

Goose Creek Watershed Improvement Effort
IMPLEMENTATION STRATEGY 2016-2020
March 2016

1. INTRODUCTION:

Background. The Goose Creek Watershed improvement effort is a collaborative partnership among the Sheridan County Conservation District (SCCD), Sheridan County, the City of Sheridan, and landowners/residents, and other local stakeholders. The initial assessment in 2001 and 2002 led to the development of the Goose Creek Watershed Plan (GCWP) in 2004. The GCWP contained a variety of objectives and action items to address bacteria and other water quality concerns from septic systems, domestic animals and livestock, and stormwater run-off. Several of the action items were directed toward increasing awareness of issues and programs.

When levels of a pollutant, such as bacteria, exceed water quality standards, the stream is considered "impaired" and states are required to establish a Total Maximum Daily Load (TMDL) for that pollutant. A TMDL is the amount of a given pollutant a waterbody can receive and still meet water quality standards; it takes a more focused, targeted approach than a watershed plan. In 2008, WDEQ decided to move forward with the development of a TMDL on the Goose Creek Watershed. The Goose Creek Watershed TMDL document was completed in September 2010. The TMDL provides several recommendations for the City of Sheridan, Sheridan County, and the SCCD to address bacteria and sediment contributions, many of which are appropriate for use in the watershed. However, the TMDL document is extensive and also includes other information. The SCCD, in partnership with Sheridan County, the City of Sheridan, the USDA Natural Resources Conservation Service, and local landowners/residents and stakeholders developed the 2012 Implementation Strategy to guide improvement activities through 2015. In 2016, the strategy was updated to include additional activities.

Planning Authority and Public Participation. The development of the original GCWP and subsequent documents (with the exception of the TMDL) was facilitated by the SCCD under Wyoming Statutes 11-16-103 and 11-16-122. In addition, the process was guided by the Watershed Strategic Plan updated in 2000 by the Wyoming Association of Conservation Districts, the USDA Natural Resources Conservation Service and the Wyoming Department of Agriculture and the Wyoming Non-Point Source Management Plan Update developed by the WDEQ. All planning activities and meetings facilitated by the SCCD were (and continue to be) open to the public and anyone with an interest in the watershed was encouraged to participate. Decisions were based on the consensus of the participants in attendance. A public comment period, as required by the Wyoming Administrative Procedures Act (W.S. 16-3-101) was held for the 2004 GCWP and the Goose Creek TMDL document.

Mission: The mission of the Goose Creek Watershed improvement effort is to establish and maintain a voluntary watershed plan that engages local citizens in the remediation of water quality issues in the Goose Creek watershed, now and into the future.

2. RESOURCE DESCRIPTION

Big and Little Goose Creeks originate in the Big Horn Mountains, and form Goose Creek in the center of Sheridan. These streams pass through the Bighorn National Forest, several ranches, rural subdivisions, and through the Town of Big Horn. Each of these streams is classified by the Wyoming Department of Environmental Quality (WDEQ) as Class 2AB – Coldwater Fisheries and is closely tied to local agriculture, recreational uses, and drinking water supplies. These streams are easily accessible through the BNF and many city parks and recreation areas; they are used extensively throughout the year.

Section 303 (d) of the Clean Water Act requires states to identify waters that are not supporting their designated uses, and/or need to have a Total Maximum Daily Load (TMDL) established and is included on the Wyoming 303 (d) list of Waters Requiring TMDLs (Table 1).

Table 1. Summary of the 303(d) Goose Creek Watershed impairments

Waterbody	Location	Listing Date	Uses Not Supported	Pollutant
Goose Creek	From confluence with Little and Big Goose Creeks downstream 12.7 miles to Tongue River	2000	Recreation	Bacteria
Goose Creek	From confluence with Little and Big Goose Creeks downstream 12.7 miles to Tongue River	2006	Aquatic Life, Cold Water Fish	Habitat, Sediment
Soldier Creek	From confluence with Goose Creek upstream 3.1 miles	2000	Recreation	Bacteria
Big Goose Creek	From confluence with Little Goose Creek upstream 19.2 miles to Rapid Creek	1996	Recreation	Bacteria
Beaver Creek	From confluence with Big Goose Creek upstream 6.5 miles to Apple Run	2000	Recreation	Bacteria
Park Creek	From confluence with Big Goose Creek upstream 2.8 miles	2000	Recreation	Bacteria
Rapid Creek	From confluence with Big Goose Creek upstream 3.2 miles	2000	Recreation	Bacteria
Little Goose Creek	From confluence with Big Goose Creek upstream 3.5 miles to Brundage Lane	1996	Recreation	Bacteria
Little Goose Creek	From confluence with Big Goose Creek upstream 3.5 miles to Brundage Lane	2006	Aquatic Life, Cold Water Fish	Habitat, Sediment
McCormick Creek	From confluence with Little Goose Creek upstream 2.2 miles	2004	Recreation	Bacteria
Kruse Creek	From confluence with Little Goose Creek upstream 2.5 miles to East Fork Kruse Creek	2000	Recreation	Bacteria
Jackson Creek	From confluence with Little Goose Creek upstream 6.4 miles	2000	Recreation	Bacteria
Sackett Creek	From confluence with Little Goose Creek upstream 3.1 miles to East Fork Sackett Creek	2000	Recreation	Bacteria

3. WATERSHED ASSESSMENT AND CONCERNs

During 1993 and 1997 the United States Geological Survey (USGS) collected quarterly water quality samples within the Goose Creek watershed that indicated elevated levels of fecal coliform. WDEQ sampling in 1998 and 1999 confirmed fecal coliform bacteria levels. The 2001-2002 Goose Creek Watershed Assessment included 19 chemical, physical, and biological parameters, including bacteria, on 46 monitoring stations on Big Goose, Little Goose, and Goose Creeks and the eight tributaries. Interim monitoring was conducted on 18 stations for a smaller suite of parameters, including bacteria.

Data from these stations indicated fecal coliform concentrations and water temperatures in Big Goose Creek and Little Goose Creek increased while traveling through the agricultural, rural, and suburban areas south and west of Sheridan, Wyoming. Soldier, Park, Rapid, McCormick, Kruse, Jackson, and Sackett Creeks along with the Coffeen Avenue storm drain also exceeded bacteria standards. In contrast, water quality appeared to improve somewhat at the lowermost station on Goose Creek located near Acme, Wyoming. Subsequent monitoring was completed in 2005, 2009, 2012, and 2015. Regardless of the possible hydrologic effects on bacteria concentrations, the data show that, in general, the same stream reaches were found to be impaired in each of the monitoring years.

4. WATERSHED IMPROVEMENT ACTIONS AND RECOMMENDATIONS

The bacteria impairments in the Goose Creek Watershed are the result of contributions from a combination of sources, including humans, domestic animals, and wildlife; it is impossible to address impairments by focusing on single sources. It is necessary to address as many potential contributors as possible through an incentive-based, voluntary program that encourages widespread cooperation, and participation from landowners. In the 2016 update, SCCD, with input from partners and committee members, incorporated items from the TMDL into 10 action items and associated tasks.

Objective: Maintain an active, collaborative Goose Creek watershed improvement effort

Action Item/Milestone	2016	2017	2018	2019	2020
Action 1. Maintain watershed steering committee to provide leadership and coordination with other entities					
Meet annually to review progress and update Implementation Strategy as needed	Feb/ Mar	Feb/ Mar	Feb/ Mar	Feb/ Mar	Feb/ Mar
Incorporate recommendations from TMDL, Septic Impact Study, Little Goose Wastewater Treatment Feasibility Study, and others as appropriate	Feb/ Mar				Feb/ Mar
Action 2. Conduct interim and follow-up monitoring to evaluate progress and long-term trends in water quality					
Establish and implement project follow-up procedures	Oct	Oct	Oct	Oct	Oct
Complete interim water quality monitoring to include SAP development, sample collection and reporting			Apr- Oct		
Complete Goose Creek data validation procedures in the SCCD database		June			
Maintain Goose Creek Watershed Progress Register to document projects	Feb	Feb	Feb	Feb	Feb
Update Load Reduction estimates by sub-watershed as new data are collected	Feb			Feb	
Action 3. Engage/Coordinate with other community organization/efforts					
Participate in upcoming/on-going projects, as needed					
<ul style="list-style-type: none"> • Goose Creek WWDC Level 1 Study • City's COE Section 1135 Study • Goose Creek Social Indicator Survey • Big Goose Watershed Control Plan • Others 	←	ON-GOING	→		
Coordinate discussions with other agencies and organizations, as needed					
<ul style="list-style-type: none"> • Stockgrower's/Cattlewomen • Ditch Companies • Realtors • Others 	←	ON-GOING	→		

Objective: Reduce direct bacteria contributions to waterbodies

Action Item/Milestone	2016	2017	2018	2019	2020
Action 4. Reduce bacteria contributions from septic systems					
Administer cost-share program to include replacement of and/or connection to City sewer for eligible septic systems	←	ON-GOING	→		
Work toward connection of all urban area septic systems to City sewer as systems fail and need replaced	←	ON-GOING	→		
Distribute Septic Homeowner Packets with septic permits and to others (realtors, contractors) as requested	←	ON-GOING	→		
Action 5. Reduce bacteria contributions from livestock/domestic animals					
Administer cost-share program to relocate facilities and feedgrounds, provide off-channel stockwater and fencing to improve management, and assist with development of grazing plans	←	ON-GOING	→		
Document existing projects/grazing plans, as appropriate	Oct				

Objective: Reduce sediment contributions and other indirect bacteria contributions

Action Item/Milestone	2016	2017	2018	2019	2020
Action 6. Reduce sediment and/or bacteria contributions from overland run-off					
Administer cost-share program to improve/establish riparian buffers and upland vegetation cover	<	ON-GOING	>		
Action 7. Reduce sediment contributions from irrigation diversions					
Partner with other agencies (WGF, NRCS, etc.) to provide cost-share funding to replace/modify irrigation diversion structures	<	ON-GOING	>		
Action 8. Reduce sediment contributions from in-stream sources					
Partner with other agencies (WGF, NRCS, etc.)to provide cost-share funding to stabilize eroding streambanks and address channel instability	<	ON-GOING	>		
Action 9. Reduce sediment contributions from residential and urban run-off (stormwater)					
Continue to implement sediment traps for storm sewer outfalls as funding and resources allow	<	ON-GOING	>		
Consider installation of additional stormwater treatment measures (such as infiltration basins and trenches, green roofs, rain gardens, porous pavement)	<	ON-GOING	>		
Consider cost-share program to address residential and urban run-off to include eligible best management practices and criteria		July			

Objective: Increase awareness of and participation in watershed improvement programs and activities through positive and consistent outreach strategies

Action Item/Milestone	2016	2017	2018	2019	2020
Action 10. Promote program participation and provide updates on issues/events					
Distribute annual watershed newsletter to Goose Creek residents through City SAWS billing inserts	Jan-Feb	Jan-Feb	Jan-Feb	Jan-Feb	Jan-Feb
Include information in SCCD semi-annual newsletter as appropriate	May Nov	May Nov	May Nov	May Nov	May Nov
Distribute "Pay it Downstream" postcards or similar to program participants (maybe with project payments)	<	ON-GOING	>		
Provide information through other local media and events, as needed					
<ul style="list-style-type: none"> • Sheridan Press • Sheridan Media • Public Pulse • Facebook/Websites • Booths/Presence at Community Events 	<	ON-GOING	>		
Provide education on other activities and topics, such as:					
<ul style="list-style-type: none"> • WACD Suitewater tool/outreach with teachers • Water Quality/Quantity information (Monitoring Results) • Pet/Domestic animal contributions • Septic systems • Horse/Livestock management • Winter feeding grounds • Manure/Nutrient/Pesticide management • Riparian buffers • Stormwater /run-off management • Irrigation management • Wildlife impacts-discourage feeding near waterways • Oil Recycling • New technologies/alternatives/best management practices • Feature spotlights on completed projects 	<	ON-GOING	>		