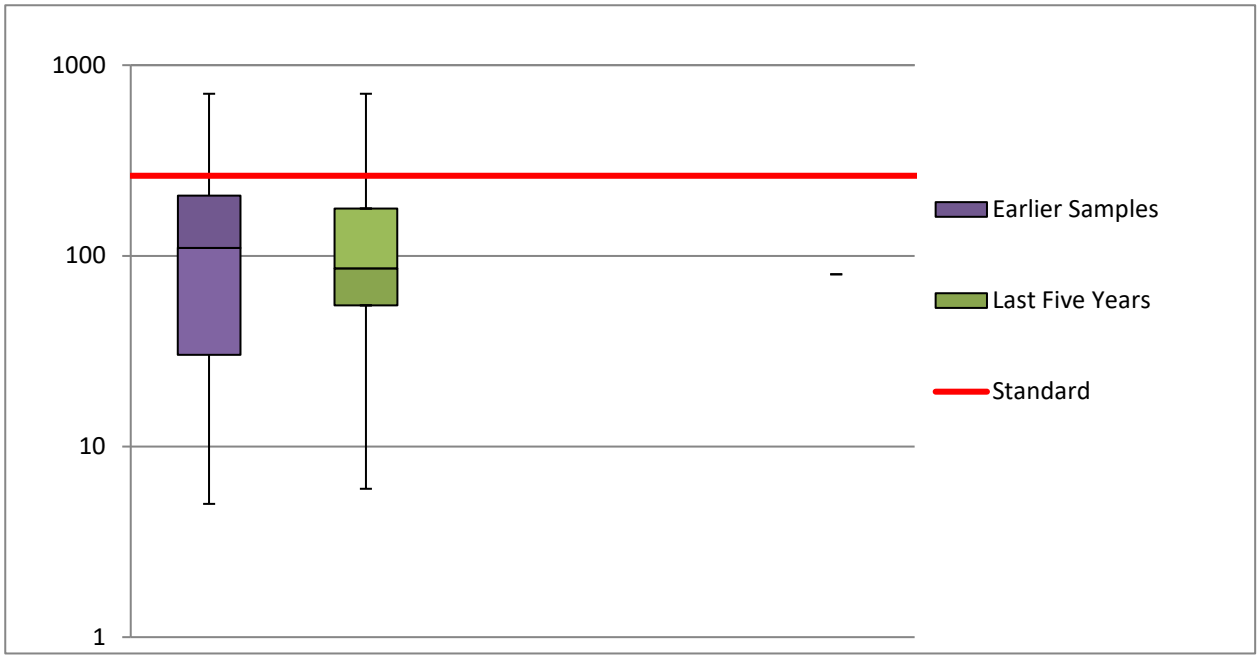


Figure 107: Total Suspended Solids for Segment 11 James River Box and Whisker Plot

All TSS samples collected from 2016 to 2021 for Segment 11 are displayed in Figure 108.

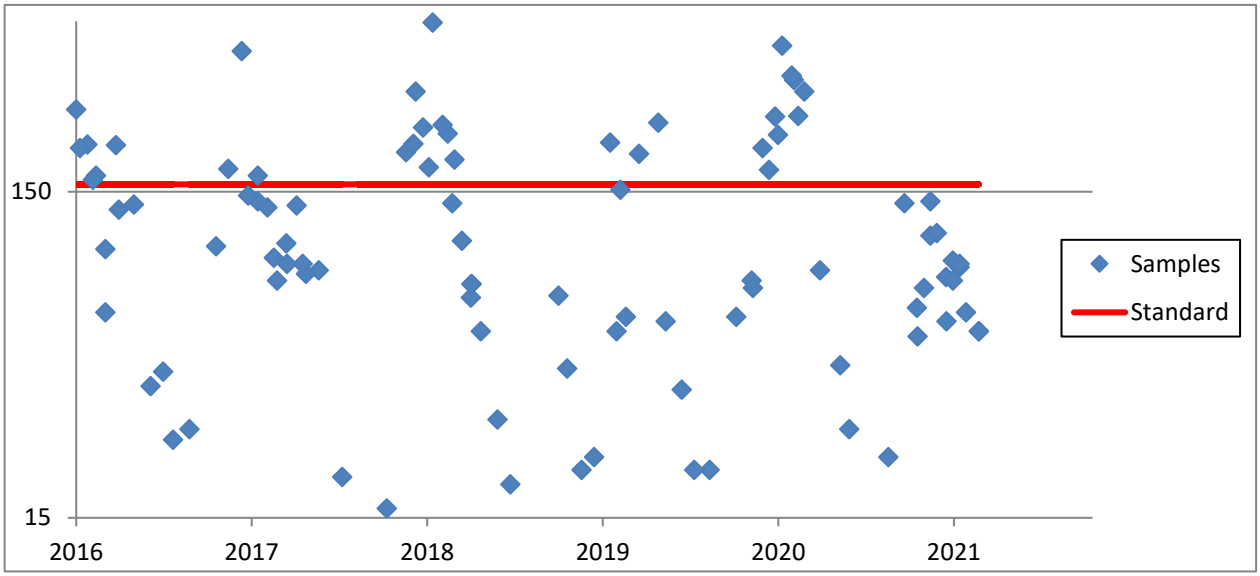


Figure 108: Total Suspended Solids Samples for Segment 11 James River

Evaluation

Locations were gathered for all BMPs installed in the Project area through the DENR Tracker system.
This was to assist in modeling and uploading information to the EPA GRTS website.
Locations of BMPs installed during this segment are shown in Figure 109. Along with the type of BMP that was installed, these maps show that several BMPs were installed throughout the watersheds. With the frequency and location of the BMPs, the Project was able to assist in improving condition of the stream reaches throughout the project area.

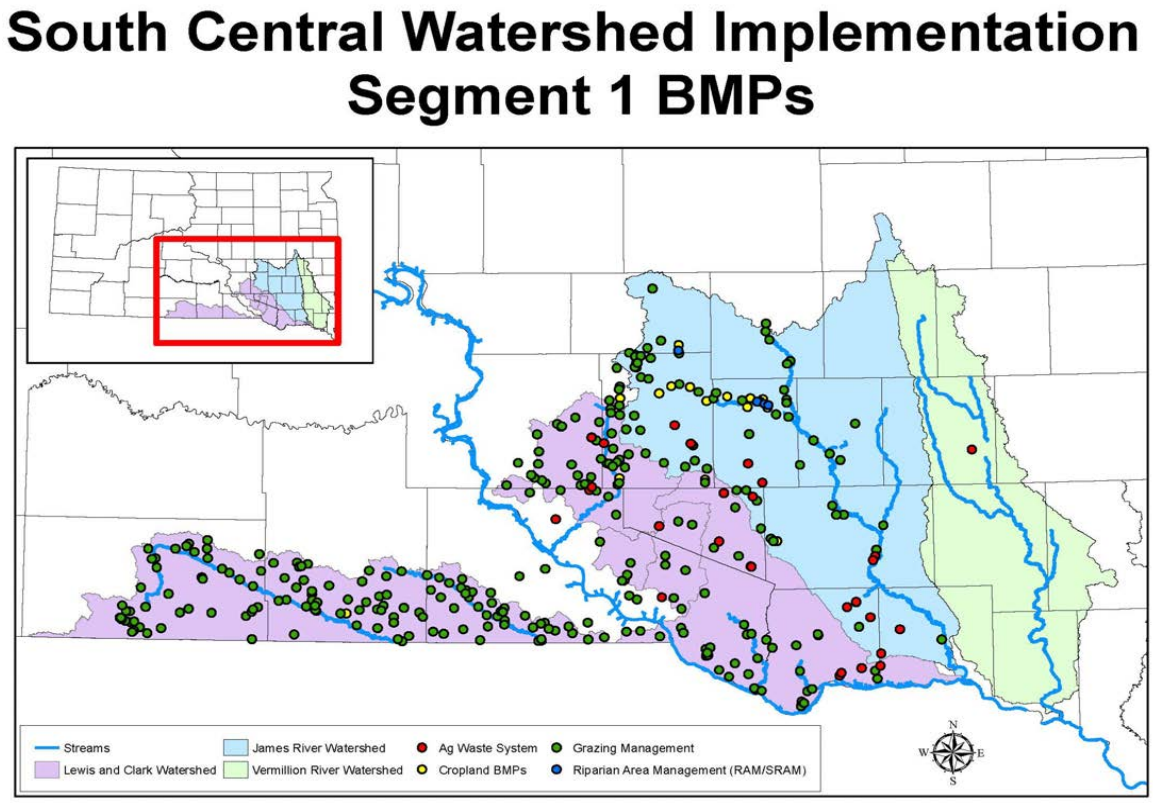


Figure 109: Locations of BMP's Installed During Project Segment l

STEPL and FLGR4 Excel spreadsheets were used to calculate load reductions for all BMPs installed through the Project segment, with the reductions recorded in DENR's Tracker for each BMP. Table 4, shown on the top of the next page, shows the reductions broken down by individual BMP tasks, and as a total unit number for the whole nutrient. Total number of projects completed through the segment are listed on the table also.

Table 4: STEPL Load Reductions by Practice

Best Management Practices		Cropland BMPs	Ag Waste Systems	Grazing Management	RAM	Total
# Of Projects:		17	25	292	3	337
N (Pounds)	Seg. 1	18,723	478,480	213,255	653	**711,111**
P (Pounds)	Seg. 1	6,588	103,134	46,211	129	**156,062**
Sediment (Tons)	Seg. 1	2,046	928	23,693	57	**26,724**

Modeled reductions by watershed from this segment can be found below in Table 5.

South Central Segment 1/Lakes	Sediment (Tons)	Nitrogen (Pounds)	Phosphorus (Pounds)
SD-JA-R-DAWSON_01	10,490	48,233	61
SD-JA-R-FIRESTEEL_01	11,315	51,203	2,598
SD-JA-R-JAMES_08	100	529	67
SD-JA-R-JAMES_09	880	5,150	310
SD-JA-R-JAMES_10	26,736	136,793	599
SD-JA-R-JAMES_11	9,400	44,690	54
SD-JA-R-PIERRE_01	88	701	36
SD-JA-R-WOLF_02	59	355	40
SD-MI-L-ANDES_01	5	19	3
SD-MI-L-GEDDES_01	268	1,249	100
SD-MI-L-PLATTE_01	6,621	29,461	150
SD-MI-R-CHOTEAU_01	6,829	31,068	668
SD-MI-R-EMANUEL_01	4,771	22,218	380
SD-MI-R-FRANCIS_CASE_01	8,118	33,314	3,601
SD-MI-R-LEWIS_AND_CLARK_01	20,257	94,765	3,067
SD-MI-R-OAHE_01	2,427	7,801	-
SD-MI-R-PLATTE_01_USGS	22,159	95,890	3,906
SD-MI-R-PONCA_01	6,108	22,133	4,172
SD-MI-R-SLAUGHTER_01	292	1,521	154
SD-NI-R-ANTELOPE_01_USGS	3,361	14,737	1,748
SD-NI-R-KEYA_PAHA_01	8,898	35,436	4,088
SD-VM-R-VERMILLION_E_FORK_02	5,166	25,830	-
SD-WH-R-LITTLE_WHITE_01	191	716	84
SD-WH-R-WHITE_04	152	617	83
Other	1,371	6,682	755
Total Reductions:	**156,062**	**711,111**	**26,724**

Project Budget

The Project received funds from many different state and federal sources to attain what has been accomplished. The original project budget with estimated funds that were expected to be spent in the project is shown in Table 6.

Table 6: Original Segment 1 Project Budget

ITEM	319-EPA	Consolidated /CWSRF-WQ	USDA EQIP/CRP/RCPP	JRWDD	CWSRF-NPS	Local	Total
Personnel Support							
Staff: Coordinator/Conservationist	$377,200	$90,000	$232,000	$174,800			$874,000
Travel	$68,000	$22,000					$90,000
Office Space/Equipment/Supplies:	$32,000	$3.000	$45,000				$80,000
Administration:	$28,600		$125,000			$12,400	$166,000
Subtotal: Personnel Support	**$505,800**	**$115,000**	**$402,000**	**$174,800**	**$0.00**	**$12,400**	**$1,210,000**
Objective 1: BMP's Installation							
Task 1: Cropland/Grassland BMP installation							
Product 1: Cropland BMP's							
(Filter Strips, Grassed Waterways, Riparian plantings etc.)			$916,950			$123,500	$1,040,450
Product 2 : Grassland BMP's -							
(Rotational grazing, fence, seeding, water development)	$1,080,000	$90,000	$1,904,674	$1,255,000		$889,406	$5,219,080
Product 3: Riparian Area Mgt. (RAM Program)	$150,000			$125,000			$275,000
Task 2: Livestock Nutrient Management							
Product 4: Ag Waste Systems							
Engineering Design Services -		$31,500	$126,000			$52,500	$210,000

System Construction -	$370,000	$950,000	$1,700,000			$1,980,000	$5,000,000
Winter Feeding Area -	$80,000	$140,000				$80,000	$300,000
Nutrient Management Plans -	$6,700	$6,000	$17,300			$10,000	$40,000
Subtotal: BMP Installation	**$1,686,700**	**$1,217,500**	**$4,664,924**	**$1,380,000**		**$3,135,406**	**$12,084,530**
Objective 2: Outreach:							
Task 3: Information Campaign							
Product 5: (Informational meetings)	$5,000					$5,000	$10,000
Subtotal: Outreach	**$5,000**	**$0**	**$0**	**$0**	**$0**	**$5,000**	**$10,000**
Objective 3: Monitoring and Project Management							
Task 4: Water Quality Sampling/Evaluations							
Product 6: 24 water samples/testing/evaluation @ $65/ea.	$13,000						$13,000
Task 5: Reports And PIP Development:							
Product 7: Reports:(2- semi-annual, 2 - annual, & 1 - final)							
Subtotal: Monitoring and Reports	**$13,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$13,000**
Total Project Cost:	**$2,210,500**	**$1,332,500**	**$5,066,924**	**$1,554,800**	**$0**	**$3,152,806**	**$13,317,530**

Several changes were made to the budget during the life of Segment 1 of the project. A summary of the amendments to the Project are listed below:

Amendment 1:

June15, 2016, the section 319 grant was increased by $839, 335 to the Project for additional interest in Grassland BMP's, AWM's, and water quality sampling.

Amendment 2:

January 10, 2017, the Section 319 grant was increased by $45,451.92 to the Project to further increase funds available for Grassland BMP's.

Amendment 3:

July 24, 2017, the Section 319 grant was increased by $464,000 to assist in the implementation of all BMP's.

Amendment 4:

July 17, 2018, the Section 319 grant was increased by a $1,000,000 award to continue many successful BMP implementations.

Amendment 5:

July 26, 2019, the Section 319 grant was increased by a $141,000 award to help implement more Grassland BMP's.

Amendment 6:

August 24, 2020, the Section 319 grant was increased by an amount of $400,000 to hel facilitate the implementation of all BMP's.

Amendment 7:

August 31, 2021, the Section 319 grant was increased by $300,000 to help implement more AWM's practices.

Funds expended through the Project can be viewed in Table 7. The Project was very well received by producers, and in turn producers share of the funds spent was well over 50% of the total of a funds spent.

Table 7: Funds Expended for Segment 1

ITEM	319-EPA	Consolidated/ CWSRF-WQ/ Con. Com.	USDA EQIP/CRP/ RCPP	JRWDD	CWSRF-NPS	Local	Total
Personnel Support							
Staff: Coordinator/Conservationist (2 FTE)	$659,943		$223,754	$127,948			$1,011,645
Travel	$111,230		$4,245				$115,475
Office Space/Equipment/Supplies:	$16,997		$382				$17,379
Administration:				$123,414			$123,414
Subtotal: Personnel Support	**$788,170**	**$0.00**	**$228,381**	**$251,362**	**$0.00**	**$0.00**	**$1,267,913**
Objective 1: BMP's Installation							
Task 1: Cropland/Grassland BMP installation							
Product 1: Cropland BMP's	$10,911	$1,013			$68,677	$120,471	$201,072
(Filter Strips, Grassed Waterways, Riparian plantings etc.)							
Product 2 : Grassland BMP's	$1,611,968	$374,379	$610,680	$8,483	$233,240	$1,053,764	$3,892,514
(Rotational grazing, fence, seeding, water development)							
Product 3: Riparian Area Mgt. (RAM Program) - 30 acres					$245,571		$245,571
Task 2: Livestock Nutrient Management							
Product 4: Ag Waste Systems							
Engineering Design Services	$92,322	$16,292				$36,204	$144,818
System Construction	$679,948	$1,834,370	$5,197,395			$10,437,969	$18,149,682
Winter Feeding Area							$0
Nutrient Management Plans							$0
Subtotal: BMP Installation	**$2,395,149**	**$2,226,054**	**$5,808,075**	**$8,483**	**$547,488**	**$11,648,408**	**$22,633,657**
Task 3: Information Campaign							$0
Product 5: (Informational meetings (2), tours (2), articles (4)							

Objective 2: Outreach:							
Subtotal: Outreach	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Objective 3: Monitoring and Project Management							
Task 4: Water Quality Sampling/Evaluations							
Product 6: 24 water samples/testing/evaluation @ $65/ea.	$2,398						$2,398
Task 5: Reports And PIP Development:							
Product 7: Reports:(2- semi-annual, 2 - annual, & 1 - final)							
Subtotal: Monitoring and Reports	**$2,398**	**$0**	**$0**	**$0**	**$0**	**$0**	**$2,398**
Total Project Cost:	**$3,185,717**	**$2,226,054**	**$6,036,456**	**$259,845**	**$547,488**	**$11,648,408**	**$23,903,968**
Match:							
Ineligible Match - Federal and/or Project Allocated			$6,036,456				
Eligible Match - Local and State		$2,2226,054		$259,845	$547,488	$11,648,408	$14,681,795
Match: Project Totals for Match	$3,185,717	$2,226,054		$259,845	$547,488	$11,648,408	$17,867,512
Match Percentages:	**18%**	**12%**	**34%**	**1%**	**1%**	**65%**	**100%**

Regional Conservation Partners Program

A grant application was submitted in July of 2015 for the USDA NRCS' Regional Conservation Partners Program. The program was to give projects and partners an amount of money, from their EQIP Program funds, to help install BMPs on the landscape over a five-year period. South Central requested an amount of $2.7 million dollars to aid in the installation of grazing and animal waste system practices. April of 2016 the project and sponsor were notified that the application was accepted and negotiations were held to disperse the funds. It was a successful program for the project as we were able to maintain control of placements of practices to maximize water quality criteria. The funds were exhausted a year and a half after the initial ranking, so was sought after by producers as well. A caveat of the program stated that if funds were used up before the end of the project, that a request could be made to insert additional funds. An application was made for this purpose and it was accepted for an additional $2.7 million program for the project. Staff is currently working on the details for this grant and should be available for the upcoming Segment 2 of the South-Central project. Below find a map of the RCPP area, which included a larger area than the 319 boundaries for better program management.

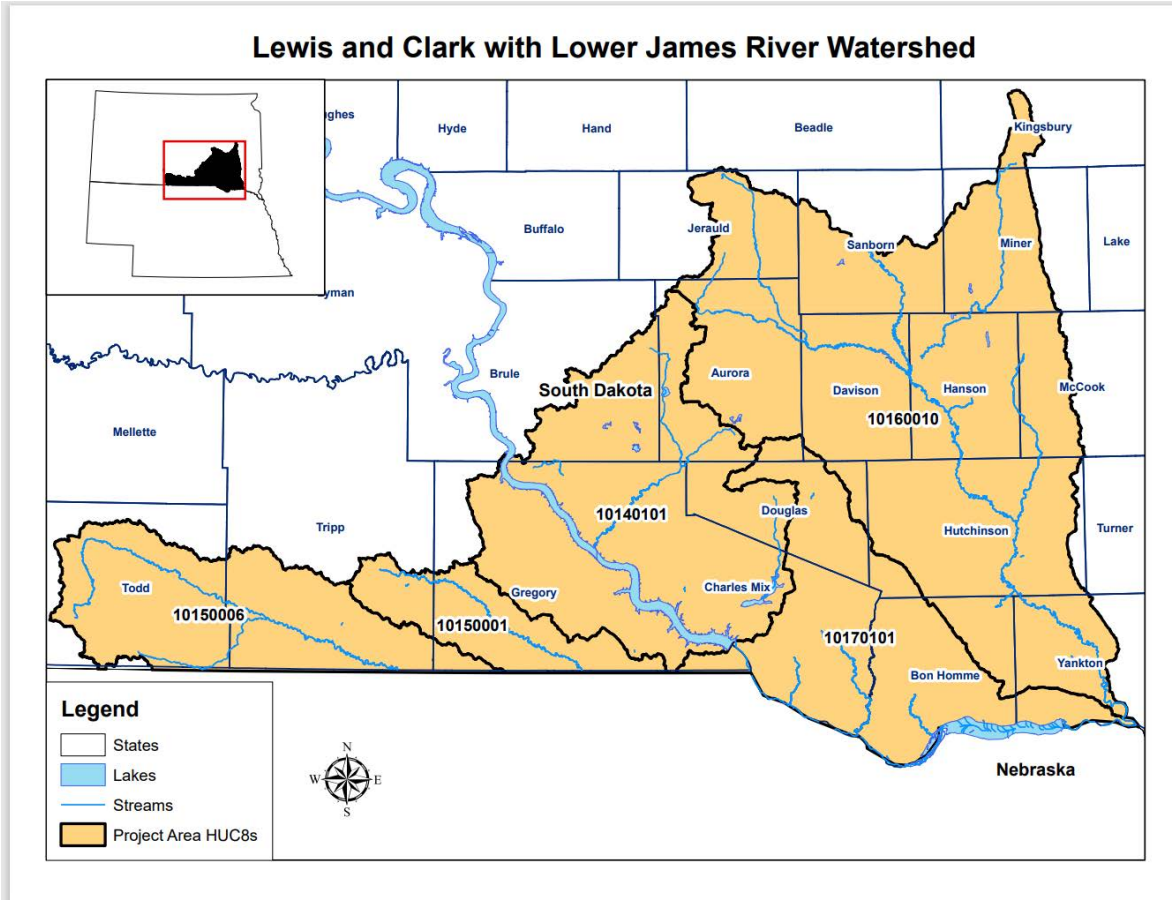


Figure 110: Map of RCPP Area

PUBLIC PARTICIPATION

Project area producers were informed of practice installation opportunities by press releases, fact sheets, brochures, feature articles, booths, and direct mailings found at partner agency offices and other public events. Reference back to the Project Goals, Objectives, and Accomplishments section of this report on pages 19-32, to get pictures and more detailed listings of the types of information provided to producers.

This Project initiated direct producer contact by hosting booths at local fairs and workshops by hosting guest speakers to provide technical information, and by simply making onsite visits to individual farms and ranch sites. This method appeared to be most successful for this Project and cemented the word-of-mouth advertising that has led to our success. Producer to producer referrals to contact us for practice information was also a leading initial contact opportunity.

Public participation is also available through the bimonthly James River Water Development Board meetings. Public comments can also be received by the numerous County Commissioner meetings, Conservation District meetings, and USDA event meetings that this group participates in.

ASPECTS OF THE PROJECT THAT DIDN'T WORK WELL

Overall, the aspects that worked far outnumbered the few that didn't work well. Probably the biggest struggle this project had was keeping funds on hand to match the high producer demand for practices offered in the project area. Comparison of the original budget to the final budget shows that the original amount anticipated to be spent doubled in the final budget at segment end, showing the increased demand and support for BMPs offered. Project staff were able to secure alternate funding pools, from various State and Federal sources, to handle a portion of the demand but the problem will probably persist going into Segment II. Employment of two experienced conservationists to assist in producer contacts and practice planning was a bonus for this segment. Another aspect that was difficult, although probably out of the project's control, was the swings in weather during the segment. In the year of 2019, we started out with large rain events on frozen ground which led to flooding and damage of fields and pastures. As the seasons progressed there were multiple one-hundred-year flood events that cumulated into early fall when there were two five-hundred-year rain events, within ten days of each other, that led to historic flooding of crop ground and pastures not to mention river and stream levels recorded their highest levels on record. Precipitation totals were 250% of normal across the state with many stations recording the wettest year on record for the project area. Structures were lost in these flood events, including bridges, dams, lagoons, etc., adding to the cost incurred by many producers, entities, and local government groups. Some pictures of lost structures and flooding follows on the next page.

Figure 111. Picture of Hidden Timber Dam breaking as a result of a four-inch rain on frozen ground in April of 2019. This structure was a WPA era dam and was the headwaters for the Keya Paha River in this project area.

Figure 112. This picture shows the breaching of Platte Lake in September of 2019 after twelve inches of rain. Platte Lake was another WPA era facility on Platte Creek in the project area.

Figure 113. Picture shows the breaching of Lake Hanson a few hours after Lake Platte broke. Again, another WPA era dam on Pierre Creek in the project area.

South Dakota is known as the “Land of Infinite Variety” and it held up to that motto during this segment. The year after the floods was a dry year but soils were saturated and didn’t pose problems for producers. 2021 was another dry year with most of the project area being in the Extreme category on the drought monitor map. These swings in rainfall kept the coordinators scrambling to keep up with producer needs, luckily, we had enough flexibility built into our Best Management Practices to make them fit the changing weather conditions.

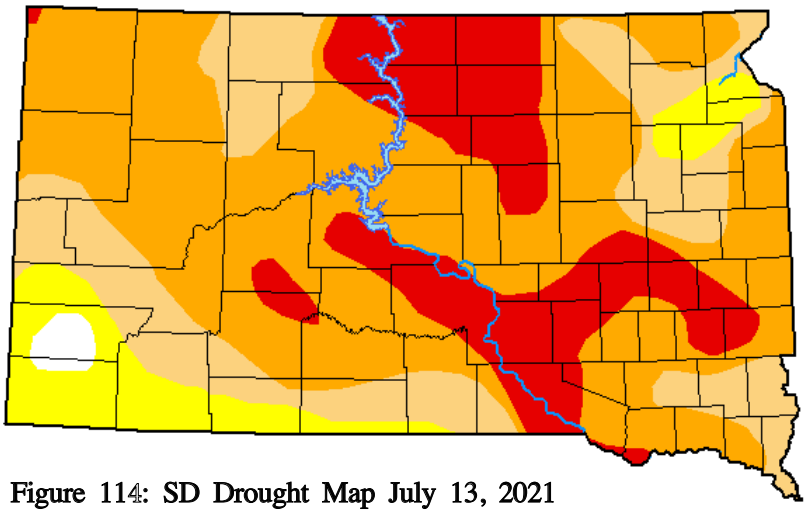


Figure 114: SD Drought Map July 13, 2021

In summation, the areas of concern were the weather cycles and having enough funds to be able to meet producer demands.

RESULTS AND FUTURE ACTIVITY RECOMMENDATIONS

We feel that Segment I of this project was successful in achieving goals set out at the start of the project. BMPs installed surpassed the original estimates and the water sampling regime verified that significant gains were made in the streams and waterbodies encompassed in the project area. One stream in particular, Pierre Creek, was delisted and had a success story written on it. Further evidence that the practices offered by this project were able to help meet the water quality goals.

Future activity for Segment II would include an expansion of the project area. This would include the rest of the James River watershed within the South Dakota area. Inclusion of this watershed would bring total acres of the project to be 16,000,000 acres or roughly one third of the state. Another coordinator, Blain Hieb, was brought into the project to help with the expansion. We are currently making applications to other funding sources within the state to help fund the additional practices in the new project area. A map on the next page will show the area to be serviced by the South-Central team.

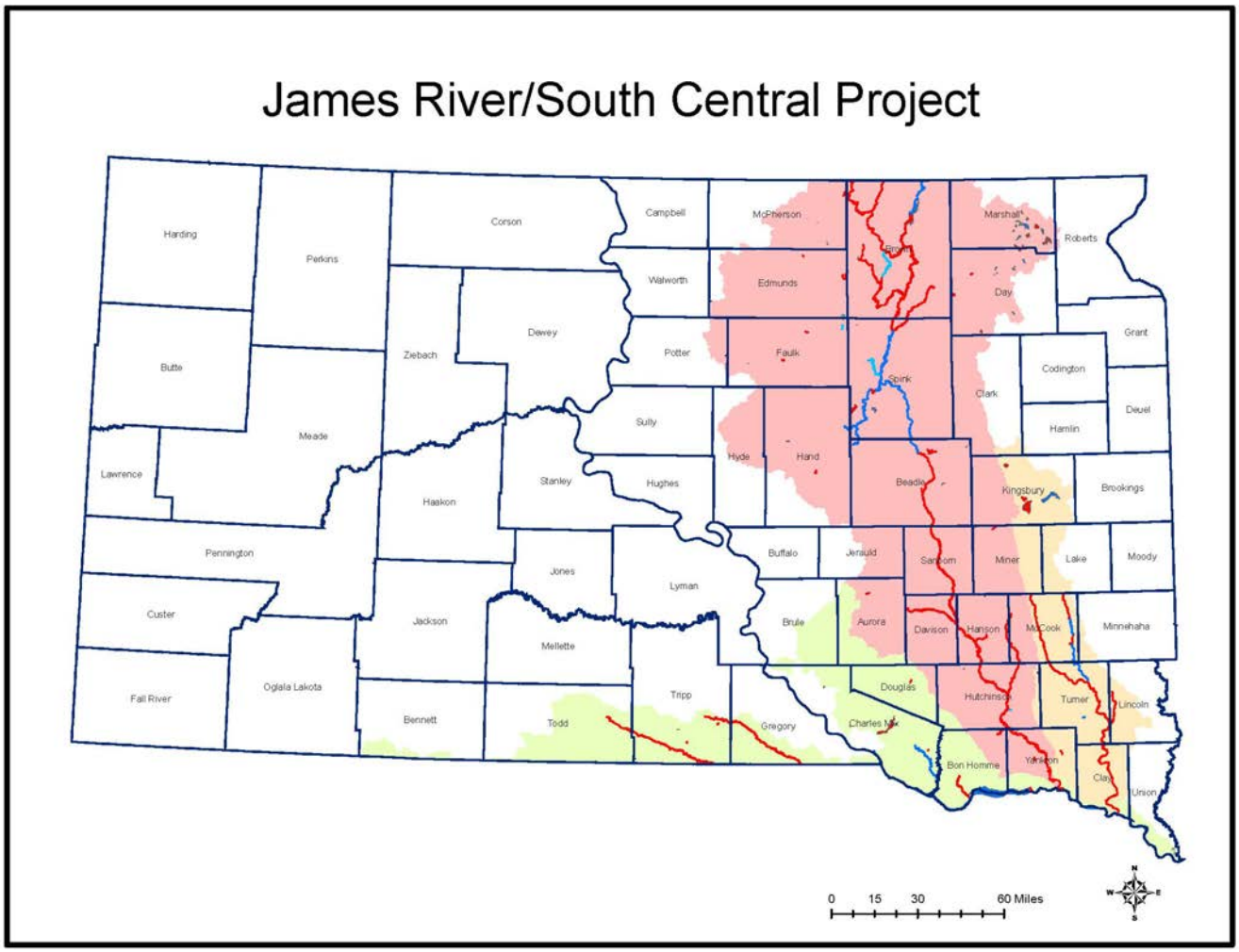


Figure 115: Watershed map for Segment II of the South-Central 319 Project

Practices and BMPs offered to producers for improving water quality concerns should remain the same as previous segment. An increased effort is recommended to be made in Segment II to get funds flowing from the newly acquired RCPP grant to assist in funding these practices and ensure the Project move forward on gains realized in water quality numbers for the watersheds. The water sampling program will be expanded into streams in the new project area as well.

APPENDIX

Brochures, Fact Sheets, Press Releases, and Promotional Materials

NONPOINT SOURCE SUCCESS STORY

South Dakota

Monoslope Barn and Grazing Management Improve Bacteria Levels in Pierre Creek

Waterbody Improved

Bacteria from agricultural nonpoint source pollution degraded Pierre Creek in Hanson County, South Dakota. As a result, the South Dakota Department of Environment and Natural Resources (DENR) placed Pierre Creek on South Dakota's 2010 Clean Water Act (CWA) section 303(d) list due to an *Escherichia coli* bacteria impairment. Natural resource agency partners collaborated to implement riparian restoration and grazing management and to install of one of the first monoslope barns in South Dakota. Bacteria levels declined after these improvements, and DENR reclassified Pierre Creek in 2020 as meeting its beneficial uses for limited contact recreation and removed it from South Dakota's CWA section 303(d) list.

Problem

Pierre Creek drains 78 square miles of land before merging with the James River in Hanson County (Figure 1). The impaired segment of Pierre Creek also flows through Lake Hanson, a shallow, 60-acre recreational reservoir near the town of Alexandria. Pierre Creek receives runoff from agricultural operations, as its watershed is composed of 54% cropland and 37% pastures/hay ground. To meet water quality standards for *E. coli*, no sample can exceed 1,178 colony-forming units per 100 milliliters (cfu/100 mL), and during a 30-day period the geometric mean of a minimum of five samples must not exceed 630 cfu/100 mL.

Pierre Creek impairments were identified during the Lake Hanson Watershed Assessment (2001–2002) and the Lower James River Watershed Assessment (2006–2007) projects. As a result, DENR added Pierre Creek to the state's list of impaired waters in 2010 for failure to attain beneficial uses for limited contact recreation due to elevated *E. coli* numbers. In 2011, a total maximum daily load (TMDL) was completed for Pierre Creek. The sources determined to have the most impact on *E. coli* levels were livestock feeding areas and lots, as well as livestock grazing areas with direct access to the stream.

Both the Lake Hanson Watershed Assessment Final Report and the Pierre Creek *E. coli* TMDL document recommended improving animal feeding operations, improving grazing management along the stream corridor and excluding livestock from accessing the stream. A septic system survey was also completed during the Lake Hanson Watershed Assessment because there are several residences around the lake that could have been sources of bacteria.

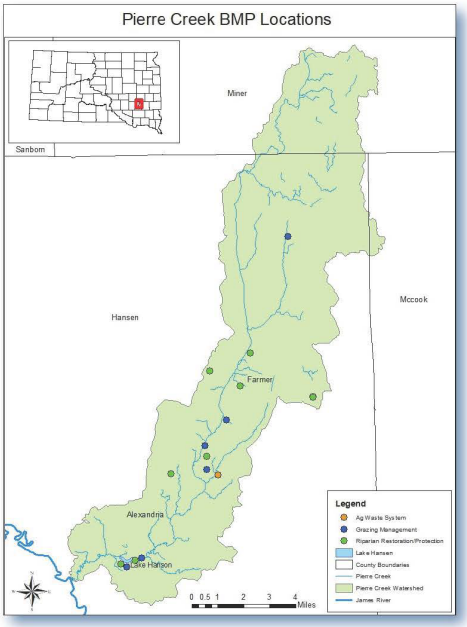


Figure 1. Pierre Creek is in southeastern South Dakota.

A load reduction was calculated for the Pierre Creek *E. coli* TMDL. During high flows, a 73% reduction was needed to meet the water quality standards. Also, in the mid flow and base flow zones in Pierre Creek, reductions of 43% and 63%, respectively, were needed to meet the water quality standard.

Story Highlights

Watershed partners implemented a variety of best management practices (BMPs), including agricultural waste systems, grazing management, and riparian restoration and protection (Figure 2). In 2014, a 433-foot long monoslope barn was installed over an open lot to reduce the amount of polluted runoff from livestock. A monoslope barn is designed with a roof with a single slant to one side. The monoslope barn is oriented from east to west with the slanted roof lower on the north side and higher on the south side. The orientation is beneficial because it takes advantage of shade and airflow through the barn in the summer and captures more warmth from sunlight during the winter months. The monoslope barn was designed to house 999 cows and includes a 12-foot deep pit to store a year's worth of manure from the cattle. The manure will be used as fertilizer on fields close to the facility.

Figure 2. BMPs installed included (clockwise from the top left): a monoslope barn, temporary fencing, portable water sources and grazing management.

Along with the monoslope barn, almost 550 acres of riparian restoration/protection and over 1,800 acres of grazing management have been implemented in the watershed (see Figure 1 for BMP locations). One example of grazing management included working with a producer to implement the use of a portable offsite watering system and temporary fencing to maximize grazing potential. These practices reduced the access and amount of time livestock could be in riparian areas and improved the grazing throughout the watershed, while also increasing biodiversity, increasing water infiltration and reducing surface runoff.

Results

As of 2020, Pierre Creek *E. coli* levels no longer violate water quality standards, and Pierre Creek was removed from the CWA section 303(d) list of impaired waters. Sampling prior to implementation had exceedances in 12 of 41 samples (29%). Sampling following implementation of BMPs had exceedances in 2 of 51 samples (4%). According to STEPL modeling, BMP implementation also reduced loadings of nitrogen by 23,266 pounds, phosphorus by 8,809 pounds, and sediment by 768 tons for Pierre Creek.

Partners and Funding

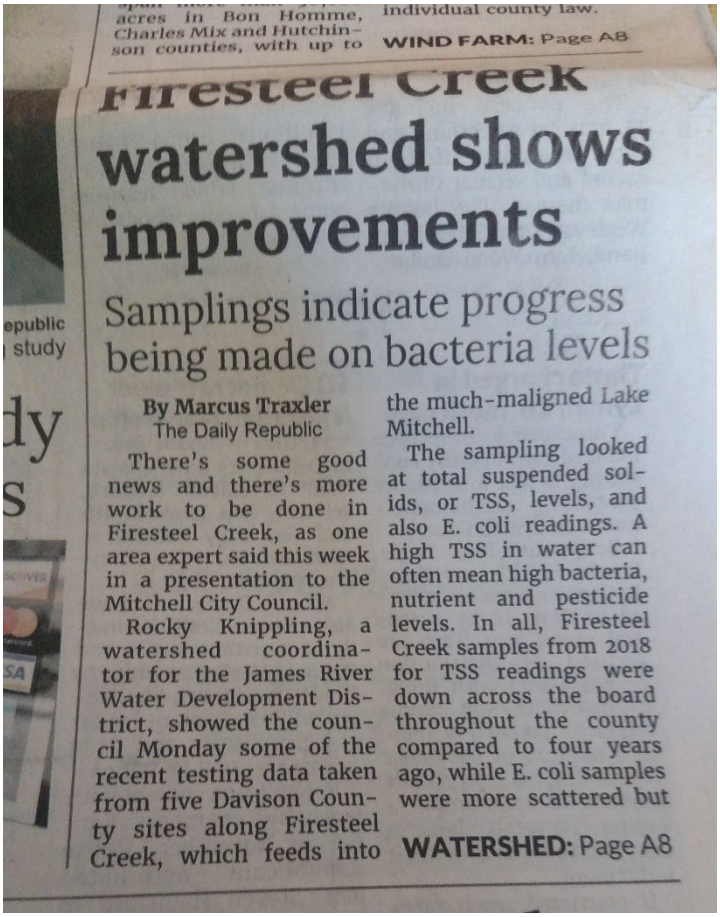
CWA section 319 funds were used for agricultural waste systems, riparian restoration and grazing management practices. Through several project segments and over 15 years of implementation, CWA section 319 funds contributed $257,772 toward BMPs. Other federal sources, including the U.S. Department of Agriculture (USDA) Environmental Quality Incentives Program, provided $202,700 to support BMPs. Local sources, including landowners, Hanson County Conservation District, Lake Hanson Association, and the James River Water Development District contributed $1,018,386. The local project sponsor has included the Hanson County Conservation District and is currently the James River Water Development District. Other local partners include participating landowners and the city of Alexandria. State partners include South Dakota DENR. Federal partners include the U.S. Environmental Protection Agency and the USDA Natural Resources Conservation Service.

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

EPA 841-F-20-001TT
December 2020

For additional information contact:
Kristopher Dozark
South Dakota Department of Environment and Natural Resources
605-773-4254 • kris.dozark@state.sd.us

Success Story on Pierre Creek in 2020



acres in Bon Homme, Charles Mix and Hutchinson counties, with up to

individual county law.

WIND FARM: Page A8

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Firesteel Creek watershed shows improvements

Samplings indicate progress being made on bacteria levels

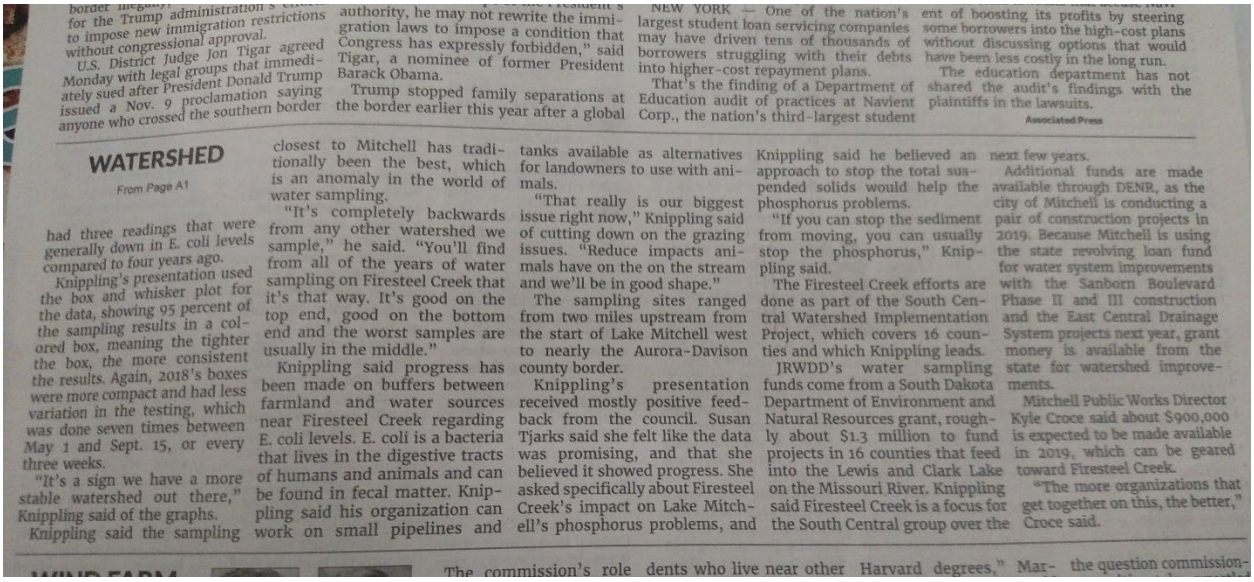
By Marcus Traxler
The Daily Republic

There's some good news and there's more work to be done in Firesteel Creek, as one area expert said this week in a presentation to the Mitchell City Council.

Rocky Knippling, a watershed coordinator for the James River Water Development District, showed the council Monday some of the recent testing data taken from five Davison County sites along Firesteel Creek, which feeds into the much-maligned Lake Mitchell.

The sampling looked at total suspended solids, or TSS, levels, and also E. coli readings. A high TSS in water can often mean high bacteria, nutrient and pesticide levels. In all, Firesteel Creek samples from 2018 for TSS readings were down across the board throughout the county compared to four years ago, while E. coli samples were more scattered but

WATERSHED: Page A8



for the Trump administration's
to impose new immigration restrictions
without congressional approval.
U.S. District Judge Jon Tigar agreed
Monday with legal groups that immedi-
ately sued after President Donald Trump
issued a Nov. 9 proclamation saying
anyone who crossed the southern border

authority, he may not rewrite the immi-
gration laws to impose a condition that
Congress has expressly forbidden," said
Tigar, a nominee of former President
Barack Obama.
Trump stopped family separations at
the border earlier this year after a global

NEW YORK — One of the nation's
largest student loan servicing companies
may have driven tens of thousands of
borrowers struggling with their debts
into higher-cost repayment plans.
That's the finding of a Department of
Education audit of practices at Navient
Corp., the nation's third-largest student

ent of boosting its profits by steering
some borrowers into the high-cost plans
without discussing options that would
have been less costly in the long run.
The education department has not
shared the audit's findings with the
plaintiffs in the lawsuits.
Associated Press

WATERSHED

From Page A1

had three readings that were generally down in E. coli levels compared to four years ago.

Knippling's presentation used the box and whisker plot for the data, showing 95 percent of the sampling results in a colored box, meaning the tighter the box, the more consistent the results. Again, 2018's boxes were more compact and had less variation in the testing, which was done seven times between May 1 and Sept. 15, or every three weeks.

"It's a sign we have a more stable watershed out there," Knippling said of the graphs.

Knippling said the sampling closest to Mitchell has traditionally been the best, which is an anomaly in the world of water sampling.

"It's completely backwards from any other watershed we sample," he said. "You'll find from all of the years of water sampling on Firesteel Creek that it's that way. It's good on the top end, good on the bottom end and the worst samples are usually in the middle."

Knippling said progress has been made on buffers between farmland and water sources near Firesteel Creek regarding E. coli levels. E. coli is a bacteria that lives in the digestive tracts of humans and animals and can be found in fecal matter. Knippling said his organization can work on small pipelines and tanks available as alternatives for landowners to use with animals.

"That really is our biggest issue right now," Knippling said of cutting down on the grazing issues. "Reduce impacts animals have on the on the stream and we'll be in good shape."

The sampling sites ranged from two miles upstream from the start of Lake Mitchell west to nearly the Aurora-Davison county border.

Knippling's presentation received mostly positive feedback from the council. Susan Tjarks said she felt like the data was promising, and that she believed it showed progress. She asked specifically about Firesteel Creek's impact on Lake Mitchell's phosphorus problems, and Knippling said he believed an approach to stop the total suspended solids would help the phosphorus problems.

"If you can stop the sediment from moving, you can usually stop the phosphorus," Knippling said.

The Firesteel Creek efforts are done as part of the South Central Watershed Implementation Project, which covers 16 counties and which Knippling leads.

JRWDD's water sampling funds come from a South Dakota Department of Environment and Natural Resources grant, roughly about $1.3 million to fund projects in 16 counties that feed into the Lewis and Clark Lake on the Missouri River. Knippling said Firesteel Creek is a focus for the South Central group over the next few years.

Additional funds are made available through DENR, as the city of Mitchell is conducting a pair of construction projects in 2019. Because Mitchell is using the state revolving loan fund for water system improvements with the Sanborn Boulevard Phase II and III construction and the East Central Drainage System projects next year, grant money is available from the state for watershed improvements.

Mitchell Public Works Director Kyle Croce said about $900,000 is expected to be made available in 2019, which can be geared toward Firesteel Creek.

"The more organizations that get together on this, the better," Croce said.

The commission's role dents who live near other Harvard degrees," Mar- the question commission-

Newspaper article from Mitchell Daily Republic on Presentation to Mitchell City Council

One year in, city's wetland project takes shape

Mitchell leaders say watershed work has been gaining more support from farmers along Firesteel Creek

Written By: Sam Fosness | Feb 25th 2020 - 6pm.

News Article from Mitchell Daily Republic on Stehly Project (Continued on next two pages)

Craig Stehly, left, and Gene Stehly walk through a portion of their land that sits along Firesteel Creek on Jan. 29, 2019 roughly 10 miles west of Mitchell. (Sam Fosness / Republic)

While it's been a year since the city of Mitchell purchased land along Firesteel Creek to implement a wetland aimed at improving the water quality of Lake Mitchell, the project has b gaining momentum.

The city's efforts to improve the water quality by working up stream of Lake Mitchell to cut down the source of phosphorus and sediment flow into the lake has been met with growing support from farmers who produce crops or graze cattle along Firesteel Creek.

From enrolling more land in the federal Conservation Reserve Program, to reducing the amou of farming along the creek with the cooperation from agriculture producers, Public Works Director Kyle Croce said the city has made key strides in its quest to address the algae woes tl Lake Mitchell experiences. As of now, there are six ag producers with farmland in the Firesteel watershed who have either enrolled acres of their lands into CRP or reduced cattle grazing an crop production to improve the water quality of the creek.

“It’s been great having the agriculture producers along the creek take measures to help the watershed,” Croce said. “Every bit of work along the creek helps in a big way. Conservation, restoration, natural grasslands, buffer strips and keeping the cattle away from the creek, are al great measures that have been taking place to improve the water quality in the creek and ultimately the lake.”

Mitchell Mayor Bob Everson said the city has been focused on working with farmers along th creek to encourage practices to reduce the amount of agricultural production and cattle grazin noting he understands it can be challenging for farmers to take on if profit margins are tight a the markets are volatile. Since the city purchased the near-lake property, Everson said there h been several additional farmers who are willing to reduce production along Firesteel Creek.

"We’ve had producers along the creek all the way up to the Wessington Springs area come to and offer ways to help us get the lake and creek water improved,” Everson said. “It’s really b a snowball effect after we bought the Kelley property.”

After decades of searching for possible ways to combat the algae blooms that plaque Lake Mitchell on a frequent basis, the city bought 371 acres of property that was previously owned Peggy Kelley and her late husband Harvey. The land, purchased for $4.1 million in January 2019, is now inching closer to becoming a wetland with cattails and a dam that are designed t filter out the sediment and phosphorus flowing through Firesteel Creek and into Lake Mitchel

According to previous studies on the lake, 53 percent of the phosphorus enters the lake from Firesteel Creek, while 47 percent is in the lake itself. Considering the purchased area of land i about 2 miles west of the lake, Everson said it will have a significant impact on helping reduce the algae problems that the lake experiences.

“We know the lake itself needs to be addressed, but this gives us an area that starts to clean the water flowing into the lake. It is tough to find someone who is willing to give up that much land to allow us to address what is coming into the lake,” Everson said. “Getting our lake cleaned starts upstream, and we’re starting to see some great movement with the wetland project.”

As for the timeline of the wetland project, Everson said he anticipates work to begin by the spring and into the summer. According to Everson, South Dakota State University civil engineering seniors are in the process of designing the wetland.

“Part of the intent of the design includes flooding the near-lake property to then adjust the water levels, which would let the nutrients come out of the water,” Everson said. “We’re also looking to build some silt ponds.”

Sustainable farming improving Firesteel watershed

Gene and Craig Stehly are two local farmers who practice sustainable farming methods along the land 2.5 miles west of the city’s near-lake property. The two have been practicing no-till farming for decades, which improves the soil health and creates organic matter to help water absorption.

The Stehlys have been farming 177 acres of the Kelley land that the city purchased since the early 1990s. When the city purchased the near-lake property, the Stehlys were in the midst of an existing lease agreement that extends to 2030, in which the city is honoring. Through their practice of rotating cover crops, paired with no-till farming, the Stehlys have improved the soil health and water quality of Firesteel Creek. Together, they hope their sustainable farming techniques can be implemented by agricultural producers alike who own and farm land in the Firesteel watershed.

“If everyone no-tilled farmed, there would be a huge reduction in carbon being omitted into the atmosphere, which would combat the climate change we see,” Gene Stehly said. “When you have healthier soil that takes less fertility and less water to grow crops, you’re not releasing carbon into the atmosphere.”

The Stehlys recently agreed with the city, as part of their lease agreement, to enroll 52 acres of the 177 acres that they farm on the city’s near lake property into the CRP program. The Stehlys commended the city for understanding the importance of working to improve the land and water along the Firesteel watershed, which encompasses roughly 350,000 acres of land stretching from Mitchell going northwest to Wessington Springs.

“I’m awful proud of the mayor (Everson), his administration and the City Council, because this wetland project and land purchase was a gutsy move that is the first real course of action that will have a big impact on the lake down the road,” Gene Stehly said.

(Stehly Article Continued)

Since the city unveiled its plan to create the wetland, Everson helped form a coalition of group members from the James River Water Development District, the Natural Resources Conservation Services (NRCS), Ducks Unlimited, the Stehlys and other wildlife services and agencies, which was created to coordinate plans to further advance the wetland project with the help of land and water environmental experts.

To continue gaining momentum and cooperation from landowners and farmers along the Firesteel Creek and watershed, Craig Stehly said it's important for federal programs to incentivise them.

Rather than eliminating cattle grazing along the Firesteel Creek outright, Craig Stehly said there are numerous methods cattle producers can utilize to maintain their profits and operation such as rotational grazing.

"There are a lot of different things you can do on the grazing end to help the soil and environment such as rotational grazing, because not everyone can completely fence off cattle from areas along the creek," Craig Stehly said. "But there needs to be serious talks of incentives for them to do these things on their cattle operations."

The city recently applied for a grant with the North American Wetlands Conservation Act (NAWCA) that could bring in close to $5 million for the wetland project and Firesteel watershed work.

"It's been great to see how much support we've had from entities like the James River Water

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From left to right: Mitchell Mayor Bob Everson, Gene Stehly, Rocky Knippling, of James River Water Development District, Dan Allen and Dave Bartel, of James River Water Development District, meet in the mayor's office Friday at City Hall to continue discussing the city of Mitchell's wetland project. (Sam Fosness / Republic)

JRWDD Tackles Water Issues

BY RANDY DOCKENDORF randy.dockencdorf@yankton.net | Posted: Tuesday, January 17, 2017 10:23 pm

The James River Water Development District (JRWDD) is working to head off water quality issues before they occur, according to a Yankton board member.

Those problems can range from feedlot runoff to sediment, JRWDD chairman Dan Klimisch told the Press & Dakotan.

The district works with property owners on efforts such as better waste management, he said. The effort has been successful because of landowners' cooperation and willingness to take necessary steps.

Dan Klimisch

JRWDD chairman Dan Klimisch of Yankton says the district is taking steps to head off water quality problems.

"I came from a five-generation farm and we took care of the land," Klimisch said. "I never met a farmer who wants to pollute."

The JRWDD has taken an active stance in protecting the meandering James River, one of the flattest rivers on Earth. The water district runs the north-south length of eastern South Dakota, from the North Dakota border to the Nebraska border

The JRWDD works with property owners and local governments, Klimisch said. The effort tackles keeping all types of pollution — including sediment and fecal coliform — out of the river in the first place, Klimisch said.

"We take very good steps to protect the water quality," he said.

As part of the effort, Rocky Knippling serves as watershed coordinator with the South Central Watershed Implementation Project. He works with a federal program aimed at reducing pollution, said JRWDD director Dave Bartel. The water district's implementation program has proven successful, he added.

News Article on South Central Project from Yankton Press and Dakotan, Continued on next three pages.

"Rocky and two others are doing a lot with the confinement barns and feeding systems to eliminate the manure runoff," Bartel said.

In addition, the JRWDD has taken water samples along the river, Bartel said. The sampling rovides a baseline reading and also warns of problems such as nitrates.

The sampling has been conducted in conjunction with the South Dakota Department of Environment and Natural Resources (DENR), he added.

"The monitoring program is ongoing. We've done it for several summers," he said. "It's better than after the horse is out of the barn."

MANAGING WASTE

The JRWDD works to provide producers with information on waste management, Bartel said. As a result, the river has been spared many major problems, he said.

"When people talk about runoff, they're usually talking about larger herds like 1,000 head," he said. "But I think, in reality, it's the smaller farmer with 50 head who does more contamination of waterways than the larger (operations). The larger producer is set up for it, while the smaller roducer may not realize what is needed.

In that respect, public awareness and education provide a valuable resource for producers of all sizes, Bartel said.

"Really, the producers are good," he said. "They're so much more aware of what they're doing and how they're affecting the system than years ago. But there's still work to be done."

Klimisch agreed, noting some major problems still remain. Because of the James River's flatness, upstream water quality issues could greatly affect downstream communities such as Yankton.

"We've identified Firesteel Creek near Mitchell as a specific area in the watershed where there are roblems," he said.

Firesteel Creek has led to problems for 160,000-gallon Lake Mitchell, a water source for the city of Mitchell, Klimisch said. Feedlot runoff, including concentrated animal feeding operations (CAFOs), is a primary contributor of the non-point source pollution, he added.

"The (lake) water is so bad, with nitrogen, phosphates and algae bloom," he said. "We've helped clean up feedlots along Firesteel Creek, which are affecting the James River watershed. We're monitoring what's happening to the lake if the CAFOs aren't properly managed."

However, Firesteel Creek and Lake Mitchell aren't the only areas of concern within the James River watershed, Klimisch said.

(Article on South Central Continued)

"We're also looking at the sediment problems up and down the river, which is a big issue for us," he said. "We have stabilization projects where the banks are deteriorating and putting sediment into the river. We want to keep the water clean."

OTHER PROJECTS

In recent months, the JRWDD has emphasized funding assistance for local projects in the watershed. During 2016, those projects included bank stabilization and earthen dams in Hutchinson and Yankton counties.

The JRWDD is also working with flood control, which carries unique circumstances in this case, Bartel said. Most areas see quick, devastating flooding that recedes. However, the James River flooding spreads over a wide area and remains flooded for a longer period of time.

"We like to make an impact on flood control. But in all honesty, the Good Lord and Mother Nature are taking care of that for us," he said. "We're still building our earthen dams and trying to slow down the water as much as we possibly can. That should help with the sediment, if we can just slow the water down."

The JRWDD also works with programs such as buffer strips and cleaning up cattails and dead trees, Klimisch said. In particular, the trees could create problems with bridges and culverts.

In addition, the district operates monitors and gauges the river, including near Scotland and Yankton, Bartel said. The public interest in the readings soars in the springtime with flooding concerns.

"We get bombarded with phone calls about the water levels," he said. "We also want to educate people on the USGS (U.S. Geological Survey) website."

OFFERING INCENTIVES

The JRWDD programs rely on voluntary compliance, which makes it more agreeable to producers and other private landowners, Klimisch said.

One of the more popular programs is the enhanced CRP (Conservation Reserve Program) incentive, he said. "We work with highly susceptible areas which see the highest amount of erosion," he added.

Under the incentive program, landowners who enroll in the CRP receive that payment, and the JRWDD pays an additional 75 percent of the amount, Klimisch said. For example, a $10,000 CRP payment would receive another $7,500 incentive payment from the JRWDD for qualifying land.

"Farmers benefit doing it rather than cropping out. It may also help up the commodity prices," he said. "We want to incentivize each one, not force them, so it's a win-win situation. It's seen as so

(Article on South Central Continued)

much goodwill through the district. And we're getting really good response from places like Hutchinson County."

The JRWDD has also added funding for tree planting and grass seed drills. The district has also talked about the possibility of high school students conducting environmental studies along the river.

In addition, this year will see more JRWDD meetings at sites outside of the usual locations in Aberdeen, Huron, Mitchell and Yankton, Klimisch said.

"We plan to have more meetings and move them to different counties where we normally don't go, like Marshall, Spink and Hutchinson counties," he said. "In Hutchinson County, we could meet in Olivet or Freeman."

Klimisch expressed excitement about the JRWDD accomplishments and direction.

"It's really an honor to serve the community on the board," he said. "As we head into 2017, I'm feeling really good about where we stand."

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South Central watershed project receives $500K for improvement work

Water flows rapidly underneath the James River bridge on Highway 18 just east of Olivet Tuesday morning. Record rainfall around Mitchell sent torrents of water down the river, impacting the day-to-day life of many local residents, including Hutterite colonies. (Erik Kaufman / Republic)

By Marcus Traxler
September 27, 2019 03:43 PM

The state Board of Water and Natural Resources helped provide another chunk of funding toward the a watershed restoration project planned for southeastern South Dakota.

The board on Thursday approved $500,000 in grant funding to the James River Water Development District, which is leading the South Central Watershed Implementation Project.

That project is in the first segment of a $19.4 million, 10-to-15-year effort planned to work with private landowners and operators to implement best management practices to improve surface water quality in South Dakota. The work involved is taking place in the watersheds of Lewis and Clark Lake, the lower James River, and the Vermillion River. In all, the watersheds cover more than 6.5 million acres.

The goal is to reduce the total maximum daily load levels in the water bodies, as well as reduce sedimentation in Lewis and Clark Lake and the lower James River. The South Central project also assists in directing assistance to help solve feedlot waste runoff and other non-point pollution problems from grazing acres.

The funding for the project is coming from sources with the U.S. Department of Agriculture and Environmental Protection Agency programs, along with state sources and the JRWDD, as well. About $6.3 million will come from local entities as well.

News Article on Grant Received for South Central