



Coal Creek Watershed Coalition

Technical Committee Memo

Summary of E. Coli Concentrations in the Slate River Watershed and 2019 Preliminary Monitoring Plan

Prepared by Ashley Bembenek for the Gunnison County Sustainable Tourism and Outdoor Recreation (STOR) Committee Meeting on April 11, 2019.

PROJECT LOCATION AND WATER USES

The Slate River Watershed is located near Crested Butte, CO and includes several significant tributaries including Poverty Gulch, Oh-Be-Joyful Creek, Coal Creek, and Washington Gulch. The Slate River Watershed is home to a wide variety of water uses. Recreation, tourism, and agriculture are the primary economic drivers in Crested Butte and Mt. Crested Butte.

MUNICIPAL AND DOMESTIC WATER USES

- **Municipal drinking water:** The Town of Crested Butte produces drinking water from Coal Creek. The Mt. Crested Butte Water and Sanitation District (MCBWS) produces drinking water from the East River and Washington Gulch for the town of Mt. Crested Butte and Meridian Lake Park subdivision, respectively.
- **Domestic drinking water:** The Moonridge Lane and Saddle Ridge subdivisions use wells to provide drinking water to residents of the subdivision. Three wells are used for drinking water supply, the shallowest of which has a total depth of approximately 17 feet. The wells are in a pasture irrigated with water from Washington Gulch. Irrigation supports groundwater recharge and maintains well performance. There are additional domestic drinking wells distributed throughout the Slate River Watershed (e.g. Wild Bird, Silver Sage, Glacier Lily, Irwin Town site, etc.).
- **Wastewater treatment:** The Town of Crested Butte discharges treated wastewater effluent into the Slate River. Mt. Crested Butte Water and Sanitation District (MCBWS) treats wastewater from Mt. Crested Butte and Meridian Lake Park Subdivision. The treated effluent is discharged into Woods Creek, a tributary to Washington Gulch.
- **On-site wastewater treatment systems (OWTS or septic systems):** Homes in the Moonridge Lane, Glacier Lily, and Wildbird subdivisions, Irwin Townsite, and homes distributed in non-incorporated areas throughout the watershed use OWTS.

RECREATIONAL WATER USES

- The upper portions of the Slate River and Oh-Be-Joyful Creek provide extremely technical kayaking opportunities. The lower portion of the Slate River is also used for kayaking.



- Stand Up Paddle-boarding (SUP) has become very popular on the Slate River. As part of the ongoing watershed management planning process, the Upper Gunnison River Water Conservancy District (UGRWCD) partnered with the Town of Crested Butte, the Crested Butte Land Trust, and fifteen other local organizations and private landowners to develop a floating plan for the Slate River from the confluence with Oh-Be-Joyful Creek to the Skyland Bridge (near Highway 135 south of Crested Butte).
- Fishing occurs throughout the Slate River Watershed.
- Swimming occurs in the Slate River at the Oh-Be-Joyful Campground, Gunsight Pass Bridge, the Recreation Path Bridge, and the Skyland Bridge. In Oh-Be-Joyful Creek, swimming occurs in pools downstream of waterfalls. In Coal Creek, swimming occurs at Totem Pole Park. Children, including those involved in daycare or sports programs, play and swim in the rivers and creeks throughout the summer.
- The Oh-Be-Joyful Campground is immediately adjacent to the Slate River.
- Hiking, biking, and other recreation occurs within the riparian area throughout the Slate River Watershed.

AGRICULTURAL WATER USES

- Flood irrigation for pasture grass and grazing occurs in the Slate River and Washington Gulch watersheds.
- Cattle graze in the throughout the Coal Creek, Slate River, and Washington Gulch watersheds.

ENVIRONMENTAL WATER USES

- The Slate River Watershed is home to outstanding riparian wetlands, including those preserved by the Crested Butte Land Trust, immediately north of Crested Butte.
- The Slate River Watershed has abundant macroinvertebrates and fish in most areas; any deficiencies are generally attributed to metals loading from historic abandoned mine features.
- The Slate River Watershed provides habitat to elk, mule deer, heron, and migratory birds that all rely upon riparian and aquatic habitat.
- Most named tributaries within the Slate River Watershed have instream flow water rights to protect the fishery and natural environment.

HISTORY

In 2014, CCWC finalized the Upper Slate River (USR) Watershed Plan¹. **Stakeholder input identified human and pet waste as a pressing concern (nonpoint source pollution)**. Dispersed camping and extensive recreational use occurs throughout the Slate River Watershed. During a six-week period beginning in July 2013, **nearly 50,000 users visited** the Oh-Be-Joyful Campground². Increased tourism

¹ The Upper Slate River Watershed Plan was funded by the Colorado Department of Public Health and Environment Nonpoint Source Program and the Colorado Division of Reclamation Mining and Safety. The plan is an “EPA nine elements” plan that was finalized and approved in 2014. The plan is available at: https://www.colorado.gov/pacific/sites/default/files/WQ_nonpoint_source-2nd-Upper-Slate-River-Watershed-Plan%20Final-2014.pdf

² Based on a magnetic vehicle counter study led by Bureau of Land Management staff.



and recreational use consistently fills the campground and dispersed camping areas throughout the Slate River Watershed from late June to mid-October.

In 2014, CCWC initiated a pilot program, to provide portable toilets at key locations in the USR Watershed. Since 2014 CCWC has worked with local partners to deliver and service portable toilets at several locations in the USR Watershed. For the past three summers, two portable toilets have been maintained at Musician's Camp. The portable toilets are in such high demand that both units must be pumped at least weekly to prevent overflow. **In the past four summers, portable toilets have prevented approximately 7,000 gallons of human waste from reaching the Slate River.** These preventive actions have likely helped preclude increases in *E. coli* concentrations in the upper portions of the Slate River Watershed. In 2018, CCWC installed a permanent toilet at Musician's Camp, in partnership with the US Forest Service and UGRWCD.



Photo 1. Musicians Camp during an average summer day. In a typical year, campers arrive following snowmelt in late June and stay through the end of Hunting Season. permanent toilet facilities were installed in 2018, with support from CCWC, USFS and UGRWCD.

SUMMARY OF *E. COLI* CONCENTRATIONS:

The Coal Creek Watershed Coalition (CCWC) began collecting *E. coli* samples in the Upper Slate River (USR) Watershed (the Slate River upstream of Crested Butte) in 2011 as part of the watershed planning process. *E. coli* sample collection was repeated in 2013, 2017, and 2018. In 2011 and 2013, *E. coli* concentrations, in samples collected by CCWC, were less than applicable standard for recreational use.

In 2017, the maximum *E. coli* concentration measured in the Slate River Watershed was collected downstream of the Town of Crested Butte's wastewater treatment plant (WWTP) at the recreation path (rec path) bridge. The *E. coli* concentration was 166 col/100 mL, which is higher than the primary contact recreation standard for *E. coli* (126 col/100 mL). However, when the Water Quality Control Division's



current protocol³ to evaluate the standard is used, this segment of the Slate River is in attainment of the *E. coli* standard, despite the elevated concentration measured at the Rec Path Bridge.

USGS collects *E. coli* samples from the mouth of Coal Creek, the Slate River downstream of McCormick Ranch Road (referred to as SR-12 by CCWC), and the Slate River downstream of Highway 135. Sample collection typically occurs every other month and the period of record spans from 1995 to 2018. *E. coli* concentrations, measured by USGS, in Coal Creek and the Slate River were less than the primary contact recreation standard, except for two samples collected from the Slate River downstream of McCormick Ranch Road. **Like, the CCWC data collected in 2011, 2013, and 2017, the USGS data was not collected frequently enough to evaluate attainment with the primary contact recreation standard.**

The 2018 *E. coli* study included additional sample collection to identify potential sources of *E. coli* in the Slate River, Coal Creek, and Washington Gulch near the town of Crested Butte. Four watershed-wide sample events, that included 14 locations from the headwaters to the Slate River downstream of Washington Gulch, were completed from June to September. Additional samples were collected from six locations in the Slate River and its tributaries between Coal Creek and Washington Gulch. A total of 82 samples, and four field blanks, were collected in 2018. The *E. coli* results are summarized in Table 1. On July 18, 2018 nutrient samples were also collected and analyzed for total phosphorus and total Kjeldahl nitrogen. The nutrient results were less than the interim nutrient standards for cold streams and rivers (Regulation 31). The nutrient results are provided in Table 2.

³ The current protocol to evaluate compliance with the primary contact recreation standard for *E. coli* includes two steps. First, an anti-biasing method is applied, where the median is calculated from samples collected from a given segment in the same 7-day period. Second, a 60-day geometric mean is calculated. The 60-day geometric mean must be less than 126 col/100 mL to be in attainment of the standard. See CDPHE's 2020 303(d) Methodology.



Table 1. *E. coli* concentrations measured in the Slate River Watershed during the summer of 2018. Red results indicate that the individual result was greater than the primary contact recreation standard (126 col/100 mL). However, attainment with the *E. coli* standard is evaluated based upon a 61-day rolling geometric mean and red values are not indicative of standards impairment.

Monitoring Location	Location Description	6/20/2018	7/2/2018	7/18/2018	8/1/2018	8/15/2018	9/5/2018	9/19/2018
SR-3a	Slate River about a half mile above the last road crossing	1	NS	4.1	NS	1	NS	1
SR-4	Slate River above Pittsburg Mine	1	SR-4 was removed from the study because access was not safe.					
POV-3	Mainstem of Poverty Gulch below confluence with Baxter Creek	3.1	NS	4.1	NS	NM ¹	NS	NM
SR-6	Slate River below Poverty Gulch, above Wetland	NA ²	NS	13.4	NS	14.6	NS	6.3
SR-6a	Slate River below Musicians Camp	1	NS	12.2	NS	93.2	NS	9.6
SR-7	Slate River above Oh-Be-Joyful Creek and Campground	1	NS	7.4	NS	104.6	NS	3.1
OBJ-4	Oh-Be-Joyful Creek at Mouth, above Slate River	2	NS	16.1	NS	43.2	NS	6.3
SR-8	Slate River below Oh-Be-Joyful Creek, Campground, and Gunsight Bridge	5.2	NS	17.1	NS	74.8	NS	70.6
SR-9	Slate River upstream of the confluence with Coal Creek.	3.1	NS	275.5	NS	166.4	NS	116.2
COAL-00	Coal Creek upstream of Gothic road	10.8	224.7	172.0	63.1	344.8	235.9	8.6
SR-10a	Slate River above Crested Butte WWTP	8.5	78.9	165.8	261.3	214.3	96	95.9
CB-EFF	Town of Crested Butte WWTP outfall	2	1	2	1	1	1	1
SR-11	Slate River below the Town of Crested Butte WWTP, at Recreation Path Bridge	9.8	105.4	93.3	179.9	214.3	219	88.6
WASH-00	Washington Gulch at mouth upstream of confluence with the Slate River	24.6	2,418.2	2419.2	816.4	488.1	420.8	325.5
SR-12	Slate River downstream of Washington Gulch and McCormick Ranch Road.	8.6	198.9	55.5	488.4	95.6	343	69.9
FB-01	Field Blank - collected at watershed wide events	<1 (SR-6a)	NS	<1 (SR-7)	NS	<1 (SR-9)	NS	1 (SR-11)

Notes

1. POV-3 was not sampled on 8/15 and 9/19 due to lack of stream flow.
 2. NA= No access to private land. Permission to access private property was granted in late June.
- NM= not sampled or sample rejected due to low flows (not representative per 303(d) Listing Methodology Guidance).
 NS= Not scheduled



Table 2. Total phosphorus and total kjeldahl nitrogen concentrations measured in the Slate River Watershed on July 18, 2018. Regulation 31 provides interim values for total phosphorus (1.1 mg/L) and total nitrogen (1.25 mg/L) in cold water streams and rivers. All samples collected from the Slate River Watershed on 7/18/18 had nutrient concentrations less than the interim values.

Slate River Watershed: Nutrient Results for 7/18/18			
Monitoring Location	Location Description	Total Phosphorus (mg/L)	Total Kjeldahl Nitrogen (mg/L)
SR-3a	Slate River about a half mile above the last road crossing	<0.01 ¹	<0.2 ²
POV-3	Mainstem of Poverty Gulch below confluence with Baxter Creek	<0.01	<0.2
SR-6	Slate River below Poverty Gulch, above Wetland	<0.01	<0.2
SR-6a	Slate River below Musicians Camp	<0.01	<0.2
SR-7	Slate River above Oh-Be-Joyful Creek and Campground	<0.01	<0.2
OBJ-4	Oh-Be-Joyful Creek at Mouth, above Slate River	<0.01	<0.2
SR-8	Slate River below Oh-Be-Joyful Creek, Campground, and Gunsight Bridge	<0.01	<0.2
SR-8-DUP	Field Duplicate at SR-8	<0.01	<0.2
SR-9	Slate River upstream of the confluence with Coal Creek.	<0.01	<0.2
COAL-00	Coal Creek upstream of Gothic road	<0.01	<0.2
SR-10a	Slate River above Crested Butte WWTP	<0.01	<0.2
CB-EFF	Town of Crested Butte WWTP outfall.	NM	NM
SR-11	Slate River below the Town of Crested Butte WWTP, at Recreation Path Bridge	<0.01	<0.2
SR-12	Slate River downstream of Washington Gulch and McCormick Ranch Road.	0.031	<0.2
WASH-00	Washington Gulch at mouth upstream of confluence with the Slate River	0.23	0.501

Notes

1. Minimum Reporting Limit (MRL) for Total Phosphorus 0.01 mg/L

2. MRL for Total Kjeldahl Nitrogen 0.2 mg/L

NM = Not measured

NA = Not applicable



The 2018 *E. coli* study found that lower Coal Creek (segment 12- upper extent unknown), the Slate River downstream of Coal Creek (Segment 8- downstream extent unknown) and Washington Gulch (Segment 9_C- upper extent unknown) are likely impaired for the *E. coli* standard for primary contact recreation.

The 2018 *E. coli* concentrations indicate that concentrations have increased since 2011.

The Town WWTF discharge is approximately 250 feet upstream from the rec path bridge. In the past five years, the WWTF has readily maintained compliance with their *E. coli* permit limits. The 7-day maximum limit is 2,610 col/100 mL; and the 30-day average limit is 1,305 col/100 mL. In recent years, *E. coli* concentrations in the Town's WWTF discharge have ranged from 1 to 322 col/100 mL. Note, that the maximum concentration, 322 col/100 mL, appears to be an outlier as the next highest value is 45 col/100 mL.

The MCBWSD WWTF is in Mt. Crested Butte, near where the rec path crosses Gothic Road. The MCBWSD WWTF discharges into Woods Creek which flows in Washington Gulch. Washington Gulch flows into the Slate River about 2 miles downstream of the MCBWSD WWTF. In the past five years, *E. coli* concentrations have ranged from < 1 to 14 col/100 mL. The current permit limits are 44 and 260 col/100 mL for the 30-day and 7-day averages, respectively (permit renewal is currently underway).

Given that both point source discharges in the study area employ modern UV-treatment and have readily met their permit limits- which were developed to assure compliance with the water quality standard in downstream waters- in the past five years, *E. coli* within the study area is attributed to nonpoint sources. There are several potential nonpoint sources of *E. coli* within the study area including:

- Grazing (livestock and wildlife) occurs in the Coal Creek, Slate River, and Washington Gulch watersheds.
- Recreational use (i.e. human and pet waste), particularly near the rec path, local trail systems, and within riparian areas.
- Irrigation, sometimes a factor in *E. coli* transit, occurs in the Slate River and Washington Gulch watersheds.
- Stormwater runoff from the northeast side of Crested Butte and Mt. Crested Butte.
- The Slate River and Washington Gulch are downgradient of the Moon Ridge Lane and other subdivisions that rely on on-site wastewater treatment systems (OWTS).
- Disturbances to native vegetation, especially riparian vegetation, can increase *E. coli* transit.

Additional data collection is recommended to evaluate nonpoint sources of *E. coli* in the upper Slate River Watershed, and better understand the effect of low flow conditions observed in 2018. Further, *E. coli* concentrations measured in 2018 suggest that nonpoint source pollution within the watershed should be controlled via best management practices including waste management (porta potties, permanent toilets, and proper pet waste disposal), septic system inspection and repair, and education and outreach.



SLATE RIVER WATERSHED INTEGRATED MONITORING PROJECT

CCWC has partnered with several organizations to continue and expand *E. coli* monitoring in the Slate River Watershed. CCWC is also considering applying for a nonpoint source grant to address nonpoint sources of *E. coli*. CCWC welcomes input and support from community members and local organizations. The 2019 integrated monitoring program is summarized below.

PROJECT DESCRIPTION

This project will build upon existing studies of *E. coli* concentrations in the Slate River Watershed. The 2019 monitoring program expands the geographic scope, sample frequency, and adds temperature and flow monitoring to better identify potential *E. coli* sources, support total maximum daily load (TMDL) development, and to identify potential management options to support the UGRWCD Watershed Management Planning (WMP) process. If funding allows, we would like to explore additional nutrient analyses, and or caffeine and artificial sweeteners (which can act as tracers since WWTFs and OSWTS cannot break down either chemical).

PROJECT NEED

The Slate River Watershed supports municipal, recreational, environmental, and agricultural water uses. *E. coli* impairment threatens existing water uses and watershed health. Given extensive human exposure through recreational use and agricultural operations in the Slate River Watershed, it is critical to identify nonpoint sources of *E. coli* and potential management solutions.

PROJECT PLAN AND TIMELINE

The 2019 *E. coli* study plan will be finalized in April and May of 2019 with support from CCWC's technical committee.

Sample collection will begin in June 2019 and continue through September 2019. Each month, during the third week of the month, there will be a watershed-wide sample event that includes sample collection at 18 locations throughout the Slate River Watershed. Weekly sample collection will occur within the Crested Butte corridor beginning in the last week of June and continuing through the first week of September. Increased sample collection frequency within the Crested Butte corridor will help identify *E. coli* sources and better characterize conditions in a popular recreation area. The sample locations are presented in Table 2 and the sample schedule is presented in Table 3.

Elevated water temperatures and low flows can increase *E. coli* survival and reproduction rates. The 2019 study includes flow and temperature monitoring at four critical locations: The Slate River upstream of Coal Creek (SR-9), Coal Creek upstream of the confluence with the Slate River (COAL-00), Washington Gulch upstream of the confluence with the Slate River (WASH-00), and the Slate River downstream of Highway 135 (SR-20). The USGS gages in Coal Creek and the Slate River will provide flow data for COAL-00 and SR-20. A pressure transducer will be installed at WASH-00 and during each sample event (n=14) field technicians will manually measure flow to develop a rating curve for Washington Gulch. Flow at SR-



9 will be established by subtraction (SR-9= SR-20 – (WASH-00 + COAL-00). Temperature sensors will be also be installed at these locations. Flow and temperature monitoring will help address data gaps identified by several stakeholders, including local municipalities, in the WMP assessment process.

Table 3. Monitoring locations in the Slater River Watershed. All locations will be sampled monthly from June to September. Locations in the Crested Butte Corridor will be sampled weekly from June 26 to September 4, 2019. Continuous flow and water temperature monitoring will occur at four locations.

Monitoring Location	Location Description	Rationale	Crested Butte Corridor	Flow Monitoring	Temperature Sensor
SR-3a	Slater River about a half mile above the last road crossing	Characterize background concentrations in the headwaters of the Slater River	No	No	No
POV-3	Mainstem of Poverty Gulch below confluence with Baxter Creek	Characterize background concentrations near the headwaters of Poverty Gulch	No	No	No
SR-6	Slater River below Poverty Gulch, above wetlands	Characterize background concentrations in the Slater River upstream of Musicians Camp	No	No	No
SR-6a	Slater River below Musicians Camp	Characterize concentrations downstream of Musicians Camp after installation of new toilet	No	No	No
SR-7	Slater River above Oh-Be-Joyful Creek and Campground	Characterize concentrations upstream of OBJ Campground, OBJ Creek, and Gunsight Bridge	No	No	No
OBJ-4	Oh-Be-Joyful Creek at Mouth, above Slater River	Characterize concentrations in Oh-Be-Joyful Creek	No	No	No
SR-8	Slater River below Oh-Be-Joyful Creek and Campground, and Gunsight Bridge	Characterize concentrations downstream of popular recreational reaches and campgrounds	No	No	No
SR-9	Slater River upstream of Coal Creek	Characterize concentrations in the Slater River upstream of Coal Creek	Yes	Yes	Yes
COAL-05	Coal Creek downstream of Wildcat Trail Bridge	Characterize concentrations upstream of Crested Butte and recreation corridor near Crested Butte	No	No	No
COAL-00	Coal Creek upstream of the confluence with the Slater River at USGS Gage	Characterize concentrations in Coal Creek downstream of town and recreation corridor (Woods Walk, frisbee golf area, etc)	Yes	Yes	Yes
SR-10a	Slater River upstream of Crested Butte WWTF	Characterize concentrations downstream of Coal Creek and upstream of WWTF	No	No	No
CB-EFF	Town of Crested Butte WWTF effluent- monthly provided via EPA ECHO.	Characterize treated effluent	No	No	No
SR-11	Slater River downstream of the Town of Crested Butte WWTF and Recreation Path Bridge	Characterize concentrations downstream of WWTF and mid-way through Crested Butte Corridor	Yes	No	No
SR-12	Slater River downstream of Washington Gulch and McCormick Ranch Road (near old USGS gage location).	Characterize concentrations downstream of Washington Gulch and the Recreation Path Bridge	Yes	No	No
WASH-40	Washington Gulch upstream of Meridian Lake Park Reservoir	Characterize concentrations in the upper Washington Gulch Watershed	No	No	No
WOODS-10	Woods Creek upstream of MCBWSD WWTF discharge	Characterize concentrations in Woods Creek upstream of WWTF and downstream of Mt CB	No	No	No
MCB-Eff	MCBWSD WWTF effluent- monthly provided via EPA ECHO.	Characterize treated effluent	No	No	No
WASH-10	Washington Gulch downstream of confluence with Woods Creek	Characterize concentrations in Washington Gulch downstream of Woods Creek	No	No	No
WASH-00	Washington Gulch upstream of confluence with the Slater River	Characterize concentrations in Washington Gulch above the Slater River	Yes	Yes	Yes
SR-20	Slater River downstream of Highway 135 at USGS gage.	Characterize concentrations below the Crested Butte Corridor.	Yes	Yes	Yes



Table 4. 2019 integrated monitoring project: *E. coli* sample collection schedule.

Month	Date	Sample Events			
		Watershed-wide (all locations)	Crested Butte Corridor (7 locations)	Field blanks	Field duplicates
June	6/19/2019	18		1	1
	6/26/2019		7		
July	7/3/2019		7	1	
	7/10/2019		7	1	1
	7/17/2019	18		1	1
	7/24/2019		7	1	1
	7/31/2019		7	1	1
August	8/7/2019		7	1	1
	8/14/2019		7	1	1
	8/21/2019	18		1	1
	8/28/2019		7		1
September	9/4/2019		7		
	9/11/2019				
	9/18/2019	18		1	1
	9/25/2019				
Number of samples		72	63	10	10
Total number of samples collected in 2019:					155

BENEFITS TO OTHER PROJECTS

This project will support the UGRWCD’s WMP effort in the East River sub-basin by collecting additional information related to important issues identified by stakeholders during the assessment phase. In particular, this study will help identify management options to protect recreational use within the Crested Butte corridor.

By coordinating sample collection with the Colorado Department of Public Health and Environment, data collected during the 2019 study will help support development of a total maximum daily load (TMDL) or TMDL alternative. Once finalized the TMDL will assign waste load allocations to both WWTFs and load allocations to nonpoint sources. A robust TMDL will help identify appropriate management measures and create funding opportunities through the Nonpoint Source (NPS) Program managed by the Colorado Department of Public Health and Environment. CCWC may pursue a NPS grant in 2020 to implement management measures to reduce *E. coli* from nonpoint sources. Addressing *E. coli* is a top priority for the NPS program.

The US Forest Service has created a stewardship fund that is expected to generate up to \$50,000 per year. The stewardship fund will be administered by Gunnison County’s Sustainable Tourism and Outdoor Recreation (STOR) committee to allocate funds to projects on Forest Service lands that protect and improve recreation and watershed health. In 2020, CCWC will provide the 2019 *E. coli* study results and management recommendations to the STOR committee to inform future management activities related to *E. coli* and recreation.



PROJECT PARTNERS

- National Park Service
- US Forest Service
- Bureau of Land Management
- Gunnison County Commissioners and the Sustainable Tourism and Outdoor Recreation Committee
- Stakeholders affiliated with the Slate River Floating Management Plan (17 parties were involved in 2018).
- Colorado Department of Public Health and Environment

As referenced throughout this proposal, there is tremendous community support to address human and pet waste issues and improve riparian conditions in the Slate River Watershed, particularly within the Crested Butte Corridor.

PROJECT BENEFICIARIES

This project benefits all downstream water users by identifying nonpoint sources of *E. coli*, a potentially deadly pathogen, and identifying management options to mitigate *E. coli*. Protecting our watersheds is increasingly important as recreation continues to grow in the Upper Gunnison Basin. Proactive measures to protect water quality will help assure all land uses, including livestock grazing, are permitted in the future. The following user groups benefit from this project:

- All recreational users in the Slate River Watershed
- Crested Butte community, local homeowners, and visitors
- Downstream water users
- Wildlife and aquatic life
- Ranching community