United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Colorado State Office
2850 Youngfield Street
Lakewood, Colorado 80215-7210

In Reply Refer To:
7250 (CO-932)

Mr. Rob Viehl
Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, Colorado 80203

Dear Mr Viehl:

The Bureau of Land Management (BLM) is writing this letter to formally communicate its recommendation for an instream flow water right on Kinney Creek, located in Water Division 5.

Location and Land Status. Kinney Creek originates on the east side of Elk Mountain approximately six miles north of Hot Sulphur Springs. Kinney Creek flows into the Colorado River approximately three miles northeast of Hot Sulphur Springs. This recommendation addresses the portion of Kinney Creek that starts at the headwaters and extends downstream to the confluence with McQueary Creek, a distance of approximately 6.3 miles. The BLM manages 3.6 miles of this reach, the U.S. Forest Service manages approximately 1.4 miles, and approximately 1.3 miles are in private ownership.

Existing Instream Flow Water Right. In 1986, the Colorado Water Conservation Board (CWCB) appropriated an instream flow water right on Kinney Creek for 1.0 cfs, year-round. This recommendation is for an increase to the existing instream flow water right.

Biological Summary. Kinney Creek is a cold water, high gradient stream. The reach that is the subject of this recommendation flows through a valley that ranges from ¼ to 1/2 mile in width. Historically, most of the reach flowed through densely forested lands, but the 2020 East Troublesome burned most of the watershed. The creek will be a priority for BLM monitoring during future years to determine if the fire will have a significant effect on water quality, sediment, and the fish population.

Substrate is generally moderate in size, ranging from gravels to eight-inch boulders. The stream provides good pools and undercut banks for cover, but riffle habitat is limited because of the steep gradient. Water quality is excellent for supporting cold water species.

Fish surveys have documented a self-supporting population of Colorado River Cutthroat Trout – Blue Lineage. BLM works with partners to manage the fishery in Kinney Creek as a core

conservation population. BLM has reintroduced beavers to the creek to create additional pool habitat and trap a portion of the high sediment load from Elk Mountain.

Surveys have indicated robust populations of stonefly and caddisfly, indicating high water quality. The riparian community is comprised of willow, alder, rushes, sedges, and grasses. Many portions of the riparian community survived the East Troublesome Fire.

R2Cross Analysis. The BLM collected the following R2Cross data from Kinney Creek:

Cross Section Date	Discharge Rate	Top Width	Winter Flow Recommendation (meets 2 of 3 hydraulic criteria)	Summer Flow Recommendation (meets 3 of 3 hydraulic criteria)
07/31/2020 #2	0.93 cfs	7.38 feet	0.92 cfs	1.45 cfs
07/31/2020 #1	1.00 cfs	6.29 feet	Out of range	1.67 cfs
06/23/2021 #1	1.78 cfs	7.78 feet	1.09 cfs	1.85 cfs
		Averages:	1.01 cfs	1.66 cfs

BLM's analysis of this data indicates that the following flows are needed to protect the natural environment to a reasonable degree:

> 1.7 cfs is recommended during the snowmelt runoff period and summer, from May 1 through July 15. This recommendation is driven by the average depth criteria. Kinney Creek has limited riffle habitat, so protecting this flow rate will ensure that the limited habitat can be fully utilized during the snowmelt and summer period. During May and June, the cutthroat trout population is completing spawning, and during July, the trout are actively moving between pools. Protecting flows during this period will allow the fish population to complete important parts of its life cycle before cold temperatures arrive.
>
> An increase is warranted because R2Cross modeling shows that the existing 1.0 cfs instream flow water right does not fully protect habitat in the variety of riffle habitats on Kinney Creek. Depending on the geomorphology of individual riffles, 1.0 cfs does not fully meet either the average depth or average velocity criteria. Implementing this recommendation will require appropriating an additional instream flow water right for 0.7 cfs, which brings the total instream flow protection to 1.7 cfs from May 1 through July 15.

Water Availability. The BLM recommends using a variety of data sources to confirm water availability, because BLM is not aware of any historical gage data on this creek. Use of Streamstats can provide an estimate of natural hydrology. One nearby gage may provide an estimate of the seasonality of flows, because it is located on a watershed with similar characteristics. USGS Gage 09040000, on East Troublesome Creek, is located on a larger watershed but appears to be relatively unaffected by diversion and storage operations. Analysis of diversion records for ditches on Kinney Creek near the confluence with the Colorado River would also provide some documentation of flows available in Kinney Creek. However, diversion records would have to be adjusted to

account for inflow from McQueary Creek below the reach that it is the subject of this recommendation.

BLM is aware of the following water right within the reach proposed for an increase:

Dennis Ditch – 2.75 cfs, 1915 priority

Relationship to Land Management Plans. The Colorado River Cutthroat Trout population in Kinney Creek has been identified as a core conservation population in the Conservation Agreement and Strategy for Colorado River Cutthroat Trout in the States of Colorado, Utah, and Wyoming (2007). In addition, the upper portions of the stream reach have been designated as an Area of Critical Environmental Concern (ACEC) in BLM's land use planning process, with land management prescriptions designed to protect and enhance cutthroat trout habitat. Increasing the instream flow water right would assist in meeting the objectives of the conservation agreement and strategy and the ACEC.

Data sheets, R2Cross output, fishery survey information, and photographs of the cross section were included with BLM's draft recommendation in February 2021. BLM thanks both Colorado Parks and Wildlife and the Colorado Water Conservation Board for their cooperation in this effort.

If you have any questions regarding our instream flow recommendation, please contact Roy Smith at 303-239-3940.

Sincerely,

ALAN BITTNER

Digitally signed by ALAN BITTNER
Date: 2021.12.14 11:25:05 -07'00'

Alan Bittner
Deputy State Director, Resources

Cc: Bill Mills, Kremmling Field Office
Paula Belcher, Kremmling Field Office
Elijah Waters, Northwest District Office

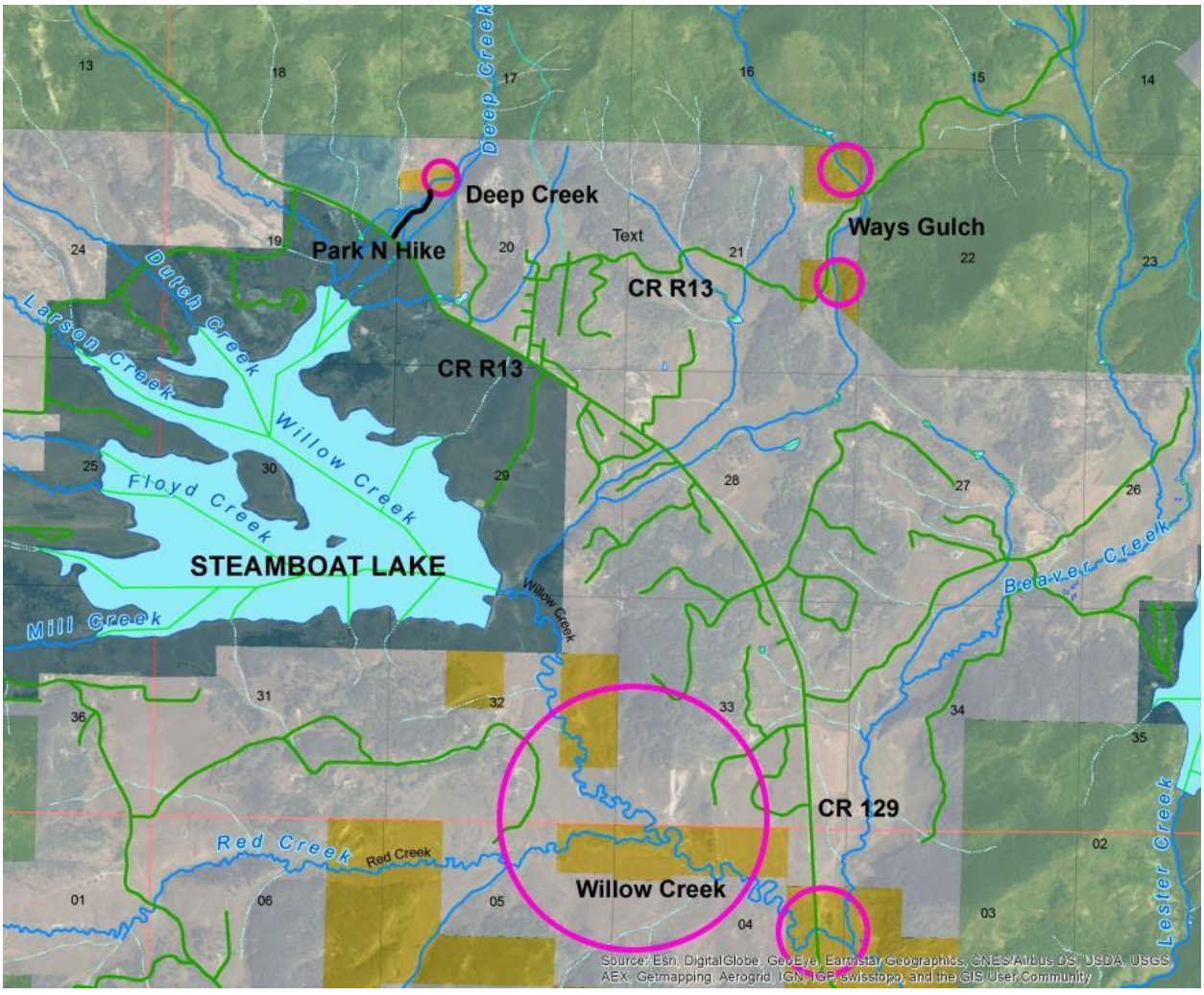
Little Snake Field Office

Stream Sampling July 2016

Deep Creek - Water Code: 21349

Introduction:

Deep Creek, located North of Clark, Colorado, near Steamboat Lake State Park on BLM lands managed by the Little Snake Field Office was sampled on July 20, 2016. Deep Creek is tributary to Steamboat Lake. Sampling was conducted to determine fishery status, species composition, and obtain a two-pass removal population estimate. One shocker was used to sample a 360 foot reach of stream. What appeared visually to be a mix of Rainbow Trout and Cutthroat Trout (RXN's) were the only species seen or collected (see photos). Personnel present included: Tom Fresques, Shawn Wiser, Kristen Doyle, and Nate Higginson, BLM, and Brian Hodge, Trout Unlimited.



Deep Creek - representative habitat

RXN hybrid – this fish appears more Cutthroat - note the distribution and fewer spots

RXN hybrid – this one appears more Rainbow - note number and distribution of spots

Discussion:

Deep Creek at the sample site supports a small population of what appeared to be rainbow x cutthroat trout hybrids. A total of 9 fish were collected and all appeared healthy. Age-class diversity was limited as only two were noted. Based on the sampling the population estimate for the stream at the site is **6 fish (≥140mm) + or – 2 fish at the 95% confidence interval, and 88 fish (≥140mm) + or – 22 fish per stream mile at the 95% confidence interval.**

Riparian vegetation was extremely dense and was comprised primarily of willow, with some alder, cow parsnip, monkshood, timothy, and larkspur. The stream was very well shaded and covered and was difficult to access. Stream habitats were comprised of a mix of riffles, small runs and small pools. Quality pool habitat was limited and is likely a limiting factor in this stream reach. Substrate was comprised of gravel with some cobble and rock. Root wads provided some habitat as well. Beaver ponds habitat was noted below the BLM reach on State Property.

This stream is small and has limited flow, but otherwise provides good habitat. Limited flow and lack of larger pool/holding habitat are likely the primary limiting factors on this stream. Water temperature at the time of sampling was 59.4°F and does not appear to be a limiting factor although a temperature probe would better inform temperature ranges and seasonal variations.

Recommendations:

- Investigate fish distribution up on Forest
- Look for barriers to fish movement
- Consider placement of a temperature probe

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Kinney Creek					CROSS-SECTION NO: 1	
CROSS-SECTION LOCATION: ~700 ft. upstream from BLM campground						
DATE: 6-23-2	OBSERVERS: R. Smith, P. Bakhar					
LEGAL DESCRIPTION	¼ SECTION: SW	SECTION: 24	TOWNSHIP: 2 (N)/S	RANGE: 78 E(W)	PM: Sixth	
COUNTY: Grand	WATERSHED: Colorado River	WATER DIVISION: 5	DOW WATER CODE: 23527			
MAP(S): USGS:	13N 407810 4011944					
MAP(S): USFS:	444/1575 - 10b, 081995					

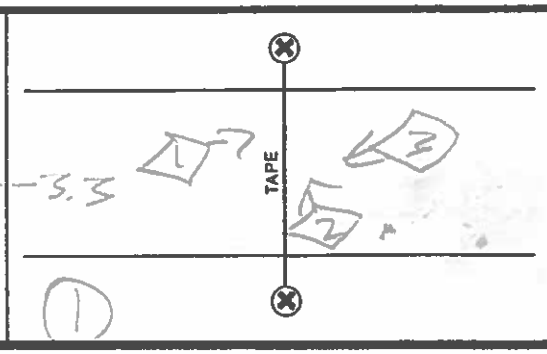
SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: YES / NO	METER TYPE: M-M			
METER NUMBER:	DATE RATED:	CALIB/SPIN: ____ sec	TAPE WEIGHT: Surveyed ____ lbs/foot	TAPE TENSION: Surveyed! ____ lbs
CHANNEL BED MATERIAL SIZE RANGE: gravel to 2-foot boulders	PHOTOGRAPHS TAKEN: (YES)/NO	NUMBER OF PHOTOGRAPHS: 3		

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
⊗ Tape @ Stake LB	0.0	Surveyed
⊗ Tape @ Stake RB	0.0	Surveyed
① WS @ Tape LB/RB	0.0 10.2	7.40/7.40
② WS Upstream	4.0	7.20
③ WS Downstream	11.6	8.08
SLOPE	0.88/15.6 = .056	

SKETCH



LEGEND: Stake ⊗, Station ①, Photo ◇→, Direction of Flow

AQUATIC SAMPLING SUMMARY

STREAM ELECTROFISHED: YES/NO	DISTANCE ELECTROFISHED: ____ft	FISH CAUGHT: YES/NO	WATER CHEMISTRY SAMPLED: (YES)/NO

LENGTH - FREQUENCY DISTRIBUTION BY ONE-INCH SIZE GROUPS (1.0-1.9, 2.0-2.9, ETC.)

SPECIES (FILL IN)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	>15	TOTAL

AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME:

caddisfly, mayfly

COMMENTS

pH = 8.20
Cond. = 74
Sal = 0.1
Temp = 9.0°

Surveyed in area burned by East Troublesome Fire. Creek appeared to be stable and many fish were sighted. Water quality excellent.

DISCHARGE/CROSS SECTION NOTES

STREAM NAME:	CROSS-SECTION NO:	DATE:	SHEET ___ OF ___
Kinnell Creek	1	6-23-21	

BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE)	LEFT / RIGHT	Gage Reading: _____ ft	TIME: 9:05 am

Features: Stake (S) Grassline (G) Waterline (W) Rock (R)	Distance From Initial Point (ft)	Width (ft)	Total Vertical Depth From Tape/Inst (ft)	Water Depth (ft)	Depth of Obser-vation (ft)	Revolutions	Time (sec)	Velocity (ft/sec) At Point	Velocity (ft/sec) Mean in Vertical	Area (ft^2)	Discharge (cfs)
RS	0.0		5.65								
	1.4		6.37								
RBF	2.5		6.87								
	3.1		7.30								
RLW	3.3		7.40								
	3.9		7.6	0.7				0.0			
	4.1		7.6	0.2				0.09			
	4.3		7.7	0.3				0.23			
	4.5		7.7	0.3				0.75			
	4.7		7.7	0.3				0.89			
	4.9		7.65	0.25				1.63			
	5.1		7.65	0.25				2.11			
	5.3		7.55	0.15				1.98			
	5.5		7.55	.15				2.25			
	5.7		7.55	.15				2.97			
	5.9		7.55	.15				2.60			
	6.1		7.6	.7				1.59			
	6.3		7.6	.7				0.92			
	6.5		7.6	.2				0.98			
	6.7		7.7	.3				0.42			
	6.9		7.7	.3				0.53			
	7.1		7.65	.25				0.93			
	7.3		7.7	.3				0.67			
	7.5		7.8	.4				0.61			
	7.7		7.85	.45				0.85			
	7.9		7.80	.4				1.04			
	8.1		7.80	.4				1.51			
	8.3		7.80	.4				0.88			
	8.5		7.7	.3				0.91			
	8.7		7.80	.4				0.94			
	8.9		7.80	.4				1.41			
	9.1		7.75	.35				1.37			
	9.3		7.7	.2				1.07			
	9.5		7.6	.2				0.19			
	9.7		7.7	.3				0.59			
	9.9		7.7	.3				0.61			
LW	10.2		7.40								
RBF	10.3		6.79								
	10.5		6.24								
LS	13.6		5.84								
TOTALS:											

End of Measurement	Time:	Gage Reading: _____ ft	CALCULATIONS PERFORMED BY:	CALCULATIONS CHECKED BY:

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

LOCATION INFORMATION

STREAM NAME: Kinney Creek						CROSS-SECTION NO.: 1	
CROSS-SECTION LOCATION: 500 ft. upstream from BLM campground + closed road							
DATE: 7-31-25	OBSERVERS: R. Smith, P. Belcher						
LEGAL DESCRIPTION	% SECTION: SW	SECTION: 24	TOWNSHIP: 2 (N)/S	RANGE: 78 E/(W)	PM: 6th		
COUNTY: Grand	WATERSHED: CO River		WATER DIVISION: 5		DOW WATER CODE: 23527		
MAP(S): USGS: Zone 13 407809			40.119084 N				
USFS: 4441525			106.081898 W				

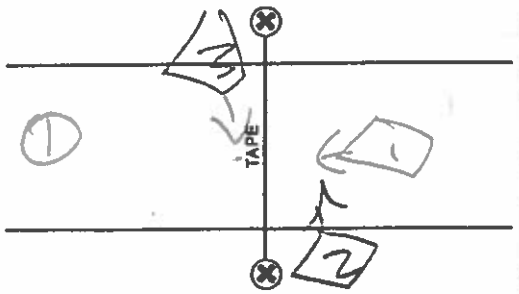
SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: (YES) NO	METER TYPE: M-M			
METER NUMBER:	DATE RATED:	CALIB/SPIN: ____ sec	TAPE WEIGHT: surveyed ____ lbs/foot	TAPE TENSION: surveyed ____ lbs
CHANNEL BED MATERIAL SIZE RANGE: gravel to 8-inch boulders		PHOTOGRAPHS TAKEN: (YES)/NO	NUMBER OF PHOTOGRAPHS: 3	

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
⊗ Tape @ Stake LB	0.0	surveyed
⊗ Tape @ Stake RB	0.0	surveyed
① WS @ Tape LB/RB	0.0	5.15 / 5.15
② WS Upstream	17.0	4.68
③ WS Downstream	8.0	5.56
SLOPE	0.88/25.0 = 0.0352	

SKETCH



LEGEND:
- Stake ⊗
- Station ①
- Photo ①
- Direction of Flow

AQUATIC SAMPLING SUMMARY

STREAM ELECTROFISHED: YES/(NO)	DISTANCE ELECTROFISHED: ____ ft	FISH CAUGHT: YES/NO	WATER CHEMISTRY SAMPLED: (YES)/NO

LENGTH - FREQUENCY DISTRIBUTION BY ONE-INCH SIZE GROUPS (1.0-1.9, 2.0-2.9, ETC.)

SPECIES (FILL IN)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	>15	TOTAL

AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME:

mayfly, caddisfly, stonefly

COMMENTS

EC 1.2

Temp. °C

alt. ± 0.1 ppt

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Kinney Creek | CROSS-SECTION NO.: 1 | DATE: 7-31-20 | SHEET ___ OF ___

BEGINNING OF MEASUREMENT | EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT | Gage Reading: _____ ft | TIME: 10:30 am

Features (Stake (S), Grassline (G), Waterline (W), Rock (R))	Distance From Initial Point (ft)	Width (ft)	Total Vertical Depth From Tape/Inst (ft)	Water Depth (ft)	Depth of Observation (ft)	Revolutions	Time (sec)	Velocity (ft/sec) At Point	Velocity (ft/sec) Mean in Vertical	Area (ft^2)	Discharge (cfs)
RS	0.0		3.86								
	0.5		4.14								
G	0.7		4.55								
	1.7		4.62								
W	2.1		5.15								
	2.5	5.35	0.2					0.49			
	2.7	5.35	0.2					1.16			
	2.9	5.3	0.15					1.35			
	3.1	5.3	0.15					1.77			
	3.3	5.35	0.2					1.86			
	3.5	5.35	0.2					2.80			
	3.7	5.35	0.2					2.34			
	3.9	5.35	0.2					2.11			
	4.1	5.35	0.2					0.18			
	4.3	5.35	0.2					1.03			
	4.5	5.35	0.2					1.17			
	4.7	5.35	0.2					2.05			
	4.9	5.4	0.25					2.1			
	5.1	5.35	0.2					1.55			
	5.3	5.35	0.2					1.38			
	5.5	5.25	0.1					1.0			
	5.7	5.25	0.1					0.84			
	5.9	5.2	0.05					0.59			
	6.1	5.2	0.05					0			
	6.3	5.2	0.05					0			
W	6.7		5.15								
	7.3		4.75								
G	7.7		4.60								
	8.6		4.46								
TOTALS:											

End of Measurement | Time: | Gage Reading: _____ ft | CALCULATIONS PERFORMED BY: | CALCULATIONS CHECKED BY:

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

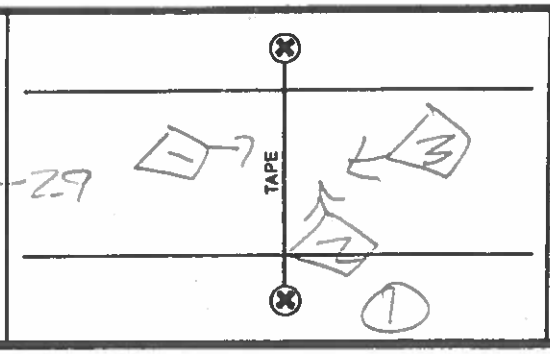
STREAM NAME: Kinney Creek						CROSS-SECTION NO.: 2	
CROSS-SECTION LOCATION: 100 ft. downstream from Kinney Creek Road Crossing							
DATE: 7-31-20	OBSERVERS: R. Smith, P. Belcher						
LEGAL DESCRIPTION	¼ SECTION: SE	SECTION: 25	TOWNSHIP: 2 N/S	RANGE: 78 E/W	PM: 6th		
COUNTY: Grand	WATERSHED: Colorado R.	WATER DIVISION: 5	DOW WATER CODE: 23527				
MAP(S): USGS: Zoke 13 408478 GPS 40.103243 N							
MAP(S): USFS: 4439769			106.073802				

SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: (YES / NO)	METER TYPE: M-M			
METER NUMBER:	DATE RATED:	CALIB/SPIN. ____ sec	TAPE WEIGHT: surveyed ____ lbs/foot	TAPE TENSION: surveyed ____ lbs
CHANNEL BED MATERIAL SIZE RANGE: gravel to 6" cobbles	PHOTOGRAPHS TAKEN: (YES/NO)	NUMBER OF PHOTOGRAPHS: 3		

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
⊗ Tape @ Stake LB	0.0	surveyed
⊗ Tape @ Stake RB	0.0	surveyed
① WS @ Tape LB/RB	0.0 8.3	5.95 5.95 -2.9
② WS Upstream	15.0	5.78
③ WS Downstream	7.5	6.06
SLOPE	0.28/22.5 = 0.0124	



AQUATIC SAMPLING SUMMARY

STREAM ELECTROFISHED: YES/NO	DISTANCE ELECTROFISHED: ____ ft	FISH CAUGHT: YES/NO	WATER CHEMISTRY SAMPLED: YES/NO

LENGTH - FREQUENCY DISTRIBUTION BY ONE-INCH SIZE GROUPS (1.0-1.9, 2.0-2.9, ETC.)

SPECIES (FILL IN)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	>15	TOTAL

AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME:

mayfly, caddisfly, stonefly

COMMENTS

pH = meter not working Riparian = Alder - Willow - Spruce

Temp = 7.7°C

Salinity = 0.1 higher

Cond = 132 elevation

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Kinney Creek	CROSS-SECTION NO: 2	DATE: 7-31-20	SHEET ___ OF ___
BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT	Gage Reading: ____ ft	TIME: 11:50 am

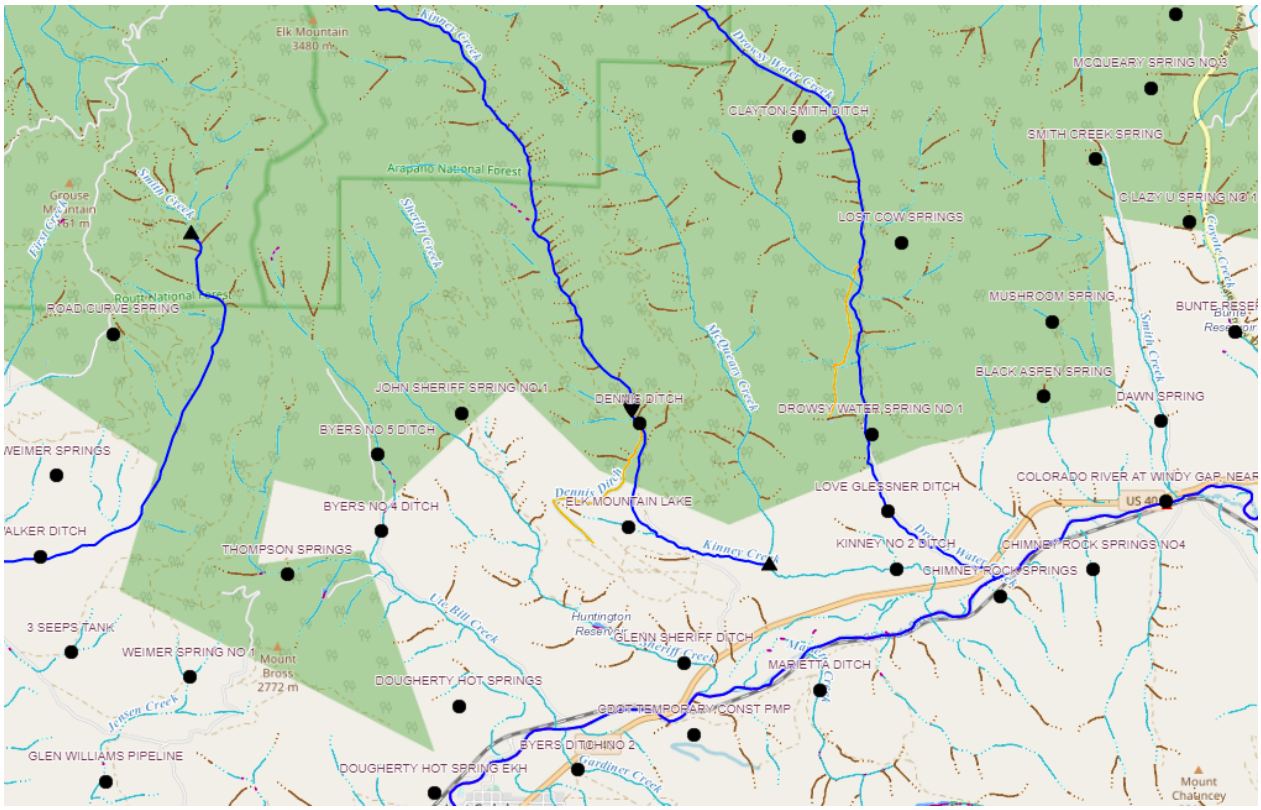
Features: Stake (S) Grassline (G) Waterline (W) Rock (R)	Distance From Initial Point (ft)	Width (ft)	Total Vertical Depth From Tape/Inst (ft)	Water Depth (ft)	Depth of Observation (ft)	Revolutions	Time (sec)	Velocity (ft/sec) At Point	Velocity (ft/sec) Mean in Vertical	Area (ft^2)	Discharge (cfs)
RS	0.0		5.15								
G	1.8		5.55								
	2.3		5.75								
W	2.9		5.95								
LEW	3.										
	3.3		6.1	0.15				0.35			
	3.5		6.15	0.2				0.72			
	3.7		6.15	0.2				0.84			
	3.9		6.15	0.2				0.94			
	4.1		6.15	0.2				0.81			
	4.3		6.15	0.2				1.00			
	4.5		6.15	0.2				0.89			
	4.7		6.15	0.2				1.05			
	4.9		6.15	0.2				1.16			
	5.1		6.15	0.2				1.21			
	5.3		6.15	0.2				0.85			
	5.5		6.15	0.2				1.22			
	5.7		6.15	0.2				1.2			
	5.9		6.15	0.2				1.33			
	6.1		6.2	0.25				1.18			
	6.3		6.2	0.25				1.03			
	6.5		6.2	0.25				1.22			
	6.7		6.25	0.3				1.11			
	6.9		6.3	0.35				0.81			
	7.1		6.15	0.2				0.42			
	7.3		6.15	0.2				0.51			
	7.5		6.05	0.1				0.49			
	7.7		6.15	0.2				0.24			
	7.9		6.15	0.2				0.16			
	8.1		6.1	0.15				0.26			
W	8.3		5.95								
	8.5		5.75								
	8.9		5.65								
G	9.3		5.60								
LS	9.7		5.10								
TOTALS:											

End of Measurement	Time:	Gage Reading: ____ ft	CALCULATIONS PERFORMED BY:	CALCULATIONS CHECKED BY:

R2Cross RESULTS

Stream Name: Kinney Creek
Stream Locations: 700 ft upstream from BLM campground SW/4 Sec 24 T2N R78W
Fieldwork Date: 06/23/2021
Cross-section: 1
Observers: R Smith, P Belcher
Coordinate System: UTM Zone 13
X (easting): 407810
Y (northing): 4441575
Date Processed: 06/24/2021
Slope: 0.056
Computation method: Manning's n
R2Cross data filename: Kinney Creek 6-23-21 #1.xlsx
R2Cross version: 1.1.19

LOCATION



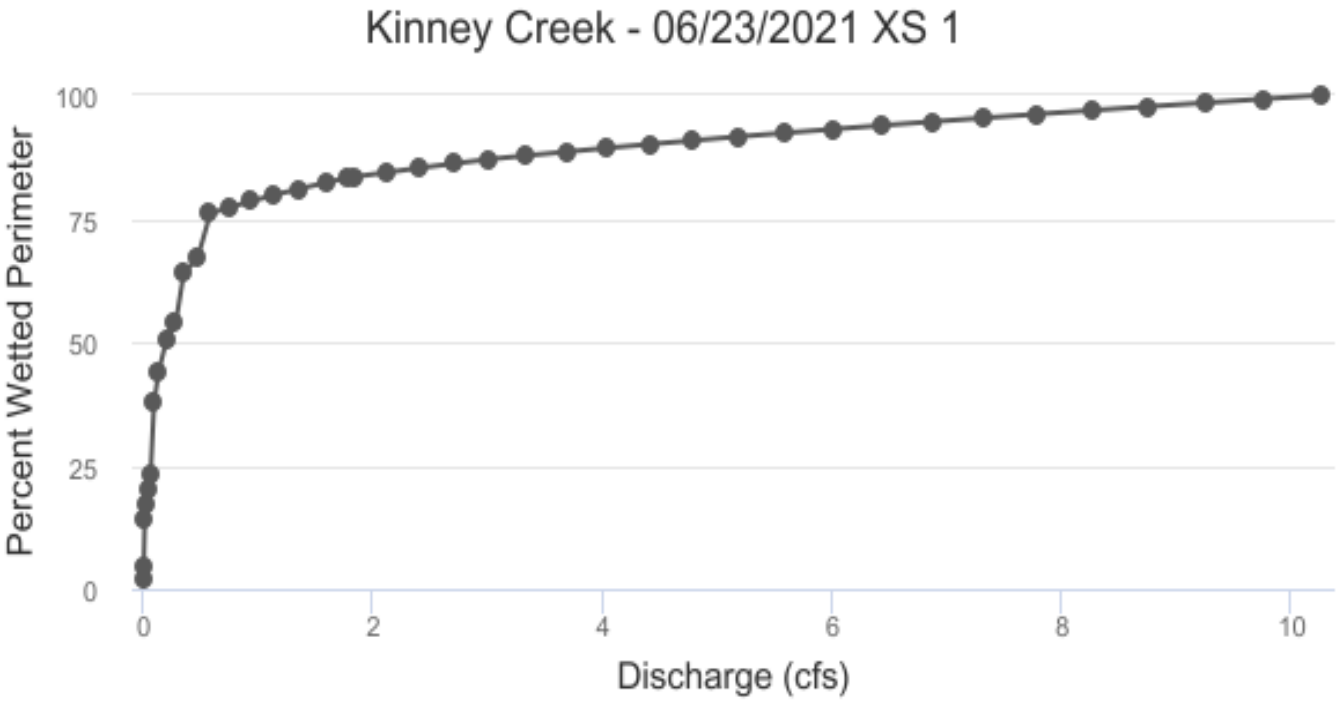
ANALYSIS RESULTS

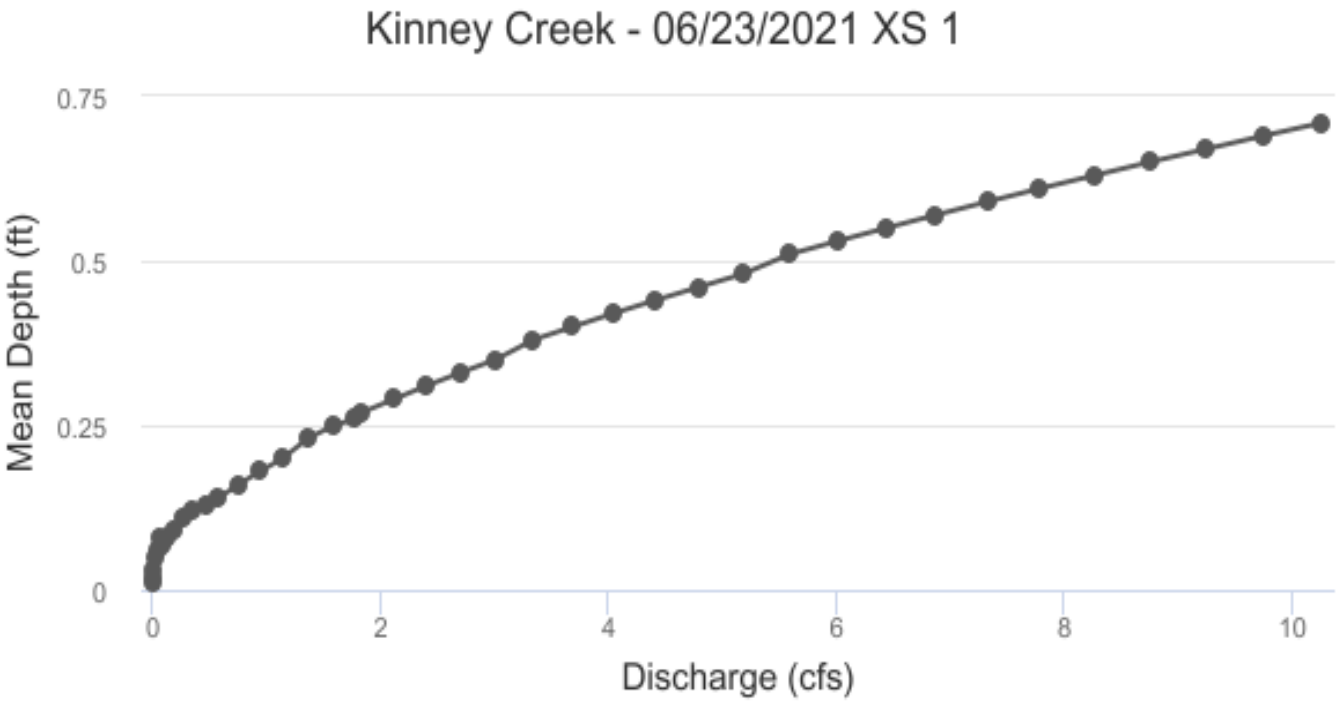
Habitat Criteria Results

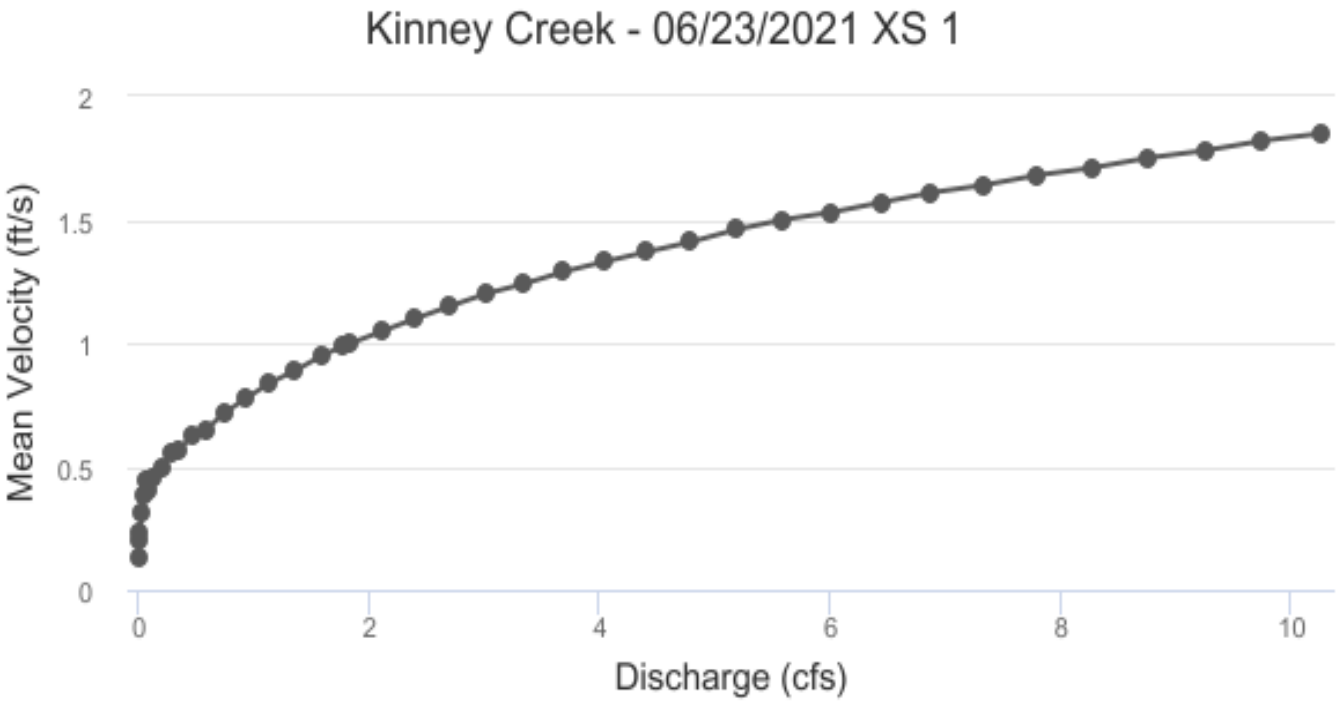
Bankfull top width (ft) = 7.78

	Habitat Criteria	Discharge (cfs) Meeting Criteria
Mean Depth (ft)	0.2	1.09
Percent Wetted Perimeter (%) **	50.0	0.19
Mean Velocity (ft/s)	1.0	1.85

**Values highlighted in yellow indicate that the discharge is less than 40% of measured Q or greater than 250% of measured Q.




Kinney Creek - 06/23/2021 XS 1
Mean Depth (ft)
0.75
0.5
0.25
0
0
2
4
6
8
10
Discharge (cfs)


Kinney Creek - 06/23/2021 XS 1
Mean Velocity (ft/s)
2
1.5
1
0.5
0
0
2
4
6
8
10
Discharge (cfs)

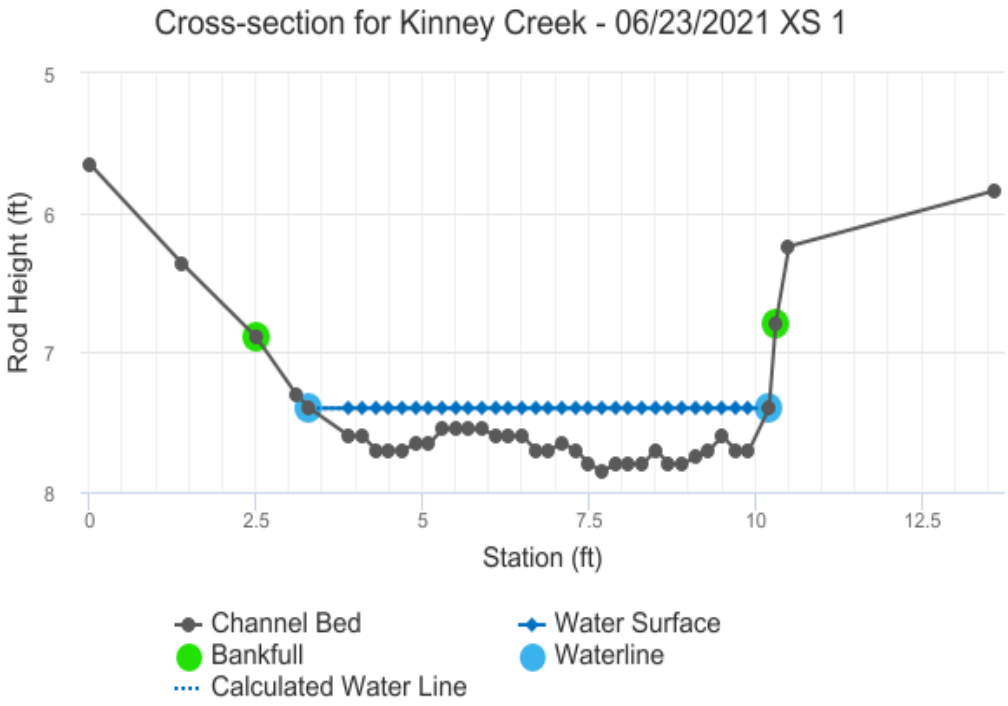
STAGING TABLE

Feature	Distance to Water (ft)	Top Width (ft)	Mean Depth (ft)	Maximum Depth (ft)	Area (SQ ft)	Wetted Perimeter (ft)	Percent Wetted Perimeter	Hydraulic Radius (ft)	Mean Velocity (ft/s)	Discharge (cfs)
Bankfull	6.89	7.78	0.71	0.96	5.56	8.76	100.00%	0.63	1.85	10.27
	6.91	7.74	0.69	0.94	5.37	8.7	99.24%	0.62	1.82	9.75
	6.94	7.71	0.67	0.91	5.19	8.63	98.47%	0.6	1.78	9.25
	6.96	7.67	0.65	0.89	5.0	8.56	97.71%	0.58	1.75	8.75
	6.99	7.63	0.63	0.86	4.82	8.49	96.95%	0.57	1.71	8.27
	7.01	7.59	0.61	0.84	4.64	8.43	96.18%	0.55	1.68	7.79
	7.03	7.55	0.59	0.82	4.46	8.36	95.42%	0.53	1.64	7.33
	7.06	7.51	0.57	0.79	4.28	8.29	94.66%	0.52	1.61	6.88
	7.08	7.47	0.55	0.77	4.1	8.23	93.90%	0.5	1.57	6.44
	7.11	7.43	0.53	0.74	3.92	8.16	93.13%	0.48	1.53	6.01
	7.13	7.39	0.51	0.72	3.74	8.09	92.37%	0.46	1.5	5.59
	7.15	7.35	0.48	0.7	3.56	8.03	91.61%	0.44	1.46	5.18
	7.18	7.31	0.46	0.67	3.39	7.96	90.84%	0.43	1.41	4.79
	7.2	7.28	0.44	0.65	3.21	7.89	90.08%	0.41	1.37	4.41
	7.23	7.24	0.42	0.62	3.04	7.83	89.32%	0.39	1.33	4.04
	7.25	7.2	0.4	0.6	2.86	7.76	88.55%	0.37	1.29	3.69
	7.27	7.16	0.38	0.58	2.69	7.69	87.79%	0.35	1.24	3.34
	7.3	7.12	0.35	0.55	2.52	7.63	87.03%	0.33	1.2	3.01
	7.32	7.07	0.33	0.53	2.35	7.55	86.15%	0.31	1.15	2.7
	7.35	7.02	0.31	0.5	2.18	7.47	85.26%	0.29	1.1	2.4
	7.37	6.96	0.29	0.48	2.01	7.39	84.37%	0.27	1.05	2.12
	7.39	6.91	0.27	0.46	1.85	7.31	83.48%	0.25	1.0	1.84
Waterline	7.4	6.9	0.26	0.45	1.81	7.29	83.26%	0.25	0.99	1.78
	7.42	6.83	0.25	0.43	1.68	7.21	82.32%	0.23	0.95	1.59
	7.44	6.73	0.23	0.41	1.52	7.1	81.06%	0.21	0.89	1.36

	7.47	6.64	0.2	0.38	1.36	6.99	79.81%	0.19	0.84	1.14
	7.49	6.54	0.18	0.36	1.2	6.88	78.55%	0.17	0.78	0.94
	7.51	6.44	0.16	0.34	1.04	6.77	77.30%	0.15	0.72	0.75
	7.54	6.35	0.14	0.31	0.89	6.66	76.05%	0.13	0.65	0.58
	7.56	5.58	0.13	0.29	0.75	5.88	67.08%	0.13	0.63	0.47
	7.59	5.34	0.12	0.26	0.62	5.61	64.08%	0.11	0.57	0.35
	7.61	4.49	0.11	0.24	0.5	4.74	54.05%	0.1	0.56	0.28
	7.63	4.23	0.09	0.22	0.39	4.43	50.60%	0.09	0.5	0.2
	7.66	3.68	0.08	0.19	0.3	3.85	43.94%	0.08	0.45	0.13
	7.68	3.18	0.07	0.17	0.21	3.3	37.71%	0.06	0.4	0.09
	7.71	1.94	0.08	0.14	0.15	2.03	23.17%	0.07	0.44	0.06
	7.73	1.7	0.06	0.12	0.1	1.77	20.21%	0.06	0.38	0.04
	7.75	1.46	0.05	0.1	0.07	1.51	17.24%	0.04	0.31	0.02
	7.78	1.22	0.03	0.07	0.03	1.25	14.27%	0.03	0.23	0.01
	7.8	0.38	0.02	0.05	0.01	0.4	4.52%	0.02	0.2	0.0
	7.83	0.19	0.01	0.02	0.0	0.2	2.26%	0.01	0.13	0.0

MODEL SUMMARY

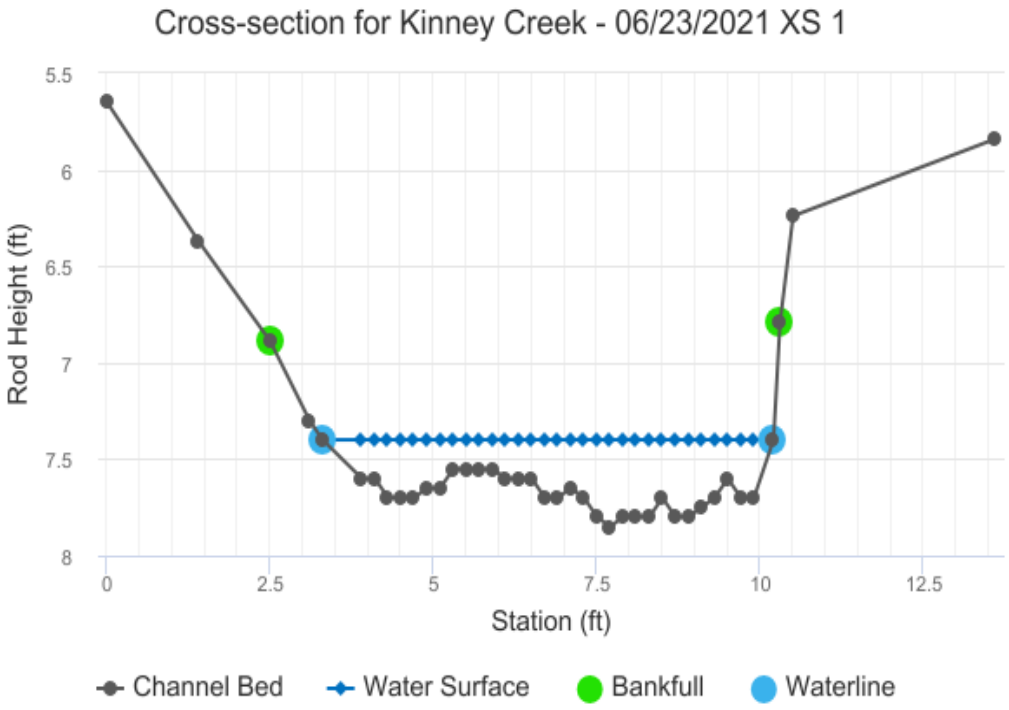
Measured Flow (Qm) =	1.78
Calculated Flow (Qc) =	1.78
(Qm-Qc)/Qm * 100 =	-0.01%
Measured Waterline (WLm) =	7.4
Calculated Waterline (WLc) =	7.4
(WLm-WLc)/WLm * 100 =	0.00%
Max Measured Depth (Dm) =	0.45
Max Calculated Depth (Dc) =	0.45
(Dm-Dc)/Dm * 100 =	-0.00%
Mean Velocity =	0.99
Manning's n =	0.141
0.4 * Qm =	0.71
2.5 * Qm =	4.45



FIELD DATA

Feature	Station (ft)	Rod Height (ft)	Water depth (ft)	Velocity (ft/s)
	0	5.65		
	1.4	6.37		
Bankfull	2.5	6.89		
	3.1	7.3		
Waterline	3.3	7.4	0	0
	3.9	7.6	0.2	0
	4.1	7.6	0.2	0.09
	4.3	7.7	0.3	0.33
	4.5	7.7	0.3	0.75
	4.7	7.7	0.3	0.89
	4.9	7.65	0.25	1.63
	5.1	7.65	0.25	2.11
	5.3	7.55	0.15	1.98
	5.5	7.55	0.15	2.25
	5.7	7.55	0.15	2.97
	5.9	7.55	0.15	2.6
	6.1	7.6	0.2	1.59
	6.3	7.6	0.2	0.93
	6.5	7.6	0.2	0.98
	6.7	7.7	0.3	0.42
	6.9	7.7	0.3	0.53
	7.1	7.65	0.25	0.73
	7.3	7.7	0.3	0.67
	7.5	7.8	0.4	0.61
	7.7	7.85	0.45	0.85
	7.9	7.8	0.4	1.04
	8.1	7.8	0.4	1.51
	8.3	7.8	0.4	0.88
	8.5	7.7	0.3	0.91
	8.7	7.8	0.4	0.84

	8.9	7.8	0.4	1.41
	9.1	7.75	0.35	1.37
	9.3	7.7	0.3	1.07
	9.5	7.6	0.2	0.69
	9.7	7.7	0.3	0.59
	9.9	7.7	0.3	0.61
Waterline	10.2	7.4	0	0
Bankfull	10.3	6.79		
	10.5	6.24		
	13.6	5.84		



COMPUTED FROM MEASURED FIELD DATA

Wetted Perimeter (ft)	Water Depth (ft)	Area (SQ ft)	Discharge (cfs)	Percent Discharge
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0.63	0.2	0.08	0	0
0.2	0.2	0.04	0	0.2
0.22	0.3	0.06	0.02	1.11
0.2	0.3	0.06	0.04	2.53
0.2	0.3	0.06	0.05	3
0.21	0.25	0.05	0.08	4.58
0.2	0.25	0.05	0.11	5.93
0.22	0.15	0.03	0.06	3.34
0.2	0.15	0.03	0.07	3.79
0.2	0.15	0.03	0.09	5.01
0.2	0.15	0.03	0.08	4.38
0.21	0.2	0.04	0.06	3.57
0.2	0.2	0.04	0.04	2.09
0.2	0.2	0.04	0.04	2.2
0.22	0.3	0.06	0.03	1.42
0.2	0.3	0.06	0.03	1.79
0.21	0.25	0.05	0.04	2.05
0.21	0.3	0.06	0.04	2.26
0.22	0.4	0.08	0.05	2.74
0.21	0.45	0.09	0.08	4.3
0.21	0.4	0.08	0.08	4.67
0.2	0.4	0.08	0.12	6.79
0.2	0.4	0.08	0.07	3.96
0.22	0.3	0.06	0.05	3.07
0.22	0.4	0.08	0.07	3.78

0.2	0.4	0.08	0.11	6.34
0.21	0.35	0.07	0.1	5.39
0.21	0.3	0.06	0.06	3.61
0.22	0.2	0.04	0.03	1.55
0.22	0.3	0.06	0.04	1.99
0.2	0.3	0.07	0.05	2.57
0.42	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

DISCLAIMER

"The Colorado Water Conservation Board makes no representations about the use of the software contained in the R2Cross platform for any purpose besides that for which it was designed. To the maximum extent permitted by applicable law, all information, modeling results, and software are provided “as is” without warranty or condition of any kind, including all implied warranties or conditions of merchantability, or fitness for a particular purpose. The user assumes all responsibility for the accuracy and suitability of this program for a specific application. In no event shall the Colorado Water Conservation Board or any state agency, official or employee be liable for any direct, indirect, punitive, incidental, special, consequential damages or any damages whatsoever including, without limitation, damages for loss of use, data, profits, or savings arising from the implementation, reliance on, or use of or inability to use the R2Cross platform.

R2Cross RESULTS

Stream Name: Kinney Creek
Stream Locations: 500 ft upstream from BLM campground
Fieldwork Date: 07/31/2020
Cross-section: 1
Observers: Smith and Belcher
Coordinate System: UTM Zone 13
X (easting): 407809
Y (northing): 4441535
Date Processed: 03/19/2021
Slope: 0.0352
Computation method: Manning's n
R2Cross data filename: EramsR2CRoss_Kinney07312020_xs1.xlsx
R2Cross version: 1.1.19

LOCATION

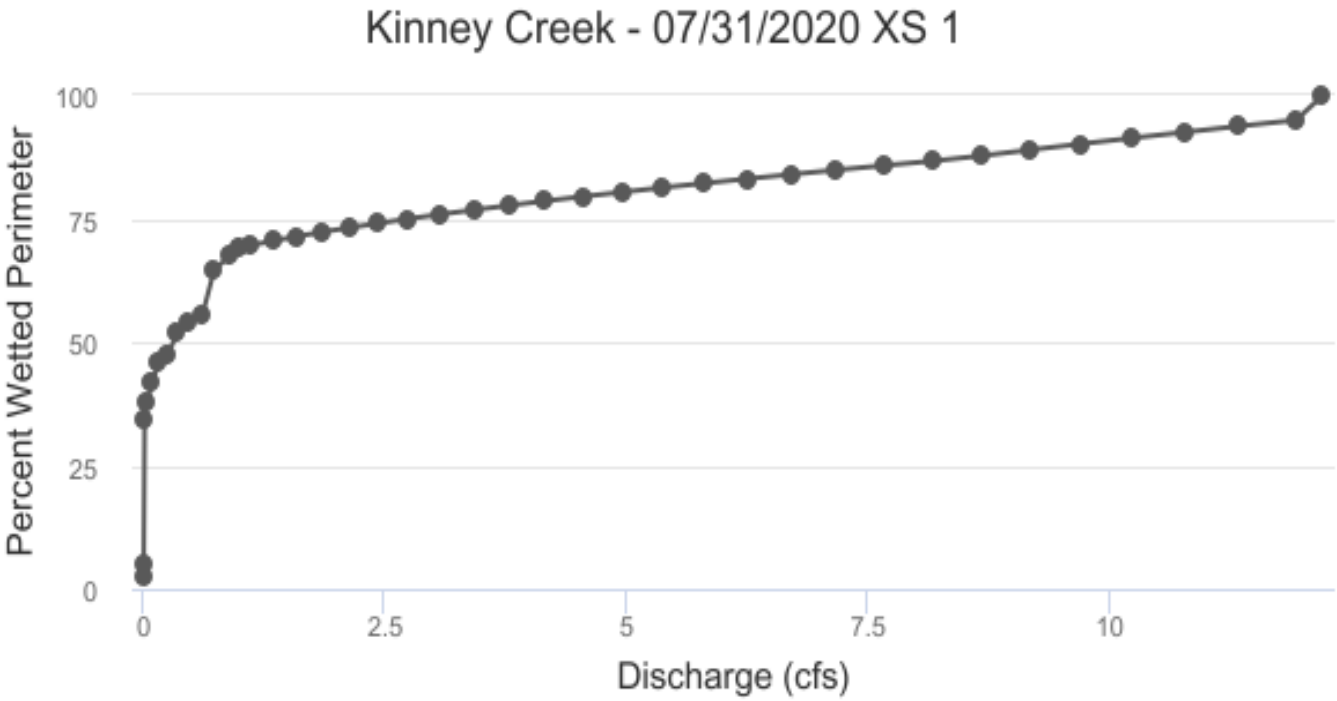
ANALYSIS RESULTS

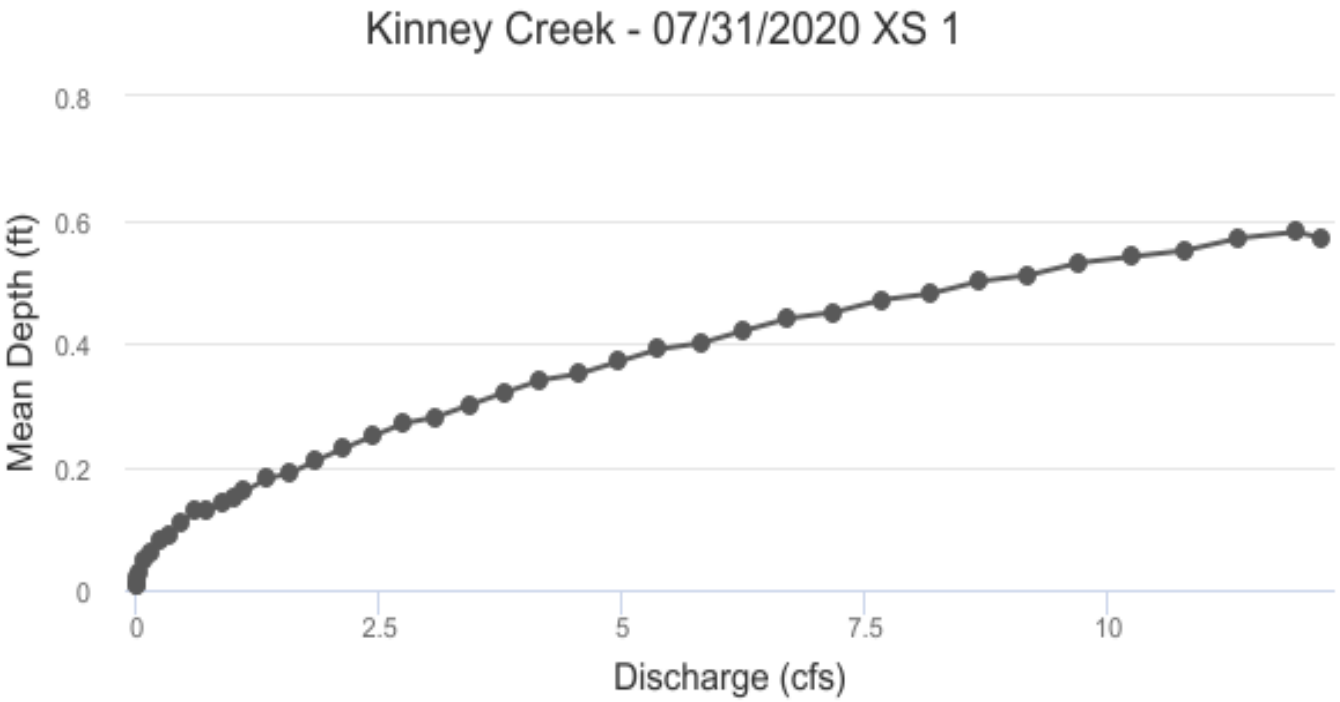
Habitat Criteria Results

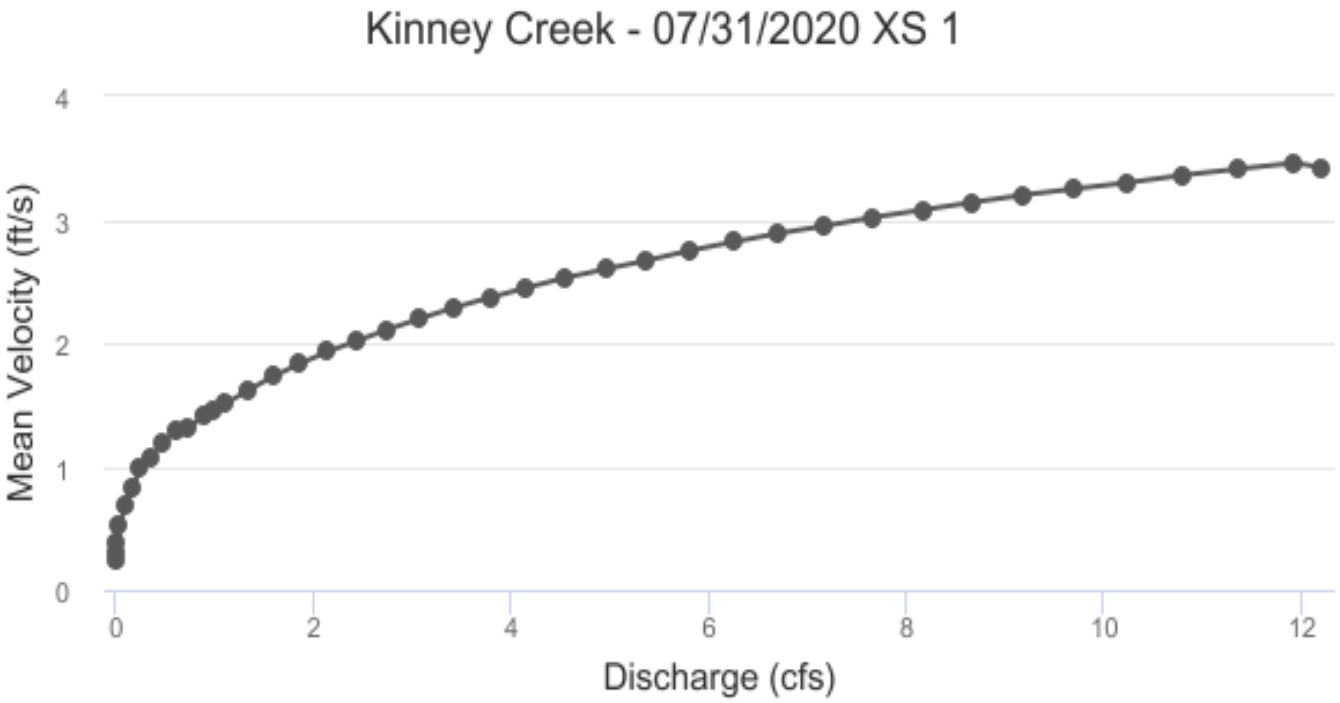
Bankfull top width (ft) = 6.29

	Habitat Criteria	Discharge (cfs) Meeting Criteria
Mean Depth (ft)	0.2	1.67
Percent Wetted Perimeter (%) **	50.0	0.31
Mean Velocity (ft/s) **	1.0	0.28

**Values highlighted in yellow indicate that the discharge is less than 40% of measured Q or greater than 250% of measured Q.




Kinney Creek - 07/31/2020 XS 1
Mean Depth (ft)
0.8
0.6
0.4
0.2
0
0
2.5
5
7.5
10
Discharge (cfs)


Kinney Creek - 07/31/2020 XS 1
Mean Velocity (ft/s)
4
3
2
1
0
0
2
4
6
8
10
12
Discharge (cfs)

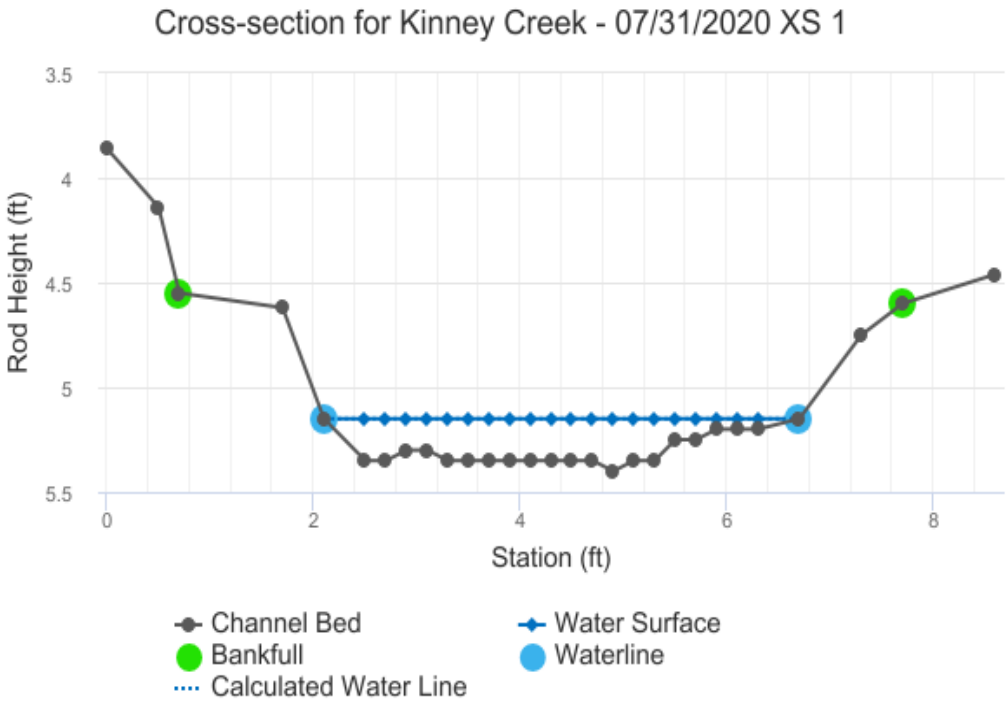
STAGING TABLE

Feature	Distance to Water (ft)	Top Width (ft)	Mean Depth (ft)	Maximum Depth (ft)	Area (SQ ft)	Wetted Perimeter (ft)	Percent Wetted Perimeter	Hydraulic Radius (ft)	Mean Velocity (ft/s)	Discharge (cfs)
Bankfull	4.6	6.29	0.57	0.8	3.57	6.8	100.00%	0.53	3.42	12.21
	4.62	5.95	0.58	0.78	3.45	6.46	94.95%	0.53	3.46	11.93
	4.64	5.88	0.57	0.76	3.33	6.38	93.75%	0.52	3.41	11.35
	4.66	5.81	0.55	0.74	3.21	6.3	92.54%	0.51	3.36	10.79
	4.68	5.74	0.54	0.72	3.1	6.21	91.34%	0.5	3.3	10.24
	4.7	5.67	0.53	0.7	2.98	6.13	90.13%	0.49	3.25	9.7
	4.72	5.6	0.51	0.68	2.87	6.05	88.93%	0.47	3.2	9.18
	4.74	5.54	0.5	0.66	2.76	5.97	87.72%	0.46	3.14	8.67
	4.76	5.48	0.48	0.64	2.65	5.9	86.67%	0.45	3.08	8.17
	4.78	5.43	0.47	0.62	2.54	5.84	85.77%	0.44	3.02	7.67
	4.8	5.39	0.45	0.6	2.43	5.77	84.87%	0.42	2.95	7.18
	4.82	5.34	0.44	0.58	2.33	5.71	83.97%	0.41	2.89	6.71
	4.84	5.3	0.42	0.56	2.22	5.65	83.07%	0.39	2.82	6.25
	4.86	5.25	0.4	0.54	2.11	5.59	82.18%	0.38	2.75	5.81
	4.88	5.21	0.39	0.52	2.01	5.53	81.28%	0.36	2.67	5.37
	4.9	5.16	0.37	0.5	1.91	5.47	80.38%	0.35	2.6	4.96
	4.92	5.12	0.35	0.48	1.8	5.41	79.48%	0.33	2.53	4.55
	4.94	5.07	0.34	0.46	1.7	5.35	78.58%	0.32	2.45	4.16
	4.96	5.03	0.32	0.44	1.6	5.29	77.69%	0.3	2.37	3.79
	4.98	4.98	0.3	0.42	1.5	5.22	76.79%	0.29	2.29	3.43
	5.0	4.94	0.28	0.4	1.4	5.16	75.89%	0.27	2.2	3.08
	5.02	4.89	0.27	0.38	1.3	5.1	74.99%	0.26	2.11	2.75
	5.04	4.85	0.25	0.36	1.2	5.04	74.09%	0.24	2.02	2.44
	5.06	4.8	0.23	0.34	1.11	4.98	73.19%	0.22	1.93	2.14
	5.08	4.76	0.21	0.32	1.01	4.92	72.30%	0.21	1.83	1.85

	5.1	4.71	0.19	0.3	0.92	4.86	71.40%	0.19	1.73	1.59
	5.12	4.67	0.18	0.28	0.82	4.8	70.50%	0.17	1.62	1.34
	5.14	4.62	0.16	0.26	0.73	4.74	69.60%	0.15	1.51	1.11
Waterline	5.15	4.6	0.15	0.25	0.69	4.7	69.15%	0.15	1.45	1.0
	5.16	4.5	0.14	0.24	0.64	4.6	67.64%	0.14	1.41	0.9
	5.18	4.3	0.13	0.22	0.55	4.4	64.61%	0.13	1.32	0.73
	5.2	3.7	0.13	0.2	0.47	3.79	55.70%	0.12	1.3	0.61
	5.22	3.58	0.11	0.18	0.39	3.66	53.83%	0.11	1.19	0.47
	5.24	3.46	0.09	0.16	0.32	3.54	51.97%	0.09	1.07	0.35
	5.26	3.16	0.08	0.14	0.26	3.23	47.43%	0.08	0.98	0.25
	5.28	3.08	0.06	0.12	0.2	3.14	46.12%	0.06	0.83	0.16
	5.3	2.8	0.05	0.1	0.13	2.85	41.86%	0.05	0.69	0.09
	5.32	2.56	0.03	0.08	0.08	2.59	38.13%	0.03	0.52	0.04
	5.34	2.32	0.01	0.06	0.03	2.34	34.39%	0.01	0.3	0.01
	5.36	0.32	0.02	0.04	0.01	0.33	4.85%	0.02	0.38	0.0
	5.38	0.16	0.01	0.02	0.0	0.16	2.42%	0.01	0.24	0.0

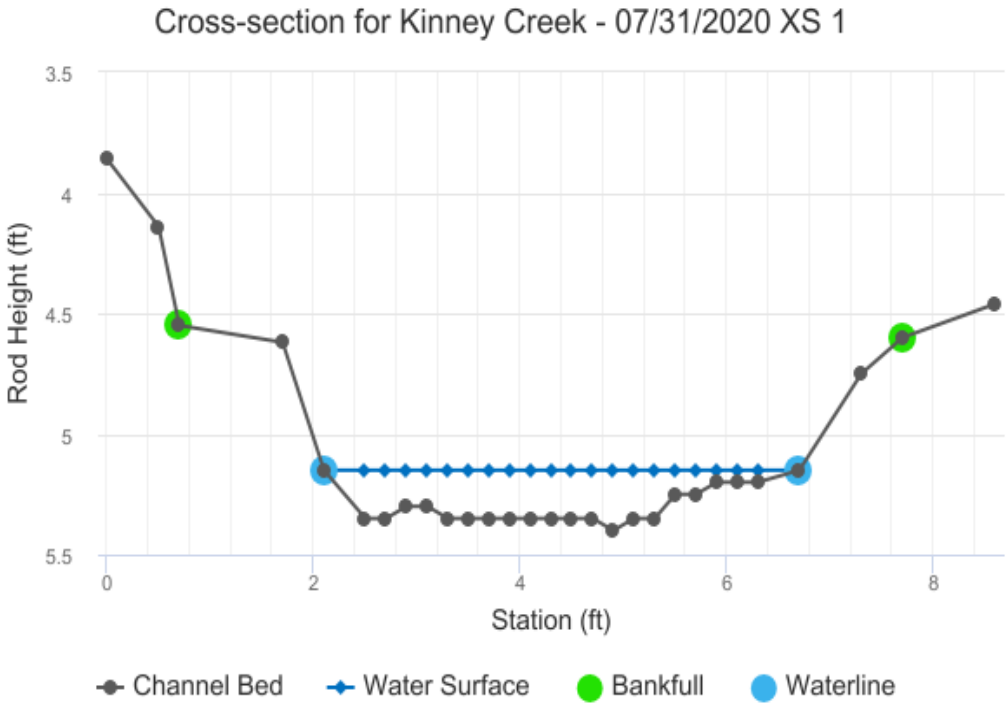
MODEL SUMMARY

Measured Flow (Qm) =	1
Calculated Flow (Qc) =	1
(Qm-Qc)/Qm * 100 =	-0.02%
Measured Waterline (WLm) =	5.15
Calculated Waterline (WLc) =	5.15
(WLm-WLc)/WLm * 100 =	0.00%
Max Measured Depth (Dm) =	0.25
Max Calculated Depth (Dc) =	0.25
(Dm-Dc)/Dm * 100 =	-0.01%
Mean Velocity =	1.45
Manning's n =	0.053
0.4 * Qm =	0.4
2.5 * Qm =	2.49



FIELD DATA

Feature	Station (ft)	Rod Height (ft)	Water depth (ft)	Velocity (ft/s)
	0	3.86		
	0.5	4.14		
Bankfull	0.7	4.55		
	1.7	4.62		
Waterline	2.1	5.15	0	0
	2.5	5.35	0.2	0.49
	2.7	5.35	0.2	1.16
	2.9	5.3	0.15	1.35
	3.1	5.3	0.15	1.77
	3.3	5.35	0.2	1.86
	3.5	5.35	0.2	2.8
	3.7	5.35	0.2	2.34
	3.9	5.35	0.2	2.11
	4.1	5.35	0.2	0.68
	4.3	5.35	0.2	1.03
	4.5	5.35	0.2	1.17
	4.7	5.35	0.2	2.05
	4.9	5.4	0.25	2.1
	5.1	5.35	0.2	1.55
	5.3	5.35	0.2	1.38
	5.5	5.25	0.1	1
	5.7	5.25	0.1	0.84
	5.9	5.2	0.05	0.59
	6.1	5.2	0.05	0
	6.3	5.2	0.05	0
Waterline	6.7	5.15	0	0
	7.3	4.75		
Bankfull	7.7	4.6		
	8.6	4.46		


Cross-section for Kinney Creek - 07/31/2020 XS 1
Rod Height (ft)
3.5
4
4.5
5
5.5
0
2
4
6
8
Station (ft)
Channel Bed
Water Surface
Bankfull
Waterline

COMPUTED FROM MEASURED FIELD DATA

Wetted Perimeter (ft)	Water Depth (ft)	Area (SQ ft)	Discharge (cfs)	Percent Discharge
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0.45	0.2	0.06	0.03	2.95
0.2	0.2	0.04	0.05	4.66
0.21	0.15	0.03	0.04	4.07
0.2	0.15	0.03	0.05	5.33
0.21	0.2	0.04	0.07	7.47
0.2	0.2	0.04	0.11	11.25
0.2	0.2	0.04	0.09	9.4
0.2	0.2	0.04	0.08	8.47
0.2	0.2	0.04	0.03	2.73
0.2	0.2	0.04	0.04	4.14
0.2	0.2	0.04	0.05	4.7
0.2	0.2	0.04	0.08	8.23
0.21	0.25	0.05	0.1	10.54
0.21	0.2	0.04	0.06	6.23
0.2	0.2	0.04	0.06	5.54
0.22	0.1	0.02	0.02	2.01
0.2	0.1	0.02	0.02	1.69
0.21	0.05	0.01	0.01	0.59
0.2	0.05	0.01	0	0
0.2	0.05	0.01	0	0
0.4	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

DISCLAIMER

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R2Cross RESULTS

Stream Name: Kinney Creek
Stream Locations: 100 ft downstream from road crossing
Fieldwork Date: 07/31/2020
Cross-section: 2
Observers: Smith and Belcher
Coordinate System: UTM Zone 13
X (easting): 408478
Y (northing): 4439769
Date Processed: 03/19/2021
Slope: 0.0124
Computation method: Manning's n
R2Cross data filename: EramsR2CRoss_Kinney07312020_xs2.xlsx
R2Cross version: 1.1.19

LOCATION

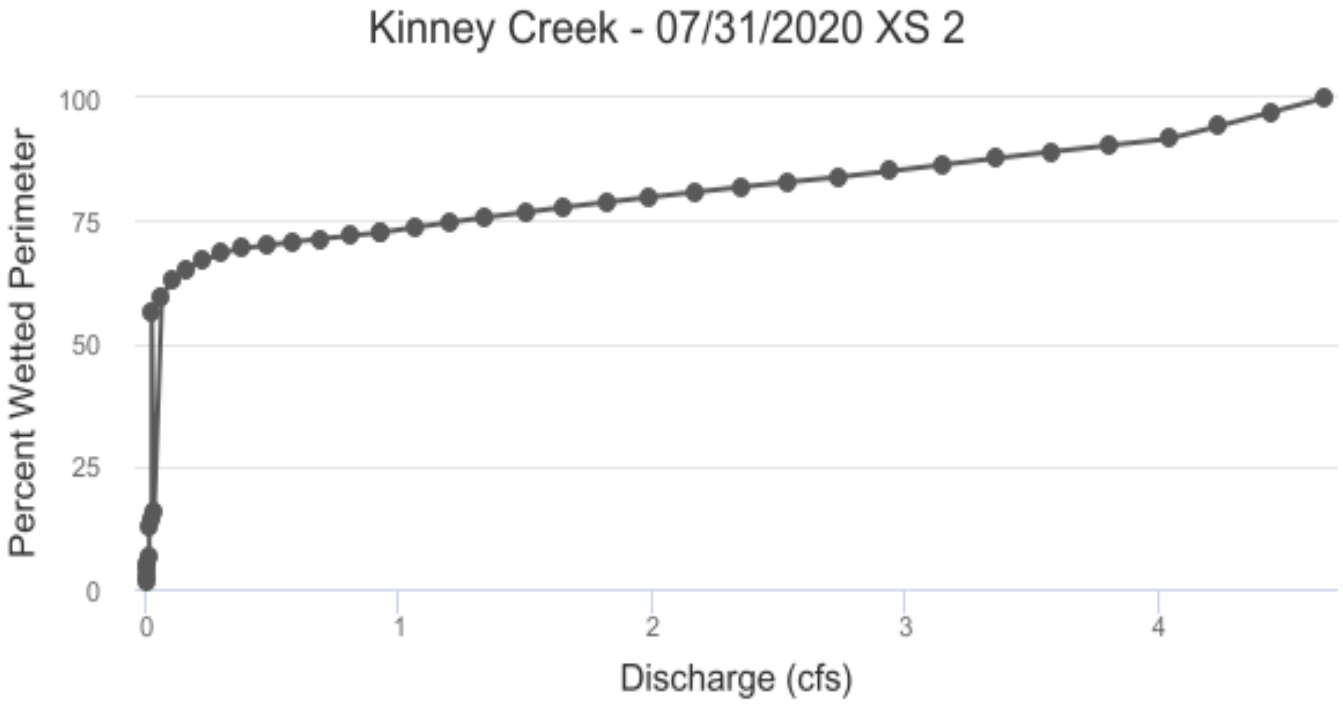
ANALYSIS RESULTS

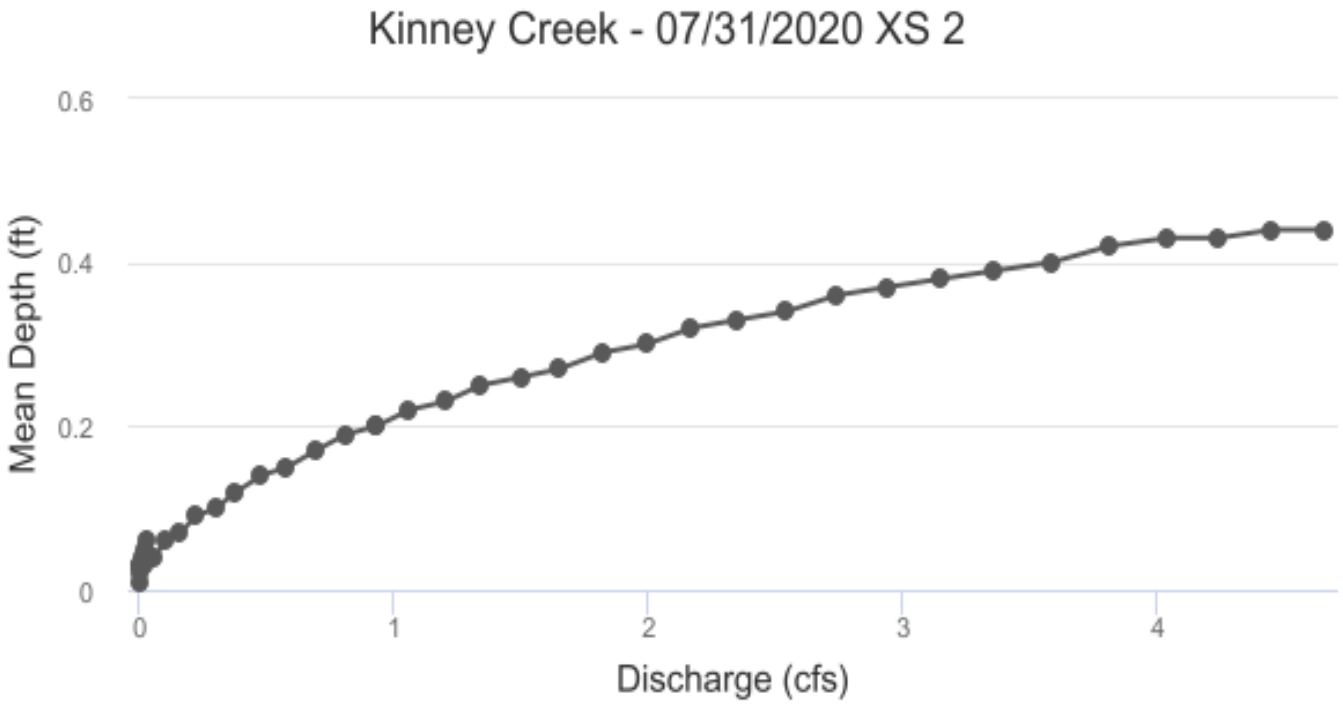
Habitat Criteria Results

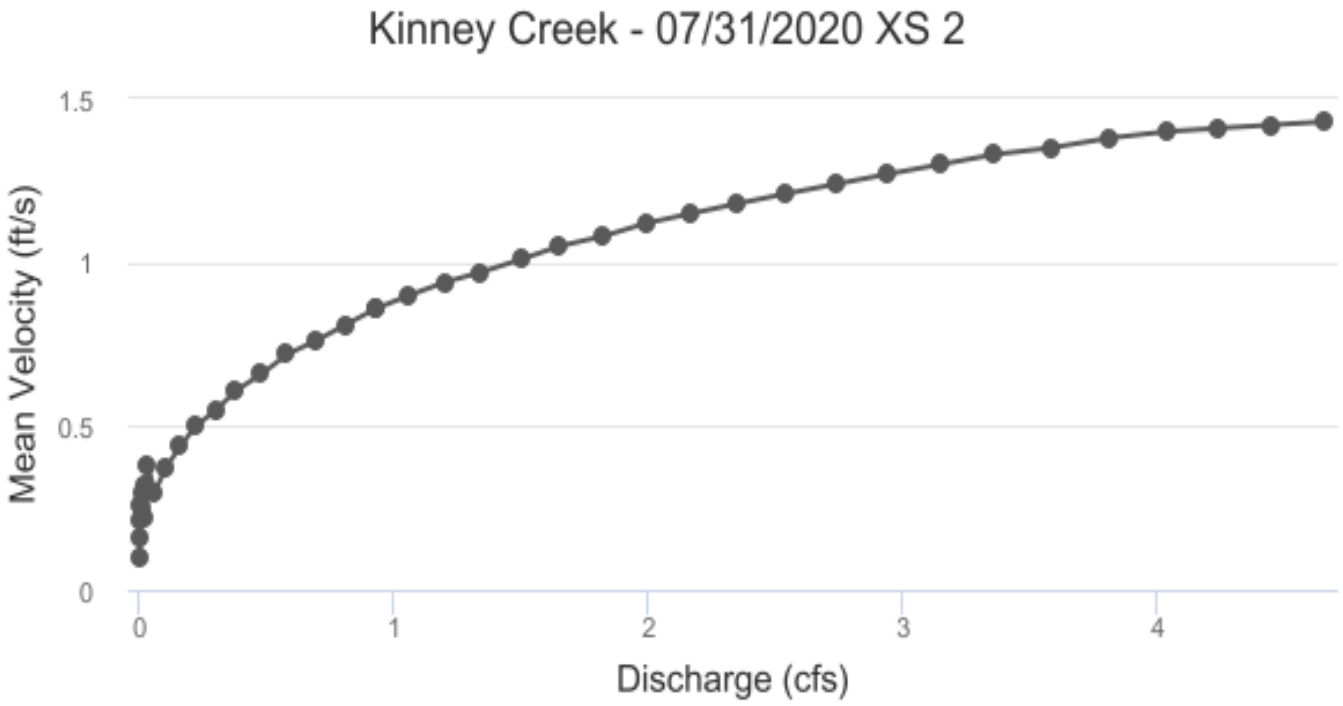
Bankfull top width (ft) = 7.38

	Habitat Criteria	Discharge (cfs) Meeting Criteria
Mean Depth (ft)	0.2	0.92
Percent Wetted Perimeter (%) **	50.0	0.03
Mean Velocity (ft/s)	1.0	1.45

**Values highlighted in yellow indicate that the discharge is less than 40% of measured Q or greater than 250% of measured Q.




Kinney Creek - 07/31/2020 XS 2
Mean Depth (ft)
0.6
0.4
0.2
0
0
1
2
3
4
Discharge (cfs)


Kinney Creek - 07/31/2020 XS 2
Mean Velocity (ft/s)
1.5
1
0.5
0
0
1
2
3
4
Discharge (cfs)

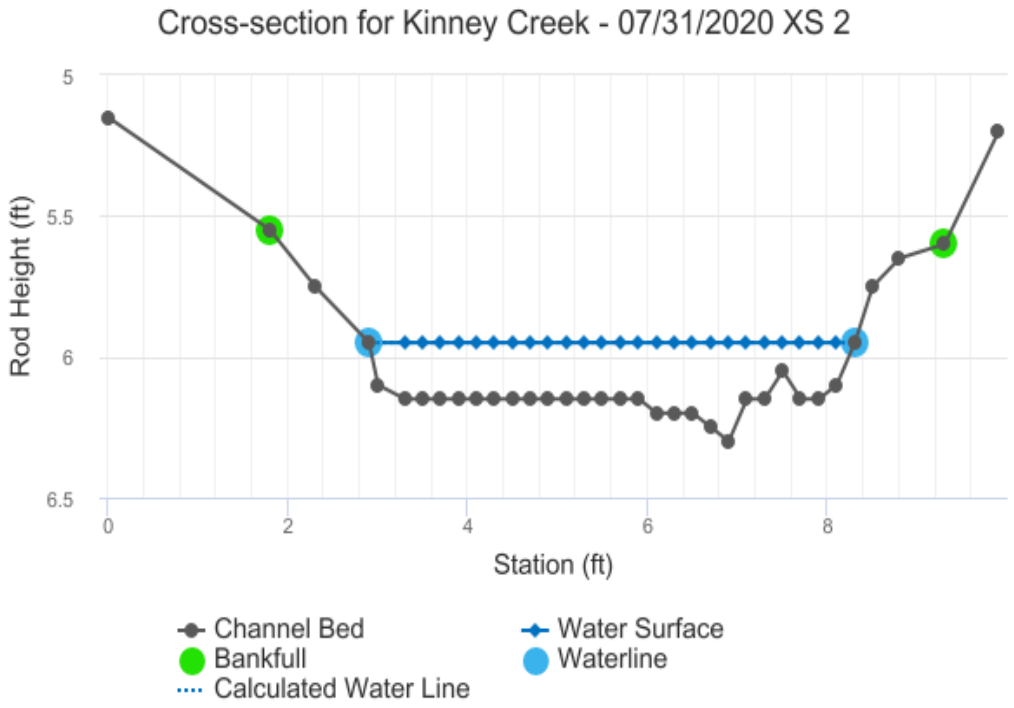
STAGING TABLE

Feature	Distance to Water (ft)	Top Width (ft)	Mean Depth (ft)	Maximum Depth (ft)	Area (SQ ft)	Wetted Perimeter (ft)	Percent Wetted Perimeter	Hydraulic Radius (ft)	Mean Velocity (ft/s)	Discharge (cfs)
Bankfull	5.6	7.38	0.44	0.7	3.25	7.79	100.00%	0.42	1.43	4.66
	5.62	7.16	0.44	0.68	3.12	7.57	97.14%	0.41	1.42	4.45
	5.63	6.94	0.43	0.67	3.0	7.35	94.28%	0.41	1.41	4.24
	5.65	6.74	0.43	0.65	2.88	7.14	91.64%	0.4	1.4	4.04
	5.67	6.64	0.42	0.63	2.76	7.04	90.32%	0.39	1.38	3.81
	5.69	6.54	0.4	0.61	2.65	6.94	89.01%	0.38	1.35	3.58
	5.71	6.45	0.39	0.59	2.53	6.84	87.69%	0.37	1.33	3.36
	5.72	6.35	0.38	0.58	2.42	6.73	86.38%	0.36	1.3	3.15
	5.74	6.25	0.37	0.56	2.31	6.63	85.06%	0.35	1.27	2.94
	5.76	6.17	0.36	0.54	2.2	6.54	83.87%	0.34	1.24	2.74
	5.78	6.1	0.34	0.53	2.1	6.46	82.85%	0.32	1.21	2.54
	5.79	6.03	0.33	0.51	1.99	6.38	81.82%	0.31	1.18	2.35
	5.81	5.96	0.32	0.49	1.89	6.3	80.79%	0.3	1.15	2.17
	5.83	5.89	0.3	0.47	1.78	6.22	79.76%	0.29	1.12	1.99
	5.84	5.82	0.29	0.46	1.68	6.14	78.74%	0.27	1.08	1.82
	5.86	5.75	0.27	0.44	1.58	6.06	77.71%	0.26	1.05	1.65
	5.88	5.68	0.26	0.42	1.48	5.98	76.68%	0.25	1.01	1.5
	5.9	5.61	0.25	0.4	1.38	5.9	75.65%	0.23	0.97	1.34
	5.92	5.54	0.23	0.39	1.28	5.82	74.63%	0.22	0.94	1.2
	5.93	5.47	0.22	0.37	1.19	5.74	73.60%	0.21	0.9	1.06
	5.95	5.4	0.2	0.35	1.09	5.66	72.57%	0.19	0.86	0.93
Waterline	5.95	5.4	0.2	0.35	1.09	5.66	72.57%	0.19	0.86	0.93
	5.97	5.37	0.19	0.33	1.0	5.61	71.93%	0.18	0.81	0.81
	5.99	5.33	0.17	0.32	0.9	5.56	71.28%	0.16	0.76	0.69
	6.0	5.29	0.15	0.3	0.81	5.51	70.64%	0.15	0.72	0.58

	6.02	5.26	0.14	0.28	0.72	5.46	69.99%	0.13	0.66	0.48
	6.04	5.22	0.12	0.26	0.63	5.41	69.35%	0.12	0.61	0.38
	6.05	5.17	0.1	0.24	0.53	5.33	68.42%	0.1	0.55	0.3
	6.07	5.07	0.09	0.23	0.44	5.2	66.77%	0.09	0.5	0.22
	6.09	4.96	0.07	0.21	0.36	5.08	65.12%	0.07	0.44	0.16
	6.11	4.79	0.06	0.19	0.27	4.89	62.77%	0.06	0.37	0.1
	6.12	4.55	0.04	0.17	0.19	4.64	59.47%	0.04	0.3	0.06
	6.14	4.3	0.03	0.16	0.11	4.38	56.18%	0.03	0.22	0.02
	6.16	1.15	0.06	0.14	0.07	1.21	15.53%	0.06	0.38	0.03
	6.18	1.05	0.05	0.12	0.05	1.11	14.23%	0.04	0.32	0.02
	6.2	0.96	0.03	0.1	0.03	1.01	12.93%	0.03	0.25	0.01
	6.21	0.47	0.04	0.09	0.02	0.51	6.50%	0.04	0.3	0.01
	6.23	0.37	0.03	0.07	0.01	0.41	5.20%	0.03	0.26	0.0
	6.25	0.28	0.03	0.05	0.01	0.3	3.90%	0.02	0.21	0.0
	6.26	0.19	0.02	0.04	0.0	0.2	2.60%	0.02	0.16	0.0
	6.28	0.09	0.01	0.02	0.0	0.1	1.30%	0.01	0.1	0.0

MODEL SUMMARY

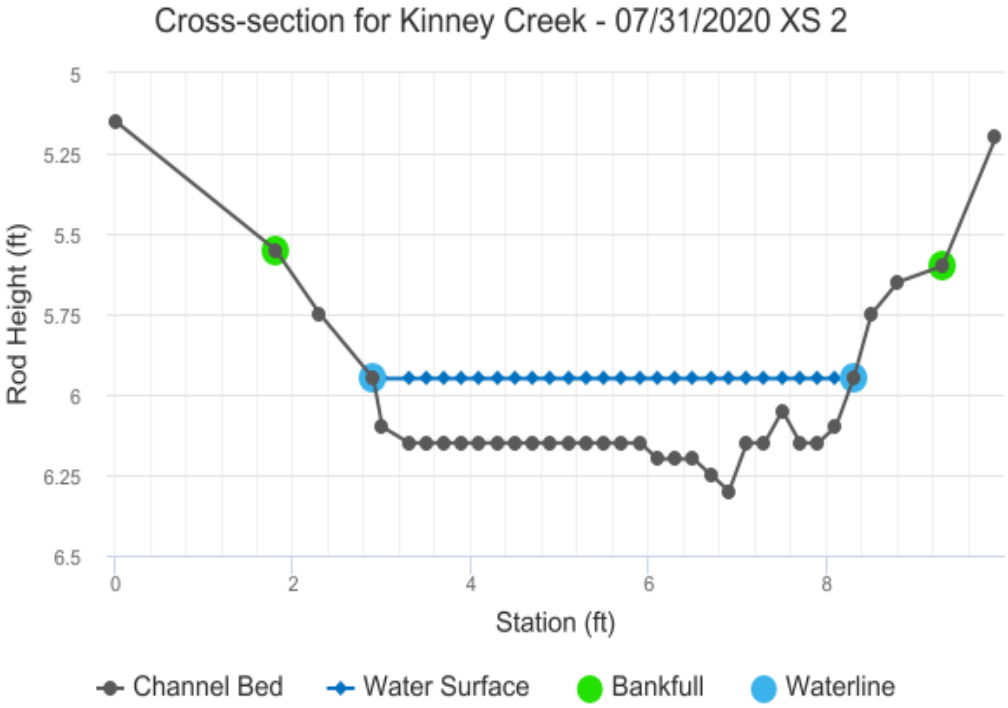
Measured Flow (Qm) =	0.93
Calculated Flow (Qc) =	0.93
(Qm-Qc)/Qm * 100 =	0.01%
Measured Waterline (WLm) =	5.95
Calculated Waterline (WLc) =	5.95
(WLm-WLc)/WLm * 100 =	-0.00%
Max Measured Depth (Dm) =	0.35
Max Calculated Depth (Dc) =	0.35
(Dm-Dc)/Dm * 100 =	0.00%
Mean Velocity =	0.86
Manning's n =	0.065
0.4 * Qm =	0.37
2.5 * Qm =	2.33



FIELD DATA

Feature	Station (ft)	Rod Height (ft)	Water depth (ft)	Velocity (ft/s)
	0	5.15		
Bankfull	1.8	5.55		
	2.3	5.75		
Waterline	2.9	5.95	0	0
	3	6.1	0.15	0
	3.3	6.15	0.2	0.35
	3.5	6.15	0.2	0.72
	3.7	6.15	0.2	0.84
	3.9	6.15	0.2	0.94
	4.1	6.15	0.2	0.81
	4.3	6.15	0.2	1
	4.5	6.15	0.2	0.89
	4.7	6.15	0.2	1.05
	4.9	6.15	0.2	1.16
	5.1	6.15	0.2	1.21
	5.3	6.15	0.2	0.85
	5.5	6.15	0.2	1.22
	5.7	6.15	0.2	1.2
	5.9	6.15	0.2	1.33
	6.1	6.2	0.25	1.18
	6.3	6.2	0.25	1.03
	6.5	6.2	0.25	1.22
	6.7	6.25	0.3	1.11
	6.9	6.3	0.35	0.81
	7.1	6.15	0.2	0.42
	7.3	6.15	0.2	0.56
	7.5	6.05	0.1	0.49
	7.7	6.15	0.2	0.24
	7.9	6.15	0.2	0.66
	8.1	6.1	0.15	0.26

Waterline	8.3	5.95	0	0
	8.5	5.75		
	8.8	5.65		
Bankfull	9.3	5.6		
	9.9	5.2		



COMPUTED FROM MEASURED FIELD DATA

Wetted Perimeter (ft)	Water Depth (ft)	Area (SQ ft)	Discharge (cfs)	Percent Discharge
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0.18	0.15	0.03	0	0
0.3	0.2	0.05	0.02	1.87
0.2	0.2	0.04	0.03	3.08
0.2	0.2	0.04	0.03	3.6
0.2	0.2	0.04	0.04	4.03
0.2	0.2	0.04	0.03	3.47
0.2	0.2	0.04	0.04	4.28
0.2	0.2	0.04	0.04	3.81
0.2	0.2	0.04	0.04	4.5
0.2	0.2	0.04	0.05	4.97
0.2	0.2	0.04	0.05	5.18
0.2	0.2	0.04	0.03	3.64
0.2	0.2	0.04	0.05	5.22
0.2	0.2	0.04	0.05	5.14
0.2	0.2	0.04	0.05	5.7
0.21	0.25	0.05	0.06	6.32
0.2	0.25	0.05	0.05	5.51
0.2	0.25	0.05	0.06	6.53
0.21	0.3	0.06	0.07	7.13
0.21	0.35	0.07	0.06	6.07
0.25	0.2	0.04	0.02	1.8
0.2	0.2	0.04	0.02	2.4
0.22	0.1	0.02	0.01	1.05
0.22	0.2	0.04	0.01	1.03
0.2	0.2	0.04	0.03	2.83
0.21	0.15	0.03	0.01	0.84

0.25	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

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Discharge Measurement Summary

Site name	Kinney
Site number	6142021A
Operator(s)	Lfs
File name	Kinney_20210614-120011.ft
Comment	Adiv

Start time	6/14/2021 11:38 AM
End time	6/14/2021 11:57 AM
Start location latitude	40.117
Start location longitude	-106.081
Calculations engine	FlowTracker2

Sensor type	Top Setting
Handheld serial number	FT2H2104006
Probe serial number	FT2P2103011
Probe firmware	1.30
Handheld software	1.6.4

# Stations	Avg interval (s)	Total discharge (ft³/s)
17	40	2.5095

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
6.550	1.7393	6.667

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
47	0.266	1.4429

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
55.241	0.380	2.5216

Discharge Uncertainty		
Category	**ISO**	**IVE**
Accuracy	1.0%	1.0%
Depth	0.4%	8.7%
Velocity	0.7%	5.8%
Width	0.1%	0.1%
Method	2.0%	
# Stations	3.0%	
Overall	**3.8%**	**10.5%**

Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

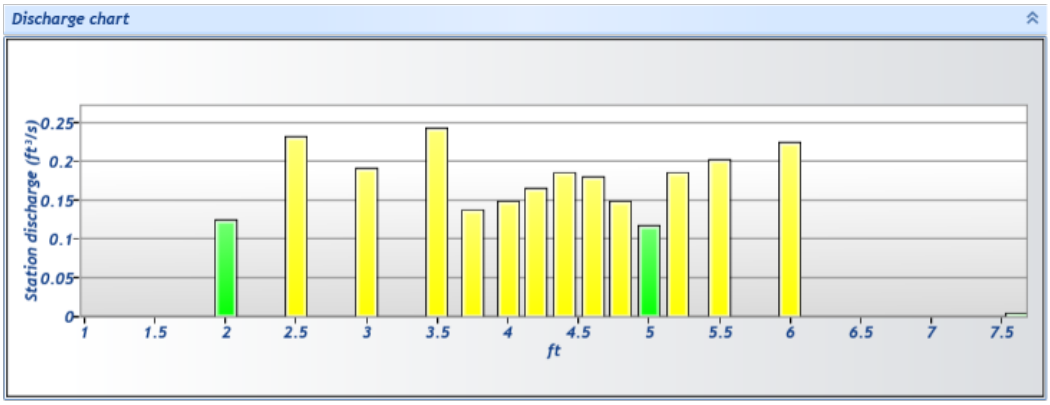
Summary overview

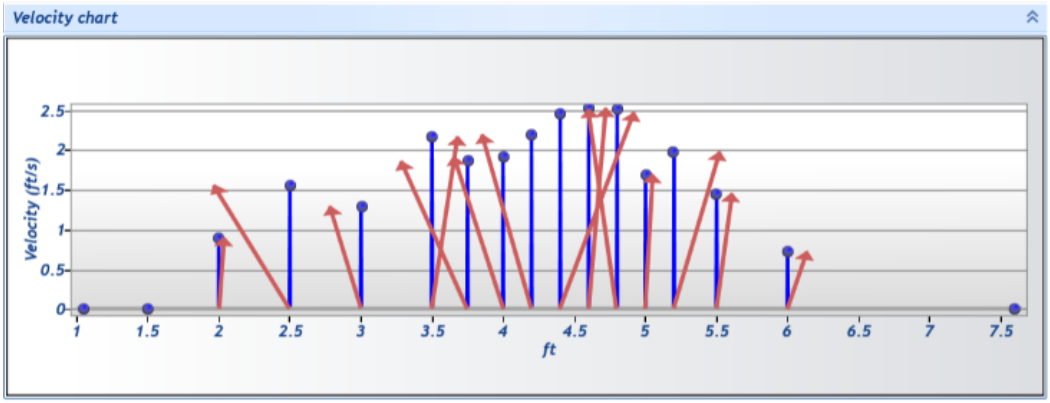
No changes were made to this file
Quality control warnings

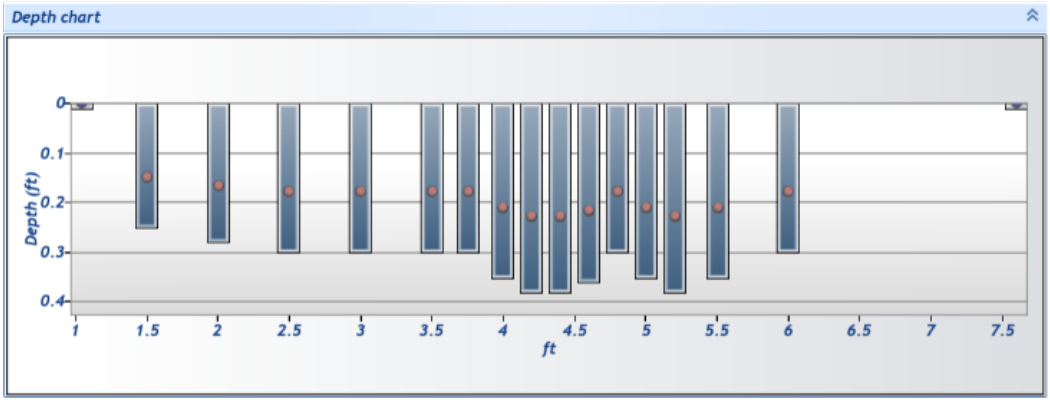
Discharge Measurement Summary

Site name	Kinney
Site number	6142021A
Operator(s)	Lfs
File name	Kinney_20210614-120011.ft
Comment	Adiv

Station Warning Settings		
Station discharge OK	Station discharge < 5.00%	
Station discharge caution	5.00% >= Station discharge < 10.00%	
Station discharge warning	Station discharge >= 10.00%	







Discharge Measurement Summary

Site name	Kinney
Site number	6142021A
Operator(s)	Lfs
File name	Kinney_20210614-120011.ft
Comment	Adiv

Measurement results

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q	
0	11:38 AM	1.050	None	0.010	0.0000	0.000	0	0.0000	1.0000	0.0008	0.0023	0.0000	0.00	✓
1	11:39 AM	1.500	0.6	0.250	0.6000	0.150	80	0.0008	1.0000	0.0008	0.1188	0.0001	0.00	✓
2	11:40 AM	2.000	0.6	0.280	0.6000	0.168	80	0.8945	1.0000	0.8945	0.1400	0.1252	4.99	✓
3	11:41 AM	2.500	0.6	0.300	0.6000	0.180	80	1.5511	1.0000	1.5511	0.1500	0.2327	9.27	✓
4	11:43 AM	3.000	0.6	0.300	0.6000	0.180	80	1.2863	1.0000	1.2863	0.1500	0.1929	7.69	✓
5	11:44 AM	3.500	0.6	0.300	0.6000	0.180	80	2.1656	1.0000	2.1656	0.1125	0.2436	9.71	✓
6	11:57 AM	3.750	0.6	0.300	0.6000	0.180	80	1.8566	1.0000	1.8566	0.0750	0.1392	5.55	✓
7	11:45 AM	4.000	0.6	0.350	0.6000	0.210	80	1.9058	1.0000	1.9058	0.0788	0.1501	5.98	✓
8	11:46 AM	4.200	0.6	0.380	0.6000	0.228	80	2.1926	1.0000	2.1926	0.0760	0.1666	6.64	✓
9	11:47 AM	4.400	0.6	0.380	0.6000	0.228	80	2.4634	1.0000	2.4634	0.0760	0.1872	7.46	✓
10	11:49 AM	4.600	0.6	0.360	0.6000	0.216	80	2.5216	1.0000	2.5216	0.0720	0.1816	7.23	✓
11	11:50 AM	4.800	0.6	0.300	0.6000	0.180	80	2.5028	1.0000	2.5028	0.0600	0.1502	5.98	✓
12	11:51 AM	5.000	0.6	0.350	0.6000	0.210	80	1.6852	1.0000	1.6852	0.0700	0.1180	4.70	✓
13	11:52 AM	5.200	0.6	0.380	0.6000	0.228	80	1.9719	1.0000	1.9719	0.0950	0.1873	7.46	✓
14	11:53 AM	5.500	0.6	0.350	0.6000	0.210	80	1.4494	1.0000	1.4494	0.1400	0.2029	8.09	✓
15	11:54 AM	6.000	0.6	0.300	0.6000	0.180	80	0.7178	1.0000	0.7178	0.3150	0.2261	9.01	✓
16	11:56 AM	7.600	None	0.010	0.0000	0.000	0	0.0000	1.0000	0.7178	0.0080	0.0057	0.23	✓

Discharge Measurement Summary

Site name	Kinney
Site number	6142021A
Operator(s)	Lfs
File name	Kinney_20210614-120011.ft
Comment	Adiv

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	20.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings	
1	11:39 AM	1.500	0.6	0.250	0.6000	0.150	SNR Threshold Variation	
2	11:40 AM	2.000	0.6	0.280	0.6000	0.168	Beam SNRs Not Similar,SNR Threshold Variation	
4	11:43 AM	3.000	0.6	0.300	0.6000	0.180	Standard Error > QC	
5	11:44 AM	3.500	0.6	0.300	0.6000	0.180	Standard Error > QC	
6	11:57 AM	3.750	0.6	0.300	0.6000	0.180	Standard Error > QC	
7	11:45 AM	4.000	0.6	0.350	0.6000	0.210	Standard Error > QC	
8	11:46 AM	4.200	0.6	0.380	0.6000	0.228	Standard Error > QC	
9	11:47 AM	4.400	0.6	0.380	0.6000	0.228	Standard Error > QC	
10	11:49 AM	4.600	0.6	0.360	0.6000	0.216	Standard Error > QC	
11	11:50 AM	4.800	0.6	0.300	0.6000	0.180	Standard Error > QC	
12	11:51 AM	5.000	0.6	0.350	0.6000	0.210	Standard Error > QC	
13	11:52 AM	5.200	0.6	0.380	0.6000	0.228	Standard Error > QC	
16	11:56 AM	7.600	None	0.010	0.0000	0.000	Stn Spacing > QC	

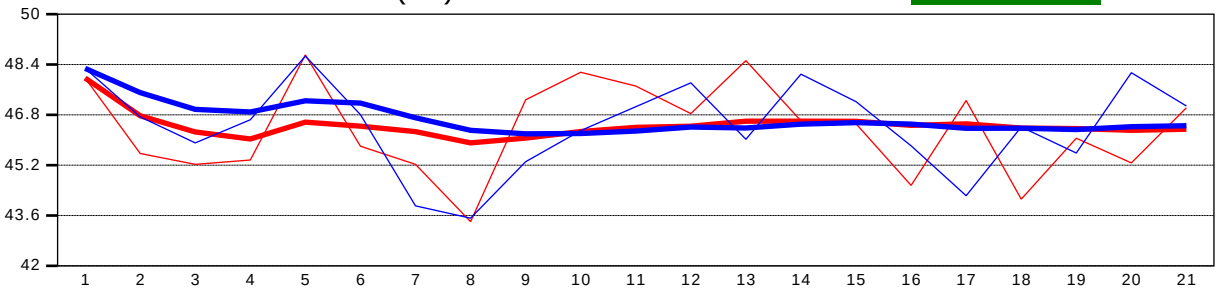
Discharge Measurement Summary

Site name	Kinney
Site number	6142021A
Operator(s)	Lfs
File name	Kinney_20210614-120011.ft
Comment	Adiv

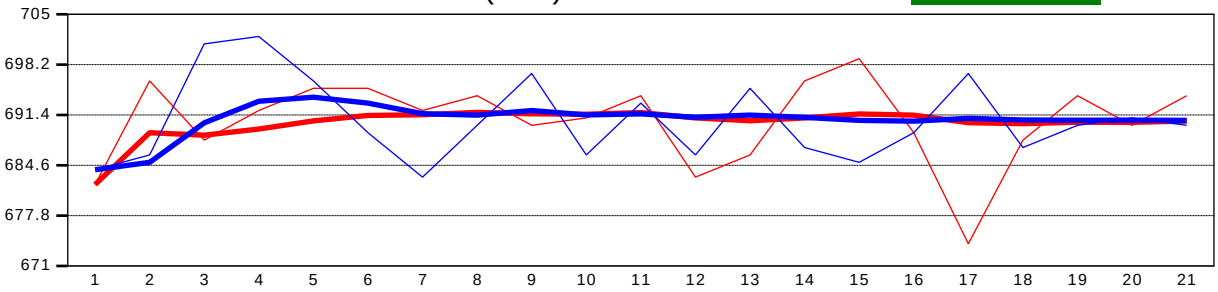
Beam 1	
Beam 2	

Automated beam check Start time 6/14/2021 11:36:08 AM

Automated beam check SNR(dB) PASS



Automated beam check Noise level(cnts) PASS



Automated beam check Quality control warnings

No quality control warnings

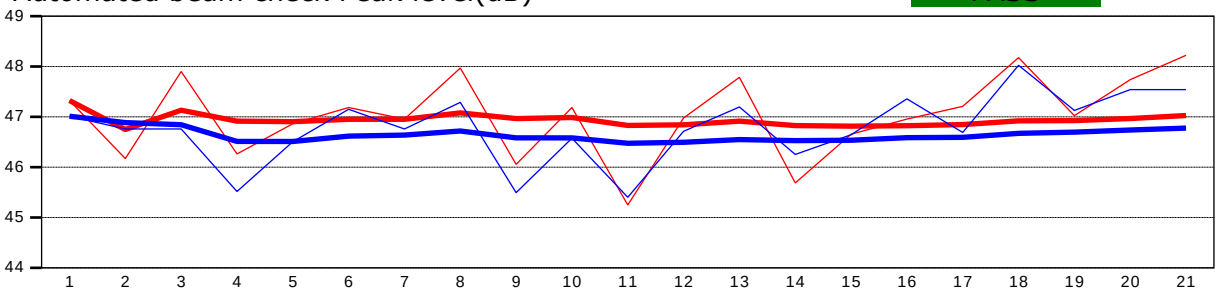
Discharge Measurement Summary

Site name	Kinney
Site number	6142021A
Operator(s)	Lfs
File name	Kinney_20210614-120011.ft
Comment	Adiv

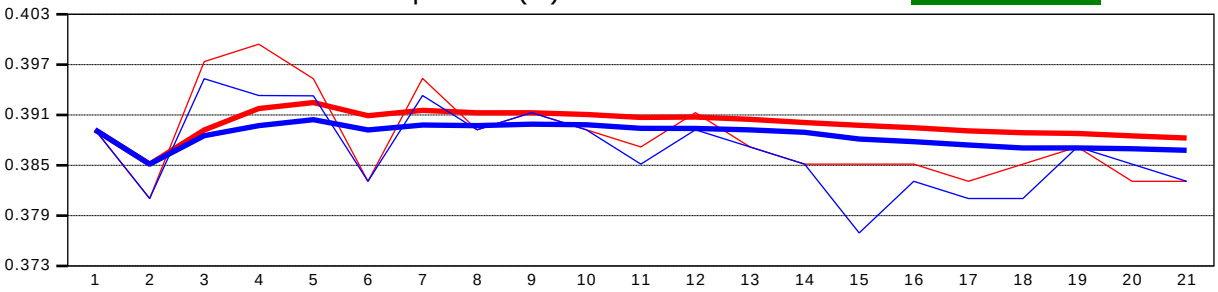
Beam 1	
Beam 2	

Automated beam check Start time 6/14/2021 11:36:08 AM

Automated beam check Peak level(dB) PASS



Automated beam check Peak position(ft) PASS



Automated beam check Quality control warnings

No quality control warnings

Discharge Measurement Summary

Site name	Kinney
Site number	6112021B
Operator(s)	Lfs
File name	Kinney_20210614-125156.ft
Comment	Bdiv

Start time	6/14/2021 12:25 PM
End time	6/14/2021 12:45 PM
Start location latitude	40.104
Start location longitude	-106.069
Calculations engine	FlowTracker2

Sensor type	Top Setting
Handheld serial number	FT2H2104006
Probe serial number	FT2P2103011
Probe firmware	1.30
Handheld software	1.6.4

# Stations	Avg interval (s)	Total discharge (ft³/s)
17	40	0.7722

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
5.500	3.2805	5.880

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
49	0.596	0.2354

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
58.638	0.800	0.7576

Discharge Uncertainty		
Category	**ISO**	**IVE**
Accuracy	1.0%	1.0%
Depth	0.5%	4.9%
Velocity	1.8%	23.8%
Width	0.2%	0.2%
Method	2.5%	
# Stations	3.0%	
Overall	**4.4%**	**24.4%**

Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Rated

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

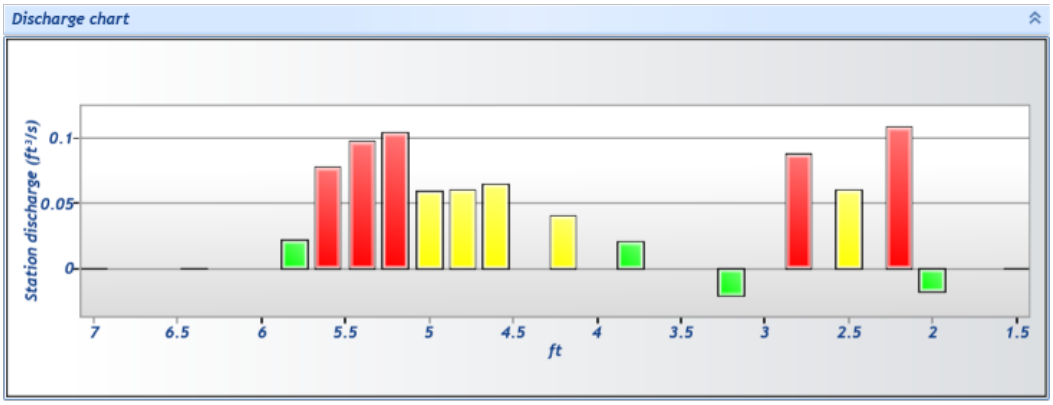
Summary overview

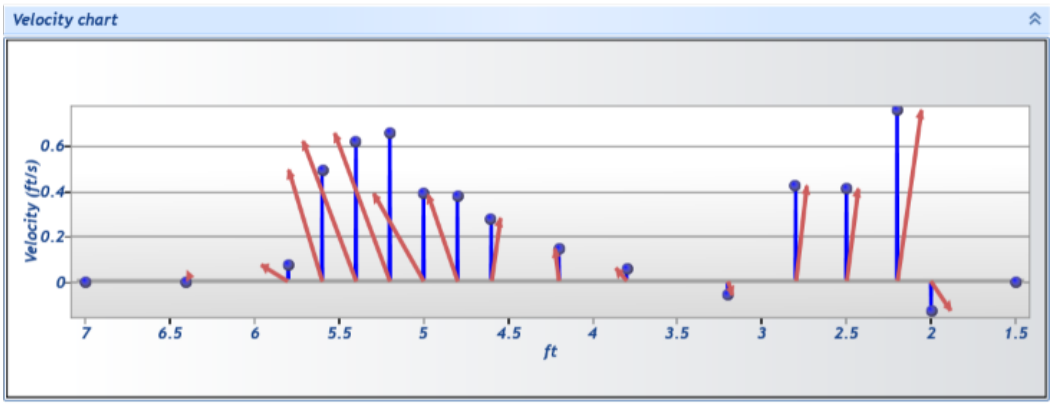
No changes were made to this file
Quality control warnings

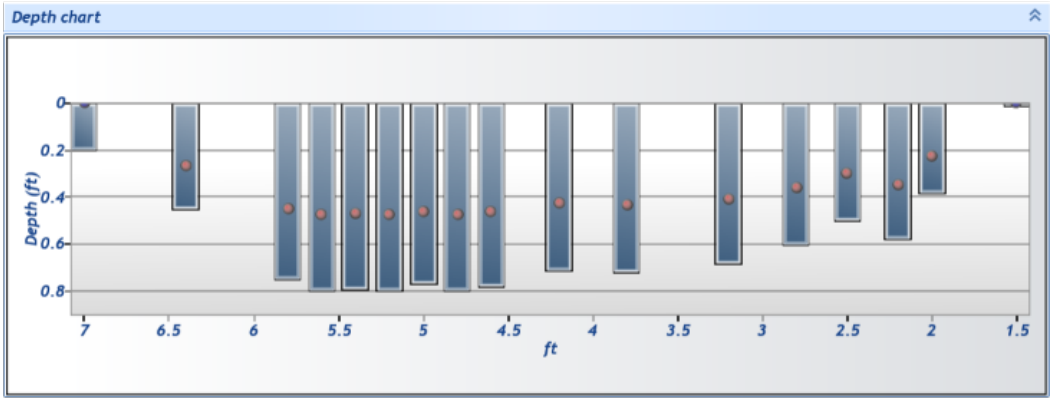
Discharge Measurement Summary

Site name	Kinney
Site number	6112021B
Operator(s)	Lfs
File name	Kinney_20210614-125156.ft
Comment	Bdiv

Station Warning Settings		
Station discharge OK	Station discharge < 5.00%	
Station discharge caution	5.00% >= Station discharge < 10.00%	
Station discharge warning	Station discharge >= 10.00%	







Discharge Measurement Summary

Site name	Kinney
Site number	6112021B
Operator(s)	Lfs
File name	Kinney_20210614-125156.ft
Comment	Bdiv

Measurement results

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft²)	Flow (ft³/s)	%Q	
0	12:25 PM	1.500	None	0.010	0.0000	0.000	0	0.0000	1.0000	-0.1311	0.0025	-0.0003	-0.04	✓
1	12:26 PM	2.000	0.6	0.380	0.6000	0.228	80	-0.1311	1.0000	-0.1311	0.1330	-0.0174	-2.26	✓
2	12:27 PM	2.200	0.6	0.580	0.6000	0.348	80	0.7576	1.0000	0.7576	0.1450	0.1099	14.23	✓
3	12:45 PM	2.500	0.6	0.500	0.6000	0.300	80	0.4087	1.0000	0.4087	0.1500	0.0613	7.94	✓
4	12:29 PM	2.800	0.6	0.600	0.6000	0.360	80	0.4220	1.0000	0.4220	0.2100	0.0886	11.48	✓
5	12:30 PM	3.200	0.6	0.680	0.6000	0.408	80	-0.0603	1.0000	-0.0603	0.3400	-0.0205	-2.66	✓
6	12:32 PM	3.800	0.6	0.720	0.6000	0.432	80	0.0575	1.0000	0.0575	0.3600	0.0207	2.68	✓
7	12:33 PM	4.200	0.6	0.710	0.6000	0.426	80	0.1435	1.0000	0.1435	0.2840	0.0407	5.28	✓
8	12:35 PM	4.600	0.6	0.780	0.6000	0.468	80	0.2785	1.0000	0.2785	0.2340	0.0652	8.44	✓
9	12:44 PM	4.800	0.6	0.800	0.6000	0.480	80	0.3805	1.0000	0.3805	0.1600	0.0609	7.88	✓
10	12:36 PM	5.000	0.6	0.770	0.6000	0.462	80	0.3882	1.0000	0.3882	0.1540	0.0598	7.74	✓
11	12:43 PM	5.200	0.6	0.800	0.6000	0.480	80	0.6558	1.0000	0.6558	0.1600	0.1049	13.59	✓
12	12:37 PM	5.400	0.6	0.790	0.6000	0.474	80	0.6202	1.0000	0.6202	0.1580	0.0980	12.69	✓
13	12:41 PM	5.600	0.6	0.800	0.6000	0.480	80	0.4930	1.0000	0.4930	0.1600	0.0789	10.22	✓
14	12:39 PM	5.800	0.6	0.750	0.6000	0.450	80	0.0732	1.0000	0.0732	0.3000	0.0220	2.85	✓
15	12:40 PM	6.400	0.6	0.450	0.6000	0.270	80	-0.0012	1.0000	-0.0012	0.2700	-0.0003	-0.04	✓
16	12:41 PM	7.000	None	0.200	0.0000	0.000	0	0.0000	1.0000	-0.0012	0.0600	-0.0001	-0.01	✓

Discharge Measurement Summary

Site name	Kinney
Site number	6112021B
Operator(s)	Lfs
File name	Kinney_20210614-125156.ft
Comment	Bdiv

Quality Control Settings	
Maximum depth change	50.00%
Maximum spacing change	100.00%
SNR threshold	10 dB
Standard error threshold	0.0328 ft/s
Spike threshold	10.00%
Maximum velocity angle	20.0 deg
Maximum tilt angle	5.0 deg

Quality control warnings

St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings	
1	12:26 PM	2.000	0.6	0.380	0.6000	0.228	Velocity Angle > QC	
2	12:27 PM	2.200	0.6	0.580	0.6000	0.348	Standard Error > QC,High Stn % Discharge	
3	12:45 PM	2.500	0.6	0.500	0.6000	0.300	Stn Spacing > QC	
4	12:29 PM	2.800	0.6	0.600	0.6000	0.360	High Stn % Discharge	
9	12:44 PM	4.800	0.6	0.800	0.6000	0.480	Velocity Angle > QC	
10	12:36 PM	5.000	0.6	0.770	0.6000	0.462	Velocity Angle > QC	
11	12:43 PM	5.200	0.6	0.800	0.6000	0.480	Velocity Angle > QC,High Stn % Discharge	
12	12:37 PM	5.400	0.6	0.790	0.6000	0.474	Velocity Angle > QC,High Stn % Discharge	
13	12:41 PM	5.600	0.6	0.800	0.6000	0.480	Velocity Angle > QC,High Stn % Discharge	
14	12:39 PM	5.800	0.6	0.750	0.6000	0.450	Velocity Angle > QC	
15	12:40 PM	6.400	0.6	0.450	0.6000	0.270	Large SNR Variation	

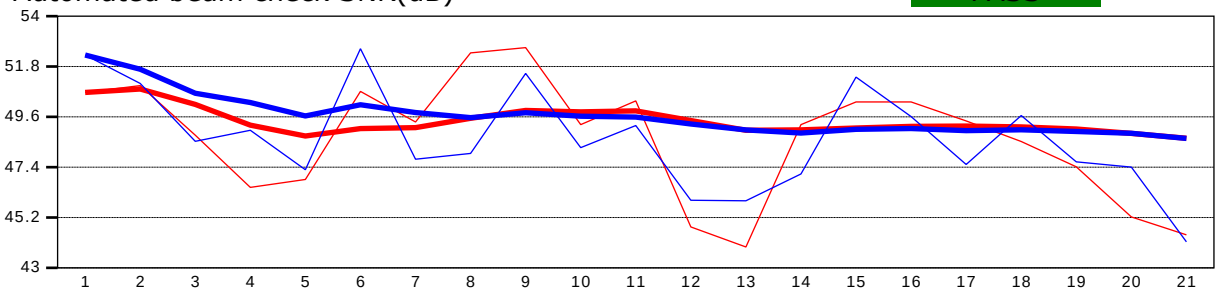
Discharge Measurement Summary

Site name	Kinney
Site number	6112021B
Operator(s)	Lfs
File name	Kinney_20210614-125156.ft
Comment	Bdiv

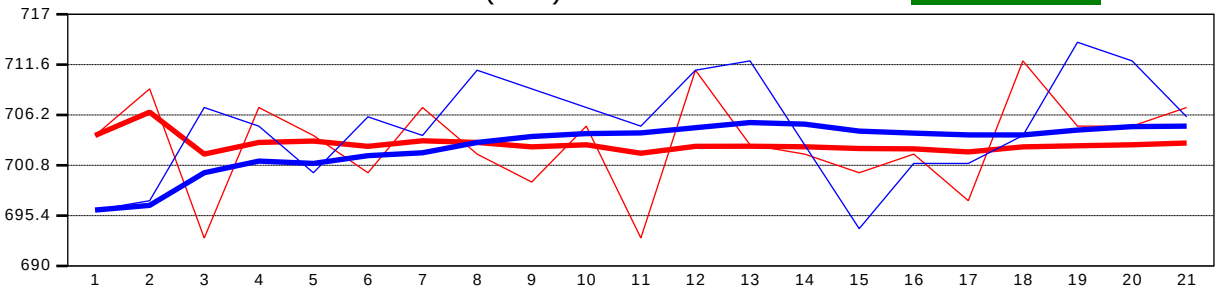
Beam 1	
Beam 2	

Automated beam check Start time 6/14/2021 12:25:24 PM

Automated beam check SNR(dB) PASS



Automated beam check Noise level(cnts) PASS



Automated beam check Quality control warnings

No quality control warnings

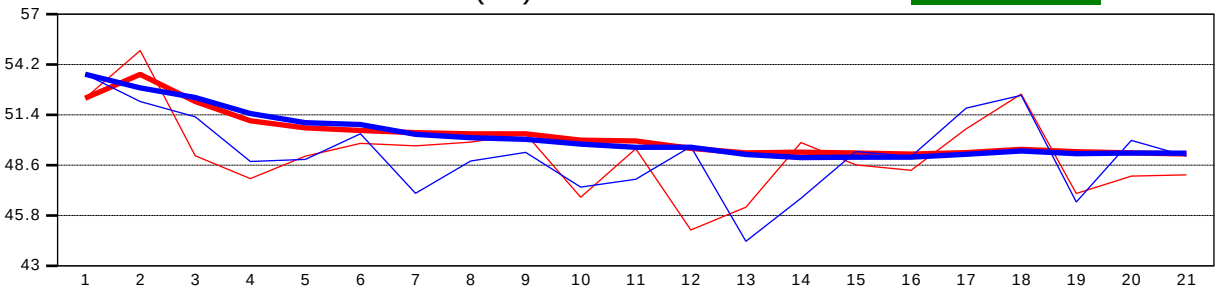
Discharge Measurement Summary

Site name	Kinney
Site number	6112021B
Operator(s)	Lfs
File name	Kinney_20210614-125156.ft
Comment	Bdiv

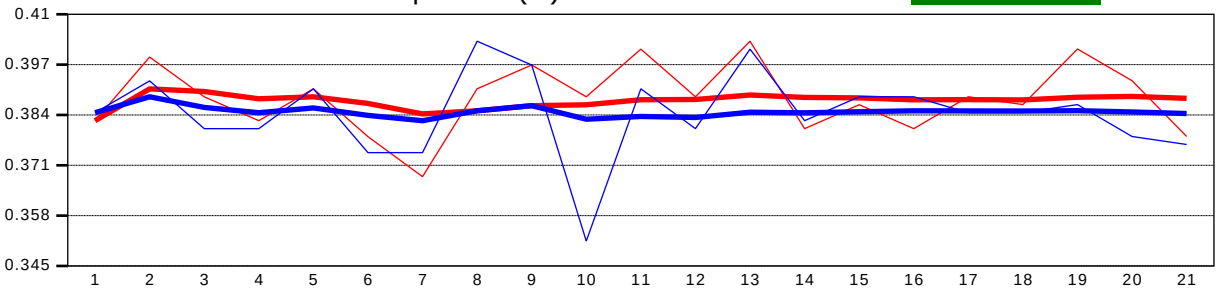
Beam 1	
Beam 2	

Automated beam check Start time 6/14/2021 12:25:24 PM

Automated beam check Peak level(dB) PASS



Automated beam check Peak position(ft) PASS



Automated beam check Quality control warnings

No quality control warnings

Discharge Measurment Field Visit Data Report *(Filters: Name begins with Kinney; Division = 5;)*

Div	Name	CWCB Case Number	Segment ID	Meas. Date	UTM	Location	Flow Amount (cfs)	Meas #	Rating	Station ID
5	Kinney Creek		22/5/A-002	06/14/2021	UTMx: 407863 UTMy: 4441337	Toured Kinney Creek from under rd culvert on BLM land to confluence with McQuery Creek. Diversion was running, visually taking less than half of the flow in the creek.	2.51	1	fair	
5	Kinney Creek		22/5/A-002	06/14/2021	UTMx: 407966 UTMy: 4441185	Toured Kinney Creek from under rd culvert on BLM land to confluence with McQuery Creek. Diversion was running, visually taking less than half of the flow in the creek.	0.77	2	poor