MEMORANDUM

TO: Jeremy Zumberg, Lindsay Patterson, Jillian Scott, Jennifer Zygmunt
FROM: Ron Steg
DATE: November 24, 2019

SUBJECT: Recreation Use Support Determination for Lander Creek, Pacific Creek, and Clarks Draw

Lander Creek, Pacific Creek, and Clark's Draw were added to Wyoming's 2012 303(d) list based on data collected by the Western Watersheds Project in 2010. Based on further analysis, it was determined that the data were not credible. As a result, these waters were removed from the 303(d) list in 2014. The Wyoming Department of Environmental Quality's (WYDEQ) Lander field team evaluated *E. coli* concentrations during a single recreation season in 2016 for Lander Creek and Pacific Creek, and 2017 for Clark's Draw, to determine whether applicable recreation criteria are attained. The results are presented in Attachment A. A use support determination was made for Lander Creek, as described below. Insufficient data were available to make use support determinations for Pacific Creek and Clark's Draw. According to *Wyoming's Methods for Determining Surface Water Quality Condition* (WDEQ/WQD, 2017), one year of data is sufficient to make a recreational use support determination when a waterbody is impaired. However, two consecutive years are needed to de-list a waterbody.

Lander Creek

The State of Wyoming currently has two designations for recreational use of surface waters: primary contact recreation and secondary contact recreation (WDEQ, 2018). Lander Creek is designated for primary contract recreation. The geometric mean of five samples collected from a single sample site between June 24 and August 15, 2016 exceeded the applicable *E. coli* criteria (see Attachment A). As a result, the designated recreation use is not supported at that site. As shown in Figure 1, a 6.4 mile segment of Lander Creek straddling the single monitoring site, from the confluence with Ord Creek (the nearest downstream named tributary) upstream to the headwaters will be placed in Category 5 in the 2020 Water Quality Integrated Report. As the first Assessment Unit to be defined in the Lander Creek 12-digit HUC, this reach will be assigned the following Assessment Unit Identifier (AUID): WYNP101800060104 _01[1].

Pacific Creek

Pacific Creek is designated for secondary contact recreation. The geometric mean of five samples collected from a single sample site between June 24 and August 15, 2016 did not exceed the applicable *E. coli* criteria (see Attachment A). The results suggest that the

[1] Methods for delineating stream segments and creation of AUIDs is presented in Wyoming's Methods for Determining Surface Water Quality Condition (WDEQ/WQD, 2017). The AU delineation presented herein for Lander Creek deviates from these methods. The AU has been extended to the headwaters because there are no landuse changes or anthropogenic inputs that would be expected to change the use support determination for the segment upstream.

designated Recreation use is supported. However, a formal conclusion regarding use support has not been reached given that two consecutive years of data are not available. Additional data collection will be needed to reach a recreation use support determination for Pacific Creek. As shown in Figure 2, a segment of Pacific Creek straddling the single monitoring site, from the confluence with Jack Morrow Creek upstream 13.8 miles to an unnamed tributary will be placed in Category 3 in the 2020 Water Quality Integrated Report[2]. This segment includes the entire length of Pacific Creek within the Middle Pacific Creek 12-digit HUC. As the first Assessment Unit to be defined in the Middle Pacific Creek 12-digit HUC, this reach will be assigned the following Assessment Unit Identifier (AUID): WYGR140401040303 _01.

Clark's Draw

Clarks Draw is designated for secondary contact recreation. Geometric means of five samples collected from two sample sites between June 7 and July 31, 2017 did not exceed the applicable *E. coli* criteria (see Attachment A). The results suggest that the designated Recreation use is supported. However, a formal conclusion regarding use support has not been reached given that two consecutive years of data are not available. Additional data collection will be needed to reach a recreation use support determination for Clark's Draw. As shown in Figure 3, a segment of Clarks Draw extending from the downstream sample site (Clarks Draw_2) upstream 3.2 miles will be placed in Category 3 in the 2020 Water Quality Integrated Report[3]. As the first Assessment Unit to be defined in the Miller Draw-Hoback River 12-digit HUC, this reach will be assigned the following Assessment Unit Identifier (AUID): WYSR170401030305_01.

References

WDEQ/WQD. 2017. Wyoming's Methods for Determining Surface Water Quality Condition. Wyoming Department of Environmental Quality, Water Quality Division, Watershed Protection Program. Document # 17-0865. Effective Date: December 21, 2017.

WDEQ. 2018. Wyoming Water Quality Rules and Regulations. Chapter 1: Wyoming Surface Water Quality Standards. Effective Date: 04/24/2018.

[2] The Pacific Creek AU was delineated based on a review of flowlines in NHD-high resolution and aerial photography. Based on review of the aerial photography, many of the NHD flowlines do not appear to represent regularly flowing tributaries and may not even include defined channels. As a result, to be conservative, the AU was extended from the nearest obviously flowing tributary downstream from the sample site, to the upper end of the Middle Pacific Creek 12-digit HUC where an unnamed tributary appears to discharge into Pacific Creek from the south east.

[3] The AU delineation presented herein for Clarks Draw deviates from WDEQ's methods. The AU has been extended to the headwaters because there are no landuse changes or anthropogenic inputs that would be expected to change the use support determination for the segment upstream.

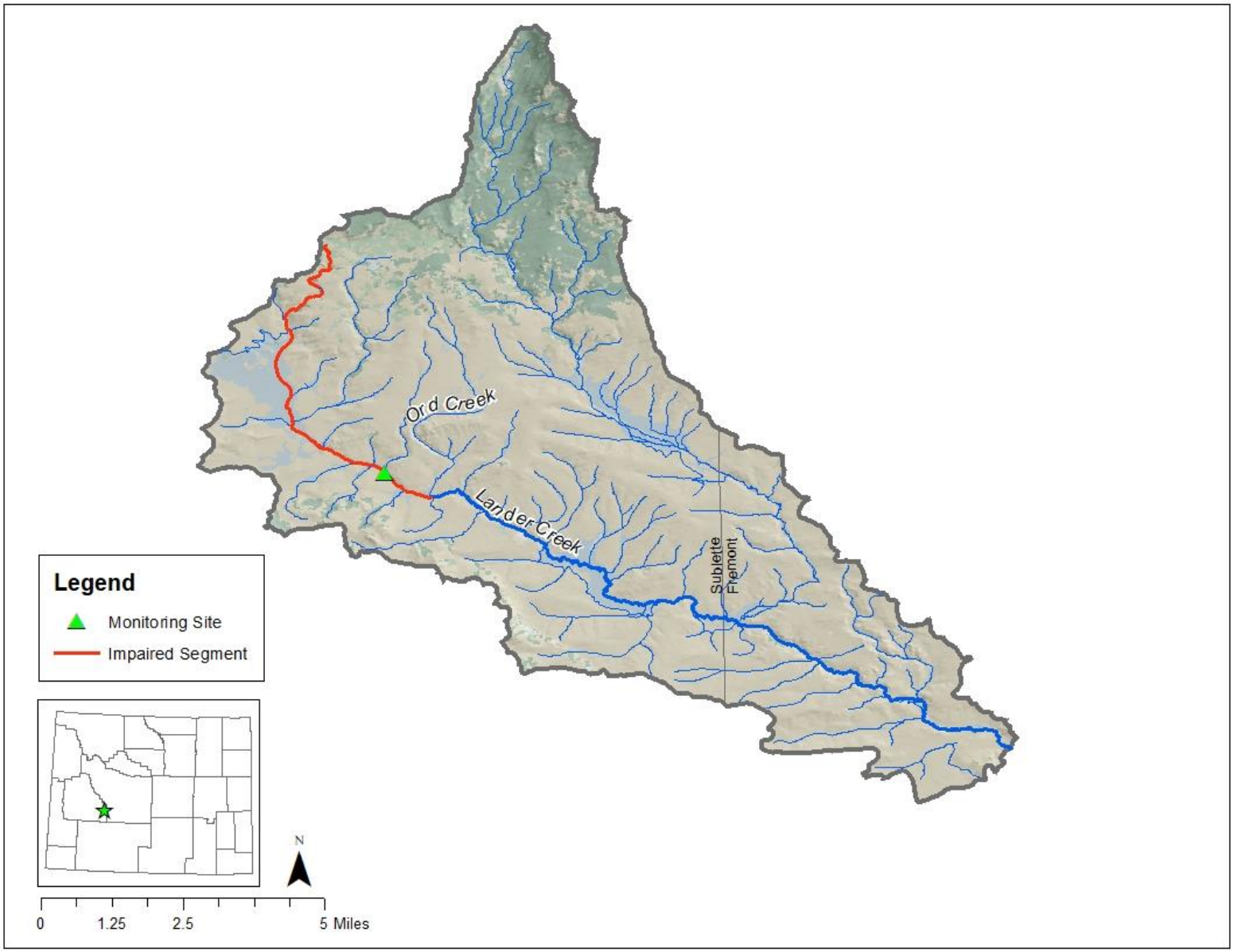

Figure 1. Lander Creek.

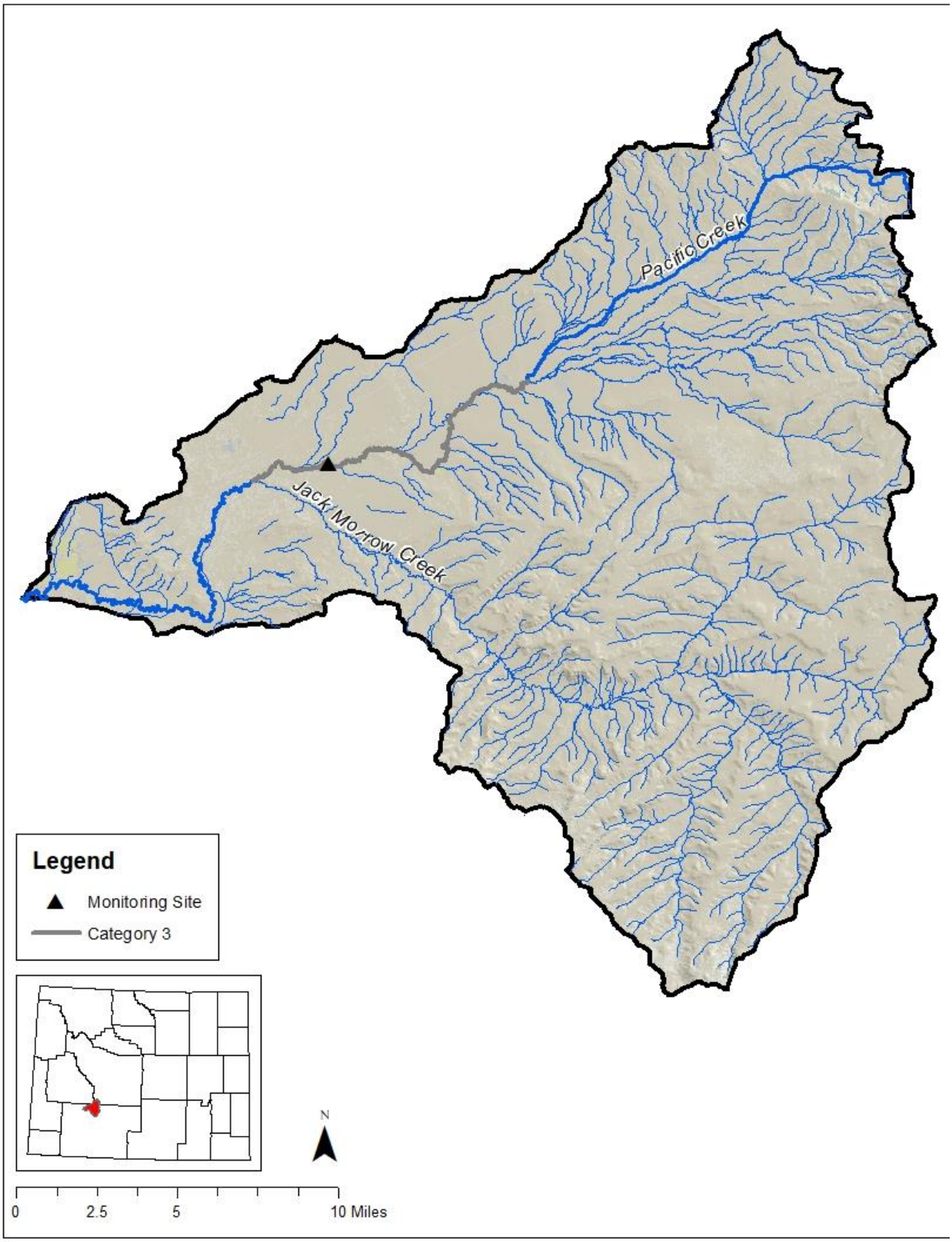

Figure 2. Pacific Creek.

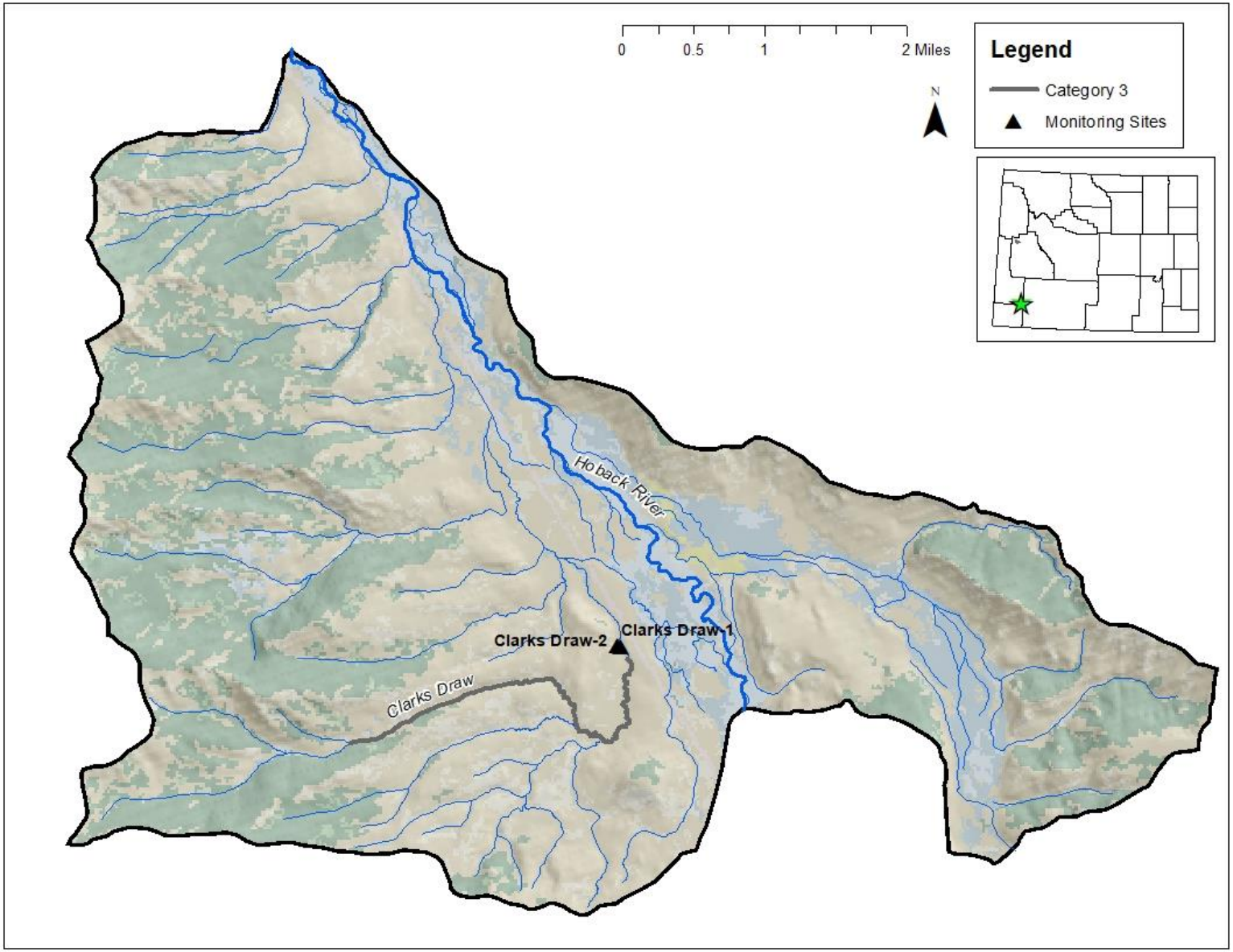

Figure 3. Clarks Draw.

Attachment A

MEMORANDUM

TO: David Waterstreet, Watershed Protection Program Manager
FROM: Jeremy Zumberge, Watershed Monitoring Supervisor
DATE: December 12, 2017

SUBJECT: Lander Creek, Pacific Creek, and Clarks Draw E. coli results

Data submitted to WDEQ in 2011 by the Western Watersheds Project suggested that Clarks Draw, Lander Creek, and Pacific Creek may not attain applicable recreation criteria. These streams were placed on the 2012 303(d) list of impaired waters, then removed from the 2014 303(d) list after the *Escherichia coli* (*E. coli*) data was found to not meet data quality requirements. WDEQ committed to independently evaluating these streams to determine if applicable recreation criteria are attained.

The Lander field team evaluated *E. coli* concentrations during the recreation season at designated sites on Clarks Draw, Lander Creek and Pacific Creek to determine whether applicable recreation criteria are attained. Samples were collected at or near sites used by Western Watersheds Project in 2010 (Table 1).

Table 1. Site locations and descriptions

Site ID	Approximate Coordinates	Basin/ HUC	Land Ownership	Sample Site Location Narrative
Clarks Draw-1	43.17402, -110.383617	Snake River 170401030305	USFS	Clarks Draw ~50-ft upstream of the FS Road 30531 crossing
Clarks Draw-2	43.17413, -110.38413	Snake River 170401030305	USFS	Clarks Draw ~150-ft downstream of the FS Road 30531 crossing
Lander Creek	42.5056674, -109.156204	North Platte River 101800060104	BLM	Lander Creek ~30-ft upstream of the BLM-WSLI fence
Pacific Creek	42.195150, -109.213348	Green River 140401040303	BLM	Pacific Creek ~40-ft upstream of the BLM Road 21 (Bar X Rd) crossing

Five bacteria samples suitable for use were collected during the recreation season over a 60-day period on each stream, with each sample separated by at least 10 days. Sampling occurred in 2016 on Lander Creek and Pacific Creek, and in 2017 on Clarks Draw. The 60-day period for Lander Creek and Pacific Creek was June 24 through August 22, 2016. The 60 day period for Clarks Draw was June 7 through August 6, 2017. The 60-day period overlaps with the sampling period used by WWP when sampling these streams in 2010.

More detail about the study design, methods, and quality assurance and control procedures is contained in the approved sampling and analysis plan. The SAP is available in the water quality assessment files in Cheyenne, at the Lander field office, and in my files in Sheridan.

Lander Creek exceeded the water quality criterion for primary contact recreation, whereas Pacific Creek and Clarks Draw did not exceed the water quality criterion for secondary contact recreation (Table 2). Recreation designation was determined using the WDEQ Categorical Use Attainability Analysis for Recreation (2017).

Table 2. E. coli sample collection date, time and results compared to applicable recreation criteria.

	Pacific Creek		Lander Creek		Clarks Draw #1		Clarks Draw #2	
Date	Time	Result	Time	Result	Time	Result	Time	Result
6/24/2016	10:35	365.4	09:45	214.3				
7/5/2016	12:04	228.2	11:14	1413.6				
7/18/2016	11:20	167	10:30	648.8				
7/29/2016	08:25	172.3	07:26	325.5				
8/15/2016	14:17	148.3	13:09	51.2				
6/7/2017					17:00	46.5	16:56	37.3
6/19/2017*					17:25	325.5*	17:21	290.9*
6/22/2017					14:32	248.9	14:28	387.3
7/5/2017					17:31	201.4	17:29	275.5
7/19/2017					10:45	172.2	10:40	1986.3
7/31/2017					13:34	2419.6	13:30	20.3
Geometric mean		204		318		250		174
Recreation designation (P or S) and criterion	S	630	P	126	S	630	S	630
Criterion exceeded?		No		Yes		No		No

*Data from 6/19/2017 was discarded because the relative percent difference (RPD) between replicate samples exceeded 50%.

Quality control sampling was conducted as outlined in the SAP. None of the remaining replicates sample pairs exceeded an RPD of 50% (Table 3). None of the field or laboratory blanks had detectable *E. coli* (Table 3).

All holding times were met. All preservation requirements were met. All pertinent SOPs and the SAP were followed. The Data Review Criteria worksheet was completed with “Satisfactory” noted for each applicable criterion.

Table 3. Quality control sample date, time, and results

Date	Time	Replicate 1 result	Replicate 2 result	Replicate RPD	Blank type	Blank result
6/24/16	09:41				Field	<1
	10:35	365.4	275.4	28		
	12:27				Lab	<1
7/5/16	11:14	1413.6	1119.9	23		
	11:19				Field	<1
	13:20				Lab	<1
7/18/16	11:20	167	185	10		
	11:25				Field	<1
	13:01				Lab	<1
7/29/16	07:17				Field	<1
	07:26	325.5	209.8	43		
	09:59				Lab	<1
8/15/16	13:00				Field	<1
	14:17	148.3	148.3	0		
	16:05				Lab	<1
6/7/17	16:50				Field	<1
	17:00	46.5	32.2	36.04		
	20:35				Lab	<1
6/19/17*	17:17				Field	<1
	17:25	325.5	686.7	71.6		
	21:21				Lab	<1
6/22/17	14:25				Field	<1
	14:32	248.9	307.6	21		
	18:26				Lab	<1
7/5/17	17:24				Field	
	17:29	275.5	387.3	33.74		
	21:41				Lab	
7/19/17	10:32				Field	<1
	10:45	172.2	235.9	31.22		
	17:15				Lab	<1
7/31/17	13:29				Field	<1
	13:30	20.3	13.4	41		
	17:11				Lab	<1

*****Discarded due to a high RPD between replicate samples

Cc: Ron Steg and Sol Brich