

# Salmon-Challis National Forest

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## Watershed Monitoring Program 2023 Monitoring Report



***USDA Forest Service  
Salmon-Challis National Forest  
Watershed Monitoring Program***

***April 08, 2024***



**Salmon-Challis National Forest  
Watershed Monitoring Program  
2023 Monitoring Report**

*This document is a compilation of Watershed monitoring data collected at 192 monitoring sites on the Salmon-Challis National Forest (SCNF) between 1993 and 2023.*

***April 08, 2024***

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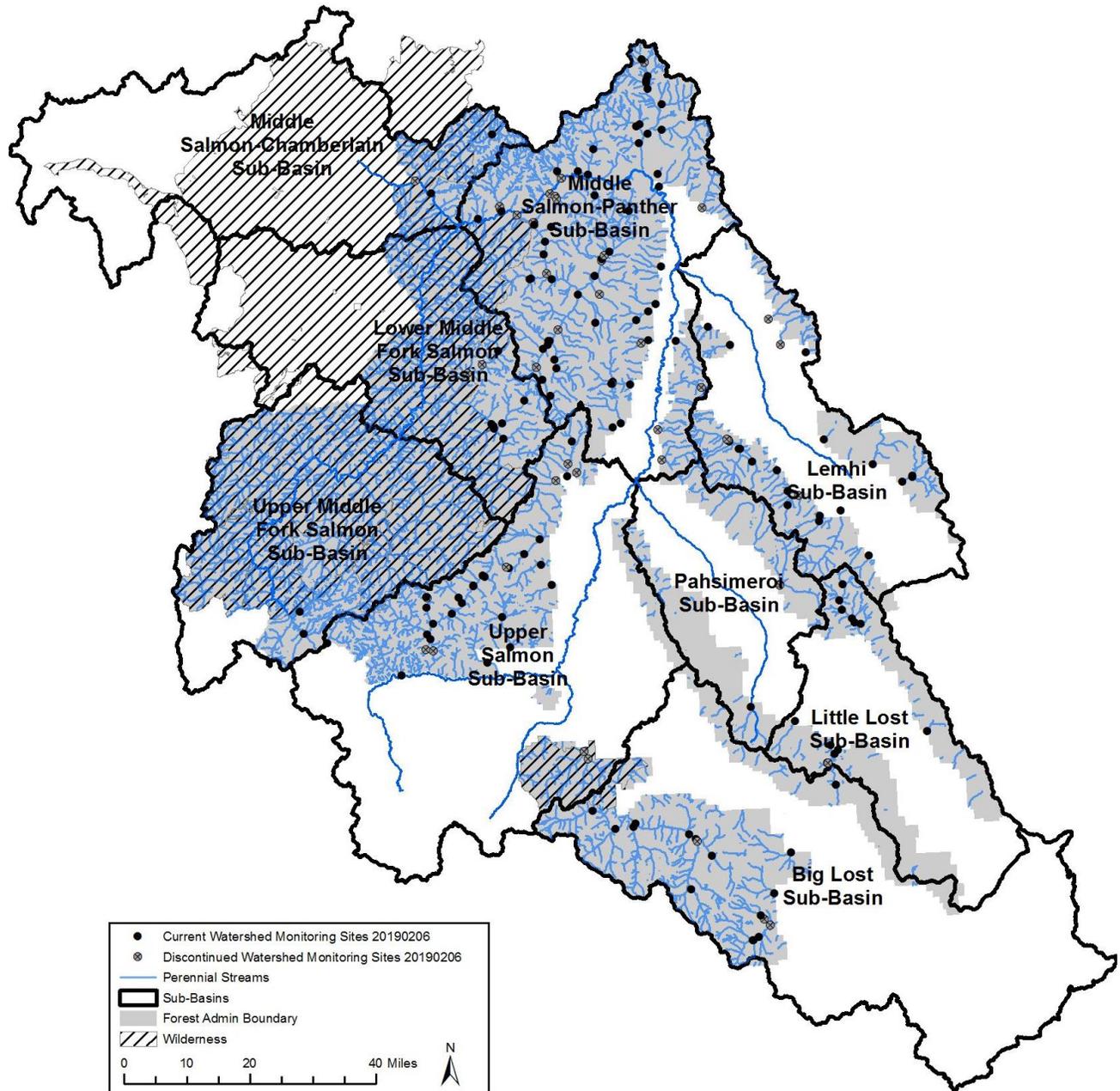
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## OVERVIEW OF MONITORING PROGRAM

A watershed monitoring program has been in place on the Salmon-Challis National Forest since 1993, when 103 permanent survey locations were established on the Salmon National Forest to monitor fine sediments and streambank stability in spawning habitat on streams throughout the Forest. Intermittent sampling also occurred in the mid-1980s. An additional 45 sites were established on the Challis National Forest in 1995. Additional sites have been established in subsequent years, and currently a total of 192 sites have been monitored on the Salmon-Challis National Forest. Most sites are accessible by road or trail. Salmon-Challis National Forest personnel conduct monitoring of a subset of these sites each year.



*Forest-wide Watershed Monitoring Site Map with Sub-Basins*

## Sampling Parameters

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The data collected at each monitoring site vary based on data needs and site sampling history, and may include the following:

### **Sediment Sampling (Depth Fines)**

Sediment sampling is the primary objective of this monitoring program, having been monitored every year since sampling began in 1993, and depth fines are quantified at all sites where appropriate sampling habitat is present. Depth fines are the portion of sediment from a core sample that is less than 0.25 inches in diameter.

Depth fines data are collected in representative spawning habitat in a glide feature using the McNeil Core sampling methodology. Although relatively labor intensive, this methodology is among the most objective, repeatable and biologically relevant of the various methods utilized to assess sediment levels and fish spawning habitat conditions of Forest streams. In light of the severely depressed numbers of returning spawners, substrate capability information derived from these surveys are perhaps the most relevant fish habitat information available to support land management decisions within critical habitat for listed anadromous stocks. Consultations with the National Marine Fisheries Service have additionally included identification of substrate sediment trends in Chinook salmon habitats as a principal term and condition of concurrence with Biological Assessments.

### **Percent Stable Banks**

Bank stability was quantified at all sites between 1994 and 2015. Monitoring of bank stability at watershed monitoring sites was discontinued beginning in 2016. Bank stability is also collected at Multiple Indicator Monitoring (MIM) Sites throughout the Forest using a similar protocol. MIM crews are trained in bank stability measurement, and these data are used for decision making in range management based on conditions at established Designated Monitoring Areas (DMAs). It has been determined that measuring bank stability at watershed monitoring sites is no longer needed in addition to the MIM sampling.

Bank stability is measured along both banks over an approximately 300-foot long reach upstream and/or downstream of the core sampling site. Crews typically sample bank stability starting at the core sample site and moving upstream, provided that this results in a reach that is representative of the conditions at that site. In some cases, changes in channel type, confluences, or other artificial constraints may be present upstream of the reach, and in those cases it may be more appropriate to sample bank stability downstream of the core sample site. Bank instability can be initiated by natural events (floods, wildfires, mass wasting), wildlife or human disturbances (grazing, logging, roads) that change discharge, sediment load and channel stability (MacDonald et al., 1991). Bank material and vegetation type and density also affect the stability of banks (Platts, 1984). Removal of streambank/ riparian vegetation along with mechanical bank damage reduces the structural stability of the streambank with several resultant negative impacts to fish productivity (Platts and Nelson, 1989). Eroding streambanks support little or no riparian vegetation, resulting in a loss of stream shading, undercut banks, and can cause stream widening and loss of aquatic habitat. Bank stability is linked to cover factors that resist the forces of stream erosion. Cover may include vegetation, rocks, logs and other resistant materials. Stable and covered banks are in balance with water velocities, provide shade for temperature control, and supply terrestrial food needed to support salmonids.

**AZAR**

Aquatic Zone Analysis Rating (AZAR) is a numerical rating (0 to 100) based on qualitative ratings of a number of different factors related to overall stream health. AZAR has been quantified at all sites since sampling began in 1993. These factors include vegetative stream cover, vegetative bank cover, dominant vegetative type, bank rock content, dominant bank rock size, bank cutting, instream sediment deposition, and ungulate bank damage. This provides a reconnaissance-level assessment of overall stream health.

**Rosgen Channel Type**

Rosgen channel types were originally collected on the majority of the established sites between 1995 and 2003. Very limited channel type data were collected from 2003 to 2014. Measurement of channel dimensions and determination of Rosgen channel type began again at all sites in 2015 in order to verify previous channel types, correct previous channel type errors, and determine channel type for sites that do not have this information. Channel type is based on a variety of parameters, including channel form, entrenchment ratio, width-to-depth ratio, gradient, sinuosity, and particle size (Rosgen, 1994). Channel type provides a way in which to compare conditions for different sampling sites on streams with similar characteristics.

**Site Descriptions (Notes and Photos)**

Site descriptions, photos, and field sketches of the core site and monitoring reach are typically collected during each sample, but may be lacking in some of the older data. This is useful information as site conditions or sampling locations change, and documents slight year-to-year changes in the sampling site location because of changes in suitable sampling habitat.

**Sample Site Selection**

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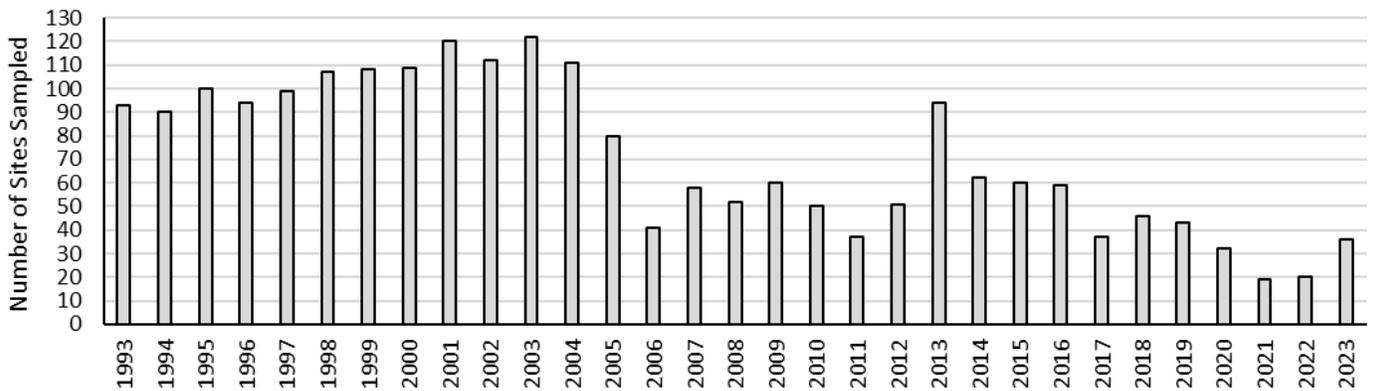
Sample sites were selected based on a number of factors and do not represent random locations. The following is a list of some of the factors that have been used to identify sample site locations:

- On streams in which anadromous and/or resident fish are present, and in which appropriate sampling habitat exists.
- On all 3<sup>rd</sup>-order and larger streams on the Forest.
- At the lowest point in the watershed on National Forest System lands, generally just upstream of the Forest boundary.
- Near the mouth of a stream if possible, just upstream of its confluence with a larger stream.
- At locations that are accessible by vehicle or relatively easily accessible by foot.
- In many cases, at previously established water right adjudication sites.
- At multiple locations on larger streams.
- At specific locations as identified by project or other monitoring needs.

It is intended that sampling occurs at generally the same location during each sample year. GPS coordinates and rebar pins are used to identify these general locations. However, the exact location of the sample site may vary slightly from year to year. Sediment sampling is the primary objective of this sampling program, and the location of sampling sites is based on the location of suitable spawning habitat for sampling. Sampling occurs at the appropriate spawning habitat at the general sample location rather than always repeating the sample at a defined location.

## Status of the Dataset

The 2023 season marks the 30<sup>th</sup> year of Watershed Monitoring on the Salmon-Challis National Forest. This long-term dataset provides trend information at each monitoring site. This information is used extensively for environmental analysis, management plan development, site specific project planning, and disturbance monitoring. Some sample sites have extensive data, while others have relatively few data points. A total of 192 sites on the Salmon-Challis National Forest have been established and sampled at least once since the beginning of the program in 1993. The number of sites sampled during each year has varied from 19 to 122, dependent on data needs and funding availability.



Recent efforts have been made to increase the efficiency of the monitoring program by decreasing the number of sites where monitoring is truly needed to inform land management decisions, and determining the ideal monitoring frequency at these sites to achieve the desired level of data integrity. As such, a number of monitoring sites were discontinued between 2014 and 2021. Sites have been discontinued for the following reasons:

- Lack of baseline data (only 1 or 2 years of data exist) with no need to collect additional data at the site. Some sites were established to monitor a specific project or location, and that monitoring need may no longer exist.
- Lack of suitable spawning habitat for core sampling exists at the site. This may be the result of channel changes, or in some situations, suitable spawning habitat never existed (eg., high gradient channels).
- Redundancy with other sites that can provide the same level of information. In some cases, multiple sites were established within close proximity, or to monitor conditions of multiple tributaries within the same general location.
- Insufficient channel size. It is difficult to apply the core sampling protocol to channels less than 10 feet in width, and sediment conditions in small channels that also have thick riparian vegetation are not good indicators of watershed stressors because transport and retention of sediment is primarily influenced by vegetation and debris within the channel.
- Channels that are too steep. Recent analysis suggests that the 5-year average percent fines in stream channels with gradients over 4% never exceeded 24% (USDA Forest Service, Salmon-Challis National Forest, 2018). These high gradient channels are generally transport channels, and even if sediment supply were high, excess fine sediment would likely not be detected in these types of channels.

Of the 192 monitoring sites that have been established, 65 sites have been discontinued. Discontinued sites are listed in **Appendix B**. The remaining 127 monitoring sites are “active monitoring sites,” where monitoring will continue in the future. These active monitoring sites will be sampled periodically, with a frequency based on site-specific data needs.

Beginning in 2021, the monitoring program adopted a more efficient monitoring strategy with the goal of reducing the monitoring frequency at each site to that required by Biological Opinions or specific project needs, or other reasonable sampling frequency determined by specialists. Each active monitoring site will be classified as one of the following:

- 5YR: Sites to be monitored once every 5 years.
- 10YR: Sites to be monitored once every 10 years.
- PROJ: Sites to be monitored at a higher frequency to meet specific project needs.

This monitoring report includes only the active monitoring sites. Data for the discontinued sites are summarized in the 2015 – 2021 Watershed Monitoring Reports.

## **2023 Monitoring**

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A total of 36 sites were sampled between June and October 2023 by members of the SCNF Watershed Monitoring Crew, SO Fisheries Crew, South Zone Fish/Watershed Crew, Salmon/Cobalt YCC, and Mackay YCC. Data collected at these sites included depth fines, AZAR rating, and site photos and notes. The data collected in 2023 will provide useful information for Biological Analyses, project-specific planning, and the [Forest Plan Revision process](#).

## SAMPLING METHODS

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Watershed monitoring protocols were developed on the Salmon-Challis National Forest. These protocols were used to collect information in this report and are described below. These protocols are conducted at established monitoring sites based on the location of a core sampling site location (in suitable spawning habitat) and a representative reach that contains the core sampling site location, is at least 20 bankfull widths in length, and contains consistent channel characteristics. Upon locating each site, crews will determine sampling locations, record location descriptions and coordinates, identify safety hazards, take photos, record notes, and complete the following monitoring protocols:

### **Sediment Sampling Protocol**

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Long term monitoring field sites have been established throughout the Salmon-Challis National Forest. Driving and hiking directions to field sites are available. Once a field site is located, ideal spawning habitat is selected. Habitat sampling sites must meet specific depth, velocity, and predominant substrate particle size criteria. This is generally the glide section of the riffle- pool-glide pattern present in many streams. This habitat also contains medium sized, uniform substrate. Five core samples are excavated at each sampling site, working within an area generally encompassing that which would be utilized by the target species in redd construction activities. Patterning of cores within the sample site generally takes a diamond or oval form within the defined spawning area.

At each sample site, a 12-inch coring tube is inserted into the streambed at the site to a sufficient depth to provide a seal from the surrounding water flow. Using a digging tool such as a small tire iron, the substrate area within the coring tube is disturbed to stir up any easily suspended fine sediments and to loosen the substrate.

Dependent upon target species, a 10 or 15-liter sample of substrate material is then excavated from within the coring tube into a bucket for transport to the shoreline processing area. A 15-liter sample approximates a six-inch deep excavation of the core tube to address substrate conditions at depths utilized by anadromous fish species. For assessment of spawning conditions for resident fish species, a 10-liter sample, representing a four-inch pocket depth, is excavated from within the tube. This sample depth reflects the shallower egg pocket depths excavated by these smaller fish. Lines drawn on the inside of the sample collection buckets identify the needed sample volumes (4-inch depth/ 6-inch depth) for both resident and anadromous fish assessments. Lines drawn on these buckets represent half of the desired core volume so 2 buckets must be filled (to the line) for each core. Each sample site is designated as anadromous (A) or Resident (R), signifying the depth of core sample excavation.

Excavated core samples are transferred to an offstream area for screening through a series of stacked U.S. Standard sieves which segregate stream bottom materials into nine specific size classes. Mesh sizes of these screens are identified in the table below. Collected substrate samples are graded through the screens by a process of repeated washing and shaking of the stacked sieves. Once sieving operations are completed, the contents of each individual screen are measured volumetrically by water displacement, allowing determination of the fractional percentage of each size class comprising the total sample. Screen contents are carefully transferred to a receiving bucket filled just to the point of overflowing through a side mounted discharge spout. Water displaced by the screen contents is collected in graduated beakers, and water

volume is recorded to the nearest 50 ML. Receiving buckets and collecting beakers are reset to starting levels for each individual measurement.

Data are collected in the field digitally via Survey 123. The total volume of sediment retained by each sieve size is used to calculate the percent depth fines, or the percentage of sediment by volume that is less than 0.25 inches diameter (ie, all material that is captured by the ¼", #4, #8, #20, #70, and #270/#300 sieves). The standard deviation of the 5 core samples at each sample site is also calculated.

Screen Size or Number	Mesh Opening	
	Inches	mm
2½" or 3"	2.5 or 3.0	63.5 or 76.2
1"	1.0	25.4
½"	0.5	12.7
¼"	0.25	6.35
#4	0.185	4.70
#8	0.0937	2.38
#20	0.0331	0.85
#70	0.0083	0.21
#270 or #300	0.0021	0.05

### Bank Stability Monitoring Protocol

Streambanks are considered stable if they do not show indications of any of the following features:

- Breakdown – Obvious blocks of bank broken away and lying adjacent to the bank.
- Slumping or False Bank – Bank has obviously slipped down, cracks may or may not be obvious, but the slump feature is obvious.
- Fracture – A crack is visibly obvious on the bank indicating that the block of bank is about to slump or move into the stream.
- Vertical and Eroding – The bank is mostly unvegetated or uncovered as defined below and the bank angle is steeper than 80 degrees from the horizontal.
- Bank has bare soil with no rock, roots or vegetation to stabilize the bank and is susceptible to erosion at bankfull flows.

Streambanks are considered vegetated if they have the following features:

- Perennial vegetation ground cover is greater than 50%.
- Roots of vegetation cover more than 50% of the bank (deep rooted plants such as willow and sedges provide such cover).

Streambanks are considered “unvegetated stable” if they have the following features:

- Banks are protected by rocks of cobble size or larger. Need to consider the stream power and evaluate if the rocks are large enough not to move during normal high flow events, on some streams boulder size rock may be needed for bank stability.
- Banks are protected by large woody debris such that they would not erode during high flow events.

### Field Methodology

- 1) Select a representative stream reach. Avoid disturbances such as stock driveways that are an infrequent disturbance. However if livestock crossings are frequent and numerous these disturbances would be representative. Avoid fence boundaries where livestock impacts are concentrated.

- 2) Evaluate the streambank located above and below the bankfull elevation. The figure below describes where to take measurements when side channels or backwater areas are present along the stream reach.
- 3) Walk both streambanks for 100 steps. At each step evaluate the streambank that is located along an imaginary line that is perpendicular to the tip of your foot. It is helpful to walk in the stream, if possible, when evaluating the banks. A step transect has been used instead of a measured transect because of the difficulty often encountered stringing a tape through thick brush. A step is defined as approximately 3 feet or one meter. Prior to beginning data collection the observer should lay out a tape for 100 feet and calibrate their step to achieve approximately 3 feet in each step.
- 4) Record each observation on the form in one of the four categories; vegetated stable, vegetated unstable, unvegetated stable or unvegetated unstable.
- 5) Sum each category for both the right and left bank.
- 6) Add up the vegetated stable and unvegetated stable totals for both banks and divide by 200 to get the Percent Stable Banks (assuming that 100 paces were recorded on each bank, if not divide by the total number of paces).

#### Equipment Necessary

- 1) Field form
- 2) Hip waders are needed on most streams for accessing both banks. On some streams the streambanks are best observed by wading down the stream.
- 3) Counter (optional) to keep track of number of observations.

#### Additional considerations

While a streambank is normally easily defined the following situations can be observed in the field:

- 1) Multiple channels:

When a side channel is present, determine whether the side channel leaves and re-enters the main channel within the reach.

If **No**, do not measure the bank in the side channel. Keep making your measurements on the bank of the main channel. Cross over the confluence of the side channel and take your next measurement on the bank of the main channel. Do not count paces within the bed of the side channel.

If **Yes**, the observer needs to estimate the flow capacity of the side channel at **bankfull** stage and determine if it is equal to or greater than 25% of the flow of the main channel. If **equal to or greater than 25%**, then collect measurements on the outside bank of the side channel, rather than on the bank of the island associated with the main channel. If the side channel has a bankfull stage flow capacity **less than 25%** of the flow of the main channel, then take measurements on the bank of the island associated with the main channel. Do not count paces within the bed of the side channel.

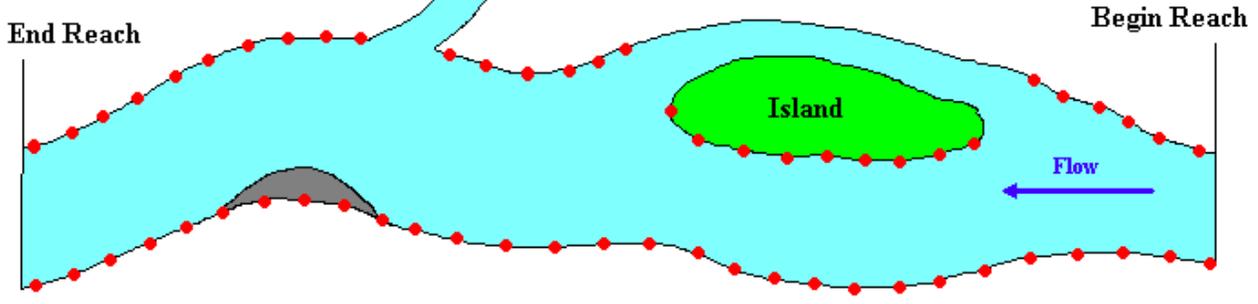
- 2) Backwater areas along a main channel:

When backwater or slough areas are located along a streambank, do not take bank measurements along the perimeter of the backwater. Cross over the backwater area and do not count paces within the bed of the backwater area. These areas are usually not susceptible to the erosive forces of bankfull flows and can be difficult to define bankfull features.

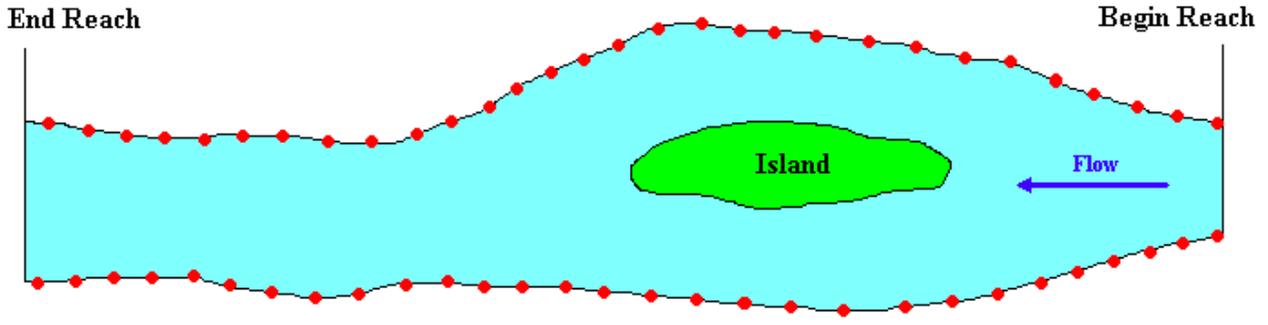
Bank Stability measurements and flow estimations are taken at and based on the bankfull elevation.

Tributary or side channel that does not enter and leave within the reach. Do not take measurements on the side channel.

Side channel with < 25% of the total bankfull flow take measurements on the bank of the island associated with the main channel.



Side channel enters and leaves within reach. If side channel flow is between 25%-50% of total bankfull flow take measurements on the outside bank of side channel.



● Measurement Points Along Stream

*Bank stability methodology where side channels exist.*

## Channel Measurements/Channel Type Protocol

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Channel type measurements will be taken in the established reach, and these data will be used to determine Rosgen channel type. For each parameter, an estimate OR a measurement is recorded on the data form, depending on site and sampling constraints.

### Identifying Bankfull Elevation

The bankfull elevation is identified first by locating consistent indicators such as the point of incipient flooding/slope break, the highest depositional surface, the base of woody vegetation, or lichens/moss on rocks.

### Cross Section Setup

A measuring tape is used to establish a channel type cross section in a representative riffle location within the reach. The ends of the tape are secured on each bank at the bankfull elevation, keeping the tape tight and as level as possible.

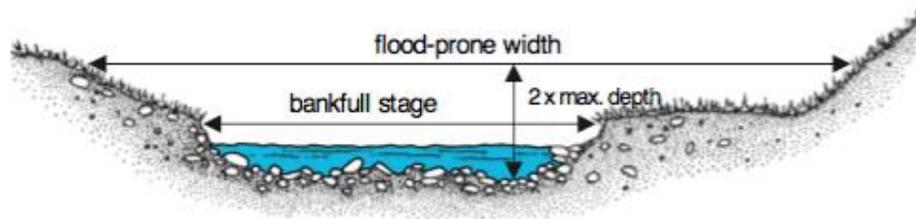
### Channel Form – reach scale

The channel form is recorded, as either single channel or multiple low flow channels separated by islands or bars.

### Entrenchment Ratio

The entrenchment ratio is determined at the representative cross section using the following steps:

- Measure and record bankfull width.
- Use a stadia rod to measure maximum bankfull depth – this is the distance from the tape to the channel bed at the thalweg.
- Double the maximum bankfull depth, and use a second tape to project a horizontal line at the elevation of 2X maximum bankfull depth. Note where this line intersects the bank/floodplain/terrace. This is the floodprone elevation. Measure and record Floodprone width.
- Calculate the entrenchment ratio by dividing floodprone width by bankfull width.



### Width to Depth Ratio

The width-to-depth ratio is determined at the representative cross section using the following steps:

- Record the bankfull width.
- Measure and record bankfull depth in at least 3 locations along the cross section using a stadia rod.
- Calculate mean bankfull depth by adding all measurements and dividing by  $n+1$ .
- Calculate width to depth ratio by dividing bankfull width by mean bankfull depth.

**Sinuosity – reach scale**

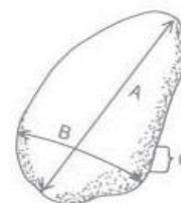
A start point and an end point will be chosen over a reach that is long enough to adequately define the reach sinuosity (at least a couple meander wavelengths). The distance along the channel is then measured – either by walking the edge of the bank, or walking the channel. Distance can be measured by pacing, using a measuring tape, or with a GPS. The straight line distance between the start and end points is then measured using the same method. Sinuosity is calculated by dividing channel distance by straight line distance. Alternatively, if on-site measurement is too difficult or time consuming because of dense vegetation, sinuosity can be measured using an aerial photograph. On larger streams, this can be faster and more accurate. This will not work on smaller streams in forest, as streams may not show up on aerial photography.

**Gradient – reach scale**

Gradient is generally measured on a reach scale using a clinometer, to the nearest 0.5%. Gradient is measured along the longest section of channel where you will be able to see your partner, and along a relatively straight channel segment (otherwise you will be measuring valley gradient, not stream gradient). The stream segment must be representative of the reach. Gradient is measured from water surface to water surface, and from similar channel characteristics (ie, from top of riffle to top of riffle). Partners can use the clinometer by sighting to the location on the partner that corresponds to the eye elevation. For best accuracy, a partner can hold the rod with the base of the rod on the water surface, and measure to the point on the rod that corresponds to the eye height (pre-measured). If vegetation is too thick, or other factors preclude use of the clinometer from stream level, gradient can be determined by measuring the elevation difference between 2 points along the stream (use stadia rod and clinometer as a level), and dividing this by the stream distance measured with a tape (rise/run=gradient).

**Dominant Substrate – reach scale**

Dominant substrate on the channel surface on a reach scale can be estimated or measured. This is different from the substrate cored at depth. Variations in substrate size in riffles, pools, and other depositional areas should be accounted for. The estimated or measured median particle size (D50) will be determined based on the intermediate axis of the substrate particles. A pebble count can be conducted to most accurately quantify the D50, or to help train the eye for estimation. To do a pebble count, a Z-pattern will be walked in the channel from bankfull elevation to bankfull elevation along enough of the length of the reach to be representative, measuring the length of the intermediate axis in millimeters of 1 randomly chosen particle every 1 to 3 steps, depending on the size of the channel. The particle that lies directly in front of the foot will be chosen, without bias. 100 particles will be sampled in this manner, and the D50, or median value, will be calculated. Substrate will be classified as follows:



A = LONGEST AXIS (LENGTH)  
 B = INTERMEDIATE AXIS (WIDTH)  
 C = SHORTEST AXIS (THICKNESS)

Substrate Class	Range of D50 (mm)
Sand	0.062 – 2
Gravel	2 – 64
Cobble	64 – 256
Boulder	>256

**Channel Type**

The data listed above will be used to determine Rosgen channel type. This will be done by Watershed personnel trained in the Rosgen stream classification system.

**AZAR Protocol**

After the stream reach has been walked and observed during previous sampling tasks, the AZAR form (shown below) is completed. This is a quick assessment, where the observer(s) assigns a score for each parameter corresponding to the description that best meets the stream condition for that parameter. An intermediate value can be selected if needed. The total AZAR score is then calculated by adding the score for each parameter.

PARAMETER	SCORE			
<b>Vegetative Stream Cover</b>	<b>20</b> Cover 50-70% of surface; Sunlight broken by branches.	<b>15</b> Cover 25-50% of surface.	<b>10</b> Cover ranging to 25% of surface, Direct exposure for extended periods.	<b>5</b> Stream totally exposed, No cover from vegetation or bank overhangs.
<b>Vegetative Bank Cover</b>	<b>12</b> Vegetation covers at least 90% of banks.	<b>9</b> Vegetation covers 75-90% of banks.	<b>6</b> Vegetation covers 50-75% of banks.	<b>3</b> Vegetation covers less than 50% of banks.
<b>Dominant Vegetative Type</b>	<b>12</b> Good mix of woody and herbaceous species.	<b>9</b> Predominantly brush species.	<b>6</b> Predominantly grass and/or forbs.	<b>3</b> Predominantly large trees with little understory.
<b>Bank Rock Content</b>	<b>6</b> Bank rock content at least 75%.	<b>5</b> Bank rock content 50-75%.	<b>3</b> Bank rock content 25-50%.	<b>2</b> Bank rock content less than 25%.
<b>Dominant Bank Rock Size</b>	<b>6</b> Large rocks greater than 12 inches.	<b>4</b> Rocks 6 to 12 inches.	<b>3</b> Rocks 3 to 6 inches.	<b>1</b> Small rocks less than 3 inches.
<b>Bank Cutting</b>	<b>16</b> Little or no cutting of banks; Eroded banks are small and short.	<b>12</b> Some cutting on outside banks; Equal to or less than channel width.	<b>8</b> Obvious cutting; Raw vertical banks; Root overhangs and sloughs.	<b>4</b> Almost continuous cuts; High vertical banks; Overhang failures.
<b>Instream Sediment Deposition</b>	<b>16</b> Very little deposition; Substrates and pools with only minor fines.	<b>12</b> Some coarse deposits at obstructions; some fines in riffles and pools.	<b>8</b> Moderate deposits; Bars enlarged; Pools filling; Moderate embeddedness.	<b>4</b> Heavy deposition; High embeddedness; Pools with heavy accumulations.
<b>Ungulate bank damage</b>	<b>12</b> Bank damage less than 10%; Little or no cuts or sloughing.	<b>9</b> Approx 25% bank damage; Crossings present; Some reduction of cover.	<b>6</b> Bank damage more than 50%; Trampling/sloughing cover greatly reduced.	<b>3</b> Bank damage more than 75%; trampling/sloughing excessive cover loss.
<b>Subtotals</b>				

**Analysis Total** \_\_\_\_\_ (out of 100)

## ANALYSIS METHODOLOGY

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This monitoring report was compiled in order to summarize the complete dataset for monitoring sites sampled in 2023 as well as all other active monitoring sites, summarize the analysis of the dataset, and provide future direction for the monitoring program.

Watershed characteristics were determined for each site using Streamstats (US Geological Survey, 2020), providing the following basin data presented in this document:

- Drainage area
- Bankfull flow (estimated as the flow with a 1.5-year return interval)
- Mean annual flow
- Mean basin elevation
- Mean basin slope (calculated from 10-meter digital elevation model)

Basin characteristics were initially derived in September 2014 using Streamstats batch processing. Basin characteristics for some watersheds were re-processed using Streamstats for watersheds in which delineation errors existed from the initial processing, or in which GIS sampling point locations were changed or corrected based on recent sampling. Because flow regression equations for the State of Idaho were updated in 2016, the current dataset utilizes a mixture of “old” and “new” regression estimates for the approximate bankfull flow and mean annual flow. As a result, some discrepancies exist in these flow estimates.

GIS analysis was conducted using delineated watersheds for each sampling site and Salmon-Challis National Forest corporate GIS data. The following basin statistics were determined for each site:

- Fifth-level watershed(s)
- Watershed aspect (N, NW, W, SW, S, SE, E, NE)
- Length of road in watershed (including open, closed, and unauthorized routes)
- Open road density (mi/sq mi)
- Percent of watershed by landtype geology (Granitic, Volcanic, Sedimentary, Quartzite, Mixed, Alluvium)
- Percent of watershed within active grazing allotments
- Percent of watershed burned by wildfire in last 5 years (2018-2022).

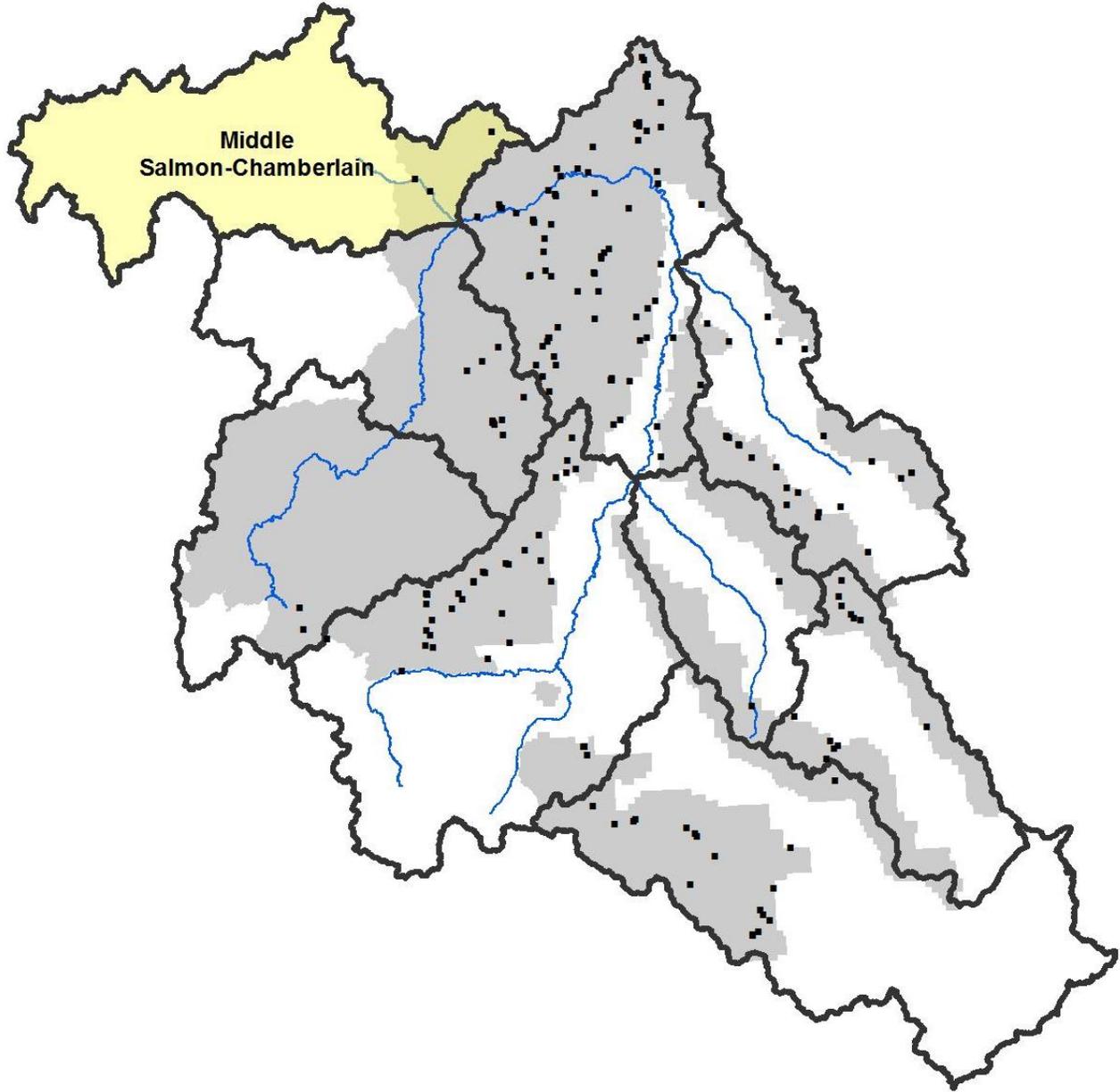
All of this information is used to provide a basin “snapshot” for each site, and to analyze relationships between sample data, basin characteristics, and land use factors. **Appendix A** includes data tables of watershed monitoring data, watershed basin characteristics, and data analysis. Note that for watersheds in which a portion of the watershed is outside of the Salmon-Challis National Forest boundary, the above analysis is for only the portion of the watershed that is within the SCNF boundary.

**MONITORING  
SITE  
DATA  
BY  
SUB-BASIN**



## MIDDLE SALMON CHAMBERLAIN SUB-BASIN

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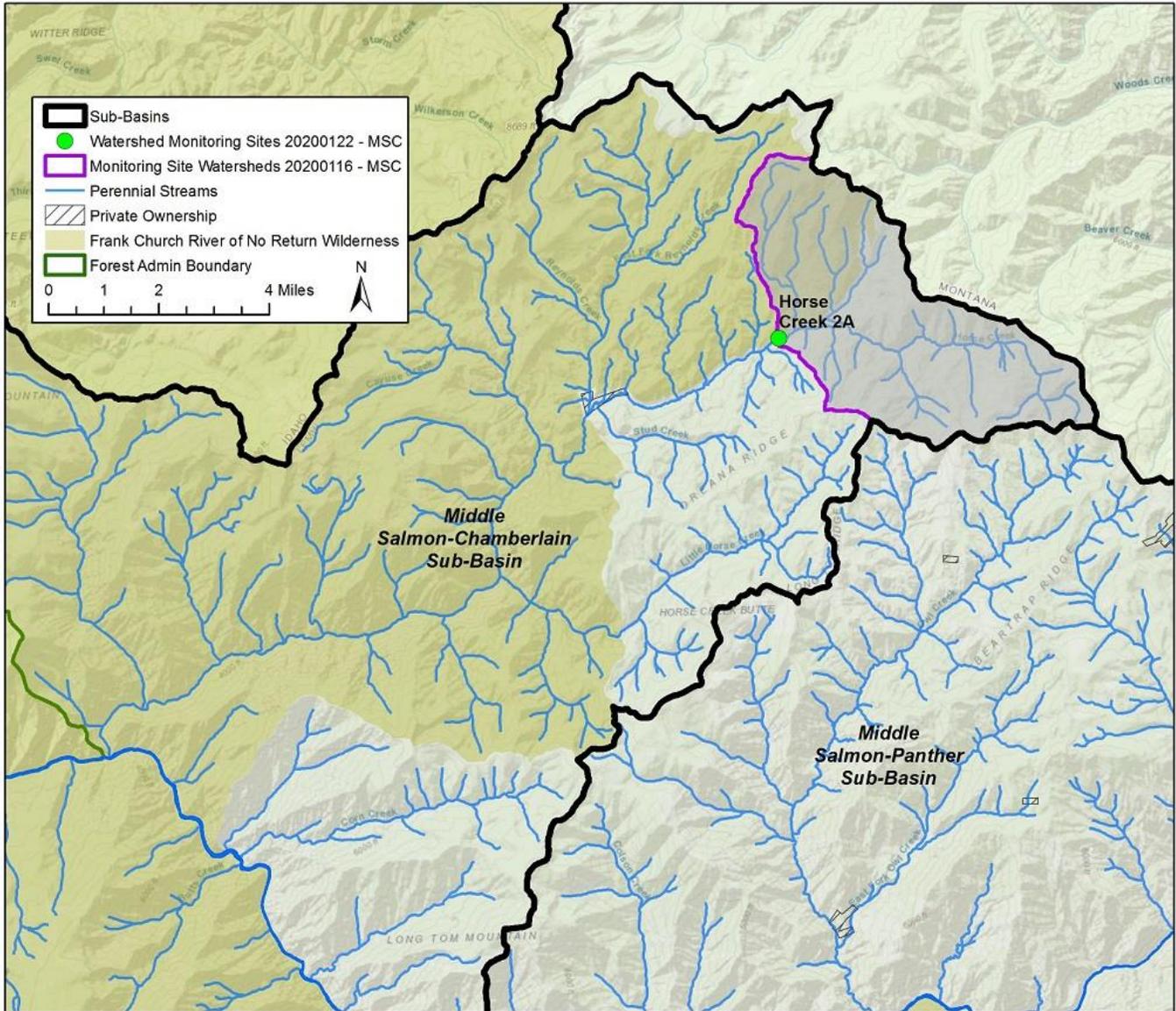


<b>Total acres within sub-basin</b>	<b>1,095,725</b>
<b>Percent of sub-basin within SCNF</b>	<b>13%</b>
<b>Active Monitoring Sites</b>	<b>1</b>
<b>Discontinued Monitoring Sites</b>	<b>2</b>
<b>Sites Monitored in 2023</b>	<b>0</b>



## Upper Middle Salmon Chamberlain

Only one monitoring site is located in the upper portion of the Middle Salmon Chamberlain Sub-basin. A portion of the Horse Creek 2A site watershed is within the Frank Church River of No Return Wilderness.



**HORSE CREEK 2A**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Horse Creek 2A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Chamberlain	<b>Ranger District</b>	North Fork
<b>Site Location</b>	Site is located along FR065 (Horse Creek Road), 0.75 mi west (downstream) of Horse Creek Hot Springs.		
<b>GPS Coordinates</b>	N 45.50032 (2019)	W -114.47809 (2019)	
<b>Site Comments</b>	31% of watershed in Wilderness. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	16.9 sq mi 10,791 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	141 cfs	<b>Mean Annual Flow</b> (Streamstats)	14.9 cfs
<b>5th-level Watershed</b>	Horse Creek / 1706020701				
<b>Mean Basin Elevation</b>	7103 ft	<b>Basin Aspect</b>	W	<b>Mean Basin Slope</b>	37%
<b>Length of Road</b>	44.0 mi	<b>Road Density</b>		2.61 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	96.5%	<b>Quartzite</b>	3.5%	
	<b>Volcanic</b>	0.0%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	0.0%	
<b>% of Watershed in Active Allotment</b>	0%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2019)**



**View Downstream (2019)**

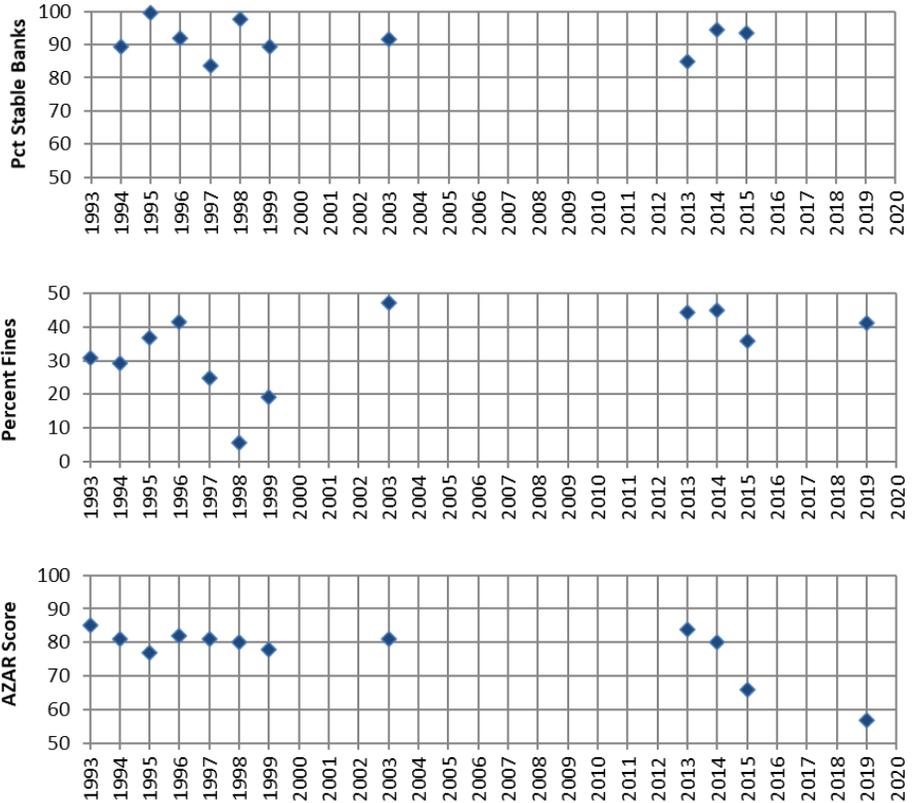
**HORSE CREEK 2A**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		30.8	85
1994	89.5	29.2	81
1995	100	36.8	77
1996	92.0	41.6	82
1997	83.5	24.9	81
1998	97.5	5.6	80
1999	89.5	19.2	78
2000			
2001			
2002			
2003	91.5	47.1	81
2004			
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013	84.8	44.3	84
2014	94.5	45.0	80
2015	93.5	35.7	66
2016			
2017			
2018			
2019		41.3	57
2020			
2021			
2022			
2023			
n	10	12	12
Mean	91.6	33.5	77.7
St Dev	5.1	12.3	8.1
n	2	3	3
Mean	94.0	40.7	67.7
St Dev	0.7	4.7	11.6

**10-yr All**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	20.5	2.5	20.5	1.5	2-3	Cob/grav	C3
2015	14.9	1.8	13.5	1.0	3.5	Gravel	B4
2019	19.2	3.6	8.0	1.2-1.5	2.0	Gravel	B4

<b>Reviewed Channel Type</b>	<b>B4</b>
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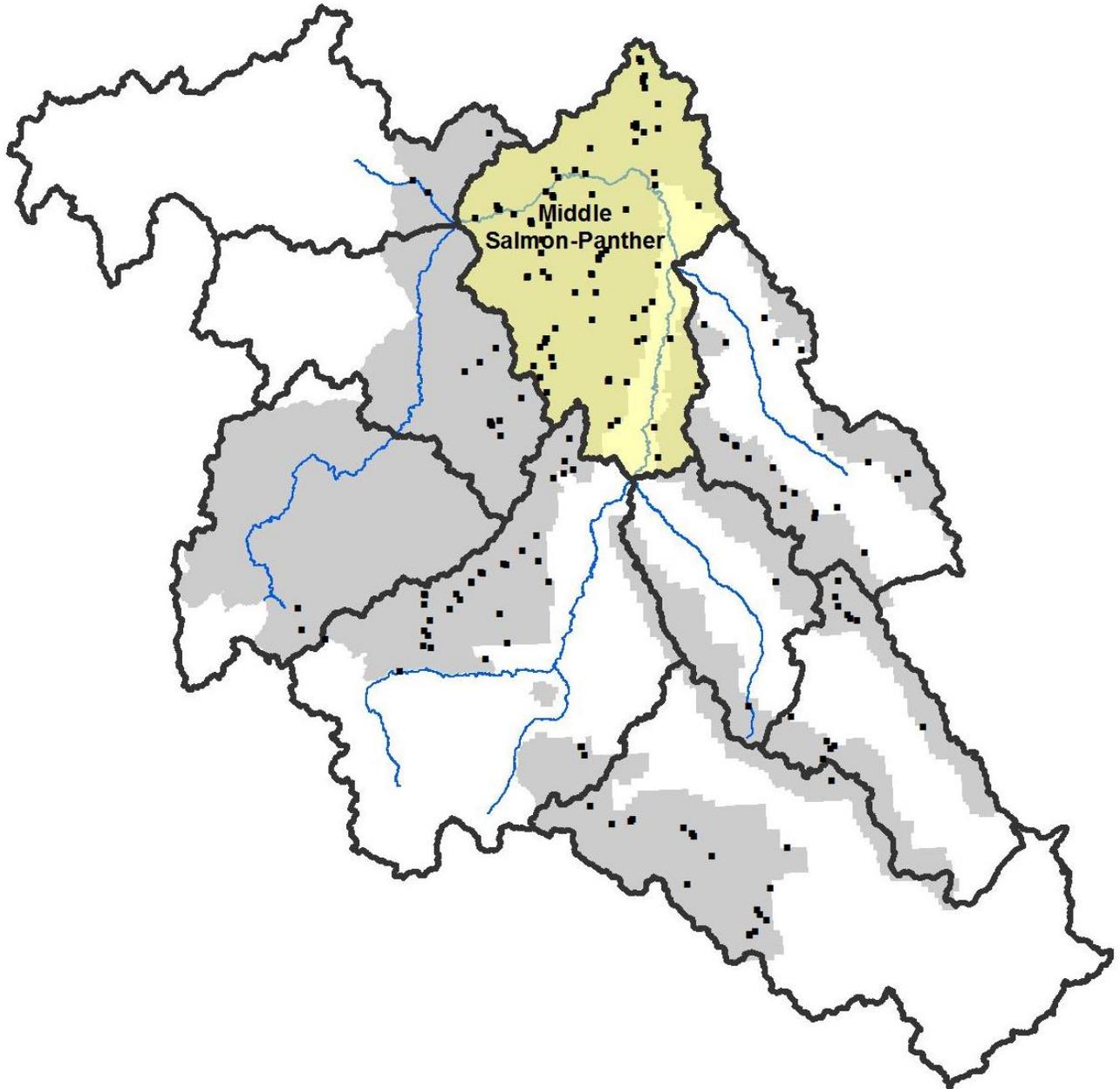
**REMARKS**

The Horse Creek 2A site was affected by the Saddle Complex Fire (2011) and post-fire flood events. Hillslopes in this area are primarily highly weathered granite, and this material has been highly mobile since the Saddle Fire. This channel also has naturally high fines because of the surrounding granitic geology. High fines were observed in 2013-2015 after the Saddle Fire, and conditions of high fines persisted in 2019 with evidence of recent flood deposition.



## MIDDLE SALMON-PANTHER SUB-BASIN

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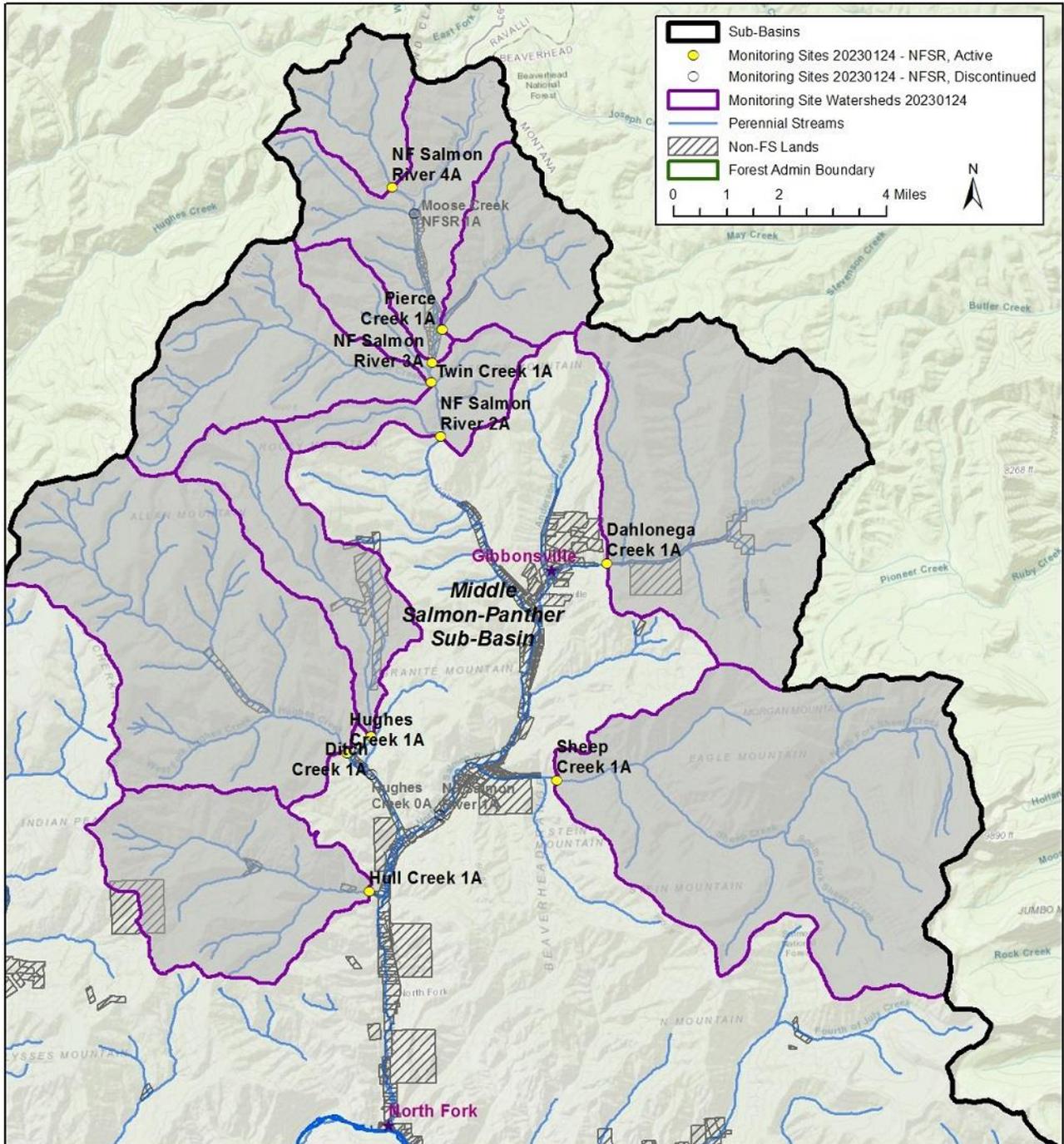


<b>Total acres within sub-basin</b>	<b>1,166,515</b>
<b>Percent of sub-basin within SCNF</b>	<b>85%</b>
<b>Active Monitoring Sites</b>	<b>49</b>
<b>Discontinued Monitoring Sites</b>	<b>30</b>
<b>Sites Monitored in 2023</b>	<b>15</b>



## North Fork Salmon River Watershed

A total of 10 active monitoring sites are located in the North Fork Salmon River Watershed.



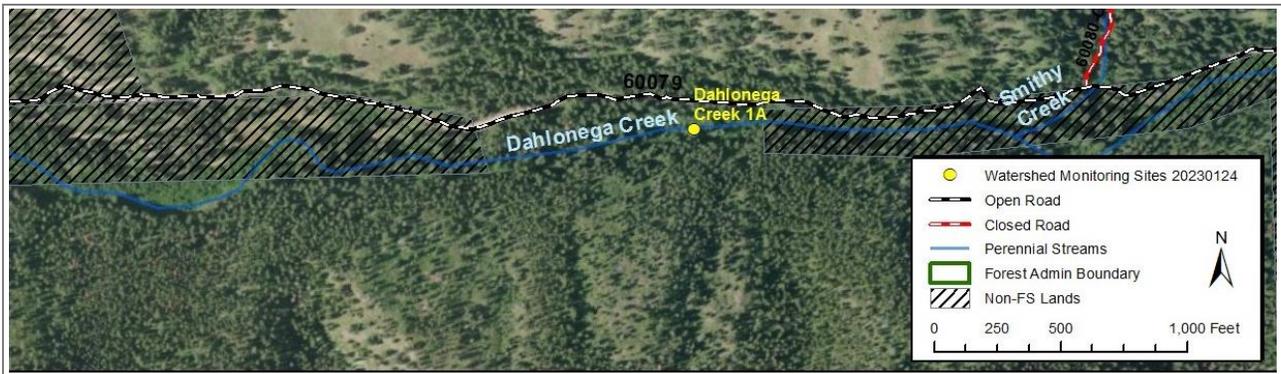
**DAHLONEGA CREEK 1A**

**Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	Dahlongega Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	North Fork
<b>Site Location</b>	Site is on Forest Road #079 (Dahlongega Creek Road) approximately 1.8 miles upstream of Hwy 93 at Gibbonsville.		
<b>GPS Coordinates</b>	N 45.55684 (2022)	W -113.90164 (2022)	
<b>Site Comments</b>	Site was moved 0.8 miles upstream in 2022 (previous site was on a small parcel of USFS land surrounded by private lands). 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	24.8 sq mi 15,862 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	118.0 cfs	<b>Mean Annual Flow</b> (Streamstats)	17.80 cfs
<b>5th-level Watershed</b>	North Fork Salmon River / 1706020306				
<b>Mean Basin Elevation</b>	6260 ft	<b>Basin Aspect</b>	W	<b>Mean Basin Slope</b>	49%
<b>Length of Road</b>	30.6 mi	<b>Road Density</b>		1.24 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	1.4%	<b>Quartzite</b>	98.6%	
	<b>Volcanic</b>	0%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	0%	<b>% of Watershed Burned (2018-2022)</b>		65.4%	

**SITE PHOTOS**



**View Upstream (8/24/2022)**



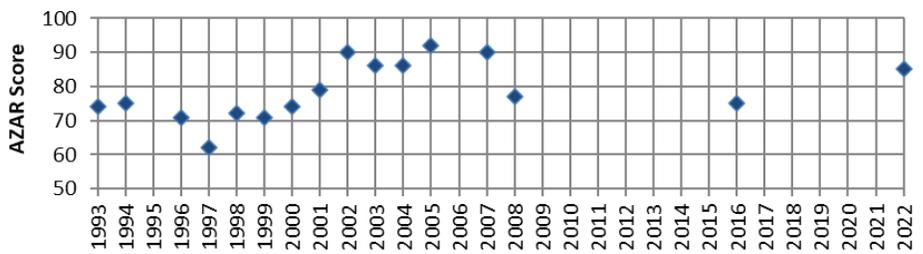
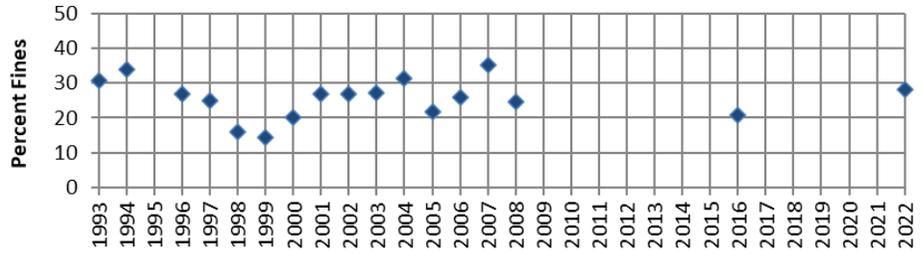
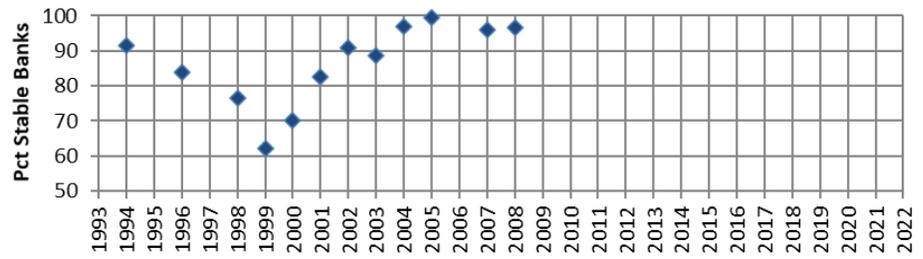
**View Downstream (8/24/2022)**

**DAHLONEGA CREEK 1A**

**Last Year Sampled: 2022**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		30.7	74
1994	91.5	34.0	75
1995			
1996	84.0	27.0	71
1997	49.0	24.8	62
1998	76.5	16.1	72
1999	62.0	14.3	71
2000	70.0	20.3	74
2001	82.5	27.0	79
2002	91.0	26.8	90
2003	88.5	27.2	86
2004	97.0	31.2	86
2005	99.5	21.6	92
2006		25.9	
2007	96.0	35.3	90
2008	96.5	24.7	77
2009			
2010			
2011			
2012			
2013			
2014			
2015			
2016		20.9	75
2017			
2018			
2019			
2020			
2021			
2022		28.3	85
2023			
n	13	17	16
Mean	83.4	25.7	78.7
St Dev	15.3	5.7	8.5
n	0	2	2
Mean	-	24.6	80.0
St Dev	-	5.2	7.1



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	20.5	4.4	17.1	1.1	2-3	Cob/Grav	C4b
2016	16.7	1.1	23.2	1.1	3	Cob/Grav	C4b
Reviewed Channel Type							C4b

**All**

**10yr**

**REMARKS**

Monitoring of this site is useful for monitoring of any impacts associated with the Upper North Fork Project, and the 2021 Trail Creek Fire, which burned 51% of the Dהלונהג Creek watershed. Previous site location was not ideal because it was surrounded by and downstream of private property along the channel. New site (2022) is still downstream of private property along the creek, but this property is not developed. Site watershed edited 1/24/2023 to reflect new location of sampling site (drainage area changed from 16,781 acres to 15,862 acres).

**DITCH CREEK 1A**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Ditch Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	North Fork
<b>Site Location</b>	Site is located about a half mile upstream of the mouth of Ditch Creek, just upstream of the FR093 Bridge. Access is via the Hughes Creek Road (FR091).		
<b>GPS Coordinates</b>	N 45.51225 (2019)	W -113.99537 (2019)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	8.2 sq mi 5,231 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	35 cfs	<b>Mean Annual Flow</b> (Streamstats)	4.1 cfs
<b>5th-level Watershed</b>	North Fork Salmon River / 1706020306				
<b>Mean Basin Elevation</b>	6772 ft	<b>Basin Aspect</b>	S	<b>Mean Basin Slope</b>	36%
<b>Length of Road</b>	21.8 mi		<b>Road Density</b>		2.66 mi/sq mi
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	74.5%	
	<b>Volcanic</b>	12.6%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	12.9%	
<b>% of Watershed in Active Allotment</b>	58.4%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2019)**



**View Downstream (2019)**

**DITCH CREEK 1A**

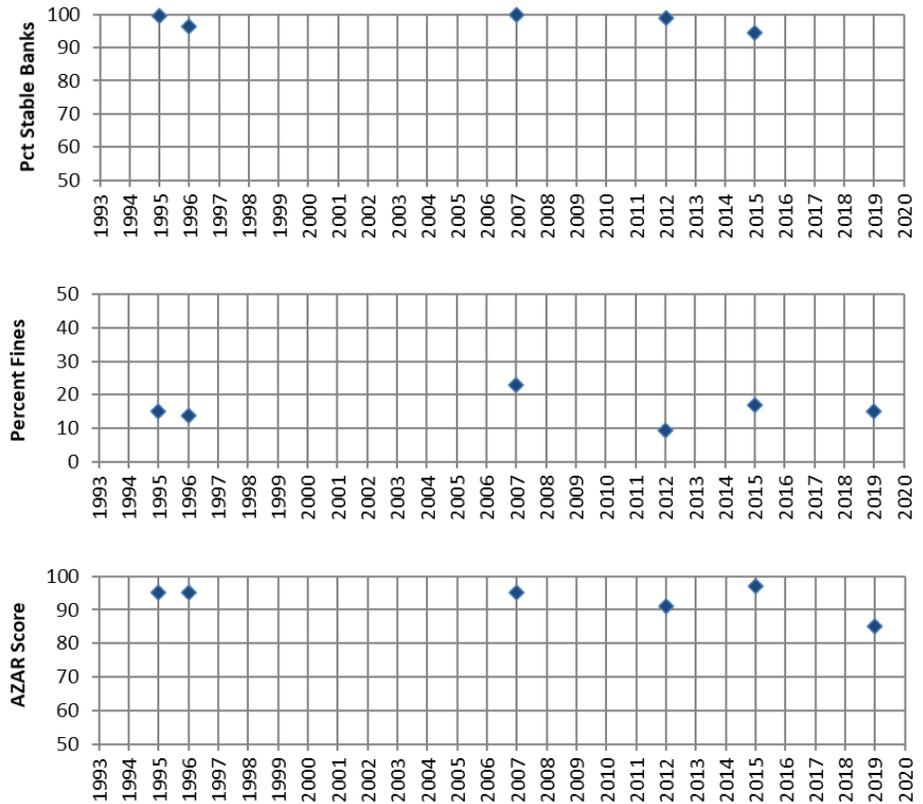
**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	99.5	14.9	95
1996	96.5	13.7	95
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007	100	22.9	95
2008			
2009			
2010			
2011			
2012	99.0	9.5	91
2013			
2014			
2015	94.5	17.0	97
2016			
2017			
2018			
2019		15.0	85
2020			
2021			
2022			
2023			
n	5	6	6
Mean	97.9	15.5	93.0
St Dev	2.3	4.4	4.4
n	1	2	2
Mean	94.5	16.0	91.0
St Dev	-	1.4	8.5

**ALL**

**10yr**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1995	10.4	3.2	6.1	-	8.5	Sm cobb	A3
2015	14.5	2.5	12.1	1.2-1.5	5.0	Cobble	C3b
2019	16.7	3.1	11.4	1.2-1.5	5.0	Cobble	C3b

**Reviewed Channel Type** **C3b**

**REMARKS**

Conditions have been relatively consistent at this site. The steep channel limits accumulation of fines. Note that an additional site on Ditch Creek (Ditch Creek 2A) was also established in 1995, but only sampled once (the Ditch Creek 2A site is not included in any monitoring report).

**HUGHES CREEK 1A**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Hughes Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	North Fork
<b>Site Location</b>	Site is located approx 2.3 miles up the Hughes Creek Road (FR#091) from Highway 93, upstream of the intersection of the Hughes and Allan/Ditch Road.		
<b>GPS Coordinates</b>	N 45.50793 (2019)	W -114.00481 (2019)	
<b>Site Comments</b>	2019 site moved 30 meters upstream of previous site to better location. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	26.2 sq mi 16,757 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	115 cfs	<b>Mean Annual Flow</b> (Streamstats)	16.4 cfs
<b>5th-level Watershed</b>	North Fork Salmon River / 1706020306				
<b>Mean Basin Elevation</b>	6446 ft	<b>Basin Aspect</b>	SE	<b>Mean Basin Slope</b>	44%
<b>Length of Road</b>	71.9 mi	<b>Road Density</b>		2.75 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>		97.4%
	<b>Volcanic</b>	0.1%	<b>Mixed</b>		0.0%
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>		2.5%
<b>% of Watershed in Active Allotment</b>	99.0%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2019)**



**View Downstream (2019)**

**HUGHES CREEK 1A**

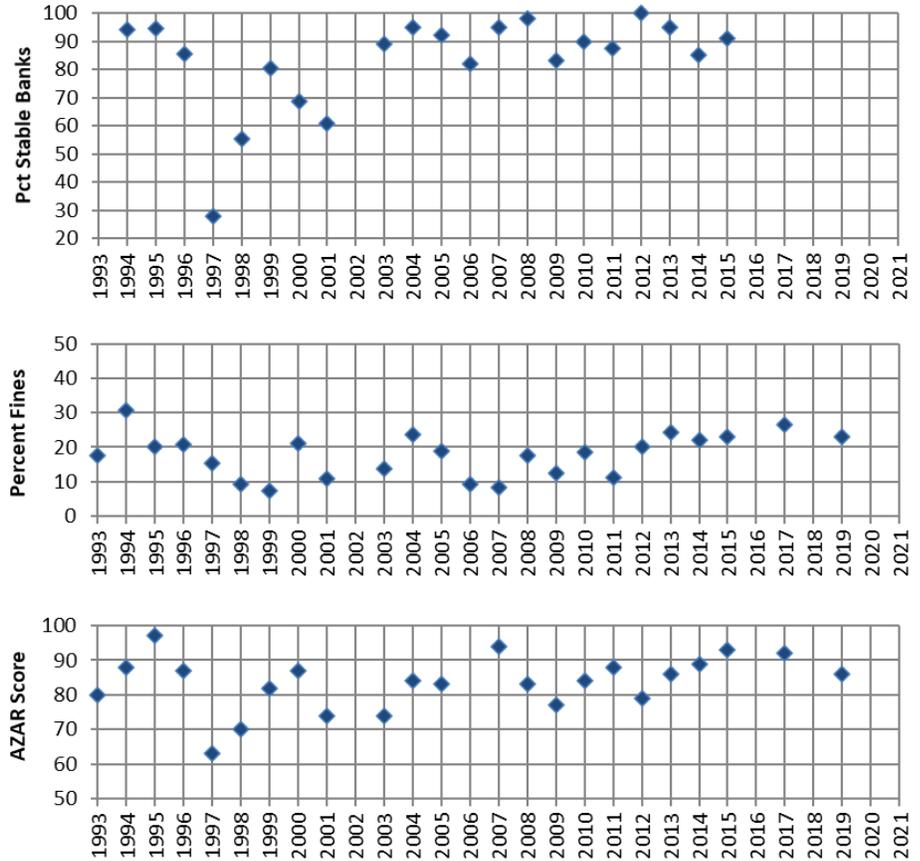
**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		17.6	80
1994	94.0	30.8	88
1995	94.5	20.0	97
1996	85.5	20.7	87
1997	28.0	15.4	63
1998	55.5	9.4	70
1999	80.5	7.5	82
2000	68.5	21.1	87
2001	61.0	11.0	74
2002			
2003	89.0	13.9	74
2004	95.0	23.6	84
2005	92.0	18.8	83
2006	82.0	9.2	
2007	95.0	8.2	94
2008	98.0	17.6	83
2009	83.0	12.5	77
2010	90.0	18.7	84
2011	87.5	11.1	88
2012	100	20.1	79
2013	95.0	24.4	86
2014	85.2	22.1	89
2015	91.0	23.1	93
2016			
2017		26.4	92
2018			
2019		23.1	86
2020			
2021			
<b>n</b>	21	24	23
<b>Mean</b>	83.3	17.8	83.5
<b>St Dev</b>	17.2	6.3	8.0
<b>n</b>	4	6	6
<b>Mean</b>	92.8	23.2	87.5
<b>St Dev</b>	6.3	2.1	5.1

**All**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	38.9	7.7	24.3	1.4	2-3	Gravel	C4b
2015	19.2	8.8	13.7	<1.2	2.0	Cobble	C3b
2017	17.5	2.5	14.3	1.1	2.0	Cobble	C3b
2019	20.4	1.8	13.5	<1.2	2.0	Gravel	C4b

**Reviewed Channel Type** **C4b**

**REMARKS**

This site has the most complete dataset of all sites. It is an important site for monitoring trends in the Upper North Fork area. High intensity of management occurs in this watershed.

**HULL CREEK 1A**

**Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	Hull Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	North Fork
<b>Site Location</b>	Site is located approximately 20 to 25 yards downstream of the Hull Creek culvert on the Hull Creek Road (FR005), 0.4 miles from Highway 93.		
<b>GPS Coordinates</b>	N 45.47007 (2022)	W -113.99830 (2022)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	13.2 sq mi 8,427 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	23 cfs	<b>Mean Annual Flow</b> (Streamstats)	9.4 cfs
<b>5th-level Watershed</b>	North Fork Salmon River / 1706020306				
<b>Mean Basin Elevation</b>	5820 ft	<b>Basin Aspect</b>	E	<b>Mean Basin Slope</b>	48%
<b>Length of Road</b>	148.7 mi	<b>Road Density</b>		11.29 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>	99.0%	
	<b>Volcanic</b>	0.7%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	0.3%	
<b>% of Watershed in Active Allotment</b>	99.3%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (8/31/2022)



View Downstream (8/31/2022)

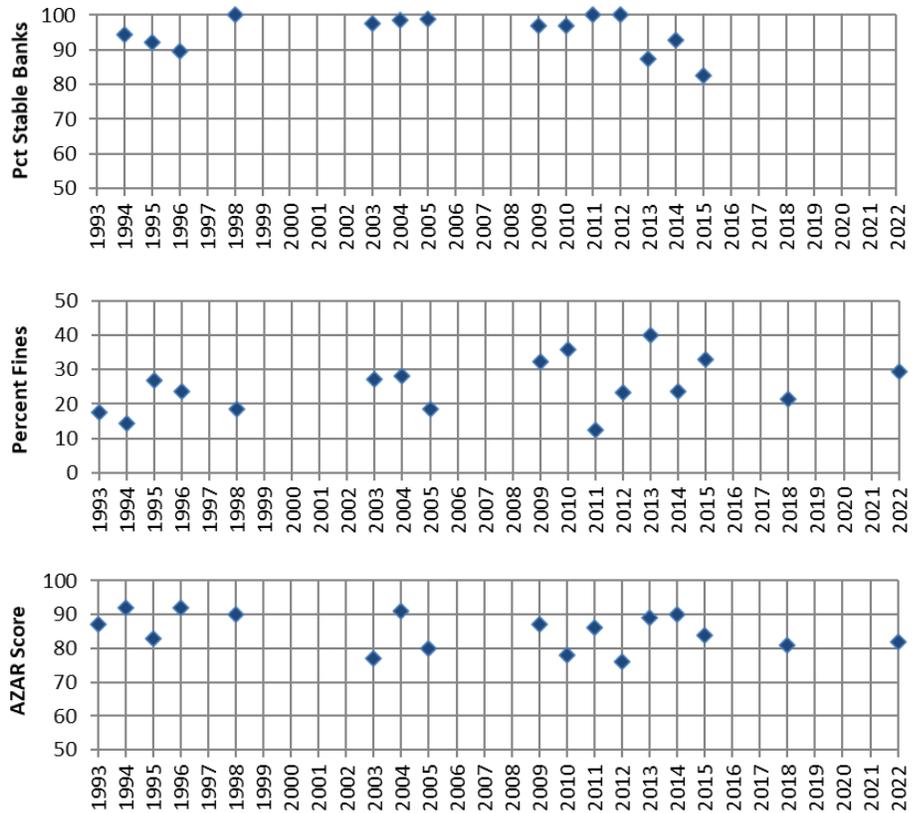
**HULL CREEK 1A**

**Last Year Sampled: 2022**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		17.6	87
1994	94.5	14.4	92
1995	92.0	26.8	83
1996	89.5	23.7	92
1997			
1998	100	18.6	90
1999			
2000			
2001			
2002			
2003	97.5	27.3	77
2004	98.5	28.2	91
2005	99.0	18.5	80
2006			
2007			
2008			
2009	97.0	32.4	87
2010	97.0	35.7	78
2011	100	12.5	86
2012	100	23.4	76
2013	87.5	40.1	89
2014	92.7	23.6	90
2015	82.5	32.9	84
2016			
2017			
2018		21.4	81
2019			
2020			
2021			
2022		29.3	82
2023			
n	14	17	17
Mean	94.8	25.1	85.0
St Dev	5.4	7.6	5.4
n	2	4	4
Mean	87.6	26.8	84.3
St Dev	7.2	5.3	4.0

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	9.9	4.8	6.6	1	2-4	Cobble	E4b
2015	10.7	2.8	11.9	< 1.2	3.3	Gravel	C4b
2018	10.5	6.7	10.6	1.5	2.0	Gravel	C4b

**Reviewed Channel Type**

**C4b**

**REMARKS**

This is a small, overgrown channel. Conditions are not ideal for core sampling because of the small channel and low flows. This site has been mistakenly labeled 1R in the past, but it should be 1A - resident digs versus anadromous digs may not be directly comparable. Increased depth fines in 2013 may have been the result of the 2012 Mustang Complex Fire.

**NORTH FORK SALMON RIVER 2A**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	North Fork Salmon River 2A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	North Fork
<b>Site Location</b>	Site is located along Highway 93, approximately 15 miles north of North Fork and 4 miles north of Gibbonsville, at large pullout.		
<b>GPS Coordinates</b>	N 45.59312 (2019)	W -113.96396 (2019)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	42.6 sq mi 27,262 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	251 cfs	<b>Mean Annual Flow</b> (Streamstats)	26.4 cfs
<b>5th-level Watershed</b>	North Fork Salmon River / 1706020306				
<b>Mean Basin Elevation</b>	6840 ft	<b>Basin Aspect</b>	S	<b>Mean Basin Slope</b>	44%
<b>Length of Road</b>	46.2 mi	<b>Road Density</b>		1.08 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	24.5%	<b>Quartzite</b>	70.3%	
	<b>Volcanic</b>	0.9%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	4.2%	
<b>% of Watershed in Active Allotment</b>	0%	<b>% of Watershed Burned (2018-2022)</b>		0.2%	

**SITE PHOTOS**



View Upstream (2019)



View Downstream (2019)



**NORTH FORK SALMON RIVER 3A**

**Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	NF Salmon River 3A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	North Fork
<b>Site Location</b>	Site is located along Highway 93, approximately 16 miles north of North Fork and 0.4 miles north of the Twin Creek Road.		
<b>GPS Coordinates</b>	N 45.61332 (2022)	W -113.96619 (2022)	
<b>Site Comments</b>	Site is located in a glide adjacent to an eroding rock face. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	23.3 sq mi 14,896 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	147 cfs	<b>Mean Annual Flow</b> (Streamstats)	14.2 cfs
<b>5th-level Watershed</b>	North Fork Salmon River / 1706020306				
<b>Mean Basin Elevation</b>	6746 ft	<b>Basin Aspect</b>	S	<b>Mean Basin Slope</b>	43%
<b>Length of Road</b>	27.6 mi	<b>Road Density</b>		1.18 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	41.2%	<b>Quartzite</b>	50.8%	
	<b>Volcanic</b>	1.6%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	6.4%	
<b>% of Watershed in Active Allotment</b>	0%	<b>% of Watershed Burned (2018-2022)</b>		0.4%	

**SITE PHOTOS**



View Upstream (9/1/2022)



View Downstream (9/1/2022)

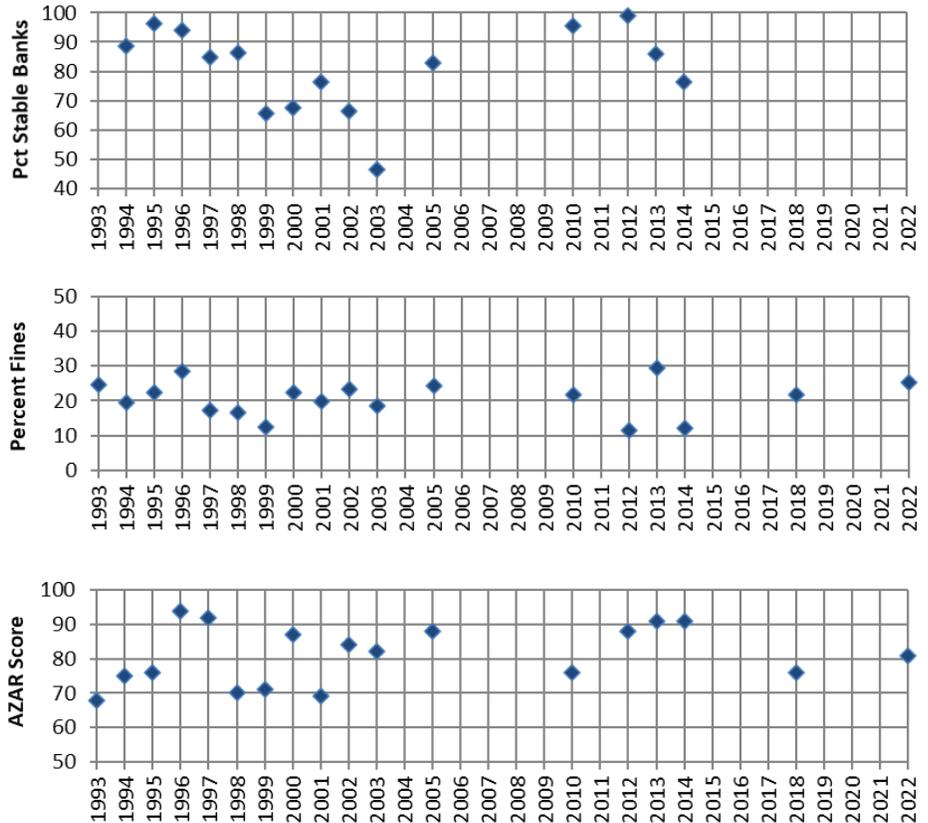
**NORTH FORK SALMON RIVER 3A**

**Last Year Sampled: 2022**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		24.6	68
1994	88.5	19.5	75
1995	96.5	22.5	76
1996	94.0	28.4	94
1997	85.0	17.2	92
1998	86.5	16.5	70
1999	65.5	12.5	71
2000	67.5	22.3	87
2001	76.5	19.8	69
2002	66.5	23.2	84
2003	46.5	18.4	82
2004			
2005	83.0	24.3	88
2006			
2007			
2008			
2009			
2010	95.5	21.9	76
2011			
2012	99.0	11.5	88
2013	86.1	29.5	91
2014	76.5	12.3	91
2015			
2016			
2017			
2018		21.6	76
2019			
2020			
2021			
2022		25.2	81
n	15	18	18
Mean	80.9	20.6	81.1
St Dev	14.5	5.2	8.7
n	1	3	3
Mean	76.5	19.7	82.7
St Dev	N/A	6.7	7.6

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	29.5	10.2	13.4	1.2	2	Cob/Grav	C4b
2018	33.0	1.4	27.5	<1.2	0.5-2.0	Cobble	B4c

<b>Reviewed Channel Type</b>	<b>B4c</b>
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**REMARKS**

Along with the North Fork Salmon River 2A monitoring site, this site is also important for monitoring conditions and trends during and following implementation of the Upper North Fork project. Fines have been consistently below 30%.

**NORTH FORK SALMON RIVER 4A**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	NF Salmon River 4A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	North Fork
<b>Site Location</b>	Site is located along Hwy 93, just north of Moose Creek Estates, and about 150 yards upstream of the large culvert at the highway crossing on a sharp bend.		
<b>GPS Coordinates</b>	N 45.66155 (2020)	W -113.97906 (2020)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	4.9 sq mi 3,120 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	51 cfs	<b>Mean Annual Flow</b> (Streamstats)	3.0 cfs
<b>5th-level Watershed</b>	North Fork Salmon River/ 1706020306				
<b>Mean Basin Elevation</b>	7248 ft	<b>Basin Aspect</b>	S	<b>Mean Basin Slope</b>	42%
<b>Length of Road</b>	2.2 mi	<b>Road Density</b>		0.44 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	86.0%	<b>Quartzite</b>	6.1%	
	<b>Volcanic</b>	7.8%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0.1%	
<b>% of Watershed in Active Allotment</b>	0%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2020)



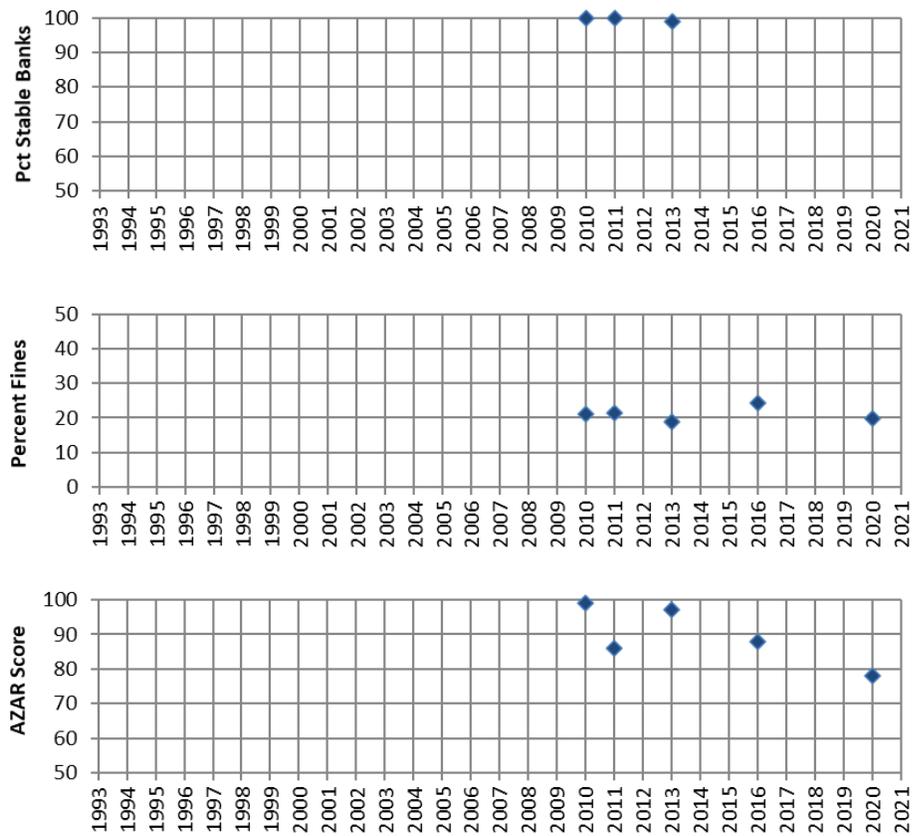
View Downstream (2020)

**NORTH FORK SALMON RIVER 4A**

**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009			
2010	100	21.2	99
2011	100	21.3	86
2012			
2013	99.0	18.8	97
2014			
2015			
2016		24.2	88
2017			
2018			
2019			
2020		19.7	78
2021			
2022			
2023			
n	3	5	5
Mean	99.7	21.0	89.6
St Dev	0.6	2.1	8.6
n	0	2	2
Mean	N/A	22.0	83.0
St Dev	N/A	3.2	7.1



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2016	15.7	1.5	30.4	1.5	4-5	Cobble	C3b
2020	18.8	14.3	13.9	1.2-1.5	3.0	Gravel	C4b

**Reviewed Channel Type** **C4b**

**10YR ALL**

**REMARKS**

This is a small, steep stream with limited data showing consistently low fines and high bank stability. This site may serve as an indicator of conditions during and following implementation of the Upper North Fork project, but high gradient may be the primary factor limiting accumulation of fines. Site watershed edited 11/30/16 to reflect actual location of sampling site (drainage area corrected from 3135 acres to 3117 acres).

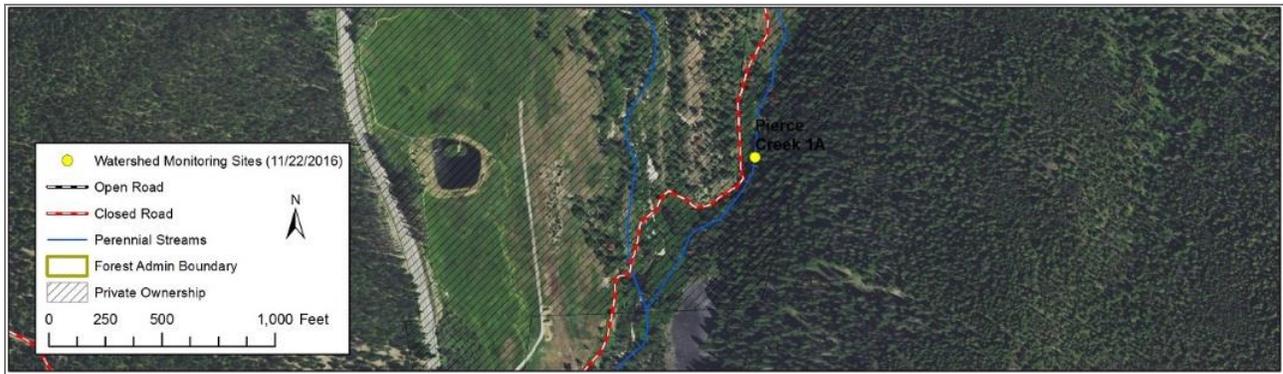
**PIERCE CREEK 1A**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Pierce Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	North Fork
<b>Site Location</b>	Site is located a short distance upstream of the mouth of Pierce Creek at the NF Salmon River.		
<b>GPS Coordinates</b>	N 45.62221 (2023)	W -113.96200 (2023)	
<b>Site Comments</b>	Site is on private property. Contact Moose Creek Homeowners Association for access. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	7.7 sq mi 4,934 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	50 cfs	<b>Mean Annual Flow</b> (Streamstats)	5.1 cfs
<b>5th-level Watershed</b>	North Fork Salmon River / 1706020306				
<b>Mean Basin Elevation</b>	6537 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	45%
<b>Length of Road</b>	7.0 mi	<b>Road Density</b>		0.91 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>	94.4%	
	<b>Volcanic</b>	0.0%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	5.6%	
<b>% of Watershed in Active Allotment</b>	0%	<b>% of Watershed Burned (2018-2022)</b>		1.1%	

**SITE PHOTOS**



**View Upstream (2023)**



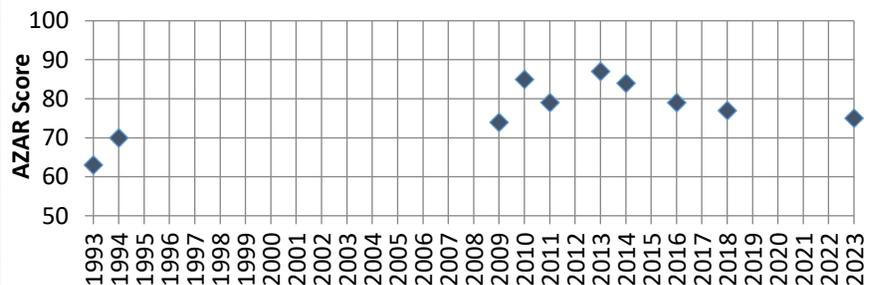
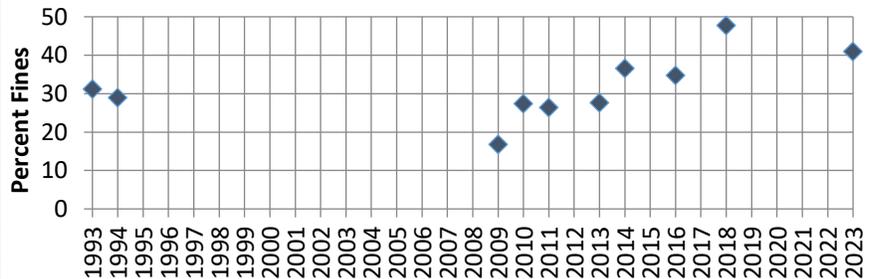
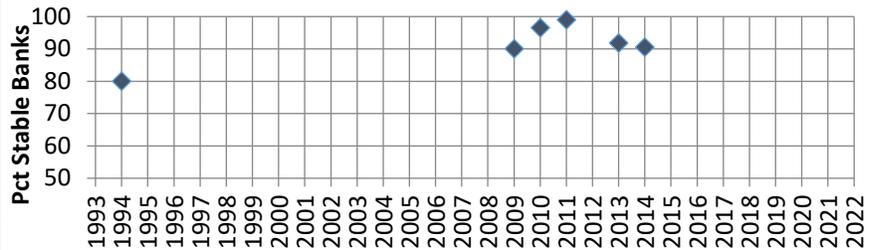
**View Downstream (2023)**

**PIERCE CREEK 1A**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		31.2	63
1994	80.0	29.0	70
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009	90.0	16.8	74
2010	96.5	27.4	85
2011	99.0	26.4	79
2012			
2013	91.8	27.7	87
2014	90.5	36.6	84
2015			
2016		34.8	79
2017			
2018		47.8	77
2019			
2020			
2021			
2022			
2023		41	75
n	6	10	10
Mean	91.3	31.9	77.3
St Dev	6.6	8.6	7.3
n	1	4	4
Mean	90.5	40.1	78.8
St Dev	N/A	5.8	3.9



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2016	10.4	7.1	23.1	1.2	<2	Gravel	C4
2018	10.7	4.8	12.3	1.2-1.5	1.5	Gravel	C4

**10YR ALL**

<b>Reviewed Channel Type</b>	<b>C4</b>
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**REMARKS**

This site has shown a recent increasing trend in fines, with fines greater than 40%. The cause of the increasing trend in depth fines is unknown, but may be related to beaver activity. The site was moved upstream in 2016 because a beaver dam was located at the original site (last sampled 2014). Observations in 2016 and 2018 indicated beaver dams downstream of the core site. The extent to which beaver activity is causing aggradation at this site will be investigated during the next site visit, as well as any evidence of increased fine sediment load from the watershed. 2023 noted stream bank erosion upstream of the sample site.

**SHEEP CREEK 1A**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Sheep Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	North Fork
<b>Site Location</b>	Site is located approximately 1.5 miles upstream of the mouth of Sheep Creek at NF Salmon River. Access is via the Sheep Creek Road (FR077), 1.7 miles from Highway 93. The site is upstream of the large culvert.		
<b>GPS Coordinates</b>	N 45.49832 (2020)	W -113.92426 (2020)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	33.7 sq mi 21,595 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	135 cfs	<b>Mean Annual Flow</b> (Streamstats)	25.8 cfs
<b>5th-level Watershed</b>	North Fork Salmon River / 1706020306				
<b>Mean Basin Elevation</b>	6964 ft	<b>Basin Aspect</b>	W	<b>Mean Basin Slope</b>	52%
<b>Length of Road</b>	14.8 mi	<b>Road Density</b>	0.44 mi/sq mi		
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	99.2%	
	<b>Volcanic</b>	0.3%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0.4%	
<b>% of Watershed in Active Allotment</b>	0%	<b>% of Watershed Burned (2018-2022)</b>	0.0%		

**SITE PHOTOS**



**View Upstream (2020)**



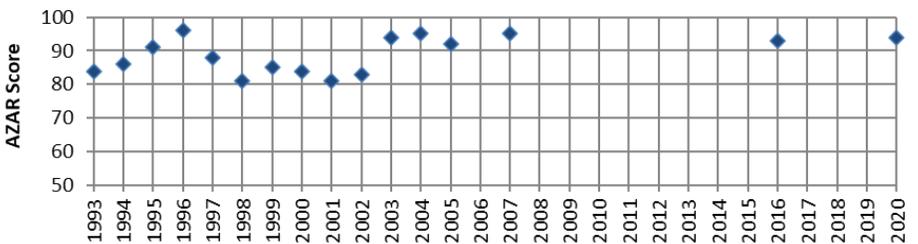
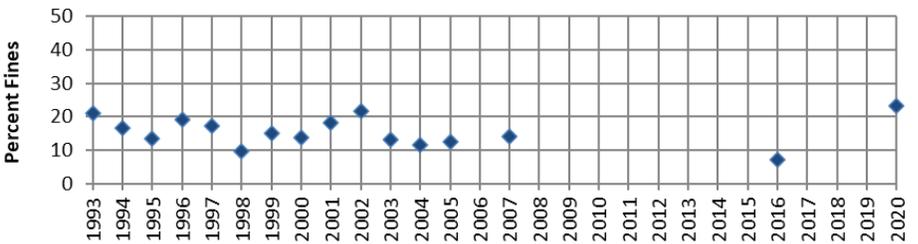
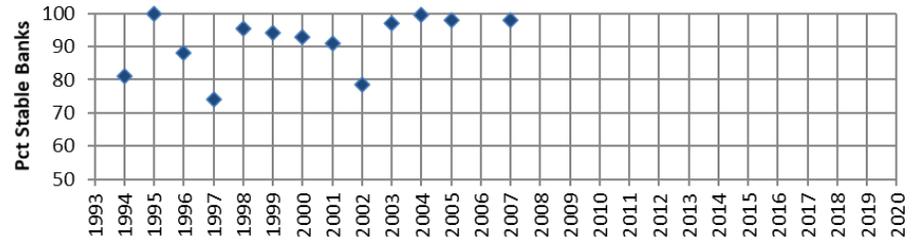
**View Downstream (2020)**

**SHEEP CREEK 1A**

**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		21.0	84
1994	81.0	16.5	86
1995	100	13.5	91
1996	88.0	19.1	96
1997	74.0	17.2	88
1998	95.5	9.7	81
1999	94.0	15.0	85
2000	93.0	13.8	84
2001	91.0	18.3	81
2002	78.5	21.6	83
2003	97.0	13.0	94
2004	99.5	11.7	95
2005	98.0	12.5	92
2006			
2007	98.0	14.1	95
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015			
2016		7.0	93
2017			
2018			
2019			
2020		23.2	94
2021			
2022			
2023			
n	13	16	16
Mean	91.3	15.5	88.9
St Dev	8.5	4.4	5.4
n	0	2	2
Mean	N/A	15.1	93.5
St Dev	N/A	11.5	0.7



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	22.0	3.3	12.9	1.4	1+	Gravel	C4
2016	24.7	1.6	25.7	1.1-1.2	2-3	Cobble	C3b
2020	21.7	4.8	16.1	<1.2	4	Cobble	C3b

**10YR ALL**

**Reviewed Channel Type C3b**

**REMARKS**

This site has shown consistently low fines. The site location should be assessed to ensure that sediment deposition is not affected by the culvert.

**TWIN CREEK 1A**

**Last Year Sampled: 2021**

**SITE INFO**

<b>Site Name</b>	Twin Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	North Fork
<b>Site Location</b>	Site is located near the mouth of Twin Creek, just upstream of Highway 93. Access is via the first jeep trail spur off the Twin Creek Road (FR156).		
<b>GPS Coordinates</b>	N 45.60802 (2021)	W -113.96703 (2021)	
<b>Site Comments</b>	Steep gradient, multiple cascades. Frequented by campers. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	11.9 sq mi 7,626 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	67 cfs	<b>Mean Annual Flow</b> (Streamstats)	8 cfs
<b>5th-level Watershed</b>	North Fork Salmon River / 1706020306				
<b>Mean Basin Elevation</b>	7255 ft	<b>Basin Aspect</b>	E	<b>Mean Basin Slope</b>	46%
<b>Length of Road</b>	6.8 mi	<b>Road Density</b>		0.57 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	2.9%	<b>Quartzite</b>	95.7%	
	<b>Volcanic</b>	0.0%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	1.3%	
<b>% of Watershed in Active Allotment</b>	0%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (7/22/2021)



View Downstream (7/22/2021)

**TWIN CREEK 1A**

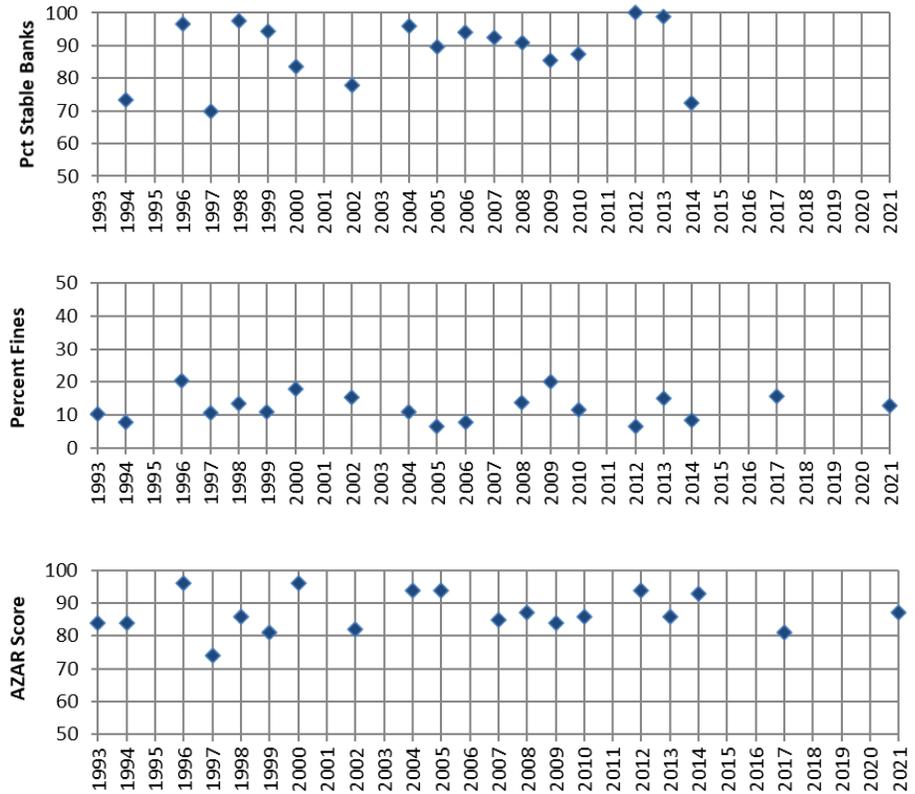
**Last Year Sampled: 2021**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		10.4	84
1994	73.5	7.9	84
1995			
1996	96.5	20.3	96
1997	70.0	10.6	74
1998	97.5	13.6	86
1999	94.5	10.9	81
2000	83.5	18.0	96
2001			
2002	78.0	15.3	82
2003			
2004	96.0	10.9	94
2005	89.5	6.6	94
2006	94.0	7.8	
2007	92.5		85
2008	91.0	13.9	87
2009	85.5	20.0	84
2010	87.5	11.7	86
2011			
2012	100	6.5	94
2013	99.0	14.9	86
2014	72.3	8.4	93
2015			
2016			
2017		15.8	81
2018			
2019			
2020			
2021		12.8	87
2022			
2023			
n	17	19	19
Mean	88.3	12.4	87.1
St Dev	9.7	4.2	6.0
n	1.0	3.0	3.0
Mean	72.3	12.3	87.0
St Dev	N/A	3.7	6.0

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	22.8	4.4	17.5	1.3	4	Gravel	C4b
2017	23.7	7.1	18.5	1.3	2.5	Gravel	C4b

**Reviewed Channel Type** **C4b**

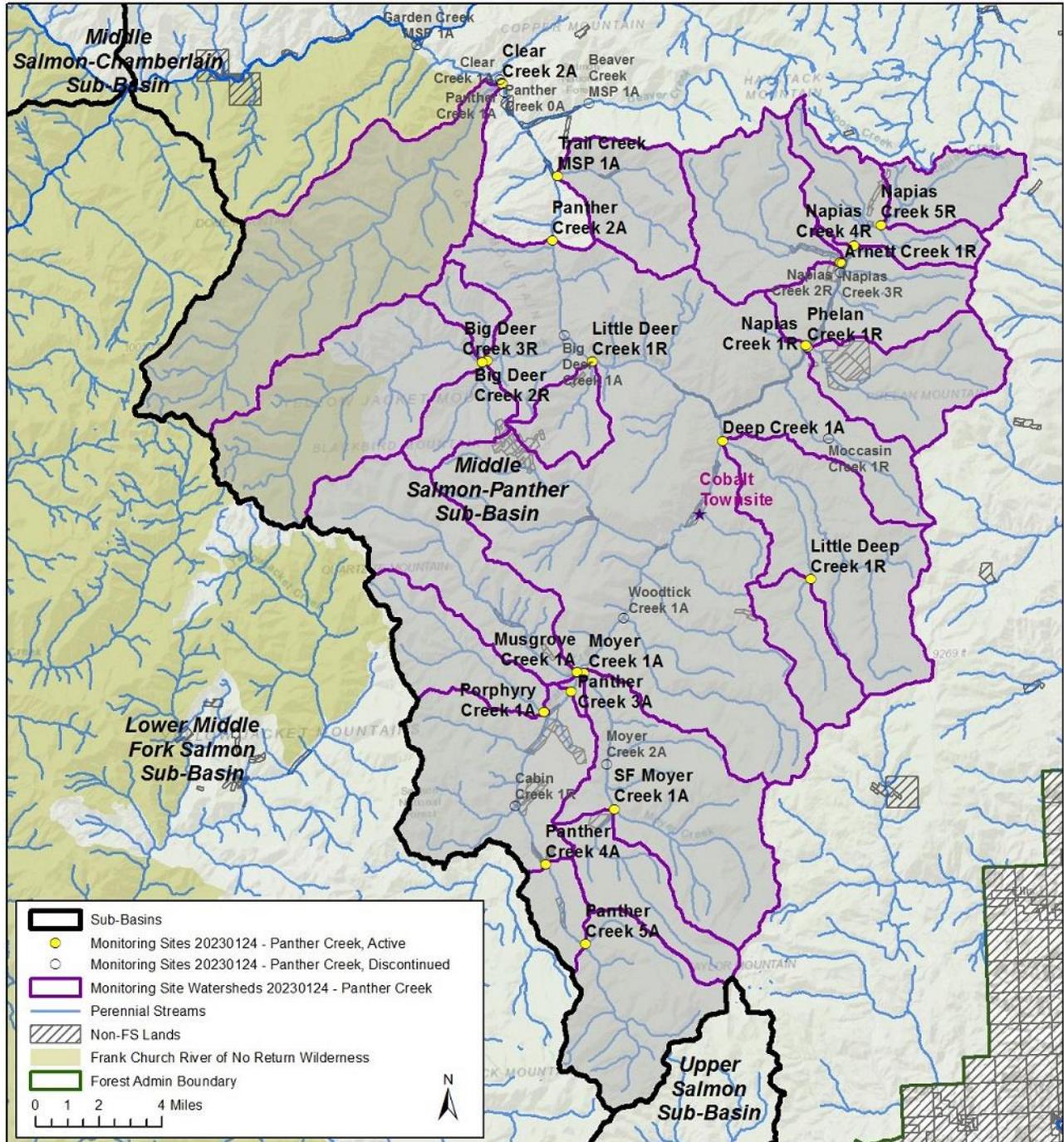
**REMARKS**

This is a steep channel, and spawning habitat may be limited. Depth fines have been consistently low (less than 20%). Dispersed camping areas may have some impact on conditions at this site. This site may serve as an indicator of conditions during and following implementation of the Upper North Fork project, but high gradient is likely to limit deposition of fines. Note: 2021 depth fines sample may slightly underestimate fines because of torn #270 sieve.



## Panther Creek Watershed

A total of 20 active monitoring sites are located in the Panther Creek Watershed.



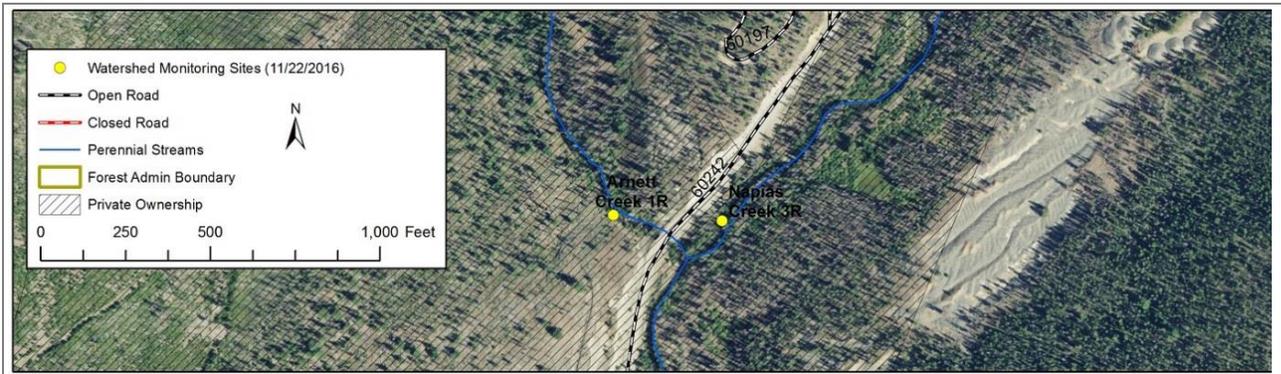
**ARNETT CREEK 1R**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Arnett Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located a short distance upstream of the mouth of Arnett Cr. at Napias Cr. Site is just upstream of FR242 bridge, approx. 1.5 miles south of Leesburg.		
<b>GPS Coordinates</b>	N 45.20626 (2023)	W -114.13489 (2023)	
<b>Site Comments</b>	Site is located on Meridian property. Permission may be needed to access site. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	18.8 sq mi 12,051 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	89 cfs	<b>Mean Annual Flow</b> (Streamstats)	6.2 cfs
<b>5th-level Watershed</b>	Napias Creek / 1706020310				
<b>Mean Basin Elevation</b>	7581 ft	<b>Basin Aspect</b>	SE	<b>Mean Basin Slope</b>	26%
<b>Length of Road</b>	40.0 mi	<b>Road Density</b>		2.12 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	20.0%	<b>Quartzite</b>	77.3%	
	<b>Volcanic</b>	0%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	2.7%	
<b>% of Watershed in Active Allotment</b>	98.0%	<b>% of Watershed Burned (2018-2022)</b>		57%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

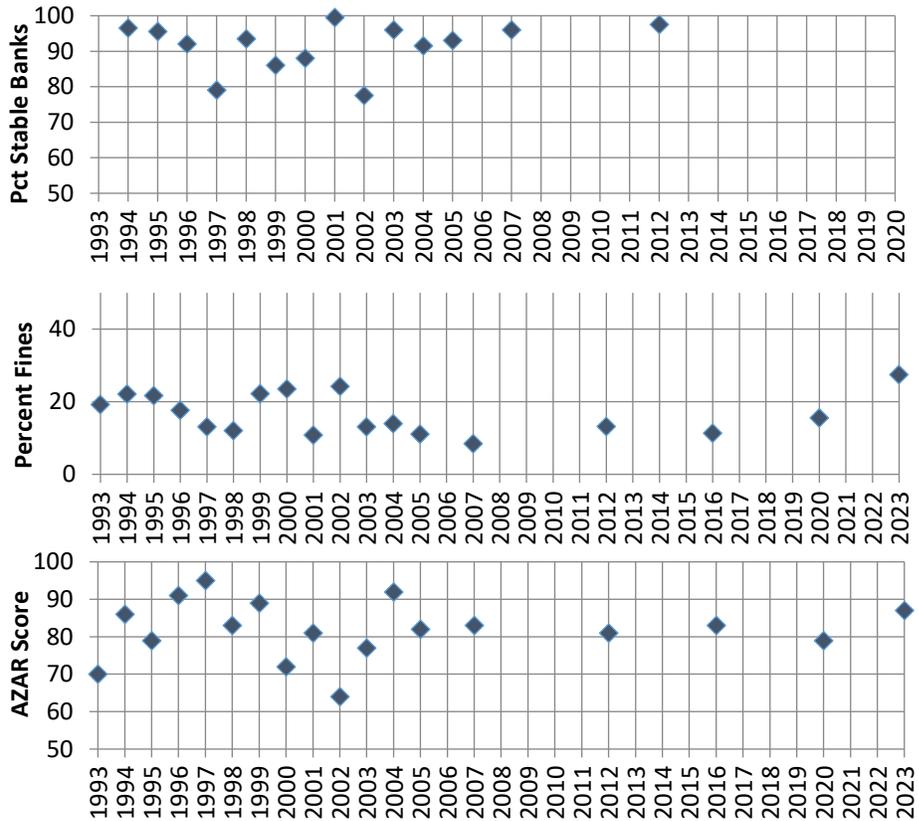
**ARNETT CREEK 1R**

**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable	Percent Fines	AZAR Score
1993		19.2	70
1994	96.5	22.1	86
1995	95.5	21.7	79
1996	92.0	17.6	91
1997	79.0	13.1	95
1998	93.5	12.0	83
1999	86.0	22.2	89
2000	88.0	23.5	72
2001	99.5	10.8	81
2002	77.5	24.2	64
2003	96.0	13.1	77
2004	91.5	14.0	92
2005	93.0	11.1	82
2006			
2007	96.0	8.4	83
2008			
2009			
2010			
2011			
2012	97.5	13.2	81
2013			
2014			
2015			
2016		11.3	83
2017			
2018			
2019			
2020		15.5	79
2021			
2022			
2023		27.5	87
<b>n</b>	14	18	18
<b>Mean</b>	91.5	16.7	81.9
<b>St Dev</b>	6.7	5.7	7.9
<b>n</b>	0	3	3
<b>Mean</b>	N/A	18.1	83.0
<b>St Dev</b>	N/A	8.4	4.0

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Channel gradient (%)	Sinuosity	Substrate	Channel Type
1998	23.5	3.5	16.8	0-1	1.0	Cob/grav	C4
2016	21.8	1.7	24.2	3	1.2	Cobble	B3
2020	22.3	3.2	17.8	3	<1.2	Cobble	C3b

**Reviewed Channel Type** **B3**

**REMARKS**

This site has shown consistently low fines (less than 25%). 2016 notes indicated questionable site suitability and possibly lack of spawning habitat, 2020 notes indicated that few pools exist. 2023 shows an increase in fines which can likely be attributed to the high intensity burns in the drainage from the 2022 Moose Fire.

**BIG DEER CREEK 2R**

**Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	Big Deer Creek 2R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	NF/Salmon-Cobalt
<b>Site Location</b>	Site is located approximately 2.8 miles upstream of the mouth of Big Deer Creek, just downstream of the confluence with SF Big Deer Creek. Access is via the Bucktail Road (FR1031) through Blackbird Mine. Site is a short distance upstream of the road ford.		
<b>GPS Coordinates</b>	N 45.16654 (2022)	W -114.36654 (2022)	
<b>Site Comments</b>	Access through Blackbird Mine – permission may be needed. 43% of watershed in Wilderness. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	42.2 sq mi 26,993 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	214 cfs	<b>Mean Annual Flow</b> (Streamstats)	29.1 cfs
<b>5th-level Watershed</b>	Middle Panther Creek / 1706020311				
<b>Mean Basin Elevation</b>	7356 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	48%
<b>Length of Road</b>	16.6 mi	<b>Road Density</b>		0.39 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	34.0%	<b>Quartzite</b>		62.9%
	<b>Volcanic</b>	0%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		3.1%
<b>% of Watershed in Active Allotment</b>	0%	<b>% of Watershed Burned (2018-2022)</b>		61.1%	

**SITE PHOTOS**



**View Upstream (9/15/2022)**



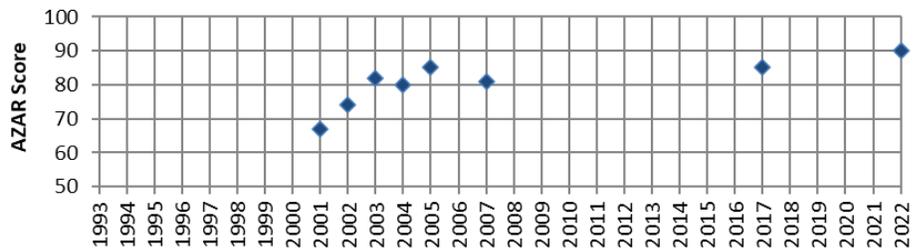
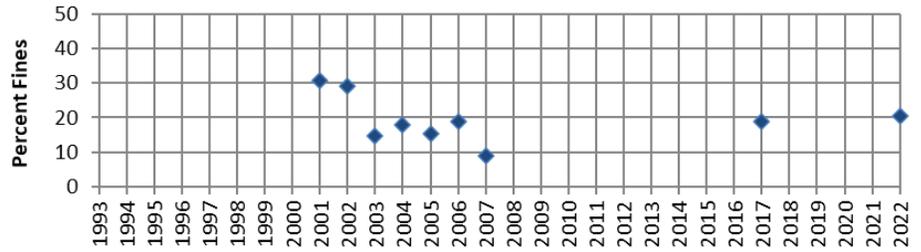
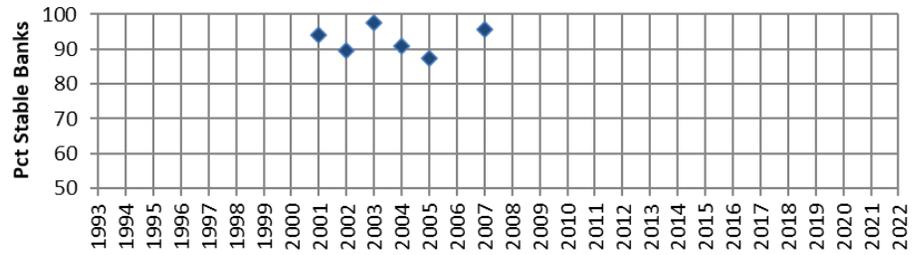
**View Downstream (9/15/2022)**

**BIG DEER CREEK 2R**

**Last Year Sampled: 2022**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001	94.0	30.7	67
2002	89.5	29.0	74
2003	97.5	14.8	82
2004	91.0	17.8	80
2005	87.5	15.5	85
2006		18.9	
2007	95.5	9.1	81
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015			
2016			
2017		18.8	85
2018			
2019			
2020			
2021			
2022		20.4	90
2023			
n	6	9	8
Mean	92.5	19.4	80.5
St Dev	3.8	6.8	7.2
n	0	2	2
Mean	-	19.6	87.5
St Dev	-	1.1	3.5



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2001	59	-	31.5	-	1	VC Gravel	C4
2017	21.9	5.5	12.2	1.3	1.5	Gravel	C4

<b>Reviewed Channel Type</b>	<b>C4</b>
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**10YR ALL**

**REMARKS**

This site represents the best monitoring location for potential impacts related to mineral development at Blackbird Mine and Idaho Cobalt Mine. Additional baseline data would be useful, as additional mining activity is under way. Sampling may need to occur more frequently depending on mining activity. A portion of this watershed burned in the 2021 Mudlick Fire.

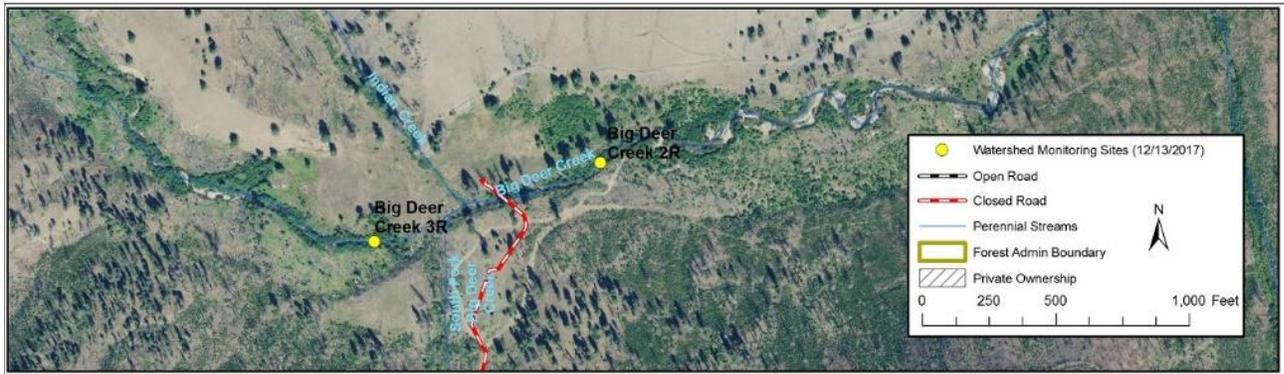
**BIG DEER CREEK 3R**

**Last Year Sampled: 2017**

**SITE INFO**

<b>Site Name</b>	Big Deer Creek 3R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	NF/Salmon-Cobalt
<b>Site Location</b>	Site is located 3 miles upstream of the mouth of Big Deer Creek, just upstream of SF Big Deer Creek. Access is via the Bucktail Road (FR1031) through Blackbird Mine.		
<b>GPS Coordinates</b>	N 45.16580 (2017)	W -114.36996 (2017)	
<b>Site Comments</b>	Access through Blackbird Mine – permission may be needed. 57% of watershed in Wilderness. 2017 survey indicated site not ideal because of safety risks assoc. with snags, logjams, and dams. 10-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	31.7 sq mi 20,295 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	186 cfs	<b>Mean Annual Flow</b> (Streamstats)	22 cfs
<b>5th-level Watershed</b>	Middle Panther Creek / 1706020311				
<b>Mean Basin Elevation</b>	7435 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	48%
<b>Length of Road</b>	1.1 mi	<b>Road Density</b>		0.03 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	41.4%	<b>Quartzite</b>		54.5%
	<b>Volcanic</b>	0%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		4.1%
<b>% of Watershed in Active Allotment</b>	0%	<b>% of Watershed Burned (2018-2022)</b>		59.6%	

**SITE PHOTOS**



**View Upstream (2017)**



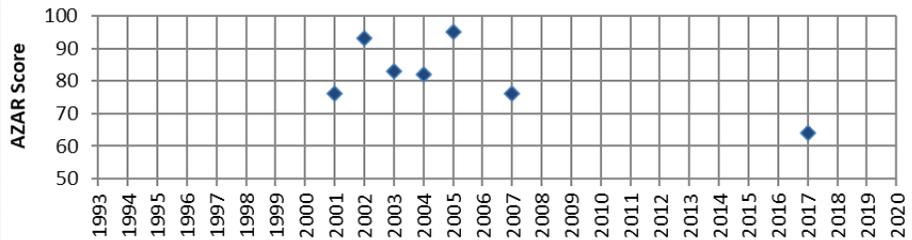
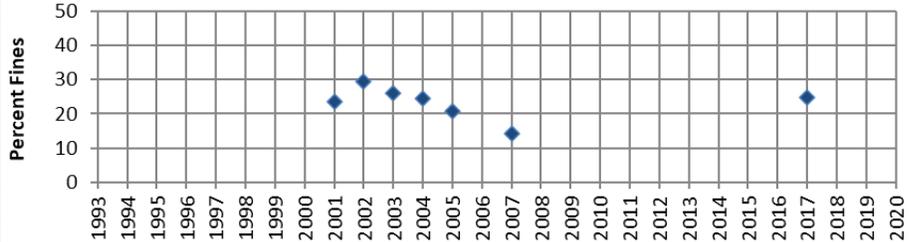
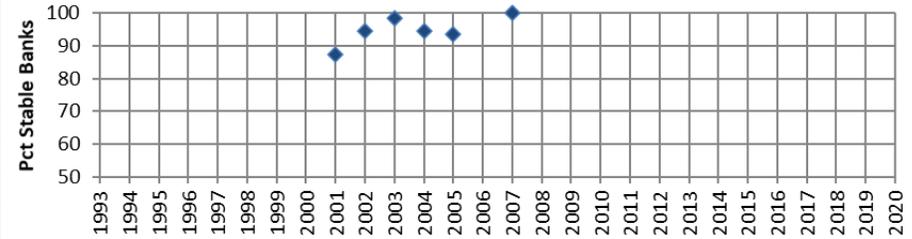
**View Downstream (2017)**

**BIG DEER CREEK 3R**

**Last Year Sampled: 2017**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001	87.5	23.5	76
2002	94.5	29.6	93
2003	98.5	26.1	83
2004	94.5	24.5	82
2005	93.5	20.9	95
2006			
2007	100	14.2	76
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015			
2016			
2017		24.7	64
2018			
2019			
2020			
2021			
2022			
2023			
n	6	7	7
Mean	94.8	23.4	81.3
St Dev	4.4	4.8	10.7
n	0	1	1
Mean	-	24.7	64.0
St Dev	-	-	-



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2001	37	-	32.9	-	1	Gravel	C4
2017	-	-	-	-	-	-	C4

**10YR ALL**

<b>Reviewed Channel Type</b>	<b>C4</b>
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**REMARKS**

This site is only a short distance upstream of Big Deer Creek 2R, but upstream of SF Big Deer Creek where the majority of mining impacts come into the system. As the channel type is similar to that of the Big Deer Creek 2R site, this site could provide a good comparison for measuring any impacts of mining. Existing channel type data are incomplete and need to be verified. Sampling should occur as needed to compare to Big Deer Creek 2R.

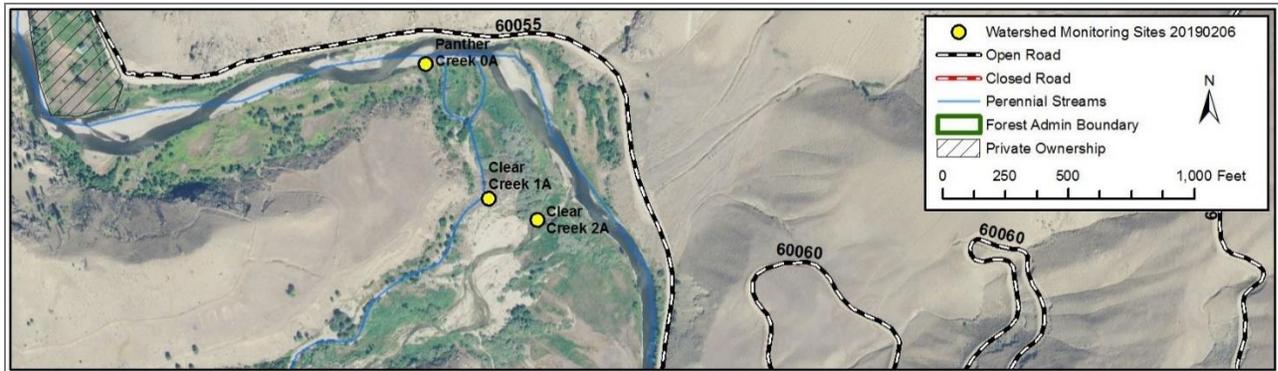
**CLEAR CREEK 2A**

**Last Year Sampled: 2018**

**SITE INFO**

<b>Site Name</b>	Clear Creek 2A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	North Fork
<b>Site Location</b>	Site is near mouth of Clear Creek at Panther Creek. Accessed by driving approx. 3.5 miles up the Panther Creek Road (FR055) from the Salmon River Road to the Clear Creek Trailhead. Access is by wading across Panther Creek.		
<b>GPS Coordinates</b>	N 45.29368 (2018)	W -114.35042 (2018)	
<b>Site Comments</b>	New channel formed following post-fire flooding (2001-2002). Site is upstream of the old Clear Creek 1A site. 100% of watershed in Wilderness. 10-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	50.5 sq mi 32,304 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	279 cfs	<b>Mean Annual Flow</b> (Streamstats)	40.2 cfs
<b>5th-level Watershed</b>	Lower Panther Creek / 1706020312				
<b>Mean Basin Elevation</b>	6890 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	54%
<b>Length of Road</b>	0.0 mi	<b>Road Density</b>		0.0 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	53.5%	<b>Quartzite</b>		42.4%
	<b>Volcanic</b>	0%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		4.1%
<b>% of Watershed in Active Allotment</b>	0%	<b>% of Watershed Burned (2018-2022)</b>		0.3%	

**SITE PHOTOS**



**View Upstream (2018)**



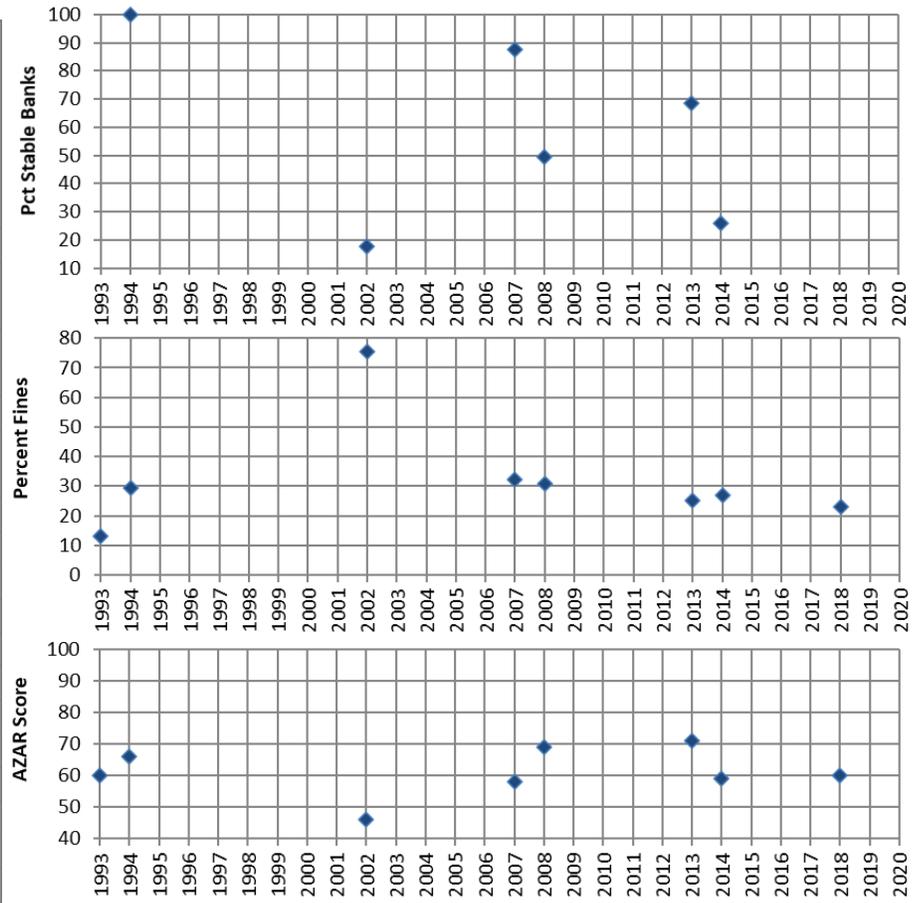
**View Downstream (2018)**

**CLEAR CREEK 2A**

**Last Year Sampled: 2018**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		13.1	60
1994	100	29.5	66
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002	17.5	75.3	46
2003			
2004			
2005			
2006			
2007	87.5	32.1	58
2008	49.5	30.8	69
2009			
2010			
2011			
2012			
2013	68.5	25.0	71
2014	26.0	26.8	59
2015			
2016			
2017			
2018		23.1	60
2019			
2020			
2021			
n	6	8	8
Mean	58.2	32.0	61.1
St Dev	33.1	18.5	7.8
n	1	2	2
Mean	26.0	25.0	59.5
St Dev	N/A	2.6	0.7



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
Pre-2001	-	-	-	-	-	-	C4
2018	59.0	4.6	72.0	1.2-1.5	1	Gravel	C4

**Reviewed Channel Type** **C4**

**10YR ALL**

**REMARKS**

This site replaces the Clear Creek 1A site, which was altered following post-fire flood events from the 2000 Clear Creek Fire. This site is located on the alluvial fan of Clear Creek. High depth fines and low bank stability were recorded at this site in 2002 following post-fire flooding from the Clear Creek Fire. Depth fines returned to baseline within several years, but channel continues to be dynamic with limited riparian vegetation on banks. Little management occurs in the watershed.

**DEEP CREEK 1A**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Deep Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located near the mouth of Deep Creek at Panther Creek, near the intersection of FR101 (Deep Creek Road) and FR055 (Panther Creek Road), and just upstream of the Panther Creek Road bridge.		
<b>GPS Coordinates</b>	N 45.12593 (2023)	W -114.21537 (2023)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



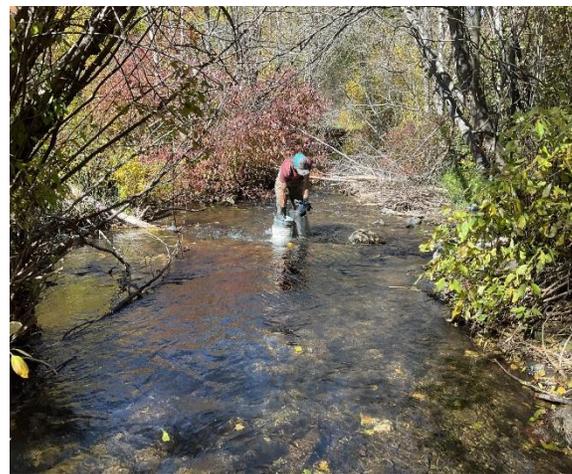
**BASIN DATA**

<b>Drainage Area at Site</b>	37.2 sq mi 23,811 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	145 cfs	<b>Mean Annual Flow</b> (Streamstats)	18 cfs
<b>5th-level Watershed</b>	Middle Panther Creek / 1706020311				
<b>Mean Basin Elevation</b>	7321 ft	<b>Basin Aspect</b>	NW	<b>Mean Basin Slope</b>	36%
<b>Length of Road</b>	95.4 mi	<b>Road Density</b>		2.56 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.4%	<b>Quartzite</b>	95.8%	
	<b>Volcanic</b>	3.6%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0.2%	
<b>% of Watershed in Active Allotment</b>	99.8%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

**DEEP CREEK 1A**

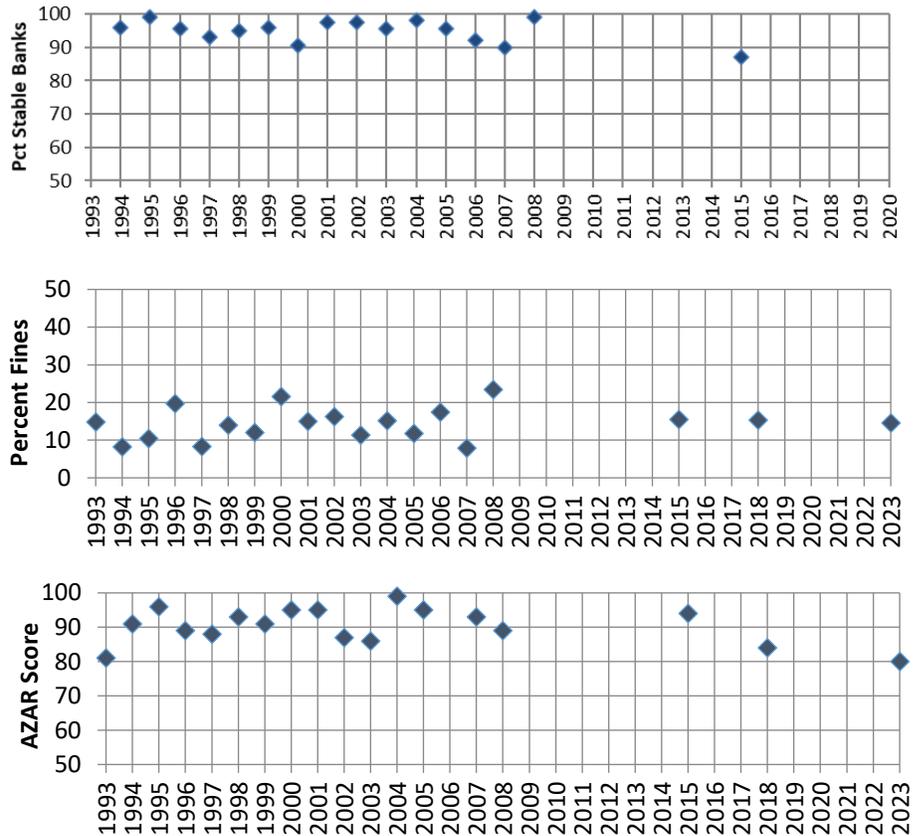
**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		14.8	81
1994	96.0	8.2	91
1995	99.0	10.4	96
1996	95.5	19.7	89
1997	93.0	8.3	88
1998	95.0	13.9	93
1999	96.0	12.0	91
2000	90.5	21.5	95
2001	97.5	14.9	95
2002	97.5	16.2	87
2003	95.5	11.3	86
2004	98.0	15.1	99
2005	95.5	11.7	95
2006	92.0	17.4	
2007	90.0	7.8	93
2008	99.0	23.4	89
2009			
2010			
2011			
2012			
2013			
2014			
2015	87.0	15.4	94
2016			
2017			
2018		15.3	84
2019			
2020			
2021			
2022			
2023		14.5	80
n	16	19	18
Mean	94.8	14.3	90.3
St Dev	3.4	4.3	5.3
n	1	3	3
Mean	87.0	15.1	86.0
St Dev	-	0.5	7.2

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	25	3.9	14.7	1	3-4	Grav/cob	B4
2015	16.4	1.8	16.9	1.3	1.0	Cobble	B3c
2018	19.8	1.8	14.1	<1.2	3	Cobble	F3b

<b>Reviewed Channel Type</b>	<b>F3b</b>
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**REMARKS**

This site has consistently low fines with the past ten years showing around 15% fines and high bank stability. Riffle morphology with few pools.

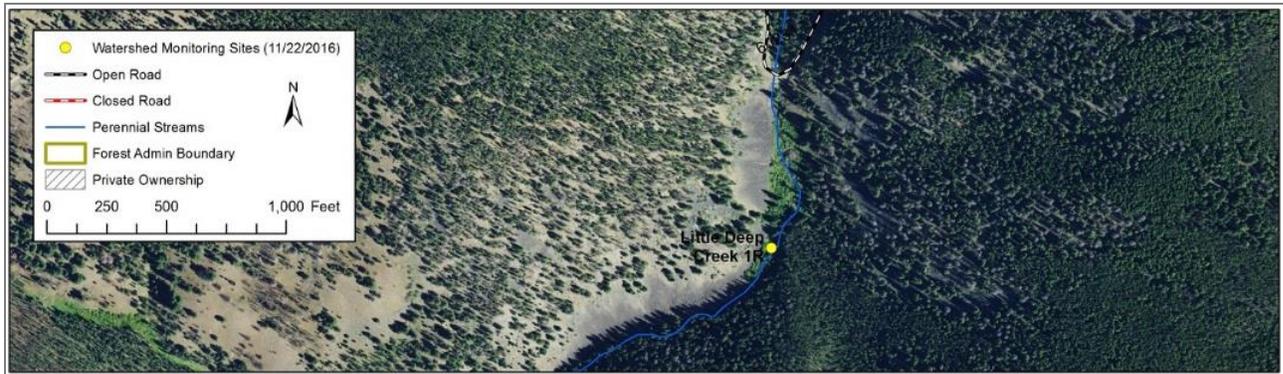
**LITTLE DEEP CREEK 1R**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Little Deep Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located a short distance upstream of the Deep Spring Road (FR231) crossing. Access is via the Ridge Road (FR020) south of Williams Creek Summit, then 7.6 miles along FR231.		
<b>GPS Coordinates</b>	N 45.06113 (2020)	W -114.16103 (2020)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	9.2 sq mi 5,872 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	49 cfs	<b>Mean Annual Flow</b> (Streamstats)	3.8 cfs
<b>5th-level Watershed</b>	Middle Panther Creek/1706020311				
<b>Mean Basin Elevation</b>	7457 ft	<b>Basin Aspect</b>	N	<b>Mean Basin Slope</b>	31%
<b>Length of Road</b>	21.1 mi	<b>Road Density</b>		2.30 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	100%	
	<b>Volcanic</b>	0%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	100%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2020)



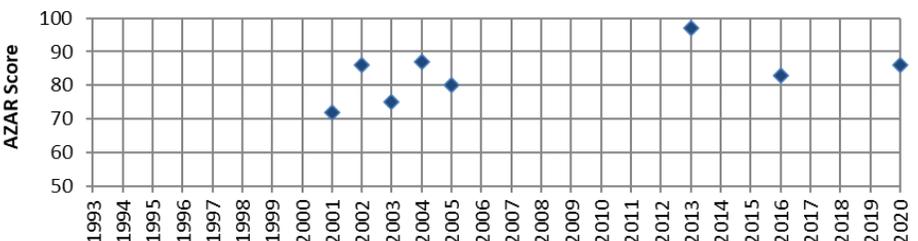
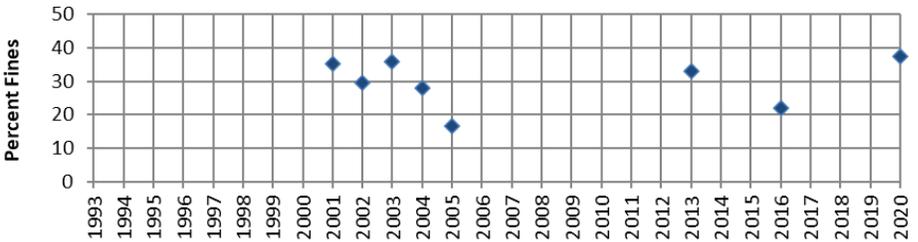
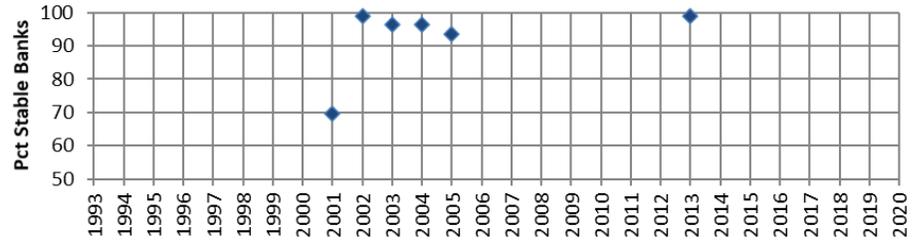
View Downstream (2020)

**LITTLE DEEP CREEK 1R**

**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001	69.5	35.1	72
2002	99.0	29.4	86
2003	96.5	35.9	75
2004	96.5	27.9	87
2005	93.5	16.6	80
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013	99.0	33.0	97
2014			
2015			
2016		21.9	83
2017			
2018			
2019			
2020		37.4	86.0
2021			
2022			
2023			
n	6	8	8
Mean	92.3	29.7	83.3
St Dev	11.4	7.3	7.8
n	0	2	2
Mean	#####	29.7	84.5
St Dev	#####	11.0	2.1



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2003	10.5	-	7.5	-	2 (?)	-	E4
2016	9.7	1.9	16.4	1.4	3	Gravel	B4
2020	10.6	1.6	12.5	1.2-1.5	2	Gravel	B4

**Reviewed Channel Type** **B4**

**ALL**

**10YR**

**REMARKS**

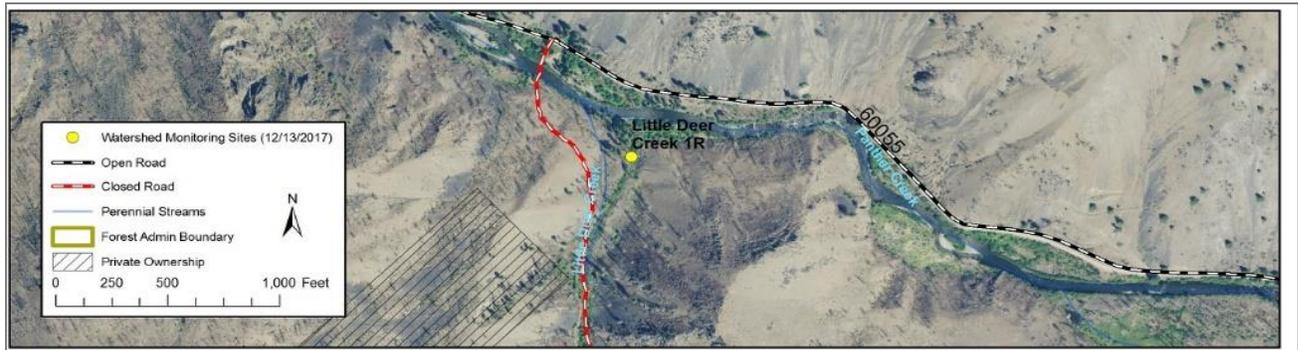
Depth fines at this site have varied, with some values greater than 30%. Bank stability has been high, with robust riparian vegetation. Site watershed edited 11/30/16 to reflect actual location of sampling site (drainage area corrected from 6111 acres to 5862 acres).

**LITTLE DEER CREEK 1R** **Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	Little Deer Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located a short distance upstream of the mouth of Little Deer Creek at Panther Creek. Access is via the Panther Creek Road (FR055), wading across Panther Creek.		
<b>GPS Coordinates</b>	N 45.16445 (2022)	W -114.29797 (2022)	
<b>Site Comments</b>	Stream is small, overgrown, and not ideal for core sampling. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	6.2 sq mi 3,946 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	23 cfs	<b>Mean Annual Flow</b> (Streamstats)	4.5 cfs
<b>5th-level Watershed</b>	Middle Panther Creek / 1706020311				
<b>Mean Basin Elevation</b>	6614 ft	<b>Basin Aspect</b>	N	<b>Mean Basin Slope</b>	48%
<b>Length of Road</b>	18.1 mi	<b>Road Density</b>		2.94 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>		100%
	<b>Volcanic</b>	0%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		0%
<b>% of Watershed in Active Allotment</b>	0%	<b>% of Watershed Burned (2018-2022)</b>		1.1%	

**SITE PHOTOS**



View Upstream (8/12/2022)



View Downstream (8/12/2022)

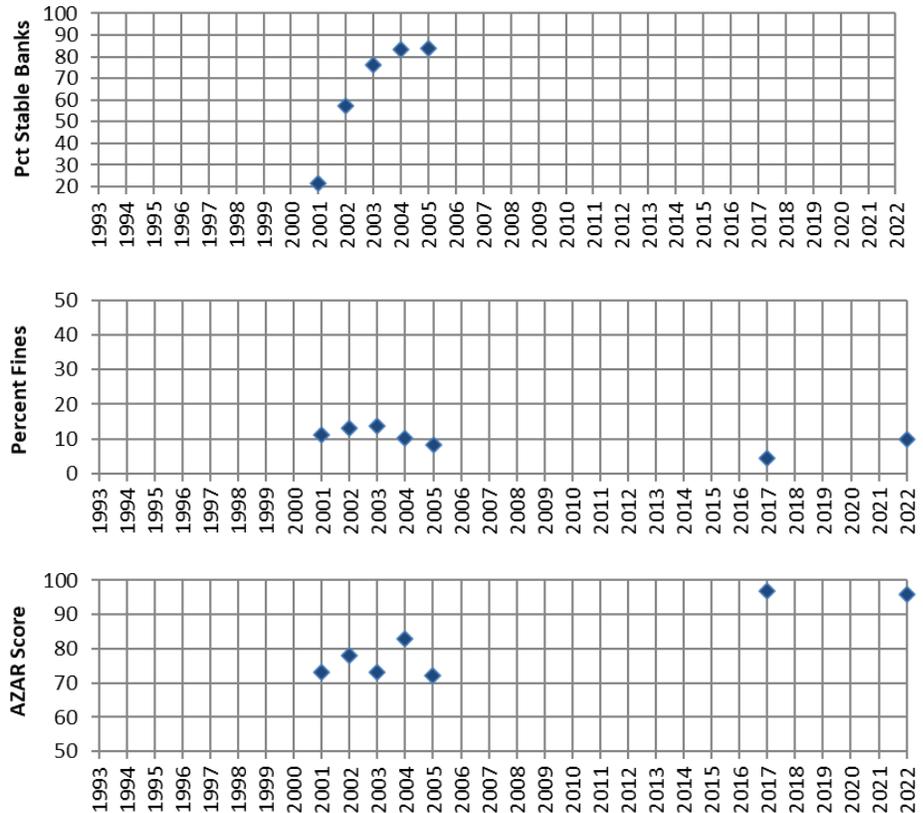
**LITTLE DEER CREEK 1R**

**Last Year Sampled: 2022**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001	21.5	11.3	73
2002	57.5	13.2	78
2003	76.0	13.8	73
2004	83.5	10.1	83
2005	84.0	8.3	72
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015			
2016			
2017		4.6	97
2018			
2019			
2020			
2021			
2022		10.0	96
2023			
<b>n</b>	5	7	7
<b>Mean</b>	64.5	10.2	81.7
<b>St Dev</b>	26.3	3.1	10.8
<b>n</b>	0	2	2
<b>Mean</b>	-	7.3	96.5
<b>St Dev</b>	-	3.8	0.7

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
?	-	-	-	-	-	-	A4
<b>2017</b>	10.0	4.0	9.6	<1.2	0.5-2	Gravel	C4

<b>Reviewed Channel Type</b>	<b>C4</b>
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**REMARKS**

Additional future mining activity is occurring in the headwaters of Little Deer Creek (Idaho Cobalt Project). This is a very small, overgrown stream and may not be entirely suitable for the core sampling protocol. Fines are typically very low.

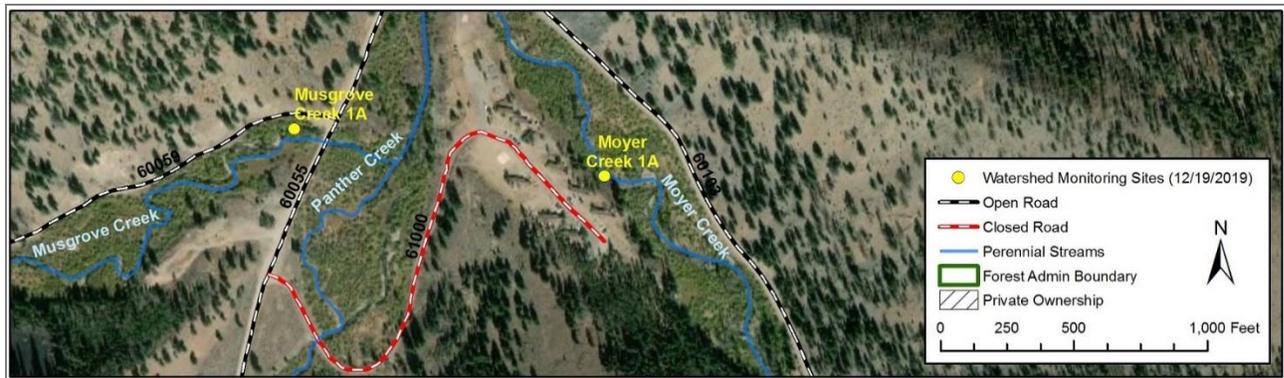
**MOYER CREEK 1A**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Moyer Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located a short distance upstream of the mouth of Moyer Creek at Panther Creek. Access is via the Moyer Creek Road (FR#103), approximately 0.1 miles upstream of the Panther Creek Road.		
<b>GPS Coordinates</b>	N 45.02154 (2019)	W -114.31036 (2019)	
<b>Site Comments</b>	5-year sampling frequency		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	41.5 sq mi 26,549 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	123 cfs	<b>Mean Annual Flow</b> (Streamstats)	20.1 cfs
<b>5th-level Watershed</b>	Upper Panther Creek / 1706020309				
<b>Mean Basin Elevation</b>	7670 ft	<b>Basin Aspect</b>	NW	<b>Mean Basin Slope</b>	36%
<b>Length of Road</b>	36.5 mi	<b>Road Density</b>		0.88 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	83.4%	
	<b>Volcanic</b>	14.6%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	2.0%	
<b>% of Watershed in Active Allotment</b>	70.9%	<b>% of Watershed Burned (2018-2022)</b>		19.6%	

**SITE PHOTOS**



View Upstream (2019)



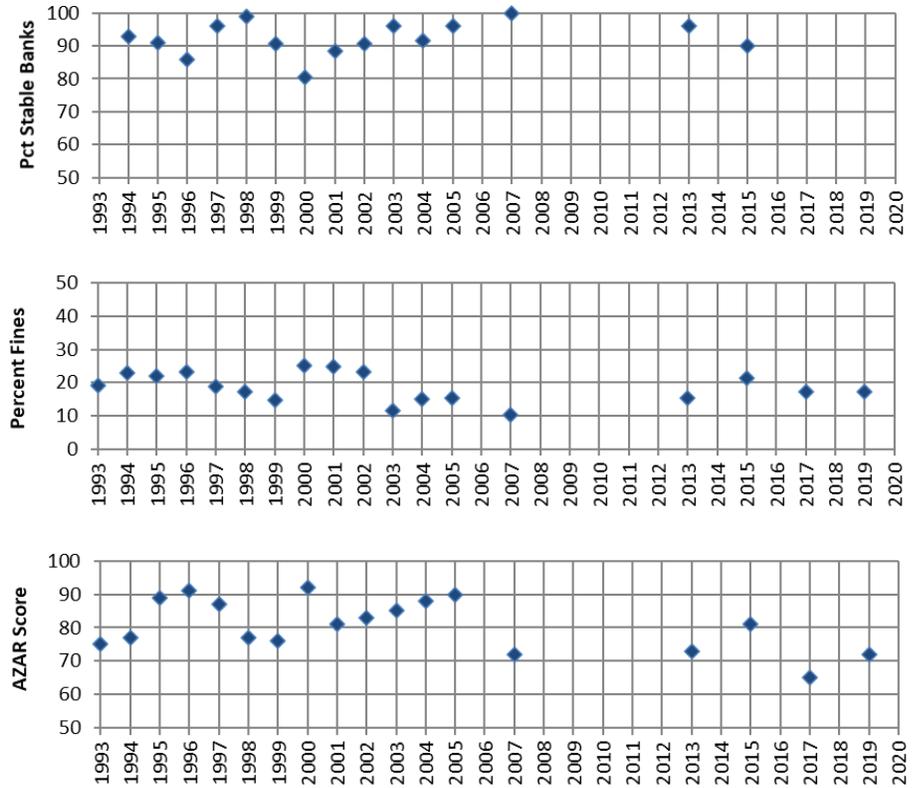
View Downstream (2019)

**MOYER CREEK 1A**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		19.0	75
1994	93.0	22.9	77
1995	91.0	22.0	89
1996	86.0	23.2	91
1997	96.0	18.8	87
1998	99.0	17.4	77
1999	90.5	14.7	76
2000	80.5	25.0	92
2001	88.5	24.8	81
2002	90.5	23.1	83
2003	96.0	11.5	85
2004	91.5	15.1	88
2005	96.0	15.2	90
2006			
2007	100	10.4	72
2008			
2009			
2010			
2011			
2012			
2013	96.0	15.4	73
2014			
2015	90.0	21.3	81
2016			
2017		17.4	65
2018			
2019		17.4	72
2020			
2021			
2022			
2023			
n	15	18	18
Mean	92.3	18.6	80.8
St Dev	5.1	4.4	7.8
n	1.0	3.0	3.0
Mean	90.0	18.7	72.7
St Dev	N/A	2.3	8.0



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	24.0	1.7	20	1.1	1-2	Cob/grav	B3
2015	19.5	5.2	21.4	1.5	2.0	Gravel	C4
2017	21.5	8.4	15.4	1.5	1.0	Gravel	C4
2019	20	1.5	15.4	1.2-1.5	1.5	Gravel	C4

**Reviewed Channel Type** **C4**

**10YR ALL**

**REMARKS**

This site has a relatively continuous dataset, with fines consistently less than 26%. The low gradient C4 channel would be sensitive to changes in sediment supply.

**MUSGROVE CREEK 1A**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Musgrove Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located near the mouth of Musgrove Creek, just upstream of the Panther Creek Road (FR055) culvert over Musgrove Creek.		
<b>GPS Coordinates</b>	N 45.02213 (2019)	W -114.31483 (2019)	
<b>Site Comments</b>	5-year sampling frequency		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	23.7 sq mi 15,172 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	99 cfs	<b>Mean Annual Flow</b> (Streamstats)	15.3 cfs
<b>5th-level Watershed</b>	Upper Panther Creek / 1706020309				
<b>Mean Basin Elevation</b>	7421 ft	<b>Basin Aspect</b>	SE	<b>Mean Basin Slope</b>	45%
<b>Length of Road</b>	63.5 mi	<b>Road Density</b>		2.68 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	3.3%	<b>Quartzite</b>		84.4%
	<b>Volcanic</b>	11.3%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		1.0%
<b>% of Watershed in Active Allotment</b>	15.7%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2019)



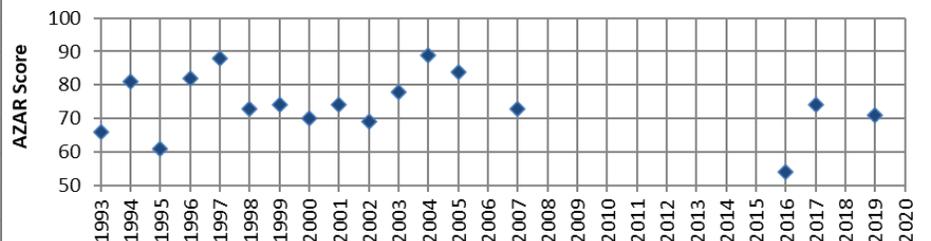
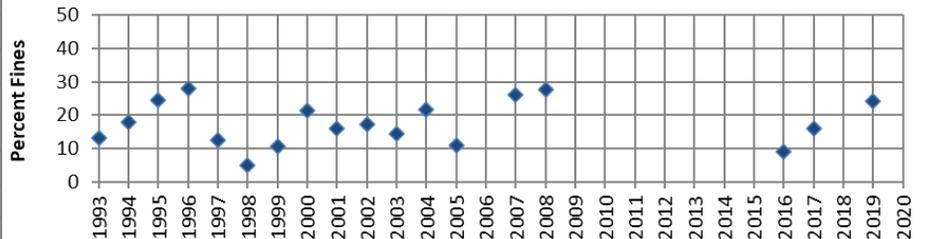
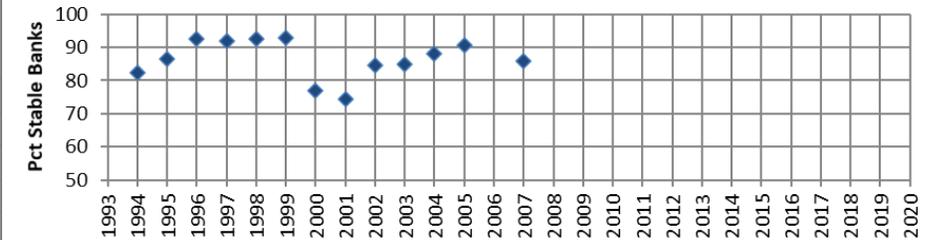
View Downstream (2019)

MUSGROVE CREEK 1A

Last Year Sampled: 2019

SITE DATA

Year	% Stable Banks	Percent Fines	AZAR Score
1993		13.2	66
1994	82.5	17.8	81
1995	86.5	24.5	61
1996	92.5	28.0	82
1997	92.0	12.4	88
1998	92.5	4.9	73
1999	93.0	10.6	74
2000	77.0	21.4	70
2001	74.5	15.9	74
2002	84.5	17.2	69
2003	85.0	14.4	78
2004	88.0	21.8	89
2005	90.5	10.9	84
2006			
2007	86.0	26.2	73
2008		27.8	
2009			
2010			
2011			
2012			
2013			
2014			
2015			
2016		8.9	54
2017		16.0	74
2018			
2019		24.2	71
2020			
2021			
2022			
2023			
n	13	18	17
Mean	86.5	17.6	74.2
St Dev	5.9	6.9	9.1
n	0	3	3
Mean	-	16.4	66.3
St Dev	-	7.7	10.8



CHANNEL MEASUREMENTS

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	21.1	8.3	19.2	1.3	2-3	Cobble	C4b
2016	18.8	5.4	16.8	1.5	1-2	Gravel	C4
2017	28.3	2.5	26.7	1.5	1.0	Gravel	C4
2019	23.2	7.1	12.1	1.2-1.5	1.5	Gravel	C4

Reviewed Channel Type

C4

10YR ALL

REMARKS

Depth fines at this site are consistently low (less than 30%). Musgrove Creek provides important salmon spawning habitat in this area. The Musgrove Creek culvert was replaced with a bridge in 2020, just downstream of the monitoring site. This project may have had some influence on sediment conditions at the site.

**NAPIAS CREEK 1R**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Napias Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located along the Leesburg Road (FR242), a short distance upstream of the Phelan Creek confluence.		
<b>GPS Coordinates</b>	N 45.16925 (2023)	W -114.15867 (2023)	
<b>Site Comments</b>	5-year sampling frequency		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	54.4 sq mi 34,812 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	158 cfs	<b>Mean Annual Flow</b> (Streamstats)	16.6 cfs
<b>5th-level Watershed</b>	Napias Creek / 1706020310				
<b>Mean Basin Elevation</b>	7501 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	25%
<b>Length of Road</b>	96.7 mi	<b>Road Density</b>		1.78 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	24.0%	<b>Quartzite</b>	60.6%	
	<b>Volcanic</b>	12.6%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	2.7%	
<b>% of Watershed in Active Allotment</b>	97.7%	<b>% of Watershed Burned (2018-2022)</b>		41%	

**SITE PHOTOS**



**View Upstream (2023)**



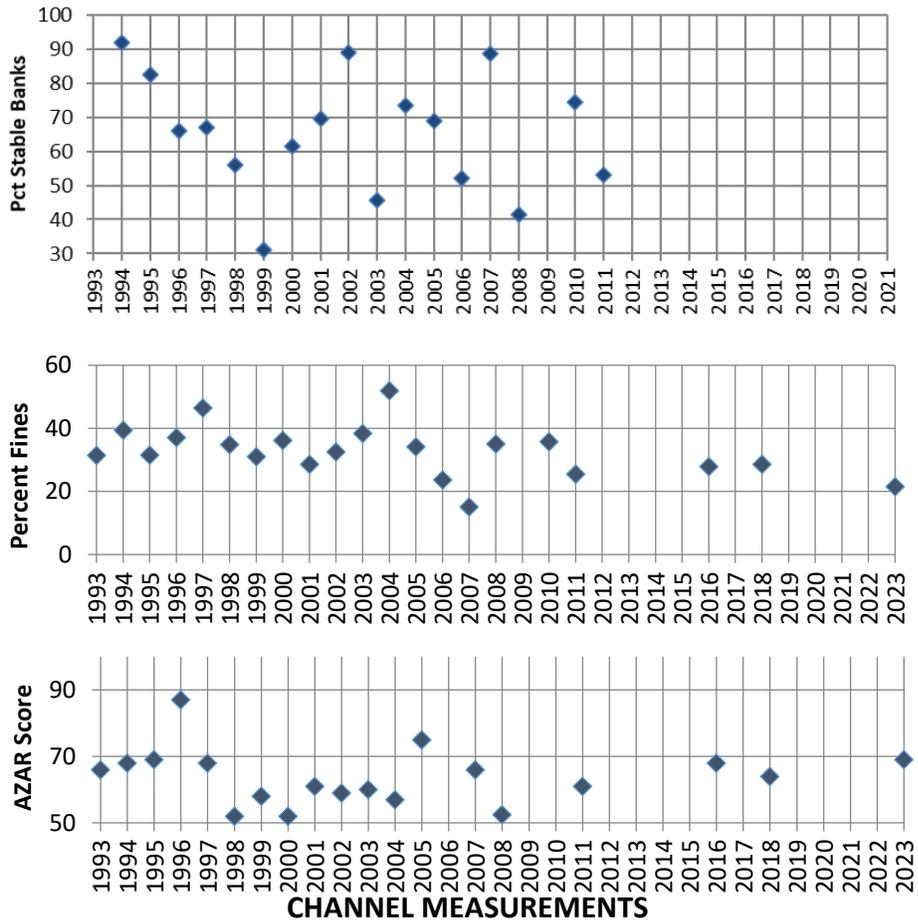
**View Downstream (2023)**

**NAPIAS CREEK 1R**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		31.4	66
1994	92.0	39.4	68
1995	82.5	31.5	69
1996	66.0	37.1	87
1997	67.0	46.5	68
1998	56.0	34.9	52
1999	31.0	31.0	58
2000	61.5	36.2	52
2001	69.5	28.6	61
2002	89.0	32.5	59
2003	45.5	38.4	60
2004	73.5	51.9	57
2005	69.0	34.1	75
2006	52.0	23.7	
2007	88.5	15.1	66
2008	41.5	35.1	53
2009			
2010	74.5	35.8	
2011	53.0	25.5	61
2012			
2013			
2014			
2015			
2016		27.9	68
2017			
2018		28.6	64
2019			
2020			
2021			
2022			
2023		21.5	69
n	17	21	19
Mean	65.4	32.7	63.8
St Dev	17.4	8.1	8.6
n	0	3	3
Mean	-	26.0	67.0
St Dev	-	3.9	2.6



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	38.9	5.7	25.9	1.0	1+	Gravel	C4
2016	41.2	1.7	37.5	1.2	1	Gravel	C4
2018	36.0	4.9	20.0	1.1	0.8	Gravel	C4

**10YR ALL**

<b>Reviewed Channel Type</b>	<b>C4</b>
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**REMARKS**

This site has been sampled fairly continuously since 1993. Depth fines and bank stability have varied, with many depth fines values greater than 30% and bank stability values less than 80%. The cause of high fines and low bank stability is not known. Site and much of Napias Creek corridor are located on private land (Meridian Gold Company), and conditions at this site may not be fully representative of National Forest management. Upper portions of this drainage were affected by the 2022 Moose Fire.

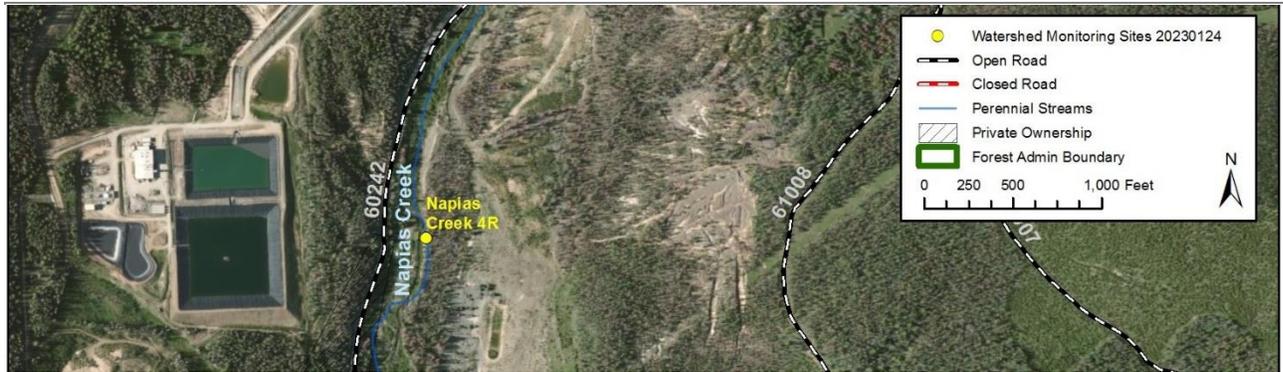
**NAPIAS CREEK 4R**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Napias Creek 4R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located along the Leesburg Road (FR242) approximately 0.75 miles upstream of Napias Creek 3R, downstream of pumpstation.		
<b>GPS Coordinates</b>	45.21420 (2023)	-114.12565 (2023)	
<b>Site Comments</b>	Discontinued in 2016, sampling resumed in 2021.		

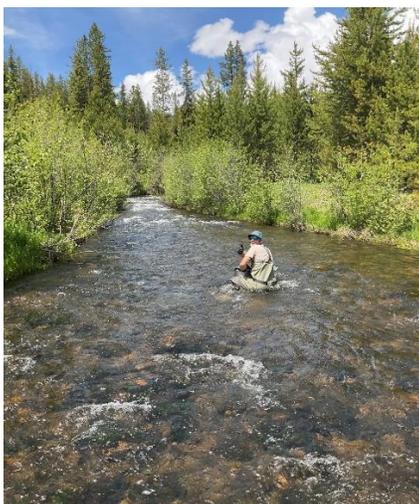
**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	20.6 sq mi 13,159 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	56.9 cfs	<b>Mean Annual Flow</b> (Streamstats)	6.1 cfs
<b>5th-level Watershed</b>	Napias Creek / 1706020310				
<b>Mean Basin Elevation</b>	7626 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	24%
<b>Length of Road</b>	30.8 mi	<b>Road Density</b>		1.50 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	43.4%	<b>Quartzite</b>	48.0%	
	<b>Volcanic</b>	6.3%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	2.3%	
<b>% of Watershed in Active Allotment</b>	98.5%	<b>% of Watershed Burned (2018-2022)</b>		55%	

**SITE PHOTOS**



View Upstream (2023)



View Downstream (2023)



**NAPIAS CREEK 5R**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Napias Creek 5R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located east of the Leesburg Townsite, upstream of the Sharkey Creek Road (FR272) bridge over Napias Creek.		
<b>GPS Coordinates</b>	N 45.22265 (2023)	W -114.10771 (2023)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	8.9 sq mi 5,724 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	26 cfs	<b>Mean Annual Flow</b> (Streamstats)	3 cfs
<b>5th-level Watershed</b>	Napias Creek / 1706020310				
<b>Mean Basin Elevation</b>	7679 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	26%
<b>Length of Road</b>	10.4 mi	<b>Road Density</b>		1.16 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	90.1%	<b>Quartzite</b>	8.9%	
	<b>Volcanic</b>	0%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	1.1%	
<b>% of Watershed in Active Allotment</b>	99.0%	<b>% of Watershed Burned (2018-2022)</b>		69%	

**SITE PHOTOS**



View Upstream (2023)



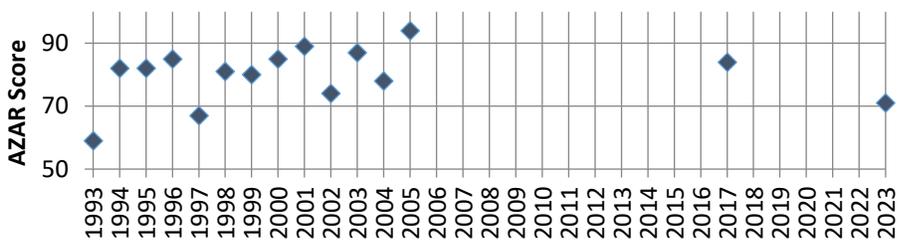
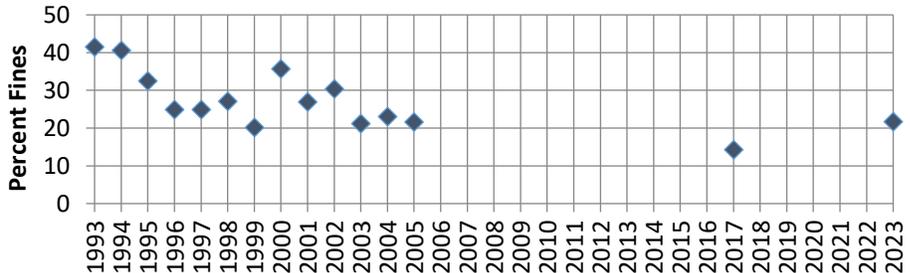
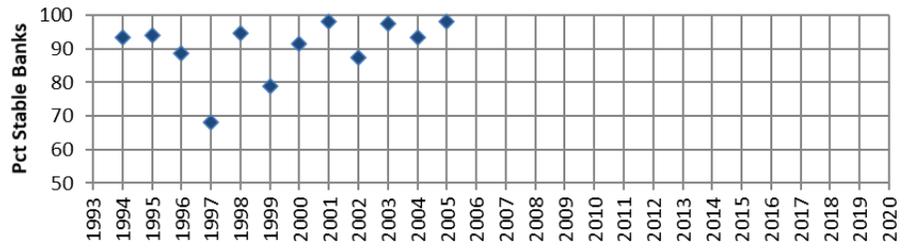
View Downstream (2023)

**NAPIAS CREEK 5R**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		41.5	59
1994	93.5	40.6	82
1995	94.0	32.5	82
1996	88.5	24.9	85
1997	68.0	24.9	67
1998	94.5	27.1	81
1999	79.0	20.2	80
2000	91.5	35.7	85
2001	98.0	26.9	89
2002	87.5	30.4	74
2003	97.5	21.2	87
2004	93.5	23.0	78
2005	98.0	21.6	94
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015			
2016			
2017		14.3	84
2018			
2019			
2020			
2021			
2022			
2023		21.7	71
n	12	15	15
Mean	90.3	27.1	79.9
St Dev	8.8	7.7	9.0
n	0	2	2
Mean	-	18.0	77.5
St Dev	-	5.2	9.2



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	11.9	8.0	9.9	1.2	1-2	Gravel	E4
2017	11.3	2.6	10.4	1.4	2.5	Gravel	C4b

**Reviewed Channel Type** **C4b**

**ALL**

**10YR**

**REMARKS**

Limited recent data. Past data indicated an improving trend in fines. Upper portions of this drainage were affected by the 2022 Moose Fire.

**PANTHER CREEK 2A**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Panther Creek 2A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	N Fork/Salmon-Cobalt
<b>Site Location</b>	Site is located along the Panther Creek Road (FR055) approx 9.5 miles upstream of the Salmon River Road, at a small camping area upstream of Gant Creek.		
<b>GPS Coordinates</b>	N 45.22096 (2019)	W -114.32119 (2019)	
<b>Site Comments</b>	4% of watershed in Wilderness. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	414.1 sq mi 264,995 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	974 cfs	<b>Mean Annual Flow</b> (Streamstats)	202 cfs
<b>5th-level Watershed</b>	Lower Panther Creek / 1706020312 Napias Creek / 1706020310		Middle Panther Creek / 1706020311 Upper Panther Creek / 1706020309		
<b>Mean Basin Elevation</b>	7227 ft	<b>Basin Aspect</b>	N	<b>Mean Basin Slope</b>	38%
<b>Length of Road</b>	743.3 mi		<b>Road Density</b>		1.80 mi/sq mi
<b>Landtype Geology</b>	<b>Granitic</b>	16.6%	<b>Quartzite</b>	65.6%	
	<b>Volcanic</b>	16.5%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	1.3%	
<b>% of Watershed in Active Allotment</b>	64.5%	<b>% of Watershed Burned (2018-2022)</b>		13.0%	

**SITE PHOTOS**



**View Upstream (2019)**



**View Downstream (2019)**

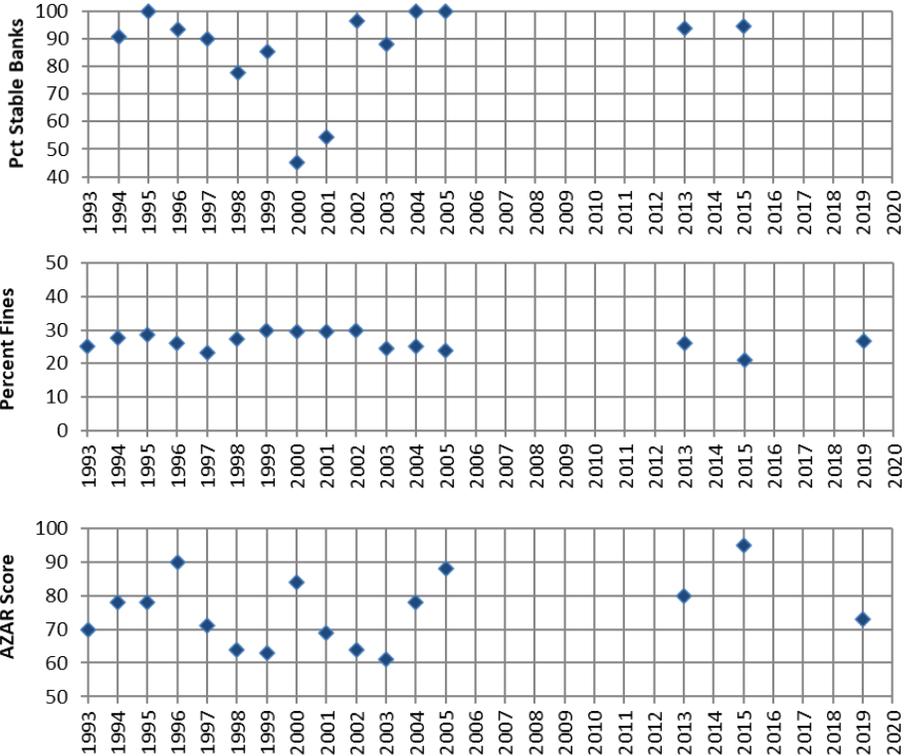
**PANTHER CREEK 2A**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		25.2	70
1994	90.5	27.8	78
1995	100	28.7	78
1996	93.5	26.0	90
1997	90.0	23.2	71
1998	77.5	27.4	64
1999	85.5	29.8	63
2000	45.0	29.5	84
2001	54.5	29.5	69
2002	96.5	29.9	64
2003	88.0	24.5	61
2004	100	25.1	78
2005	100	23.8	88
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013	93.8	26.2	80
2014			
2015	94.5	20.9	95
2016			
2017			
2018			
2019		26.6	73
2020			
2021			
2022			
2023			
n	14	16	16
Mean	86.4	26.5	75.4
St Dev	16.8	2.6	10.3
n	1	2	2
Mean	94.5	23.8	84.0
St Dev	N/A	4.0	15.6

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	83	3.6	31.9	1.1	0-1+	Cobble	B4c
2015	56	2.0	43.1	1.3	2	Cobble	B3c
2019	60.5	3.0	19.8	<1.2	1.0	Cobble	B3c

**Reviewed Channel Type** **B3c**

**REMARKS**

This site has a relatively continuous dataset, with consistently low fines (20 to 30%) and variable bank stability. This site has a very large drainage area, and the channel at this location is very large.

**PANTHER CREEK 3A**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Panther Creek 3A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located along the Panther Creek Road (FR055) approximately 11.2 miles upstream of the Salmon River Road and about 1 mile upstream of Moyer Creek. A jeep trail leads down to a campsite near Panther Creek.		
<b>GPS Coordinates</b>	N 45.01323 (2017)	W -114.31886 (2017)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	63.5 sq mi 40,664 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	215 cfs	<b>Mean Annual Flow</b> (Streamstats)	30.4 cfs
<b>5th-level Watershed</b>	Upper Panther Creek / 1706020309				
<b>Mean Basin Elevation</b>	7293 ft	<b>Basin Aspect</b>	N	<b>Mean Basin Slope</b>	36%
<b>Length of Road</b>	113.4 mi	<b>Road Density</b>		1.78 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	28.3%	
	<b>Volcanic</b>	70.0%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	1.7%	
<b>% of Watershed in Active Allotment</b>	87.8%	<b>% of Watershed Burned (2018-2022)</b>		20.7%	

**SITE PHOTOS**



**View Upstream (2019)**



**View Downstream (2019)**

**PANTHER CREEK 3A**

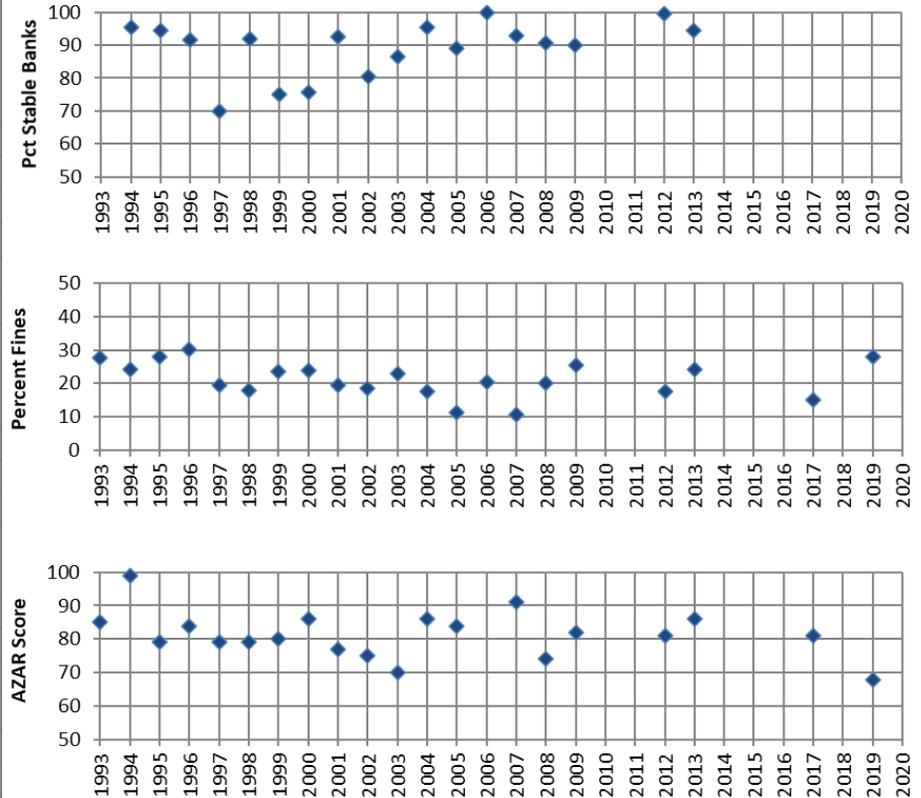
**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		27.7	85
1994	95.5	24.2	99
1995	94.5	28.0	79
1996	91.5	30.3	84
1997	70.0	19.6	79
1998	92.0	18.0	79
1999	75.0	23.6	80
2000	75.5	24.0	86
2001	92.5	19.3	77
2002	80.5	18.4	75
2003	86.5	22.9	70
2004	95.5	17.7	86
2005	89.0	11.4	84
2006	100	20.4	
2007	93.0	10.6	91
2008	90.5	20.1	74
2009	90.0	25.4	82
2010			
2011			
2012	100	17.6	81
2013	94.4	24.3	86
2014			
2015			
2016			
2017		15.1	81
2018			
2019		28.1	68
2020			
2021			
2022			
2023			
n	18	21	20
Mean	89.2	21.3	81.3
St Dev	8.5	5.3	7.0
n	0	2	2
Mean	N/A	21.6	74.5
St Dev	N/A	9.2	9.2

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	32.3	3.5	35.9	1.3	1-2	Cobble	C3
2017	22.5	5.3	18.8	1.3	1.0	Gravel	C4
2019	18.7	10.6	15.7	1.2-1.5	2.0	Gravel	C4

Reviewed Channel Type **C4**

**REMARKS**

This site has a nearly continuous dataset, showing consistently low fines (less than 30%) and variable (improving) bank stability.

**PANTHER CREEK 4A**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Panther Creek 4A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located along the Panther Creek Road (FR055) approximately 0.2 miles upstream of the intersection of Panther Creek Rd and Silver Creek Rd.		
<b>GPS Coordinates</b>	N 44.93418 (2023)	W -114.33900 (2023)	
<b>Site Comments</b>	Heavy shrub vegetation surrounds the site. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	24.8 sq mi 15,903 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	88 cfs	<b>Mean Annual Flow</b> (Streamstats)	12.2 cfs
<b>5th-level Watershed</b>	Upper Panther Creek / 1706020309				
<b>Mean Basin Elevation</b>	7776 ft	<b>Basin Aspect</b>	NW	<b>Mean Basin Slope</b>	36%
<b>Length of Road</b>	30.0 mi	<b>Road Density</b>		1.21 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>	41.5%	
	<b>Volcanic</b>	55.8%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	2.7%	
<b>% of Watershed in Active Allotment</b>	78.7%	<b>% of Watershed Burned (2018-2022)</b>		53.0%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

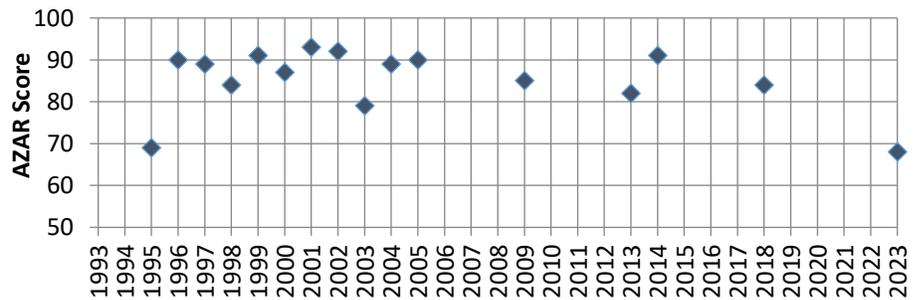
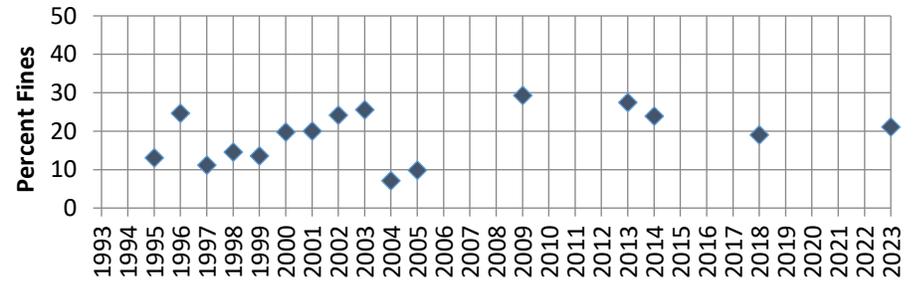
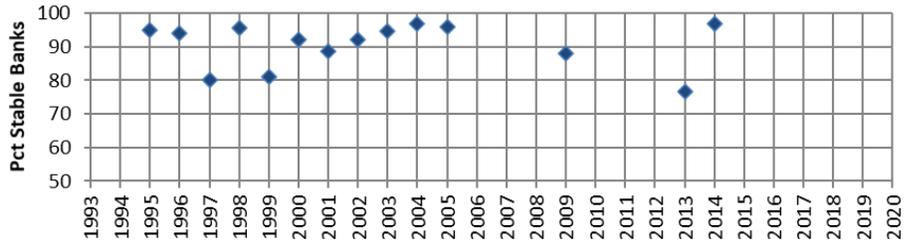
**PANTHER CREEK 4A**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	95.0	13.0	69
1996	94.0	24.6	90
1997	80.0	11.1	89
1998	95.5	14.5	84
1999	81.0	13.5	91
2000	92.0	19.7	87
2001	88.5	20.0	93
2002	92.0	24.1	92
2003	94.5	25.5	79
2004	97.0	7.1	89
2005	96.0	9.8	90
2006			
2007			
2008			
2009	88.0	29.3	85
2010			
2011			
2012			
2013	76.8	27.4	82
2014	97.0	23.9	91
2015			
2016			
2017			
2018		19.0	84
2019			
2020			
2021			
2022			
2023		21.1	68
n	14	16	16
Mean	90.5	19.0	85.2
St Dev	6.7	6.7	7.6
n	2	4	4
Mean	86.9	22.9	81.3
St Dev	14.3	3.6	9.6

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	27.8	10.8	23.2	1.1	6-7 ??	Cobble	C3b
2018	22.9	2.9	19.9	1.2	3.5	Cob/Grav	C4b

**Reviewed Channel Type** **C4b**

**REMARKS**

This site is a steep cobble channel. Depth fines have been consistently less than 30%.

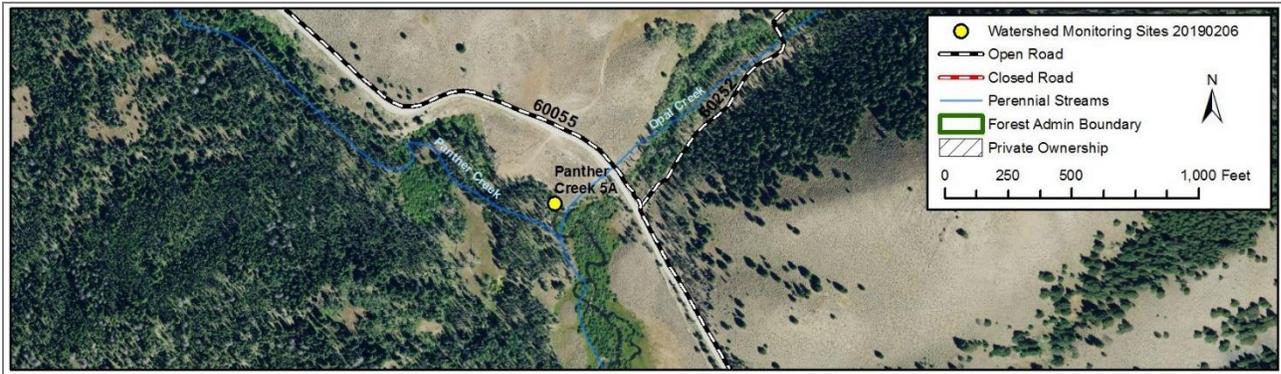
**PANTHER CREEK 5A**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Panther Creek 5A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located along the Panther Creek Road (FR055) approximately 5 miles north of Morgan Creek Summit, just downstream of the Opal Creek confluence.		
<b>GPS Coordinates</b>	N 44.89707 (2023)	W -114.31652 (2023)	
<b>Site Comments</b>	2018 site moved upstream to avoid horse camp influence. Large pasture just upstream of reach (different channel type). 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	20.0 sq mi 12,797 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	106 cfs	<b>Mean Annual Flow</b> (Streamstats)	10.9 cfs
<b>5th-level Watershed</b>	Upper Panther Creek / 1706020309				
<b>Mean Basin Elevation</b>	7980 ft	<b>Basin Aspect</b>	NW	<b>Mean Basin Slope</b>	39%
<b>Length of Road</b>	13.9 mi	<b>Road Density</b>		0.70 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>	51.2%	
	<b>Volcanic</b>	46.2%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	2.6%	
<b>% of Watershed in Active Allotment</b>	74.3%	<b>% of Watershed Burned (2018-2022)</b>		65.9%	

**SITE PHOTOS**



**View Upstream (2023)**



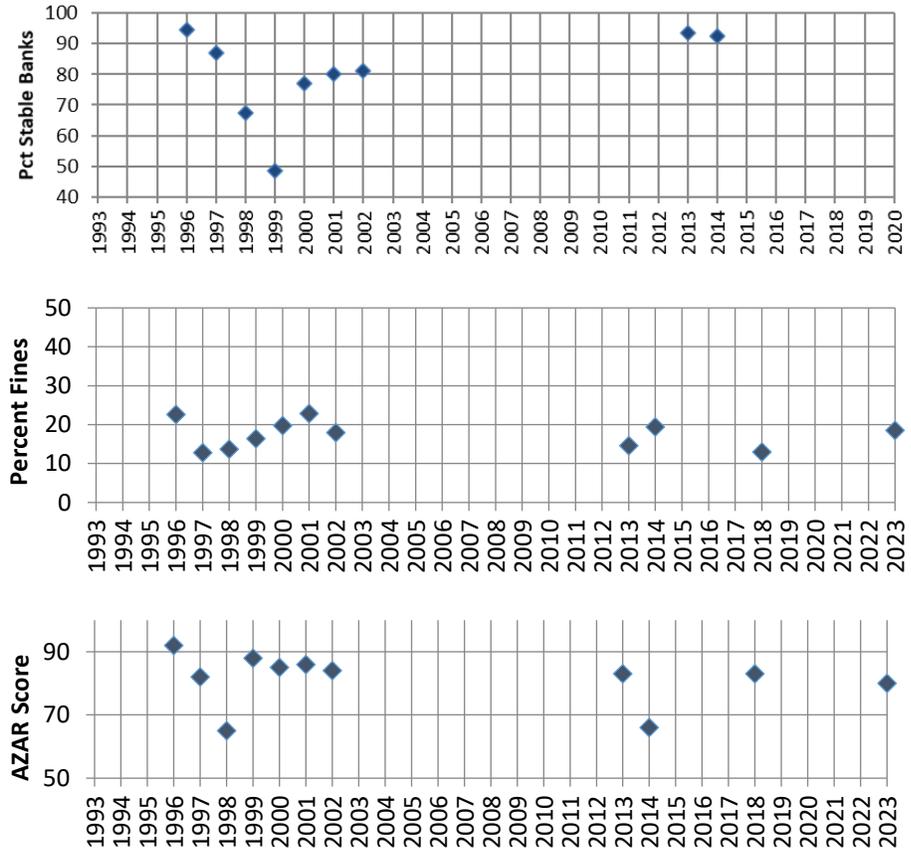
**View Downstream (2023)**

**PANTHER CREEK 5A**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996	94.5	22.6	92
1997	87.0	12.8	82
1998	67.5	13.7	65
1999	48.5	16.4	88
2000	77.0	19.8	85
2001	80.0	22.9	86
2002	81.0	18.0	84
2003			
2004			
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013	93.6	14.6	83
2014	92.6	19.4	66
2015			
2016			
2017			
2018		13.0	83
2019			
2020			
2021			
2022			
2023		18.5	80
n	9	11	11
Mean	80.2	17.4	81.3
St Dev	14.8	3.6	8.4
n	1	3	3
Mean	92.6	17.0	76.3
St Dev	N/A	3.5	9.1



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	21.5	3.9	13.4	1.3	2-3	Gravel	C4b
2018	21.0	2.0	17.6	<1.2	2.5	Gravel	B4

<b>Reviewed Channel Type</b>	<b>B4</b>
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**10YR ALL**

**REMARKS**

Sporadic sampling at this site indicates consistently low fines and variable bank stability. Site watershed and basin data edited 2/21/2019 to reflect current location of monitoring site, based on 2018 GPS data. Past sampling location has varied. Drainage area decreased from 12,867 acres to 12,797 acres.

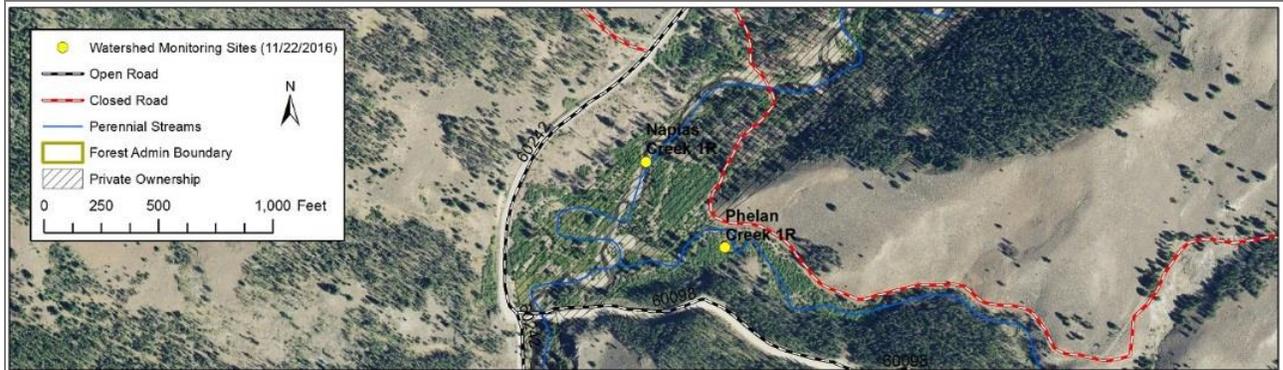
**PHELAN CREEK 1R**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Phelan Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located near the mouth of Phelan Creek at Napias Creek, approximately 15 meters upstream of the Phelan Creek Cutoff Road (FR267) bridge.		
<b>GPS Coordinates</b>	N 45.16788 (2020)	W -114.15836 (2020)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	16.0 sq mi 10,222 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	58 cfs	<b>Mean Annual Flow</b> (Streamstats)	6.1 cfs
<b>5th-level Watershed</b>	Napias Creek / 1706020310				
<b>Mean Basin Elevation</b>	7563 ft	<b>Basin Aspect</b>	W	<b>Mean Basin Slope</b>	29%
<b>Length of Road</b>	37.4 mi		<b>Road Density</b>		2.34 mi/sq mi
<b>Landtype Geology</b>	<b>Granitic</b>	2.7%	<b>Quartzite</b>	77.0%	
	<b>Volcanic</b>	18.1%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	2.1%	
<b>% of Watershed in Active Allotment</b>	89.5%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2020)**



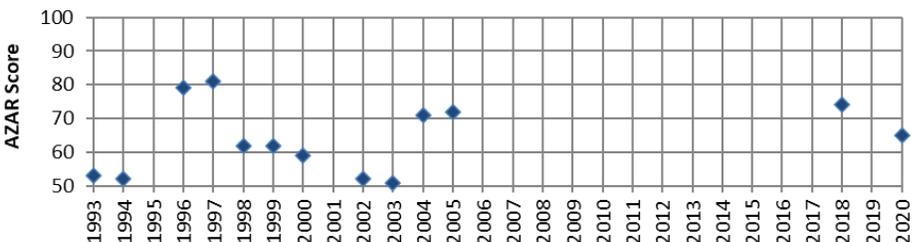
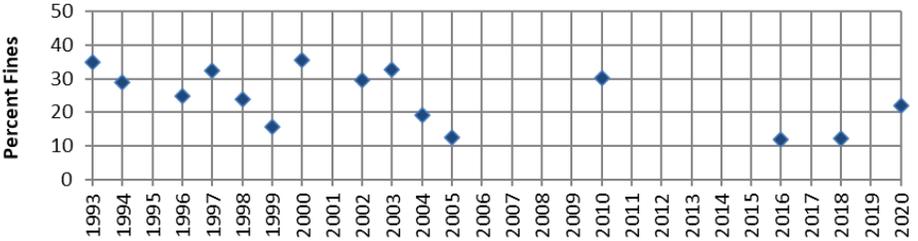
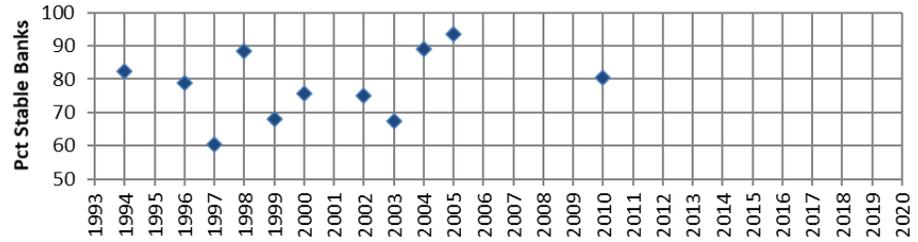
**View Downstream (2020)**

**PHELAN CREEK 1R**

**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		34.8	53
1994	82.5	28.9	52
1995			
1996	79.0	24.7	79
1997	60.5	32.4	81
1998	88.5	23.8	62
1999	68.0	15.8	62
2000	75.5	35.6	59
2001			
2002	75.0	29.5	52
2003	67.5	32.6	51
2004	89.0	19.1	71
2005	93.5	12.4	72
2006			
2007			
2008			
2009			
2010	80.5	30.1	
2011			
2012			
2013			
2014			
2015			
2016		11.9	45
2017			
2018		12.1	74
2019			
2020		22.1	65
2021			
2022			
2023			
n	11	15	14
Mean	78.1	24.4	62.7
St Dev	10.2	8.5	11.4
n	0	3	3
Mean	-	15.4	61.3
St Dev	-	5.8	14.8



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	23.3	1.6	14.6	1.2	1	Gravel	B4c
2016	18.3	1.7	15.3	1.5	<2	Gravel	C4
2018	16.0	1.9	13.4	1.5	1	Gravel	C4
2020	15.1	4.8	13.0	>1.5	1.5	Gravel	C4

<b>Reviewed Channel Type</b>	<b>C4</b>
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**10YR ALL**

**REMARKS**

Depth fines have been variable, with several values over 30% but low values in recent years. Bank stability has also been variable, with several values less than 80%.

**PORPHYRY CREEK 1A**

**Last Year Sampled: 2021**

**SITE INFO**

<b>Site Name</b>	Porphyry Creek 1A	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located near the mouth of Porphyry Creek at Panther Creek, approximately 1.5 miles west of Moyer. Access is via the Yellowjacket Road (FR112).		
<b>GPS Coordinates</b>	N 45.00424 (2021)	W -114.33686 (2021)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	11.9 sq mi 7,641 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	49 cfs	<b>Mean Annual Flow</b> (Streamstats)	7.2 cfs
<b>5th-level Watershed</b>	Upper Panther Creek / 1706020309				
<b>Mean Basin Elevation</b>	7174 ft	<b>Basin Aspect</b>	SE	<b>Mean Basin Slope</b>	42%
<b>Length of Road</b>	34.2 mi	<b>Road Density</b>		2.87 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	57.1%	
	<b>Volcanic</b>	42.9%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	93.7%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (8/2/2021)



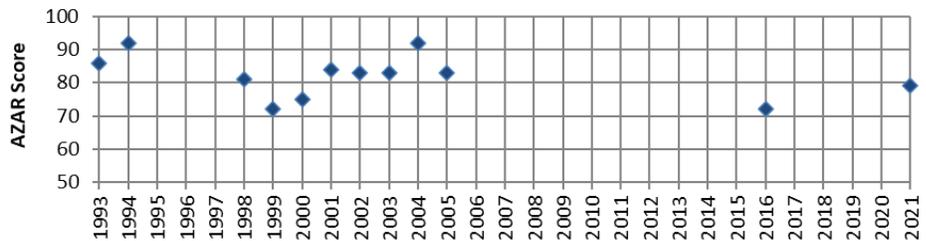
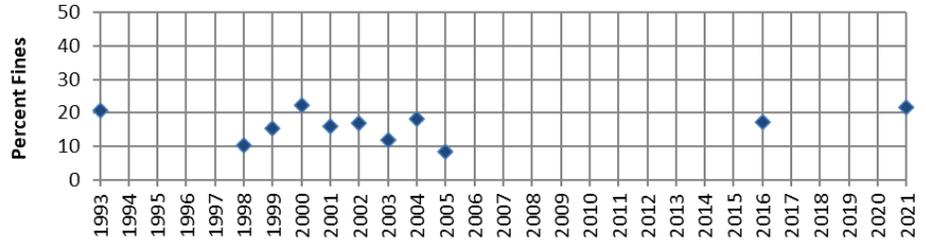
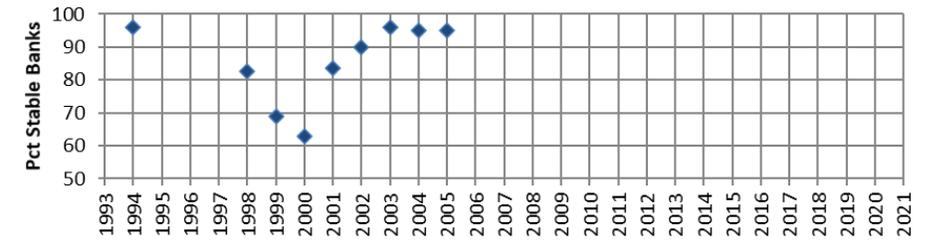
View Downstream (8/2/2021)

**PORPHYRY CREEK 1A**

**Last Year Sampled: 2021**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		20.8	86
1994	96.0		92
1995			
1996			
1997			
1998	82.5	10.4	81
1999	69.0	15.3	72
2000	63.0	22.3	75
2001	83.5	16.1	84
2002	90.0	17.0	83
2003	96.0	11.9	83
2004	95.0	18.1	92
2005	95.0	8.5	83
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015			
2016		17.4	72
2017			
2018			
2019			
2020			
2021		21.8	79.0
2022			
2023			
n	9	11	12
Mean	85.6	16.3	81.8
St Dev	12.3	4.6	6.6
n	0	2	2
Mean	-	19.6	75.5
St Dev	-	3.1	4.9



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	16.8	3.1	11.2	1.2	3-4	Cobble	C4b
2016	11.5	2.2	15.5	1.1	2+	Gravel	C4b

Reviewed Channel Type **C4b**

**10YR ALL**

**REMARKS**

This site has shown consistently low fines (less than 22%) and variable bank stability. Note: was Porphyry Creek 1R (resident digs 1993-2004), now Porphyry Creek 1A (anadromous digs 2005-2016). This is an anadromous stream. Past data may not be directly comparable.

**SOUTH FORK MOYER CREEK 1A**

**Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	SF Moyer Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon Cobalt
<b>Site Location</b>	Site is located near the mouth of SF Moyer Creek at Moyer Creek, approx. 5.1 miles up the Moyer Creek Road (FR103) from the Panther Creek Road (FR055).		
<b>GPS Coordinates</b>	N 44.95853 (2022)	W -114.29369 (2022)	
<b>Site Comments</b>	Debris damming near confluence influences sediment deposition. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	11.2 sq mi 7,166 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	29 cfs	<b>Mean Annual Flow</b> (Streamstats)	4.1 cfs
<b>5th-level Watershed</b>	Upper Panther Creek / 1706020309				
<b>Mean Basin Elevation</b>	7677 ft	<b>Basin Aspect</b>	NW	<b>Mean Basin Slope</b>	28%
<b>Length of Road</b>	16.2 mi	<b>Road Density</b>		1.45 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>		64.7%
	<b>Volcanic</b>	27.9%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		7.4%
<b>% of Watershed in Active Allotment</b>	57.3%	<b>% of Watershed Burned (2018-2022)</b>		40.1	

**SITE PHOTOS**



View Upstream (8/25/2022)



View Downstream (8/25/2022)

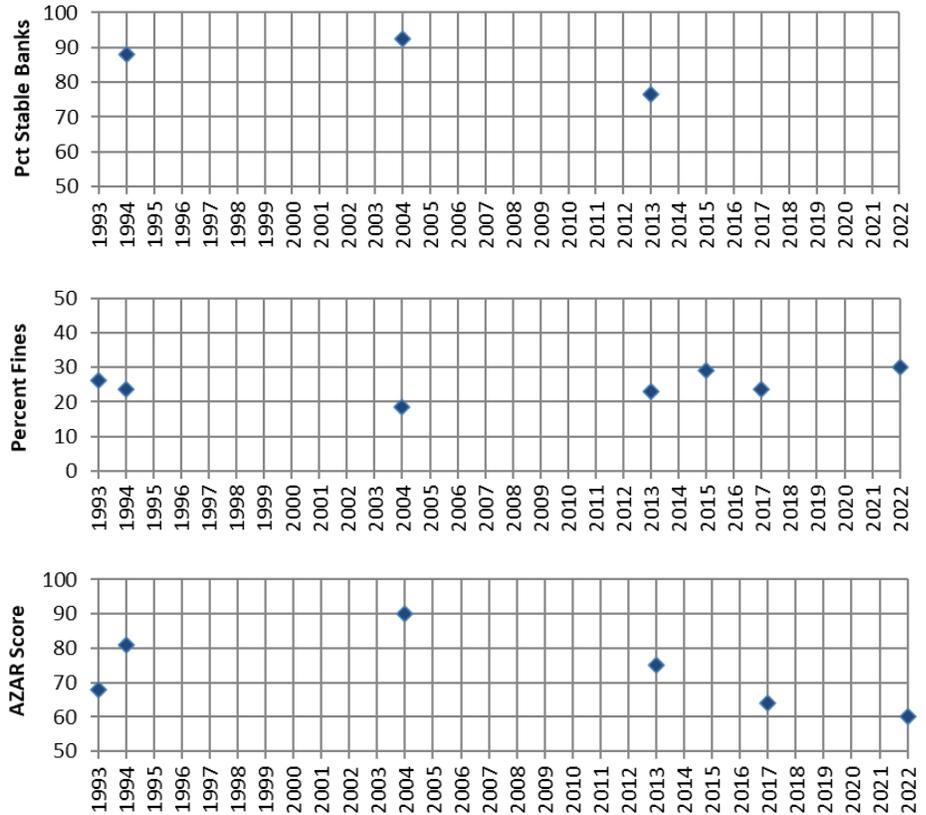
**SOUTH FORK MOYER CREEK 1A**

**Last Year Sampled: 2022**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		26.2	68
1994	88.0	23.6	81
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004	92.5	18.6	90
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013	76.6	23.1	75
2014			
2015		29.1	
2016			
2017		23.7	64
2018			
2019			
2020			
2021			
2022		30.2	60
2023			
<b>n</b>	3	7	6
<b>Mean</b>	85.7	24.9	73.0
<b>St Dev</b>	8.2	3.9	11.2
<b>n</b>	0	3	2
<b>Mean</b>	N/A	27.7	62.0
<b>St Dev</b>	N/A	3.5	2.8

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2017	13.9	10.8	9.9	1.2	5.0	Gravel	C4b
<b>Reviewed Channel Type</b>							<b>C4b</b>

**REMARKS**

Limited sampling has occurred at this site. Depth fines have been consistently less than 30%. Note: The fence in question during the 2015 sample is not a private property boundary – the private parcel SW of the sampling site does not include SF Moyer Creek.

**TRAIL CREEK MSP 1A**

**Last Year Sampled: 2021**

**SITE INFO**

<b>Site Name</b>	Trail Creek MSP 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located near the mouth of Trail Creek at Panther Creek. Access is via the Panther Creek Road (FR055) approximately 7 miles upstream of the Salmon River Road (FR030). Site is upstream of the foot bridge.		
<b>GPS Coordinates</b>	N 45.25044 (2021)	W -114.31681 (2021)	
<b>Site Comments</b>	None		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	13.4 sq mi 8,561 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	38 cfs	<b>Mean Annual Flow</b> (Streamstats)	11 cfs
<b>5th-level Watershed</b>	Lower Panther Creek / 1706020312				
<b>Mean Basin Elevation</b>	6226 ft	<b>Basin Aspect</b>	NW	<b>Mean Basin Slope</b>	54%
<b>Length of Road</b>	4.7 mi	<b>Road Density</b>		0.35 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	31.5%	<b>Quartzite</b>		68.5%
	<b>Volcanic</b>	0%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		0%
<b>% of Watershed in Active Allotment</b>	0.5%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (8/19/2021)**



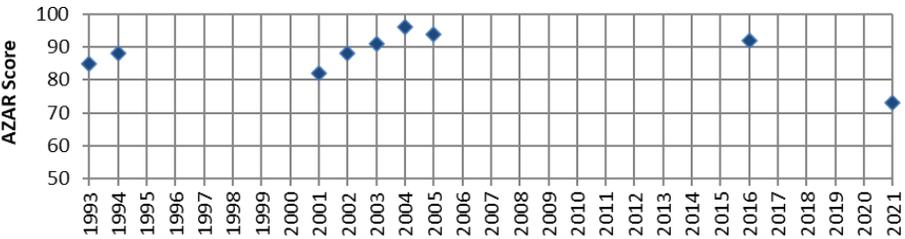
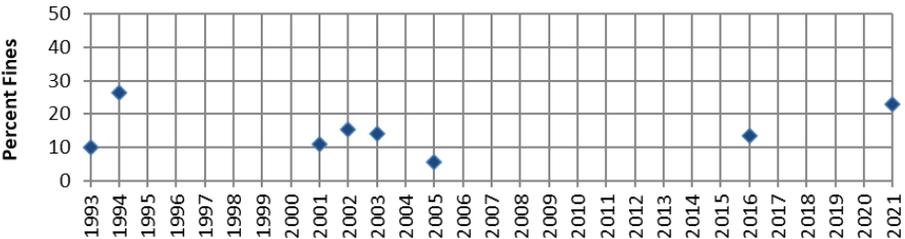
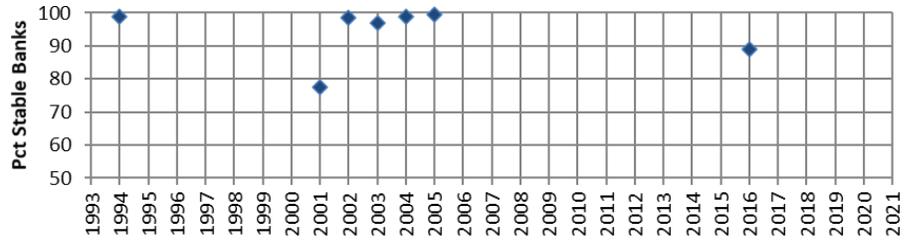
**View Downstream (8/19/2021)**

**TRAIL CREEK MSP 1A**

**Last Year Sampled: 2021**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		9.9	85
1994	99.0	26.5	88
1995			
1996			
1997			
1998			
1999			
2000			
2001	77.5	10.9	82
2002	98.5	15.3	88
2003	97.0	14.0	91
2004	99.0		96
2005	99.5	5.6	94
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015			
2016	89.0	13.6	92
2017			
2018			
2019			
2020			
2021		22.9	73
2022			
2023			
n	7	8	9
Mean	94.2	14.8	87.7
St Dev	8.2	6.9	7.0
n	1	2	2
Mean	89.0	18.3	82.5
St Dev	-	6.6	13.4



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2001	8.0	-	6.6	-	3 (?)	Gravel	E4b
2016	6.8	1.8	5.5	1.1	5.8	Cobble	G3
Reviewed Channel Type							<b>G3</b>

**ALL**

**10YR**

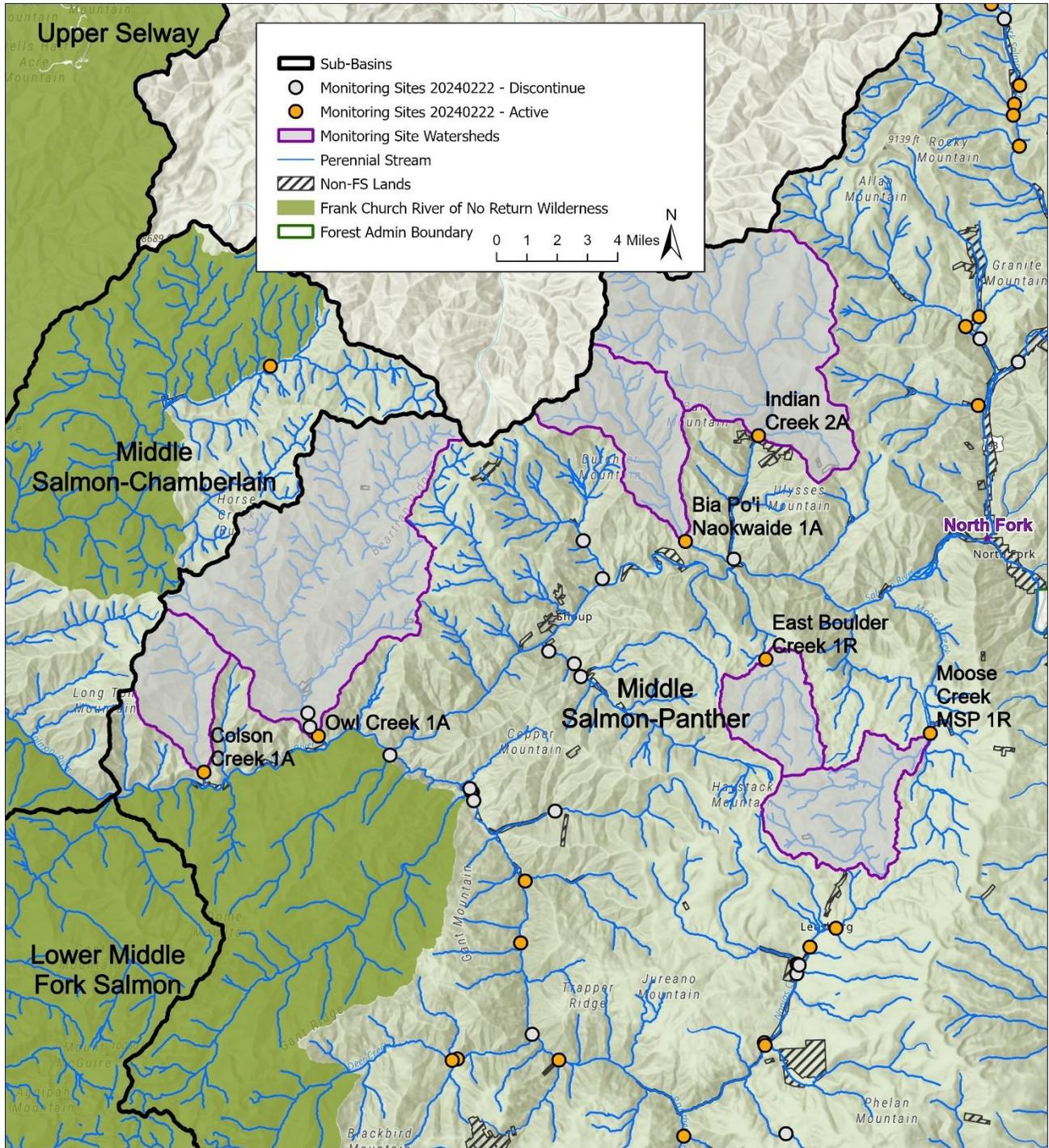
**REMARKS**

This is a constricted, downcut, steep channel with low fines, high bank stability, and lots of riparian vegetation.



### Salmon River Watersheds Downstream of North Fork

A total of 6 active monitoring sites are located in watersheds draining to the Salmon River downstream of North Fork.





**COLSON CREEK 1A**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Colson Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	North Fork
<b>Site Location</b>	The site is located on FR#123 approximately 0.6 miles north of the Salmon River Road (FR#030), just upstream of the "Fish and Game cabin."		
<b>GPS Coordinates</b>	N 45.30741 (2016)	W -114.53185 (2016)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



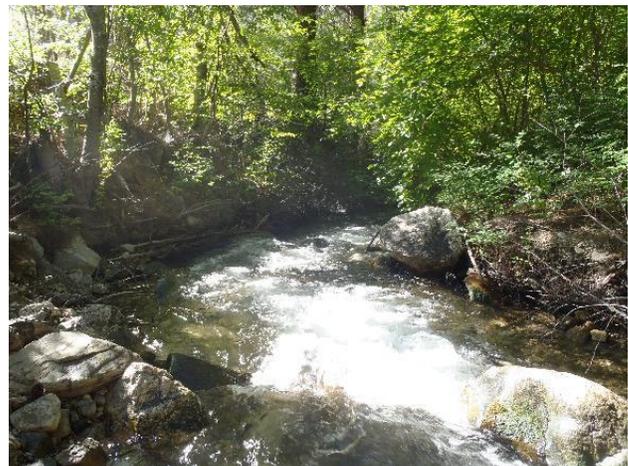
**BASIN DATA**

<b>Drainage Area at Site</b>	10.6 sq mi 6,752 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	49 cfs	<b>Mean Annual Flow</b> (Streamstats)	8.3 cfs
<b>5th-level Watershed</b>	Owl Creek-Salmon River / 1706020313				
<b>Mean Basin Elevation</b>	6005 ft	<b>Basin Aspect</b>	S	<b>Mean Basin Slope</b>	52%
<b>Length of Road</b>	48.8 mi	<b>Road Density</b>		4.63 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	97.6%	<b>Quartzite</b>		2.4%
	<b>Volcanic</b>	0.0%	<b>Mixed</b>		0.0%
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>		0.0%
<b>% of Watershed in Active Allotment</b>	0%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (7/16/2020)



View Downstream (7/16/2020)

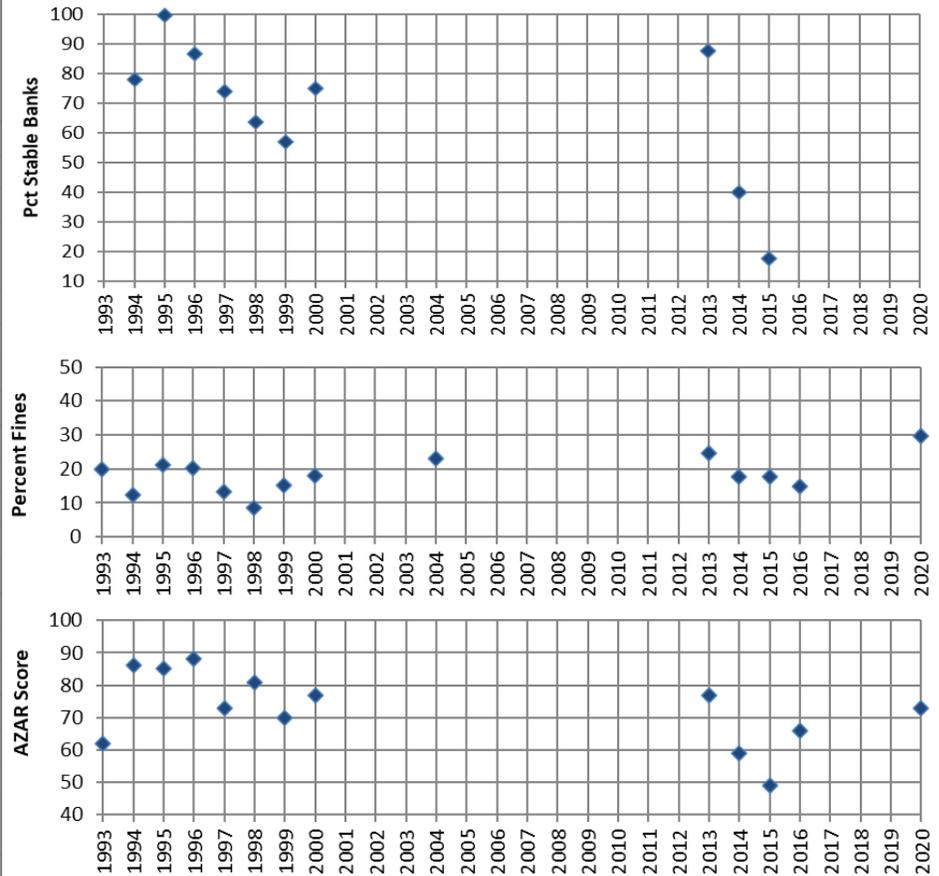
**COLSON CREEK 1A**

**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		19.9	62
1994	78.0	12.2	86
1995	99.5	21.2	85
1996	86.5	20.3	88
1997	74.0	13.4	73
1998	63.5	8.6	81
1999	57.0	15.0	70
2000	75.0	18.1	77
2001			
2002			
2003			
2004		22.9	
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013*	87.5 (53.7)	24.6 (54.3)	77 (47)
2014	39.9	17.8	59
2015	17.5	17.6	49
2016		14.8	66
2017			
2018			
2019			
2020		29.7	73
2021			
2022			
2023			
n	10	14	13
Mean	67.8	18.3	72.8
St Dev	24.5	5.4	11.5
n	2	4	4
Mean	28.7	20.0	61.8
St Dev	15.8	6.6	10.2

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	12.9	2.3	9.9	1.4	6-8	Cobble	A4
2015	13.5	1.6	16.3	1.2-1.5	2.5	Cobble	B3
2016	12.3	1.4	17.6	1.2-1.4	2.5	Cobble	B3
2020	15.8	2.7	6.6	1.2-1.5	4.5	Cobble	B3

**Reviewed Channel Type** **B3**

**RMRKS**

Small, moderately steep channel. The entire watershed burned extensively during the 2012 Mustang Complex Fire, and Colson Creek blew out several times during post-fire flood events. Sediment deposition and subsequent downcutting occurred on multiple occasions. Despite the high sediment supply, depth fines have remained mostly low (less than 30%) because this is a transport reach. Two samples conducted in 2013 – before and after flood event – increased to 54.3% fines post-flood – only the initial sample used for statistics.

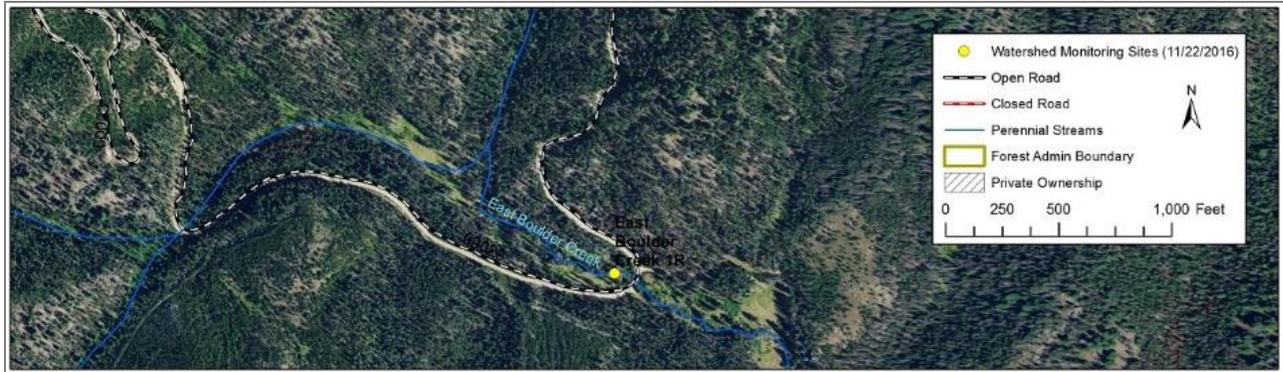
**EAST BOULDER CREEK 1R**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	East Boulder Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located just downstream of the Stormy Peak Road (FR#023) crossing.		
<b>GPS Coordinates</b>	N 45.35246 (2023)	W -114.14879 (2023)	
<b>Site Comments</b>	2017 site moved downstream of previous location to more suitable habitat. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	9.5 sq mi 6,095 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	27 cfs	<b>Mean Annual Flow</b> (Streamstats)	4.1 cfs
<b>5th-level Watershed</b>	Indian Creek – Salmon River / 1706020307				
<b>Mean Basin Elevation</b>	7405 ft	<b>Basin Aspect</b>	N	<b>Mean Basin Slope</b>	32%
<b>Length of Road</b>	5.7 mi	<b>Road Density</b>		0.59 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	92.2%	<b>Quartzite</b>	5.6%	
	<b>Volcanic</b>	0.0%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	2.2%	
<b>% of Watershed in Active Allotment</b>	99.8%	<b>% of Watershed Burned (2018-2022)</b>		73%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

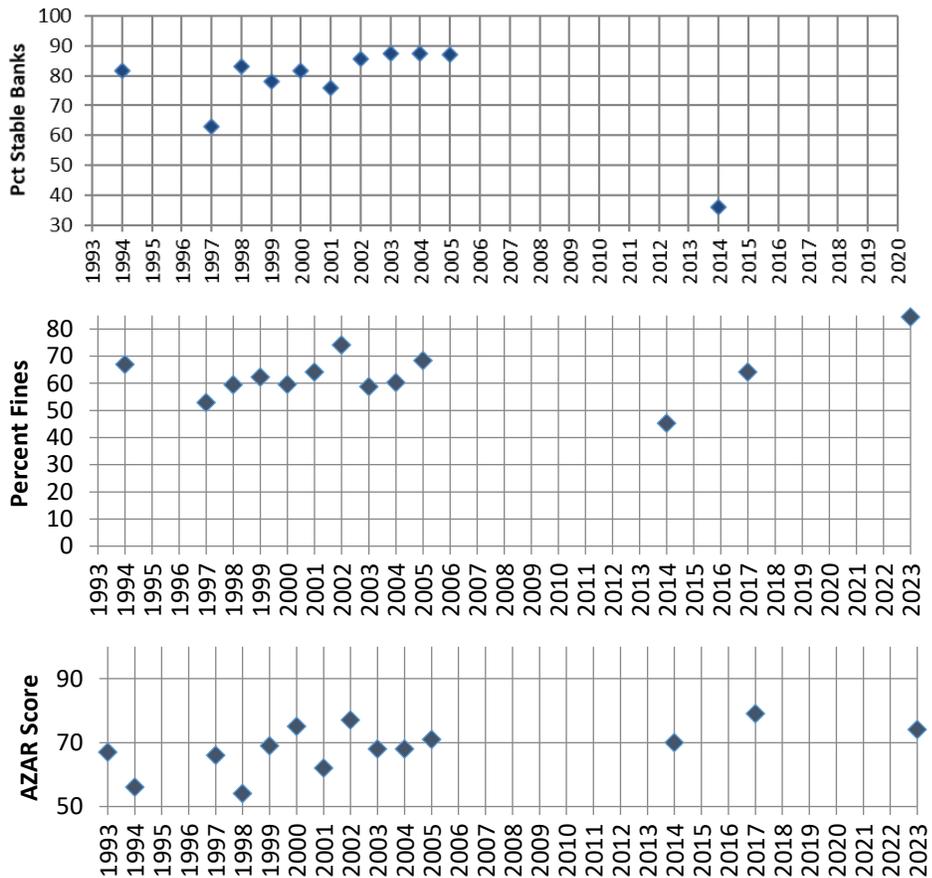
**EAST BOULDER CREEK 1R**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			67
1994	81.5	67.0	56
1995			
1996			
1997	63.0	52.9	66
1998	83.0	59.5	54
1999	78.0	62.3	69
2000	81.5	59.6	75
2001	76.0	64.2	62
2002	85.5	74.1	77
2003	87.5	58.8	68
2004	87.5	60.3	68
2005	87.0	68.4	71
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013			
2014	35.8	45.3	70
2015			
2016			
2017		64.2	79
2018			
2019			
2020			
2021			
2022			
2023		84.4	74
n	11	13	14
Mean	76.9	63.2	68.3
St Dev	15.4	9.5	7.2
n	1	3	3
Mean	35.8	64.6	74.3
St Dev	-	19.6	4.5

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	17.4	6.6	9.7	1.6	1	Grav/sand	F4
2017	20.5	1.2	17.1	1.7	1.0	Gravel	F4

<b>Reviewed Channel Type</b>	<b>F4</b>
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**REMARKS**

This site has shown very high levels of fines in past years (50-80%) and moderate bank stability. The cause of the excess fines is unknown, but the low gradient channel and granitic source material may be the primary factors resulting in a natural sand and gravel channel. The 2022 Moose Creek fire had a large impact on this watershed. Part of these impacts may be reflected in the 20% increase of fine material.

**INDIAN CREEK 2A**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Indian Creek 2A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	North Fork
<b>Site Location</b>	Site is located approx 4.5 miles up the Indian Creek Rd (FR036) from the Salmon River Rd (FR030), on NFS land just upstream of private property at Ulysses.		
<b>GPS Coordinates</b>	N 45.45937 (2023)	W -114.14824 (2023)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	41.6 sq mi 26,641 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	235 cfs	<b>Mean Annual Flow</b> (Streamstats)	28.7 cfs
<b>5th-level Watershed</b>	Indian Creek – Salmon River / 170620307				
<b>Mean Basin Elevation</b>	6610 ft	<b>Basin Aspect</b>	S	<b>Mean Basin Slope</b>	48%
<b>Length of Road</b>	61.2 mi	<b>Road Density</b>		1.47 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.6%	<b>Quartzite</b>	97.5%	
	<b>Volcanic</b>	0.0%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	1.9%	
<b>% of Watershed in Active Allotment</b>	46.0%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2023)**



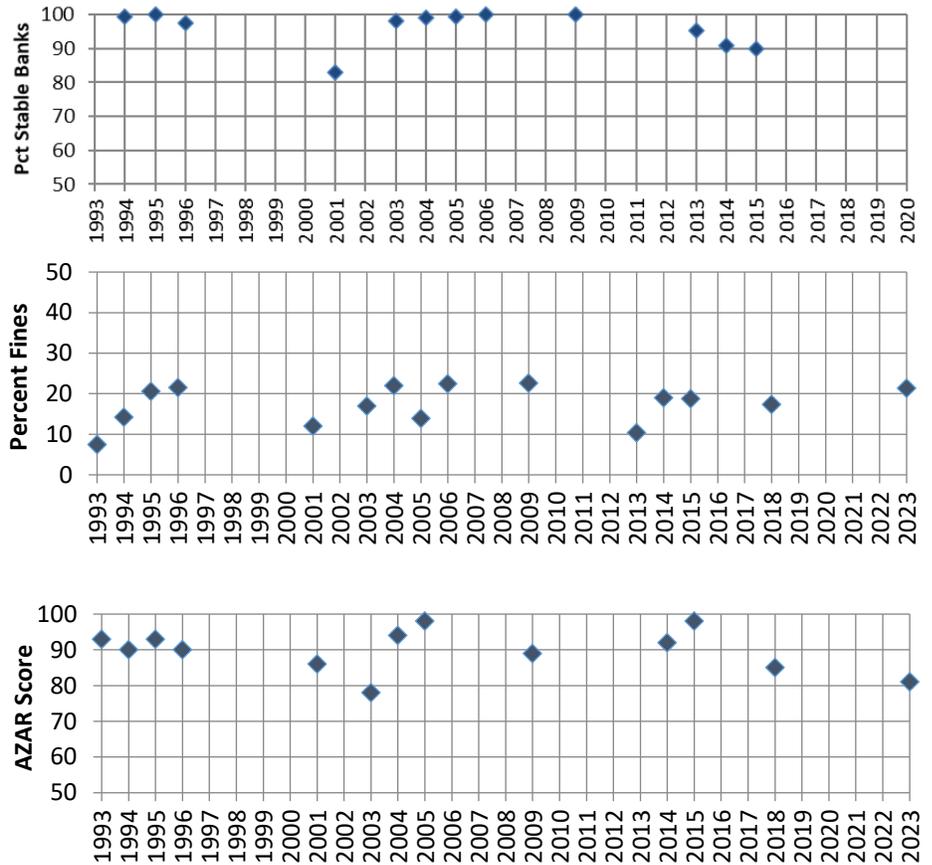
**View Downstream (2023)**

**INDIAN CREEK 2A**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		7.5	93
1994	99.5	14.2	90
1995	100	20.6	93
1996	97.5	21.5	90
1997			
1998			
1999			
2000			
2001	83.0	12.0	86
2002			
2003	98.0	17.0	78
2004	99.0	22.0	94
2005	99.5	13.9	98
2006	100	22.5	
2007			
2008			
2009	100	22.6	89
2010			
2011			
2012			
2013	95.3	10.4	
2014	90.8	19.0	92
2015	90.0	18.8	98
2016			
2017			
2018		17.4	85
2019			
2020			
2021			
2022			
2023		21.4	81
n	12	15	13
Mean	96.1	17.4	89.8
St Dev	5.4	4.8	6.0
n	2	4	4
Mean	90.4	19.2	89.0
St Dev	0.6	1.7	7.5



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1995	20.3	1.1	10.1	-	2	vc gravel	B4
2015	23.0	1.5	25.6	<1.2	2.0	Cobble	B3
2018	25.6	2.7	14.5	<1.2	2.5	Gravel	C4b

**Reviewed Channel Type** **C4b**

**10YR ALL**

**REMARKS**

Indian Creek 2A has undergone a series of changes and was relocated a short distance upstream in 2014. Depth fines have been consistently low (less than 23%). Depth fines did not show an increase after the 2012 Mustang Complex Fire, and bank stability remained high. 2023 notes indicate that a local resident mentions extensive incision in the area, but incision was not noted at the sample site.

**MOOSE CREEK MSP 1R**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Moose Creek MSP 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located approximately 100 meters upstream of a bridge crossing Moose Creek on the Stormy Creek Road (FR023).		
<b>GPS Coordinates</b>	N 45.31430 (2023)	W -114.03917 (2023)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	15.1 sq mi 9,659 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	58.7 cfs	<b>Mean Annual Flow</b> (Streamstats)	4.1 cfs
<b>5th-level Watershed</b>	Indian Creek-Salmon River / 1706020307				
<b>Mean Basin Elevation</b>	7531 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	22%
<b>Length of Road</b>	22.7 mi		<b>Road Density</b>		1.50 mi/sq mi
<b>Landtype Geology</b>	<b>Granitic</b>	34.9%	<b>Quartzite</b>	61.1%	
	<b>Volcanic</b>	0.0%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	4.0%	
<b>% of Watershed in Active Allotment</b>	99.8%	<b>% of Watershed Burned (2018-2022)</b>		81.6%	

**SITE PHOTOS**



**View Upstream (2023)**



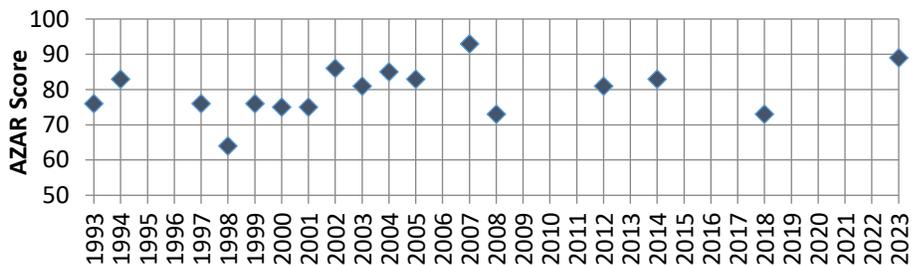
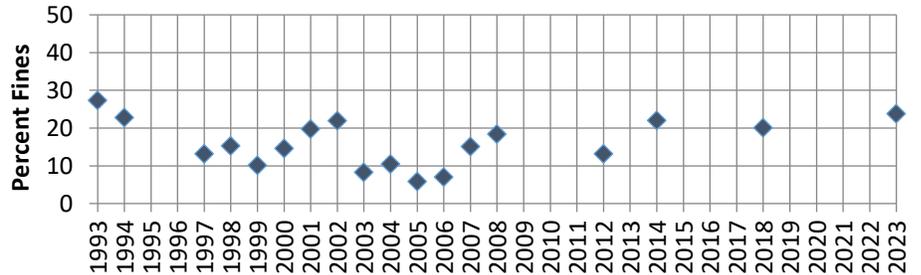
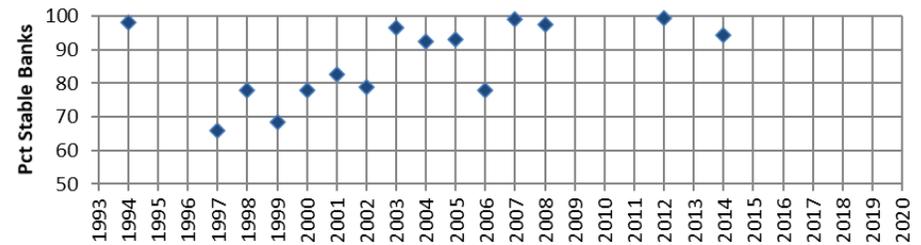
**View Downstream (2023)**

**MOOSE CREEK MSP 1R**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		27.3	76
1994	98.0	22.8	83
1995			
1996			
1997	66.0	13.2	76
1998	78.0	15.3	64
1999	68.5	10.1	76
2000	78.0	14.6	75
2001	82.5	19.7	75
2002	79.0	21.9	86
2003	96.5	8.3	81
2004	92.5	10.5	85
2005	93.0	5.8	83
2006	78.0	7.0	
2007	99.0	15.1	93
2008	97.5	18.4	73
2009			
2010			
2011			
2012	99.5	13.2	81
2013			
2014	94.2	22.0	83
2015			
2016			
2017			
2018		20.1	73
2019			
2020			
2021			
2022			
2023		23.8	89
n	15	18	17
Mean	86.7	16.1	79.5
St Dev	11.5	6.3	7.0
n	1	3	3
Mean	94.2	22.0	81.7
St Dev	-	1.9	8.1



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	21.7	13.8	18.1	1.4	1-2	Cobble	C4
2018	25.0	5.6	25.3	1.3	1.0	Gravel	C4

**Reviewed Channel Type** **C4**

**10YR ALL**

**REMARKS**

This site has been sampled relatively continuously. Depth fines have been consistently less than 28%, and bank stability has shown an increasing trend. This area has been largely affected by the 2022 Moose Fire.

**OWL CREEK 1A**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Owl Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	North Fork
<b>Site Location</b>	Site is located approximately 0.4 miles upstream of the mouth of Owl Creek at the Salmon River. Site is accessed by hiking the Owl Creek Trail from the Salmon River Road (FR030) to a point just upstream of the canyon mouth.		
<b>GPS Coordinates</b>	N 45.32298 (2023)	W -114.45343 (2023)	
<b>Site Comments</b>	2018 site moved to more suitable site upstream of diversion dam. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	53.7 sq mi 34,362 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	282 cfs	<b>Mean Annual Flow</b> (Streamstats)	34.9 cfs
<b>5th-level Watershed</b>	Owl Creek-Salmon River / 1706020313				
<b>Mean Basin Elevation</b>	6625 ft	<b>Basin Aspect</b>	S	<b>Mean Basin Slope</b>	46%
<b>Length of Road</b>	101.7 mi	<b>Road Density</b>		1.89 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	90.5%	<b>Quartzite</b>	8.9%	
	<b>Volcanic</b>	0.0%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	0.6%	
<b>% of Watershed in Active Allotment</b>	0%	<b>% of Watershed Burned (2018-2022)</b>		11.3%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

**OWL CREEK 1A**

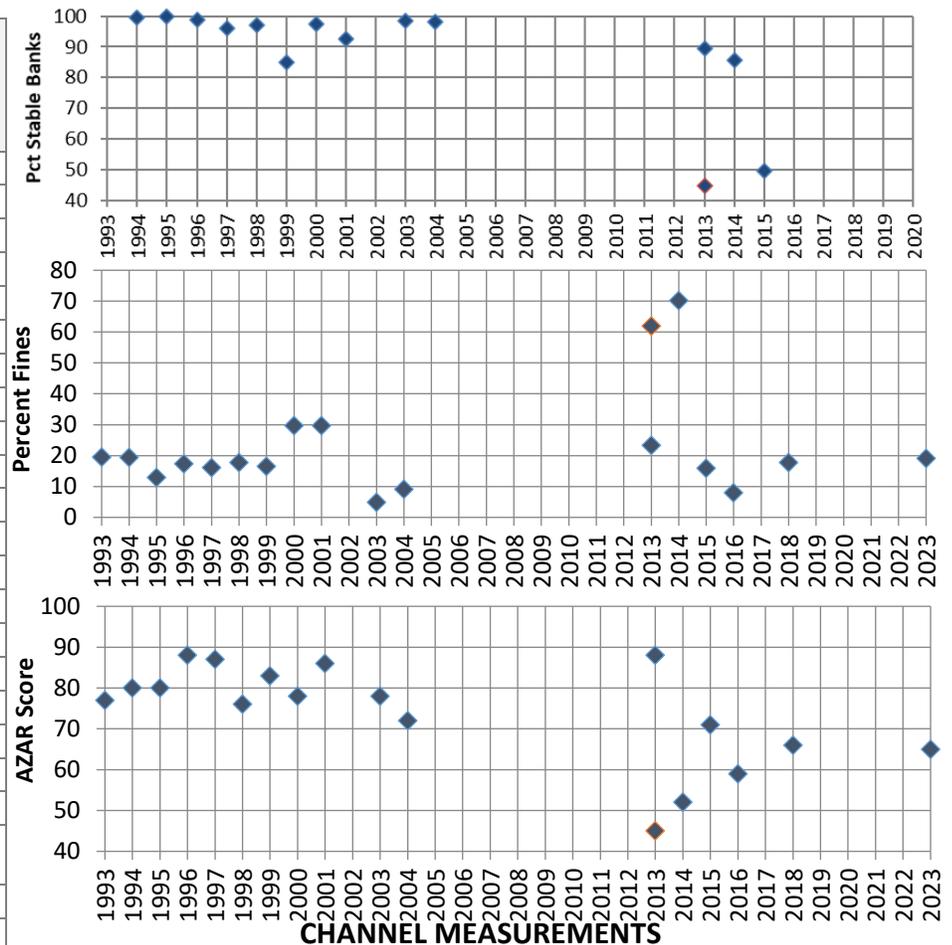
**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		19.5	77
1994	99.5	19.4	80
1995	100	13.0	80
1996	99.0	17.4	88
1997	96.0	16.1	87
1998	97.0	17.8	76
1999	85.0	16.6	83
2000	97.5	29.7	78
2001	92.5	29.7	86
2002			
2003	98.5	4.9	78
2004	98.0	9.1	72
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013*	89.6 (44.6)	23.4 (62.0)	88 (45)
2014	85.5	70.2	52
2015	49.5	15.9	71
2016		8.0	59
2017			
2018		17.8	66
2019			
2020			
2021			
2022			
2023		19.1	65
n	13	17	17
Mean	91.4	20.4	75.6
St Dev	13.6	14.4	10.4
n	2	5	5
Mean	67.5	26.2	62.6
St Dev	25.5	25.0	7.3

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	25.2	1.5	14.8	<1.2	4	Cobble	B3a
2016	20.9	1.3	12.6	1.2	3-4	Cobble	B3
2018	26.5	1.4	14.0	<1.2	3	Cobble	B3

**Reviewed Channel Type** **B3**

**RMRKS**

The Owl Creek Watershed burned extensively during the 2012 Mustang Complex Fire. Post-fire flood events in 2013 and 2014 resulted in high fines in 2013 and 2014, and decreased bank stability. The channel has been drastically influenced by these flood events, but depth fines recovered quickly as a result of the high energy of this channel.  
 \* 2 samples conducted in 2013 – before and after flood event – percent fines increased to 62% post-flood – only the initial sample used for statistics.

**BIA PO'I NAKWAIDE 1A**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Bia Po'i Naokwaide 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	North Fork
<b>Site Location</b>	Site is located along Forest Road 60039 approximately 1.7 miles upstream of the Salmon River Road (FR030).		
<b>GPS Coordinates</b>	N 45.41010 (2020)	W -114.20024 (2020)	
<b>Site Comments</b>	5-year sampling frequency		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	14.5 sq mi 9,307 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	75 cfs	<b>Mean Annual Flow</b> (Streamstats)	11.4 cfs
<b>5th-level Watershed</b>	Indian Creek-Salmon River / 1704021702				
<b>Mean Basin Elevation</b>	6416 ft	<b>Basin Aspect</b>	SE	<b>Mean Basin Slope</b>	52%
<b>Length of Road</b>	20.5 mi	<b>Road Density</b>		1.41 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	99.7%	<b>Quartzite</b>	0.3%	
	<b>Volcanic</b>	0.0%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	0.0%	
<b>% of Watershed in Active Allotment</b>	0%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2020)



View Downstream (2020)

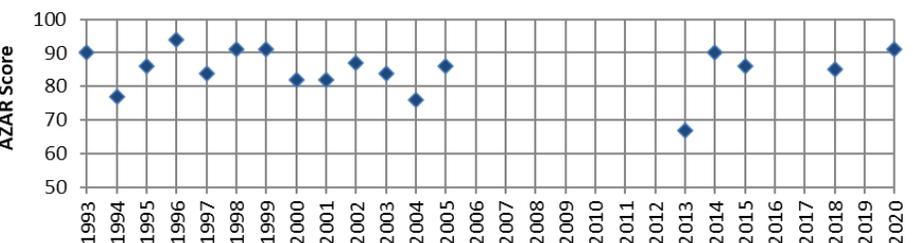
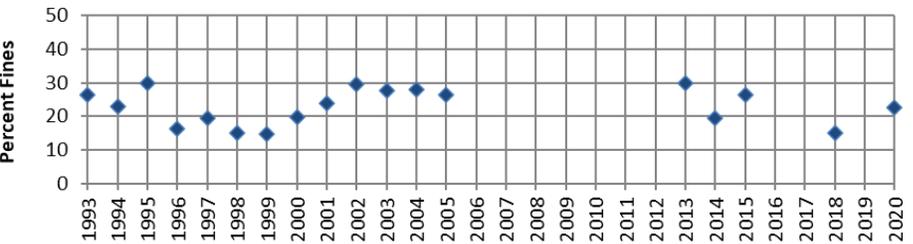
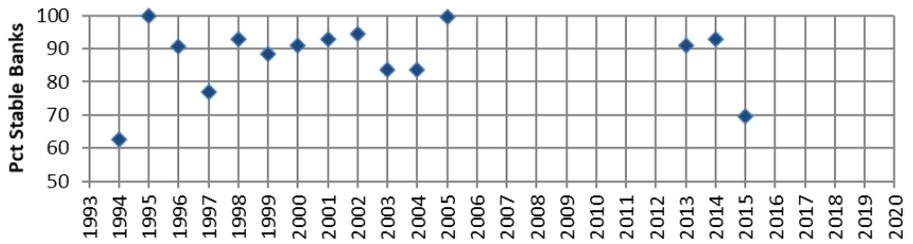
**BIA PO'I NAKWAIDE 1A**

**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		26.5	90
1994	62.5	23.0	77
1995	100	30.0	86
1996	90.5	16.3	94
1997	77.0	19.3	84
1998	93.0	15.1	91
1999	88.5	14.8	91
2000	91.0	19.7	82
2001	93.0	24.0	82
2002	94.5	29.6	87
2003	83.5	27.6	84
2004	83.5	28.0	76
2005	99.5	26.3	86
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013	91.0	30.0	67
2014	93.0	19.4	90
2015	69.5	26.5	86
2016			
2017			
2018		15.0	85
2019			
2020		22.6	91
2021			
2022			
2023			
n	15	18	18
Mean	87.3	23.0	84.9
St Dev	10.6	5.4	6.6
n	2	4	4
Mean	81.3	20.9	88.0
St Dev	16.6	4.9	2.9

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	12	1.8	15	1.0	1-2	Cobble	B4c
2015	8.8	1.4	7.6	<1.2	4.0	Gravel	G4
2018	17.9	3.2	17.4	<1.2	3	Gravel	C4b
2020	13.5	4.4	8.4	1.2-1.5	2.5	Gravel	C4b

<b>Reviewed Channel Type</b>	<b>C4b</b>
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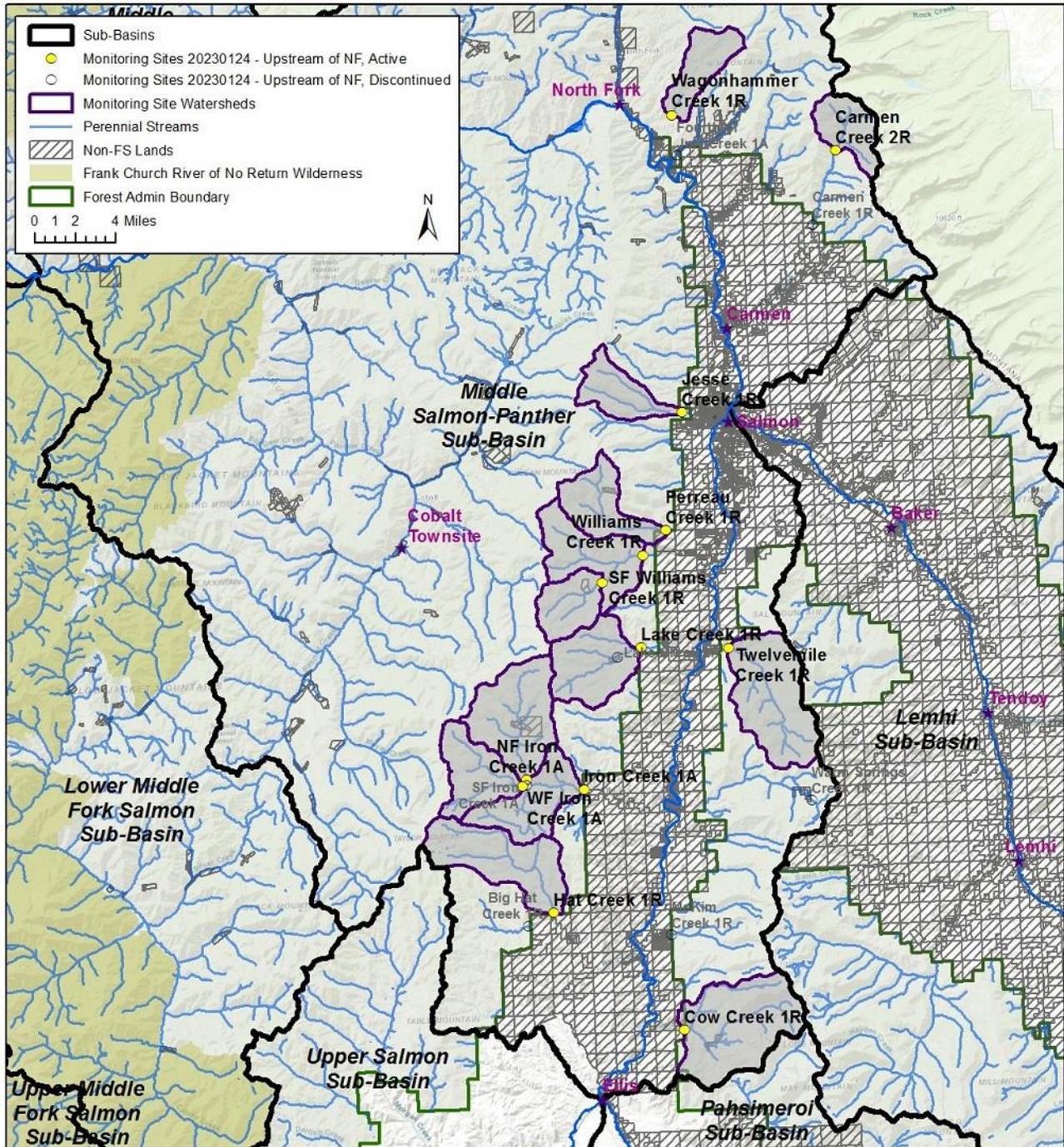
**REMARKS**

Depth fines have been consistently less than 30%, and bank stability has varied. Fines do not appear to have increased over baseline levels following the 2012 Mustang Complex Fire. Some post-fire flood events did occur, leading to channel instability and dynamic channel changes. 2018 site moved 30 feet upstream to suitable spawning habitat, old site (2015) is continuous riffle in incised channel – C4b and G4 channel types both exist on a reach scale.



### Salmon River Watersheds Upstream of North Fork

A total of 13 active monitoring sites are located in watersheds draining to the Salmon River upstream of North Fork.



**CARMEN CREEK 2R**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Carmen Creek 2R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	North Fork
<b>Site Location</b>	Site is located off FR60069-C, about 3.7 miles upstream of the Forest boundary, and about 1.9 miles upstream of the upper Carmen Creek Bridge on FR60069.		
<b>GPS Coordinates</b>	N 45.36716 (2019)	W -113. 77612 (2019)	
<b>Site Comments</b>	New site established 2019. 10-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	8.3 sq mi 5,303 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	105 cfs	<b>Mean Annual Flow</b> (Streamstats)	5.5 cfs
<b>5th-level Watershed</b>	Carmen Creek-Salmon River / 1706020305				
<b>Mean Basin Elevation</b>	8080 ft	<b>Basin Aspect</b>	S	<b>Mean Basin Slope</b>	45%
<b>Length of Road</b>	0.5 mi	<b>Road Density</b>		0.06 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	9.7%	<b>Quartzite</b>		85.1%
	<b>Volcanic</b>	0%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		5.2%
<b>% of Watershed in Active Allotment</b>	99.9%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (8/6/2019)**



**View Downstream (8/6/2019)**



**COW CREEK 1R**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Cow Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Challis-Yankee Fork
<b>Site Location</b>	Site is located approximately 2 miles upstream of the mouth, at the Forest boundary.		
<b>GPS Coordinates</b>	N 44.73971 (2023)	W -113.96194 (2023)	
<b>Site Comments</b>	No access through private property at mouth of Cow Creek makes access very difficult. Grazing BA changed to 10-year sampling frequency.		

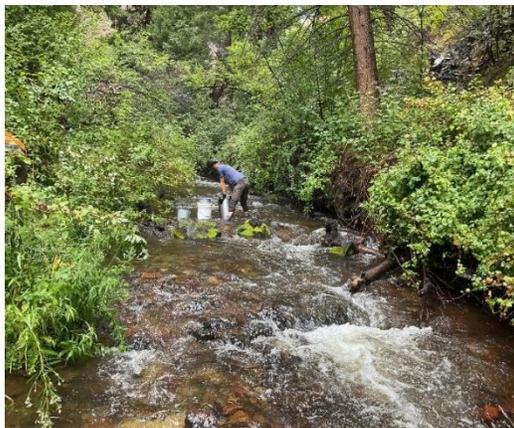
**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	24.1 sq mi 15,440 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	27 cfs	<b>Mean Annual Flow</b> (Streamstats)	16.5 cfs
<b>5th-level Watershed</b>	Carmen Creek-Salmon River / 1706020305				
<b>Mean Basin Elevation</b>	7741 ft	<b>Basin Aspect</b>	W	<b>Mean Basin Slope</b>	47%
<b>Length of Road</b>	6.1 mi	<b>Road Density</b>		0.25 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	62.2%	
	<b>Volcanic</b>	37.8%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	96.8%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2023)



View Downstream (2023)

**COW CREEK 1R**

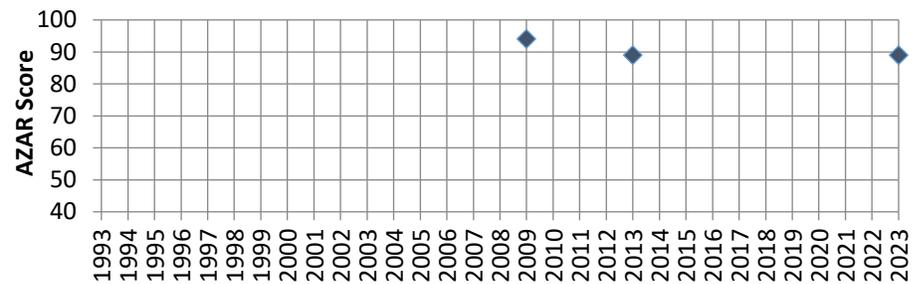
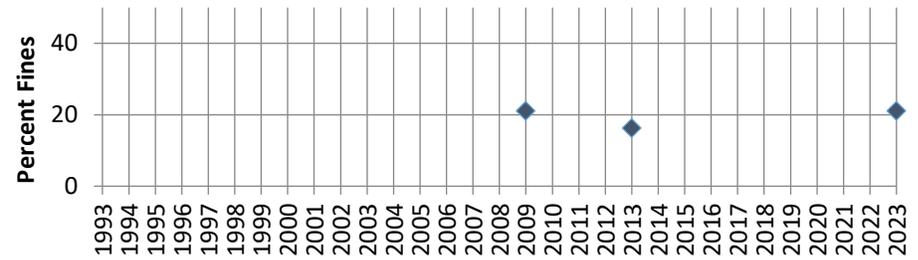
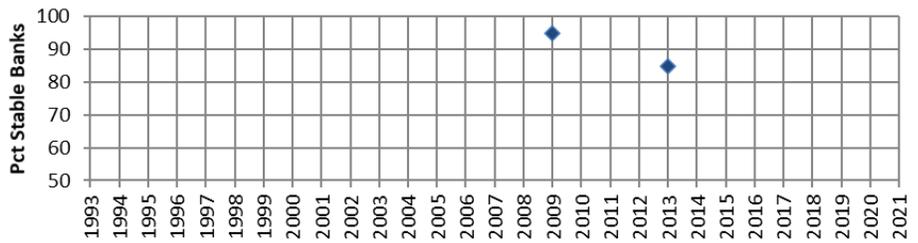
**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009	95.0	21.1	94.0
2010			
2011			
2012			
2013	84.8	16.3	89.0
2014			
2015			
2016			
2017			
2018			
2019			
2020			
2021			
2022			
2023		21.1	89.0
<b>n</b>	2	3	3
<b>Mean</b>	89.9	19.5	90.7
<b>St Dev</b>	7.2	2.8	2.9
<b>n</b>	0	1	1
<b>Mean</b>	-	21.1	89.0
<b>St Dev</b>	-	-	-

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2023	30	1.4-2.2	16	<1.2	2-4%	Gravel	B4 C4b

**Reviewed Channel Type**

**REMARKS**

Periodic monitoring at this site is needed for the Cow Creek grazing BA. Access is difficult because of private property at the mouth of Cow Creek. Depth fines have remained consist between 16-21%. Reach is at the bottom of a narrow steep walled canyon. 2023 channel measurements are estimates from field photos

**HAT CREEK 1R**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Hat Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located on Hat Creek at the Forest Boundary, approximately 0.4 miles upstream of the confluence with Big Hat Creek. Access is via the Hat Creek Road (FR093) to Big Hat Creek, then hiking NE to Hat Creek.		
<b>GPS Coordinates</b>	N 44.82761 (2020)	W -114.09075 (2020)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	18.1 sq mi 11,597 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	42 cfs	<b>Mean Annual Flow</b> (Streamstats)	8.6 cfs
<b>5th-level Watershed</b>	Hat Creek-Salmon River / 1706020301				
<b>Mean Basin Elevation</b>	7615 ft	<b>Basin Aspect</b>	SE	<b>Mean Basin Slope</b>	35%
<b>Length of Road</b>	46.7 mi		<b>Road Density</b>		2.58 mi/sq mi
<b>Landtype Geology</b>	<b>Granitic</b>	0%		<b>Quartzite</b>	41.1%
	<b>Volcanic</b>	58.9%		<b>Mixed</b>	0%
	<b>Sedimentary</b>	0%		<b>Alluvium</b>	0%
<b>% of Watershed in Active Allotment</b>	91.8%	<b>% of Watershed Burned (2018-2022)</b>		41.9%	

**SITE PHOTOS**



View Upstream (2020)



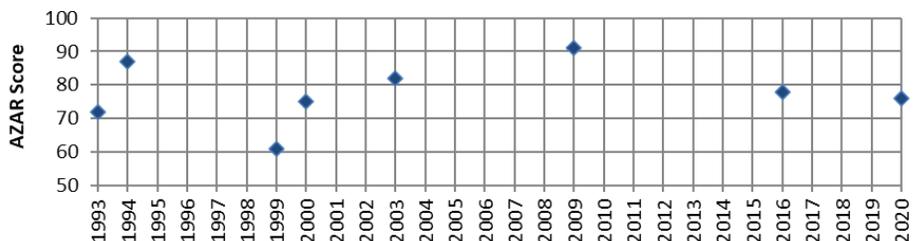
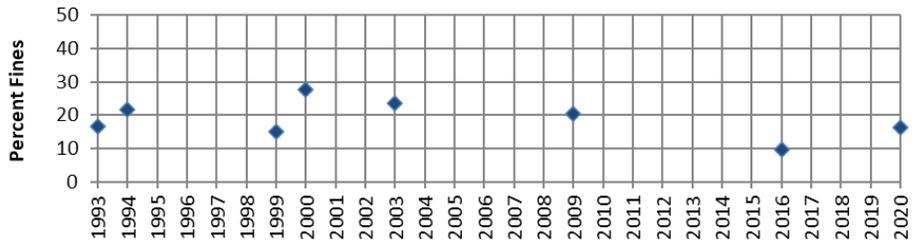
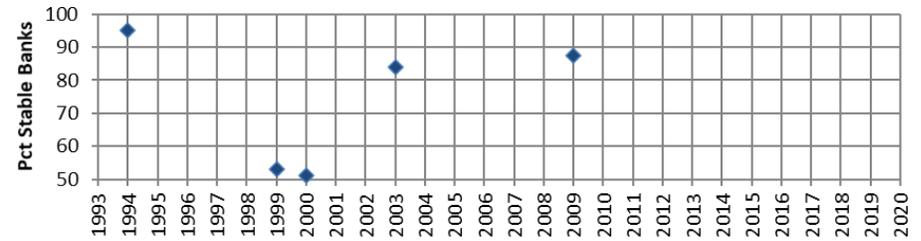
View Downstream (2020)

HAT CREEK 1R

Last Year Sampled: 2020

SITE DATA

Year	% Stable Banks	Percent Fines	AZAR Score
1993		16.7	72
1994	95.0	21.8	87
1995			
1996			
1997			
1998			
1999	53.0	15.1	61
2000	51.0	27.6	75
2001			
2002			
2003	84.0	23.7	82
2004			
2005			
2006			
2007			
2008			
2009	87.5	20.3	91
2010			
2011			
2012			
2013			
2014			
2015			
2016		9.6	78
2017			
2018			
2019			
2020		16.4	76
2021			
2022			
2023			
n	5	8	8
Mean	74.1	18.9	77.8
St Dev	20.6	5.6	9.3
n	0	2	2
Mean	-	13.0	77.0
St Dev	-	4.8	1.4



CHANNEL MEASUREMENTS

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2003	15.7	-	11.4	-	4	-	A4
2016	15.0	2.4	20.3	1.2	4	Gravel	C4b
2020	17.8	4.5	13.6	<1.2	5	Cobble	C3b

Reviewed Channel Type

C3b

10YR ALL

REMARKS

Sporadic sampling has occurred at this site. Depth fines have been consistently low, and bank stability has been variable. Site was originally on private property upstream of the Big Hat Creek confluence. It is unclear where the sampling occurred (original site vs on NFS lands) in subsequent years. The 2016 site was just upstream of the Forest boundary.

**IRON CREEK 1A**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Iron Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located just upstream of the Forest Boundary along the Iron Creek Road (FR045), approximately 5 miles up the road from Highway 93.		
<b>GPS Coordinates</b>	N 44.91530 (2023)	W -114.05578 (2023)	
<b>Site Comments</b>	5-year sampling frequency		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	42.5 sq mi 27,197 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	131 cfs	<b>Mean Annual Flow</b> (Streamstats)	24.1 cfs
<b>5th-level Watershed</b>	Iron Creek-Salmon River / 1706020302				
<b>Mean Basin Elevation</b>	7484 ft	<b>Basin Aspect</b>	E	<b>Mean Basin Slope</b>	41%
<b>Length of Road</b>	125.9 mi	<b>Road Density</b>		2.96 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	52.8%	
	<b>Volcanic</b>	47.2%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	99.5%	<b>% of Watershed Burned (2018-2022)</b>		8.7%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

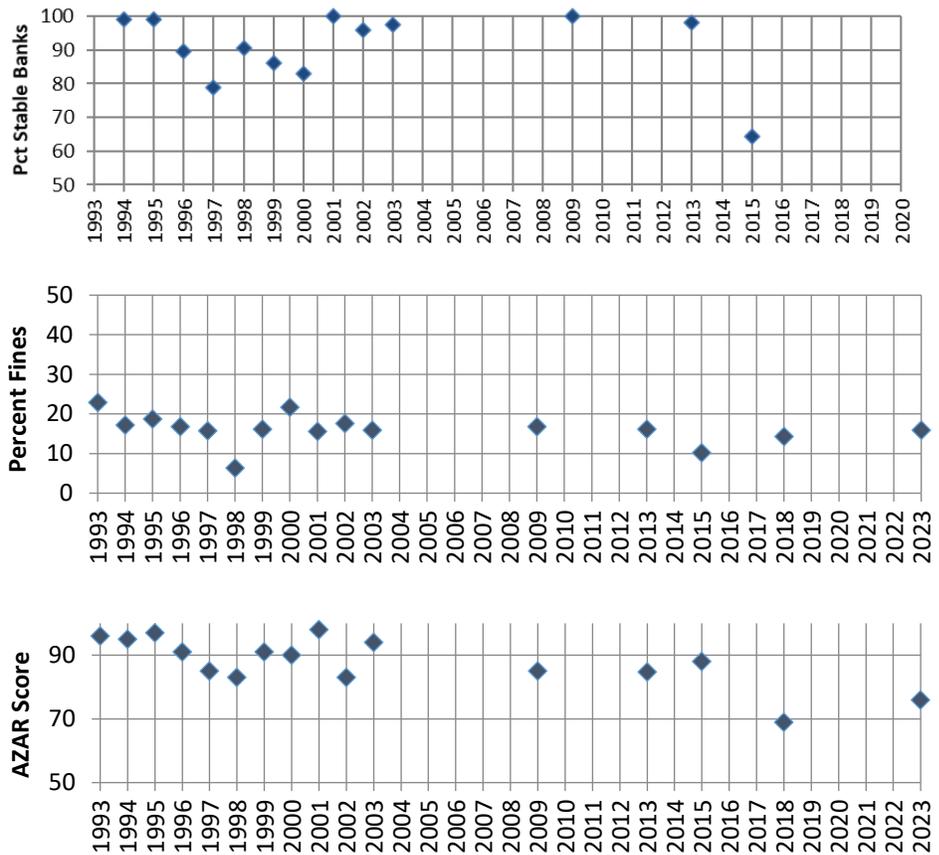
**IRON CREEK 1A**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		22.9	96
1994	99.0	17.2	95
1995	99.0	18.7	97
1996	89.5	16.8	91
1997	79.0	15.8	85
1998	90.5	6.4	83
1999	86.0	16.2	91
2000	83.0	21.7	90
2001	100	15.6	98
2002	96.0	17.6	83
2003	97.5	15.9	94
2004			
2005			
2006			
2007			
2008			
2009	100	16.8	85
2010			
2011			
2012			
2013	98.0	16.2	84.75
2014			
2015	64.5	10.2	88
2016			
2017			
2018		14.3	69
2019			
2020			
2021			
2022			
2023		15.9	76
n	13	16	16
Mean	90.9	16.1	87.9
St Dev	10.6	3.8	7.9
n	1	3	3
Mean	64.5	13.5	77.7
St Dev	-	2.9	9.6

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1995	23.8	1.6	11.9	-	7	Sm cob	B3a
1998	15.5	11.6	9.1	1.1+	4-5	Cobble	B3a
2015	16.5	10.6	15.0	1.2-1.5	2.0	Gravel	C4
2018	27	3.2	16.9	1.1	1.8	Gravel	C4

**Reviewed Channel Type** **C4**

**REMARKS**

This site has a relatively continuous dataset. Depth fines have been consistently low (less than 22%), and bank stability has been variable. Data show no apparent increases in fines as a result of the 2011 Salt Fire. The cause of the decrease in bank stability in 2015 is unknown.

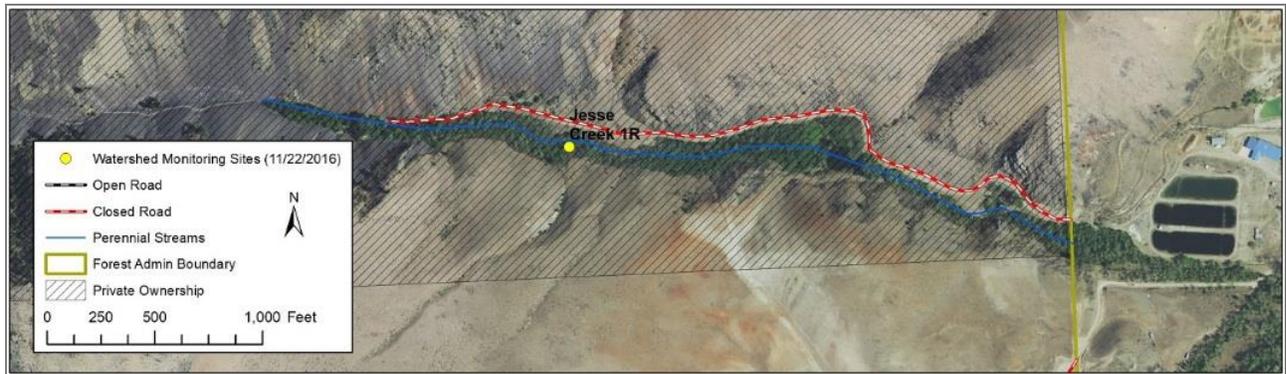
**JESSE CREEK 1R**

**Last Year Sampled: 2021**

**SITE INFO**

<b>Site Name</b>	Jesse Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located approximately 0.5 miles upstream of the Forest boundary on the Jesse Creek Road (FR039) just west of Salmon. The site is at a stilling well, upstream of the waterworks for the City of Salmon.		
<b>GPS Coordinates</b>	N 45.18360 (2021)	W -113.94244 (2016)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	8.6 sq mi 5,500 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	26 cfs	<b>Mean Annual Flow</b> (Streamstats)	5.2 cfs
<b>5th-level Watershed</b>	Williams Creek-Salmon River / 1706020304				
<b>Mean Basin Elevation</b>	7342 ft	<b>Basin Aspect</b>	E	<b>Mean Basin Slope</b>	42%
<b>Length of Road</b>	7.4 mi	<b>Road Density</b>		0.86 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	11.1%	<b>Quartzite</b>		88.3%
	<b>Volcanic</b>	0.6%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		0%
<b>% of Watershed in Active Allotment</b>	1.0%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (7/26/2021)**



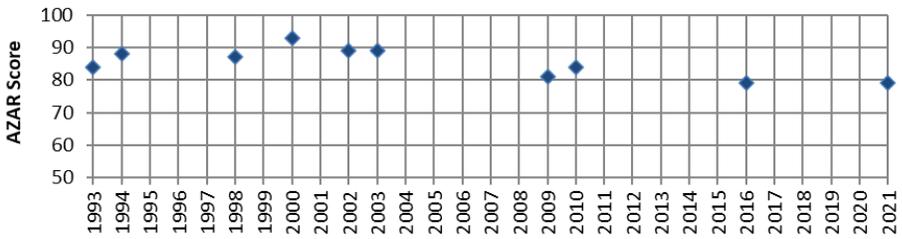
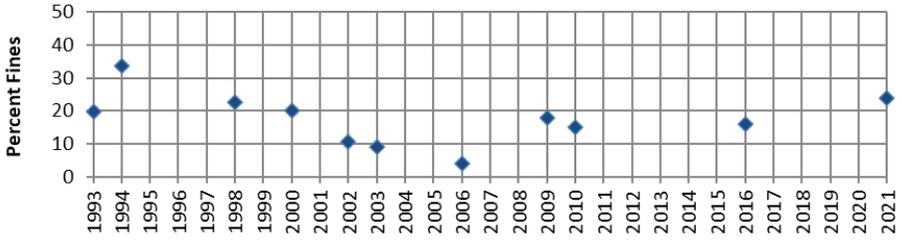
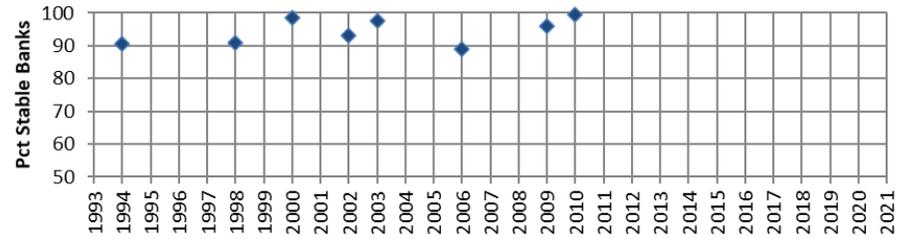
**View Downstream (7/26/2021)**

**JESSE CREEK 1R**

**Last Year Sampled: 2021**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		19.7	84
1994	90.5	33.5	88
1995			
1996			
1997			
1998	91.0	22.6	87
1999			
2000	98.5	20.1	93
2001			
2002	93.0	10.5	89
2003	97.5	9.1	89
2004			
2005			
2006	89.0	3.9	
2007			
2008			
2009	96.0	18.0	81
2010	99.5	15.0	84
2011			
2012			
2013			
2014			
2015			
2016		15.9	79
2017			
2018			
2019			
2020			
2021		23.9	79.0
2022			
2023			
n	8	11	10
Mean	94.4	17.5	85.3
St Dev	4.0	8.1	4.7
n	0	2	2
Mean	-	19.9	79.0
St Dev	-	5.7	0.0



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	16.3	2.7	11.6	1.1	2-3	Cobble	B4
2016	9.4	2.1	16.8	1.2	4	Gravel	B4

<b>Reviewed Channel Type</b>	<b>B4</b>
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**10YR ALL**

**REMARKS**

The Jesse Creek watershed is the municipal watershed for the City of Salmon. The sampling site is located downstream of a subterranean section of channel (beneath talus), which may act to filter out sand-sized fines. As such, depth fines are consistently below 25% (with the exception of 1994). Site watershed edited 11/30/16 to reflect actual location of sampling site (drainage area corrected from 5524 acres to 5491 acres).

**LAKE CREEK 1R**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Lake Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located approximately 0.3 miles upstream of Williams Lake. Access is via a pullout and short trail from the Lake Creek Road (FR028).		
<b>GPS Coordinates</b>	N 45.01581 (2020)	W -113.99264 (2020)	
<b>Site Comments</b>	Avoid sampling during spawning periods. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	14.0 sq mi 8,990 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	54 cfs	<b>Mean Annual Flow</b> (Streamstats)	7.9 cfs
<b>5th-level Watershed</b>	Twelvemile Creek-Salmon River / 1706020303				
<b>Mean Basin Elevation</b>	7294 ft	<b>Basin Aspect</b>	E	<b>Mean Basin Slope</b>	40%
<b>Length of Road</b>	35.6 mi		<b>Road Density</b>		2.53 mi/sq mi
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	28.5%	
	<b>Volcanic</b>	71.5%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	99.0%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2020)



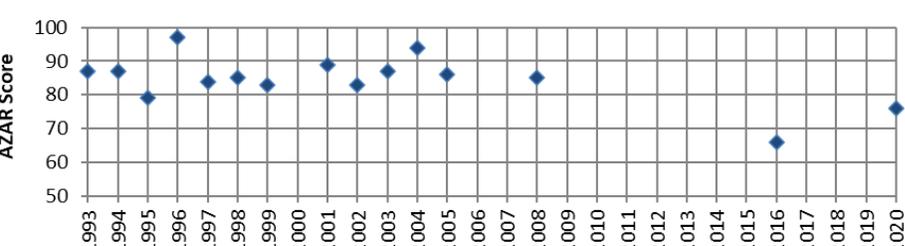
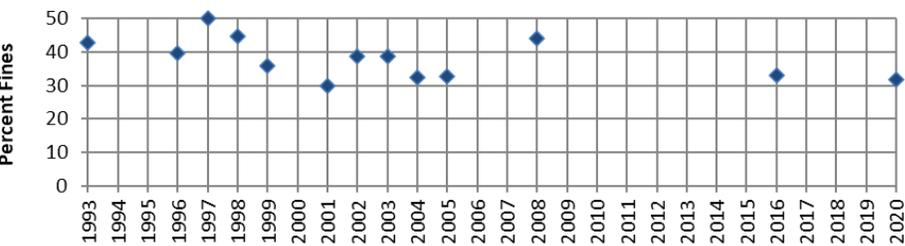
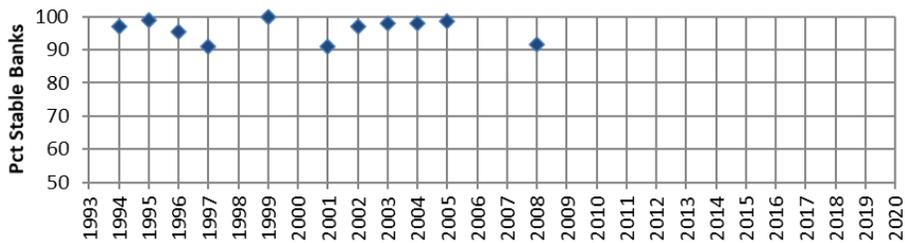
View Downstream (2020)

**LAKE CREEK 1R**

**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		42.7	87
1994	97.0	52.0	87
1995	99.0	53.8	79
1996	95.5	39.7	97
1997	91.0	50.0	84
1998		44.6	85
1999	100	35.9	83
2000			
2001	91.0	29.8	89
2002	97.0	38.6	83
2003	98.0	38.7	87
2004	98.0	32.4	94
2005	98.5	32.8	86
2006			
2007			
2008	91.5	44.0	85
2009			
2010			
2011			
2012			
2013			
2014			
2015			
2016		32.9	66
2017			
2018			
2019			
2020		31.6	76
2021			
2022			
2023			
n	11	15	15
Mean	96.0	40.0	84.5
St Dev	3.3	7.7	7.3
n	0	2	2
Mean	-	32.3	71.0
St Dev	-	0.9	7.1



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	11.1	38.7	10.1	1.1	2-3	Gravel	E4b
2016	10-15	16-25	11-16	1.2	2	Gravel	C4
2020	9	3.3	11.1	1.2-1.5	1.5	Gravel	C4

**Reviewed Channel Type** **C4**

**10YR ALL**

**REMARKS**

Recent data at this site are limited. Depth fines have been consistently high, between 30 and 54%. Fines are high for this type of channel, and the source of fines is unknown. Bank stability has been consistently high.

**NORTH FORK IRON CREEK 1A**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	North Fork Iron Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located approximately 0.3 miles upstream of the mouth of SF Iron Creek at Iron Creek. Access is via the Iron Creek Road (FR045), 8.2 miles from Highway 93.		
<b>GPS Coordinates</b>	N 44.92393 (2019)	W -114.11295 (2019)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	18.5 sq mi 11,869 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	73 cfs	<b>Mean Annual Flow</b> (Streamstats)	10.1 cfs
<b>5th-level Watershed</b>	Iron Creek-Salmon River / 1706020302				
<b>Mean Basin Elevation</b>	7645 ft	<b>Basin Aspect</b>	S	<b>Mean Basin Slope</b>	39%
<b>Length of Road</b>	63.1 mi	<b>Road Density</b>	3.40 mi/sq mi		
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	67.3%	
	<b>Volcanic</b>	32.7%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	98.8%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2019)



View Downstream (2019)

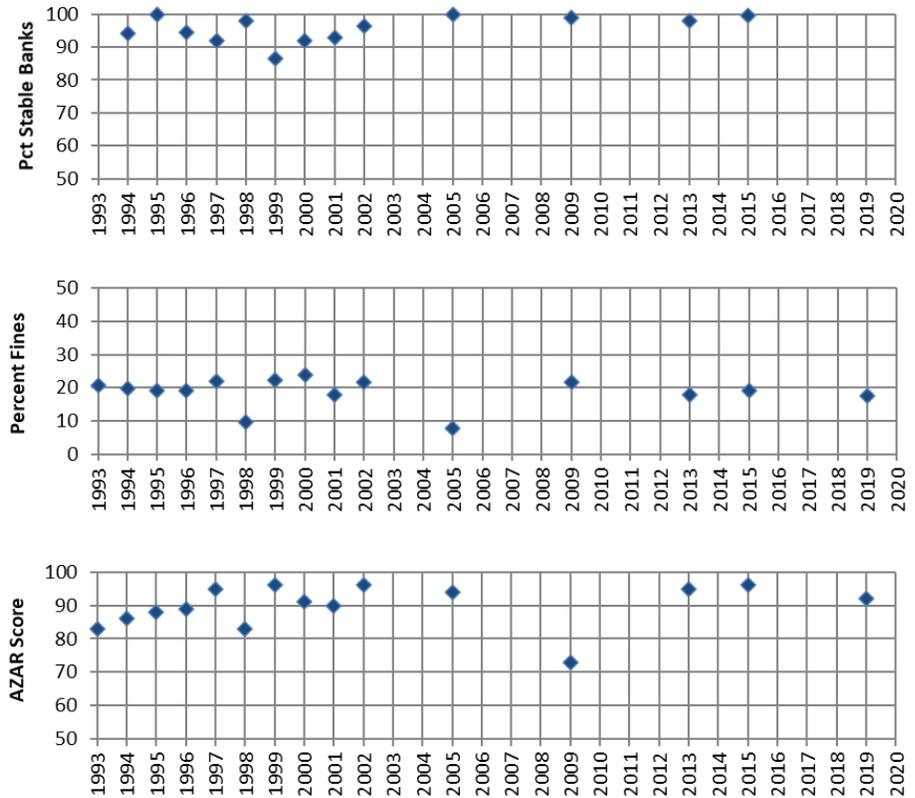
**NORTH FORK IRON CREEK 1A**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		20.7	83
1994	94.0	19.7	86
1995	100	19.2	88
1996	94.5	19.0	89
1997	92.0	21.9	95
1998	98.0	9.6	83
1999	86.5	22.4	96
2000	92.0	23.8	91
2001	93.0	17.9	90
2002	96.5	21.8	96
2003			
2004			
2005	100	7.7	94
2006			
2007			
2008			
2009	99.0	21.6	73
2010			
2011			
2012			
2013	98.0	17.8	95
2014			
2015	99.5	19.1	96
2016			
2017			
2018			
2019		17.7	92.0
2020			
2021			
2022			
2023			
n	13	15	15
Mean	95.6	18.7	89.8
St Dev	4.1	4.5	6.5
n	1	2	2
Mean	99.5	18.4	94.0
St Dev	-	1.0	2.8

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	20.0	5.5	12.5	< 1.2	1.5	Gravel	C4
2019	16.3	1.9	40.0	<1.2	3.0	Gravel	C4b

<b>Reviewed Channel Type</b>	<b>C4</b>
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**REMARKS**

This site has been periodically sampled over the last 15 years. Depth fines have been consistently low (less than 24%), and bank stability has been high.

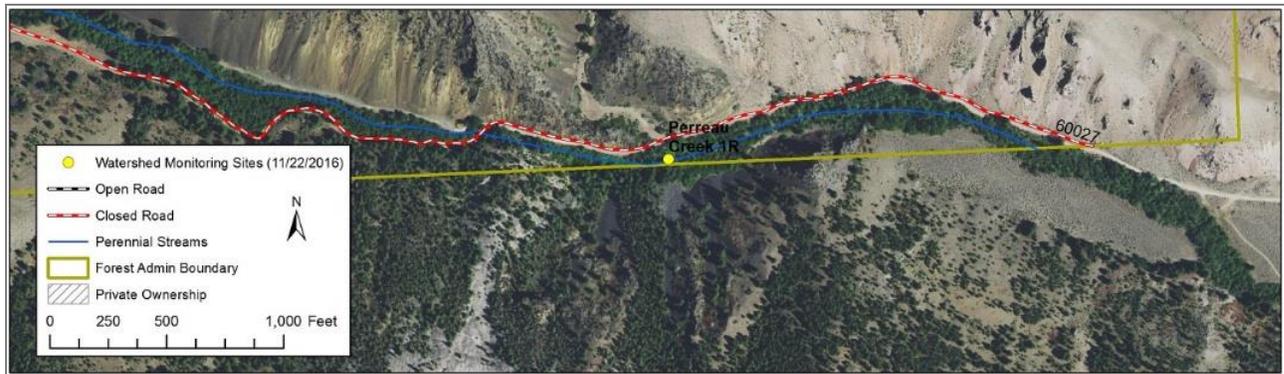
**PERREAU CREEK 1R**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Perreau Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located on Perreau Creek at the Forest boundary. Access is via the Perreau Creek Road (FR027), 3.3 miles from the intersection with the Williams Creek Road.		
<b>GPS Coordinates</b>	N 45.09928 (2020)	W -113.96304 (2020)	
<b>Site Comments</b>	10-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	11.1 sq mi 7,109 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	45 cfs	<b>Mean Annual Flow</b> (Streamstats)	7.7 cfs
<b>5th-level Watershed</b>	Williams-Salmon River / 1706020304				
<b>Mean Basin Elevation</b>	7100 ft	<b>Basin Aspect</b>	SE	<b>Mean Basin Slope</b>	47%
<b>Length of Road</b>	24.9 mi	<b>Road Density</b>		2.24 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	72.0%	
	<b>Volcanic</b>	28.0%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	96.3%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2020)



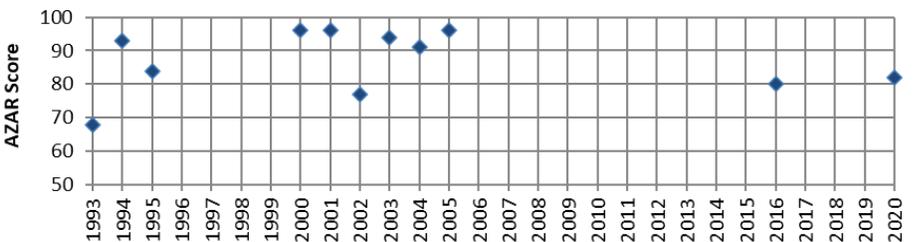
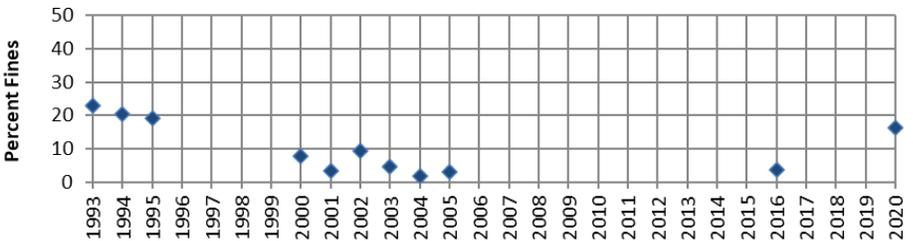
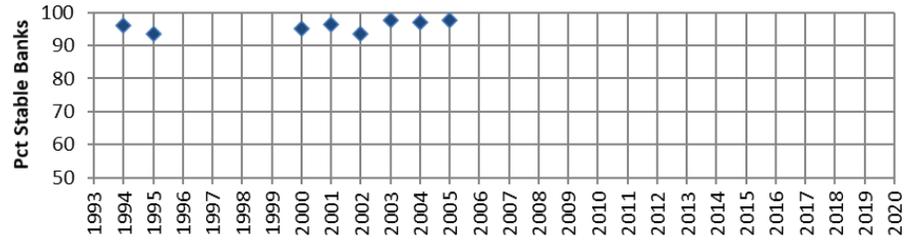
View Downstream (2020)

**PERREAU CREEK 1R**

**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		22.9	68
1994	96.0	20.5	93
1995	93.5	19.0	84
1996			
1997			
1998			
1999			
2000	95.0	7.9	96
2001	96.5	3.5	96
2002	93.5	9.4	77
2003	97.5	4.7	94
2004	97.0	1.9	91
2005	97.5	3.0	96
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015			
2016		3.8	80
2017			
2018			
2019			
2020		16.4	82
2021			
2022			
2023			
n	8	11	11
Mean	95.8	10.3	87.0
St Dev	1.6	7.9	9.4
n	0	2	2
Mean	-	10.1	81.0
St Dev	-	8.9	1.4



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1995	17.0	2.3	18.8	-	2	Gravel	C4b
2016	10.5	7.9	17.1	1.3	3	Gravel	C4b
2020	33.5	2.5	34.2	<1.2	2-4	Gravel	C4b

**Reviewed Channel Type** **C4b**

**ALL**

**10YR**

**REMARKS**

Recent data are limited at this site. Depth fines have been consistently very low (mostly less than 10%), and bank stability has been consistently very high. This is a small channel, and site-specific conditions are heavily influenced by riparian vegetation.

**SOUTH FORK WILLIAMS CREEK 1R**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	SF Williams Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located 1.3 miles upstream of the mouth of SF Williams Creek at Williams Creek. Access is via the SF Williams Creek Road (FR028) 1.4 miles from the Williams Creek Road (FR021).		
<b>GPS Coordinates</b>	N 45.06286 (2019)	W -114.02987 (2019)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	8.6 sq mi 5,509 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	48 cfs	<b>Mean Annual Flow</b> (Streamstats)	4.0 cfs
<b>5th-level Watershed</b>	Williams Creek-Salmon River / 1706020304				
<b>Mean Basin Elevation</b>	7410 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	34%
<b>Length of Road</b>	25.8 mi	<b>Road Density</b>		3.00 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>	55.2%	
	<b>Volcanic</b>	44.8%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	0.0%	
<b>% of Watershed in Active Allotment</b>	97.1%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2019)



View Downstream (2019)

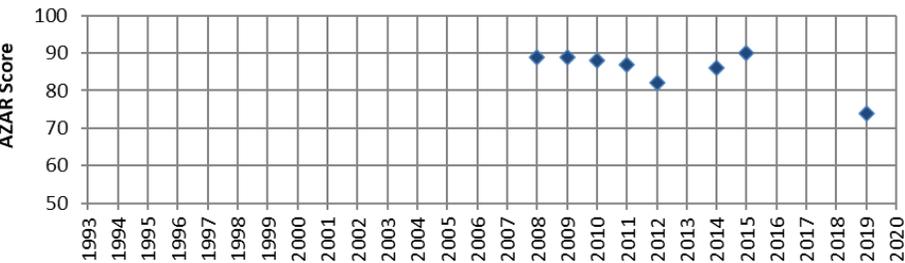
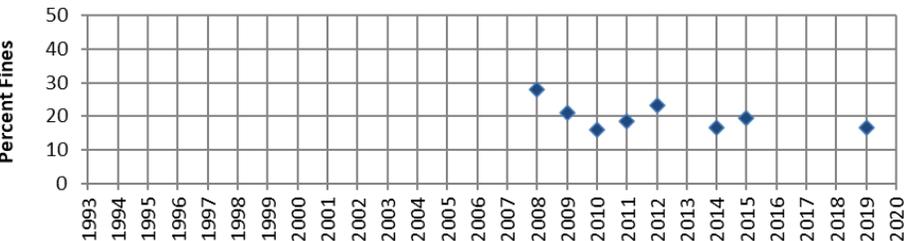
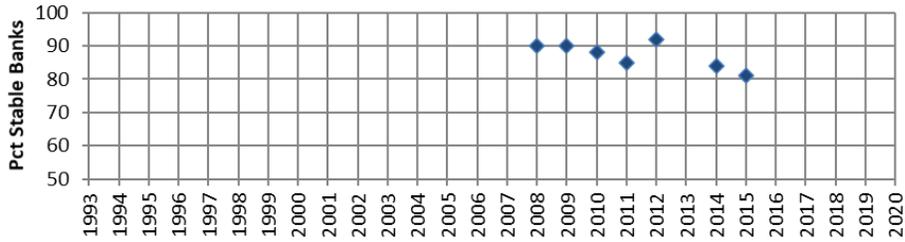
**SOUTH FORK WILLIAMS CREEK 1R**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008	90.0	28.1	89
2009	90.0	21.0	89
2010	88.0	16.1	88
2011	85.0	18.5	87
2012	92.0	23.3	82
2013			
2014	84.0	16.6	86
2015	81.0	19.4	90
2016			
2017			
2018			
2019		16.6	74.0
2020			
2021			
2022			
2023			
n	7	8	8
Mean	87.1	20.0	85.6
St Dev	3.9	4.1	5.3
n	2	3	3
Mean	82.5	17.5	83.3
St Dev	2.1	1.6	8.3

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	9.5	5.0	9.7	1.2-1.5	3.5	Cobble	C3b
2019	10.6	4.8	11.0	1.2-1.5	2-4	Gravel-?	C3b

**Reviewed Channel Type** **C3b**

**REMARKS**

This site has been sampled continuously since 2008. Depth fines have been consistently low (less than 30%), and bank stability has been consistently high (greater than 80%). No increase in fines was measured following prescribed burning in the watershed in 2014. 1/16/2020: Watershed edited based on 2019 site location, watershed size changed from 9.3 square miles to 8.6 square miles, basin data updated.

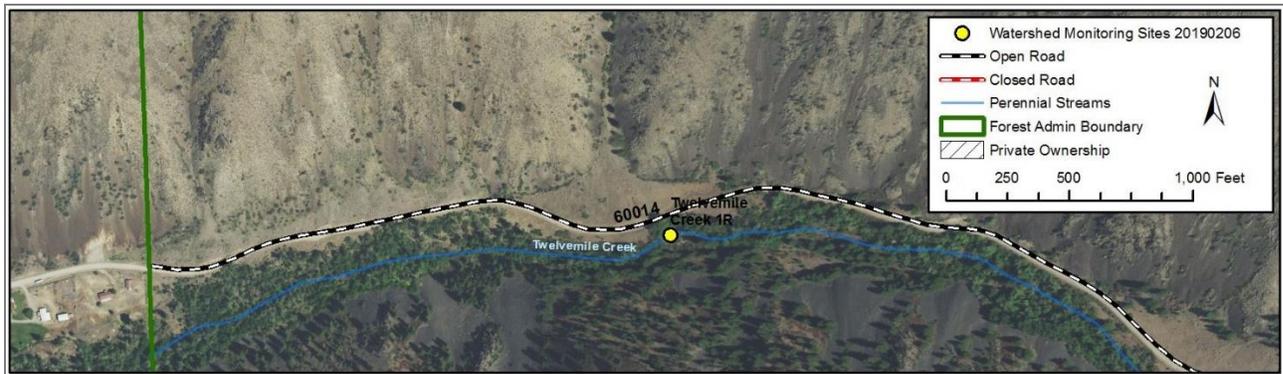
**TWELVEMILE CREEK 1R**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Twelvemile Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located a short distance upstream of the Forest Boundary along the Twelvemile Creek Road (FR014), 0.9 miles upstream of Highway 93.		
<b>GPS Coordinates</b>	N 45.01279 (2023)	W -113.90428 (2023)	
<b>Site Comments</b>	Channel is close to the road with one area of rip rap within reach. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	21.0 sq mi 13,423 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	47.5 cfs	<b>Mean Annual Flow</b> (Streamstats)	13.6 cfs
<b>5th-level Watershed</b>	Twelvemile Creek-Salmon River / 1706020303				
<b>Mean Basin Elevation</b>	7200 ft	<b>Basin Aspect</b>	NW	<b>Mean Basin Slope</b>	45%
<b>Length of Road</b>	49.5 mi	<b>Road Density</b>		2.36 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	75.0%	
	<b>Volcanic</b>	25.0%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	100%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

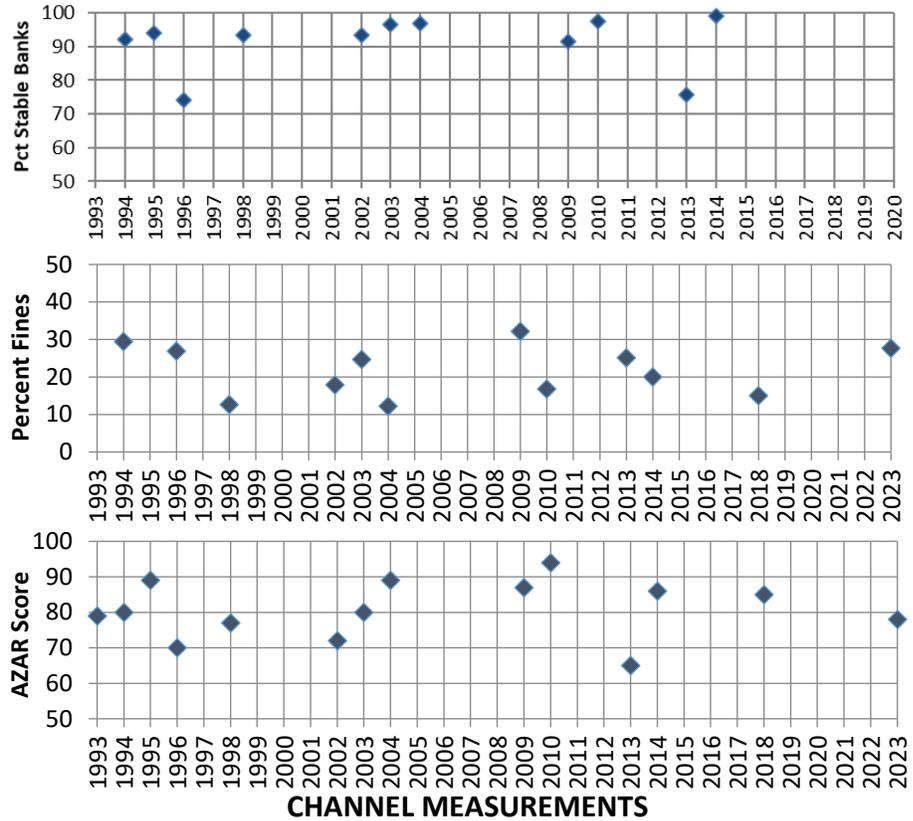
**TWELVEMILE CREEK 1R**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			79
1994	92.0	29.4	80
1995	94.0		89
1996	74.0	26.9	70
1997			
1998	93.5	12.6	77
1999			
2000			
2001			
2002	93.5	17.9	72
2003	96.5	24.7	80
2004	97.0	12.2	89
2005			
2006			
2007			
2008			
2009	91.5	32.1	87
2010	97.5	16.8	94
2011			
2012			
2013	75.8	25.1	65
2014	99.0	20.0	86
2015			
2016			
2017			
2018		15.0	85
2019			
2020			
2021			
2022			
2023		27.6	78
n	11	12	14
Mean	91.3	21.7	80.8
St Dev	8.5	6.8	8.1
n	1	3	3
Mean	99.0	17.5	85.5
St Dev	-	6.3	4.4

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1995	19	2.4	10.5	-	-	vc gravel	E4b
1998	17.4	2.4	17.4	1.5	2-3	Cob/grav	C4b
2018	13.8	14.5	12.2	<1.2	2.5	Gravel	C4b

**Reviewed Channel Type**

**C4b**

**REMARKS**

Depth fines have been consistently low, generally less than 30%. This site may be affected by its close proximity to the road. Note: Twelvemile Creek 2R sampling site was established and monitored in 1993 (depth fines only – 21.3%), but other data are not available and Twelvemile Creek 2R is not included in the analysis or GIS database. Site watershed and basin data edited 2/21/2019 to reflect actual location of monitoring site based on 2018 GPS data (drainage area decreased from 13,644 acres to 13,423 acres). Bill mention a large washup upstream of sampling location which may indicate fines of 28% in 2023.

**WAGONHAMMER CREEK 1R**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Wagonhammer Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	North Fork
<b>Site Location</b>	Site is located approximately 1.3 miles upstream of the mouth of Wagonhammer Creek at the Salmon River. Access is via the Wagonhammer Road (FR072), 1.1 miles upstream of the USFS gate.		
<b>GPS Coordinates</b>	N 45.39711 (2020)	W -113.94169 (2020)	
<b>Site Comments</b>	FR072 is closed to vehicle travel, and access to the sampling site is by foot (1.1 mile hike one-way). 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	8.4 sq mi 5,360 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	13 cfs	<b>Mean Annual Flow</b> (Streamstats)	7.1 cfs
<b>5th-level Watershed</b>	Carmen Creek-Salmon River / 1706020305				
<b>Mean Basin Elevation</b>	5919 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	55%
<b>Length of Road</b>	7.2 mi	<b>Road Density</b>		0.86 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>		83.5%
	<b>Volcanic</b>	16.5%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		0%
<b>% of Watershed in Active Allotment</b>	99.8%	<b>% of Watershed Burned (2018-2022)</b>		0.0%	

**SITE PHOTOS**



**View Upstream (2020)**



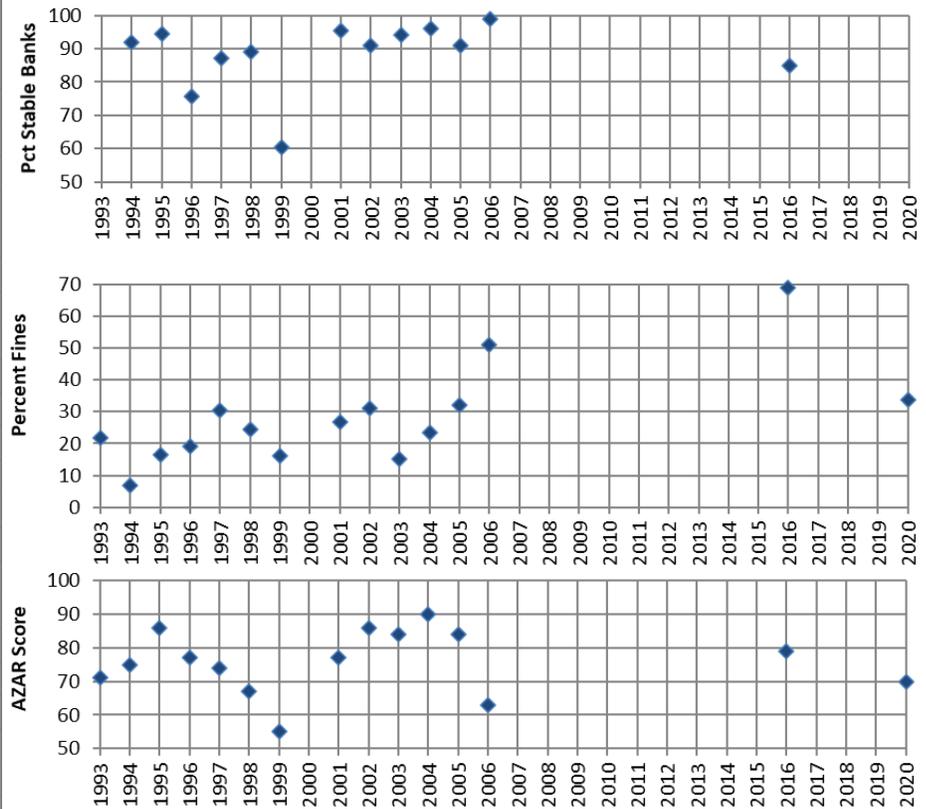
**View Downstream (2020)**

**WAGONHAMMER CREEK 1R**

**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		21.9	71
1994	92.0	6.7	75
1995	94.5	16.4	86
1996	75.5	19.0	77
1997	87.0	30.4	74
1998	89.0	24.5	67
1999	60.5	16.3	55
2000			
2001	95.5	26.6	77
2002	91.0	31.2	86
2003	94.0	15.2	84
2004	96.0	23.6	90
2005	91.0	32.0	84
2006	99.0	51.1	63
2007			
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015			
2016	85.0	68.8	79
2017			
2018			
2019			
2020		33.8	70
2021			
2022			
2023			
n	13	15	15
Mean	88.5	27.8	75.9
St Dev	10.3	15.4	9.6
n	1	2	2
Mean	85.0	51.3	74.5
St Dev	-	24.7	6.4



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1995	5.2	2.3	2.8	-	0.1 (?)	Gravel	G4
2016	5.5	1.6	9.6	1.2	4.5	Gravel	G4
2020	3	3.3	3.6	>1.5	2	Gravel	E4b

**Reviewed Channel Type**

**E4b**

**10YR ALL**

**REMARKS**

Recent data are limited for this site. This is a small and very narrow channel. Despite its confined nature, depth fines are very high in the most recent samples. The cause of the excessive fines is unknown. Site-specific conditions may be heavily influenced by riparian vegetation, and the channel is narrow for conducting the core sampling methodology.

**WEST FORK IRON CREEK 1A**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	WF Iron Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located a short distance upstream of the confluence with SF Iron Creek. Access is via the SF Iron Creek Road (FR047), 0.3 miles from the Iron Creek Road (FR045). This is approx. 8.2 miles from Highway 93.		
<b>GPS Coordinates</b>	N 44.91909 (2015*)	W -114.11751 (2015*)	
<b>Site Comments</b>	This site has generally poor spawning habitat- large boulders and cobbles. Note: NHD stream name at this location is Iron Creek (not West Fork). *2019 GPS coordinates not accurate... location based on old GPS coordinates. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	11.4 sq mi 7,282 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	50 cfs	<b>Mean Annual Flow</b> (Streamstats)	6.7 cfs
<b>5th-level Watershed</b>	Iron Creek-Salmon River / 1706020302				
<b>Mean Basin Elevation</b>	7800 ft	<b>Basin Aspect</b>	E	<b>Mean Basin Slope</b>	41%
<b>Length of Road</b>	18.5 mi	<b>Road Density</b>		1.63 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>		51.2%
	<b>Volcanic</b>	48.8%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		0%
<b>% of Watershed in Active Allotment</b>	100%	<b>% of Watershed Burned (2018-2022)</b>		15.2%	

**SITE PHOTOS**



**View Upstream (2019)**



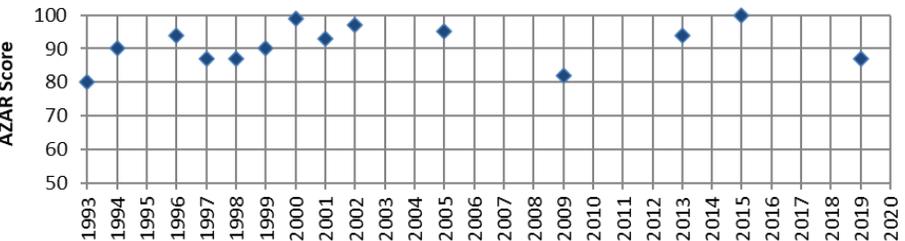
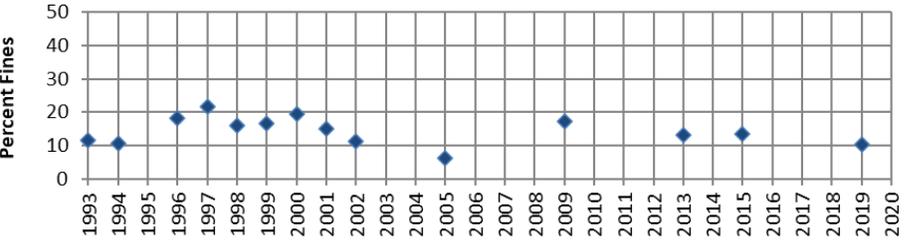
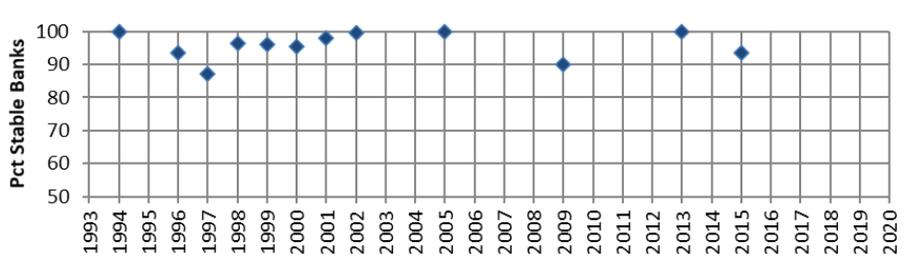
**View Downstream (2019)**

**WEST FORK IRON CREEK 1A**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		11.5	80
1994	100	10.7	90
1995			
1996	93.5	18.1	94
1997	87.0	21.7	87
1998	96.5	16.0	87
1999	96.0	16.7	90
2000	95.5	19.5	99
2001	98.0	14.9	93
2002	99.5	11.2	97
2003			
2004			
2005	100	6.3	95
2006			
2007			
2008			
2009	90.0	17.2	82
2010			
2011			
2012			
2013	100	13.0	94
2014			
2015	93.5	13.4	100
2016			
2017			
2018			
2019		10.4	87.0
2020			
2021			
2022			
2023			
n	12	14	14
Mean	95.8	14.3	91.1
St Dev	4.2	4.2	6.0
n	1	2	2
Mean	93.5	11.9	93.5
St Dev	-	2.1	9.2



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	27	4.2	11.3	1.3	2-3	Grav/cob	E4b
2015	14.6	3.5	13.3	1.6	3.5	Cobble	C3b
2019	20	2.3	17.9	1.2-1.5	4.0	Cobble	C3b

**Reviewed Channel Type** **C3b**

**ALL**

**10YR**

**REMARKS**

Relatively continuous data exist for this site. Depth fines have been consistently low (less than 22%), and bank stability has been high. Note: Site moved approx. 500 feet upstream in 2015 because of beaver dams at established site. Sample site GIS location, watershed, and basin data were corrected 12/2015 to reflect this new location.

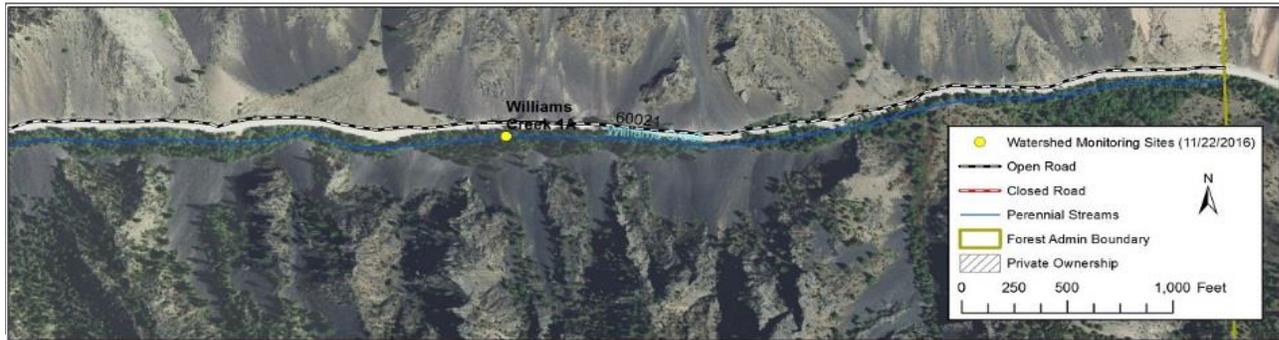
**WILLIAMS CREEK 1R**

**Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	Williams Creek 1A	<b>Site Type</b>	Resident*
<b>Sub-Basin</b>	Middle Salmon-Panther	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located along the Williams Creek Road (FR021), approximately 0.6 miles upstream of the USFS boundary.		
<b>GPS Coordinates</b>	N 45.08179 (2022)	W -113.98720 (2022)	
<b>Site Comments</b>	Riffle-dominated reach, few pools. Site moved 50m downstream in 2022. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	22.6 sq mi 14,446 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	90 cfs	<b>Mean Annual Flow</b> (Streamstats)	11.5 cfs
<b>5th-level Watershed</b>	Williams Creek-Salmon River / 1706020304				
<b>Mean Basin Elevation</b>	7067 ft	<b>Basin Aspect</b>	E	<b>Mean Basin Slope</b>	37%
<b>Length of Road</b>	46.1 mi	<b>Road Density</b>		2.04 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>		32.0%
	<b>Volcanic</b>	68.0%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		0%
<b>% of Watershed in Active Allotment</b>	98.9%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (7/27/2022)**



**View Downstream (7/27/2022)**

**WILLIAMS CREEK 1R**

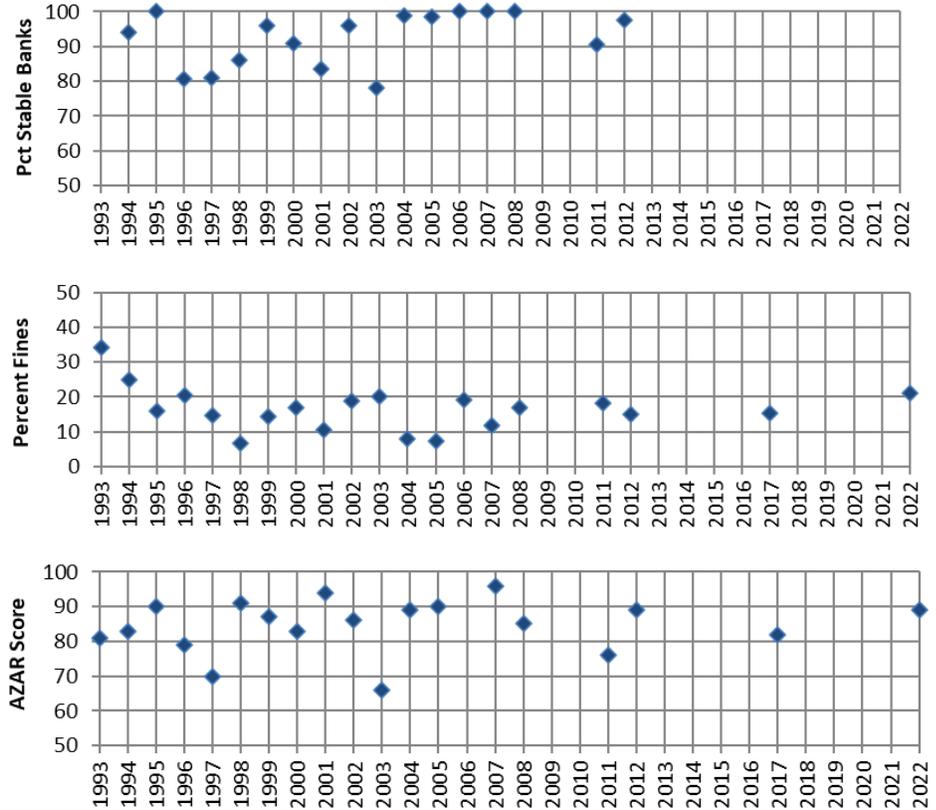
**Last Year Sampled: 2022**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		34.1	81
1994	94.0	24.8	83
1995	100	16.1	90
1996	80.5	20.6	79
1997	81.0	14.6	70
1998	86.0	6.6	91
1999	96.0	14.4	87
2000	91.0	17.0	83
2001	83.5	10.7	94
2002	96.0	18.8	86
2003	78.0	20.0	66
2004	99.0	8.1	89
2005	98.5	7.4	90
2006	100	19.3	
2007	100	11.7	96
2008	100	17.1	85
2009			
2010			
2011	90.5	18.1	76
2012	97.5	15.0	89
2013			
2014			
2015			
2016			
2017		15.4	82
2018			
2019			
2020			
2021			
2022		21.0	89
2023			
<b>n</b>	17	20	19
<b>Mean</b>	92.4	16.5	84.5
<b>St Dev</b>	7.8	6.3	7.7
<b>n</b>	0	2	2
<b>Mean</b>	-	18.2	85.5
<b>St Dev</b>	-	4.0	4.9

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1995	20.2	6.1	10.6	-	2	Gravel	C4b
1998	18	2.0	22.5	1.6	2	Gravel	B4
2017	13.4	3.3	11.4	1.4	3.0	Gravel	C4b

**Reviewed Channel Type** C4b

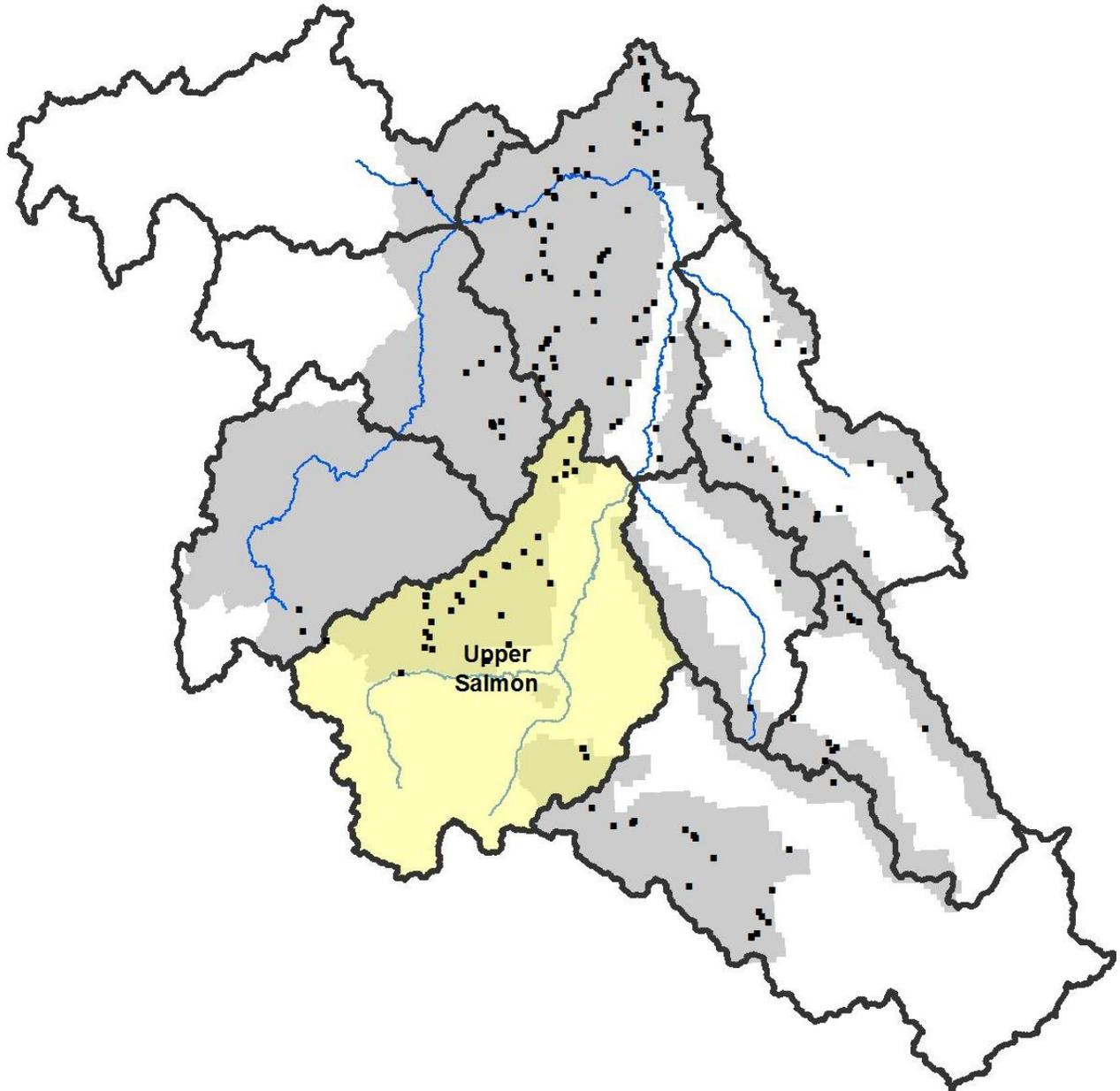
**REMARKS**

A relatively continuous dataset exists for this site. Depth fines have been consistently low (generally less than 20%), and bank stability has been high. Changed from Anadromous to Resident in 2021. Core samples from prior to this date may not be directly comparable to core samples after this date.



## UPPER SALMON SUB-BASIN

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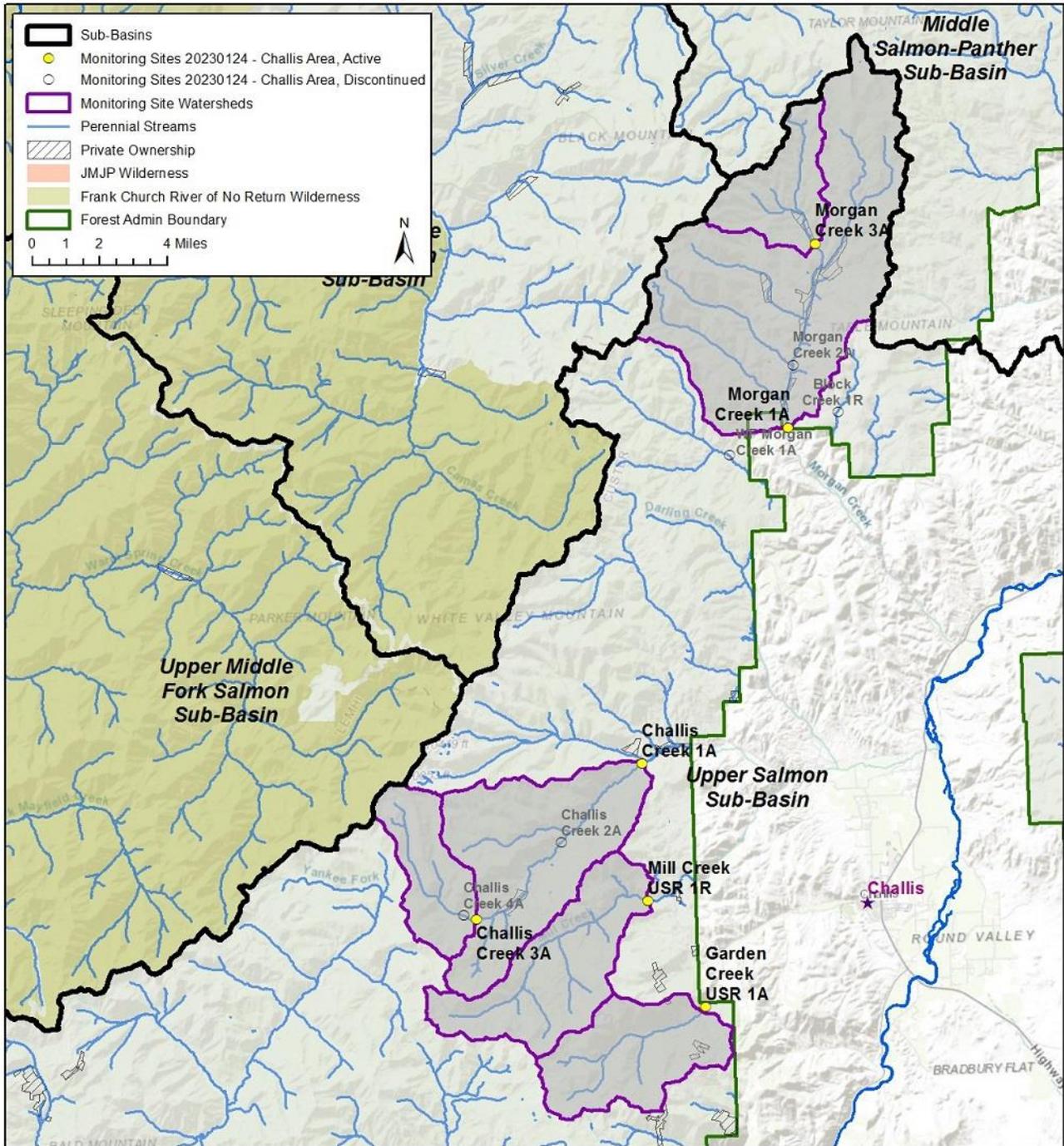


<b>Total acres within sub-basin</b>	<b>1,551,971</b>
<b>Percent of sub-basin within SCNF</b>	<b>35%</b>
<b>Active Monitoring Sites</b>	<b>21</b>
<b>Discontinued Monitoring Sites</b>	<b>16</b>
<b>Sites Monitored in 2023</b>	<b>2</b>



### Challis Area

A total of 6 active monitoring sites are located in the Challis area, including the Challis Creek, Garden Creek, Mill Creek, and Morgan Creek Watersheds.



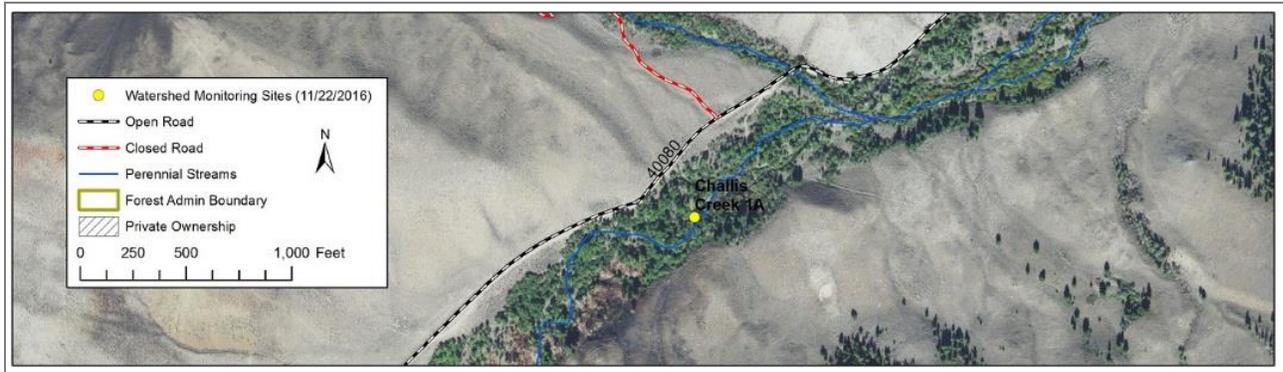
**CHALLIS CREEK 1A**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Challis Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee Fork
<b>Site Location</b>	Site is located on Challis Creek approximately 1.6 miles upstream of the Forest boundary and a short distance upstream of the Bear Creek confluence. Access is via the Challis Creek Road (FR080).		
<b>GPS Coordinates</b>	N 44.56795 (2020)	W -114.36511 (2020)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	32.4 sq mi 20,752 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	152 cfs	<b>Mean Annual Flow</b> (Streamstats)	17.4 cfs
<b>5th-level Watershed</b>	Challis Creek / 1706020116				
<b>Mean Basin Elevation</b>	7923 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	39%
<b>Length of Road</b>	36.0 mi	<b>Road Density</b>		1.11 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>	0.0%	
	<b>Volcanic</b>	94.5%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	5.5%	
<b>% of Watershed in Active Allotment</b>	99.1%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2020)**



**View Downstream (2020)**

**CHALLIS CREEK 1A**

**Last Year Sampled: 2020**

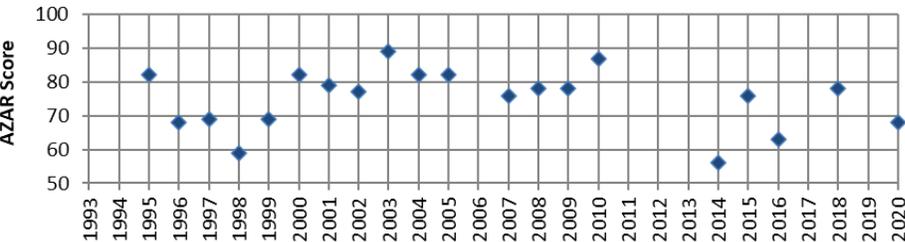
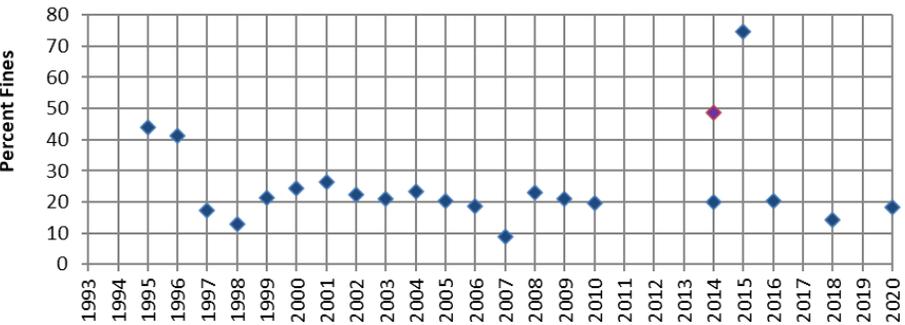
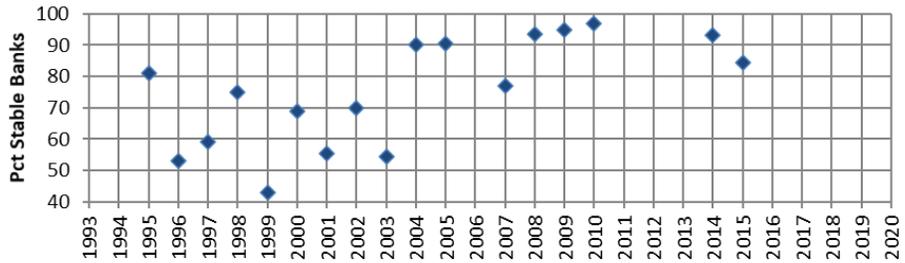
**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	81.0	44.1	82
1996	53.0	41.1	68
1997	59.0	17.4	69
1998	75.0	13.0	59
1999	43.0	21.3	69
2000	69.0	24.3	82
2001	55.5	26.5	79
2002	70.0	22.4	77
2003	54.5	21.0	89
2004	90.0	23.4	82
2005	90.5	20.3	82
2006		18.6	
2007	77.0	9.0	76
2008	93.5	23.0	78
2009	95.0	20.9	78
2010	97.0	19.6	87
2011			
2012			
2013			
2014*	93.0	20.0 (48.5)	56
2015	84.5	74.6	76
2016		20.2	63
2017			
2018		14.4	78
2019			
2020		18.2	68
2021			
2022			
2023			
n	17	21	20
Mean	75.3	24.4	74.9
St Dev	17.3	14.0	8.9
n	2	5	5
Mean	88.8	29.5	68.2
St Dev	6.0	25.3	9.1

**ALL**

**10YR**

**RMRKS**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Channel gradient (%)	Sinuosity	Substrate	Channel Type
1998	17.7	14.1	13.6	1	1.1	Cobble	C3
2015	21.7	13.4	12.8	2	1.2-1.5	Gravel	C4b
2016	27.0	1.7	28.9	3	1.3	Gravel	C4b
2018	25.0	3.6	17.4	3	1.2	Gravel	C4b
2020	25.9	13.4	9.6	3	<1.2	Gravel	C4b

<b>Reviewed Channel Type</b>	<b>C4b</b>
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This site has been sampled almost continuously since 1995. Much of the Challis Creek watershed burned during the 2013 Lodgepole Fire, and major blowouts occurred upstream of the site in 2014. Depth fines increased in 2015, but recovered the following year despite continued sediment input. \* Two depth fines samples conducted in 2014 – before and after flood event – depth fines increased to 48.5% post-fire. Only the initial sample used for averaging.

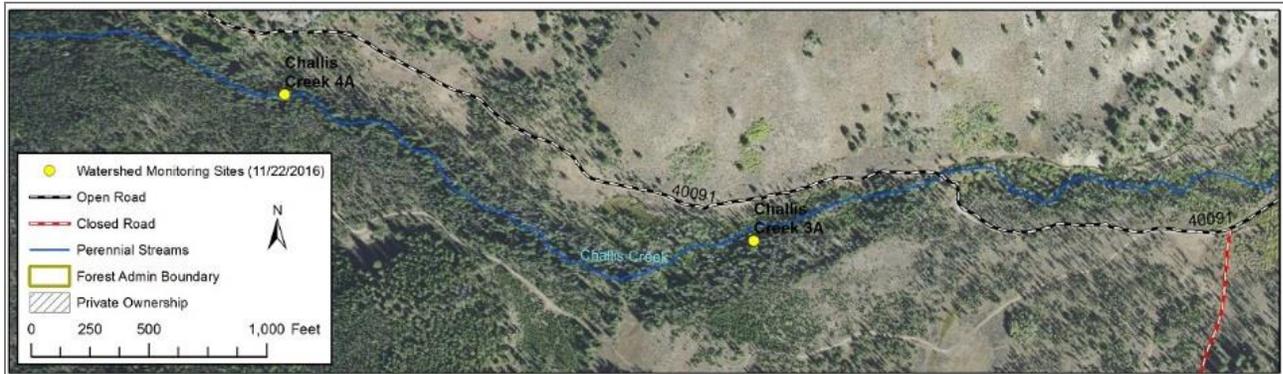
**CHALLIS CREEK 3A**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Challis Creek 3A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee
<b>Site Location</b>	Site is located approximately 1.2 miles upstream of Mosquito Flat Reservoir. Access is via the Challis Creek Lakes Road (FR091). Site is 0.15 miles upstream of ford.		
<b>GPS Coordinates</b>	N 44.50289 (2019)	W -114.46780 (2019)	
<b>Site Comments</b>	5-year sampling frequency		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	8.9 sq mi 5,707 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	64 cfs	<b>Mean Annual Flow</b> (Streamstats)	5.0 cfs
<b>5th-level Watershed</b>	Challis Creek / 7206020116				
<b>Mean Basin Elevation</b>	8497 ft	<b>Basin Aspect</b>	E	<b>Mean Basin Slope</b>	39%
<b>Length of Road</b>	5.7 mi	<b>Road Density</b>		0.64 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	92.9%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	7.1%	
<b>% of Watershed in Active Allotment</b>	99.9%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2019)**



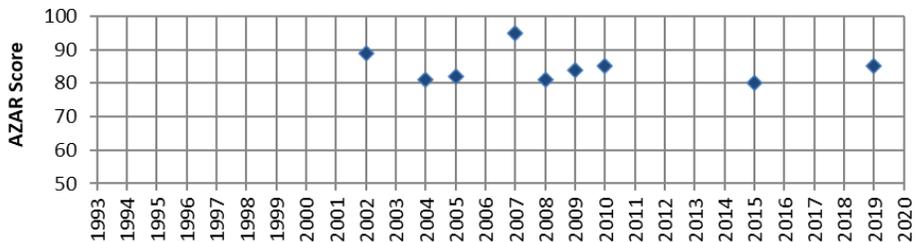
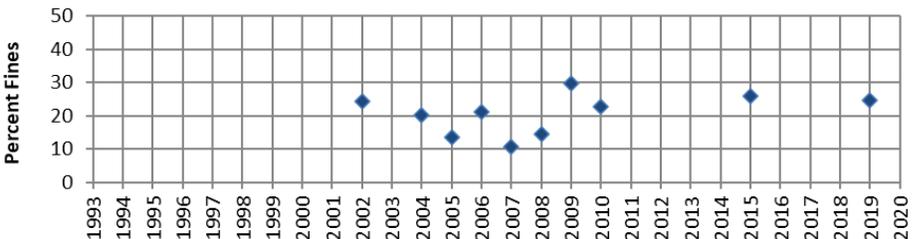
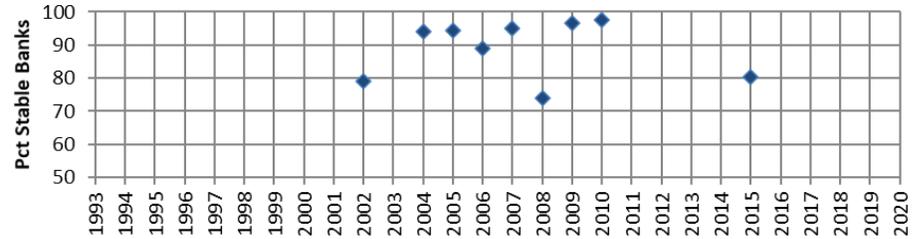
**View Downstream (2019)**

**CHALLIS CREEK 3A**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002	79.0	24.2	89
2003			
2004	94.0	20.1	81
2005	94.5	13.6	82
2006	89.0	21.3	
2007	95.0	10.8	95
2008	74.0	14.5	81
2009	96.5	29.6	84
2010	97.5	22.6	85
2011			
2012			
2013			
2014			
2015	80.5	25.9	80
2016			
2017			
2018			
2019		24.8	85.0
2020			
2021			
2022			
2023			
n	9	10	9
Mean	88.9	20.7	84.7
St Dev	8.8	6.0	4.8
n	1	2	2
Mean	80.5	25.4	82.5
St Dev	-	0.8	3.5



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	14.9	2.3	13.5	1.4	2.0	Gravel	C4
2019	17.7	7.5	17.0	1.2-1.5	1.0	Gravel	C4

**Reviewed Channel Type** **C4**

**ALL**

**10YR**

**REMARKS**

This site has been sampled almost continuously since 2002. Depth fines have been low (less than 30%), and bank stability has been generally high. This location is 0.4 miles downstream of Challis Creek 4A – both sites are not needed, and the Challis Creek 3A site provides better sampling habitat. Challis Creek 4A was discontinued.

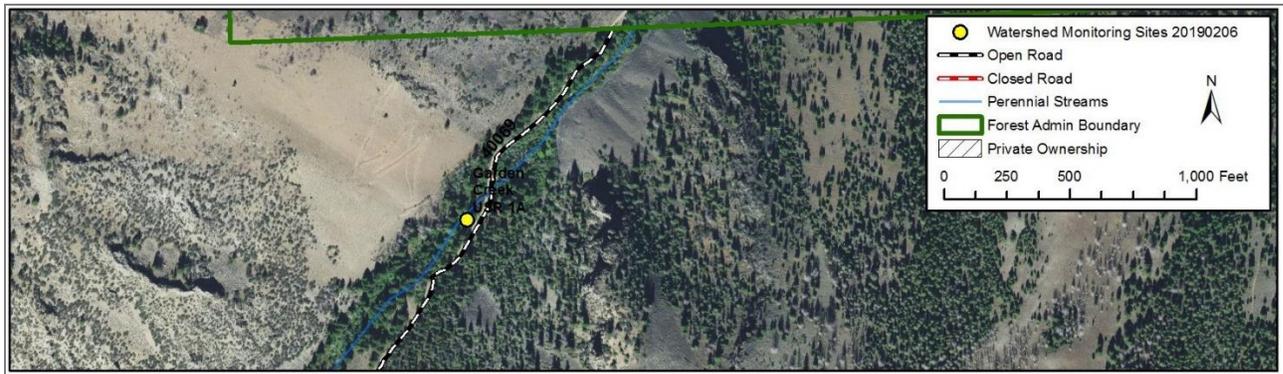
**GARDEN CREEK USR 1A**

**Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	Garden Creek USR 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee
<b>Site Location</b>	Site is located on Garden Creek approximately 0.3 miles upstream of the Forest boundary. Access is via the Buster Lake Road (FR069), approximately 2 miles south of the Custer Motorway (FR070).		
<b>GPS Coordinates</b>	N 44.46194 (2022)	W -114.33142 (2022)	
<b>Site Comments</b>	5-year sampling frequency		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	13.9 sq mi 8,895 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	70 cfs	<b>Mean Annual Flow</b> (Streamstats)	8.4 cfs
<b>5th-level Watershed</b>	Garden Creek-Salmon River / 1706020118				
<b>Mean Basin Elevation</b>	8444 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	42%
<b>Length of Road</b>	23.3 mi	<b>Road Density</b>		1.68 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	43.7%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	51.2%	<b>Alluvium</b>	5.1%	
<b>% of Watershed in Active Allotment</b>	99.1%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (7/28/2022)**



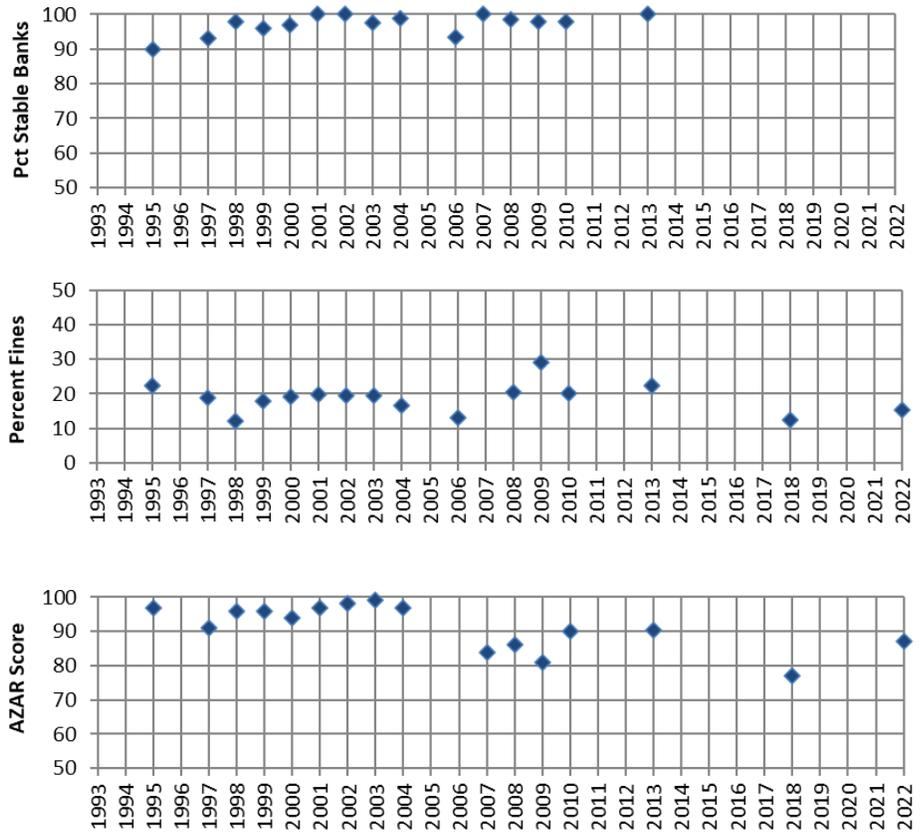
**View Downstream (7/28/2022)**

**GARDEN CREEK USR 1A**

**Last Year Sampled: 2022**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	90.0	22.4	97
1996			
1997	93.0	19.0	91
1998	98.0	12.3	96
1999	96.0	18.0	96
2000	97.0	19.2	94
2001	100	19.7	97
2002	100	19.4	98
2003	97.5	19.5	99
2004	99.0	16.7	97
2005			
2006	93.5	13.1	
2007	100		84
2008	98.5	20.6	86
2009	98.0	29.2	81
2010	98.0	20.2	90
2011			
2012			
2013	100	22.5	91
2014			
2015			
2016			
2017			
2018		12.6	77
2019			
2020			
2021			
2022		15.2	87
2023			
n	15	16	16
Mean	97.2	18.7	91.3
St Dev	3.0	4.3	6.7
n	0	2	2
Mean	-	13.9	82.0
St Dev	-	1.8	7.1



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2010	22.2	1.6	23.4	1.3	2	-	B3
2018	19.7	2.7	17.1	<1.2	4	Cobble	C3b

**Reviewed Channel Type** **C3b**

**10YR ALL**

**REMARKS**

This site has a nearly continuous dataset since 1995, but recent sampling is limited. Depth fines have been consistently low (less than 30%), and bank stability has been consistently high (greater than 90%). Note: the 2007 Depth Fines sample (3.0%) was removed on 2/11/2020 because notes indicated that the core tube had not sealed properly, causing abnormally low fines.

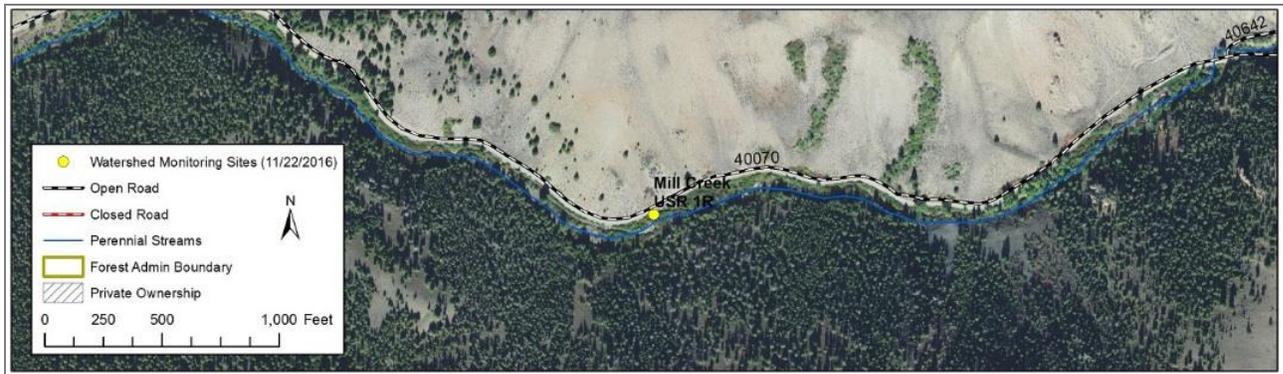
**MILL CREEK USR 1R**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Mill Creek USR 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee
<b>Site Location</b>	Site is located along the Custer Motorway, approximately 0.5 miles upstream of the Mill Creek culvert at the bottom of the Corkscrew Grade. Site is located 150 feet upstream of a prominent tree along the road.		
<b>GPS Coordinates</b>	N 44.50859 (2020)	W -114.36388 (2020)	
<b>Site Comments</b>	5-year sampling frequency		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	17.0 sq mi 10,862 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	95 cfs	<b>Mean Annual Flow</b> (Streamstats)	9.9 cfs
<b>5th-level Watershed</b>	Challis Creek / 1706020116				
<b>Mean Basin Elevation</b>	8206 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	41%
<b>Length of Road</b>	23.6 mi	<b>Road Density</b>		1.39 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	84.0%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	13.7%	<b>Alluvium</b>	2.4%	
<b>% of Watershed in Active Allotment</b>	100%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2020)**



**View Downstream (2020)**

**MILL CREEK USR 1R**

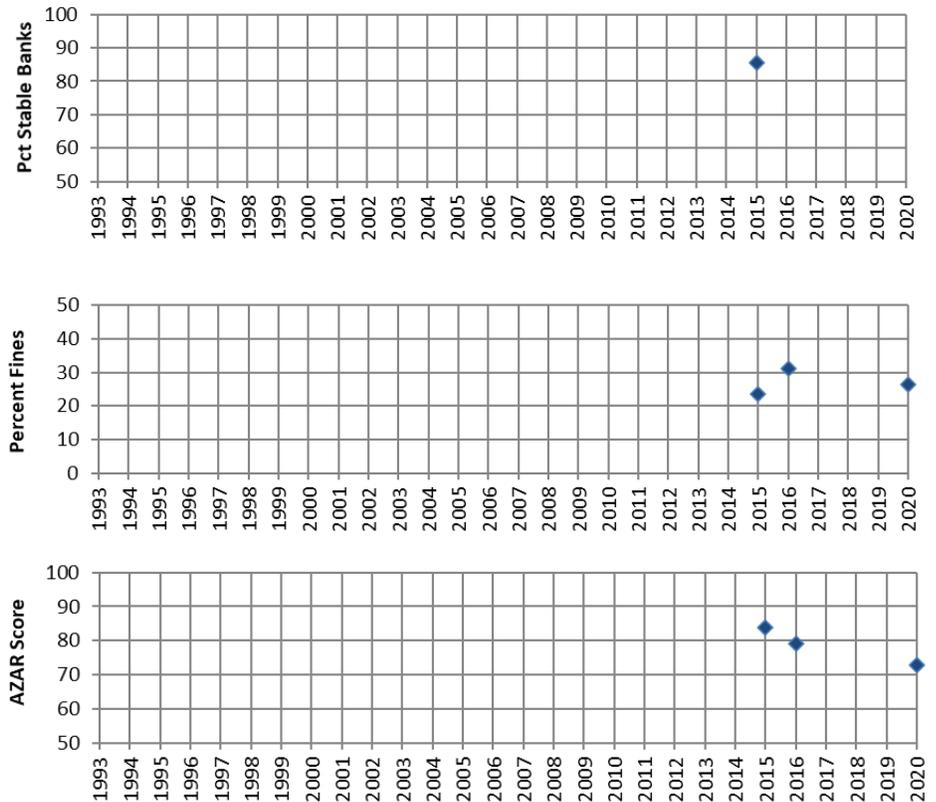
**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015	85.5	23.6	84
2016		31.0	79
2017			
2018			
2019			
2020		26.5	73
2021			
2022			
2023			
<b>n</b>	1	3	3
<b>Mean</b>	85.5	27.0	78.7
<b>St Dev</b>	-	3.7	5.5
<b>n</b>	1	3	3
<b>Mean</b>	85.5	27.0	78.7
<b>St Dev</b>	-	3.7	5.5

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	16.7	1.1	22.3	1.3	1.5	Gravel	F4
2016	12	1.7	15.4	1.3	2	Gravel	C4
2020	23	5.3	13.7	1.2-1.5	3.5	Gravel	C4b

**Reviewed Channel Type** **C4b**

**REMARKS**

This site was established in 2015 and sampled 2015-2016 for baseline data. Depth fines and bank stability both showed moderate values.

**MORGAN CREEK 1A**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Morgan Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee Fork
<b>Site Location</b>	Site is located along the Morgan Creek-Panther Creek Road (FR055) just upstream of the Forest Boundary, approx. 9 miles north of Highway 93.		
<b>GPS Coordinates</b>	N 44.71043 (2020)	W -114.27028 (2020)	
<b>Site Comments</b>	Channel is directly adjacent to road, with steep access down to stream. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	52.5 sq mi 33,622 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	127 cfs	<b>Mean Annual Flow</b> (Streamstats)	27 cfs
<b>5th-level Watershed</b>	Morgan Creek / 1706020117				
<b>Mean Basin Elevation</b>	7399 ft	<b>Basin Aspect</b>	S	<b>Mean Basin Slope</b>	38%
<b>Length of Road</b>	54.2 mi	<b>Road Density</b>		1.03 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>	0.0%	
	<b>Volcanic</b>	97.5%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	2.5%	
<b>% of Watershed in Active Allotment</b>	96.4%	<b>% of Watershed Burned (2018-2022)</b>		27.8%	

**SITE PHOTOS**



View Upstream (2020)



View Downstream (2020)



**MORGAN CREEK 3A**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Morgan Creek 3A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee Fork
<b>Site Location</b>	Site is located along the Morgan Creek-Panther Creek Road (FR055), approximately 15 miles north of Hwy 93, downstream of Annie Rooney bridge.		
<b>GPS Coordinates</b>	N 44.78936 (2023)	W -114.24994 (2023)	
<b>Site Comments</b>	Site is located near large bank instabilities. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	9.1 sq mi 5,797 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	31 cfs	<b>Mean Annual Flow</b> (Streamstats)	5.2 cfs
<b>5th-level Watershed</b>	Morgan Creek / 1706020117				
<b>Mean Basin Elevation</b>	7535 ft	<b>Basin Aspect</b>	SE	<b>Mean Basin Slope</b>	40%
<b>Length of Road</b>	13.6 mi	<b>Road Density</b>		1.50 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>	0.0%	
	<b>Volcanic</b>	97.8%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	2.2%	
<b>% of Watershed in Active Allotment</b>	97.6%	<b>% of Watershed Burned (2018-2022)</b>		71.4%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

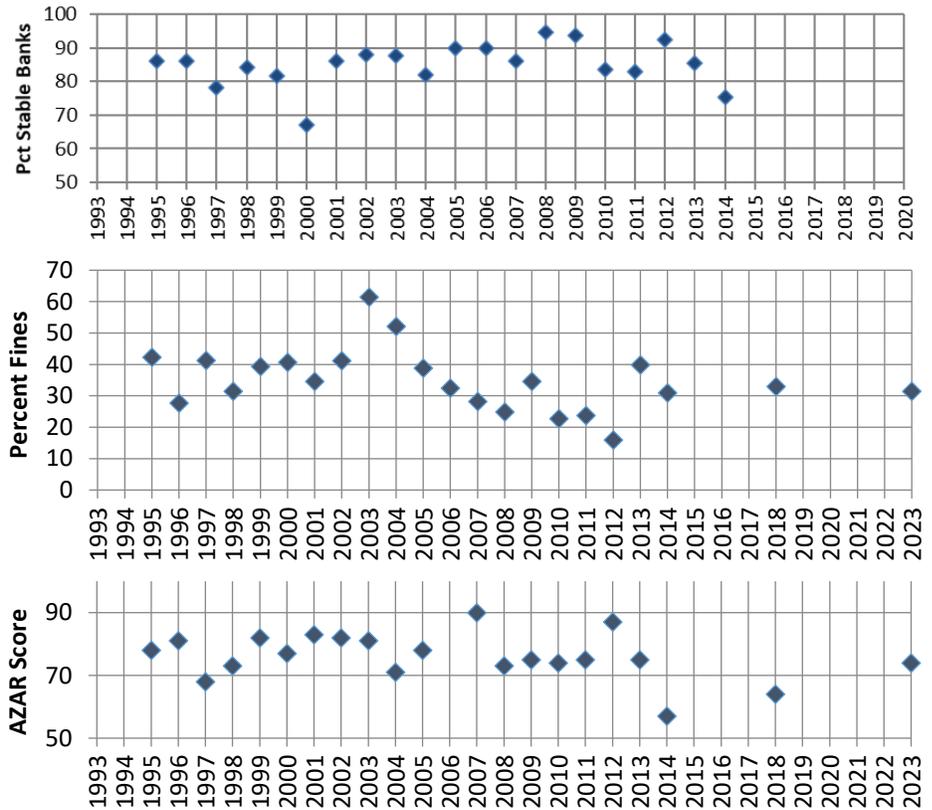
**MORGAN CREEK 3A**

**Last Year Sampled: 2023**

SITE DATA

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	86.0	42.3	78
1996	86.0	27.7	81
1997	78.0	41.3	68
1998	84.0	31.4	73
1999	81.5	39.4	82
2000	67.0	40.7	77
2001	86.0	34.6	83
2002	88.0	41.2	82
2003	87.5	61.4	81
2004	82.0	52.1	71
2005	90.0	38.8	78
2006	90.0	32.5	
2007	86.0	28.2	90
2008	94.5	24.9	73
2009	93.5	34.6	75
2010	83.5	22.7	74
2011	83.0	23.7	75
2012	92.5	15.9	87
2013	85.3	39.9	75
2014	75.4	30.9	57
2015			
2016			
2017			
2018		33.0	64
2019			
2020			
2021			
2022			
2023		31.4	74
n	20	22	21
Mean	85.0	34.9	76.1
St Dev	6.4	10.0	7.5
n	0	2	2
Mean	-	32.2	69.0
St Dev	-	1.1	7.1

10YR ALL



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	15.3	6.2	15.3	1.1	1	Gravel	C4
2018	12.4	1.5	13.3	<1.2	1.5	Gravel	F4
Reviewed Channel Type							F4

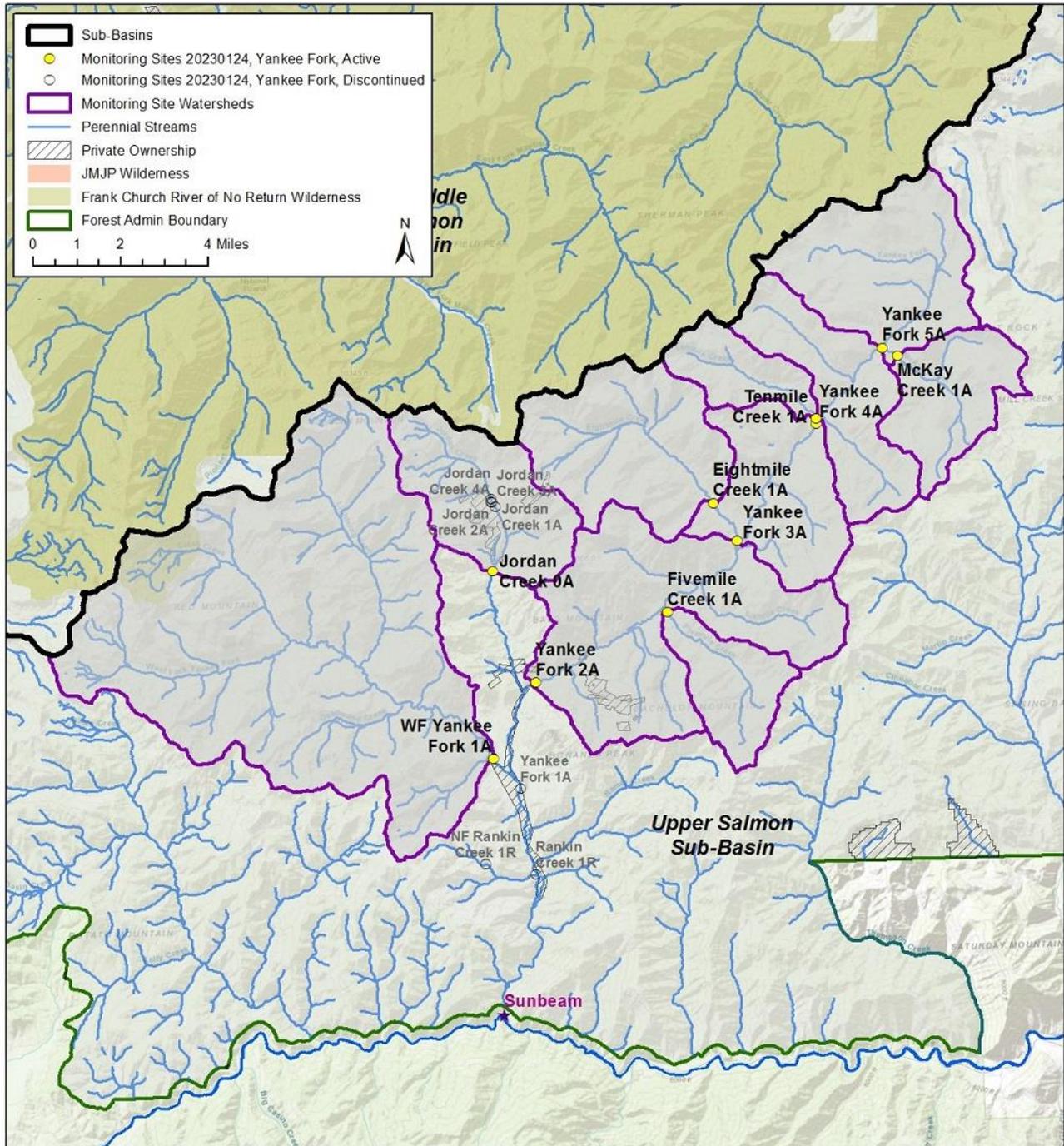
REMARKS

This site has been monitored nearly continuously since 1995. Depth fines have ranged from 17% to 61%, with many values exceeding 30%. Bank stability has been generally greater than 80%. The cause of high fines is unknown. Notes in 2018 indicate silt embedded at depth.



## Yankee Fork Watershed

A total of 10 active monitoring sites are located in the Yankee Fork Watershed.



**EIGHTMILE CREEK 1A**

**Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	Eightmile Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee
<b>Site Location</b>	Site is located approximately 1.1 miles upstream of the mouth of Eightmile Creek at the Yankee Fork. Access is via East Eightmile Road (FR901), 1 mile north of the Custer Motorway (FR070).		
<b>GPS Coordinates</b>	N 44.43855 (2022)	W -114.63122 (2022)	
<b>Site Comments</b>	5-year monitoring frequency. Good representation of stream and good spawning habitat.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	13.8 sq mi 8,814 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	65 cfs	<b>Mean Annual Flow</b> (Streamstats)	22.9 cfs
<b>5th-level Watershed</b>	Yankee Fork / 1706020105				
<b>Mean Basin Elevation</b>	8358 ft	<b>Basin Aspect</b>	SE	<b>Mean Basin Slope</b>	46%
<b>Length of Road</b>	3.2 mi	<b>Road Density</b>		0.23 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>		0%
	<b>Volcanic</b>	96.9%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		3.1%
<b>% of Watershed in Active Allotment</b>	99.2%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (8/1/2022)**



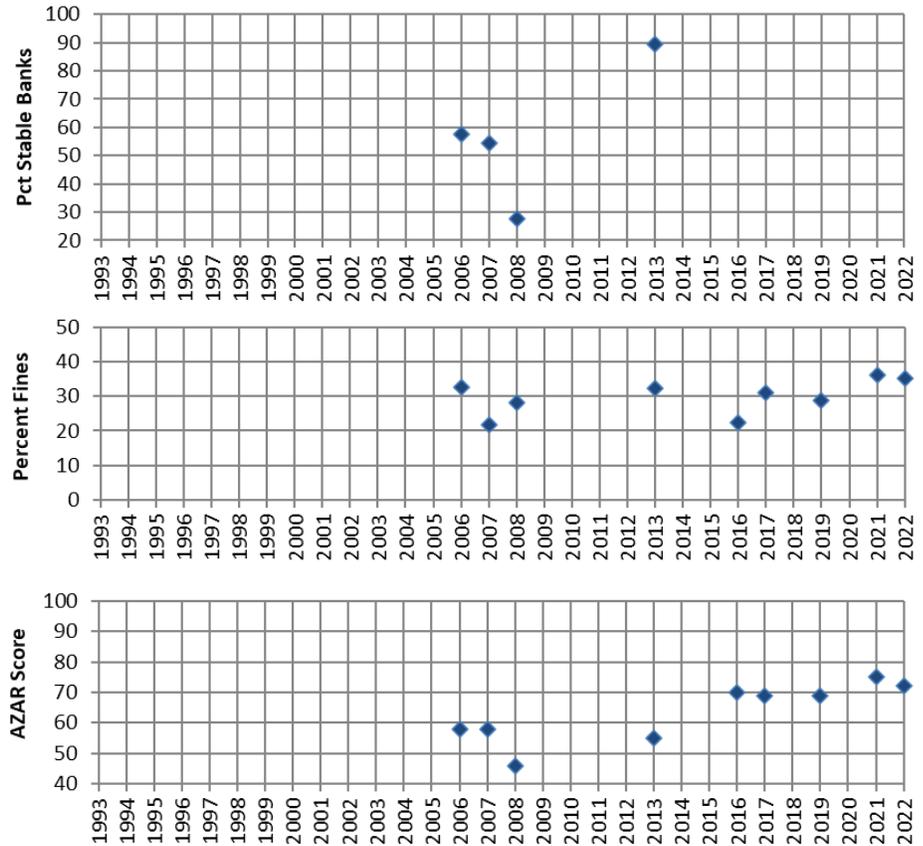
**View Downstream (8/1/2022)**

**EIGHTMILE CREEK 1A**

**Last Year Sampled: 2022**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006	57.5	32.5	58
2007	54.5	21.8	58
2008	27.5	28.3	46
2009			
2010			
2011			
2012			
2013	89.3	32.2	55
2014			
2015			
2016		22.4	70
2017		30.9	69
2018			
2019		28.7	69
2020			
2021		36.0	75
2022		35.3	72
2023			
n	4	9	9
Mean	57.2	29.8	63.6
St Dev	25.3	5.1	9.7
n	0	5	5
Mean	-	30.7	71.0
St Dev	-	5.5	2.5



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2016	23.1	1.6	42.8	1.2	1-2	Gravel	C4
2017	48.4	1.9	47.0	1.3	1.5	Gravel	C4
<b>Reviewed Channel Type</b>							<b>C4</b>

**10YR ALL**

**REMARKS**

Limited data exist for this site. Depth fines have been moderate, and bank stability has been variable. Eightmile Stream Restoration Project implemented in 2020 – large woody debris placed in reach. Site was moved downstream about 250 feet in 2021 to a location out of the direct influence of large woody debris.

**FIVEMILE CREEK 1A**

**Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	Fivemile Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee
<b>Site Location</b>	Site is located near the mouth of Fivemile Creek at the Yankee Fork. Access is via the Custer Motorway (FR070), and the site is located approximately 30 yards upstream of the FR070 culvert.		
<b>GPS Coordinates</b>	N 44.40312 (2022)	W -114.65398 (2022)	
<b>Site Comments</b>	Site moved upstream of road in 2017. May have been sampled downstream of road in previous years. 5-year monitoring frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	5.8 sq mi 3,704 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	15 cfs	<b>Mean Annual Flow</b> (Streamstats)	12.6 cfs
<b>5th-level Watershed</b>	Yankee-Fork / 1706020105				
<b>Mean Basin Elevation</b>	8113 ft	<b>Basin Aspect</b>	NW	<b>Mean Basin Slope</b>	47%
<b>Length of Road</b>	0.1 mi	<b>Road Density</b>		0.01 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	100%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	99.5%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (8/22/2022)



View Downstream (8/22/2022)

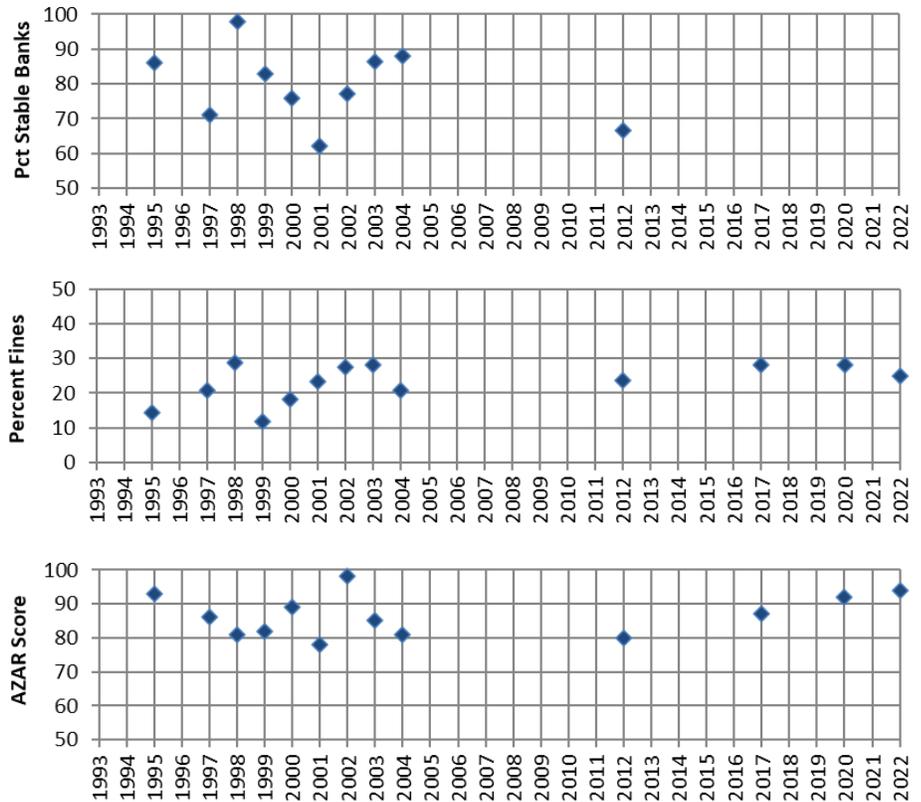
**FIVEMILE CREEK 1A**

**Last Year Sampled: 2022**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	86.0	14.3	93
1996			
1997	71.0	20.8	86
1998	98.0	28.8	81
1999	83.0	11.7	82
2000	76.0	18.2	89
2001	62.0	23.4	78
2002	77.0	27.5	98
2003	86.5	28.3	85
2004	88.0	20.8	81
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012	66.5	23.7	80
2013			
2014			
2015			
2016			
2017		28.0	87
2018			
2019			
2020		28.3	92
2021			
2022		24.9	94
2023			
n	10	13	13
Mean	79.4	23.0	86.6
St Dev	11.0	5.6	6.2
n	0	3	3
Mean	-	27.1	91.0
St Dev	-	1.9	3.6

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1995	17.7	1.8	22.1	-	3	Gravel	C4b
1998	13.5	4.3	16.9	1.1	1	Gravel	C4
2017	14.7	4.4	13.6	1.5	1.5	Gravel	C4
2020	11.7	4.0	16.0	1.2-1.5	3.0	Gravel	C4

<b>Reviewed Channel Type</b>	<b>C4</b>
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**REMARKS**

Limited recent data exist for this site. Depth fines have been consistently low (less than 30%), and bank stability has been variable. Previous GPS coordinates (N 44.403841 W -114.654346) show location 150 feet downstream of road. 2017 site located based on existing driving directions, about 200 feet upstream of road. 2020 and 2022 sites are same as 2017 site, has a more characteristic pool tailout than the site below culvert.

**JORDAN CREEK OA**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Jordan Creek OA	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee
<b>Site Location</b>	Site is located approximately 3 miles up the Beaver-Loon Road (FR172) from the Yankee Fork Road (FR013).		
<b>GPS Coordinates</b>	N 44.41862 (2023)	W -114.73393 (2023)	
<b>Site Comments</b>	Core site located just upstream of where the creek splits into 2 channels. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	10.5 sq mi 6,732 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	47 cfs	<b>Mean Annual Flow</b> (Streamstats)	19.6 cfs
<b>5th-level Watershed</b>	Yankee Fork / 1706020105				
<b>Mean Basin Elevation</b>	8259 ft	<b>Basin Aspect</b>	S	<b>Mean Basin Slope</b>	47%
<b>Length of Road</b>	41.8 mi	<b>Road Density</b>	3.97 mi/sq mi		
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	99.1%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0.9%	
<b>% of Watershed in Active Allotment</b>	0.2%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

**JORDAN CREEK 0A**

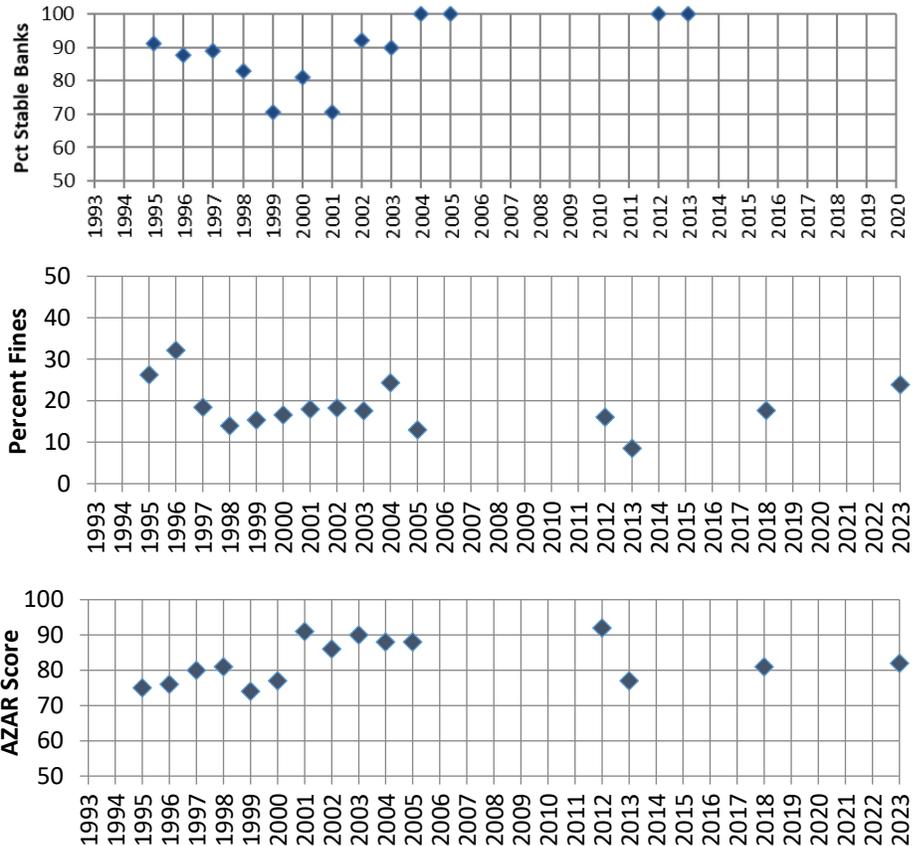
**Last Year Sampled: 2023**

SITE DATA

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	91.0	26.2	75
1996	87.5	32.1	76
1997	89.0	18.4	80
1998	83.0	13.9	81
1999	70.5	15.3	74
2000	81.0	16.5	77
2001	70.5	17.9	91
2002	92.0	18.2	86
2003	90.0	17.5	90
2004	100	24.3	88
2005	100	12.9	88
2006			
2007			
2008			
2009			
2010			
2011			
2012	100	16.0	92
2013	100	8.5	77
2014			
2015			
2016			
2017			
2018		17.6	81
2019			
2020			
2021			
2022			
2023		23.8	82
n	13	15	15
Mean	88.8	18.6	82.5
St Dev	10.3	5.9	6.2
n	0	2	2
Mean	-	20.7	81.5
St Dev	-	4.4	0.7

ALL

10YR



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	36.8	1.6	29.4	1.1	2	Cobble	B4
2018	27.0	3.5	19.4	<1.2	3	Cobble	C3b

Reviewed Channel Type C3b

REMARKS

This site was monitored continuously from 1995 to 2005, and then intermittently. Bank stability has ranged from 70% to 100%, with an increasing trend. Depth fines have ranged from 9% to 32%, with most values less than 20%. Small scale mining activity and large scale mine reclamation (Grouse Creek Mine) occur in the watershed. This site has shown an increasing trend in depth fines over the last 10 years. 2023 notes indicated small log jams in the area which may be contributing to overall fines.

**MCKAY CREEK 1A**

**Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	McKay Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee
<b>Site Location</b>	Site is located approx. 0.5 miles upstream of the confluence with the Yankee Fork, 4.3 miles west of Mill Creek Summit. The site is about 20 feet upstream of the FR070 (Custer Motorway) culvert.		
<b>GPS Coordinates</b>	N 44.48581 (2022)	W -114.54404 (2022)	
<b>Site Comments</b>	Stream name is McKay Creek (not Mackay Creek). 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	7.3 sq mi 4,703 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	43 cfs	<b>Mean Annual Flow</b> (Streamstats)	15.6 cfs
<b>5th-level Watershed</b>	Yankee Fork / 1706020105				
<b>Mean Basin Elevation</b>	8511 ft	<b>Basin Aspect</b>	NW	<b>Mean Basin Slope</b>	37%
<b>Length of Road</b>	4.6 mi	<b>Road Density</b>		0.63 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	98.2%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	1.8%	
<b>% of Watershed in Active Allotment</b>	100%	<b>% of Watershed Burned (2018-2022)</b>			

**SITE PHOTOS**



**View Upstream (7/26/2022)**



**View Downstream (7/26/2022)**

**MCKAY CREEK 1A**

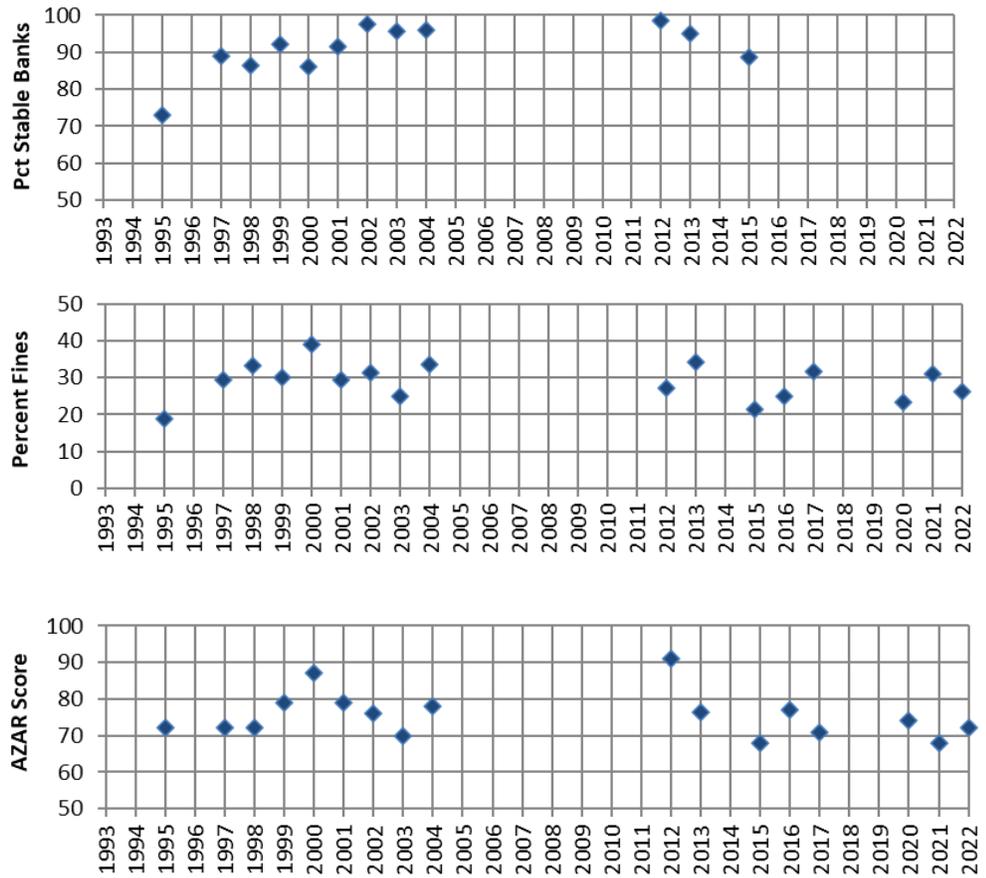
**Last Year Sampled: 2022**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	73.0	19.0	72
1996			
1997	89.0	29.3	72
1998	86.5	33.2	72
1999	92.0	30.1	79
2000	86.0	38.9	87
2001	91.5	29.4	79
2002	97.5	31.3	76
2003	95.5	24.8	70
2004	96.0	33.7	78
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012	98.5	27.1	91
2013	95.1	34.3	77
2014			
2015	88.5	21.5	68
2016		24.8	77
2017		31.7	71
2018			
2019			
2020		23.4	74
2021		31.0	68
2022		26.1	72
2023			
<b>n</b>	12	17	17
<b>Mean</b>	90.8	28.8	75.4
<b>St Dev</b>	7.0	5.1	6.2
<b>n</b>	1	6	6
<b>Mean</b>	88.5	26.4	71.7
<b>St Dev</b>	-	4.1	3.5

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	17.9	8.4	17.4	1.1	1	Gravel	C4
2015	10.9	2.0	14.3	1.3	2.0	Gravel	C4
2016	11.7	2.0	26.6	1.3	2	Gravel	C4
2017	16.2	6.2	13.5	1.2	2.0	Gravel	C4
2020	13.3	9.8	20.5	<1.2	1	Cobble	C4

<b>Reviewed Channel Type</b>	<b>C4</b>
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**REMARKS**

This site was sampled nearly continuously from 1995 to 2004, and 2012 to 2017. Bank stability has been generally greater than 85%. Depth fines have ranged from 19% to 39%, with many values over 30%. The 2015 Elevenmile Fire burned a large portion of this drainage (prior to the 2015 sampling, but before any runoff producing storm events). Sampling in 2016 and 2017 indicated no increase in fines resulting from the fire.

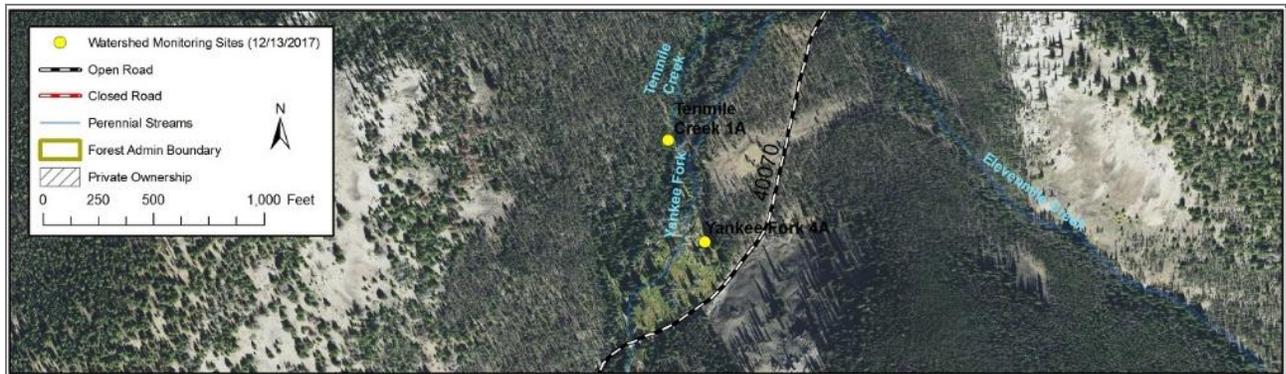
**TENMILE CREEK 1A**

**Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	Tenmile Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee
<b>Site Location</b>	Site is located near the mouth of Tenmile Creek at the Yankee Fork. Access is via the Custer Motorway (FR070).		
<b>GPS Coordinates</b>	N 44.46574 (2022)	W -114.58263 (2022)	
<b>Site Comments</b>	This site is part of a 3-year monitoring commitment 2020-2022 for the Garden Creek Allotment.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	4.5 sq mi 2,864 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	24 cfs	<b>Mean Annual Flow</b> (Streamstats)	10.2 cfs
<b>5th-level Watershed</b>	Yankee Fork / 1706020105				
<b>Mean Basin Elevation</b>	8447 ft	<b>Basin Aspect</b>	SE	<b>Mean Basin Slope</b>	46%
<b>Length of Road</b>	0 mi	<b>Road Density</b>		0 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	100%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	99.8%	<b>% of Watershed Burned (2018-2022)</b>		17.9%	

**SITE PHOTOS**



**View Upstream (8/1/2022)**



**View Downstream (8/1/2022)**

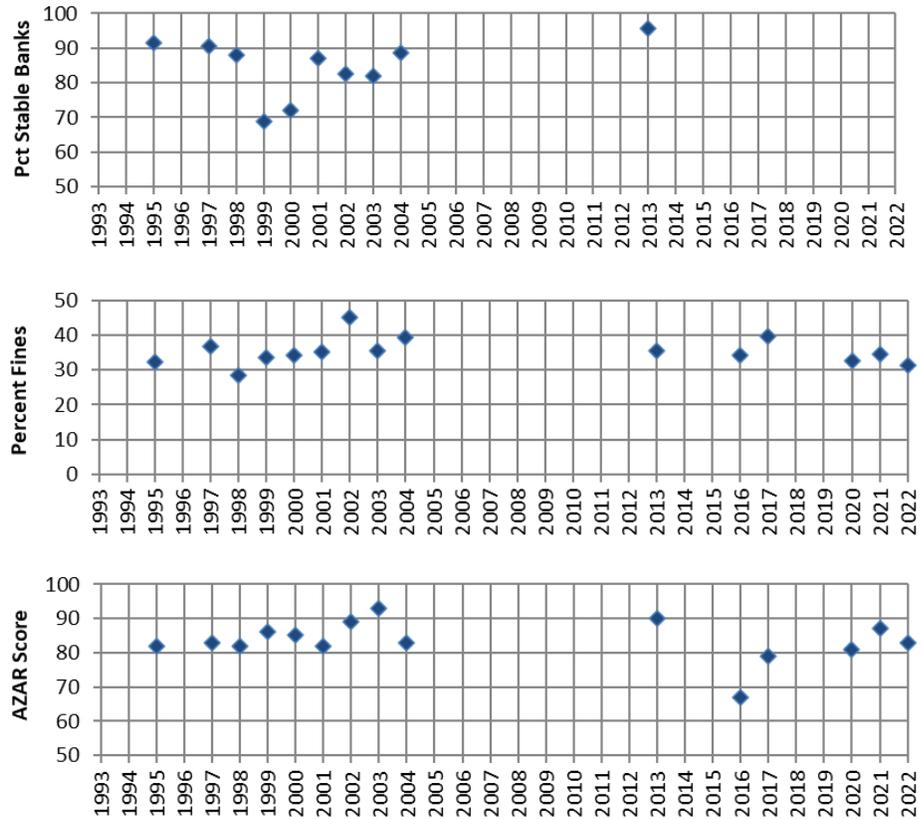
TENMILE CREEK 1A

Last Year Sampled: 2022

SITE DATA

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	91.5	32.3	82.0
1996			
1997	90.5	36.9	83.0
1998	88.0	28.5	82.0
1999	69.0	33.7	86.0
2000	72.0	34.3	85.0
2001	87.0	35.3	82.0
2002	82.5	45.0	89.0
2003	82.0	35.6	93.0
2004	88.5	39.5	83.0
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013	95.5	35.5	90.0
2014			
2015			
2016		34.2	67.0
2017		39.7	79.0
2018			
2019			
2020		32.7	81.0
2021		34.5	87.0
2022		31.5	83
2023			
n	10	15	15
Mean	84.7	35.3	83.5
St Dev	8.5	3.9	5.9
n	0	5	5
Mean	-	34.5	79.4
St Dev	-	3.1	7.5

10YR ALL



CHANNEL MEASUREMENTS

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	9.3	5.2	10.0	1.4	1	Gravel	C4
2016	9.8	1.3	18.1	1.5	2	Gravel	C4
2017	13.2	2.3	10.6	1.3	2.6 (?)	Gravel	C4
2020	13.5	5.1	16.4	1.2-1.5	2.0	Gravel	C4

Reviewed Channel Type C4

REMARKS

Depth fines have been generally greater than 30%. The cause of high fines is not known. The 2015 Elevenmile Fire burned a portion of this drainage, mostly at low and moderate severity. 2016 and 2017 sampling did not show large increases in fines as a result of the fire. Site watershed was previously delineated incorrectly, but watershed was corrected 11/30/2016 (previously 30.4 sq miles, actual drainage area is 4.5 sq miles). Site moved 200 feet upstream in 2021 so that it is outside of the influence of the confluence.

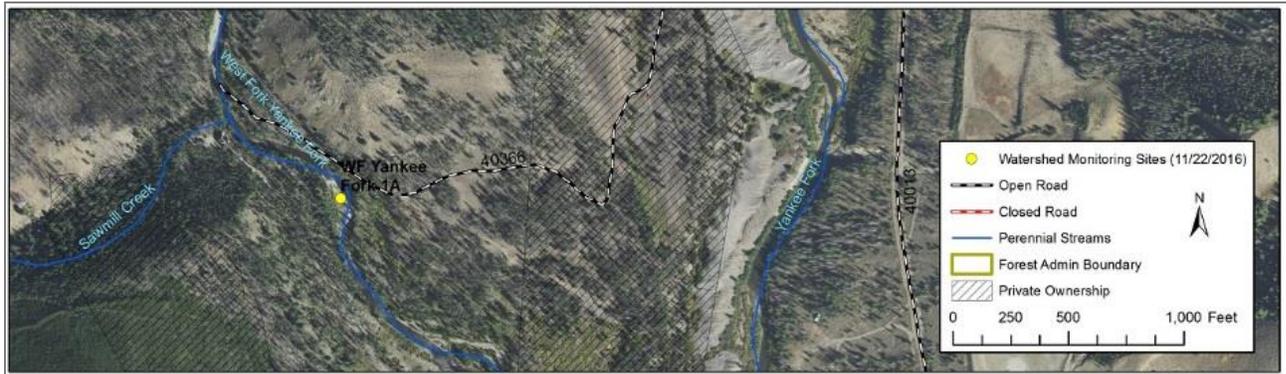
**WEST FORK YANKEE FORK 1A**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	West Fork Yankee Fork 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee Fork Middle Fork
<b>Site Location</b>	Site is located approx. 0.7 miles upstream of the confluence with the Yankee Fork. Access is via the Sawmill Transfer Road (FR366) at the Sawmill Creek Trailhead, 1.4 miles from Bonanza on the Yankee Fork Road.		
<b>GPS Coordinates</b>	N 44.35612 (2019)	W -114.73598 (2019)	
<b>Site Comments</b>	4% of watershed in Wilderness. 10-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	57.2 sq mi 36,595 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	246 cfs	<b>Mean Annual Flow</b> (Streamstats)	86.9 cfs
<b>5th-level Watershed</b>	Yankee Fork / 1706020105				
<b>Mean Basin Elevation</b>	7940 ft	<b>Basin Aspect</b>	SE	<b>Mean Basin Slope</b>	44%
<b>Length of Road</b>	7.1 mi	<b>Road Density</b>		0.12 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	4.7%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	90.1%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	5.1%	
<b>% of Watershed in Active Allotment</b>	0%	<b>% of Watershed Burned (2018-2022)</b>		0.0%	

**SITE PHOTOS**



**View Upstream (2019)**



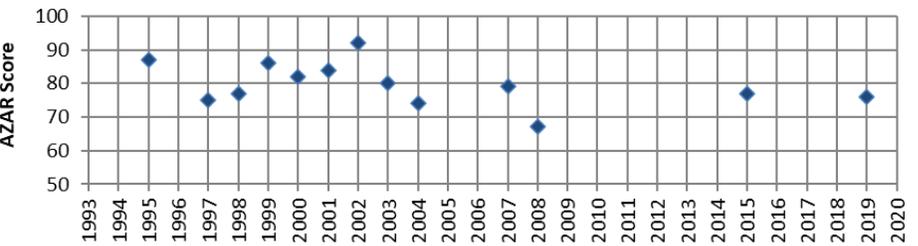
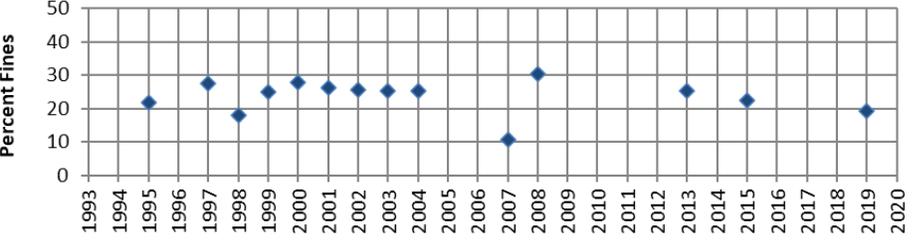
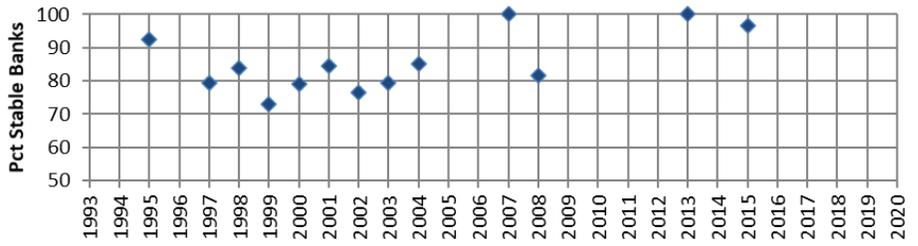
**View Downstream (2019)**

**WEST FORK YANKEE FORK 1A**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	92.5	21.9	87
1996			
1997	79.5	27.5	75
1998	84.0	18.1	77
1999	73.0	25.1	86
2000	79.0	27.8	82
2001	84.5	26.1	84
2002	76.5	25.6	92
2003	79.5	25.4	80
2004	85.0	25.2	74
2005			
2006			
2007	100	10.6	79
2008	81.5	30.5	67
2009			
2010			
2011			
2012			
2013	100	25.4	
2014			
2015	96.5	22.4	77
2016			
2017			
2018			
2019		19.4	76.0
2020			
2021			
2022			
2023			
n	13	14	13
Mean	85.5	23.6	79.7
St Dev	9.0	5.0	6.5
n	1	2	2
Mean	96.5	20.9	76.5
St Dev	####	2.1	0.7



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1995	56	1.5	43.1	-	<1	Sm cobble	B3c
1998	64.5	2.5	47.8	1.1	1	Cobble	C3
2015	43	5.7	25.3	1.4	2.0	Cobble	C3
2019	47.9	1.2	47.5	<1.2	2.5	Gravel (cob)	C3

**ALL**

**10YR**

<b>Reviewed Channel Type</b>	<b>C3</b>
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**REMARKS**

This site was sampled continuously from 1995 to 2004, then periodically since 2004. Bank stability has ranged from 72% to 100%, with an increasing trend. Depth fines have ranged from 10% to 30%, with recent values less than 30%. Monitoring indicated no major impacts to the channel in 2013 or 2015 following the 2012 Halstead Fire. Other impacts in the watershed are limited. This site could potentially be used as a “reference site” for a large, forested, C3 channel.

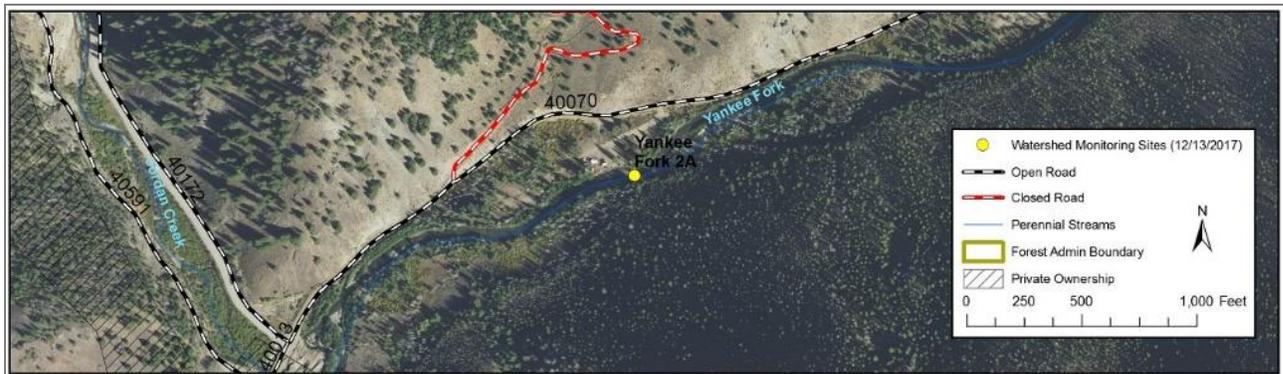
**YANKEE FORK 2A**

**Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	Yankee Fork 2A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis Yankee Fork
<b>Site Location</b>	Site is located along the Yankee Fork Road (FR013) approximately 8.5 miles upstream of Highway 75, upstream of Jordan Creek confluence.		
<b>GPS Coordinates</b>	N 44.38091 (2022)	W -114.71542 (2022)	
<b>Site Comments</b>	Adjacent to a campsite. 5-year monitoring frequency. Not optimal spawning habitat, but there is potential for it to be spawning habitat.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	86.4 sq mi 55,276 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	389 cfs	<b>Mean Annual Flow</b> (Streamstats)	116 cfs
<b>5th-level Watershed</b>	Yankee Fork / 1706020105				
<b>Mean Basin Elevation</b>	8207 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	42%
<b>Length of Road</b>	50.7 mi	<b>Road Density</b>		0.59 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>	0.0%	
	<b>Volcanic</b>	96.6%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	3.4%	
<b>% of Watershed in Active Allotment</b>	87.1%	<b>% of Watershed Burned (2018-2022)</b>		7.9%	

**SITE PHOTOS**



**View Upstream (9/22/2022)**



**View Downstream (9/22/2022)**

**YANKEE FORK 2A**

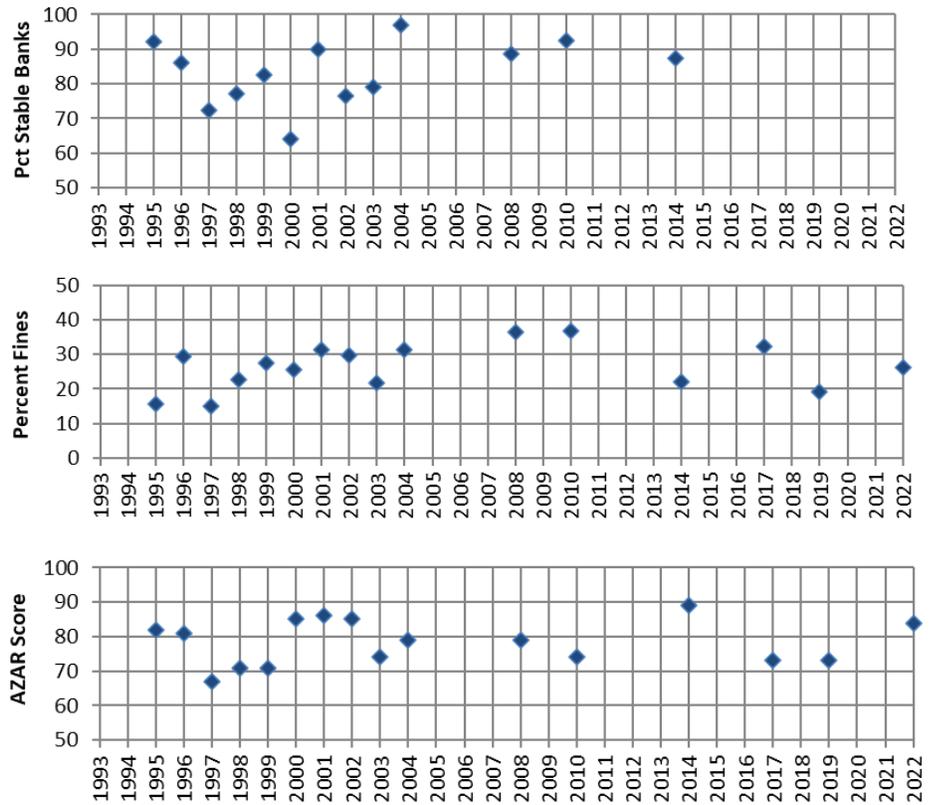
**Last Year Sampled: 2022**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	92.0	15.6	82
1996	86.0	29.5	81
1997	72.5	14.9	67
1998	77.0	22.6	71
1999	82.5	27.5	71
2000	64.0	25.6	85
2001	90.0	31.4	86
2002	76.5	29.7	85
2003	79.0	21.8	74
2004	97.0	31.3	79
2005			
2006			
2007			
2008	88.5	36.5	79
2009			
2010	92.5	36.7	74
2011			
2012			
2013			
2014	87.5	22.2	89
2015			
2016			
2017		32.3	73
2018			
2019		19.1	73
2020			
2021			
2022		26.2	84
2023			
n	13	16	16
Mean	83.5	26.4	78.3
St Dev	9.3	6.7	6.6
n	1	4	4
Mean	87.5	25.0	79.8
St Dev	-	5.7	8.1

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	64	2.7	38.3	1.02	1	Cobble	C3
2001	53	>2.2	30.1	1.6	1	Gravel	C4
2017	56.6	2.1	26.3	1.1	1.5	Gravel	C4
2019	58	7.9	22.8	<1.2	1.0	Cobble	C3

**Reviewed Channel Type** **C3**

**REMARKS**

This site was monitored continuously from 1995 to 2004, then periodically since 2004. Bank stability has ranged from 63% to 98%, with an increasing trend. Depth fines have ranged from 14% to 38%. Impacts from the 2015 Elevenmile Fire are not likely to be observed at this site.

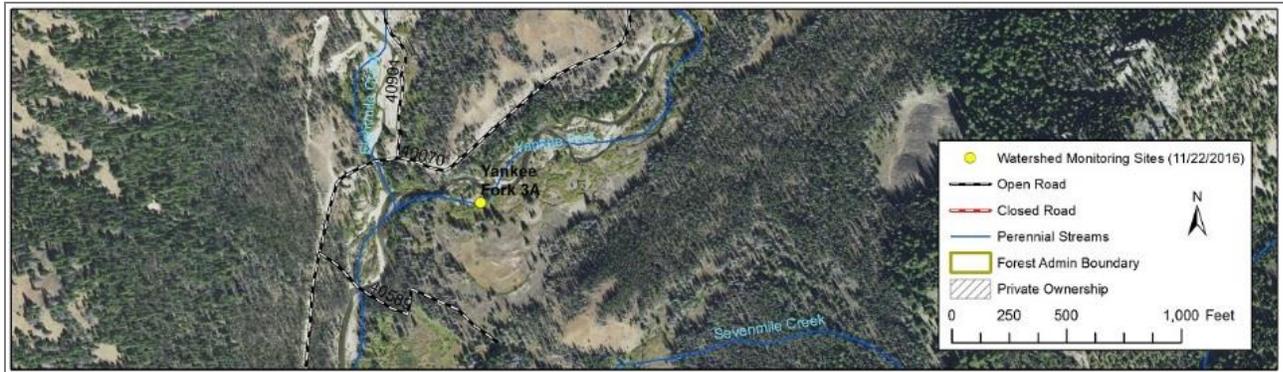
**YANKEE FORK 3A**

**Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	Yankee Fork 3A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee Fork
<b>Site Location</b>	Site is located along the Custer Motorway (FR070) approximately 13.4 miles upstream of Highway 75, just downstream of the confluence of Eightmile Creek.		
<b>GPS Coordinates</b>	N 44.42617 (2021) / 44.42529 (2022)	W -114.62070 (2020) / -114.62120 (2022)	
<b>Site Comments</b>	2022 site moved downstream due to redd at usual site. 5-year monitoring frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	58.7 sq mi 37,547 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	323 cfs	<b>Mean Annual Flow</b> (Streamstats)	102 cfs
<b>5th-level Watershed</b>	Yankee Fork / 1706020105				
<b>Mean Basin Elevation</b>	8317 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	40%
<b>Length of Road</b>	17.3 mi	<b>Road Density</b>		0.29 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	96.6%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	3.4%	
<b>% of Watershed in Active Allotment</b>	99.8%	<b>% of Watershed Burned (2018-2022)</b>		11.7%	

**SITE PHOTOS**



View Upstream (10/4/2022)



View Downstream (10/4/2022)

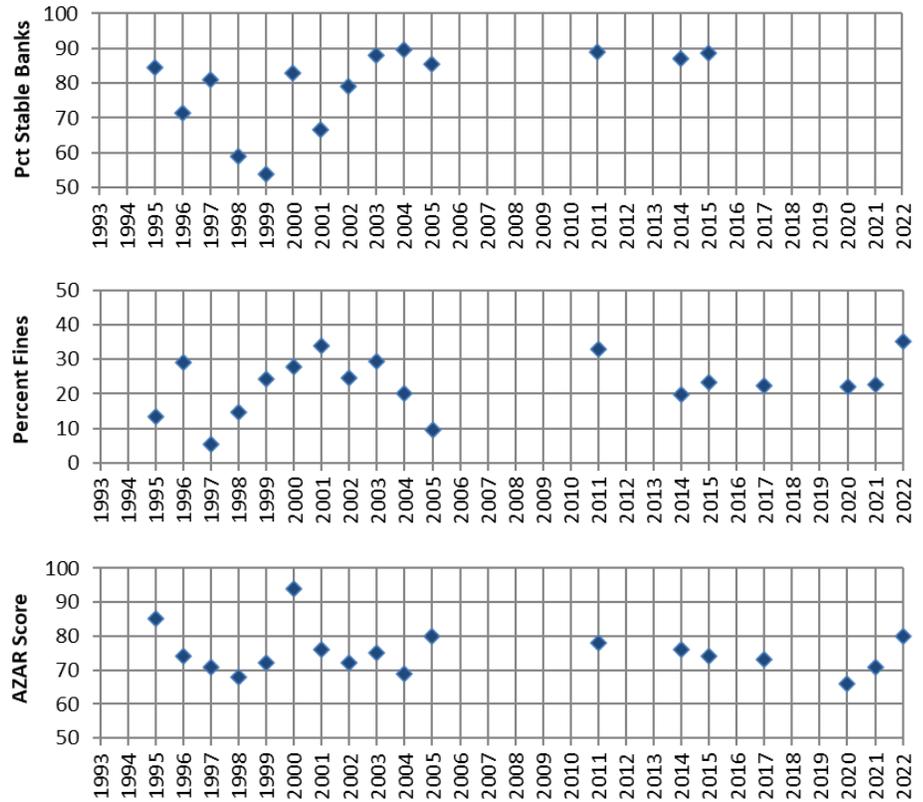
**YANKEE FORK 3A**

**Last Year Sampled: 2022**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	84.5	13.3	85
1996	71.5	29.1	74
1997	81.0	5.3	71
1998	59.0	14.7	68
1999	54.0	24.2	72
2000	83.0	27.8	94
2001	66.5	34.0	76
2002	79.0	24.7	72
2003	88.0	29.5	75
2004	89.5	20.1	69
2005	85.5	9.7	80
2006			
2007			
2008			
2009			
2010			
2011	89.0	32.9	78
2012			
2013			
2014	87.0	19.9	76
2015	88.5	23.2	74
2016			
2017		22.5	73
2018			
2019			
2020		22.0	66
2021		22.6	71
2022		35.3	80
2023			
n	14	18	18
Mean	79.0	22.8	75.2
St Dev	11.7	8.2	6.6
n	2	6	6
Mean	87.8	24.3	73.3
St Dev	1.1	5.5	4.7

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	39.5	1.5	43.9	1.7	1.0	Gravel	C4
2017	58.8	2.7	53.5	1.1	1.5	Gravel	C4
2020	43.2	5.6	19.6	<1.2	2.0	Cobble	C3

**Reviewed Channel Type** **C3**

**REMARKS**

This site was sampled continuously from 1995 to 2005, then periodically since 2005. Bank stability ranged from 54% to 90%, with an increasing trend. Depth fines ranged from 6% to 32%, with recent values between 20 and 23%. The 2015 Elevenmile Fire burned a large portion of the watershed – the 2015 sampling occurred after the fire, but before any runoff-producing events. No increase in depth fines was observed in 2017 as a result of the Elevenmile Fire. Note: 2015 sampling occurred upstream of Eightmile Creek confluence because of redd at original site. 2022 moved downstream due to redd at usual site.

**YANKEE FORK 4A**

**Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	Yankee Fork 4A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee
<b>Site Location</b>	Site is located along the Custer Motorway (FR070), about 100 yards downstream of the Tenmile Creek confluence.		
<b>GPS Coordinates</b>	N 44.46400 (2022)	W -114.58236 (2022)	
<b>Site Comments</b>	5-year monitoring frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	34.9 sq mi 22,319 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	217 cfs	<b>Mean Annual Flow</b> (Streamstats)	70.2 cfs
<b>5th-level Watershed</b>	Yankee Fork / 1706020105				
<b>Mean Basin Elevation</b>	8406 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	36%
<b>Length of Road</b>	8.4 mi	<b>Road Density</b>		0.24 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	97.7%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	2.3%	
<b>% of Watershed in Active Allotment</b>	99.9%	<b>% of Watershed Burned (2018-2022)</b>		19.6%	

**SITE PHOTOS**



**View Upstream (8/11/2022)**



**View Downstream (8/11/2022)**

**YANKEE FORK 4A**

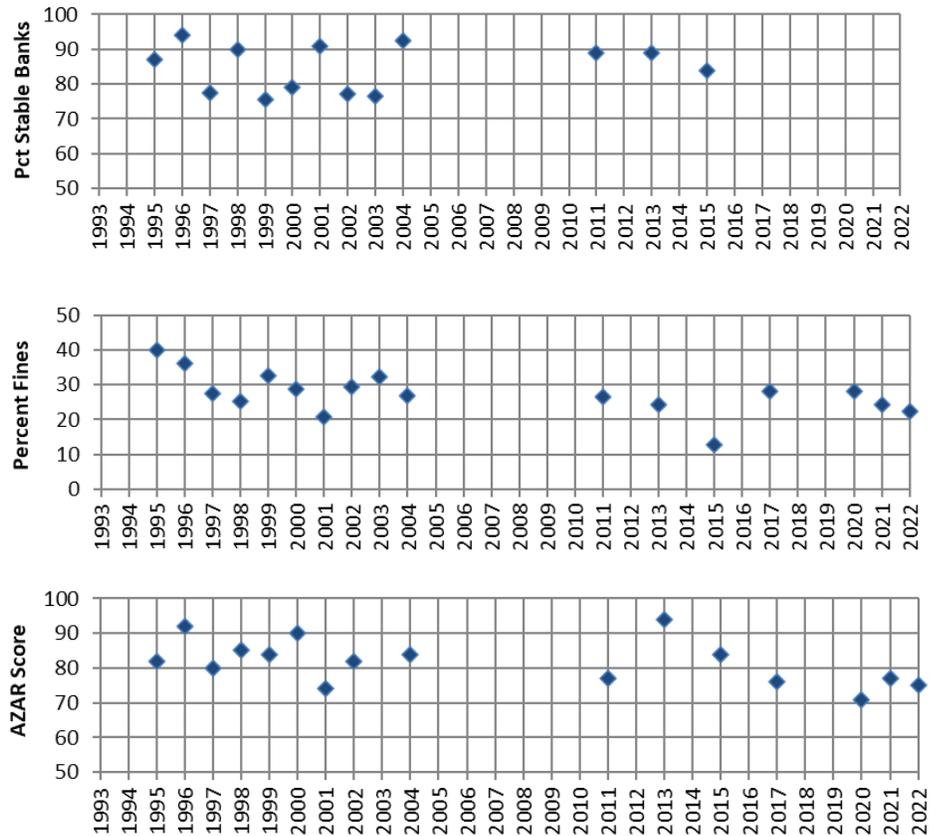
**Last Year Sampled: 2022**

SITE DATA

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	87.0	40.1	82
1996	94.0	36.1	92
1997	77.5	27.4	80
1998	90.0	25.2	85
1999	75.5	32.7	84
2000	79.0	28.9	90
2001	91.0	20.8	74
2002	77.0	29.4	82
2003	76.5	32.3	
2004	92.5	27.0	84
2005			
2006			
2007			
2008			
2009			
2010			
2011	89.0	26.5	77
2012			
2013	88.8	24.4	94
2014			
2015	84.0	12.9	84
2016			
2017		28.3	76
2018			
2019			
2020		28.2	71
2021		24.2	77
2022		22.5	75
2023			
<b>n</b>	13	17	16
<b>Mean</b>	84.8	27.5	81.7
<b>St Dev</b>	6.8	6.1	6.6
<b>n</b>	1	5	5
<b>Mean</b>	84.0	23.2	76.6
<b>St Dev</b>	-	6.3	4.7

ALL

10YR



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	27.3	6.0	32.5	1.8	1.5	Cobble	C3
2017	35.0	3.4	25.0	1.3	1.0	Gravel	C4
2020	38.6	3.2	39.0	1.2-1.5	1.5	Gravel	C4
<b>Reviewed Channel Type</b>							<b>C4</b>

REMARKS

This site was monitored continuously from 1995 to 2004, then periodically since 2004. Bank stability ranged from 77% to 93%. Depth fines ranged from 13% to 40%, with a decreasing trend. The 2015 Elevenmile Fire burned a large portion of the watershed (the 2015 sampling occurred before the fire). Depth fines increased from 2015 to 2017, but this is not likely the result of the Elevenmile Fire because 2017 values are similar to baseline values.

**YANKEE FORK 5A**

**Last Year Sampled: 2022**

SITE INFO

<b>Site Name</b>	Yankee Fork 5A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee
<b>Site Location</b>	Site is located along the Custer Motorway (FR070), just downstream of the Mackay Cr. confluence and upstream of the Upper Yankee Fork Trailhead ford.		
<b>GPS Coordinates</b>	N 44.48866 (2022)	W -114.55097 (2022)	
<b>Site Comments</b>	5-year monitoring frequency. Not optimal spawning habitat, but representative of reach.		

SITE MAP



BASIN DATA

<b>Drainage Area at Site</b>	20.5 sq mi 13,088 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	151 cfs	<b>Mean Annual Flow</b> (Streamstats)	47.8 cfs
<b>5th-level Watershed</b>	Yankee Fork / 1706020105				
<b>Mean Basin Elevation</b>	8439 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	31%
<b>Length of Road</b>	6.0 mi	<b>Road Density</b>		0.29 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	97.6%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	2.4%	
<b>% of Watershed in Active Allotment</b>	99.9%	<b>% of Watershed Burned (2018-2022)</b>		15.9%	

SITE PHOTOS



View Upstream (8/11/2022)



View Downstream (8/11/2022)

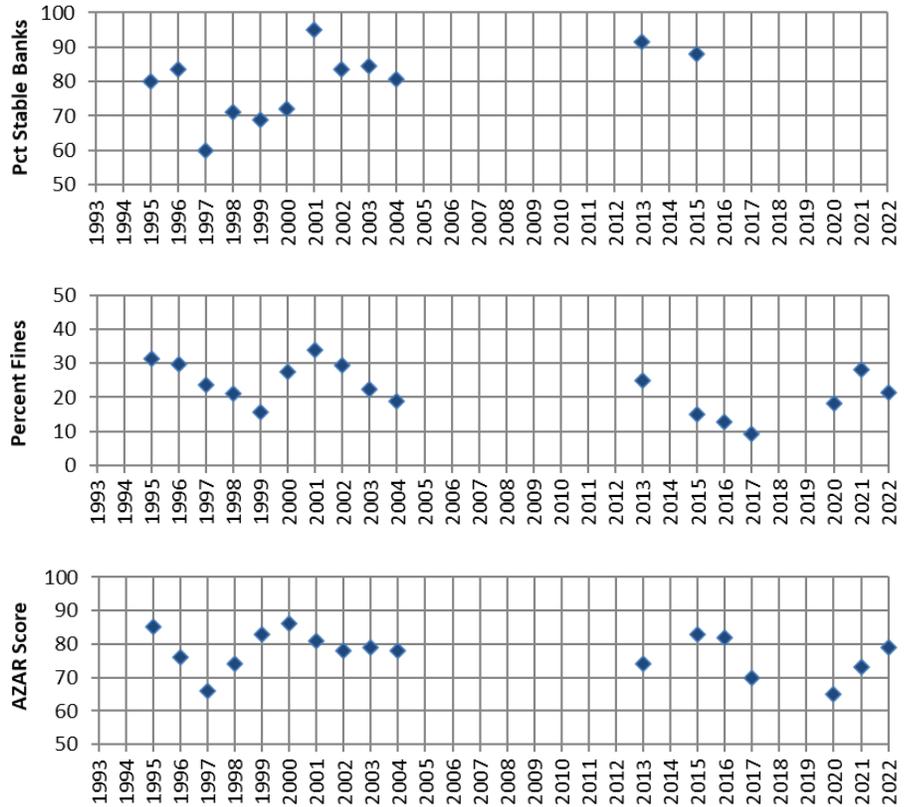
YANKEE FORK 5A

Last Year Sampled: 2022

SITE DATA

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	80.0	31.5	85
1996	83.5	29.7	76
1997	60.0	23.6	66
1998	71.0	21.0	74
1999	69.0	15.7	83
2000	72.0	27.6	86
2001	95.0	33.8	81
2002	83.5	29.5	78
2003	84.5	22.5	79
2004	80.5	19.0	78
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013	91.6	24.8	74
2014			
2015	88.0	14.9	83
2016		12.9	82
2017		9.2	70
2018			
2019			
2020		18.3	65
2021		28.1	73
2022		21.4	79
2023			
n	12	17	17
Mean	79.9	22.6	77.2
St Dev	10.2	7.0	6.2
n	1	6	6
Mean	88.0	17.5	75.3
St Dev	-	6.7	7.2

10YR ALL



CHANNEL MEASUREMENTS

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	17.5	1.5	14.1	1.2	1.5	Gravel	B3c
2016	14	1.6	19.2	1.2	2	Cobble	C3
2017	20.4	>2.2	12.8	<1.2	1.5	Gravel	C4
2020	16.6	1.7	16.4	<1.2	3.0	Cobble	C3

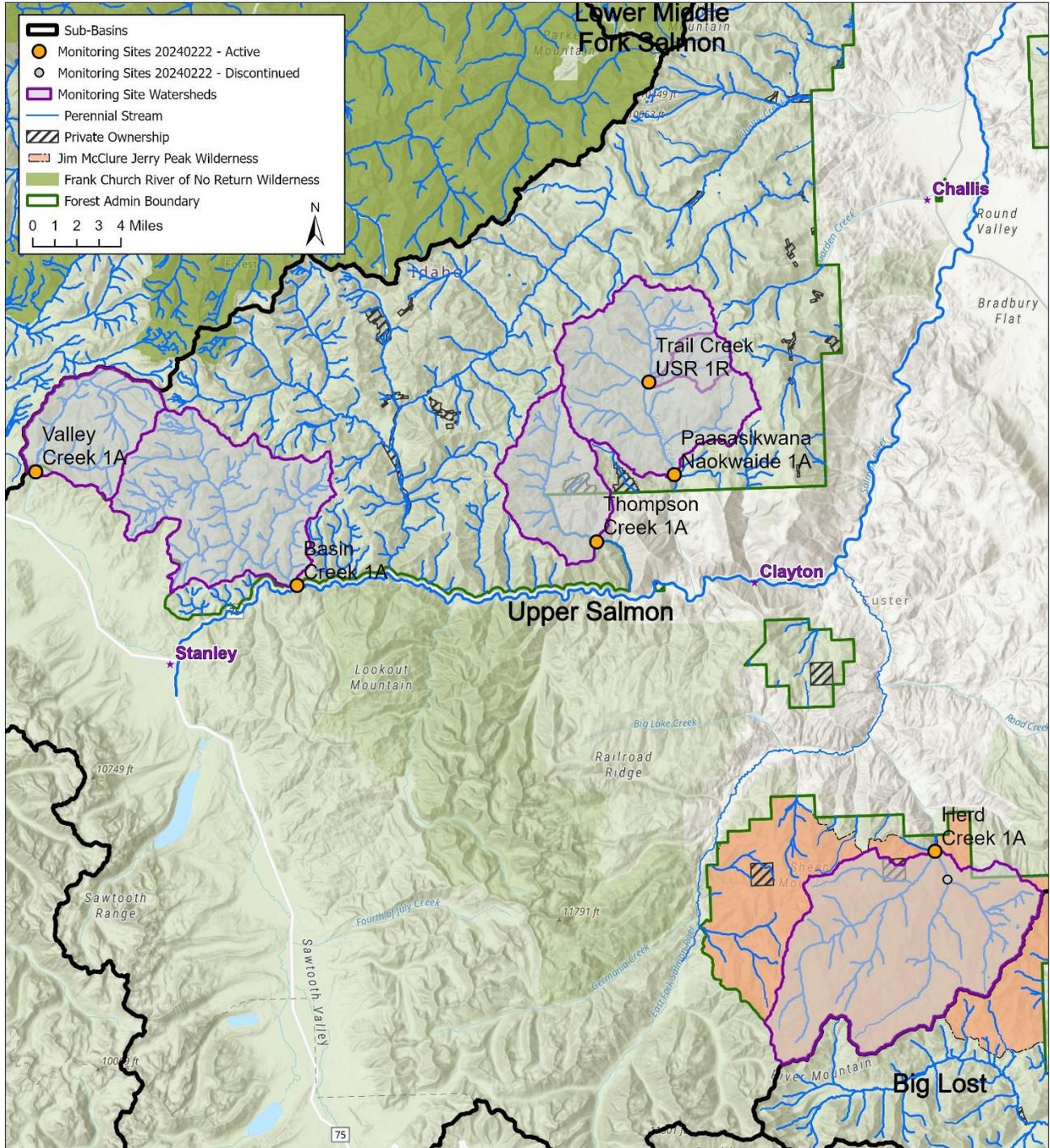
<b>Reviewed Channel Type</b>	<b>C3</b>
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REMARKS

This site was monitored continuously from 1995 to 2004, then periodically since 2004. Bank stability ranged from 60% to 96%, with an increasing trend. Depth fines ranged from 15% to 33%, with a decreasing trend in recent years. The 2015 Elevenmile Fire burned a large portion of the watershed (the 2015 sampling occurred before the fire). 2016 and 2017 data indicate no impacts as a result of the fire.

## Stanley Area

A total of 6 active monitoring sites are located in watersheds that drain directly to the Salmon River upstream of Challis. The Herd Creek watershed is located entirely within the newly established Jim McClure-Jerry Peak Wilderness.





**BASIN CREEK 1A**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Basin Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee Fork
<b>Site Location</b>	Site is located near the mouth of Basin Creek at the Salmon River. Access is via the Basin Creek Road (FR034), 0.1 miles north of Highway 75.		
<b>GPS Coordinates</b>	N 44.26411 (2019)	W -114.81927 (2019)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	52.7 sq mi 33,722 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	205 cfs	<b>Mean Annual Flow</b> (Streamstats)	64 cfs
<b>5th-level Watershed</b>	Basin Creek-Salmon River/ 1706020106				
<b>Mean Basin Elevation</b>	7522 ft	<b>Basin Aspect</b>	SE	<b>Mean Basin Slope</b>	39%
<b>Length of Road</b>	88.7 mi	<b>Road Density</b>		1.68 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	57.7%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	0%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	38.0%	<b>Alluvium</b>	4.3%	
<b>% of Watershed in Active Allotment</b>	14.7%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2019)**



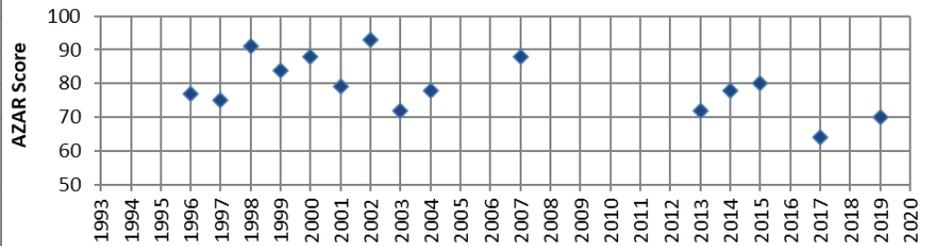
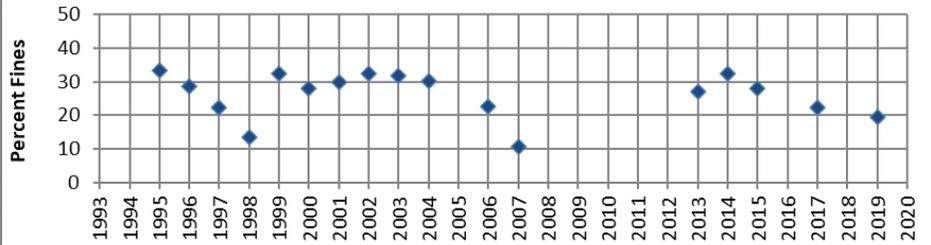
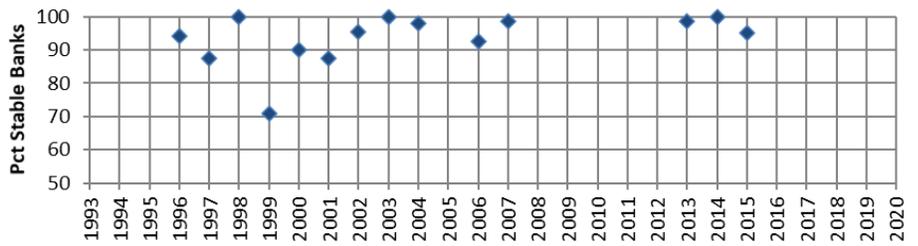
**View Downstream (2019)**

**BASIN CREEK 1A**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995		33.3	
1996	94.0	28.5	77
1997	87.5	22.3	75
1998	100	13.5	91
1999	71.0	32.4	84
2000	90.0	28.1	88
2001	87.5	30.0	79
2002	95.5	32.3	93
2003	100	31.8	72
2004	98.0	30.3	78
2005			
2006	92.5	22.7	
2007	98.5	10.7	88
2008			
2009			
2010			
2011			
2012			
2013*	98.5 (98.5)	27.0 (21.0)	72 (92)
2014	100	32.4	78
2015	95.0	27.9	80
2016			
2017		22.2	64
2018			
2019		19.4	70
2020			
2021			
2022			
2023			
n	14	17	15
Mean	93.4	26.2	79.3
St Dev	7.8	6.8	8.3
n	2	4	4
Mean	97.5	25.5	73.0
St Dev	3.5	5.8	7.4



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	44	3.3	33.8	1.04	1	Cobble	C3
2015	27.4	1.4	24.9	1.1	2.5	Cobble	B3
2017	35.4	1.4	25.3	1.1	1.0	Gravel	B4c
2019	32	8.1	16.0	<1.2	1.0	Cobble	C3

**Reviewed Channel Type** **C3**

**ALL**

**10YR**

**RMRKS**

Depth fines have varied from 11% to 33%. Samples following the 2012 Halstead Fire did not show an increase over baseline values for depth fines (despite multiple blowouts in the watershed), and bank stability did not decrease. \* Two samples conducted in 2013 – before and after flood event – depth fines decreased to 21% post-flood. Only the initial sample used for statistics. Consider moving site to more suitable spawning habitat upstream of hot spring.

**HERD CREEK 1A**

**Last Year Sampled: 2018**

**SITE INFO**

<b>Site Name</b>	Herd Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee Fork
<b>Site Location</b>	Site is located just downstream of the confluence with East Pass Creek. Access is via the EF Salmon River Road and the Herd Creek Road. Site is accessed by hiking approximately 2 miles south on the Herd Creek Trail.		
<b>GPS Coordinates</b>	N 44.07695 (2018)	W -114.24469 (2018)	
<b>Site Comments</b>	Site and entire site watershed are within Jim McClure-Jerry Peak Wilderness (established 2015). 10-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	77.4 sq mi 49,525 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	411 cfs	<b>Mean Annual Flow</b> (Streamstats)	51.3 cfs
<b>5th-level Watershed</b>	Herd Creek / 1706020112				
<b>Mean Basin Elevation</b>	8433 ft	<b>Basin Aspect</b>	N	<b>Mean Basin Slope</b>	47%
<b>Length of Road</b>	0.0 mi	<b>Road Density</b>		0.0 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	29.3%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	63.8%	<b>Mixed</b>	6.8%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	0.1%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2018)**



**View Downstream (2018)**

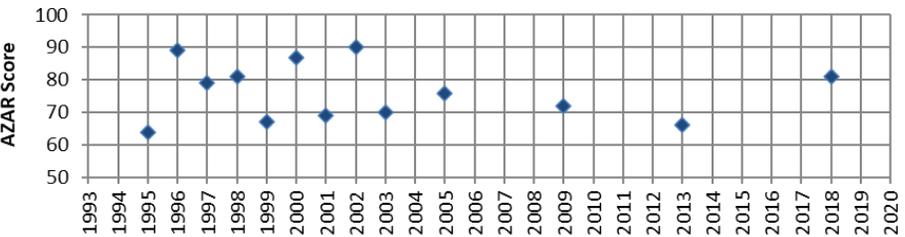
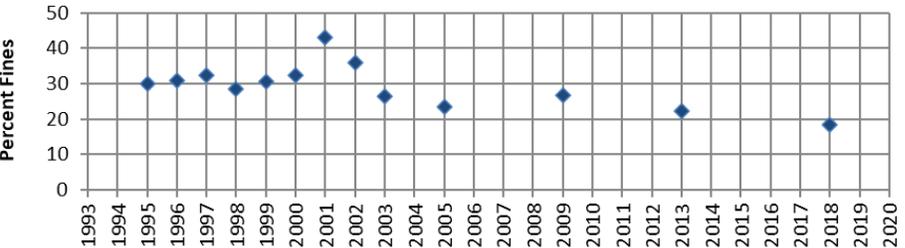
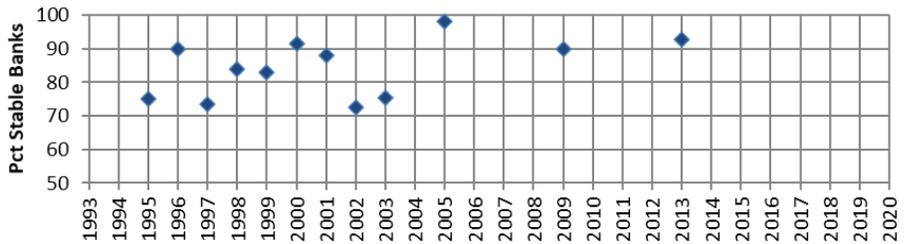
**HERD CREEK 1A**

**Last Year Sampled: 2018**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	75.0	30.1	64
1996	90.0	31.0	89
1997	73.5	32.5	79
1998	84.0	28.4	81
1999	83.0	30.7	67
2000	91.5	32.5	87
2001	88.0	43.2	69
2002	72.5	36.0	90
2003	75.5	26.4	70
2004			
2005	98.0	23.4	76
2006			
2007			
2008			
2009	90.0	26.7	72
2010			
2011			
2012			
2013	92.6	22.4	66
2014			
2015			
2016			
2017			
2018		18.4	81
2019			
2020			
2021			
2022			
2023			
n	12	13	13
Mean	84.5	29.4	76.2
St Dev	8.6	6.3	9.0
n	0	1	1
Mean	-	18.4	81.0
St Dev	-	-	-

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	28.5	5.6	23.8	1.9	1	Gravel	C4
2018	25.2	1.8	19.1	>1.5	0.5-2.0	Gravel	C4

**Reviewed Channel Type**

**C4**

**REMARKS**

This site was sampled continuously from 1995 to 2003, then periodically after 2003. Bank stability has ranged from 72% to 99%, with an increasing trend. Depth fines have ranged from 22% to 43%, with a decreasing trend. The Herd Creek allotment was closed in December 2017 – permittee waived grazing rights following establishment of the Jim McClure-Jerry Peak Wilderness in 2015.

**PAASASIKWANA NAOKWAIDE 1A**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Paasasikwana Naokwaide 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee Fork
<b>Site Location</b>	Site is located 0.2 miles upstream of the Forest Boundary. Access is via the Forest Road 40041, approximately 5.7 miles from Highway 75.		
<b>GPS Coordinates</b>	N 44.32107 (2017) N 44.32966 (2019)	W -114.47092 (2017) W -114.47147 (2019)	
<b>Site Comments</b>	Limited spawning habitat at 2017/2008 sampling location. 2019 sampling occurred 0.6 miles upstream of 2017 site, with more suitable spawning habitat. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	55.0 sq mi 35,215 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	214 cfs	<b>Mean Annual Flow</b> (Streamstats)	29.2 cfs
<b>5th-level Watershed</b>	Paasikwana Naokwaide / 1706020108				
<b>Mean Basin Elevation</b>	7870 ft	<b>Basin Aspect</b>	S	<b>Mean Basin Slope</b>	39%
<b>Length of Road</b>	47.7 mi	<b>Road Density</b>	0.87 mi/sq mi		
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	96.6%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	3.4%	
<b>% of Watershed in Active Allotment</b>	100%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2019)



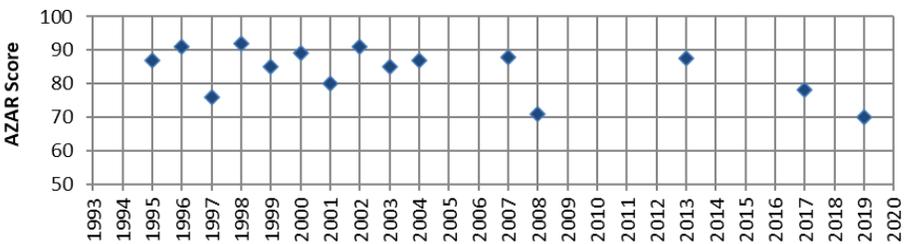
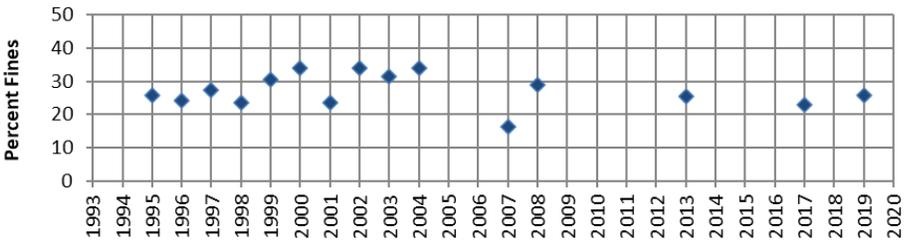
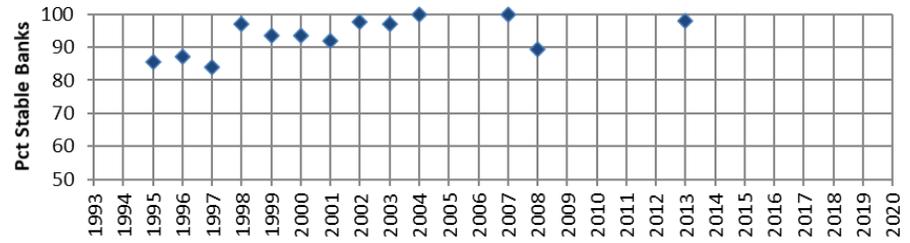
View Downstream (2019)

**PAASASIKWANA NOKWAIDE 1A**  
**2019**

**Last Year Sampled:**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	85.5	25.9	87
1996	87.0	24.2	91
1997	84.0	27.4	76
1998	97.0	23.5	92
1999	93.5	30.5	85
2000	93.5	34.0	89
2001	92.0	23.5	80
2002	97.5	33.9	91
2003	97.0	31.5	85
2004	100	33.9	87
2005			
2006			
2007	100	16.4	88
2008	89.5	29.0	71
2009			
2010			
2011			
2012			
2013	98.1	25.3	87.5
2014			
2015			
2016			
2017		23.0	78
2018			
2019		25.9	70.0
2020			
2021			
2022			
2023			
n	13	15	15
Mean	93.4	27.2	83.8
St Dev	5.5	5.0	7.2
n	0	2	2
Mean	-	24.5	74.0
St Dev	-	2.1	5.7



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1995	23	1.4	20.9	-	1	Cobble	B3c
1998	39	1.4	19.5	1.2	1	Cobble	B3
2017	22.4	1.6	16.0	1.3	2.0	Cobble	B3
2019	34.8	1.3	24.9	<1.2	2.0	Cobble	B3

**Reviewed Channel Type** **B3**

**10YR ALL**

**REMARKS**

Depth fines have ranged from 17% to 33%, with a slight decreasing trend. This site has a coarse armor layer with limited spawning habitat. Site was moved upstream 0.6 miles in 2019 to a location with more suitable spawning habitat, but same channel type. Site GIS location and Watershed edited 12/13/17 to reflect actual site location downstream of tributary – changed drainage area from 59.4 to 61.2 sq mi. Site GIS location and Watershed edited 1/16/2020 based on 2019 site location – drainage area changed from 61.2 sq mi to 55.0 sq mi.

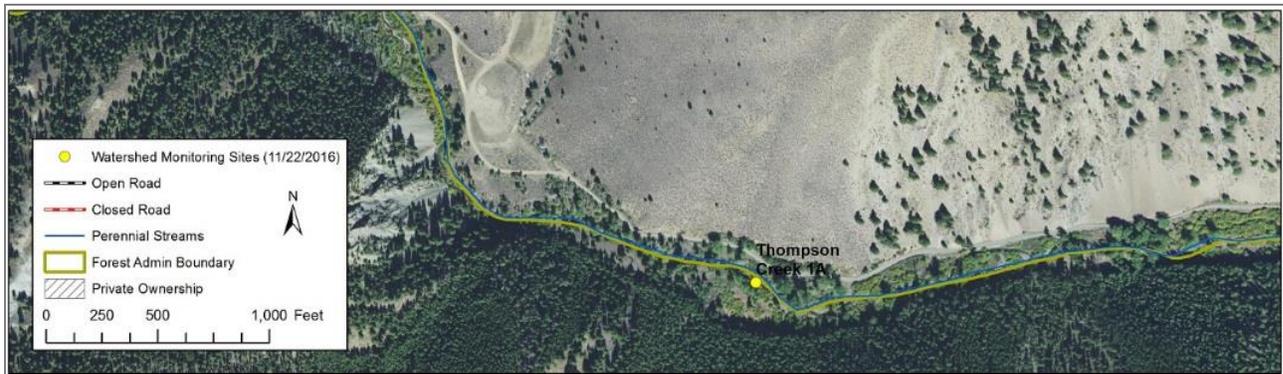
**THOMPSON CREEK 1A**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Thompson Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee Fork
<b>Site Location</b>	Site is located approx. 3.7 miles upstream of the confluence with the Salmon River, and just downstream of the confluence with Pat Hughes Creek. Access is via the Thompson Creek Road (FR040), approx. 5.9 miles from Highway 75.		
<b>GPS Coordinates</b>	N 44.28720 (2020)	W -114.54431 (2020)	
<b>Site Comments</b>	Site is downstream of the Thompson Creek Mine. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	25.2 sq mi 16,153 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	74 cfs	<b>Mean Annual Flow</b> (Streamstats)	19 cfs
<b>5th-level Watershed</b>	Slate Creek Salmon River / 1706020109				
<b>Mean Basin Elevation</b>	7732 ft	<b>Basin Aspect</b>	S	<b>Mean Basin Slope</b>	51%
<b>Length of Road</b>	11.1 mi	<b>Road Density</b>		0.44 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	96.6%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	1.6%	<b>Alluvium</b>	1.8%	
<b>% of Watershed in Active Allotment</b>	0.1%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2020)



View Downstream (2020)

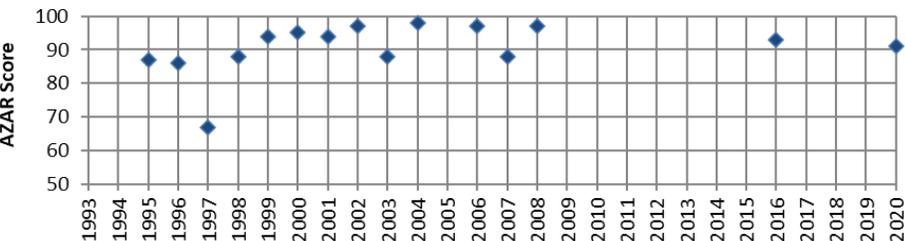
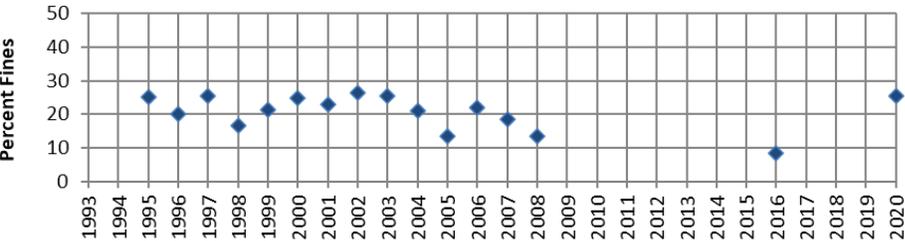
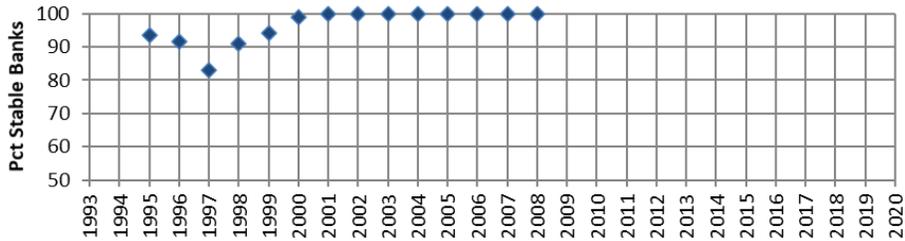
**THOMPSON CREEK 1A**

**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	93.5	25.1	87
1996	91.5	20.2	86
1997	83.0	25.4	67
1998	91.0	16.5	88
1999	94.0	21.2	94
2000	99.0	24.7	95
2001	100	22.9	94
2002	100	26.5	97
2003	100	25.4	88
2004	100	21.1	98
2005	100	13.4	
2006	100	22.1	97
2007	100	18.6	88
2008	100	13.4	97
2009			
2010			
2011			
2012			
2013			
2014			
2015			
2016		8.4	93
2017			
2018			
2019			
2020		25.4	91
2021			
n	14	16	15
Mean	96.6	20.6	90.7
St Dev	5.2	5.3	7.7
n	0	2	2
Mean	-	16.9	92.0
St Dev	-	12.0	1.4

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	25.8	3.9	24.6	1.5	1	Cobble	C3
2016	14.9	2.0	23.7	1.5	2-3	Cobble	C3b
2020	20	1.6	14.3	<1.2	3.0	Gravel	C3b

**Reviewed Channel Type** **C3b**

**REMARKS**

This site was sampled continuously from 1995 to 200, and 2016. Bank stability has been very high, with the most recent 8 years at 100%. Depth fines have ranged from 8% to 27%, with a decreasing trend.

**TRAIL CREEK USR 1R**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Trail Creek USR 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee Fork
<b>Site Location</b>	Site is located approx. 250 ft upstream of the confluence with Paasikwana Naokwaide. Access is via Forest Road 40041, 10.5 miles from Hwy 75. From the end of the road by the gate, the site is a 20 minute hike up a trail along Paasikwana Naokwaide.		
<b>GPS Coordinates</b>	N 44.39084 (2020)	W -114.49211 (2020)	
<b>Site Comments</b>	Discontinue sampling at this site after 2020.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	5.7 sq mi 3,628 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	27 cfs	<b>Mean Annual Flow</b> (Streamstats)	1.8 cfs
<b>5th-level Watershed</b>	Paasikwana Naokwaide / 1706020108				
<b>Mean Basin Elevation</b>	8214 ft	<b>Basin Aspect</b>	W	<b>Mean Basin Slope</b>	25%
<b>Length of Road</b>	6.7 mi	<b>Road Density</b>		1.18 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	100%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	100%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2020)**



**View Downstream (2020)**

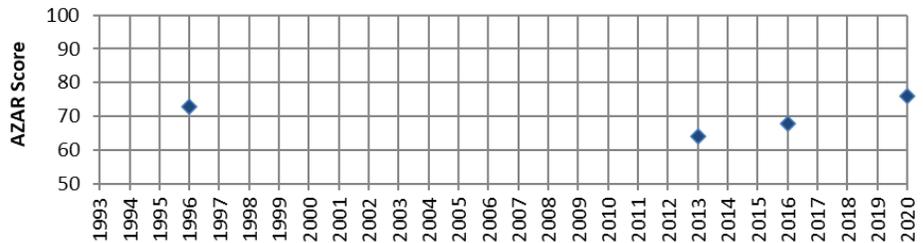
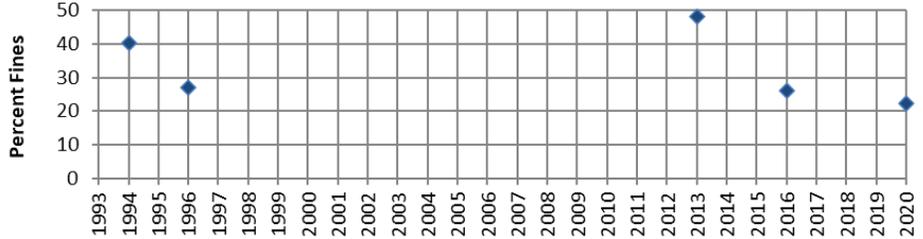
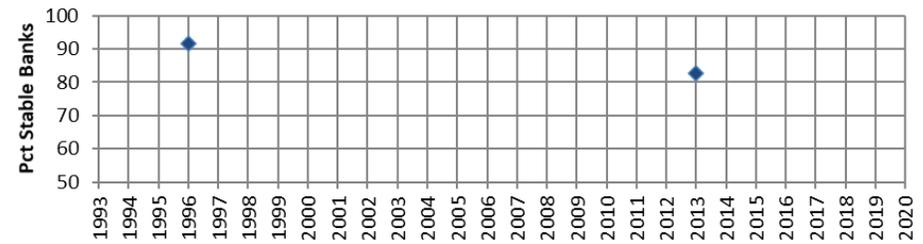
**TRAIL CREEK USR 1R**

**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994		40.2	
1995			
1996	91.5	27.0	73
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013	82.8	48.3	64
2014			
2015			
2016		26.1	68
2017			
2018			
2019			
2020		22.2	76
2021			
2022			
2023			
n	2	5	4
Mean	87.2	32.8	70.3
St Dev	6.2	11.0	5.3
n	0	2	2
Mean	-	24.2	72.0
St Dev	-	2.8	5.7

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2016	11.7	1.3	23.4	1.1	1	Gravel	C4
2020	9.6	1.5	6.1	<1.2	5.0	Gravel	C4b

**Reviewed Channel Type** C4b

**REMARKS**

Limited sampling has occurred at this site. Bank stability has been greater than 80%. Depth fines have ranged from 26% to 48%. The cause of the high fines in not known. This is a small channel with site-specific conditions heavily influenced by riparian vegetation. The suitability of spawning habitat for sampling should be evaluated.

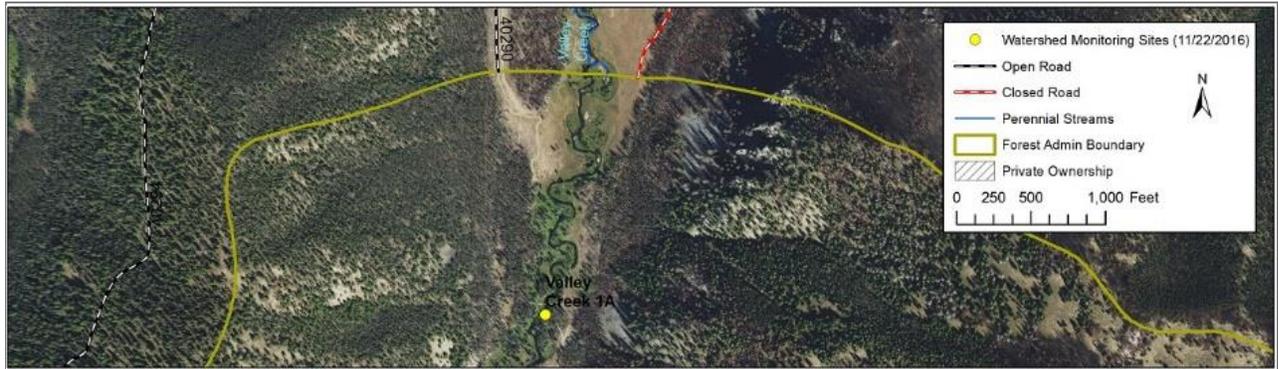
**VALLEY CREEK 1A**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Valley Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Salmon	<b>Ranger District</b>	Challis-Yankee Fork Middle Fork
<b>Site Location</b>	Site is located on Valley Creek approx. 10 miles NW of Stanley. Access is via the Valley Creek Rd (FR029), 2.4 miles from Hwy 21, at the East Valley Cr Trailhead.		
<b>GPS Coordinates</b>	N 44.34289 (2019)	N -115.05570 (2019)	
<b>Site Comments</b>	Site is about 1900 feet downstream of SCNF boundary. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	24.3 sq mi 15,529 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	123 cfs	<b>Mean Annual Flow</b> (Streamstats)	29.9 cfs
<b>5th-level Watershed</b>	Valley Creek / 1706020101				
<b>Mean Basin Elevation</b>	7706 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	33%
<b>Length of Road</b>	14.0 mi	<b>Road Density</b>		0.58 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	88.0%	<b>Quartzite</b>		0.0%
	<b>Volcanic</b>	3.7%	<b>Mixed</b>		0.0%
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>		8.4%
<b>% of Watershed in Active Allotment</b>	1.5%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2019)**



**View Downstream (2019)**

**VALLEY CREEK 1A**

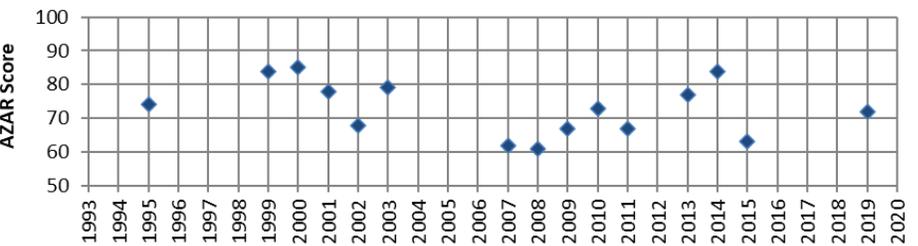
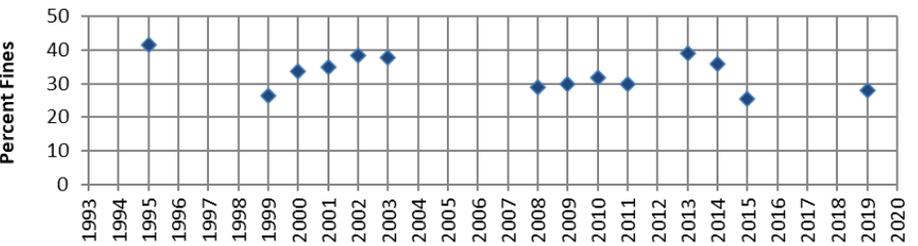
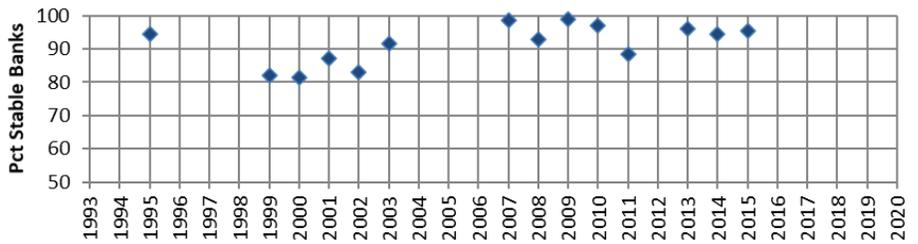
**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	94.5	41.4	74
1996			
1997			
1998			
1999	82.0	26.4	84
2000	81.5	33.8	85
2001	87.0	35.0	78
2002	83.0	38.5	68
2003	91.5	37.8	79
2004			
2005			
2006			
2007	98.5		62
2008	93.0	28.9	61
2009	99.0	29.8	67
2010	97.0	31.7	73
2011	88.5	29.9	67
2012			
2013	96.0	39.0	77
2014	94.5	35.7	84
2015	95.5	25.6	63
2016			
2017			
2018			
2019		27.9	72.0
2020			
2021			
2022			
2023			
n	14	14	15
Mean	91.5	33.0	72.9
St Dev	6.1	5.1	8.1
n	2	3	3
Mean	95.0	29.7	73.0
St Dev	0.7	5.3	10.5

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	27.5	4.2	27.5	1.5	1.5	Gravel	C4
2019	26.2	3.0	19.4	1.5	1.0	Gravel	C4

<b>Reviewed Channel Type</b>	<b>C4</b>
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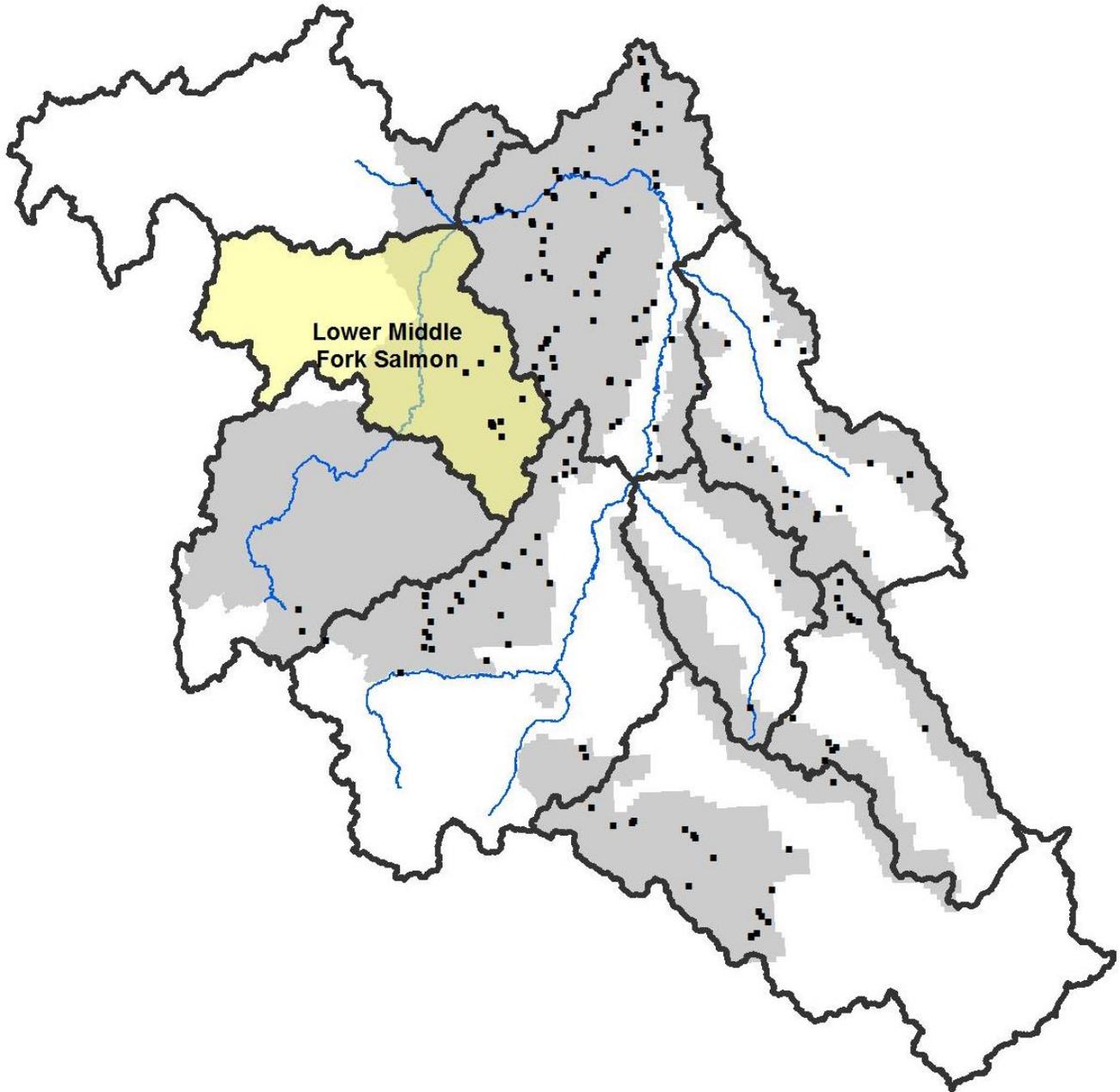
**REMARKS**

This site has been sampled nearly continuously since 1999. Bank stability has been consistently greater than 80%, with an increasing trend. Depth fines have ranged from 26% to 42%, with a slight decreasing trend. Fines showed an increase in 2013, following the 2012 Halstead Fire, followed by a decrease in subsequent years – however, these values were all similar to baseline values. Consider an alternate sampling location on NFS lands if suitable spawning habitat exists.



## LOWER MIDDLE FORK SALMON SUB-BASIN

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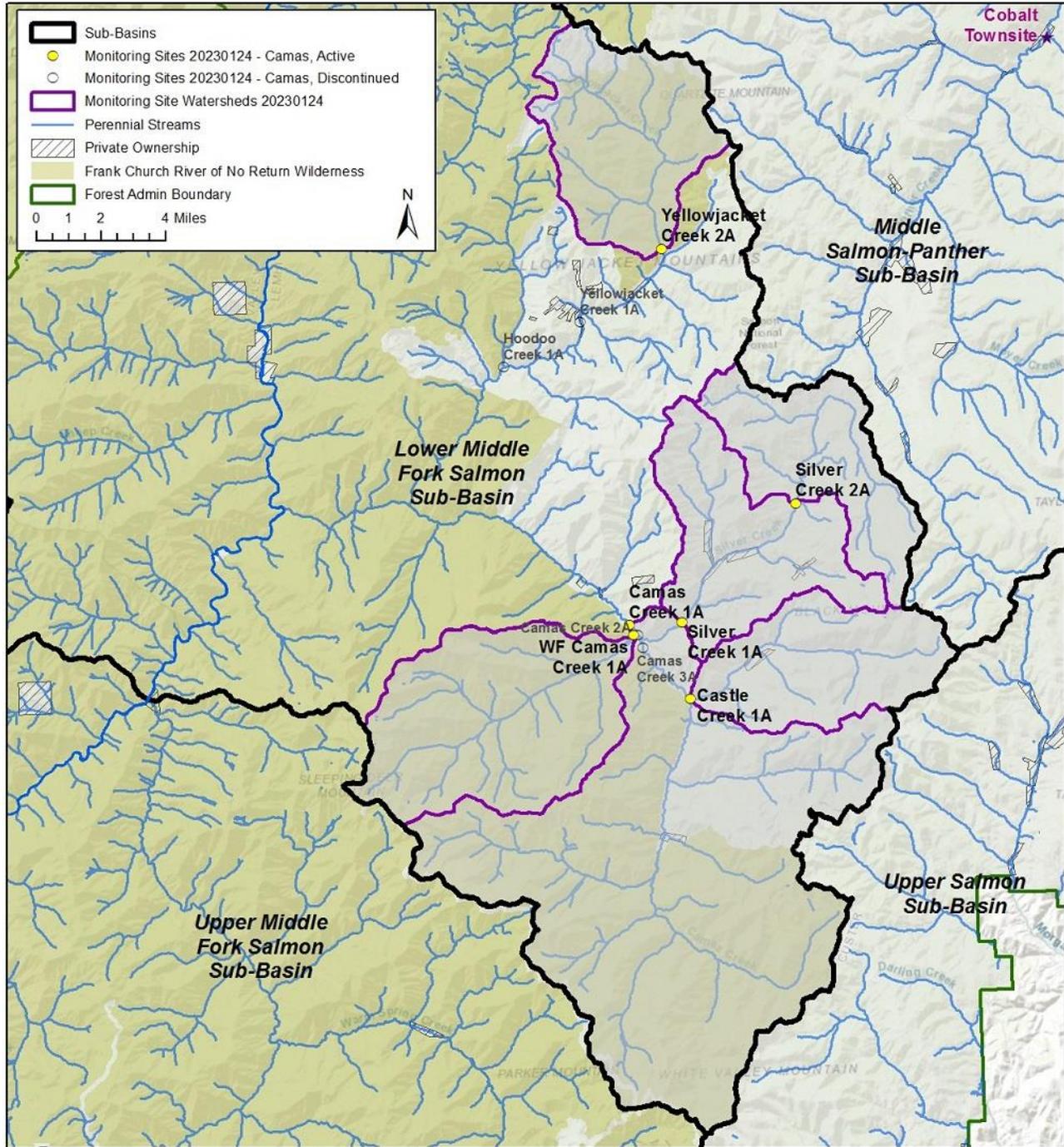


<b>Total acres within sub-basin</b>	<b>880,270</b>
<b>Percent of sub-basin within SCNF</b>	<b>57%</b>
<b>Active Monitoring Sites</b>	<b>6</b>
<b>Discontinued Monitoring Sites</b>	<b>4</b>
<b>Sites Monitored in 2023</b>	<b>4</b>



## Camas Creek Watershed

A total of 6 active monitoring sites are located in the Camas Creek watershed. A portion of the Camas Creek, WF Camas Creek, and Yellowjacket Creek site watersheds are within the Frank Church River of No Return Wilderness.



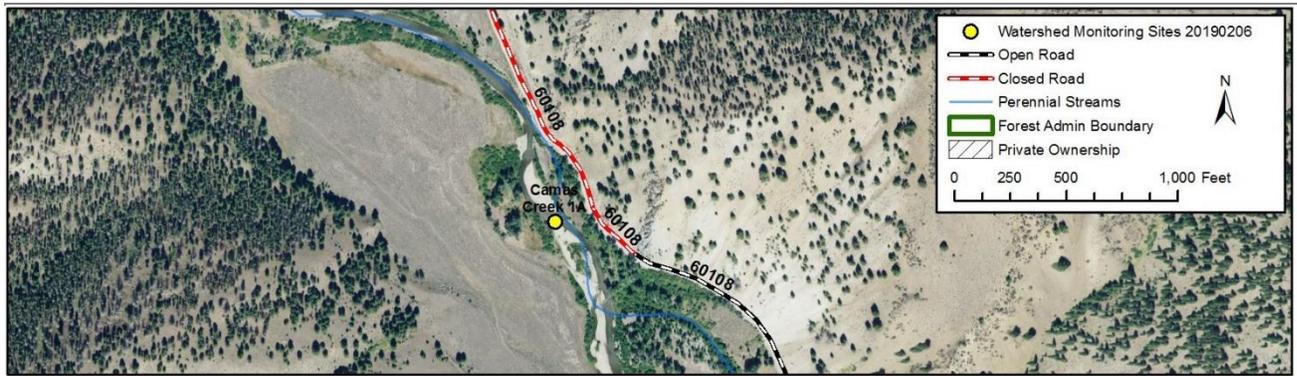
**CAMAS CREEK 1A**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Camas Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Lower Middle Fork Salmon	<b>Ranger District</b>	Middle Fork Salmon-Cobalt
<b>Site Location</b>	Site is located at Meyers Cove, 0.2 miles downstream of the WF Camas Creek confluence. Access is from the gate at the end of the Silver Creek Rd (FR108).		
<b>GPS Coordinates</b>	N 44.83538 (2023)	N -114.50769 (2023)	
<b>Site Comments</b>	54% of watershed in Wilderness. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	225.5 sq mi 144,314 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	894 cfs	<b>Mean Annual Flow</b> (Streamstats)	334 cfs
<b>5th-level Watershed</b>	Lower Camas Creek / 1706020603, Upper Camas Creek / 1706020601				
<b>Mean Basin Elevation</b>	7530 ft	<b>Basin Aspect</b>	N	<b>Mean Basin Slope</b>	48%
<b>Length of Road</b>	109.2 mi	<b>Road Density</b>	0.48 mi/sq mi		
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	0.5%	
	<b>Volcanic</b>	95.6%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	3.8%	
<b>% of Watershed in Active Allotment</b>	50.1%	<b>% of Watershed Burned (2018-2022)</b>		4.2%	

**SITE PHOTOS**



View Upstream (2023)



View Downstream (2023)

**CAMAS CREEK 1A**

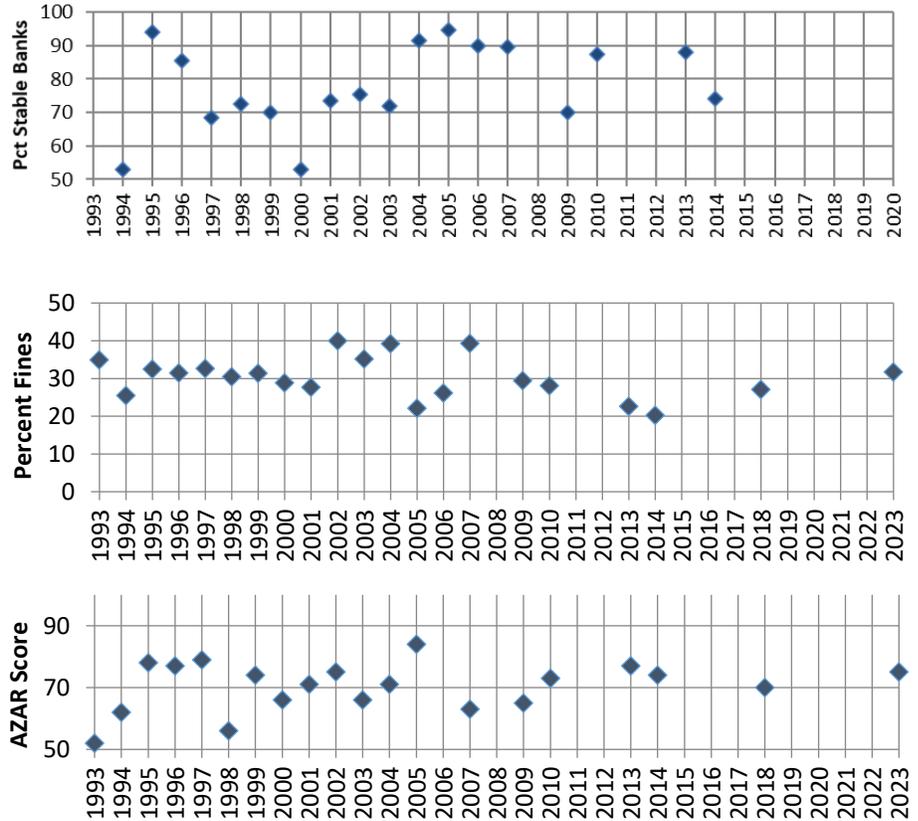
**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		34.9	52
1994	53.0	25.5	62
1995	94.0	32.5	78
1996	85.5	31.5	77
1997	68.5	32.7	79
1998	72.5	30.5	56
1999	70.0	31.4	74
2000	53.0	28.9	66
2001	73.5	27.7	71
2002	75.5	40.0	75
2003	72.0	35.2	66
2004	91.5	39.2	71
2005	94.5	22.1	84
2006	90.0	26.2	
2007	89.5	39.3	63
2008			
2009	70.0	29.5	65
2010	87.5	28.1	73
2011			
2012			
2013	88.1	22.6	77
2014	74.0	20.3	74
2015			
2016			
2017			
2018		27.1	70
2019			
2020			
2021			
2022			
2023		31.7	75
n	18	21	20
Mean	77.9	30.3	70.4
St Dev	12.9	5.5	8.0
n	1	3	3
Mean	74.0	26.4	73.0
St Dev	-	5.8	2.6

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1995	75	5.3	62.5	-	<2	vc gravel	C4
2018	87.1	4.2	51.2	<1.2	1.5	Gravel	C4

**Reviewed Channel Type** **C4**

**REMARKS**

This site has been sampled nearly continuously since 1993. Bank stability has ranged from 52% to 95%, with an increasing trend. Depth fines have ranged from 20% to 40%, with a slight decreasing trend. Horses are frequently used in this area. 2023 field notes indicate hoof shear present on banks. Salmon carcasses found downstream of site.

**CASTLE CREEK 1A**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Castle Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Lower Middle Fork Salmon	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located 600 feet upstream of the mouth of Castle Creek at Camas Creek. Access is via the WF Camas Creek Rd (FR259) to the Camas Creek Rd (FR258). Site is 2.6 miles from the Silver Cr Rd (FR108), at the 2nd ford over Camas Cr.		
<b>GPS Coordinates</b>	N 44.80141 (2023)	W -114.47071 (2023)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	24.2 sq mi 15,468 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	98 cfs	<b>Mean Annual Flow</b> (Streamstats)	61 cfs
<b>5th-level Watershed</b>	Upper Camas Creek / 1706020601				
<b>Mean Basin Elevation</b>	7755 ft	<b>Basin Aspect</b>	W	<b>Mean Basin Slope</b>	47%
<b>Length of Road</b>	5.0 mi	<b>Road Density</b>		0.21 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>		0.0%
	<b>Volcanic</b>	94.8%	<b>Mixed</b>		0.0%
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>		5.2%
<b>% of Watershed in Active Allotment</b>	55.2%	<b>% of Watershed Burned (2018-2022)</b>		11.1%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

**CASTLE CREEK 1A**

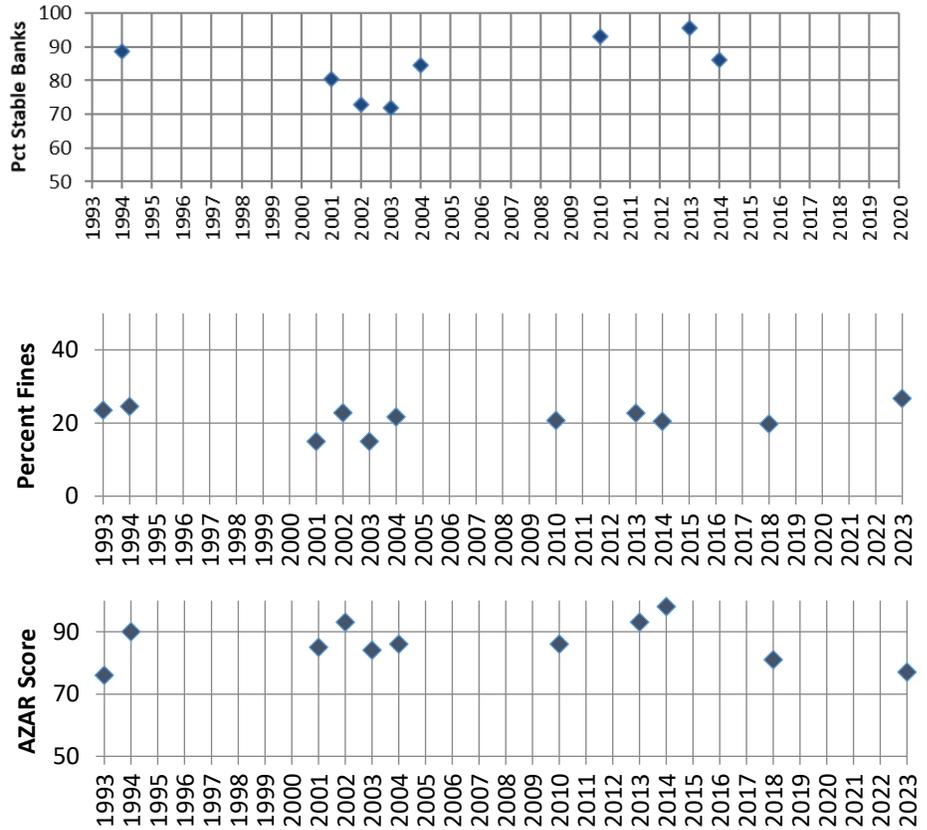
**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		23.5	76
1994	88.5	24.5	90
1995			
1996			
1997			
1998			
1999			
2000			
2001	80.5	14.9	85
2002	73.0	22.8	93
2003	72.0	14.9	84
2004	84.5	21.6	86
2005			
2006			
2007			
2008			
2009			
2010	93.0	20.7	86
2011			
2012			
2013	95.5	22.7	93
2014	86.0	20.4	98
2015			
2016			
2017			
2018		19.7	81
2019			
2020			
2021			
2022			
2023		26.7	77
n	8	11	11
Mean	84.1	21.1	86.3
St Dev	8.6	3.7	6.8
n	1	3	3
Mean	86.0	22.3	85.3
St Dev	-	3.9	11.2

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2001	34	-	14.9	-	3	Crs gravel	-
2018	17.0	4.5	15.2	<1.2	0.5-2.0	Gravel	C4

**Reviewed Channel Type** **C4**

**REMARKS**

This site has been monitored periodically since 1993. Bank stability has shown an increasing trend, and depth fines have been relatively steady around 20%. 2023 field notes indicate bank erosion and blown out log jams upstream of core site which may be a possible source of the increased fines.

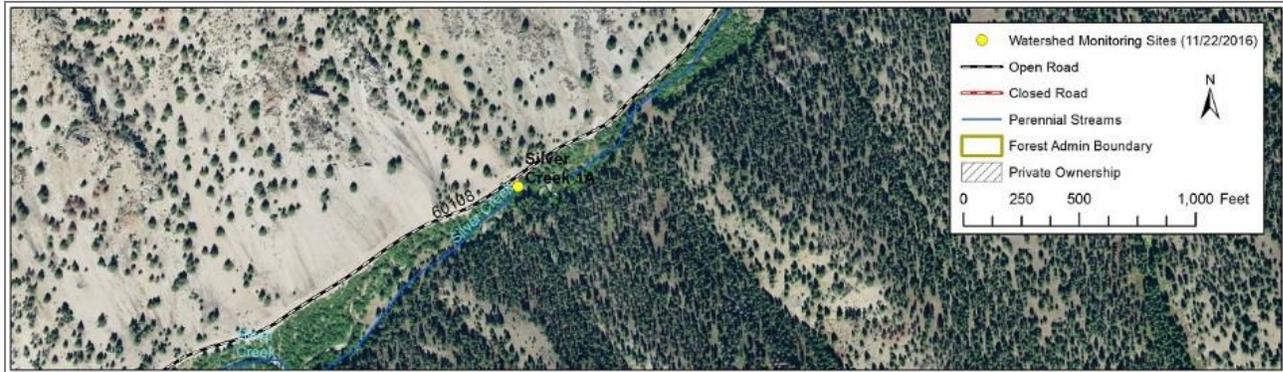
**SILVER CREEK 1A**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Silver Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Lower Middle Fork Salmon	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located east of Meyers Cove along the Silver Creek Road (FR108), 0.8 miles south of Lost Spring Campground.		
<b>GPS Coordinates</b>	N 44. 83587 (2023)	W -114.47428 (2023)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	50.6 sq mi 32,375 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	248 cfs	<b>Mean Annual Flow</b> (Streamstats)	91.3 cfs
<b>5th-level Watershed</b>	Lower Camas Creek / 1706020603				
<b>Mean Basin Elevation</b>	7063 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	40%
<b>Length of Road</b>	81.4 mi	<b>Road Density</b>		1.61 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.2%	<b>Quartzite</b>	2.1%	
	<b>Volcanic</b>	96.1%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	1.7%	
<b>% of Watershed in Active Allotment</b>	98.3%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2023)



View Downstream (2023)

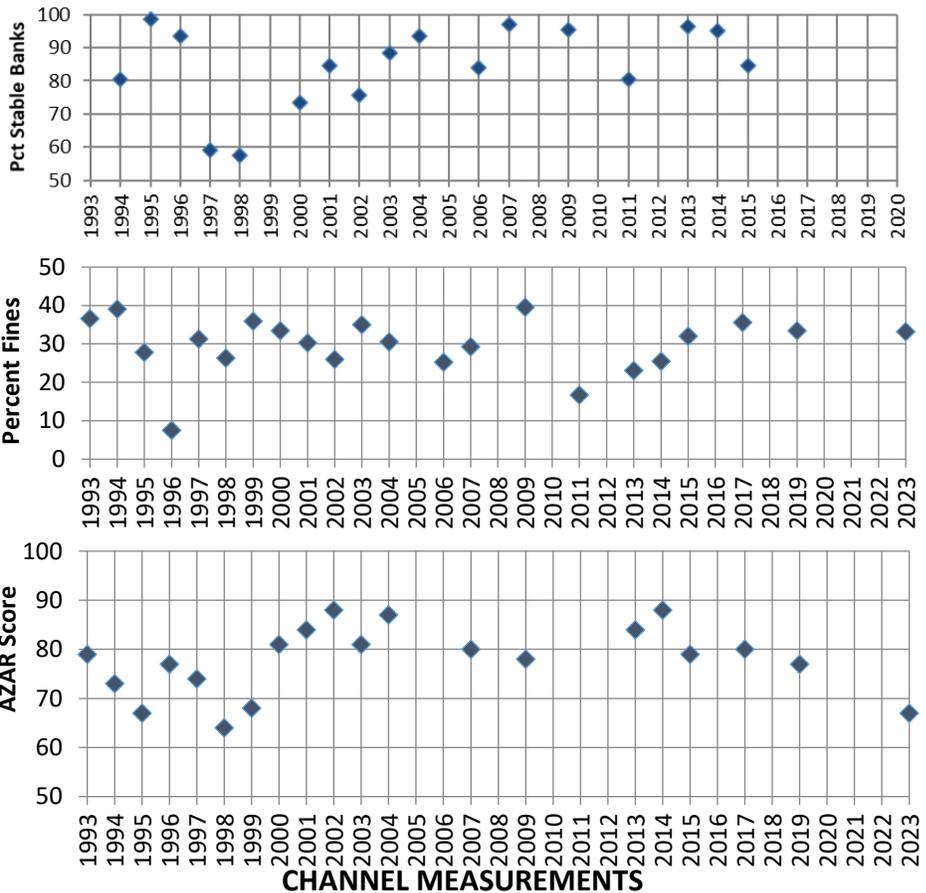
**SILVER CREEK 1A**

**Last Year Sampled: 2023**

SITE DATA

Year	% Stable Banks	Percent Fines	AZAR Score
1993		36.6	79
1994	80.5	39.1	73
1995	98.5	27.8	67
1996	93.5	7.5	77
1997	59.0	31.3	74
1998	57.5	26.3	64
1999	39.0	35.9	68
2000	73.5	33.4	81
2001	84.5	30.3	84
2002	75.5	26.0	88
2003	88.5	35.0	81
2004	93.5	30.5	87
2005			
2006	84.0	25.2	
2007	97.0	29.3	80
2008			
2009	95.5	39.6	78
2010			
2011	80.5	16.7	
2012			
2013	96.5	23.1	84
2014	95.0	25.5	88
2015	84.5	32.0	79
2016			
2017		35.6	80
2018			
2019		33.4	77
2020			
2021			
2022			
2023		33.2	67
n	18	21	19
Mean	82.0	29.5	78
St Dev	16.2	7.6	7.3
n	2.0	5.0	5.0
Mean	89.8	31.9	78.2
St Dev	7.42	3.83	7.53

10YR ALL



Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	15.7	8.4	19.6	1.6	1.8	Gravel	C4
2017	20.5	3.5	19.7	1.5	1.5	Gravel	C4
2019	18.6	4.5	36.8	1.3	2.0	Gravel	C4

**Reviewed Channel Type** **C4**

REMARKS

This site has been sampled nearly continuously since 1993. Bank stability ranged from 39% to 98%, with an increasing trend. Depth fines ranged from 8% to 40%, with many values exceeding 30%. Note: Pre-2000 samples were taken at a site about 0.6 miles upstream of present site, although site location is not always recorded for older samples. The 2014 GIS sampling location was incorrect (at pre-2000 site location). Sample site GIS location, watershed, and basin data were corrected 2/2016. Several Beaver complexes along Silver creek. The closest beaver activity to this site was roughly 1 miles upstream.

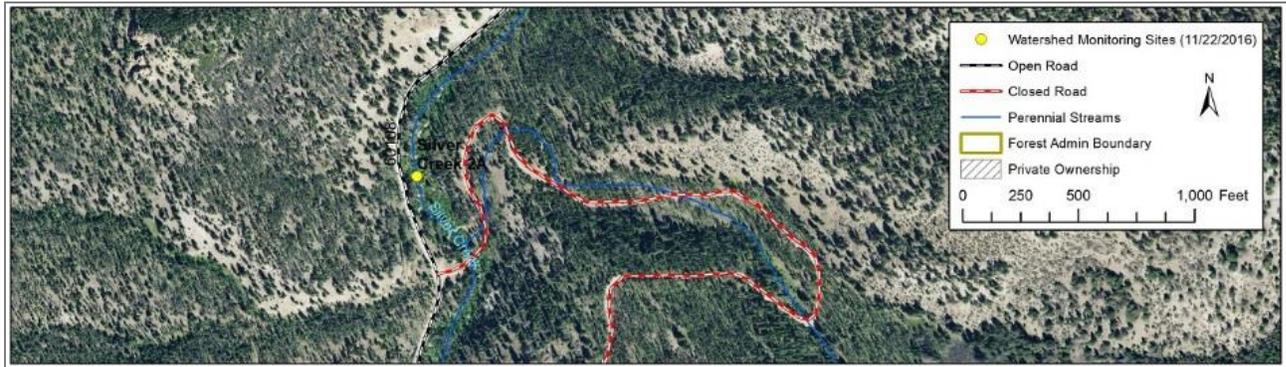
**SILVER CREEK 2A**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Silver Creek 2A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Lower Middle Fork Salmon	<b>Ranger District</b>	Salmon-Cobalt
<b>Site Location</b>	Site is located along the Silver Creek Road (FR108), approximately 5.2 miles SW of Rabbits Foot Summit.		
<b>GPS Coordinates</b>	N 44.88793 (2023)	W -114.40104 (2023)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	22.7 sq mi 14,500 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	145 cfs	<b>Mean Annual Flow</b> (Streamstats)	32.1 cfs
<b>5th-level Watershed</b>	Lower Camas Creek / 1706020603				
<b>Mean Basin Elevation</b>	7241 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	34%
<b>Length of Road</b>	54.6 mi	<b>Road Density</b>		2.41 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	100.0%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	99.9%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

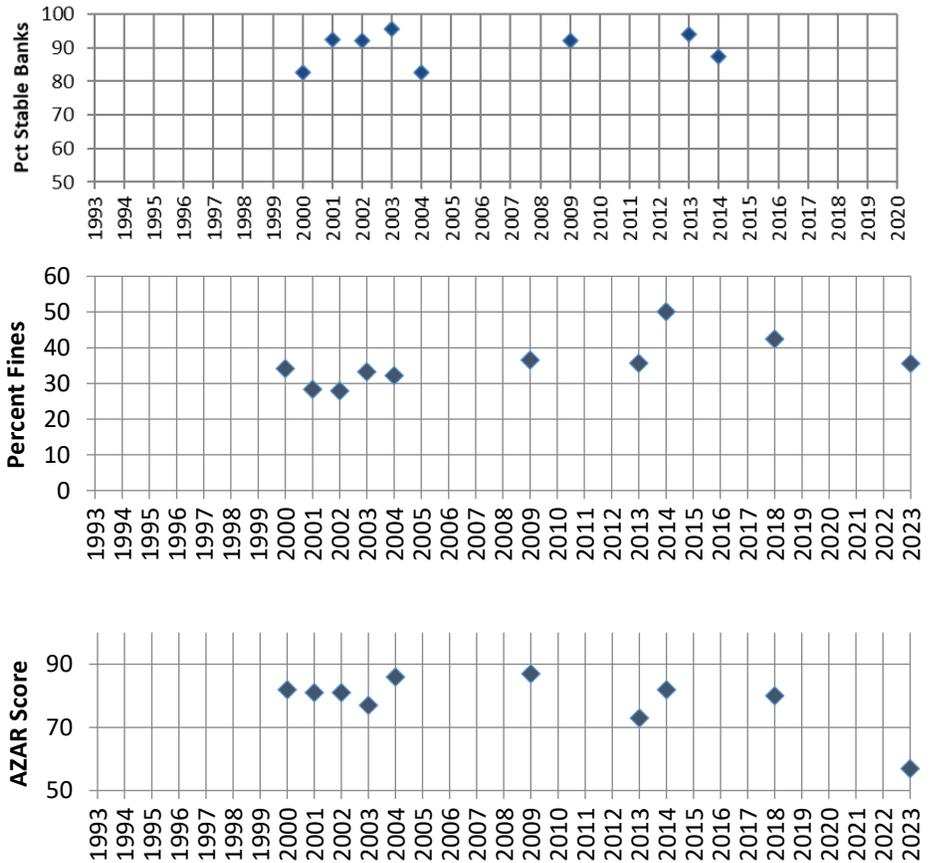
**SILVER CREEK 2A**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000	82.5	34.2	82
2001	92.5	28.4	81
2002	92.0	27.9	81
2003	95.5	33.3	77
2004	82.5	32.2	86
2005			
2006			
2007			
2008			
2009	92.0	36.6	87
2010			
2011			
2012			
2013	94.0	35.7	73
2014	87.5	50.1	82
2015			
2016			
2017			
2018		42.5	80
2019			
2020			
2021			
2022			
2023		35.6	57
n	8	10	10
Mean	89.8	35.7	78.6
St Dev	5.1	6.6	8.6
n	1	3	3
Mean	87.5	42.7	73.0
St Dev	-	7.3	13.9

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2000	-	Low	-	-	-	-	C4
2018	9.8	2.6	10.9	1.2-1.5	0.5	Gravel	C4

<b>Reviewed Channel Type</b>	<b>C4</b>
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**REMARKS**

This site was sampled continuously from 2000 to 2004, then periodically since 2004. Bank stability has been consistently greater than 80%. Depth fines ranged from 28% to 50%, mostly greater than 30% with recent years showing a decreasing trend. This is a low gradient depositional channel, deposition of fines in pools.

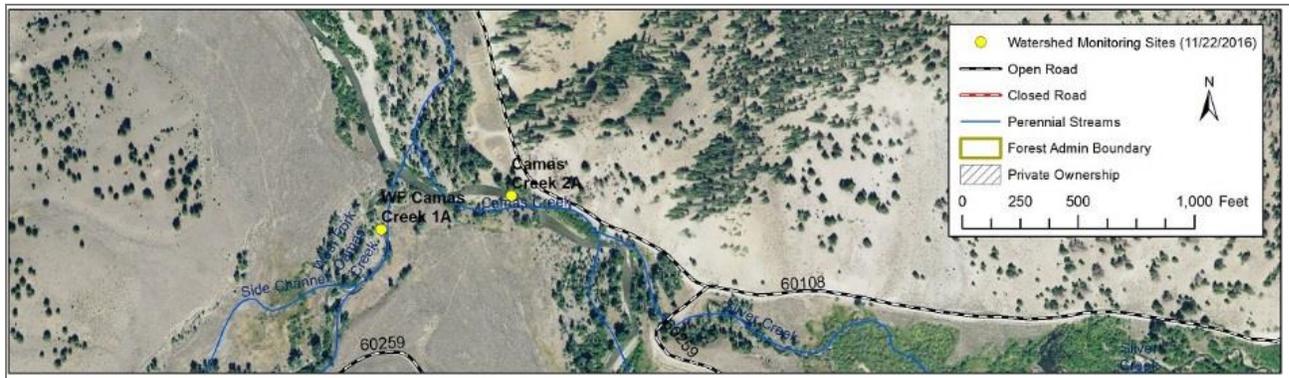
**WEST FORK CAMAS CREEK 1A**

**Sample Year: 2018**

**SITE INFO**

<b>Site Name</b>	WF Camas Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Lower Middle Fork Salmon	<b>Ranger District</b>	Middle Fork/Salmon-Cobalt
<b>Site Location</b>	Site is located approximately 300 feet upstream of the mouth of WF Camas Creek at Camas Creek. Site is accessed via the Everett Decora Campground off the Silver Creek Road (FR108) at Meyers Cove.		
<b>GPS Coordinates</b>	N 44.83055 (2018)	W -114.50523 (2018)	
<b>Site Comments</b>	99% of watershed in Wilderness. 10-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	39.5 sq mi 25,302 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	136 cfs	<b>Mean Annual Flow</b> (Streamstats)	105 cfs
<b>5th-level Watershed</b>	Lower Camas Creek / 1706020603, Upper Camas Creek / 1706020601				
<b>Mean Basin Elevation</b>	7509 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	55%
<b>Length of Road</b>	1.7 mi		<b>Road Density</b>		0.04 mi/sq mi
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	96.9%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	3.1%	
<b>% of Watershed in Active Allotment</b>	40.0%	<b>% of Watershed Burned (2018-2022)</b>		0.1%	

**SITE PHOTOS**



View Upstream (2018)



View Downstream (2018)

**WEST FORK CAMAS CREEK 1A**

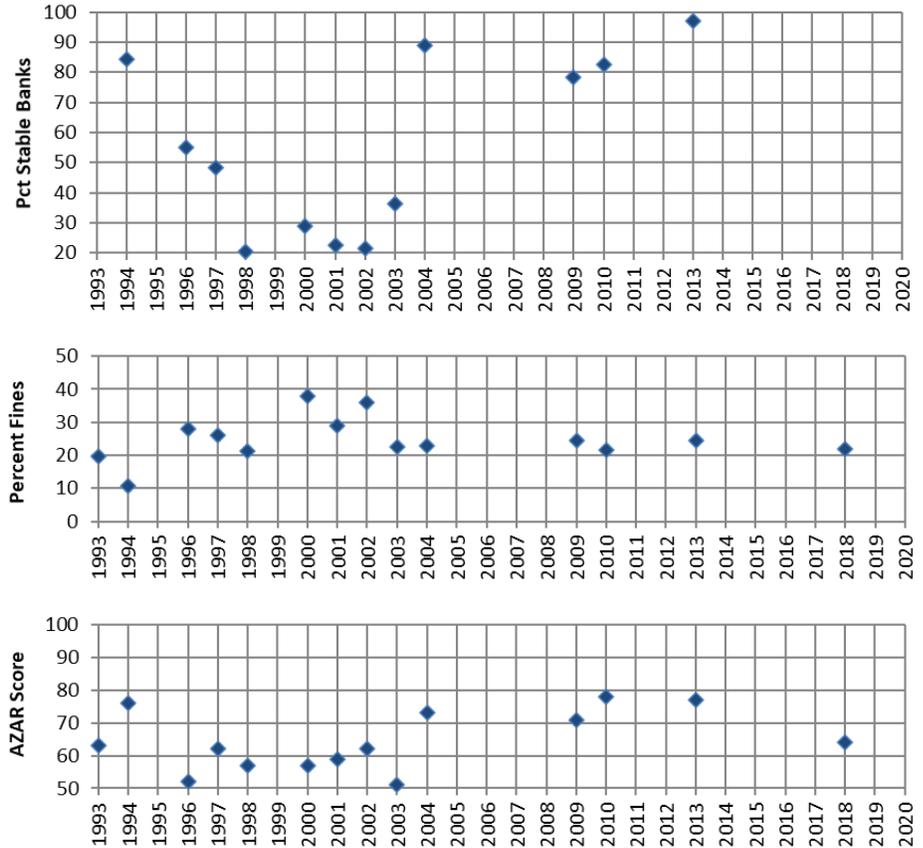
**Sample Year: 2018**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		19.8	63
1994	84.5	10.8	76
1995			
1996	55.0	27.9	52
1997	48.5	26.2	62
1998	20.5	21.4	57
1999			
2000	29.0	37.9	57
2001	22.5	28.8	59
2002	21.5	36.1	62
2003	36.5	22.7	51
2004	89.0	22.8	73
2005			
2006			
2007			
2008			
2009	78.5	24.3	71
2010	82.5	21.6	78
2011			
2012			
2013	97.0	24.5	77
2014			
2015			
2016			
2017			
2018		21.9	64
2019			
2020			
2021			
2022			
2023			
n	12	14	14
Mean	55.4	24.8	64.4
St Dev	29.4	6.7	9.1
n	0	1	1
Mean	-	21.9	64.0
St Dev	-	-	-

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	26	3	21.7	1.4	1	Gravel	C4
2018	27.0	4.1	25.5	1.2-1.5	0.5-2.0	Gravel	C4

**Reviewed Channel Type**

**C4**

**REMARKS**

This site was sampled nearly continuously from 1993 to 2004, then periodically since 2004. Bank stability ranged from 20% to 98%, with an increasing trend. Depth fines ranged from 11% to 38%, with recent values around 25%. This could be a good “reference site” for large non-forested C4 channels in volcanics. 40% of watershed is within an allotment, but 99% of watershed is in wilderness.

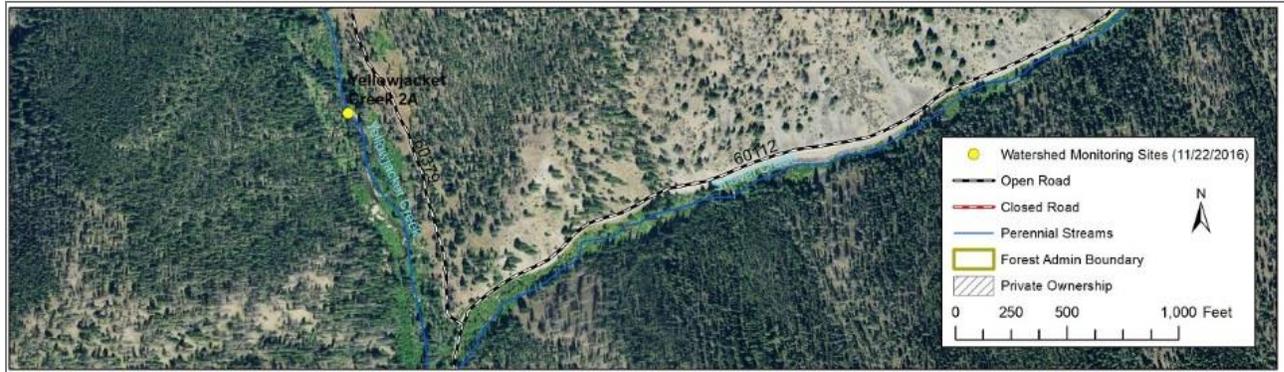
**YELLOWJACKET CREEK 2A**

**Last Year Sampled: 2017**

**SITE INFO**

<b>Site Name</b>	Yellowjacket Creek 2A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Lower Middle Fork Salmon	<b>Ranger District</b>	North Fork/Salmon-Cobalt
<b>Site Location</b>	Site is located along the Yellowjacket Trailhead Road (FR379), approximately 0.2 miles off the Yellowjacket Road (FR112).		
<b>GPS Coordinates</b>	N 45.00345 (2017)	W -114.48003 (2017)	
<b>Site Comments</b>	82% of watershed in Wilderness. 10-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	28.2 sq mi 18,019 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	165 cfs	<b>Mean Annual Flow</b> (Streamstats)	34 cfs
<b>5th-level Watershed</b>	Yellowjacket Creek / 1706020602				
<b>Mean Basin Elevation</b>	7746 ft	<b>Basin Aspect</b>	S	<b>Mean Basin Slope</b>	40%
<b>Length of Road</b>	15.8 mi	<b>Road Density</b>		0.56 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	34.8%	<b>Quartzite</b>	59.2%	
	<b>Volcanic</b>	0%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	6.1%	
<b>% of Watershed in Active Allotment</b>	0.1%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2017)**



**View Downstream (2017)**

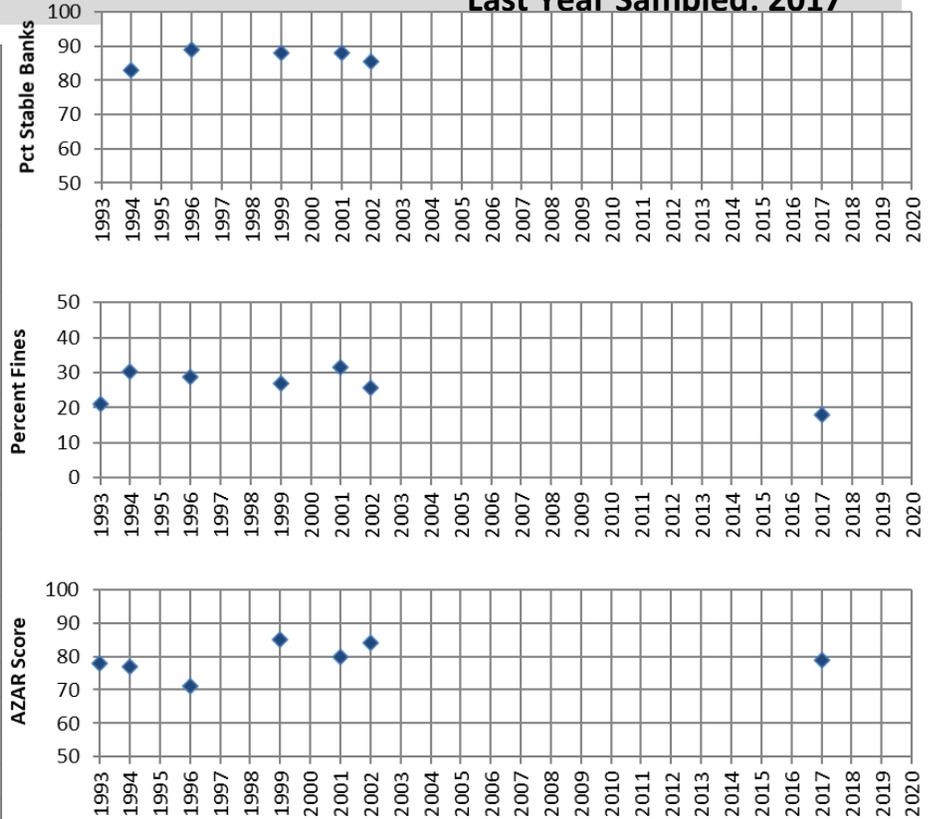
**YELLOWJACKET CREEK 2A**

**Last Year Sampled: 2017**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		20.9	78
1994	83.0	30.2	77
1995			
1996	89.0	28.8	71
1997			
1998			
1999	88.0	27.0	85
2000			
2001	88.0	31.6	80
2002	85.5	25.8	84
2003			
2004			
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015			
2016			
2017		17.9	79
2018			
2019			
2020			
2021			
2022			
2023			
n	5	7	7
Mean	86.7	26.0	79.1
St Dev	2.4	5.0	4.7
n		1	1
Mean	-	17.9	79.0
St Dev	-	-	-

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2017	20.9	4.6	13.9	1.05	2.0	Cobble	C3
Reviewed Channel Type							C3

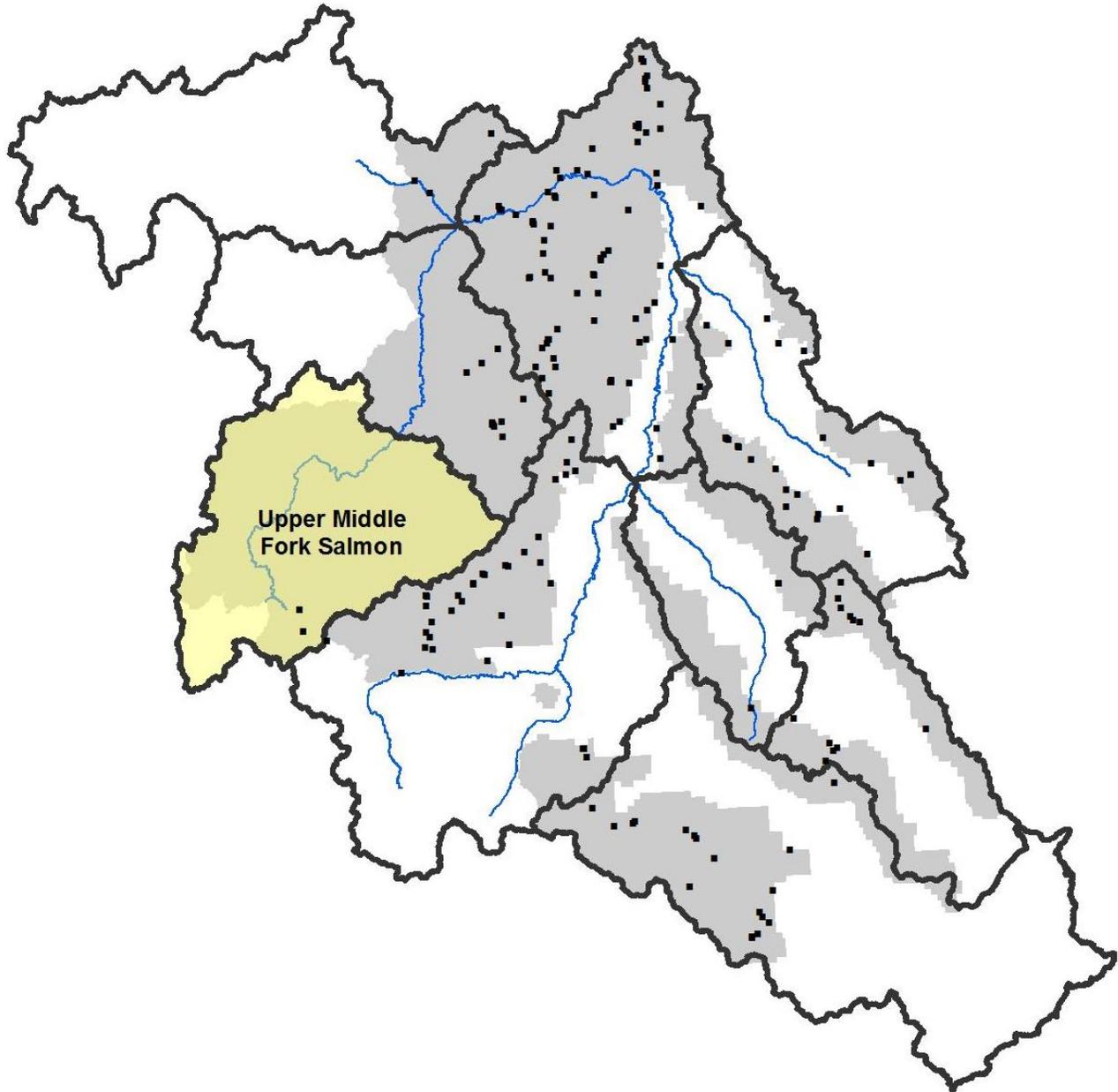
**REMARKS**

This site was sampled frequently from 1993 to 2002. Bank stability was consistently greater than 80%, and depth fines ranged from 20% to 31%. The Yellowjacket 1A and 2A sites are not both needed to monitor impacts in the watershed. Yellowjacket Creek 1A was discontinued in favor of the 2A site.



## UPPER MIDDLE FORK SALMON SUB-BASIN

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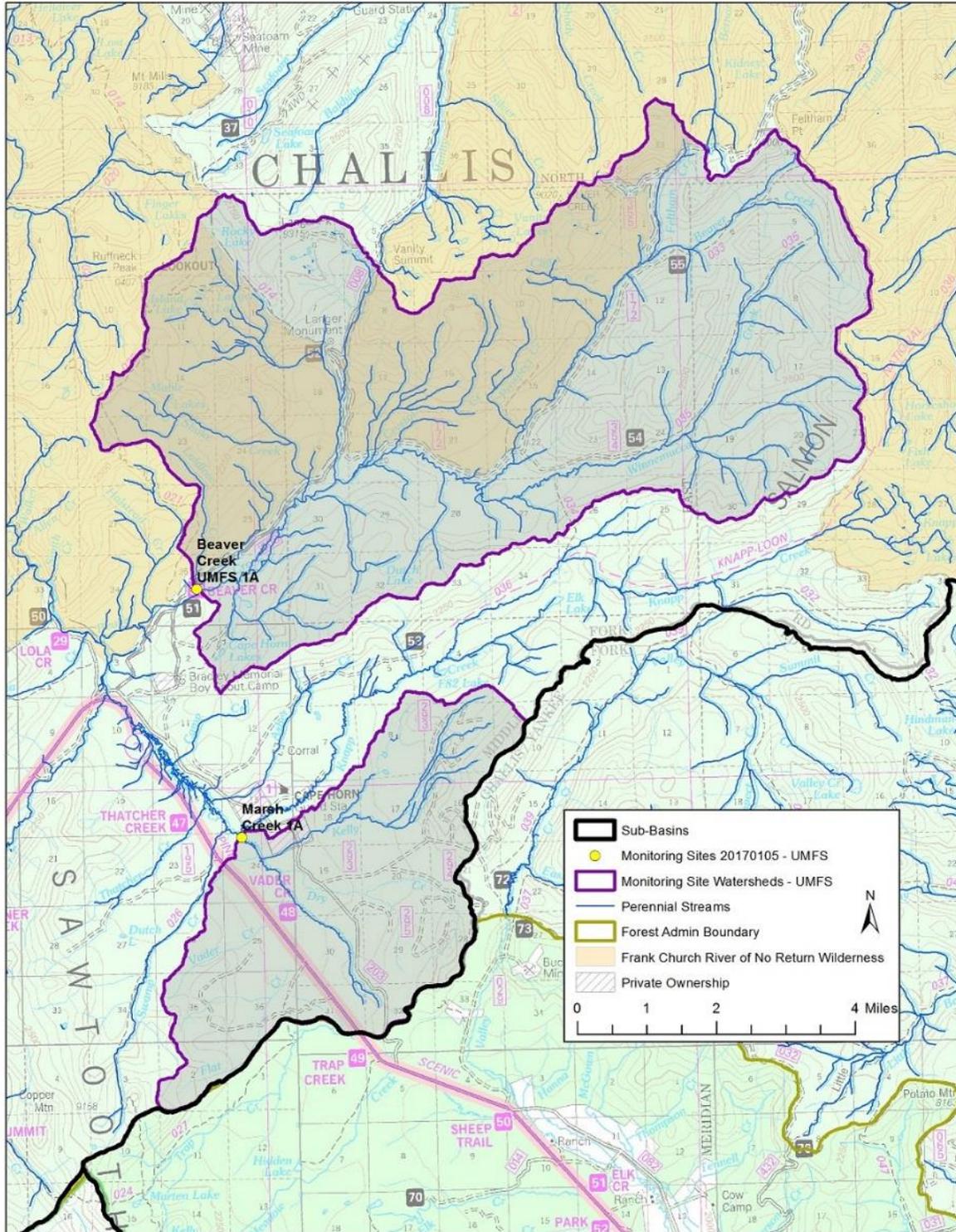


<b>Total acres within sub-basin</b>	<b>960,920</b>
<b>Percent of sub-basin within SCNF</b>	<b>87%</b>
<b>Active Monitoring Sites</b>	<b>2</b>
<b>Discontinued Monitoring Sites</b>	<b>0</b>
<b>Sites Monitored in 2023</b>	<b>2</b>



## Marsh Creek Watershed

Two active monitoring sites are located in the Marsh Creek Watershed near Cape Horn, northwest of Stanley, Idaho.



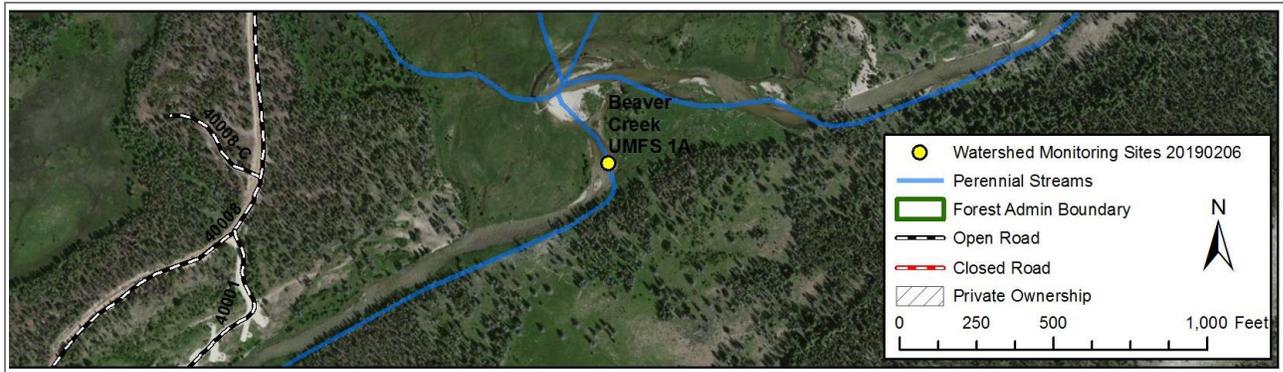
**BEAVER CREEK UMFS 1A**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Beaver Creek UMFS 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Middle Fork Salmon	<b>Ranger District</b>	Middle Fork
<b>Site Location</b>	Site is located near Cape Horn about 2 miles upstream of the confluence with Marsh Creek. Site is accessed via the Beaver Creek Campground off the Beaver Creek Road (FR008).		
<b>GPS Coordinates</b>	N 44.41617 (2023)	W -115.14151 (2023)	
<b>Site Comments</b>	39% of watershed in Wilderness. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	51.1 sq mi 32,700 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	360 cfs	<b>Mean Annual Flow</b> (Streamstats)	84.4 cfs
<b>5th-level Watershed</b>	Marsh Creek / 1706020503				
<b>Mean Basin Elevation</b>	7678 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	31%
<b>Length of Road</b>	21.2 mi	<b>Road Density</b>		0.42 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	91.7%	<b>Quartzite</b>		0%
	<b>Volcanic</b>	0%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		8.3%
<b>% of Watershed in Active Allotment</b>	0%	<b>% of Watershed Burned (2018-2022)</b>		0.1%	

**SITE PHOTOS**



**View Upstream (2018)**



**View Downstream (2018)**

**BEAVER CREEK UMFS 1A**

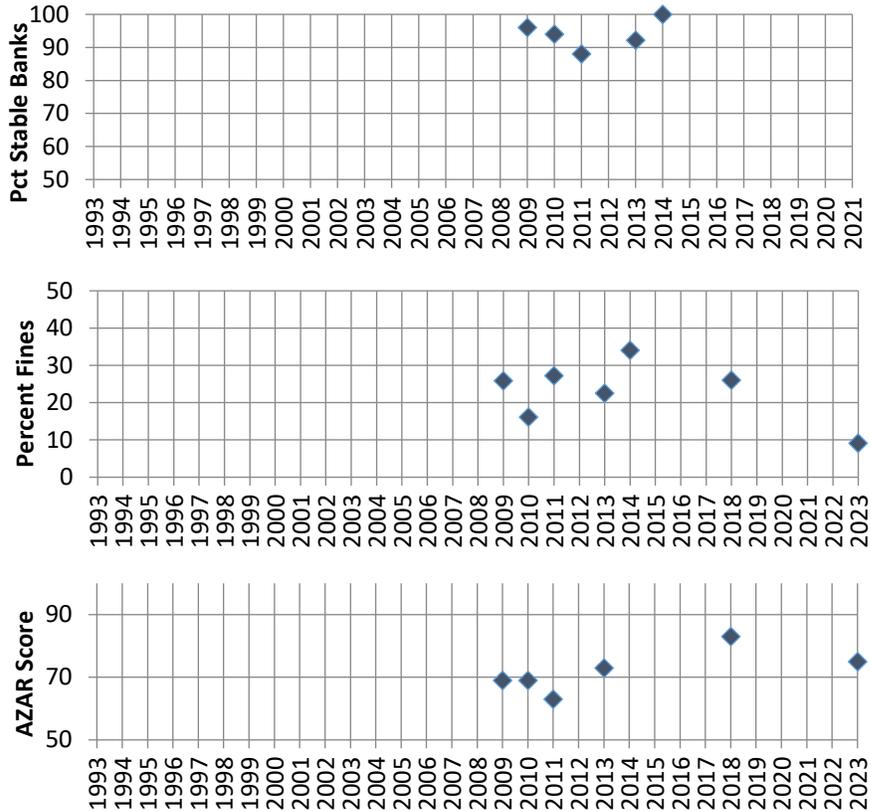
**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009	96.0	25.8	69
2010	94.0	16.1	69
2011	88.0	27.2	63
2012			
2013	92.2	22.5	73
2014	100	34.0	
2015			
2016			
2017			
2018		26.0	83
2019			
2020			
2021			
2022			
2023		9.1	75
n	5	7	6
Mean	94.0	23.0	72.0
St Dev	4.5	8.1	6.8
n	1	3	2
Mean	100	23.0	79.0
St Dev	-	12.7	5.7

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2018	47.0	17.0	34.8	<1.2	0.5-2.0	Gravel	C4
2023							
<b>Reviewed Channel Type</b>							<b>C4</b>

**REMARKS**

Site established in 2009. This site is characterized by high bank stability and relatively consistent depth fines averaging about 25%. This site is a low gradient, depositional reach. The 2014 site appears to be in a different location based on photos (no GPS coordinates available), possibly a side channel or different creek – data from 2014 are not directly comparable. 2023 notes indicate a large log jam complex just upstream and higher energy flow on river right where core samples were collected may account for low observed fines.

**MARSH CREEK 1A**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Marsh Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Upper Middle Fork Salmon	<b>Ranger District</b>	Middle Fork
<b>Site Location</b>	Site is located near the Cape Horn Guard Station, just upstream of the confluence with Knapp Creek. Site is accessed via the Marsh Creek Cutoff Road (FR343), 0.4 miles from the Marsh Creek Road (FR203).		
<b>GPS Coordinates</b>	N 44.36479 (2023)	W -115.13070 (2023)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	15.5 sq mi 9,942 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	96 cfs	<b>Mean Annual Flow</b> (Streamstats)	17.7 cfs
<b>5th-level Watershed</b>	Marsh Creek / 1706020503				
<b>Mean Basin Elevation</b>	6928 ft	<b>Basin Aspect</b>	NW	<b>Mean Basin Slope</b>	16%
<b>Length of Road</b>	36.1 mi	<b>Road Density</b>		2.32 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	79.6%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	0%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	20.4%	
<b>% of Watershed in Active Allotment</b>	5.3%	<b>% of Watershed Burned (2018-2022)</b>		22.1%	

**SITE PHOTOS**



View Upstream (2023)



View Downstream (2023)

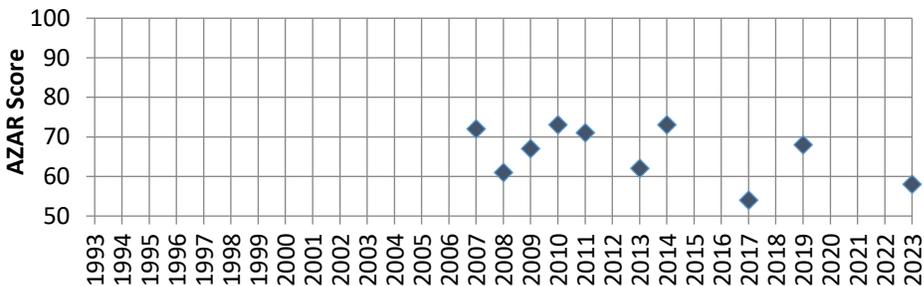
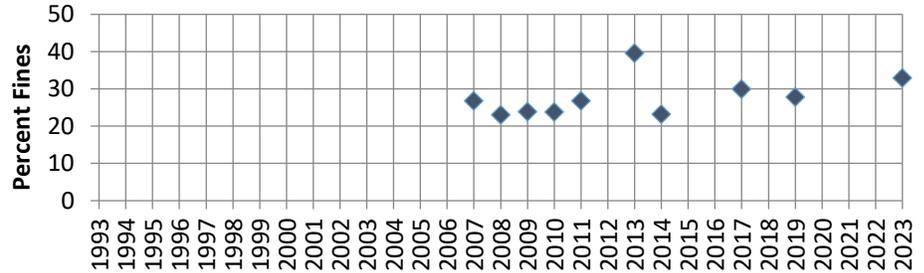
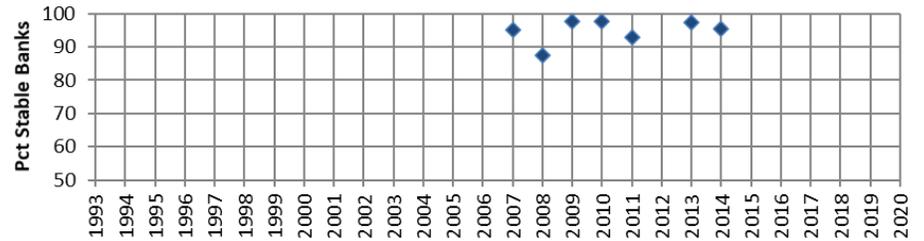
**MARSH CREEK 1A**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007	95.0	26.8	72
2008	87.5	23.0	61
2009	97.5	23.9	67
2010	97.5	23.8	73
2011	93.0	26.8	71
2012			
2013	97.4	39.6	62
2014	95.5	23.2	73
2015			
2016			
2017		29.9	54
2018			
2019		27.8	68
2020			
2021			
2022			
2023		32.9	58.0
n	7	10	10
Mean	94.8	27.8	65.9
St Dev	3.6	5.2	6.8
n	1	4	4
Mean	95.5	28.5	63.3
St Dev	-	4.1	8.8

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2017	23.6	3.2	25.7	1.3	1.0	Gravel	C4
2019	22	6.8	19.1	1.7	1.0	Gravel	C4
<b>Reviewed Channel Type</b>							<b>C4</b>

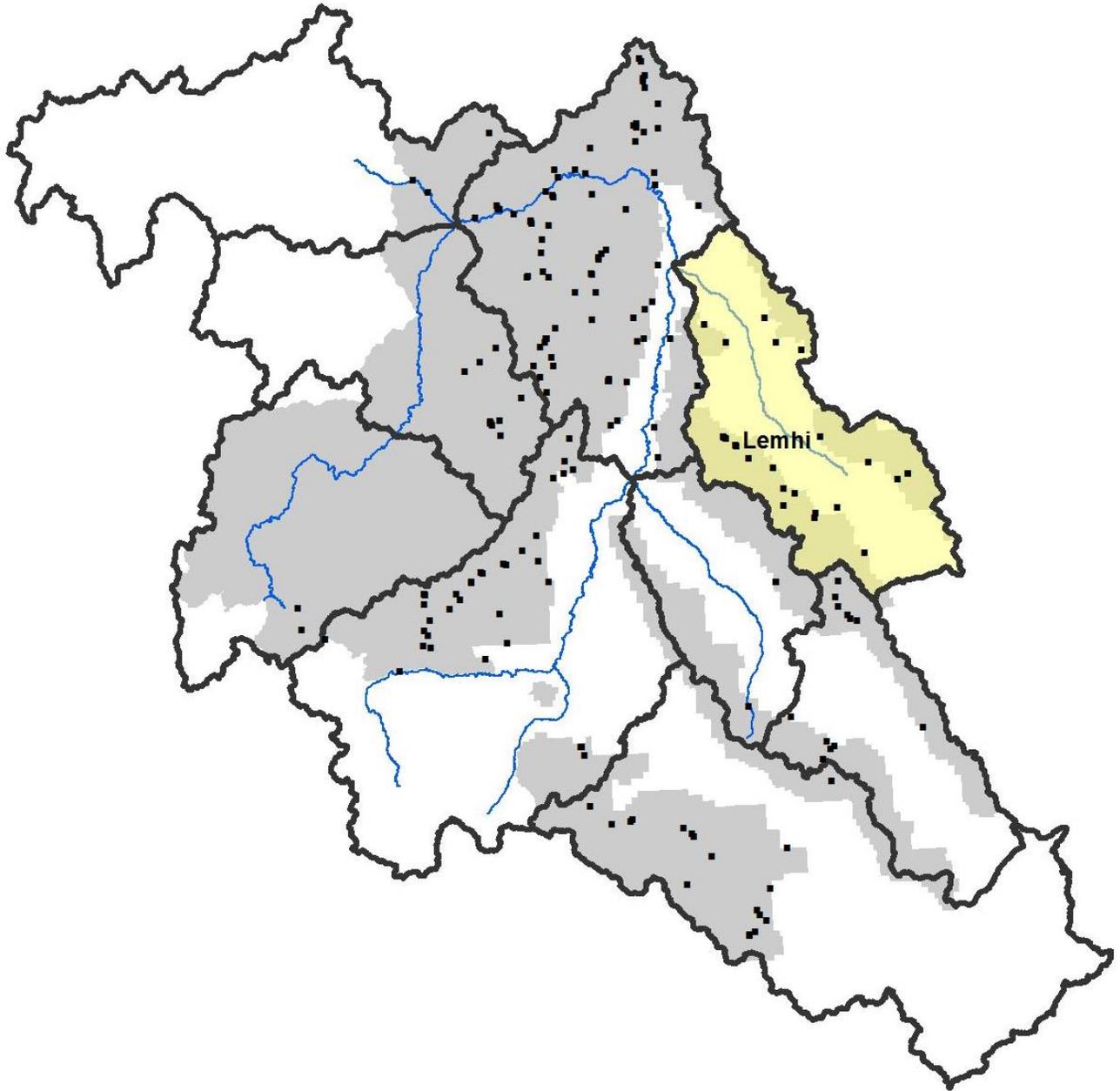
**REMARKS**

This site was established in 2007. Bank stability has been high, consistently greater than 85%. Depth fines have been generally between 20% and 32%, with one exception at 40% in 2013. The increase in fines seen in 2013 may be the result of post-fire runoff and sedimentation from the 2012 Halstead Fire, but conditions returned to baseline in 2014. 2023 indicate increased erosion on outside bends and large pools developing in the area.



## LEMHI SUB-BASIN

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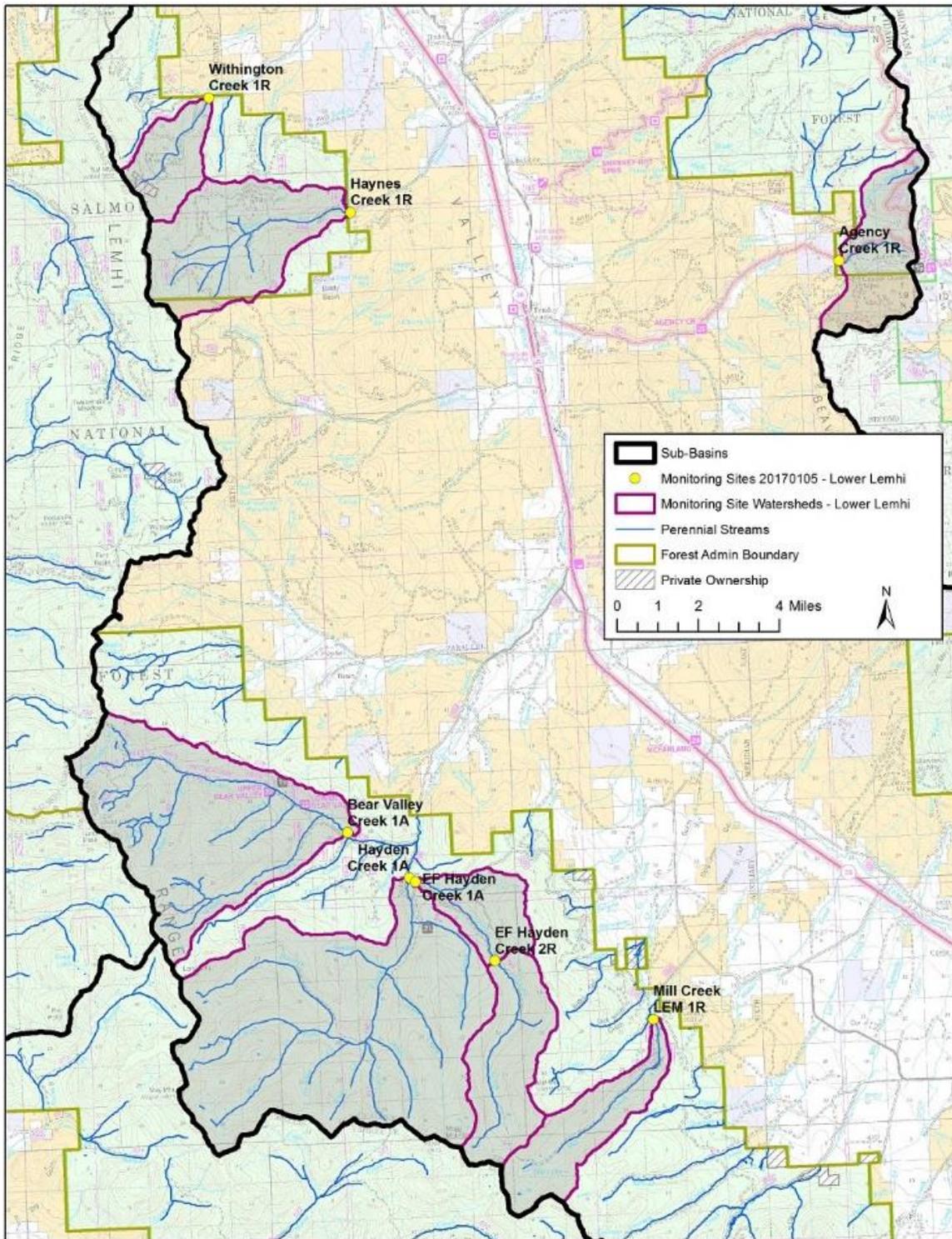


<b>Total acres within sub-basin</b>	<b>808,205</b>
<b>Percent of sub-basin within SCNF</b>	<b>40%</b>
<b>Active Monitoring Sites</b>	<b>20</b>
<b>Discontinued Monitoring Sites</b>	<b>6</b>
<b>Sites Monitored in 2023</b>	<b>5</b>



## Lower Lemhi River Watershed

A total of 8 active monitoring sites are located in the lower portion of the Lemhi River watershed.



**AGENCY CREEK 1R**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Agency Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is located 8.6 miles up Agency Creek Road from Lemhi Road. The site is approximately 80 feet upstream of the fence and cattleguard.		
<b>GPS Coordinates</b>	N 44.97335 (2020)	W -113.48434 (2020)	
<b>Site Comments</b>	5-year sampling frequency		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	6.6 sq mi 4,200 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	12 cfs	<b>Mean Annual Flow</b> (Streamstats)	3.8 cfs
<b>5th-level Watershed</b>	Middle Lemhi River/1706020407				
<b>Mean Basin Elevation</b>	7310 ft	<b>Basin Aspect</b>	W	<b>Mean Basin Slope</b>	40%
<b>Length of Road</b>	16.7 mi	<b>Road Density</b>		2.55 mi/mi <sup>2</sup>	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	98.9%	
	<b>Volcanic</b>	1.1%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	60.0%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2020)



View Downstream (2020)

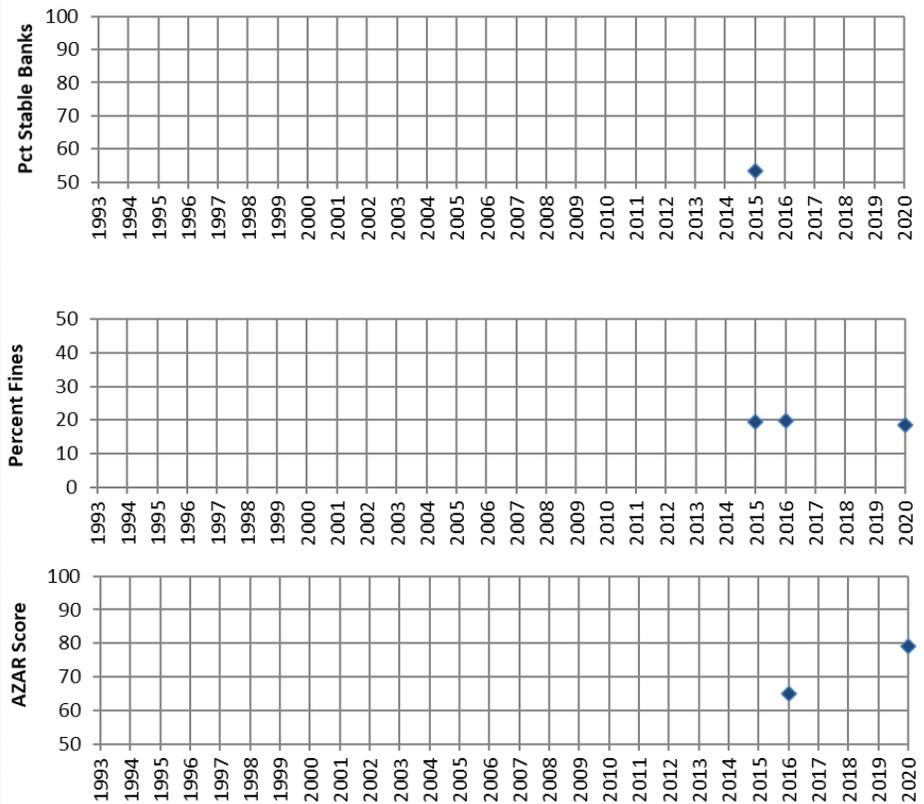
**AGENCY CREEK 1R**

**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015	53.5	19.6	43
2016		19.8	65
2017			
2018			
2019			
2020		18.6	79
2021			
2022			
2023			
<b>n</b>	1	3	3
<b>Mean</b>	53.5	19.3	62.3
<b>St Dev</b>	-	0.6	18.1
<b>n</b>	1	3	3
<b>Mean</b>	53.5	19.3	62.3
<b>St Dev</b>	-	0.6	18.1

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Channel gradient (%)	Sinuosity	Substrate	Channel Type
2015	8.7	1.5	29.0	3	1.2	Gravel	B4
2016	6.8	1.4	9.3	2	1.2	Gravel	B4
2020	7.5	1.8	7.4	1.2-1.5	1	Gravel	G4

**Reviewed Channel Type** **G4**

**REMARKS**

This site was established in 2015, and 2 years of baseline data were collected. Depth fines were low (20%), and bank stability was low (54%).

**BEAR VALLEY CREEK 1A**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Bear Valley Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is located approximately 2 miles upstream of the mouth at Hayden Creek and 0.15 miles upstream of the confluence with Kadletz Creek. Site is accessed via the Bear Valley Creek Road (FR009).		
<b>GPS Coordinates</b>	N 44.77724 (2023)	W -113.74321 (2023)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	21.4 sq mi 13,704 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	77 cfs	<b>Mean Annual Flow</b> (Streamstats)	14.2 cfs
<b>5th-level Watershed</b>	Hayden Creek / 1706020406				
<b>Mean Basin Elevation</b>	8604 ft	<b>Basin Aspect</b>	E	<b>Mean Basin Slope</b>	46%
<b>Length of Road</b>	10.6 mi	<b>Road Density</b>	0.49 mi/sq mi		
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	84.9%	
	<b>Volcanic</b>	5.3%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	9.8%	
<b>% of Watershed in Active Allotment</b>	40.8%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

**BEAR VALLEY CREEK 1A**

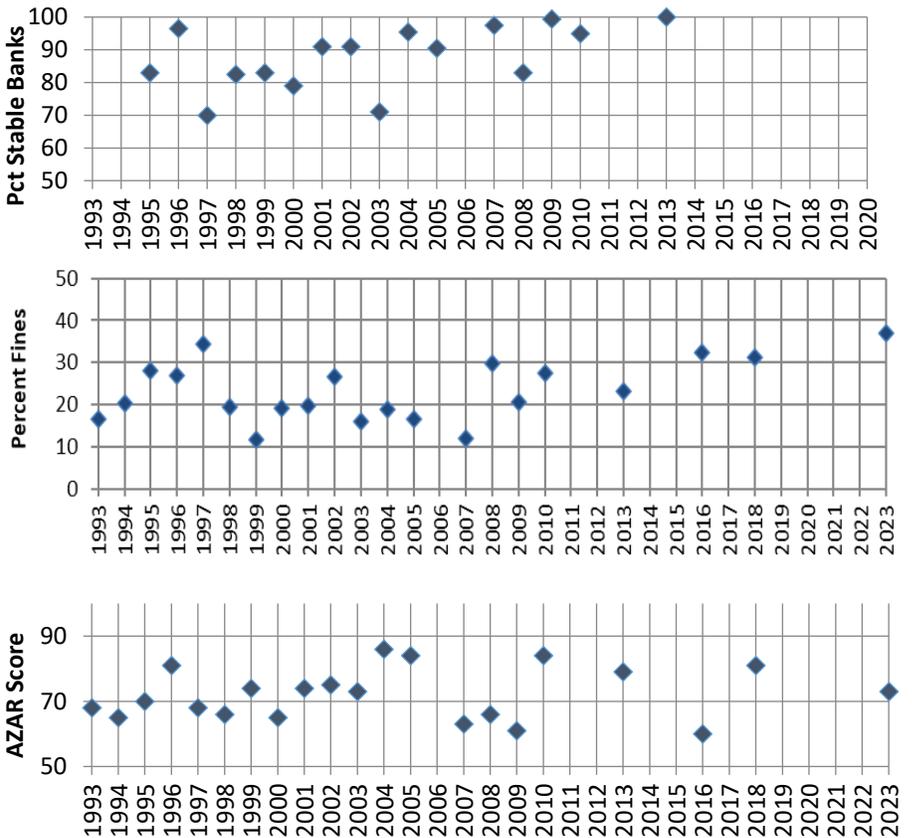
**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		16.5	68
1994	46.0	20.3	65
1995	83.0	28.2	70
1996	96.5	26.8	81
1997	70.0	34.5	68
1998	82.5	19.4	66
1999	83.0	11.6	74
2000	79.0	19.2	65
2001	91.0	19.7	74
2002	91.0	26.5	75
2003	71.0	15.9	73
2004	95.5	18.8	86
2005	90.5	16.5	84
2006			
2007	97.5	12.0	63
2008	83.0	29.9	66
2009	99.5	20.7	61
2010	95.0	27.4	84
2011			
2012			
2013	100	23.1	79
2014			
2015			
2016		32.4	60
2017			
2018		31.1	81
2019			
2020			
2021			
2022			
2023		37	73
n	17	21	21
Mean	85.5	23.2	72.2
St Dev	13.8	7.3	8.0
n	0	3	3
Mean	-	33.5	71.3
St Dev	-	3.1	10.6

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Channel gradient (%)	Sinuosity	Substrate	Channel Type
1995	17.4	2.6	10.2	1.5	-	Gravel	C4
2016	25.8	3.0	26.3	0.5	1.3	Gravel	C4
2018	30.2	3.9	19.1	1.5	1.5	Gravel	C4

**Reviewed Channel Type** **C4**

**REMARKS**

This site has been sampled nearly continuously since 1993. Bank stability has shown an increasing trend, with recent samples near 100%. Depth fines have varied between 11 and 35%, with recent measurements around 30%. Very well-defined gravel substrate glide. 2023 showed fines increasing from 31 to 37%. Causes may be related to the Hayden Creek Fire suppression activities (Handline Ect.) near Bear Valley Creek.

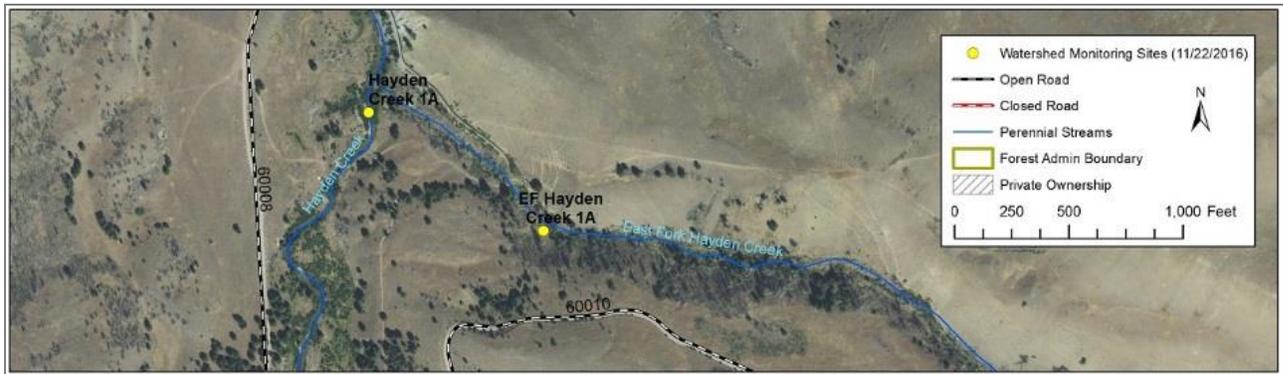
**EAST FORK HAYDEN CREEK 1A**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	East Fork Hayden Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is located near the mouth of EF Hayden Creek at Hayden Creek. Access is via the Hayden Creek Road (FR008), 10 miles from Hwy 28. Site is just upstream of the EF Hayden Creek diversion.		
<b>GPS Coordinates</b>	N 44.75814 (2019)	W -113.70975 (2019)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	11.9 sq mi 7,639 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	45 cfs	<b>Mean Annual Flow</b> (Streamstats)	6.6 cfs
<b>5th-level Watershed</b>	Hayden Creek / 1706020406				
<b>Mean Basin Elevation</b>	8456 ft	<b>Basin Aspect</b>	NW	<b>Mean Basin Slope</b>	39%
<b>Length of Road</b>	15.9 mi	<b>Road Density</b>		1.34 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>		92.3%
	<b>Volcanic</b>	0.2%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		7.5%
<b>% of Watershed in Active Allotment</b>	100%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2019)**



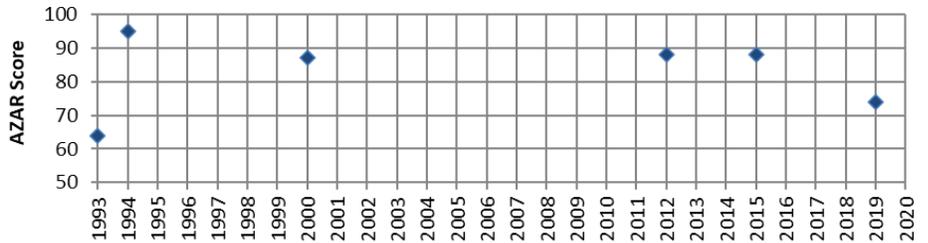
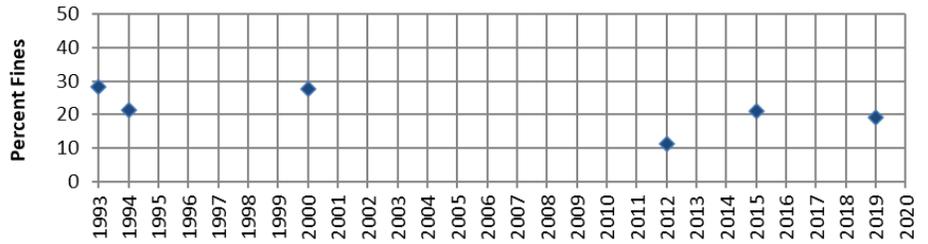
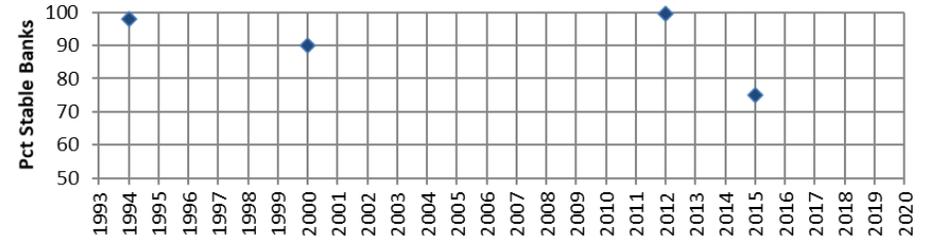
**View Downstream (2019)**

**EAST FORK HAYDEN CREEK 1A**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		28.2	64
1994	98.0	21.3	95
1995			
1996			
1997			
1998			
1999			
2000	90.0	27.8	87
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012	99.5	11.4	88
2013			
2014			
2015	75.0	21.0	88
2016			
2017			
2018			
2019		19.1	74
2020			
2021			
2022			
2023			
n	4	6	6
Mean	90.6	21.5	82.7
St Dev	11.2	6.2	11.4
n	1	2	2
Mean	75.0	20.1	81.0
St Dev	-	1.3	9.9



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	14.8	2.6	11.2	1.3	4.5	Cobble	C3b
2019	14.5	4.6	11.5	1.2	4.5	Cobble	C3b

**10YR ALL**

<b>Reviewed Channel Type</b>	<b>C3b</b>
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**REMARKS**

This site has been monitored infrequently since 1993. Bank stability has been high, with 2015 showing a sharp decrease. Depth fines have ranged from 11% to 29%.

**EAST FORK HAYDEN CREEK 2R**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	EF Hayden Creek 2R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is located approximately 3 miles upstream of the mouth of EF Hayden Creek. Access is via the Hayden Creek-Mill Creek Road (FR010), 3.4 miles from the Hayden Creek Road (FR008). Site is a short distance upstream of the bridge.		
<b>GPS Coordinates</b>	N 44.72881 (2020)	W -113.67155 (2020)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	7.9 sq mi 5,024 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	44 cfs	<b>Mean Annual Flow</b> (Streamstats)	5.1 cfs
<b>5th-level Watershed</b>	Hayden Creek / 1706020406				
<b>Mean Basin Elevation</b>	8870 ft	<b>Basin Aspect</b>	N	<b>Mean Basin Slope</b>	44%
<b>Length of Road</b>	0.0 mi	<b>Road Density</b>		0.0 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>		91.5%
	<b>Volcanic</b>	0.1%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		8.4%
<b>% of Watershed in Active Allotment</b>	99.9%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2020)



View Downstream (2020)

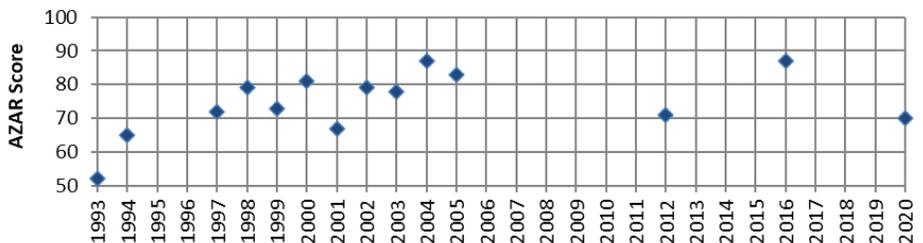
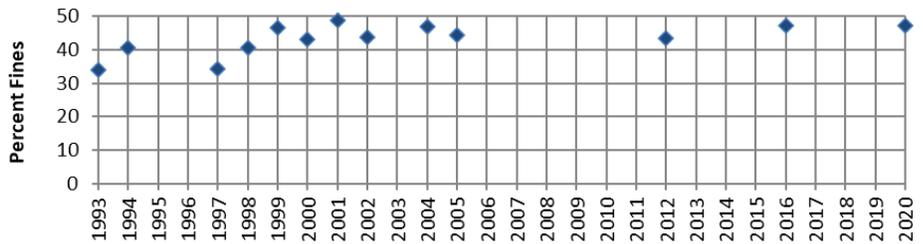
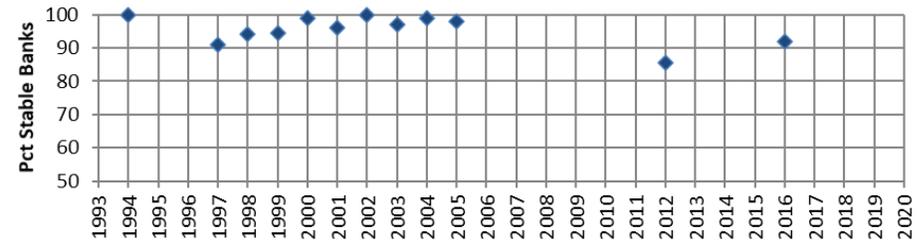
**EAST FORK HAYDEN CREEK 2R**

**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		34.0	52.0
1994	100	40.5	65.0
1995			
1996			
1997	91.0	34.2	72.0
1998	94.0	40.5	79.0
1999	94.5	46.5	73.0
2000	99.0	43.1	81.0
2001	96.0	48.8	67.0
2002	100	43.7	79.0
2003	97.0	52.7	78.0
2004	99.0	46.9	87.0
2005	98.0	44.4	83.0
2006			
2007			
2008			
2009			
2010			
2011			
2012	85.4	43.5	71
2013			
2014			
2015			
2016	92	47.1	87
2017			
2018			
2019			
2020		47.1	70
2021			
2022			
2023			
n	12	14	14
Mean	95.5	43.8	74.6
St Dev	4.4	5.2	9.5
n	1	2	2
Mean	92.0	47.1	78.5
St Dev	-	0.0	12.0

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Channel gradient (%)	Sinuosity	Substrate	Channel Type
1998	12.3	20.3	7.7	0-0.1	1.1	Gravel	E4
2016	14.2	14.1	10.3	0.5	1.7	Gravel	E4
2020	12.5	16.0	12.0	1.5	>1.5	Gravel	E4

<b>Reviewed Channel Type</b>	<b>E4</b>
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**REMARKS**

This site was sampled continuously from 1997 to 2005, but only twice since 2005. Bank stability has been generally very high. Depth fines have been consistently high – between 32% and 52%. The cause of the high fines is unknown, although the very low gradient is likely to be a factor.

**HAYDEN CREEK 1A**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Hayden Creek 1A	<b>Site Type</b>	Anadromous
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is located just upstream of the confluence with EF Hayden Creek. Access is via the Hayden Creek Road (FR008), 9.4 miles from Hwy 28.		
<b>GPS Coordinates</b>	44.75898 (2023)	-113.71332 (2023)	
<b>Site Comments</b>	Sample earlier in the summer to avoid red at site. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	35.7 sq mi 22,872 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	136 cfs	<b>Mean Annual Flow</b> (Streamstats)	21.6 cfs
<b>5th-level Watershed</b>	Hayden Creek / 1706020406				
<b>Mean Basin Elevation</b>	8271 ft	<b>Basin Aspect</b>	N	<b>Mean Basin Slope</b>	43%
<b>Length of Road</b>	27.3 mi	<b>Road Density</b>		0.76 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	81.1%	
	<b>Volcanic</b>	9.7%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	9.2%	
<b>% of Watershed in Active Allotment</b>	99.9%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

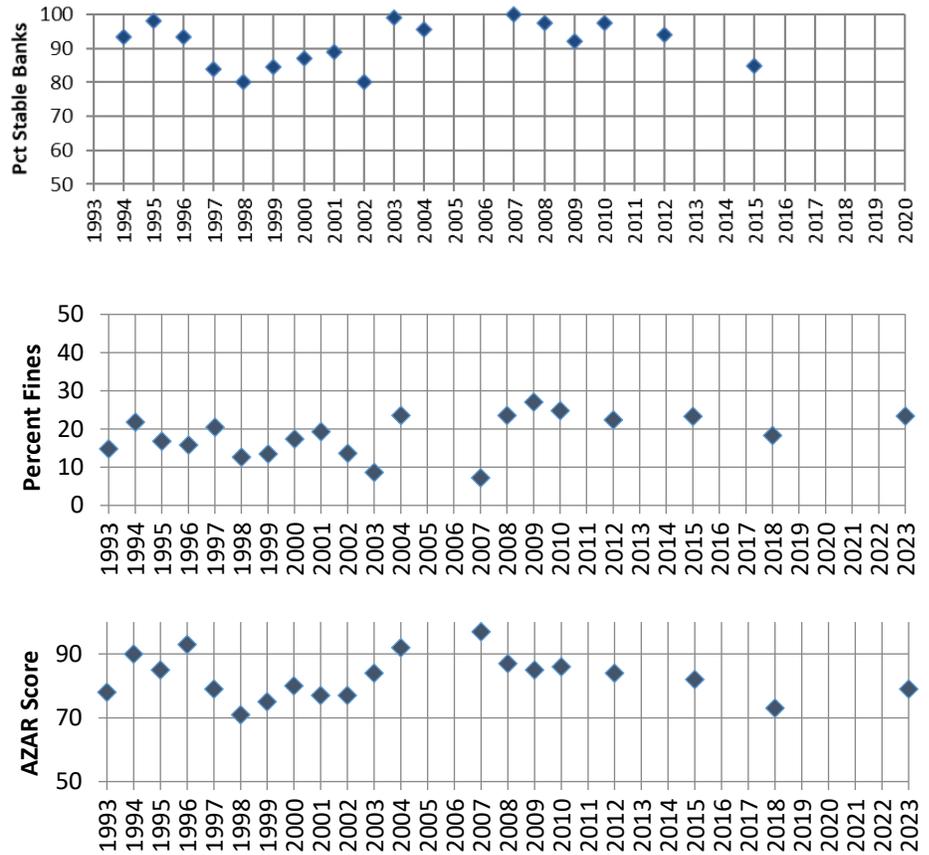
**HAYDEN CREEK 1A**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		14.8	78
1994	93.5	21.8	90
1995	98.0	16.8	85
1996	93.5	15.8	93
1997	84.0	20.5	79
1998	80.0	12.7	71
1999	84.5	13.5	75
2000	87.0	17.4	80
2001	89.0	19.3	77
2002	80.0	13.7	77
2003	99.0	8.7	84
2004	95.5	23.6	92
2005			
2006			
2007	100	7.3	97
2008	97.5	23.6	87
2009	92.0	27.1	85
2010	97.5	24.8	86
2011			
2012	94.1	22.4	84
2013			
2014			
2015	84.7	23.3	82
2016			
2017			
2018		18.3	73
2019			
2020			
2021			
2022			
2023		23.4	79
n	17	20	20
Mean	91.2	18.4	82.7
St Dev	6.7	5.5	6.9
n	1	3	3
Mean	84.7	21.7	78.0
St Dev	-	2.9	4.6

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	37.1	8.1	23.2	1.1	2-3	Cobble	C3
2015	28.0	3.4	18.7	1.4	2.5	Cobble	C3b
2018	28.5	3.3	22.4	<1.2	2.0	Cobble	C3

**Reviewed Channel Type** **C3**

**REMARKS**

This site has been sampled nearly continuously since 1993. Bank stability has been consistently greater than 80%. Depth fines have ranged from 8% to 28%. Note that sampling should occur earlier in the summer to avoid impacts to the redd located at the site. Site is currently located in a cattle enclosure fence. Area was affected by the 2023 Hayden fire and sample was collected after the fire.

**HAYNES CREEK 1R**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Haynes Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is located about 5 miles NW of Tendoy, at the Forest Boundary. Access is via the Haynes Creek Road (FR350), 4.2 miles from Hwy 28. Site is just upstream of the Baldy Basin Road (FR152) crossing.		
<b>GPS Coordinates</b>	N 44.99783 (2020)	W -113.72863 (2020)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	11.1 sq mi 7,110 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	15 cfs	<b>Mean Annual Flow</b> (Streamstats)	7.5 cfs
<b>5th-level Watershed</b>	Lower Lemhi River / 1706020408				
<b>Mean Basin Elevation</b>	7274 ft	<b>Basin Aspect</b>	E	<b>Mean Basin Slope</b>	46%
<b>Length of Road</b>	20.0 mi	<b>Road Density</b>		1.80 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	75.0%	
	<b>Volcanic</b>	25.0%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	0%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	94.4%	<b>% of Watershed Burned (2018-2022)</b>		6.0%	

**SITE PHOTOS**



View Upstream (2020)



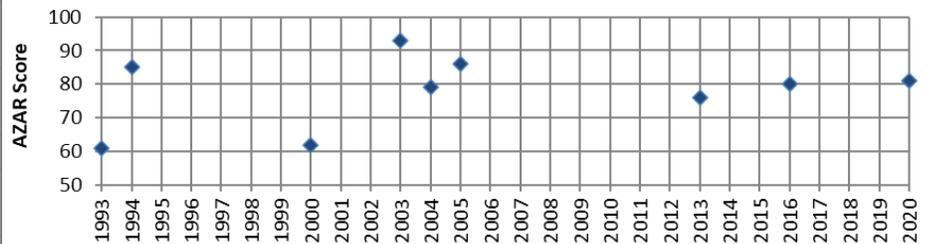
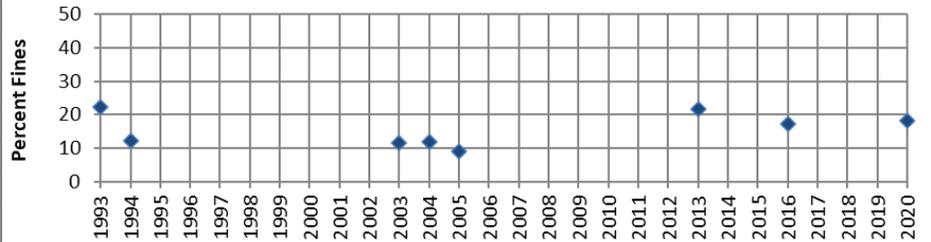
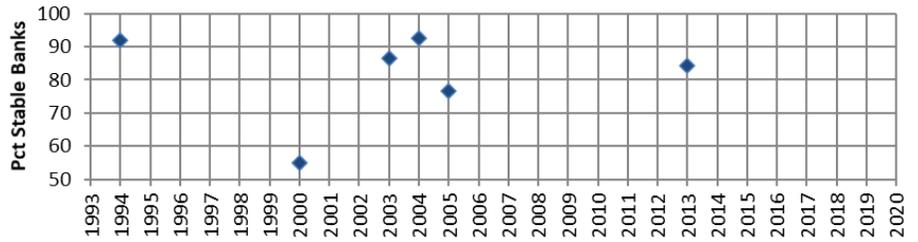
View Downstream (2020)

**HAYNES CREEK 1R**

**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		22.3	61
1994	92.0	12.1	85
1995			
1996			
1997			
1998			
1999			
2000	55.0		62
2001			
2002			
2003	86.5	11.7	93
2004	92.5	11.9	79
2005	76.5	9.0	86
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013	84.3	21.6	76
2014			
2015			
2016		17.3	80
2017			
2018			
2019			
2020		18.1	81
2021			
2022			
2023			
n	6	8	9
Mean	81.1	15.5	78.1
St Dev	14.1	5.0	10.6
n	0	2	2
Mean	-	17.7	80.5
St Dev	-	0.6	0.7



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2016	13.2	5.0	18.1	1.2	3	Gravel	C4b
2020	12.3	3.8	23.4	1.2-1.5	0.5-2%	Gravel	C4

**Reviewed Channel Type** **C4**

**ALL**

**10YR**

**REMARKS**

This site has been monitored periodically since 1993. Bank stability has varied from 55% to 92%. Depth fines have been consistently between 9% and 22% (low).

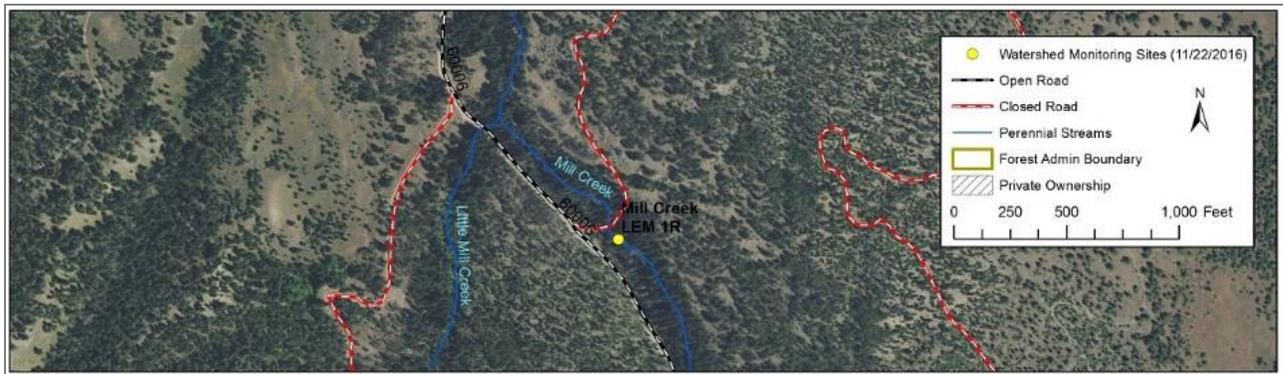
**MILL CREEK LEM 1R**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Mill Creek LEM 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is located about ½ mile upstream of the Forest Boundary. Access is via the Mill Creek Road (FR006). Site is upstream of the FR203 (closed) crossing.		
<b>GPS Coordinates</b>	N 44.70562 (2019)	W -113.59358 (2019)	
<b>Site Comments</b>	Lots of downed trees & fast-moving water. Unknown if 2015 sample location was same as 2012. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	6.5 sq mi 4,137 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	29 cfs	<b>Mean Annual Flow</b> (Streamstats)	4.3 cfs
<b>5th-level Watershed</b>	Upper Lehmi River/1706020405				
<b>Mean Basin Elevation</b>	8719 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	45%
<b>Length of Road</b>	9.3 mi	<b>Road Density</b>		1.44 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>	77.9%	
	<b>Volcanic</b>	8.6%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	13.5%	
<b>% of Watershed in Active Allotment</b>	99.8%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2019)



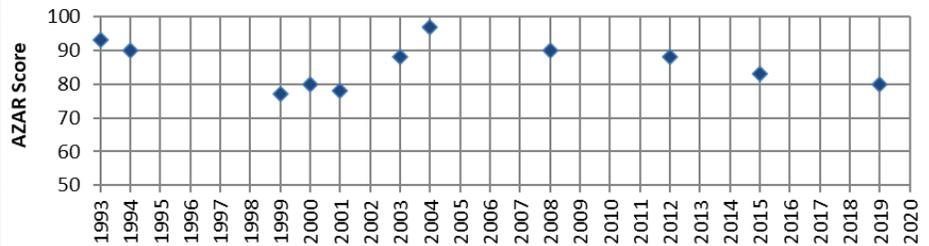
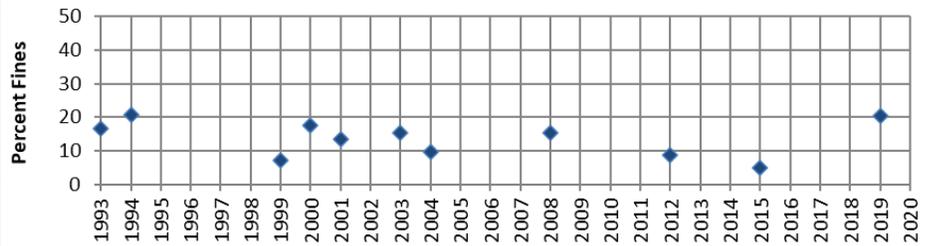
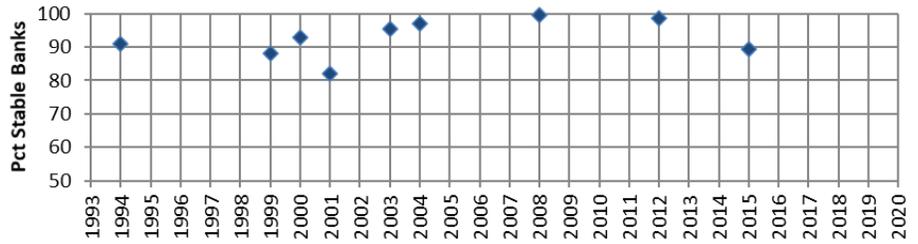
View Downstream (2019)

**MILL CREEK LEM 1R**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		16.6	93
1994	91.0	20.8	90
1995			
1996			
1997			
1998			
1999	88.0	7.0	77
2000	93.0	17.5	80
2001	82.0	13.4	78
2002			
2003	95.5	15.4	88
2004	97.0	9.7	97
2005			
2006			
2007			
2008	99.5	15.4	90
2009			
2010			
2011			
2012	98.5	8.8	88
2013			
2014			
2015	89.5	5.0	83
2016			
2017			
2018			
2019		20.4	80
2020			
2021			
2022			
2023			
n	9	11	11
Mean	92.7	13.6	85.8
St Dev	5.7	5.3	6.6
n	1	2	2
Mean	89.5	12.7	81.5
St Dev	6.4	8.0	4.0



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	11	2.8	9.2	1.1	5.0	Cobble	C3b
2019	17	1.9	17.6	<1.2	3.5	Gravel	C4b

**Reviewed Channel Type** **C4b**

**ALL**

**10YR**

**REMARKS**

This site has been sampled periodically since 1993. Bank stability has been high, and depth fines have been low. Note: Past surveys had the site downstream of FR203. GIS site location and watershed were corrected 6/18/2015 to the location upstream of FR203, and the basin data reflect the corrected watershed delineation.

**WITHINGTON CREEK 1R**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Withington Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Access is via the Withington Creek Road (FR031), about 6 miles from Highway 28 at Baker. Site is located on the "Harmony Fork," just upstream of its confluence with Withington Creek, and just upstream of the FR031 crossing.		
<b>GPS Coordinates</b>	N 45.04096 (2019)	W -113.79764 (2019)	
<b>Site Comments</b>	Bank pin is wooden stake with flagging. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	4.0 sq mi 2,541 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	6 cfs	<b>Mean Annual Flow</b> (Streamstats)	3.1 cfs
<b>5th-level Watershed</b>	Lower Lemhi River / 1706020408				
<b>Mean Basin Elevation</b>	7319 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	51%
<b>Length of Road</b>	5.6 mi	<b>Road Density</b>		1.41 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>		59.2%
	<b>Volcanic</b>	40.8%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		0%
<b>% of Watershed in Active Allotment</b>	94.9%	<b>% of Watershed Burned (2018-2022)</b>		0.5%	

**SITE PHOTOS**



View Upstream (2019)



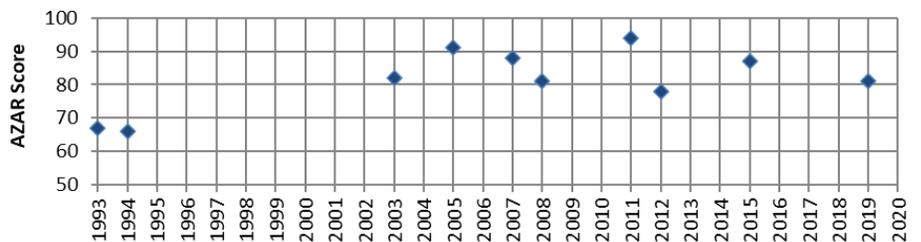
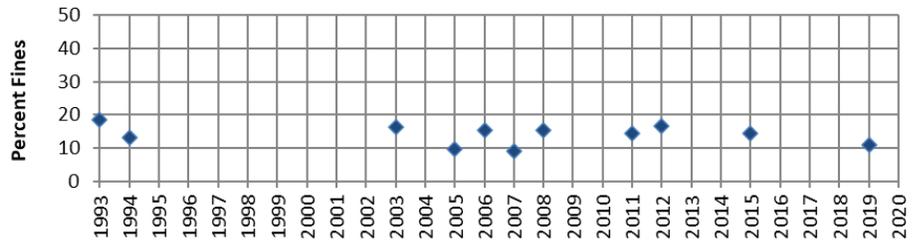
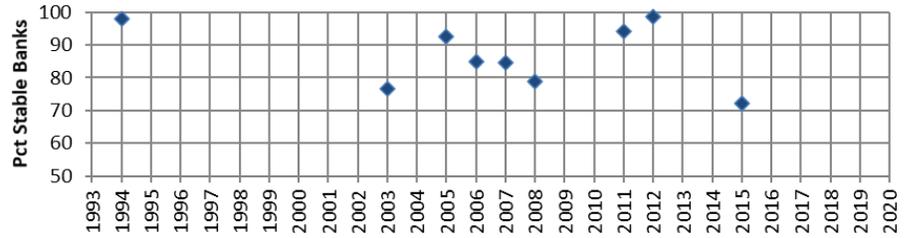
View Downstream (2019)

**WITHINGTON CREEK 1R**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		18.6	67
1994	98.0	13.3	66
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003	76.5	16.4	82
2004			
2005	92.5	9.8	91
2006	85.0	15.4	
2007	84.5	9.0	88
2008	79.0	15.4	81
2009			
2010			
2011	94.0	14.3	94
2012	98.5	16.5	78
2013			
2014			
2015	72.2	14.3	87
2016			
2017			
2018			
2019		11.0	81
2020			
2021			
2022			
2023			
n	9	11	10
Mean	86.7	14.0	81.5
St Dev	9.6	3.0	9.3
n	1	2	2
Mean	72.2	12.7	84.0
St Dev	-	2.3	4.2



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	11.7	2.5	10.6	1.3	5.0	Cobble	C3b
2019	10.8	1.6	10.8	<1.2	2.0	Cobble	C3b

**Reviewed Channel Type** **C3b**

**10YR ALL**

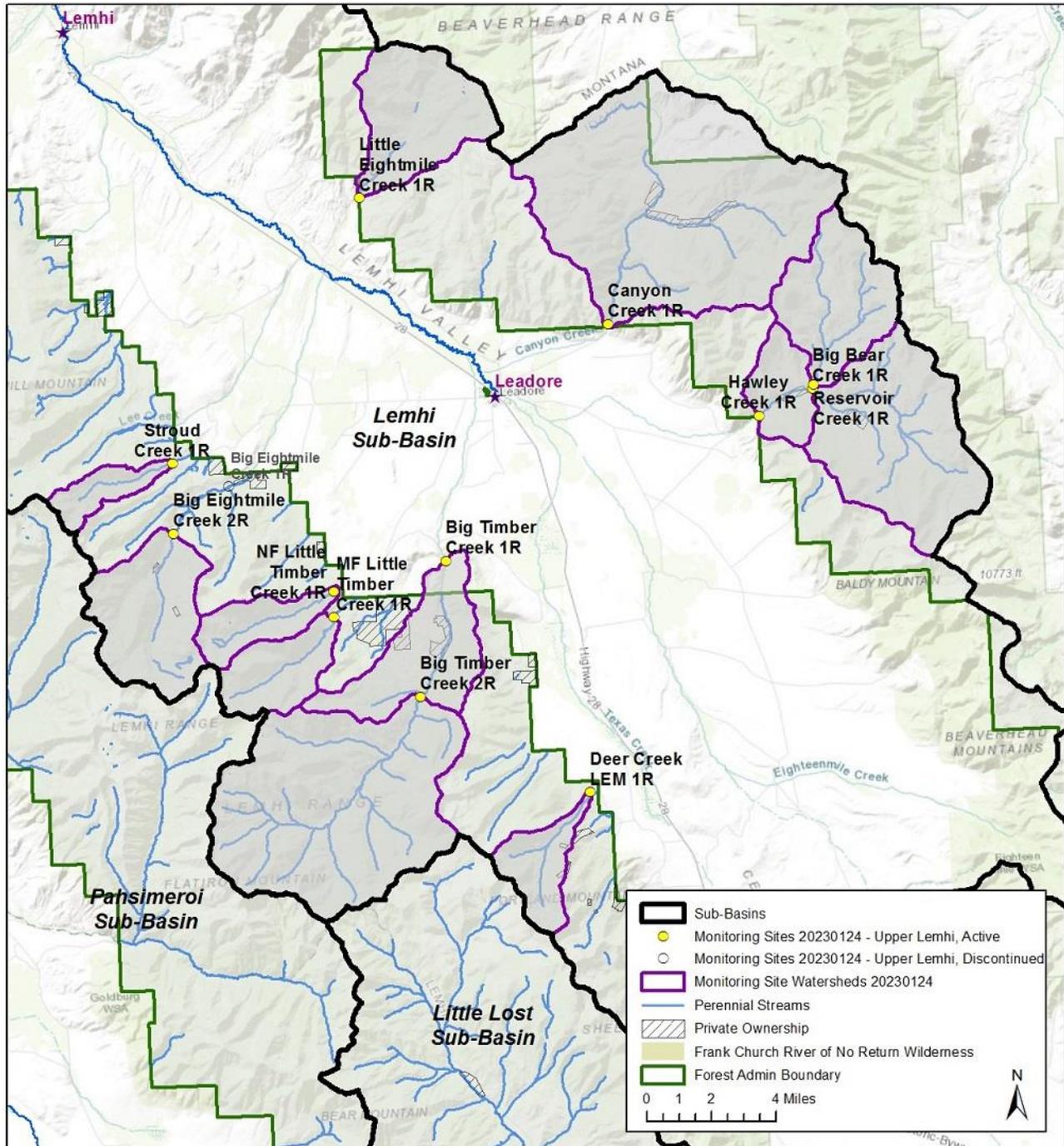
**REMARKS**

This site has been sampled periodically since 1993. Bank stability has ranged from 72% to 99%, with a sharp decline in 2015. Depth fines have been consistently low, between 10% and 20%. This is a small channel, heavily influenced by riparian vegetation and woody debris.



## Upper Lemhi River Watershed

A total of 12 active monitoring sites are located in the Upper Lemhi River Watershed, in the Leadore area.



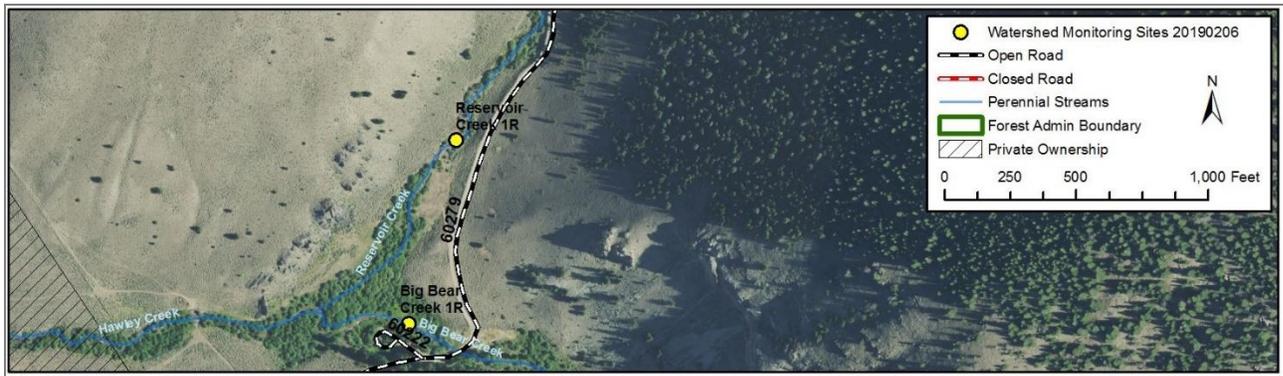
**BIG BEAR CREEK 1R**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Big Bear Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is just upstream of the confluence of Big Bear Creek and Reservoir Creek. Access is via the Reservoir Creek Rd (FR279), 0.15 miles off the Hawley Creek Rd (FR275). Site is at campsite area just before the bridge over Big Bear Creek.		
<b>GPS Coordinates</b>	N 44.67699 (2019)	W -113.15830 (2019)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	23.6 sq mi 15,073 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	41 cfs	<b>Mean Annual Flow</b> (Streamstats)	11.5 cfs
<b>5th-level Watershed</b>	Hawley Creek / 1706020402				
<b>Mean Basin Elevation</b>	8308 ft	<b>Basin Aspect</b>	W	<b>Mean Basin Slope</b>	36%
<b>Length of Road</b>	28.7 mi	<b>Road Density</b>		1.22 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	1.1%	<b>Quartzite</b>	23.9%	
	<b>Volcanic</b>	25.6%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	49.1%	<b>Alluvium</b>	0.3%	
<b>% of Watershed in Active Allotment</b>	99.0%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2019)



View Downstream (2019)

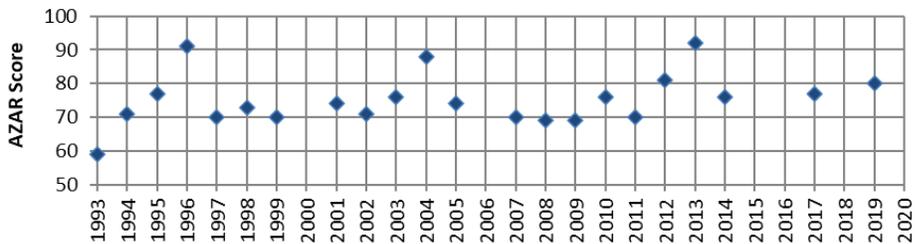
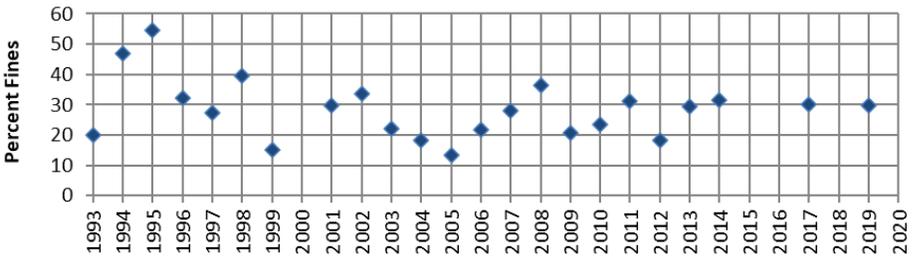
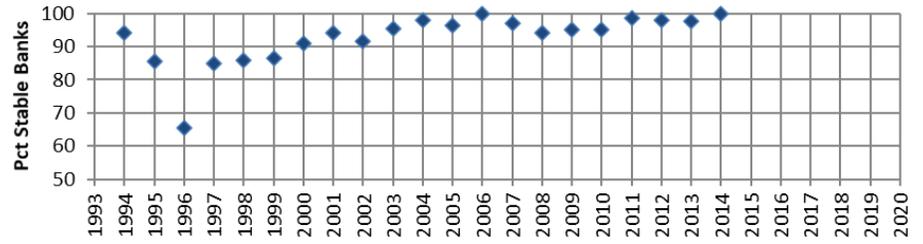
**BIG BEAR CREEK 1R**

**Last Year Sampled: 2019**

SITE DATA

Year	% Stable Banks	Percent Fines	AZAR Score
1993		20.1	59
1994	94.0	46.9	71
1995	85.5	54.6	77
1996	65.5	32.1	91
1997	84.8	27.5	70
1998	86.0	39.7	73
1999	86.5	15.1	70
2000	91.0		
2001	94.0	29.9	74
2002	91.5	33.7	71
2003	95.5	22.0	76
2004	98.0	18.4	88
2005	96.5	13.4	74
2006	100	21.9	
2007	97.0	27.9	70
2008	94.0	36.3	69
2009	95.0	20.7	69
2010	95.0	23.4	76
2011	98.5	31.2	70
2012	98.0	18.2	81
2013	97.7	29.4	92
2014	100	31.7	76
2015			
2016			
2017		30.1	77
2018			
2019		29.8	80
2020			
2021			
2022			
2023			
n	21	23	22
Mean	92.6	28.4	75.2
St Dev	7.8	9.8	7.7
n	1	3	3
Mean	100	30.5	77.7
St Dev	-	1.0	2.1

10YR ALL



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	14	4.4	19	1	2	Gravel	C4
2017	14.5	6.4	17.7	1.1	2.5	Gravel	C4b
2019	13.4	6.9	16.0	<1.2	2.0	Gravel	C4b

<b>Reviewed Channel Type</b>	<b>C4b</b>
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REMARKS

This site has a continuous dataset since 1993. Bank stability has been very high. Recent depth fines measurements have been consistently around 30%.

**BIG EIGHTMILE CREEK 2R**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Big Eightmile Creek 2R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is located 3 miles upstream of the Big Eightmile Creek 1R site. Access is via the Big Eightmile Road (FR096), 12.1 miles from Highway 28.		
<b>GPS Coordinates</b>	N 44.62481 (2019)	W -113.56344 (2019)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	13.9 sq mi 8,866 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	85 cfs	<b>Mean Annual Flow</b> (Streamstats)	8.8 cfs
<b>5th-level Watershed</b>	Upper Lemhi River / 1706020405				
<b>Mean Basin Elevation</b>	8930 ft	<b>Basin Aspect</b>	N	<b>Mean Basin Slope</b>	44%
<b>Length of Road</b>	15.2 mi	<b>Road Density</b>		1.09 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	17.8%	<b>Quartzite</b>	66.9%	
	<b>Volcanic</b>	0.0%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	15.3%	
<b>% of Watershed in Active Allotment</b>	59.6%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2019)**



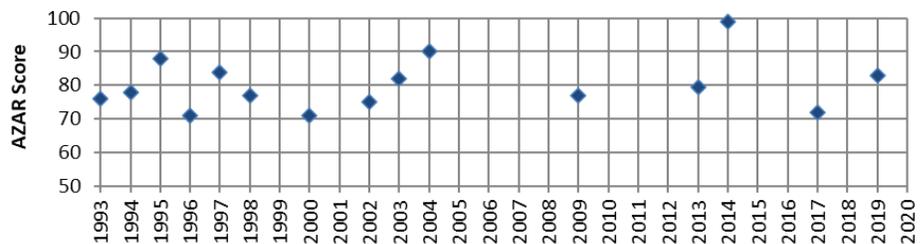
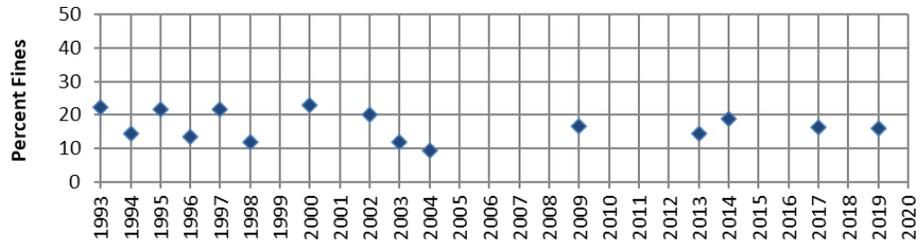
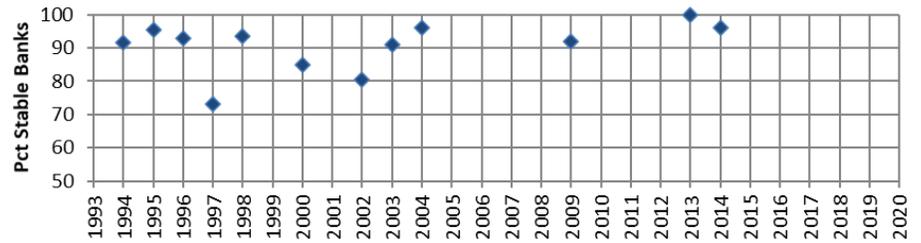
**View Downstream (2019)**

**BIG EIGHTMILE CREEK 2R**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		22.2	76
1994	91.5	14.5	78
1995	95.5	21.8	88
1996	93.0	13.5	71
1997	73.0	21.6	84
1998	93.5	11.9	77
1999			
2000	85.0	22.8	71
2001			
2002	80.5	20.0	75
2003	91.0	11.9	82
2004	96.0	9.3	90
2005			
2006			
2007			
2008			
2009	92.0	16.5	77
2010			
2011			
2012			
2013	100	14.5	80
2014	96.0	18.9	99
2015			
2016			
2017		16.3	72
2018			
2019		15.9	83
2020			
2021			
2022			
2023			
n	12	15	15
Mean	90.6	16.8	80.2
St Dev	7.6	4.3	7.8
n	1	4	4
Mean	96.0	16.8	84.3
St Dev	-	1.4	11.1



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	23.8	12.6	26.4	1.2	1	Gravel	C4
2017	38.8	>2.2	29.0	-	1.0	Gravel	C4
2019	27.4	3.9	26.1	1.8	1.9	Gravel	C4

**ALL**

**10YR**

<b>Reviewed Channel Type</b>	<b>C4</b>
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**REMARKS**

This site has been sampled periodically since 1993. Bank stability has been high, and depth fines have been low. Site GIS location and Watershed edited 12/13/17 to reflect actual location of site (previous GIS point was incorrectly located 3,000 feet upstream, but all sampling was done at actual location) – changed drainage area from 12.7 to 13.9 sq mi.

**BIG TIMBER CREEK 1A**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Big Timber Creek 1A	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is located about 5 miles south of Leadore, just upstream of the confluence with Basin Creek. Access is via the Timber Creek Road and unimproved BLM roads. Site is ½ mile upstream of the bridge over Big Timber Creek.		
<b>GPS Coordinates</b>	N 44.60693 (2023)	W -113.39309 (2023)	
<b>Site Comments</b>	Site is approximately 1 mile downstream of Forest Boundary (on BLM land). 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	51.6 sq mi 33,044 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	193 cfs	<b>Mean Annual Flow</b> (Streamstats)	25.7 cfs
<b>5th-level Watershed</b>	Timber Creek / 1706020404				
<b>Mean Basin Elevation</b>	8499 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	37%
<b>Length of Road</b>	21.1 mi	<b>Road Density</b>		0.41 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	3.5%	<b>Quartzite</b>		46.6%
	<b>Volcanic</b>	31.2%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	3.6%	<b>Alluvium</b>		15.2%
<b>% of Watershed in Active Allotment</b>	64.0%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2023)**



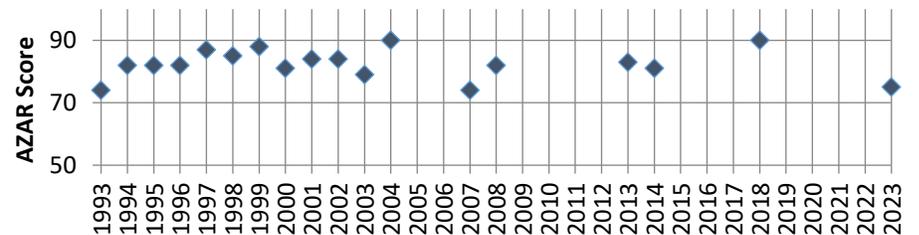
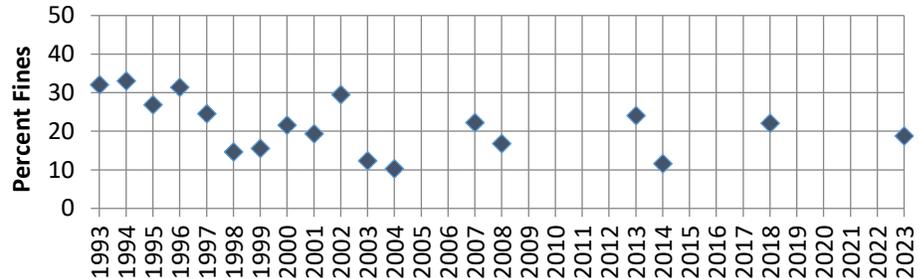
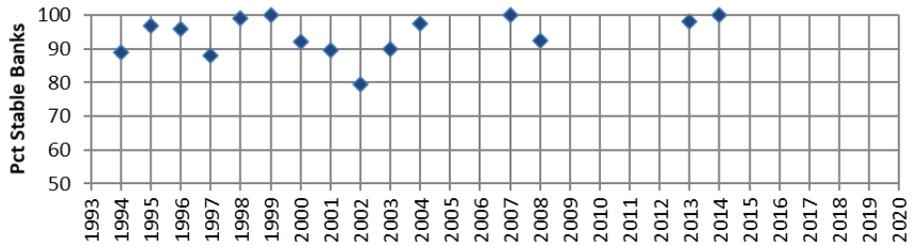
**View Downstream (2023)**

**BIG TIMBER CREEK 1A**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		32.1	74
1994	89.0	33.1	82
1995	97.0	26.9	82
1996	96.0	31.4	82
1997	88.0	24.6	87
1998	99.0	14.7	85
1999	100	15.6	88
2000	92.0	21.6	81
2001	89.5	19.4	84
2002	79.5	29.5	84
2003	90.0	12.4	79
2004	97.5	10.3	90
2005			
2006			
2007	100	22.3	74
2008	92.5	16.8	82
2009			
2010			
2011			
2012			
2013	98.0	24.1	83
2014	100	11.6	81
2015			
2016			
2017			
2018		22.1	90
2019			
2020			
2021			
2022			
2023		18.8	75
n	15	18	18
Mean	93.9	21.5	82.4
St Dev	5.9	7.2	4.8
n	1	3	3
Mean	100	17.5	82.0
St Dev	-	5.4	7.5



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	23.5	2.4	19.6	1.1	2+	Cobble	B3
2018	28.0	2.4	20.4	<1.2	3	Cobble	C3b

**ALL**

**10YR**

<b>Reviewed Channel Type</b>	<b>C3b</b>
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**REMARKS**

Bank stability has been high, and depth fines have shown a slight decreasing trend. This site is not ideal because it is 1 mile downstream of the Forest boundary, and channel conditions may not reflect management occurring on NFS lands. A new site was established on Big Timber Creek upstream of the Forest Service boundary (Big Timber Creek 2A). Big Timber Creek is now accessible to anadromous fish. Data from 1993-2023 were collected as a resident site.

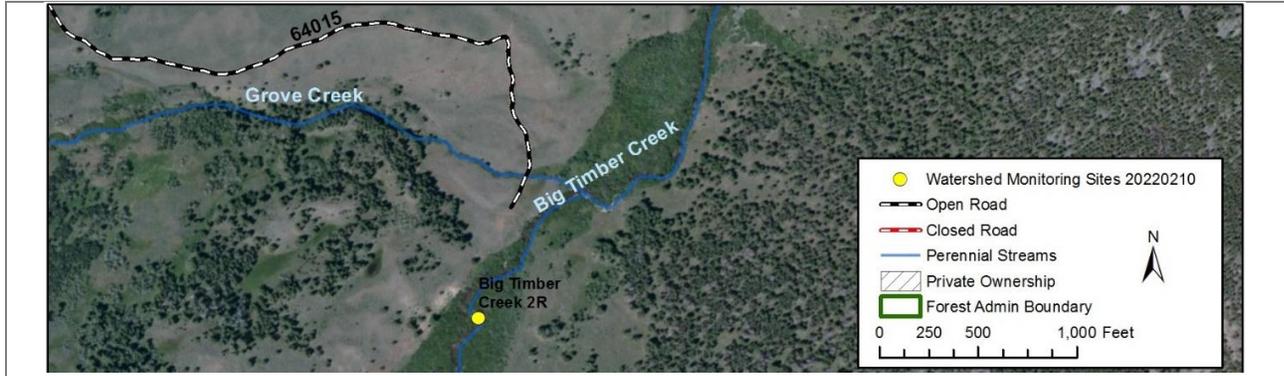
**BIG TIMBER CREEK 2A**

**Last Year Sampled: 2021**

**SITE INFO**

<b>Site Name</b>	Big Timber Creek 2A	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is located about 3.5 miles upstream of the Forest boundary, just upstream of the Grove Creek confluence. Access is via FR60105/FR64015-B/FR64015.		
<b>GPS Coordinates</b>	N 44.54677 (2021)	W -113.41320 (2021)	
<b>Site Comments</b>	New site established 2021. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	39.0 sq mi 25,033 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	154 cfs	<b>Mean Annual Flow</b> (Streamstats)	22.2 cfs
<b>5th-level Watershed</b>	Timber Creek / 1706020404				
<b>Mean Basin Elevation</b>	8780 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	41%
<b>Length of Road</b>	0 mi	<b>Road Density</b>		0 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	4.5%	<b>Quartzite</b>		49.9%
	<b>Volcanic</b>	23.8%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	4.0%	<b>Alluvium</b>		17.7%
<b>% of Watershed in Active Allotment</b>	58.1%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (7/29/2021)



View Downstream (7/29/2021)



**CANYON CREEK 1R**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Canyon Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is located approximately 4 miles NE of Leadore, just upstream of the Forest Boundary. Access is via Hwy 29.		
<b>GPS Coordinates</b>	N 44.70995 (2023)	W -113.28470 (2023)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	49.9 sq mi 31,961 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	23 cfs	<b>Mean Annual Flow</b> (Streamstats)	19.9 cfs
<b>5th-level Watershed</b>	Upper Lemhi River / 1706020405				
<b>Mean Basin Elevation</b>	7834 ft	<b>Basin Aspect</b>	S	<b>Mean Basin Slope</b>	31%
<b>Length of Road</b>	60.4 mi	<b>Road Density</b>		1.21 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	2.7%	<b>Quartzite</b>	21.5%	
	<b>Volcanic</b>	11.6%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	64.2%	<b>Alluvium</b>	0.0%	
<b>% of Watershed in Active Allotment</b>	97.8%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2023)



View Downstream (2023)

**CANYON CREEK 1R**

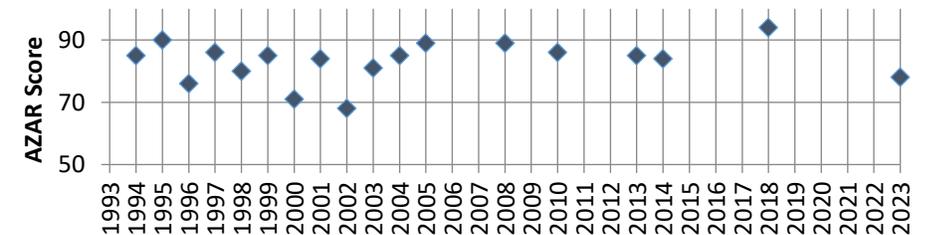
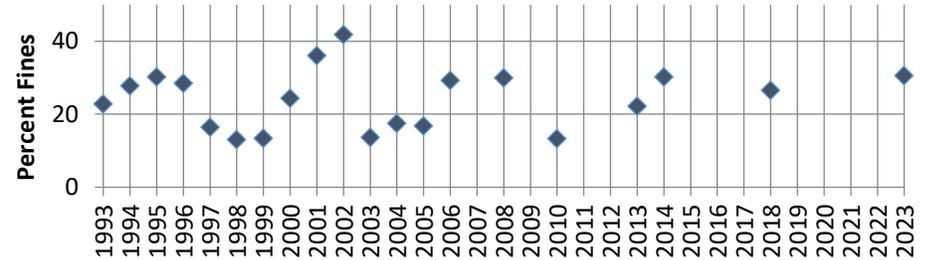
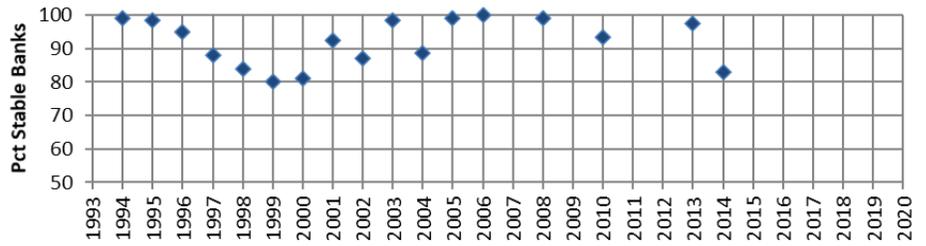
**Last Year Sampled: 2023**

SITE DATA

Year	% Stable Banks	Percent Fines	AZAR Score
1993		22.8	
1994	99.0	27.8	85
1995	98.5	30.2	90
1996	95.0	28.5	76
1997	88.0	16.5	86
1998	84.0	13.1	80
1999	80.0	13.4	85
2000	81.0	24.4	71
2001	92.5	36.1	84
2002	87.0	41.8	68
2003	98.5	13.7	81
2004	88.5	17.5	85
2005	99.0	16.8	89
2006	100	29.3	
2007			
2008	99.0	30.0	89
2009			
2010	93.5	13.3	86
2011			
2012			
2013	97.5	22.2	85
2014	83.0	30.2	84
2015			
2016			
2017			
2018		26.6	94
2019			
2020			
2021			
2022			
2023		30.6	78
n	17	20	18
Mean	92.0	24.2	83.1
St Dev	7.1	8.3	6.6
n	1	3	3
Mean	83.0	29.1	85.3
St Dev	-	2.2	8.1

ALL

10YR



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	15.0	2.1	13.6	1	1-2	cob/grav	B4c
2018	13.8	2.6	13.4	<1.2	2.5	Gravel	B4

**Reviewed Channel Type** **B4**

REMARKS

This site has been sampled nearly continuously since 1993. Bank stability has been high. Depth fines have varied, with recent values around 30%. Note that stream restoration has been occurring on Canyon Creek upstream of the monitoring site. Steep canyon walls with erosion on outer banks.

**DEER CREEK LEM 1R**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Deer Creek LEM 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is located approx. 0.3 miles upstream of the FS boundary, and about 50 feet upstream of the "corner" at the diversion (cross-valley berm). Access is via Hwy 28 north of Leadore at "the Corral", following unmarked roads 1.9 miles from Hwy 28 (see map), and walking about 1300 ft from the parking location.		
<b>GPS Coordinates</b>	N 44.50092 (2020)	W -113.30955 (2020)	
<b>Site Comments</b>	Site contains marginal spawning habitat, but is the best location on the stream. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	5.8 sq mi 3,698 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	30.1 cfs	<b>Mean Annual Flow</b> (Streamstats)	4.3 cfs
<b>5th-level Watershed</b>	Texas Creek/1706020401				
<b>Mean Basin Elevation</b>	9060 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	49%
<b>Length of Road</b>	1.9 mi	<b>Road Density</b>		0.32 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>		83.7%
	<b>Volcanic</b>	0%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	4.3%	<b>Alluvium</b>		12.0%
<b>% of Watershed in Active Allotment</b>	98.1%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2020)



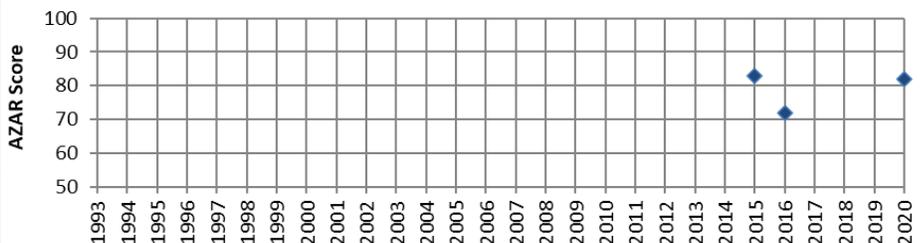
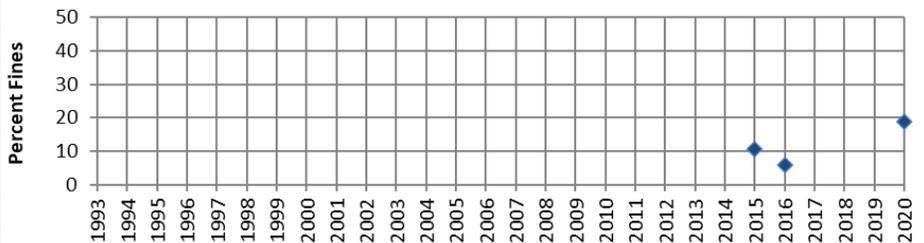
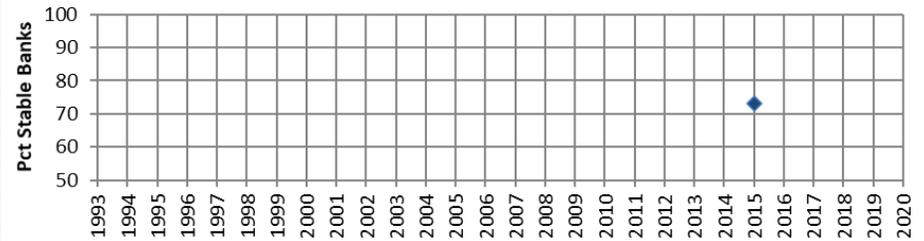
View Downstream (2020)

DEER CREEK LEM 1R

Last Year Sampled: 2020

SITE DATA

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015	73.0	10.5	83
2016		6.0	72
2017			
2018			
2019			
2020		18.8	82
2021			
2022			
2023			
n	1	3	3
Mean	73.0	11.8	79.0
St Dev	-	6.5	6.1
n	1	3	3
Mean	73.0	11.8	79.0
St Dev	-	6.5	6.1



CHANNEL MEASUREMENTS

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	8.0	5.4	8.2	1.3	6	Cobble	C3b
2016	8.5	1.4	11.6	1.1	6	Cobble	C3b
2020	18.8	6.3	17.1	<1.2	5.0	Gravel	C3b

Reviewed Channel Type **C3b**

10YR ALL

REMARKS

This site was established in 2015 in order to begin collecting baseline data. Initial data indicate low fines and low bank stability.

**HAWLEY CREEK 1R**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Hawley Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is located about 9 miles east of Leadore, just upstream of the Forest Boundary. Access is via the Hawley Creek Road (FR275).		
<b>GPS Coordinates</b>	N 44.66605 (2019)	W -113.19285 (2019)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	42.4 sq mi 27,164 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	56 cfs	<b>Mean Annual Flow</b> (Streamstats)	20.5 cfs
<b>5th-level Watershed</b>	Hawley Creek / 1706020402				
<b>Mean Basin Elevation</b>	8209 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	36%
<b>Length of Road</b>	47.6 mi	<b>Road Density</b>		1.12 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.9%	<b>Quartzite</b>	22.3%	
	<b>Volcanic</b>	30.2%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	45.9%	<b>Alluvium</b>	0.8%	
<b>% of Watershed in Active Allotment</b>	98.9%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2019)**



**View Downstream (2019)**

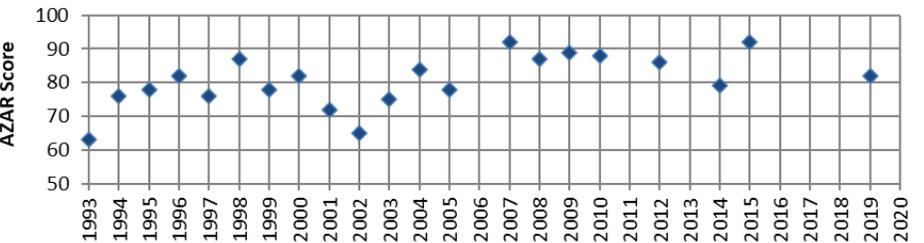
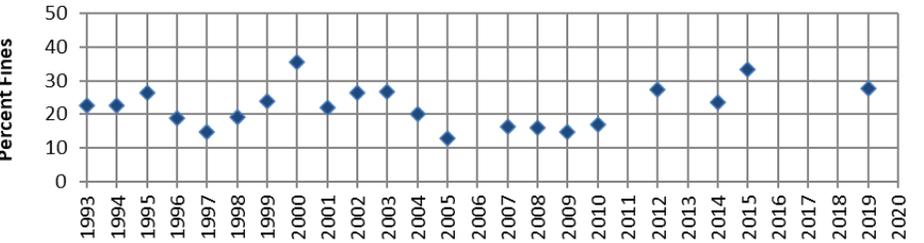
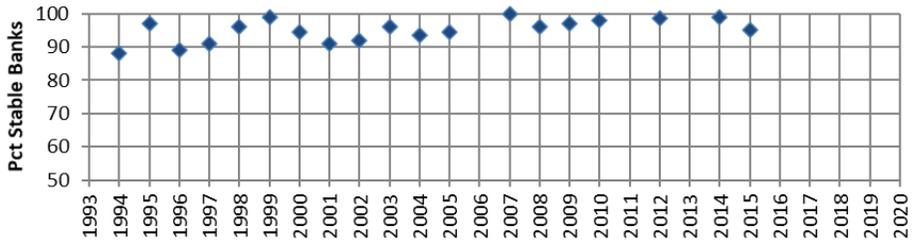
**HAWLEY CREEK 1R**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		22.6	63
1994	88.0	22.5	76
1995	97.0	26.4	78
1996	89.0	18.9	82
1997	91.1	14.8	76
1998	96.0	19.1	87
1999	99.0	23.9	78
2000	94.5	35.4	82
2001	91.0	22.1	72
2002	92.0	26.3	65
2003	96.0	26.7	75
2004	93.5	20.2	84
2005	94.5	12.8	78
2006			
2007	100	16.3	92
2008	96.0	16.1	87
2009	97.0	14.8	89
2010	98.0	17.0	88
2011			
2012	98.5	27.2	86
2013			
2014	99.0	23.6	79
2015	95.1	33.4	92
2016			
2017			
2018			
2019		27.8	82
2020			
2021			
2022			
2023			
n	19	21	21
Mean	95.0	22.3	80.5
St Dev	3.5	6.1	7.9
n	2	3	3
Mean	97.1	28.3	84.3
St Dev	2.8	4.9	6.8

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	25.4	4.1	19.5	1	0-2	Gravel	C4
2015	17.0	4.5	17.0	1.2-1.5	3.0	Cobble	C3b
2019	12.6	3.6	14.0	1.1	3.0	Gravel	C4b

**Reviewed Channel Type** **C4b**

**REMARKS**

This site has been sampled almost every year since 1993. Bank stability has been very high, and depth fines have varied, occasionally exceeding 30%.

**LITTLE EIGHTMILE CREEK 1R**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Little Eightmile Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is located about 7.4 miles NW of Leadore, at the FS Boundary. Access is via the Little Eightmile Road (FR303), approximately 2.3 miles from Hwy 28.		
<b>GPS Coordinates</b>	N 44.77174 (2019)	W -113.43751 (2019)	
<b>Site Comments</b>	Changed to private property across barbed wire fence. Moved bank pin to more appropriate site sampled in 2015. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	13.6 sq mi 8,685 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	21 cfs	<b>Mean Annual Flow</b> (Streamstats)	9.6 cfs
<b>5th-level Watershed</b>	Upper Lemhi River / 1706020405				
<b>Mean Basin Elevation</b>	8086 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	48%
<b>Length of Road</b>	9.3 mi	<b>Road Density</b>		0.69 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.3%	<b>Quartzite</b>		57.2%
	<b>Volcanic</b>	21.4%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	21.1%	<b>Alluvium</b>		0%
<b>% of Watershed in Active Allotment</b>	99.7%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2019)



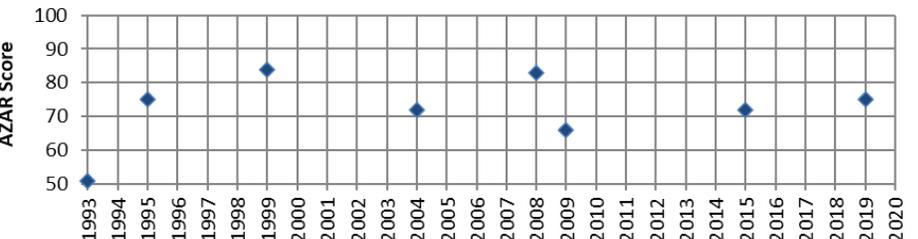
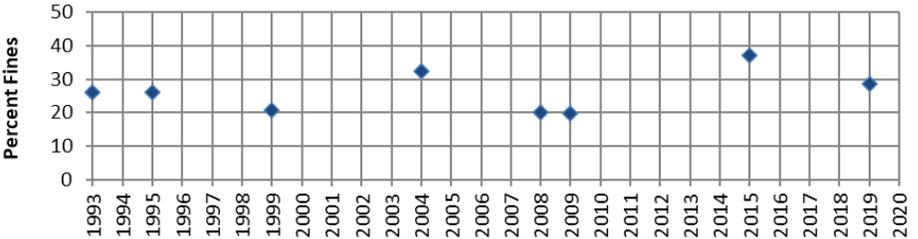
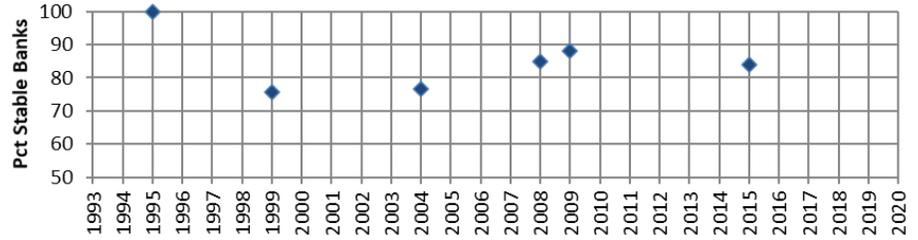
View Downstream (2019)

**LITTLE EIGHTMILE CREEK 1R**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		26.2	51
1994			
1995	100	26.1	75
1996			
1997			
1998			
1999	75.5	20.8	84
2000			
2001			
2002			
2003			
2004	76.5	32.5	72
2005			
2006			
2007			
2008	85.0	20.0	83
2009	88.0	19.8	66
2010			
2011			
2012			
2013			
2014			
2015	84.0	37.2	72
2016			
2017			
2018			
2019		28.6	75
2020			
2021			
2022			
2023			
n	6	8	8
Mean	84.8	26.4	72.3
St Dev	8.9	6.3	10.4
n	1	2	2
Mean	84.0	32.9	73.5
St Dev	-	6.1	2.1



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1999	15.5	2.1	9.5	-	2.4	vc gravel	E4b
2015	10	1.4	12.5	1.3	2.0	vc gravel	G4
2019	10.5	1.3	12.2	<1.2	2.0	Gravel	G4

**Reviewed Channel Type** **G4**

**10YR ALL**

**REMARKS**

This site has been sampled infrequently since 1993. Bank stability has ranged from 76% to 100%. Depth fines have been moderate, with a considerable increase in 2015 to 37%.

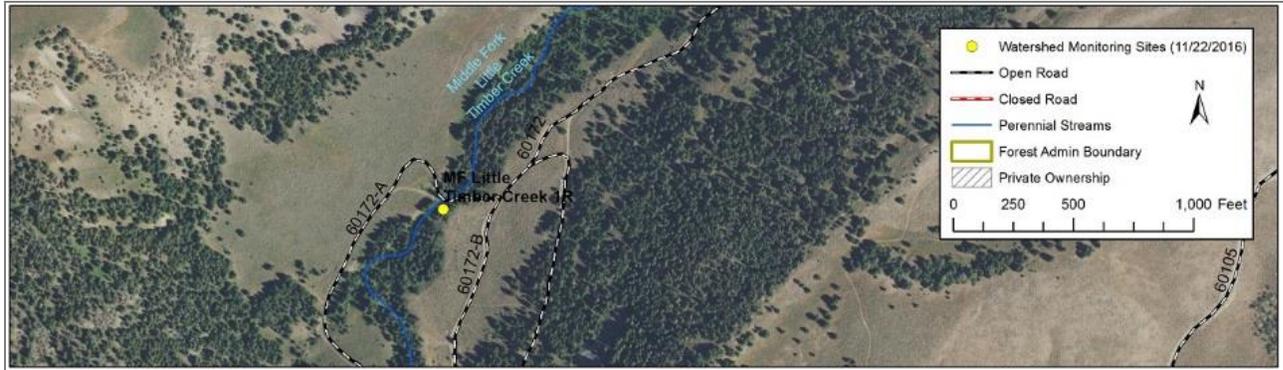
**MIDDLE FORK LITTLE TIMBER CREEK 1R**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	MF Little Timber Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is located about 7.5 miles SW of Leadore, at the Forest Boundary, about 1/3 mile downstream of Stone Reservoir. Access is via the Timber Cr Rd (FR105).		
<b>GPS Coordinates</b>	N 44.58452 (2019)	W -113.46504 (2019)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	7.3 sq mi 4,665 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	38 cfs	<b>Mean Annual Flow</b> (Streamstats)	5.3 cfs
<b>5th-level Watershed</b>	Timber Creek / 1706020404				
<b>Mean Basin Elevation</b>	8993 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	48%
<b>Length of Road</b>	2.2 mi	<b>Road Density</b>		0.30 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>	57.9%	
	<b>Volcanic</b>	3.2%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	25.3%	<b>Alluvium</b>	13.6%	
<b>% of Watershed in Active Allotment</b>	32.0%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2019)



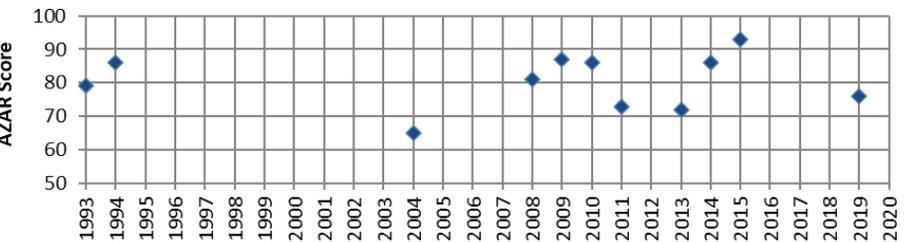
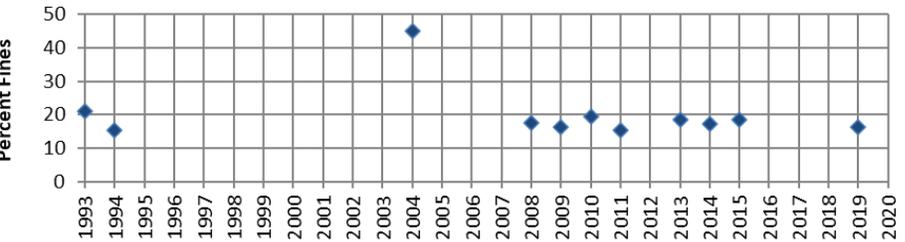
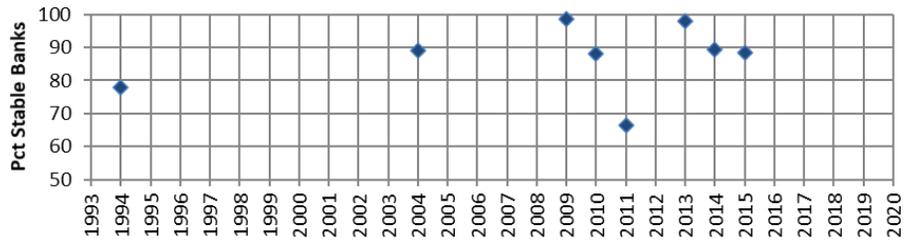
View Downstream (2019)

MIDDLE FORK LITTLE TIMBER CREEK 1R

Last Year Sampled: 2019

SITE DATA

Year	% Stable Banks	Percent Fines	AZAR Score
1993		21.1	79
1994	78.0	15.5	86
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004	89.0	45.0	65
2005			
2006			
2007			
2008		17.5	81
2009	98.5	16.3	87
2010	88.0	19.6	86
2011	66.5	15.3	73
2012			
2013	98.0	18.6	72
2014	89.5	17.2	86
2015	88.5	18.5	93
2016			
2017			
2018			
2019		16.4	76
2020			
2021			
2022			
2023			
n	8	11	11
Mean	87.0	20.1	80.4
St Dev	10.5	8.4	8.2
n	2	3	3
Mean	89.0	17.4	85.0
St Dev	0.7	1.1	8.5



CHANNEL MEASUREMENTS

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	15.5	2.3	13.5	1.1	5.5	Gravel	C4b
2019	19.5	3.4	19.3	<1.2	3.0	Gravel	C4b

Reviewed Channel Type **C4b**

10YR ALL

REMARKS

This site has been sampled periodically starting in 1993, then almost continuously since 2008. Bank stability has varied, but recent values have been high. Depth fines have been consistently low since 2008.

**NORTH FORK LITTLE TIMBER CREEK 1R**

**Last Year Sampled: 2021**

**SITE INFO**

<b>Site Name</b>	NF Little Timber Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is located about 7.6 miles SW of Leadore at the Forest Boundary. Access is via the NF Timber Creek Road (FR173) across private lands.		
<b>GPS Coordinates</b>	N 44.59584 (2021)	W -113.46466 (2021)	
<b>Site Comments</b>	Road access to this site requires permission to cross private lands. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	5.4 sq mi 3,478 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	27 cfs	<b>Mean Annual Flow</b> (Streamstats)	3.8 cfs
<b>5th-level Watershed</b>	Timber Creek / 1706020404				
<b>Mean Basin Elevation</b>	9020 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	47%
<b>Length of Road</b>	0.5 mi	<b>Road Density</b>		0.10 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>		80.4%
	<b>Volcanic</b>	0.2%	<b>Mixed</b>		0.0%
	<b>Sedimentary</b>	7.3%	<b>Alluvium</b>		12.2%
<b>% of Watershed in Active Allotment</b>	99.6%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (9/23/2021)**



**View Downstream (9/23/2021)**



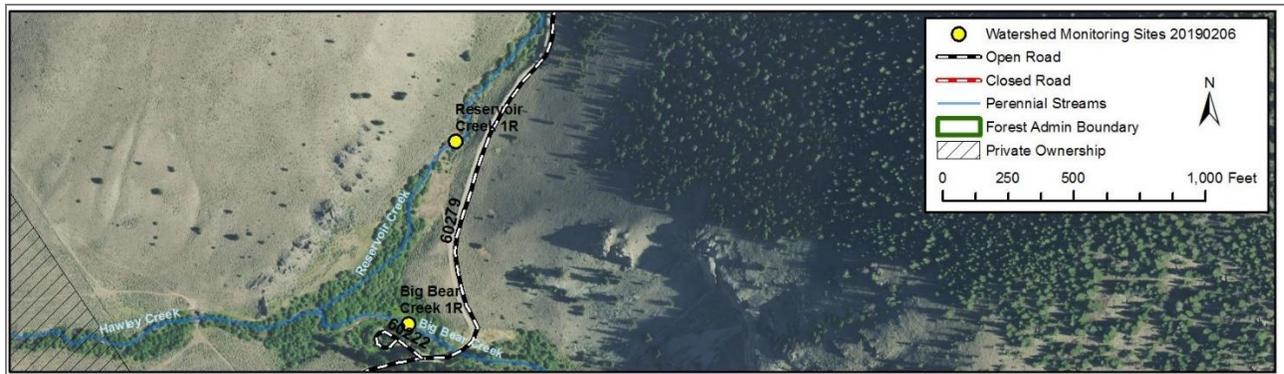
**RESERVOIR CREEK 1R**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Reservoir Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is located a short distance upstream of the mouth of Reservoir Creek at the confluence with Big Bear Creek. Access is via the Reservoir Creek Road (FR279), 0.3 miles from the Hawley Creek Road (FR275).		
<b>GPS Coordinates</b>	N 44.67894 (2023)	W -113.15753 (2023)	
<b>Site Comments</b>	5-year sampling frequency		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	13.2 sq mi 8,452 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	16 cfs	<b>Mean Annual Flow</b> (Streamstats)	6.3 cfs
<b>5th-level Watershed</b>	Hawley Creek / 1706020402				
<b>Mean Basin Elevation</b>	8274 ft	<b>Basin Aspect</b>	S	<b>Mean Basin Slope</b>	35%
<b>Length of Road</b>	12.0 mi	<b>Road Density</b>		0.91 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	29.1%	
	<b>Volcanic</b>	51.3%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	19.6%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	100%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

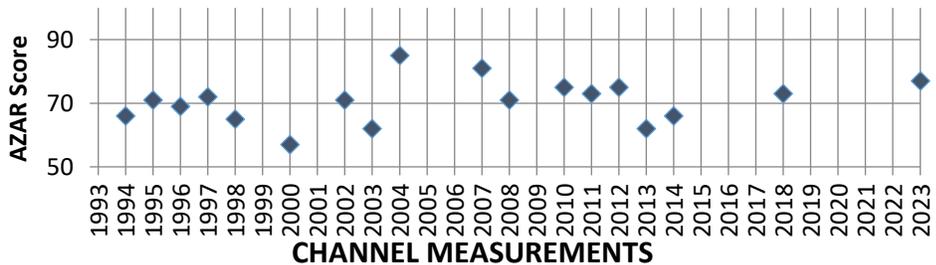
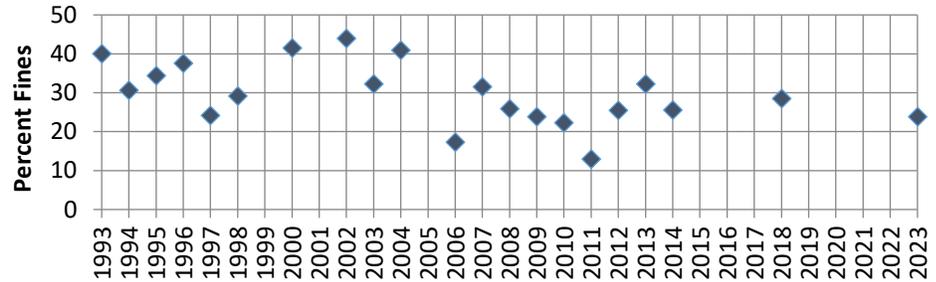
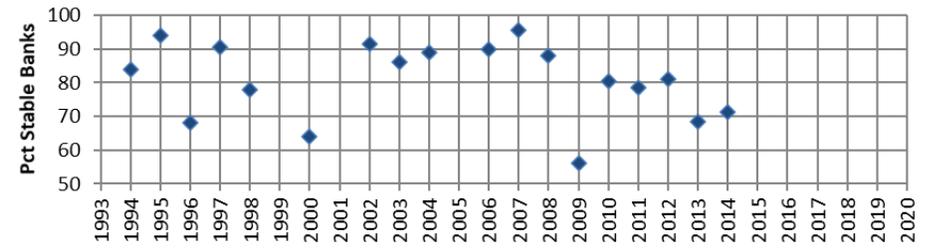
**RESERVOIR CREEK 1R**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993		40.1	46
1994	84.0	30.7	66
1995	94.0	34.4	71
1996	68.0	37.6	69
1997	90.5	24.2	72
1998	78.0	29.2	65
1999			
2000	64.0	41.5	57
2001			
2002	91.5	44.0	71
2003	86.0	32.3	62
2004	89.0	41.0	85
2005			
2006	90.0	17.3	
2007	95.5	31.6	81
2008	88.0	25.9	71
2009	56.0	23.9	43
2010	80.5	22.3	75
2011	78.5	13.0	73
2012	81.0	25.5	75
2013	68.5	32.3	62
2014	71.4	25.6	66
2015			
2016			
2017			
2018		28.5	73
2019			
2020			
2021			
2022			
2023		23.9	77
n	18	21	20
Mean	80.8	29.8	68.0
St Dev	11.3	8.1	10.4
n	1	3	3
Mean	71.4	26.0	72.0
St Dev	-	2.3	5.6

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	9.3	8.6	13.3	1.1	2	Gravel	C4
2018	10.5	6.9	11.5	1.2	1.6	Gravel	C4

**Reviewed Channel Type** **C4**

**REMARKS**

This site has been sampled most years since 1993. Bank stability has been variable, with recent values around 70% (low). Channel is incised downstream of reach (G4 channel type). Depth fines have showed a decreasing trend, with recent values around 24%.

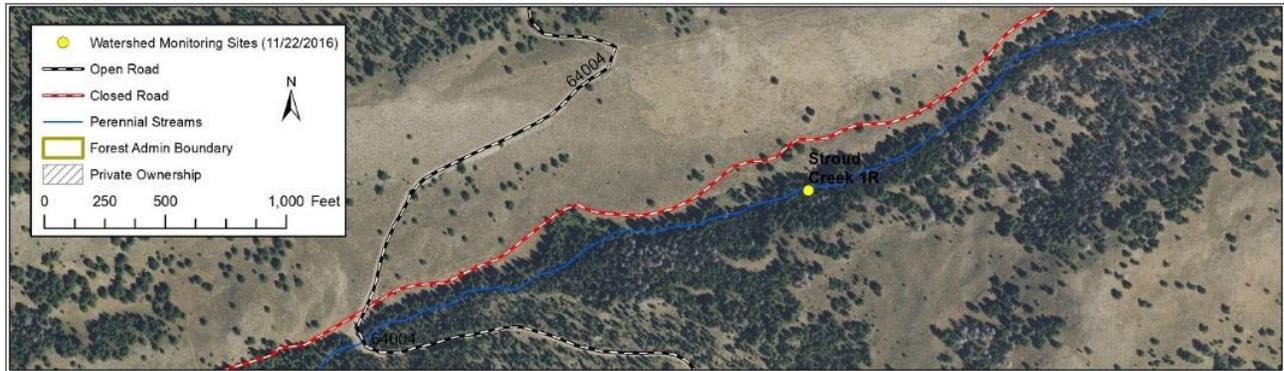
**STROUD CREEK 1R**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Stroud Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Lemhi	<b>Ranger District</b>	Leadore
<b>Site Location</b>	Site is located 0.4 mi downstream of the FR004 crossing and 0.7 miles upstream of the FS boundary. Access is via the Lee Creek Rd from Leadore to FR004.		
<b>GPS Coordinates</b>	N 44.65636 (2020)	W -113.56242 (2020)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	3.6 sq mi 2,297 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	17.3 cfs	<b>Mean Annual Flow</b> (Streamstats)	2.5 cfs
<b>5th-level Watershed</b>	Upper Lemhi River/1706020405				
<b>Mean Basin Elevation</b>	8790 ft	<b>Basin Aspect</b>	E	<b>Mean Basin Slope</b>	46%
<b>Length of Road</b>	4.1 mi	<b>Road Density</b>		1.13 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>		57.0%
	<b>Volcanic</b>	32.6%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		10.5%
<b>% of Watershed in Active Allotment</b>	99.7%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2020)



View Downstream (2020)

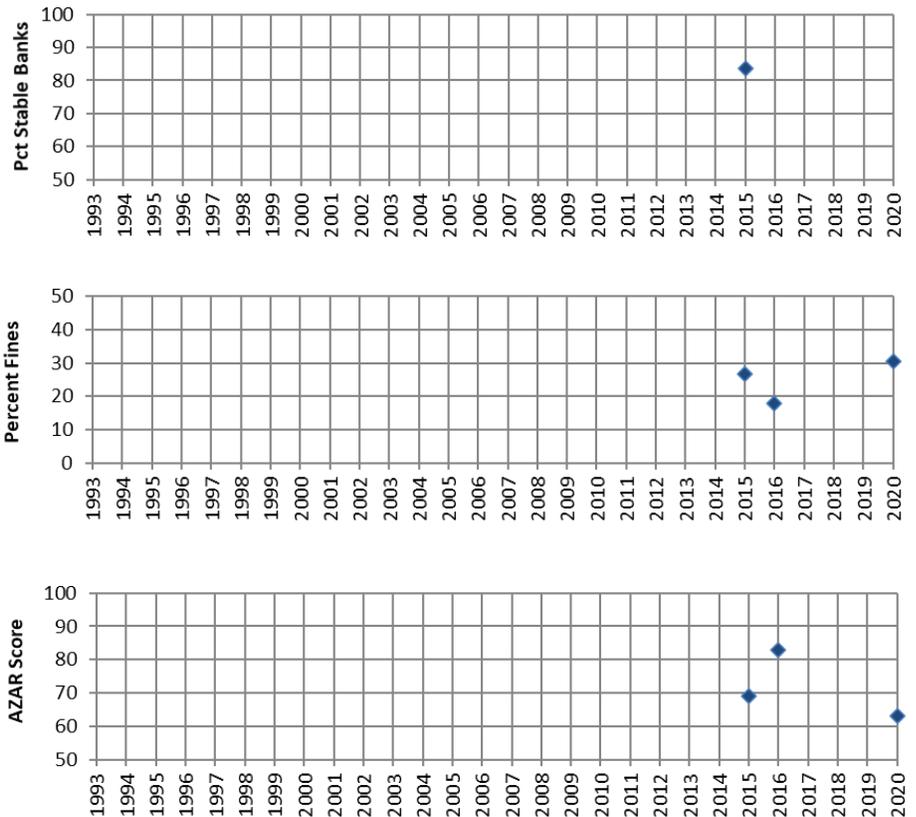
**STROUD CREEK 1R**

**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015	83.5	26.8	69
2016		17.9	83
2017			
2018			
2019			
2020		30.4	63
2021			
2022			
2023			
n	1	3	3
Mean	83.5	25.0	71.7
St Dev	-	6.4	10.3
n	1	3	3
Mean	83.5	25.0	71.7
St Dev	-	6.4	10.3

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	7.1	15.3	5.5	1.3	3	Gravel	C4b
2016	8.3	2.6	10.8	1.2	4	Gravel	C4b
2020	8.0	6.3	6.7	1.2-1.5	4.0	Gravel	C4b
Reviewed Channel Type							C4b

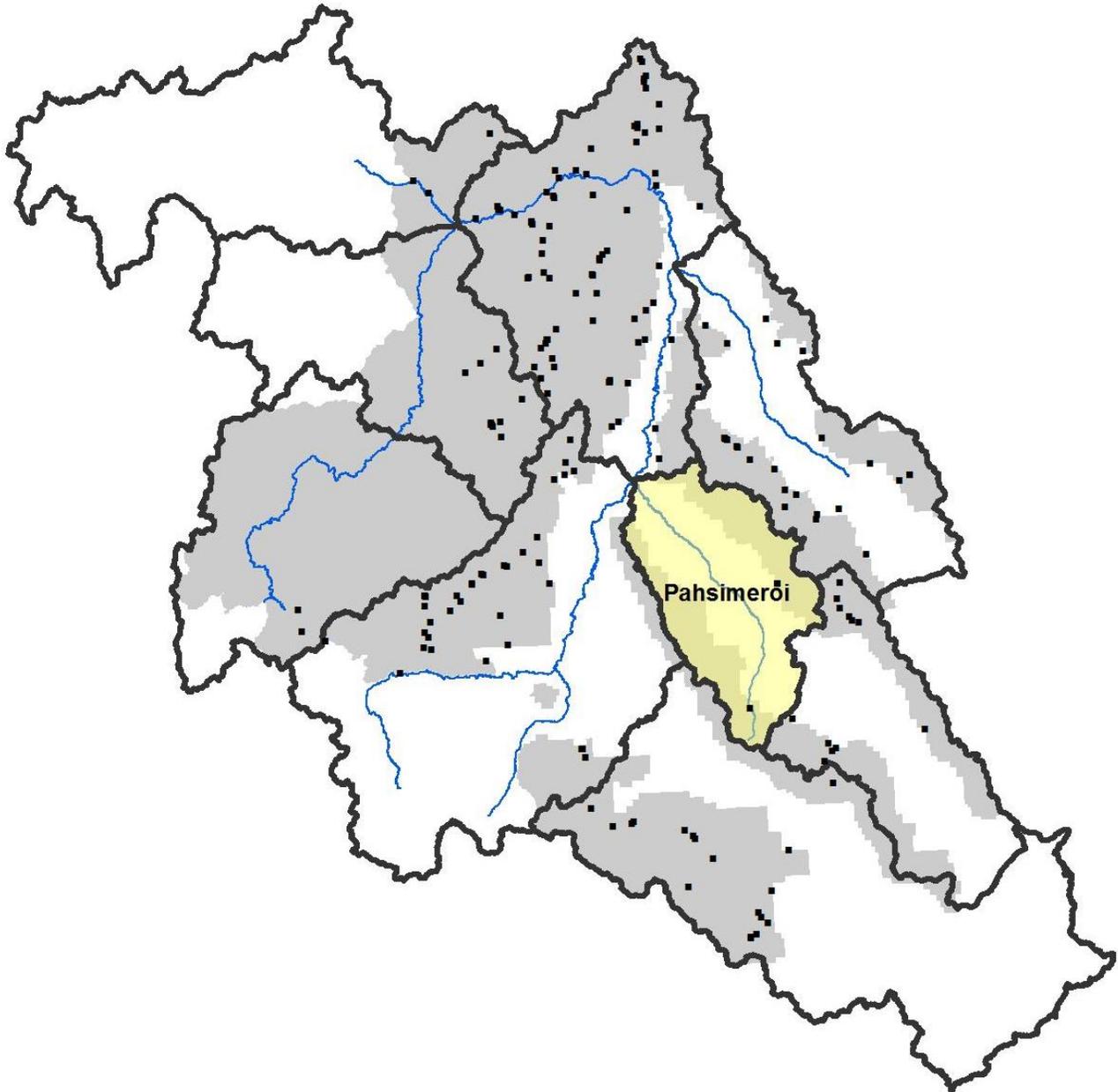
**REMARKS**

This site was established in 2015 in order to begin collecting baseline data. Initial data indicate moderate fines and high bank stability.



## PAHSIMEROI SUB-BASIN

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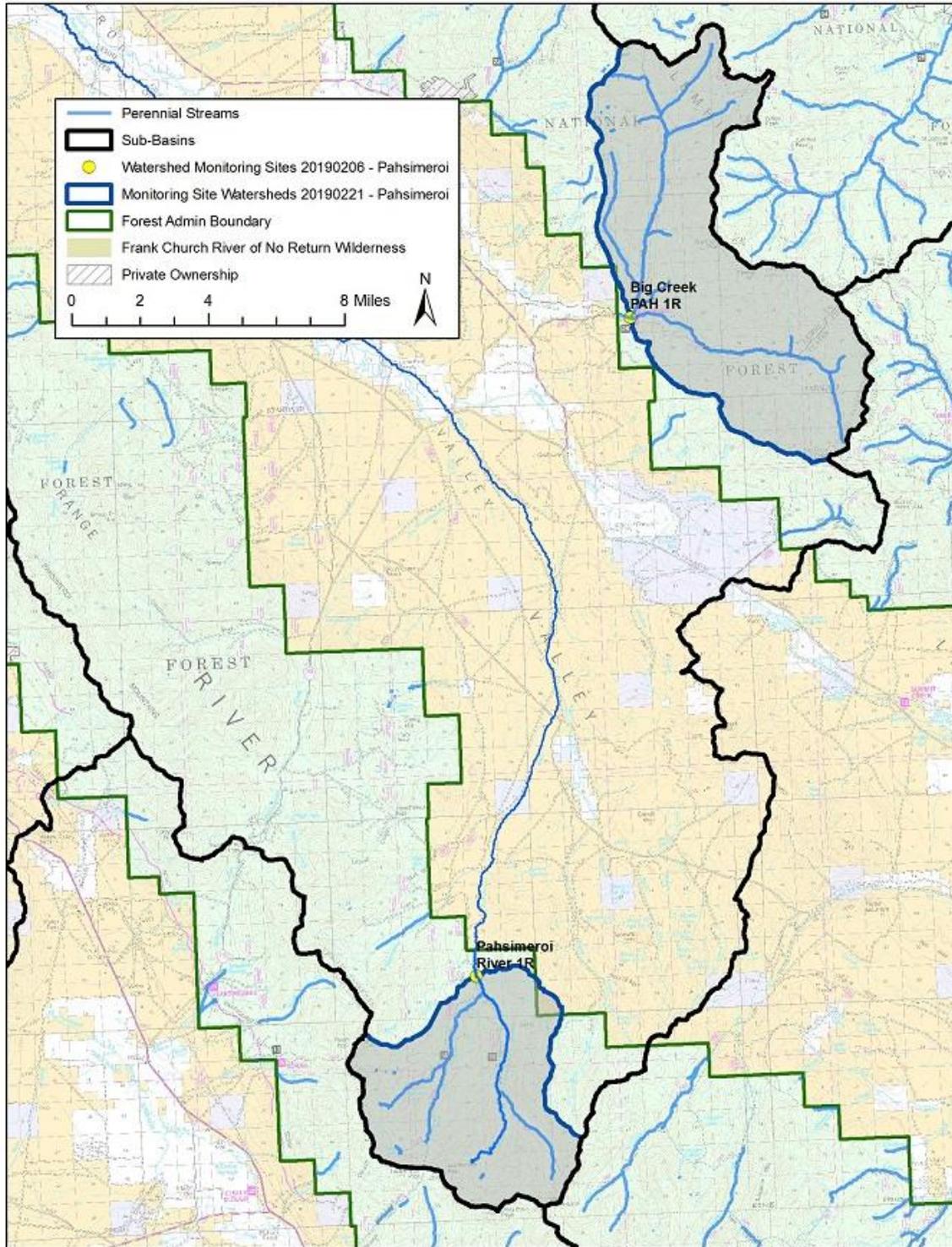


<b>Total acres within sub-basin</b>	<b>531,909</b>
<b>Percent of sub-basin within SCNF</b>	<b>46%</b>
<b>Active Monitoring Sites</b>	<b>2</b>
<b>Discontinued Monitoring Sites</b>	<b>2</b>
<b>Sites Monitored in 2023</b>	<b>1</b>



## Pahsimeroi River Watershed

A total of 2 active monitoring sites are located in the Pahsimeroi River watershed.



**BIG CREEK PAH 1R**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Big Creek PAH 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Pahsimeroi	<b>Ranger District</b>	Challis-Yankee
<b>Site Location</b>	Site is located approx. 0.4 miles upstream of the Forest Boundary, just downstream of the confluence with NF Big Creek. This is located approx. 3.6 miles up the Big Creek Road (FR097) from the Pahsimeroi Road.		
<b>GPS Coordinates</b>	N 44.44186 (2019)	W -113.60110 (2019)	
<b>Site Comments</b>	Cobble armor layer at site. 2019 site moved 300 ft downstream of 2017 site. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	53.9 sq mi 34,576 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	263 cfs	<b>Mean Annual Flow</b> (Streamstats)	38.9 cfs
<b>5th-level Watershed</b>	Middle Pahsimeroi / 1706020202				
<b>Mean Basin Elevation</b>	8830 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	50%
<b>Length of Road</b>	0.1 mi		<b>Road Density</b>	0.0 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%		<b>Quartzite</b>	81.1%
	<b>Volcanic</b>	18.9%		<b>Mixed</b>	0%
	<b>Sedimentary</b>	0%		<b>Alluvium</b>	0%
<b>% of Watershed in Active Allotment</b>	0%		<b>% of Watershed Burned (2018-2022)</b>	0%	

**SITE PHOTOS**



View Upstream (2019)



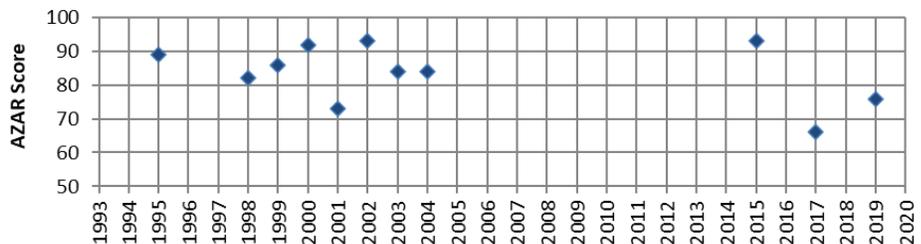
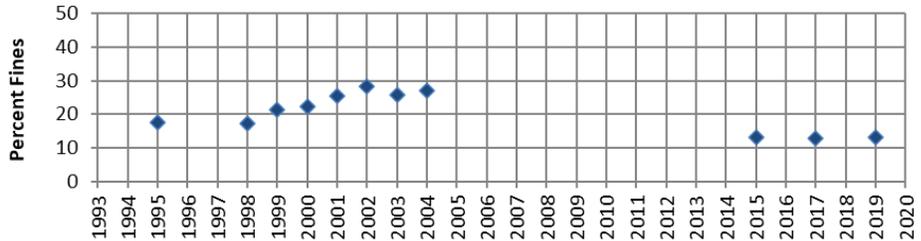
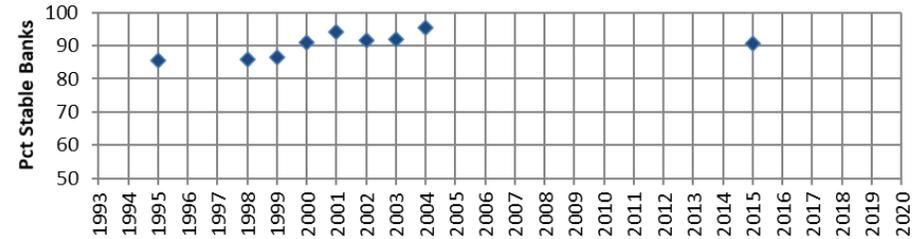
View Downstream (2019)

**BIG CREEK PAH 1R**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	85.5	17.7	89
1996			
1997			
1998	86.0	17.4	82
1999	86.5	21.5	86
2000	91.0	22.2	92
2001	94.0	25.6	73
2002	91.5	28.2	93
2003	92.0	25.8	84
2004	95.5	27.1	84
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015	90.5	13.3	93
2016			
2017		12.7	66
2018			
2019		13.1	76
2020			
2021			
2022			
2023			
n	9	11	11
Mean	90.3	20.4	83.5
St Dev	3.6	5.9	8.7
n	1	3	3
Mean	90.5	13.0	78.3
St Dev	-	0.3	13.7



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	38.5	1.4	32.1	1.3	1.5	Cobble	B3c
2017	30.6	5.9	21.9	1.1	1.7	Cobble	C3
2019	35	2.7	20.6	1.2-1.5	3.0	Cobble	C3

<b>Reviewed Channel Type</b>	<b>C3</b>
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**10YR ALL**

**REMARKS**

This site as sampled continuously from 1998 to 2004, then not again until 2015. Bank stability has been very high. Depth fines measured in 2015 and 2017 were low compared to past values. 1/16/2020: Updated watershed based on 2019 site location. Drainage area changed from 54.0 to 53.9 square miles, updated basin data for site.

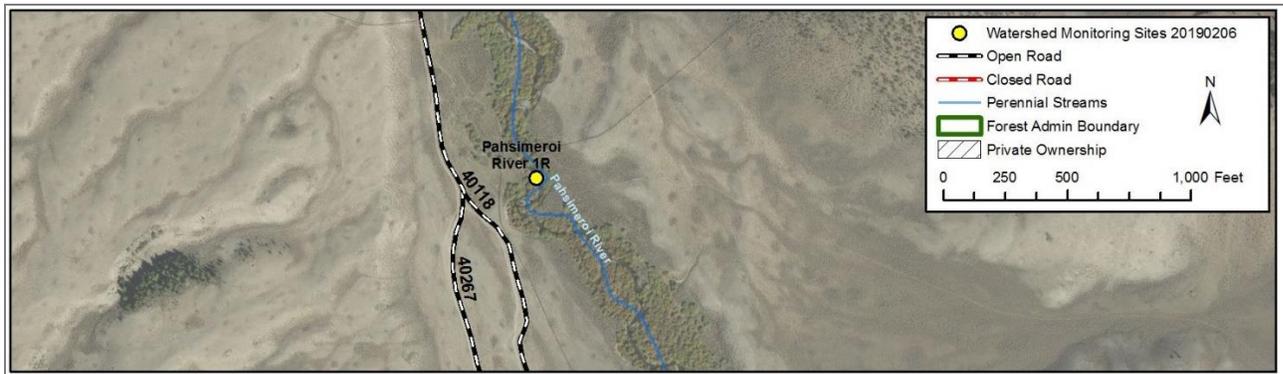
**PAHSIMEROI RIVER 1R**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Pahsimeroi River 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Pahsimeroi	<b>Ranger District</b>	Challis-Yankee
<b>Site Location</b>	Site is located a short distance downstream of the confluence of the EF Pahsimeroi and WF Pahsimeroi Rivers. Access is via the Upper Pahsimeroi Road (FR118). Follow FR 110.		
<b>GPS Coordinates</b>	N 44.16435 (2023)	W -113.70765 (2023)	
<b>Site Comments</b>	Difficult access via 4WD roads. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	31.6 sq mi 20,211 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	250 cfs	<b>Mean Annual Flow</b> (Streamstats)	26 cfs
<b>5th-level Watershed</b>	Upper Pahsimeroi River / 1706020201				
<b>Mean Basin Elevation</b>	9500 ft	<b>Basin Aspect</b>	N	<b>Mean Basin Slope</b>	55%
<b>Length of Road</b>	14.9 mi	<b>Road Density</b>		0.47 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	73.2%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	25.6%	<b>Alluvium</b>	1.2%	
<b>% of Watershed in Active Allotment</b>	98.3%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2023)



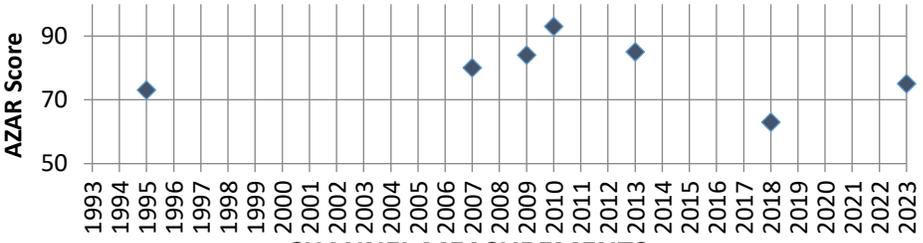
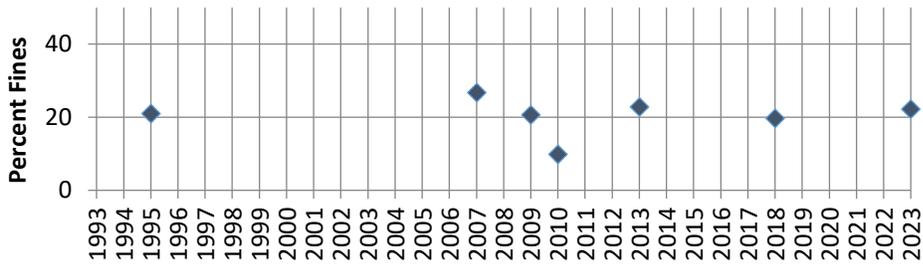
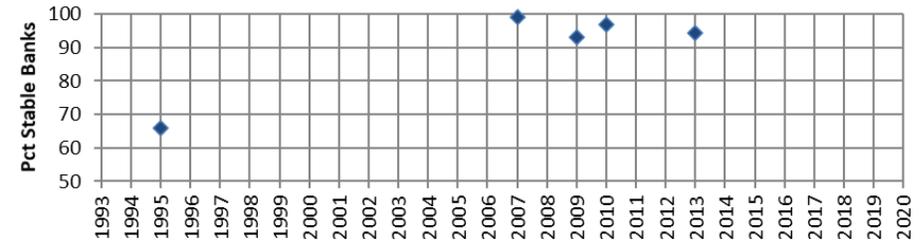
View Downstream (2023)

**PAHSIMEROI RIVER 1R**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	66.0	20.9	73
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007	99.0	26.7	80
2008			
2009	93.0	20.6	84
2010	97.0	9.8	93
2011			
2012			
2013	94.4	22.8	85
2014			
2015			
2016			
2017			
2018		19.6	63
2019			
2020			
2021			
2022			
2023		22.2	75
n	5	7	7
Mean	89.9	20.4	79.0
St Dev	13.5	5.2	9.7
n	0	2	2
Mean	-	20.9	69.0
St Dev	-	1.8	8.5



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1995	22	1.7	14.7	-	1.5	Sm cobble	B3c
2018	26.0	5.0	16.3	<1.2	0.5-2.0	Gravel	C4

**Reviewed Channel Type** **C4**

**ALL**

**10YR**

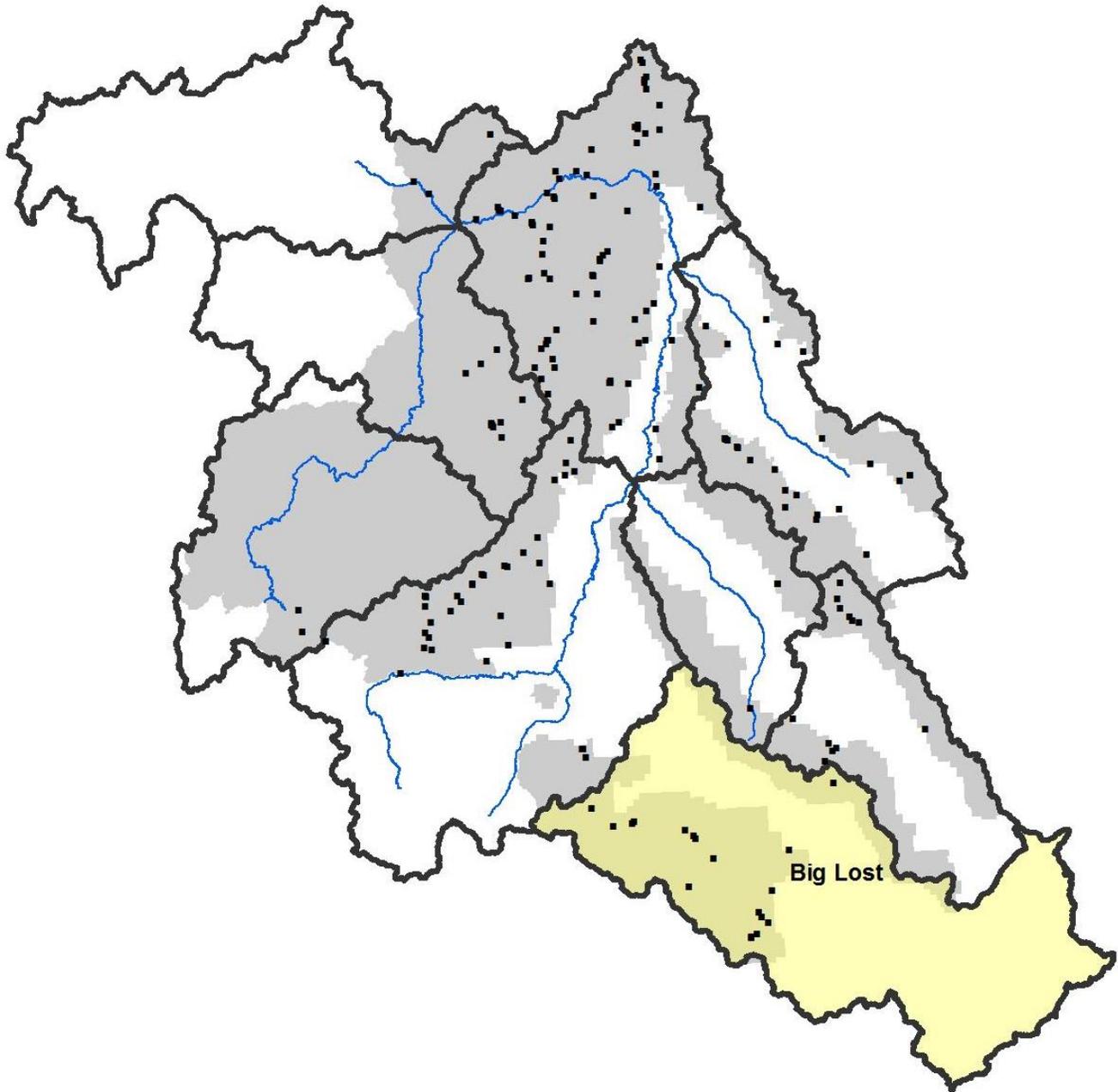
**REMARKS**

This site has been sampled periodically since 1995. Bank stability has been very high. Depth fines have been moderate. Site watershed and basin data edited 2/21/2019 to reflect actual location of monitoring site using 2018 GPS data. Previous GPS point was derived from inaccurate placement of point on paper map. Drainage area increased from 19,550 acres to 20,211 acres.



## BIG LOST SUB-BASIN

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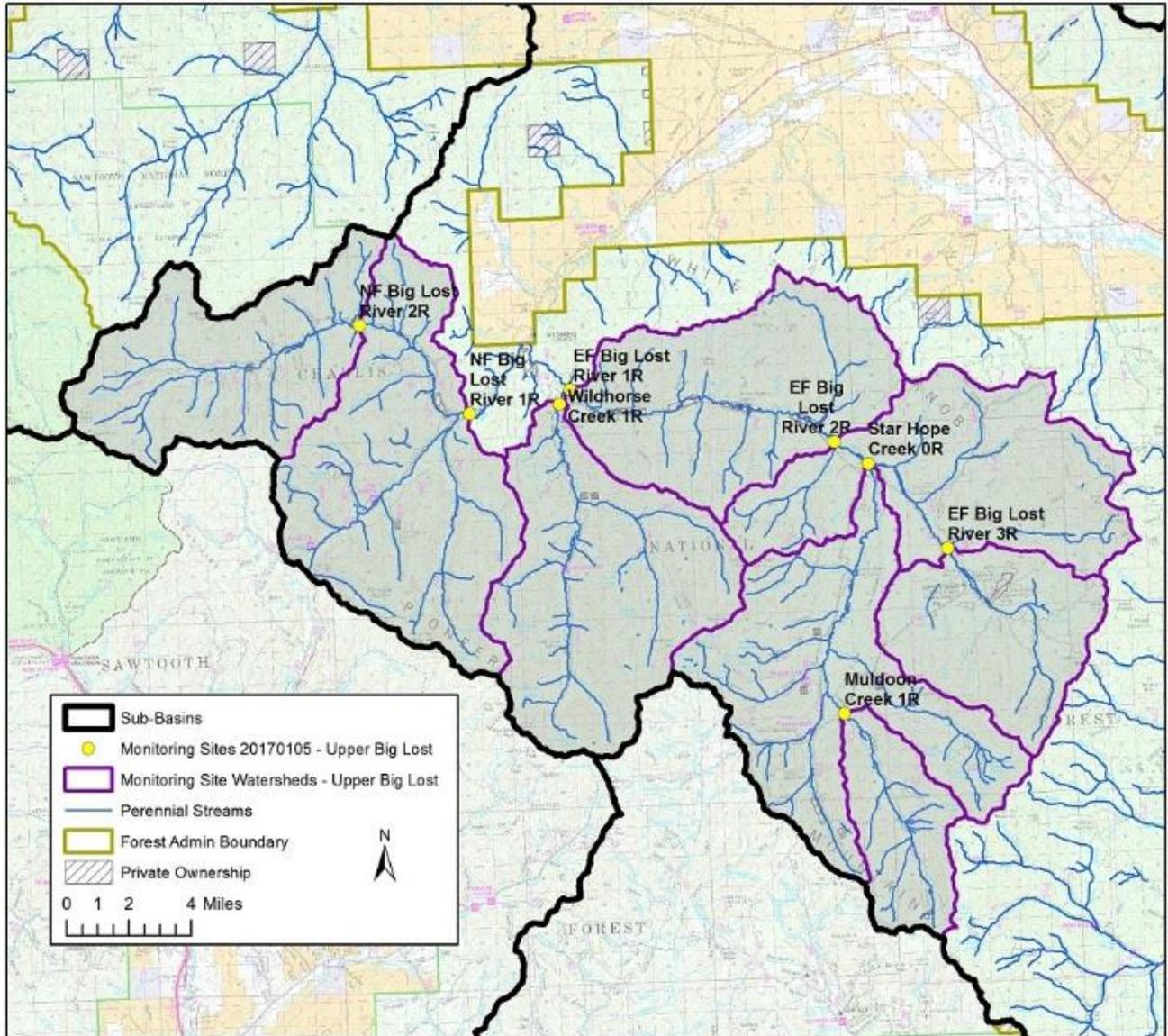


<b>Total ares within sub-basin</b>	<b>1,572,188</b>
<b>Percent of sub-basin within SCNF</b>	<b>35%</b>
<b>Active Monitoring Sites</b>	<b>15</b>
<b>Discontinued Monitoring Sites</b>	<b>3</b>
<b>Sites Monitored in 2023</b>	<b>7</b>



## Upper Big Lost River

A total of 8 active monitoring sites are located in the upper portion of the Big Lost River watershed.



**EAST FORK BIG LOST RIVER 1R**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	East Fork Big Lost River 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Big Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located approx. 0.15 miles upstream of the confluence with Wildhorse Creek, near the Wildhorse Guard Station. Access is via the Trail Creek Road FR208 and the Copper Basin Road FR135. Park at the Wildcat Canyon Trailhead.		
<b>GPS Coordinates</b>	N 43.90656 (2023)	W -114.08936 (2023)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	210.8 sq mi 134,894 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	573 cfs	<b>Mean Annual Flow</b> (Streamstats)	94.2 cfs
<b>5th-level Watershed</b>	East Fork Big lost River / 1704021802, Star Hope Creek / 1704021801				
<b>Mean Basin Elevation</b>	8649 ft	<b>Basin Aspect</b>	NW	<b>Mean Basin Slope</b>	35%
<b>Length of Road</b>	193.7 mi	<b>Road Density</b>		0.92 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	21.4%	<b>Quartzite</b>	17.2%	
	<b>Volcanic</b>	35.2%	<b>Mixed</b>	2.7%	
	<b>Sedimentary</b>	19.6%	<b>Alluvium</b>	3.9%	
<b>% of Watershed in Active Allotment</b>	99.3%	<b>% of Watershed Burned (2018-2022)</b>		0.3%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

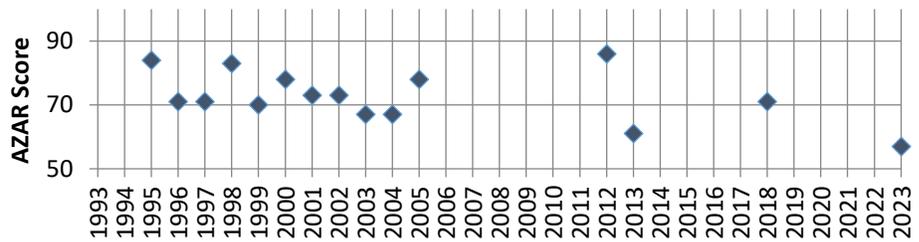
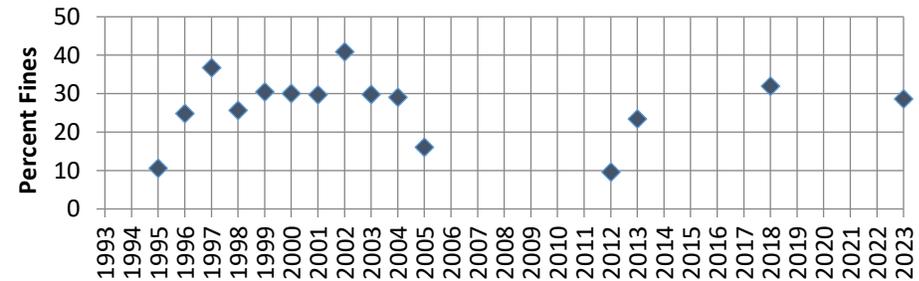
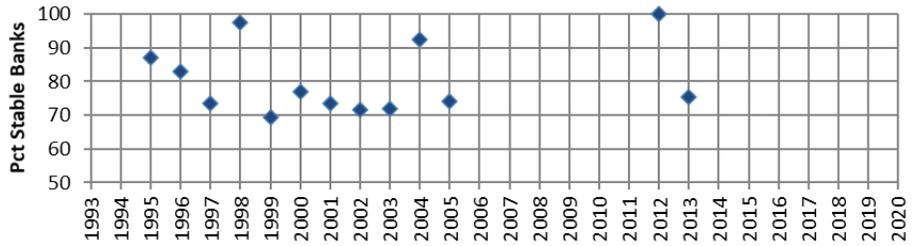
**EAST FORK BIG LOST RIVER 1R**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	87.0	10.6	84
1996	83.0	24.8	71
1997	73.5	36.7	71
1998	97.5	25.6	83
1999	69.5	30.4	70
2000	77.0	30.0	78
2001	73.5	29.7	73
2002	71.5	40.9	73
2003	72.0	29.8	67
2004	92.5	29.0	67
2005	74.0	16.0	78
2006			
2007			
2008			
2009			
2010			
2011			
2012	100	9.6	86
2013	75.5	23.4	61
2014			
2015			
2016			
2017			
2018		31.9	71
2019			
2020			
2021			
2022			
2023		28.6	57
<b>n</b>	13	15	15
<b>Mean</b>	80.5	26.5	72.7
<b>St Dev</b>	10.5	8.7	8.2
<b>n</b>	0	2	2
<b>Mean</b>	-	30.3	64.0
<b>St Dev</b>	-	2.3	9.9

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	59	1.5	31.9	1.2	1	Cobble	B3c
2003	61.2	-	40.8	-	0.5	-	-
2018	57.0	2.6	29.4	<1.2	0.5-2.0	Cobble	C3

**Reviewed Channel Type** **C3**

**REMARKS**

Bank stability has varied from 70 to 100%. Depth fines have varied from 10 to 40%.

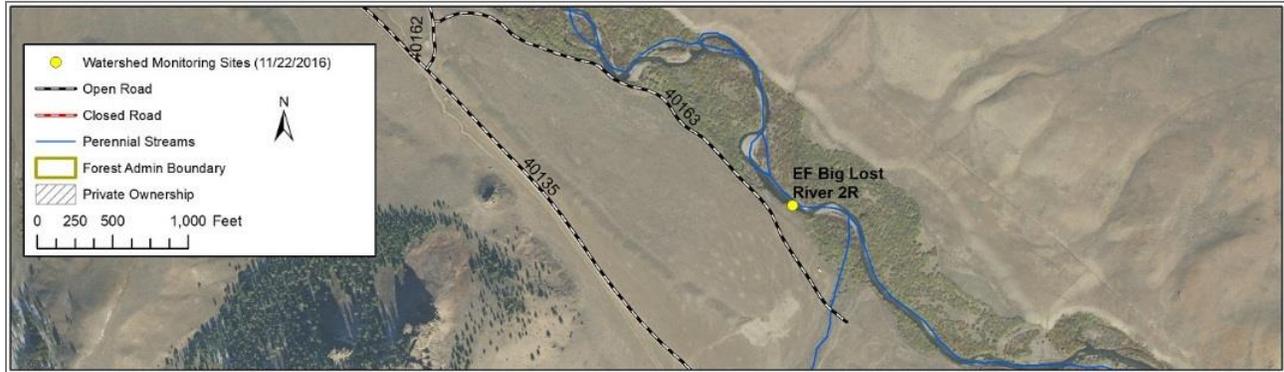
**EAST FORK BIG LOST RIVER 2R**

**Last Year Sampled: 2016**

**SITE INFO**

<b>Site Name</b>	EF Big Lost River 2R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Big Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located 1.8 miles downstream of the Star Hope Creek confluence. Access is via the Trail Creek Road FR208 and the Copper Basin Road FR135 (11.9 miles).		
<b>GPS Coordinates</b>	N 43.87777 (2016)	W -113.92063 (2016)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	159.7 sq mi 102,237 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	464 cfs	<b>Mean Annual Flow</b> (Streamstats)	69.4 cfs
<b>5th-level Watershed</b>	East Fork Big Lost River / 1704021802, Star Hope Creek / 1704021801				
<b>Mean Basin Elevation</b>	8780 ft	<b>Basin Aspect</b>	NW	<b>Mean Basin Slope</b>	34%
<b>Length of Road</b>		161.0 mi	<b>Road Density</b>		1.01 mi/sq mi
<b>Landtype Geology</b>	<b>Granitic</b>	27.9%	<b>Quartzite</b>	20.4%	
	<b>Volcanic</b>	24.0%	<b>Mixed</b>	3.6%	
	<b>Sedimentary</b>	19.0%	<b>Alluvium</b>	5.1%	
<b>% of Watershed in Active Allotment</b>	99.6%	<b>% of Watershed Burned (2018-2022)</b>		0.4%	

**SITE PHOTOS**



**View Upstream (2016)**



**View Downstream (2016)**

EF BIG LOST RIVER 2R

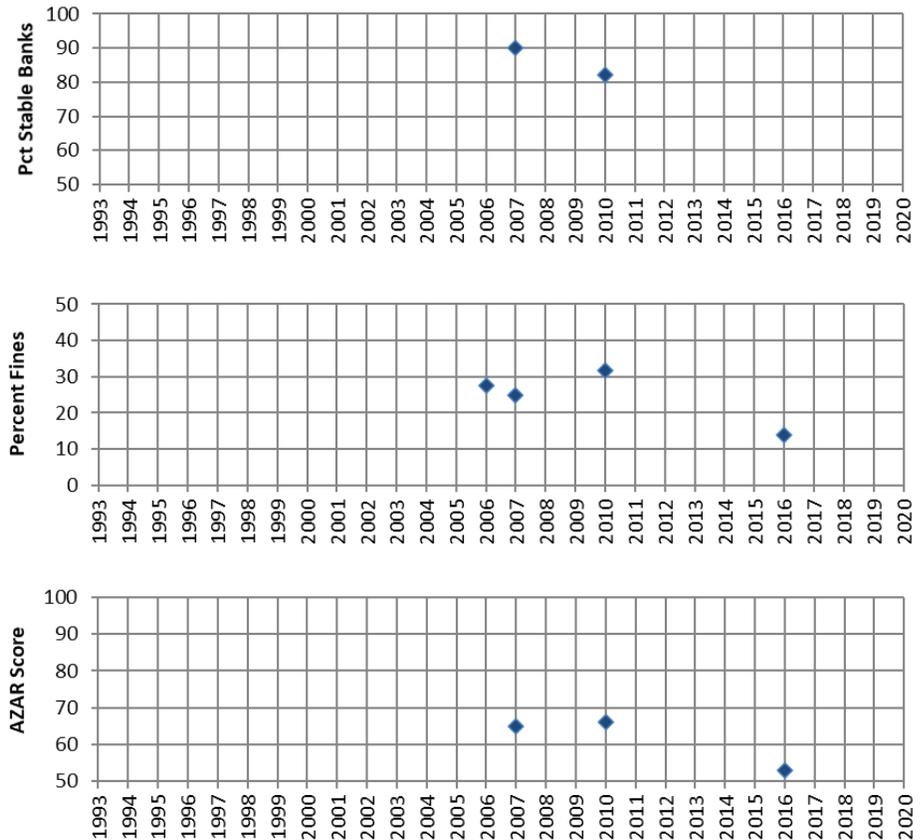
Last Year Sampled: 2016

SITE DATA

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006		27.6	
2007	90.0	24.8	65
2008			
2009			
2010	82.0	31.8	66
2011			
2012			
2013			
2014			
2015			
2016		14.0	53
2017			
2018			
2019			
2020			
2021			
2022			
2023			
n	2	4	3
Mean	86.0	24.6	61.3
St Dev	5.7	7.6	7.2
n	0	1	1
Mean	-	14.0	53.0
St Dev	-	-	-

ALL

10YR



CHANNEL MEASUREMENTS

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2016	59.2	2.3	40.5	1.2	<2	Cobble	C3
Reviewed Channel Type							C3

REMARKS

This site has been sampled only a handful of times, since 2006. Bank stability has been high, and depth fines have been around 30%. Site Watershed edited 11/30/16 to reflect actual location of sampling site (drainage area corrected from 160.5 sq mi to 159.5 sq mi). This site may not be necessary in addition to East Fork Big Lost River 1R and 3R – conditions are similar to the 1R site.

**EAST FORK BIG LOST RIVER 3R**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	EF Big Lost River 3R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Big Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located near the Copper Basin Guard Station. Access is via the Trail Creek Road FR208 and the Copper Basin Road FR135 (17 miles). Site is upstream of the Burma Road FR142.		
<b>GPS Coordinates</b>	N 43.82619 (2023)	W -113.85017 (2023)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	31.8 sq mi 20,377 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	82 cfs	<b>Mean Annual Flow</b> (Streamstats)	11.4 cfs
<b>5th-level Watershed</b>	East Fork Big Lost River / 1704021802				
<b>Mean Basin Elevation</b>	8640 ft	<b>Basin Aspect</b>	NW	<b>Mean Basin Slope</b>	28%
<b>Length of Road</b>	45.8 mi	<b>Road Density</b>		1.44 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	27.3%	<b>Quartzite</b>		13.1%
	<b>Volcanic</b>	18.3%	<b>Mixed</b>		10.8%
	<b>Sedimentary</b>	7.5%	<b>Alluvium</b>		23.0%
<b>% of Watershed in Active Allotment</b>	98.9%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**



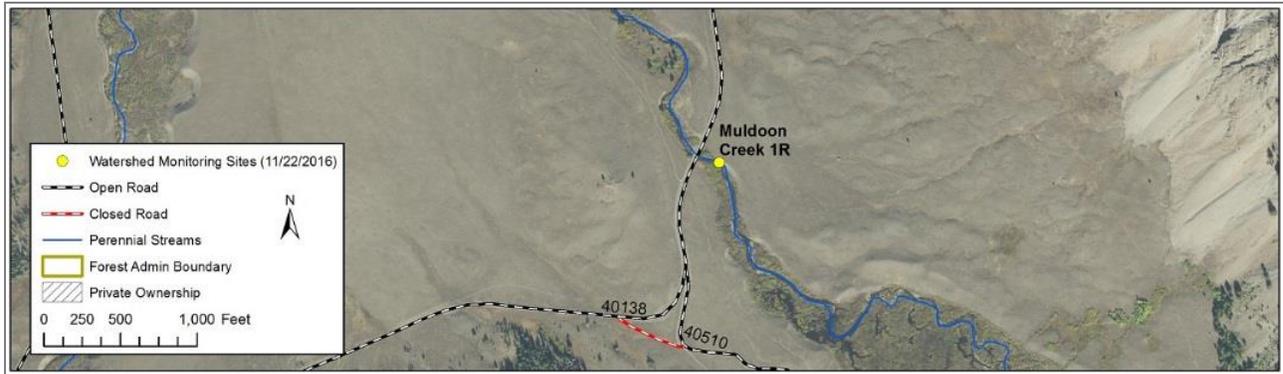
**MULDOON CREEK 1R**

**Last Year Sampled: 2021**

**SITE INFO**

<b>Site Name</b>	Muldoon Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Big Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Access is via the Trail Creek Road FR208, the Copper Basin Road FR135 (13 miles), and the Copper Basin Loop Road FR138 (10.5 miles). Site is about 1 mile east of Star Hope Campground, just upstream of the FR138 culvert.		
<b>GPS Coordinates</b>	N 43.75089 (2021)	W -113.92052 (2021)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	19.0 sq mi 12,156 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	110 cfs	<b>Mean Annual Flow</b> (Streamstats)	12 cfs
<b>5th-level Watershed</b>	Star Hope Creek / 1704021801				
<b>Mean Basin Elevation</b>	9131 ft	<b>Basin Aspect</b>	N	<b>Mean Basin Slope</b>	44%
<b>Length of Road</b>	13.1 mi	<b>Road Density</b>		0.69 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	31.1%	<b>Quartzite</b>	18.3%	
	<b>Volcanic</b>	5.1%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	45.5%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	99.9%	<b>% of Watershed Burned (2018-2022)</b>		0.3%	

**SITE PHOTOS**



**View Upstream (7/14/2021)**



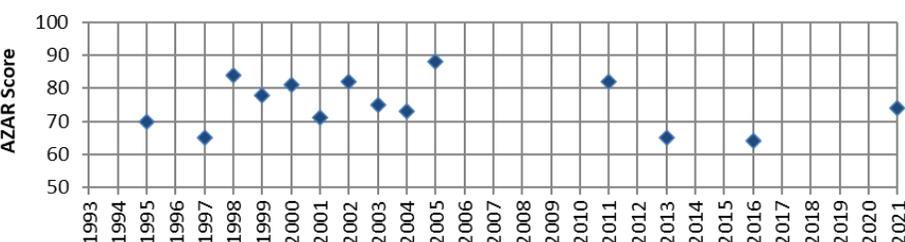
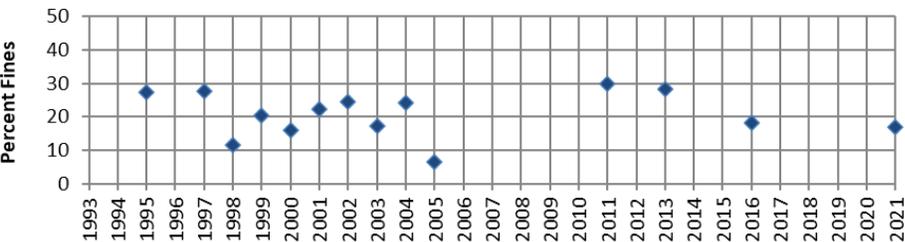
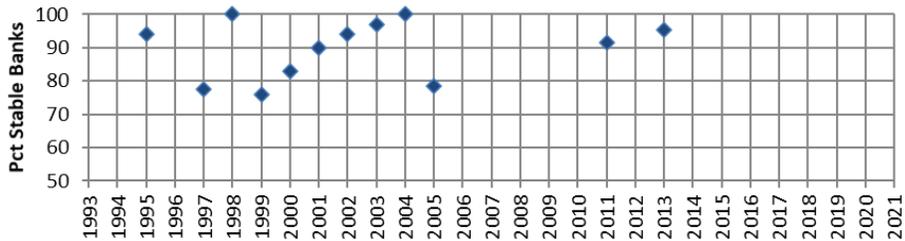
**View Downstream (7/14/2021)**

MULDOON CREEK 1R

Last Year Sampled: 2021

SITE DATA

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	94.0	27.2	70
1996			
1997	77.5	27.5	65
1998	100	11.7	84
1999	76.0	20.5	78
2000	83.0	16.0	81
2001	90.0	22.3	71
2002	94.0	24.5	82
2003	97.0	17.1	75
2004	100	24.3	73
2005	78.5	6.6	88
2006			
2007			
2008			
2009			
2010			
2011	91.5	30.0	82
2012			
2013	95.5	28.3	65
2014			
2015			
2016		18.3	64
2017			
2018			
2019			
2020			
2021		17.0	74
2022			
2023			
n	12	14	14
Mean	89.8	20.8	75.1
St Dev	8.8	6.8	7.6
n	0	2	2
Mean	-	17.7	69.0
St Dev	-	0.9	7.1



CHANNEL MEASUREMENTS

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	39	2.56	27.9	1.1	1	Cobble	C3
2016	28.3	2.3	30.3	1.3	1	Gravel	C4

Reviewed Channel Type **C4**

10YR ALL

REMARKS

This site was monitored continuously from 1995 to 2005, then periodically since 2005. Bank stability has been very high in recent years. Depth fines have been consistently below 30%.

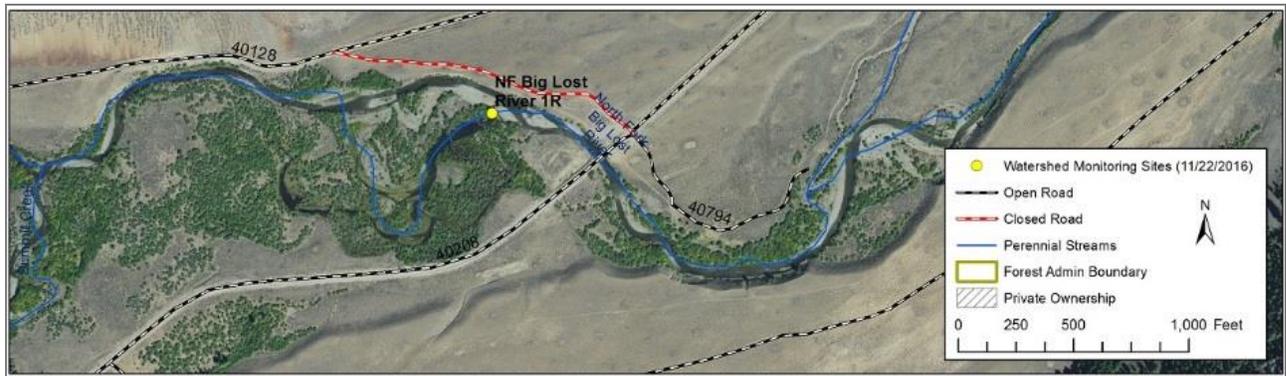
**NORTH FORK BIG LOST RIVER 1R**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	North Fork Big Lost River 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Big Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located about a half mile downstream of the Summit Creek confluence. Access is via the Trail Creek Road FR208 (18.7 miles) and the North Fork Big Lost River Road FR627 (0.1 miles).		
<b>GPS Coordinates</b>	N 43.89718 (2023)	W -114.15553 (2023)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	107.0 sq mi 68,469 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	621 cfs	<b>Mean Annual Flow</b> (Streamstats)	70.3 cfs
<b>5th-level Watershed</b>	North Fork Big Lost River / 1704021803				
<b>Mean Basin Elevation</b>	8737 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	47%
<b>Length of Road</b>	93.3 mi	<b>Road Density</b>		0.87 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	26.5%	<b>Quartzite</b>	9.6%	
	<b>Volcanic</b>	29.3%	<b>Mixed</b>	4.4%	
	<b>Sedimentary</b>	30.2%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	40.7%	<b>% of Watershed Burned (2018-2022)</b>		0.6%	

**SITE PHOTOS**



View Upstream (2023)



View Downstream (2023)

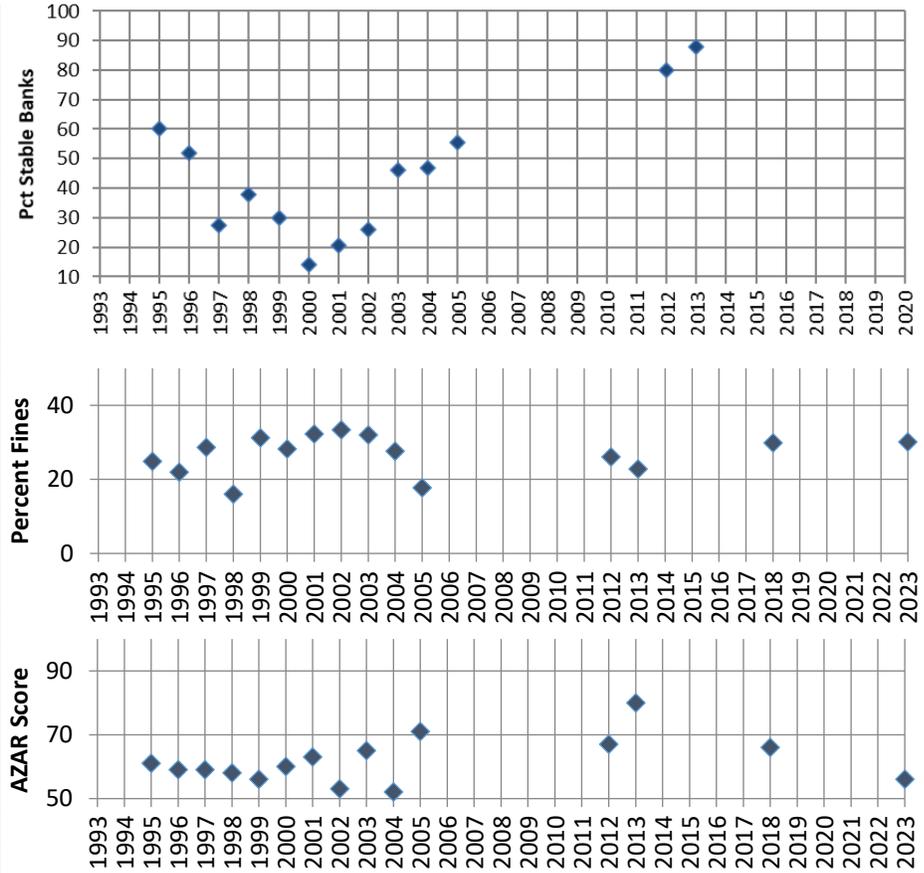
**NORTH FORK BIG LOST RIVER 1R**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	60.0	24.8	61
1996	52.0	21.9	59
1997	27.5	28.6	59
1998	38.0	16.0	58
1999	30.0	31.2	56
2000	14.0	28.2	60
2001	20.5	32.2	63
2002	26.0	33.3	53
2003	46.0	32.0	65
2004	47.0	27.6	52
2005	55.5	17.7	71
2006			
2007			
2008			
2009			
2010			
2011			
2012	80.0	26.0	67
2013	88.0	22.8	80
2014			
2015			
2016			
2017			
2018		29.8	66
2019			
2020			
2021			
2022			
2023		30.1	56
n	13	15	15
Mean	45.0	26.8	61.7
St Dev	22.3	5.3	7.3
n	0	2	2
Mean	-	30.0	61.0
St Dev	-	0.2	7.1

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	60.0	9.1	41.3	1.4	1	Cobble	C3
2018	82.0	2.7	56.6	<1.2	0.5-2.0	Cobble	C3

**Reviewed Channel Type** **C3**

**REMARKS**

This site was sampled continuously from 1995 to 2005, then intermittently. Bank stability in the past was very low, ranging from 13% to 60%, but recent years have shown improvement to values greater than 80%. Depth fines have been fairly consistent, generally between 20 and 30%.

**NORTH FORK BIG LOST RIVER 2R**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	NF Big Lost River 2R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Big Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located 5+ miles upstream of the confluence with Summit Creek. Access is via the Trail Creek Road FR208 (18.7 miles) and the North Fork Big Lost River Road FR128 (5.6 miles).		
<b>GPS Coordinates</b>	N 43.93966 (2020)	W -114.22335 (2020)	
<b>Site Comments</b>	5-year sampling frequency.		

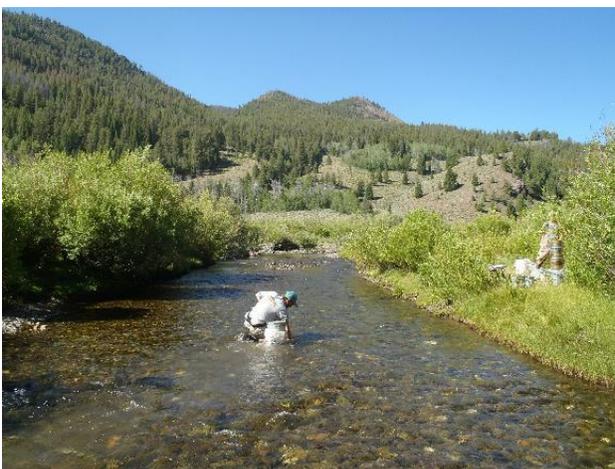
**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	43.8 sq mi 28,063 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	356 cfs	<b>Mean Annual Flow</b> (Streamstats)	28.6 cfs
<b>5th-level Watershed</b>	North Fork Big Lost River / 1704021803				
<b>Mean Basin Elevation</b>	8888 ft	<b>Basin Aspect</b>	E	<b>Mean Basin Slope</b>	46%
<b>Length of Road</b>	35.8 mi	<b>Road Density</b>		0.82 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	26.6%	<b>Quartzite</b>	5.8%	
	<b>Volcanic</b>	37.1%	<b>Mixed</b>	7.7%	
	<b>Sedimentary</b>	22.9%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	14.6%	<b>% of Watershed Burned (2018-2022)</b>		1.4%	

**SITE PHOTOS**



View Upstream (2020)



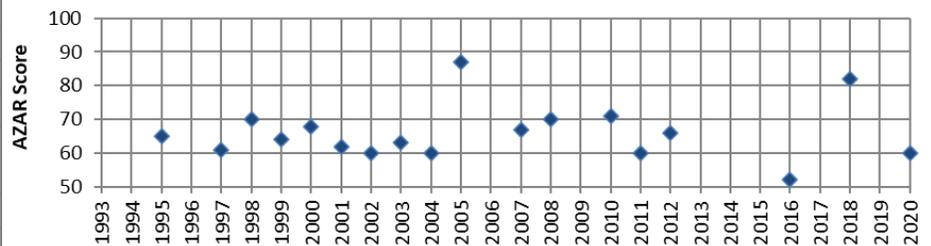
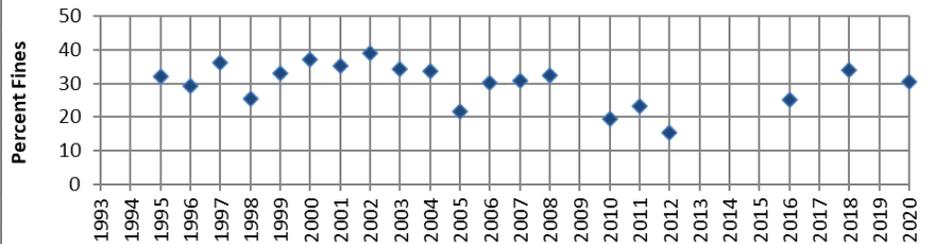
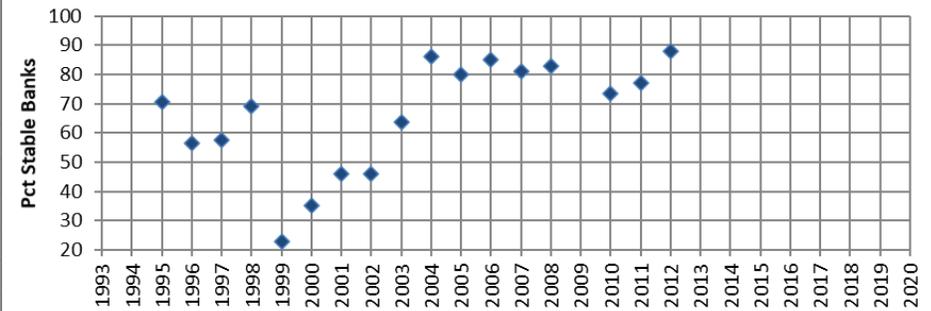
View Downstream (2020)

**NORTH FORK BIG LOST RIVER 2R**

**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	70.5	32.1	65
1996	56.5	29.1	
1997	57.5	36.0	61
1998	69.0	25.3	70
1999	23.0	32.9	64
2000	35.0	37.1	68
2001	46.0	35.3	62
2002	46.0	39.0	60
2003	63.5	34.2	63
2004	86.0	33.7	60
2005	80.0	21.5	87
2006	85.0	30.1	
2007	81.0	30.8	67
2008	83.0	32.3	70
2009			
2010	73.5	19.4	71
2011	77.0	23.1	60
2012	88.0	15.4	66
2013			
2014			
2015			
2016		25.1	52
2017			
2018		33.8	82
2019			
2020		30.5	60
2021			
2022			
2023			
n	17	20	18
Mean	65.9	29.8	66.0
St Dev	19.3	6.3	8.2
n	0	3	3
Mean	-	29.8	64.7
St Dev	-	4.4	15.5



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1995	23	4.8	12.1	2.8	<1	Gravel	C4
2016	20.1	3.5	19.9	1.2	<2	Gravel	C4
2018	27.5	3.7	21.5	>1.5	0.5-2.0	Gravel	C4
2020	40.5	3.1	32.7	>1.5	0.5-2.0	Gravel	C4

**Reviewed Channel Type** **C4**

**10YR ALL**

**REMARKS**

This site was sampled nearly continuously from 1995 to 2012. Bank stability has shown an increasing trend, with past values as low as 22% and recent values greater than 70%. Depth fines have been generally between 20 and 40%.

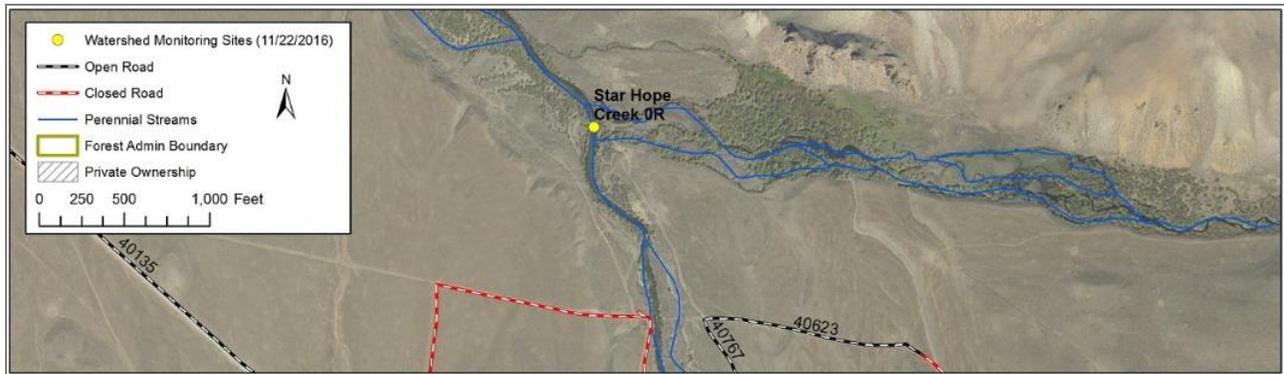
**STAR HOPE CREEK OR**

**Last Year Sampled: 2021**

**SITE INFO**

<b>Site Name</b>	Star Hope Creek OR	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Big Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located just upstream of the mouth of Star Hope Creek at East Fork Big Lost River. Access is via the Trail Creek Road FR208 (18.4 miles) and the Copper Basin Road FR135 (13.7 miles).		
<b>GPS Coordinates</b>	N 43.86707 (2021)	W -113.89922 (2021)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	76.1 sq mi 48,674 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	288 cfs	<b>Mean Annual Flow</b> (Streamstats)	37 cfs
<b>5th-level Watershed</b>	Star Hope Creek / 1704021801				
<b>Mean Basin Elevation</b>	8939 ft	<b>Basin Aspect</b>	N	<b>Mean Basin Slope</b>	55%
<b>Length of Road</b>	58.8 mi	<b>Road Density</b>		0.77 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	43.8%	<b>Quartzite</b>	27.9%	
	<b>Volcanic</b>	8.3%	<b>Mixed</b>	3.0%	
	<b>Sedimentary</b>	16.9%	<b>Alluvium</b>	0.1%	
<b>% of Watershed in Active Allotment</b>	99.7%	<b>% of Watershed Burned (2018-2022)</b>		0.8%	

**SITE PHOTOS**



**View Upstream (7/15/2021)**



**View Downstream (7/15/2021)**

**STAR HOPE CREEK OR**

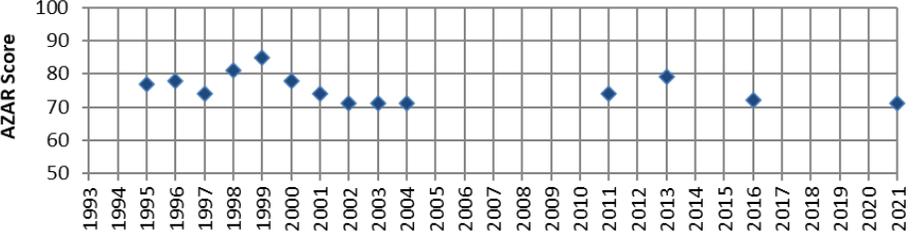
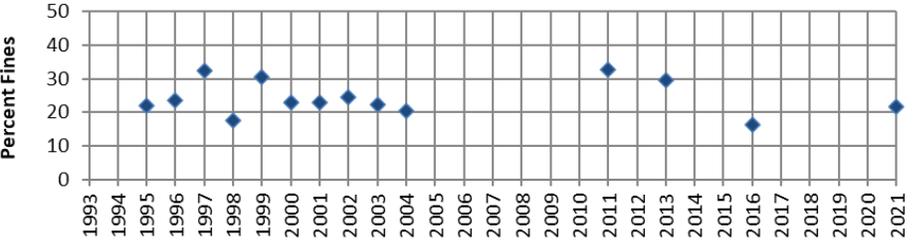
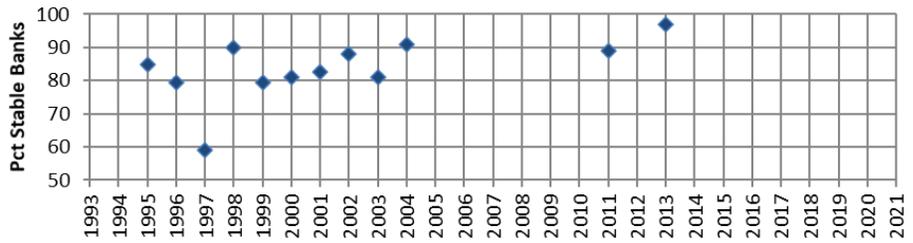
**Last Year Sampled: 2016**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	85.0	21.9	77
1996	79.5	23.4	78
1997	59.0	32.3	74
1998	90.0	17.5	81
1999	79.5	30.6	85
2000	81.0	23.0	78
2001	82.5	22.9	74
2002	88.0	24.6	71
2003	81.0	22.4	71
2004	91.0	20.4	71
2005			
2006			
2007			
2008			
2009			
2010			
2011	89.0	32.6	74
2012			
2013	97.0	29.7	79
2014			
2015			
2016		16.3	72
2017			
2018			
2019			
2020			
2021		21.8	71
2022			
2023			
n	12	14	14
Mean	83.5	24.2	75.4
St Dev	9.4	5.2	4.4
n	0	2	2
Mean	-	19.1	71.5
St Dev	-	3.9	0.7

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	50.5	2.7	23.5	1.1	1	Cobble	C3
2016	49.2	1.6	30.8	1.2	2	Cobble	C3

<b>Reviewed Channel Type</b>	<b>C3</b>
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**REMARKS**

Bank stability has shown an increasing trend, with recent values very high. Depth fines have varied between 17 and 32%. Note: Pre-2015 GIS point was located downstream of EF Big Lost River, and watershed included EF Big Lost River. Relocated GIS point to Star Hope Creek just upstream of confluence with EF Big Lost and delineated new watershed on 6/18/15. Basin data reflect corrected watershed delineation. However, some flow from EF Big Lost River may join Star Hope Creek upstream of the monitoring site.

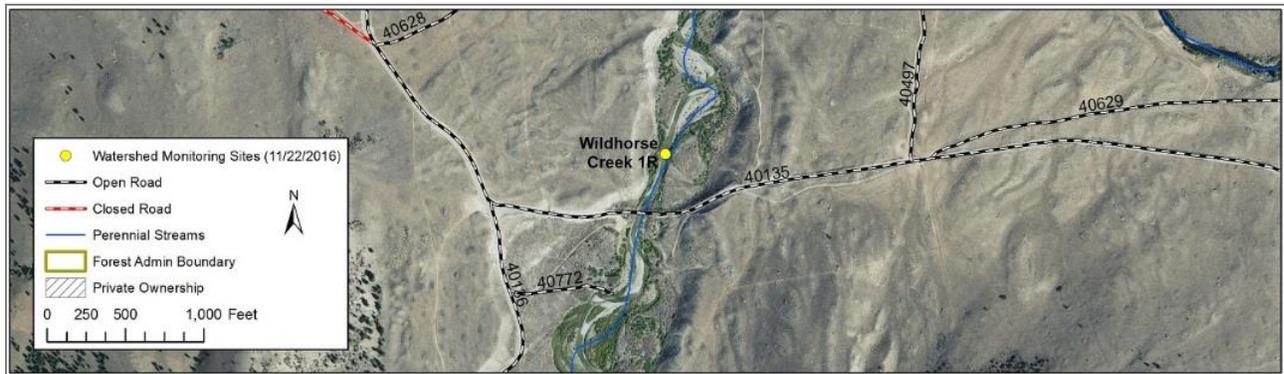
**WILDHORSE CREEK 1R**

**Last Year Sampled: 2020**

**SITE INFO**

<b>Site Name</b>	Wildhorse Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Big Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is 0.6 miles upstream of the confluence with EF Big Lost River, 1 mile north of the Wildhorse Guard Station. Access is via the Trail Creek Rd FR208 and the Copper Basin Rd FR135. Site is 200 feet downstream of the FR135 bridge.		
<b>GPS Coordinates</b>	N 43.89991 (2020)	W -114.09663 (2020)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	56.8 sq mi 36,378 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	374 cfs	<b>Mean Annual Flow</b> (Streamstats)	46.1 cfs
<b>5th-level Watershed</b>	East Fork Big Lost River / 1704021802				
<b>Mean Basin Elevation</b>	9247 ft	<b>Basin Aspect</b>	N	<b>Mean Basin Slope</b>	55%
<b>Length of Road</b>	23.7 mi	<b>Road Density</b>		0.42 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	62.4%	<b>Quartzite</b>	27.9%	
	<b>Volcanic</b>	3.3%	<b>Mixed</b>	1.9%	
	<b>Sedimentary</b>	4.5%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	20.9%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2020)



View Downstream (2020)

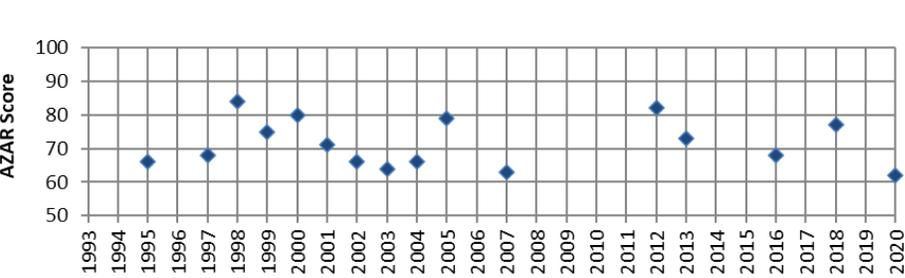
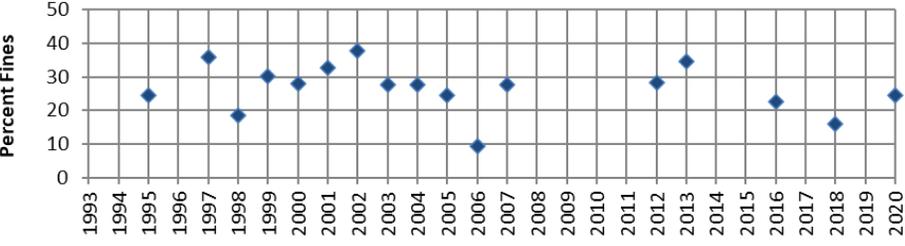
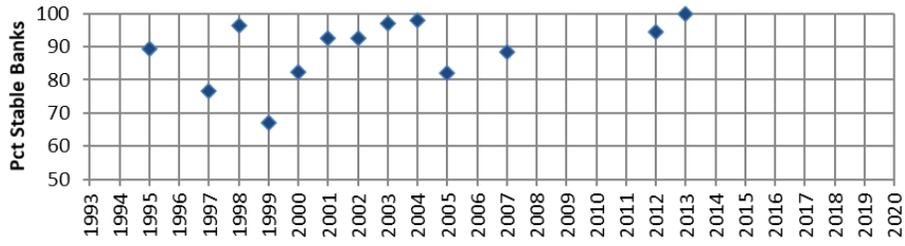
**WILDHORSE CREEK 1R**

**Last Year Sampled: 2020**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	89.5	24.5	66
1996			
1997	76.5	36.0	68
1998	96.5	18.5	84
1999	67.0	30.2	75
2000	82.5	28.0	80
2001	92.5	32.8	71
2002	92.5	37.8	66
2003	97.0	27.6	64
2004	98.0	27.6	66
2005	82.0	24.4	79
2006		9.3	
2007	88.5	27.8	63
2008			
2009			
2010			
2011			
2012	94.5	28.3	82
2013	100	34.6	73
2014			
2015			
2016		22.7	68
2017			
2018		15.9	77
2019			
2020		24.4	62
2021			
2022			
2023			
n	13	17	16
Mean	89.0	26.5	71.5
St Dev	9.6	7.3	7.2
n	0	3	3
Mean	-	21.0	69.0
St Dev	-	4.5	7.5

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	60.0	3.5	35.3	1.1	-	Cobble	C3
2016	54.9	1.4	32.3	1.2	2	Cobble	C3
2018	50.0	1.4	40.7	<1.2	0.5-2.0	Cobble	C3
2020	52.8	5.7	19.2	1.2-1.5	2.0	Gravel	C3

**Reviewed Channel Type** **C3**

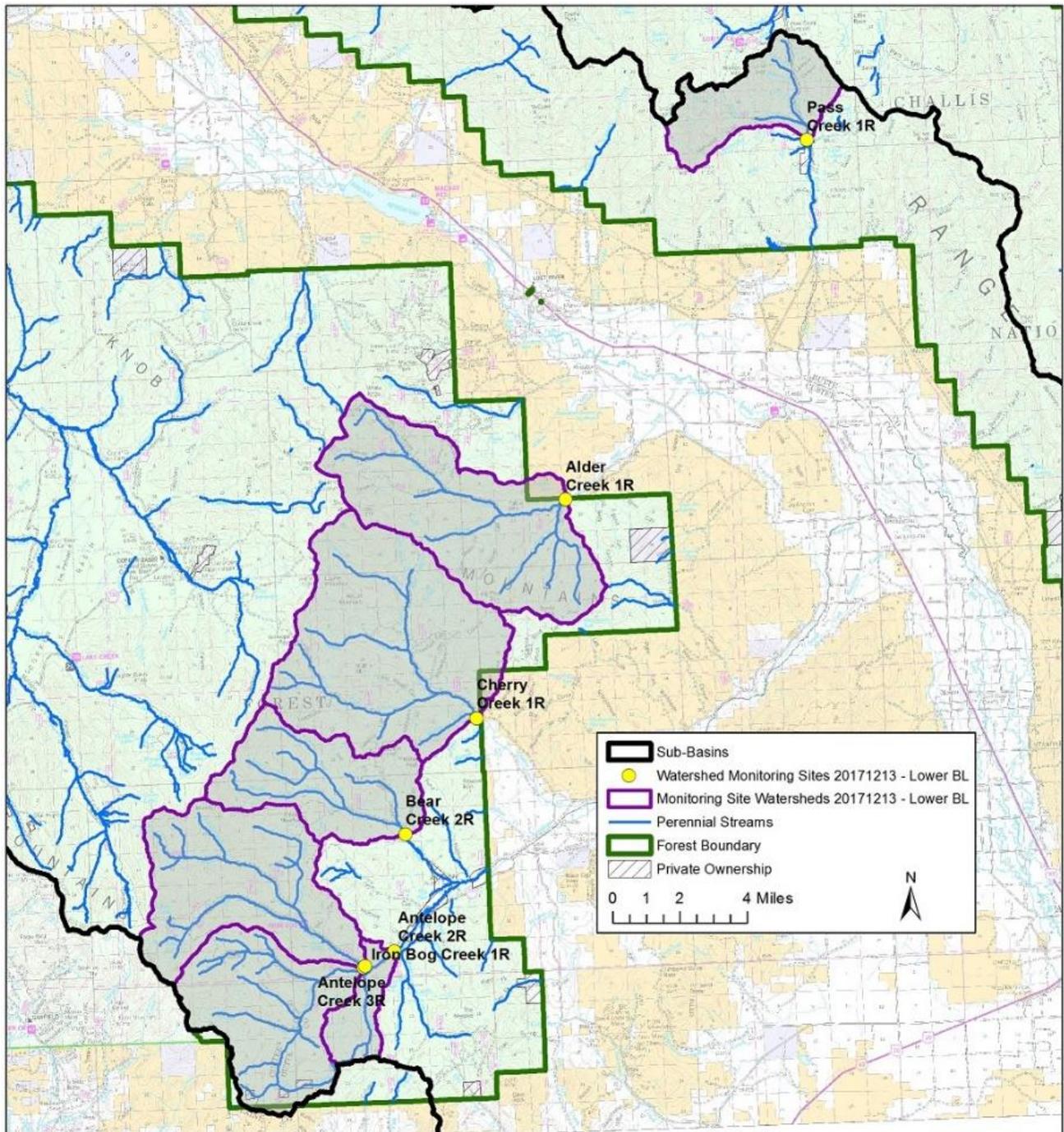
**REMARKS**

Bank stability has shown an increasing trend, with recent values very high. Depth fines have been relatively steady, with recent values around 20%.



## Lower Big Lost River

A total of 7 active monitoring sites are located in the lower portion of the Big Lost River Watershed.



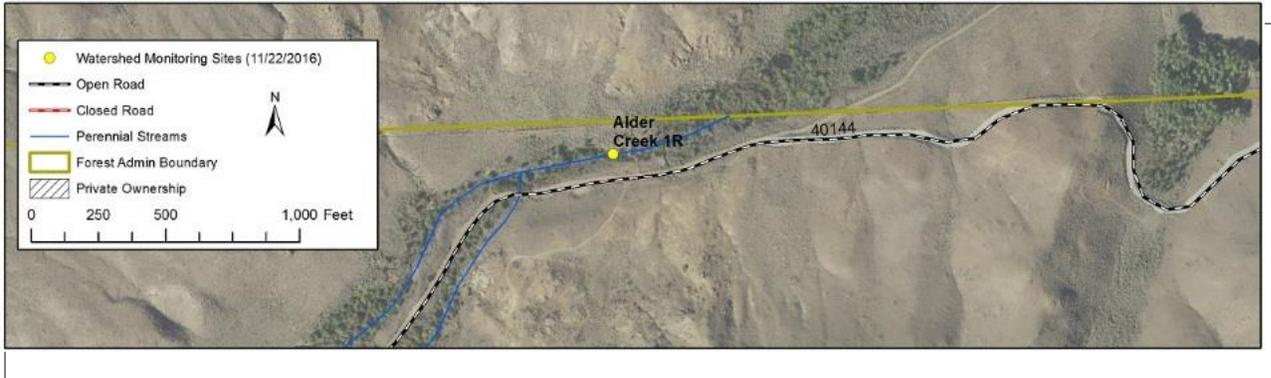
**ALDER CREEK 1R**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Alder Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Big Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located along the Alder Creek Road (FR155), about 0.1 mile upstream of the Forest Boundary, south of Mackay. Access is via the Houston Road (2.0 miles) and the Alder Creek Road (4.4 miles).		
<b>GPS Coordinates</b>	N 43.82726 (2023)	W -113.59943 (2023)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	27.9 sq mi 17,833 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	55 cfs	<b>Mean Annual Flow</b> (Streamstats)	17.4 cfs
<b>5th-level Watershed</b>	Middle Big Lost River/ 1704021807				
<b>Mean Basin Elevation</b>	8146 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	44%
<b>Length of Road</b>	21.8 mi	<b>Road Density</b>		0.78 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	19.1%	<b>Quartzite</b>		0%
	<b>Volcanic</b>	71.7%	<b>Mixed</b>		2.4%
	<b>Sedimentary</b>	6.7%	<b>Alluvium</b>		0%
<b>% of Watershed in Active Allotment</b>	97.3%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

**ALDER CREEK 1R**

**Last Year Sampled: 2023**

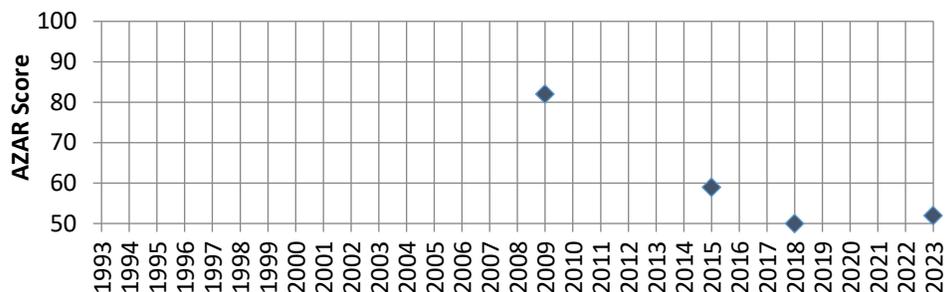
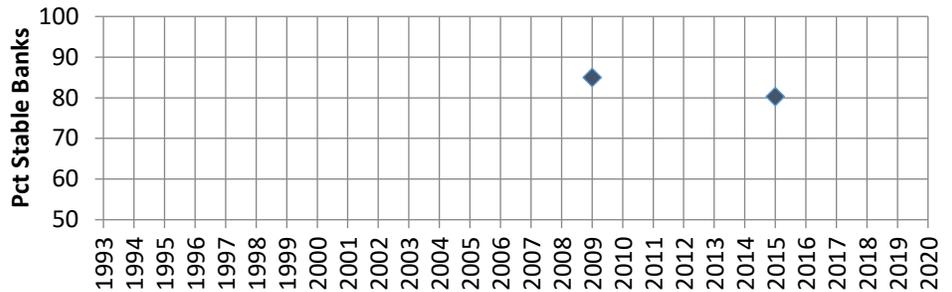
Data Break

Site Data

All

10YR

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2006			
2007			
2008			
2009	85.0	28.9	82
2010			
2011			
2012			
2013			
2014			
2015	80.3	40.5	59
2016			
2017			
2018		8.4	50
2019			
2020			
2021			
2022			
2023	15.4	25.5	52
n	2	4	4
Mean	82.7	34.7	60.8
St Dev	3.3	13.3	14.7
n	0	3	3
Mean	-	21.0	69.0
StDev	-	4.5	7.5



Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Channel gradient (%)	Sinuosity	Substrate	Channel Type
2015	16.9	2.0	14.3	2.0	1.8	Sand	C5
2018	19.0	2.0	19.0	2.4%	1.2-1.5	Gravel	C4

<b>Reviewed Channel Type</b>	<b>C4</b>
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REMARKS

Sampling indicates moderate bank stability and highly variable depth fines. Notes indicate that the channel is highly impacted by cattle. 2023 notes mention that a few log jams have blown out, timing is unknown but, it may account for the increase in fines from 2018 as sediment is mobilized. Stream is confined to a steep canyon with moderate erosion taking place. 2015 sampling indicated a sand substrate, while 2018 sampling indicated a surface layer of sand with gravel at depth. The source of the fines is unknown.

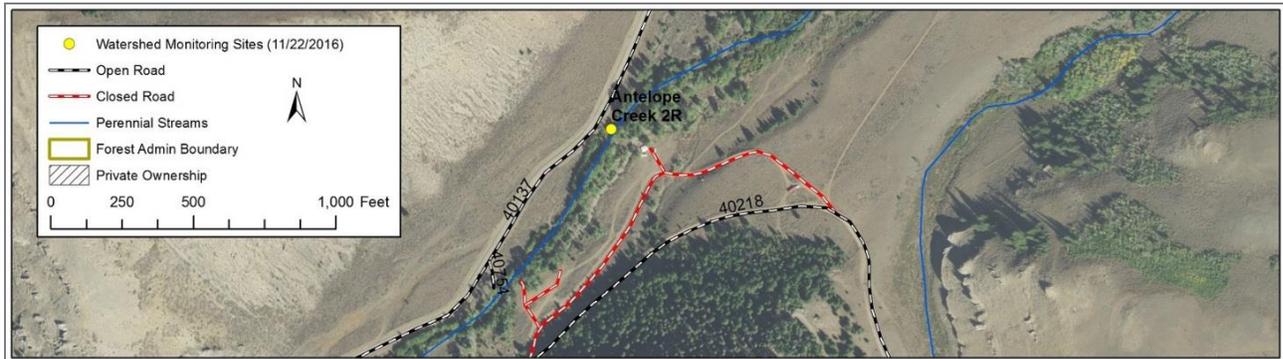
**ANTELOPE CREEK 2R**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Antelope Creek 2R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Big Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located about 3 miles upstream of the Antelope Creek 1R site, upstream of the confluence with Leadbelt Creek, and 0.25 miles downstream of the FR137 bridge. Access is via the Antelope Creek Road (FR137).		
<b>GPS Coordinates</b>	N 43.63492 (2023)	W -113.7124138 (2023)	
<b>Site Comments</b>	Site established in 2007 as replacement for Antelope Creek 1R site. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	46.4 sq mi 29,707 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	122 cfs	<b>Mean Annual Flow</b> (Streamstats)	28.7 cfs
<b>5th-level Watershed</b>	Antelope Creek / 1704021806				
<b>Mean Basin Elevation</b>	8468 ft	<b>Basin Aspect</b>	E	<b>Mean Basin Slope</b>	44%
<b>Length of Road</b>	16.4 mi	<b>Road Density</b>		0.35 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	22.1%	<b>Quartzite</b>		0.0%
	<b>Volcanic</b>	63.9%	<b>Mixed</b>		0.0%
	<b>Sedimentary</b>	6.4%	<b>Alluvium</b>		7.7%
<b>% of Watershed in Active Allotment</b>	98.9%	<b>% of Watershed Burned (2018-2022)</b>		0.1%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

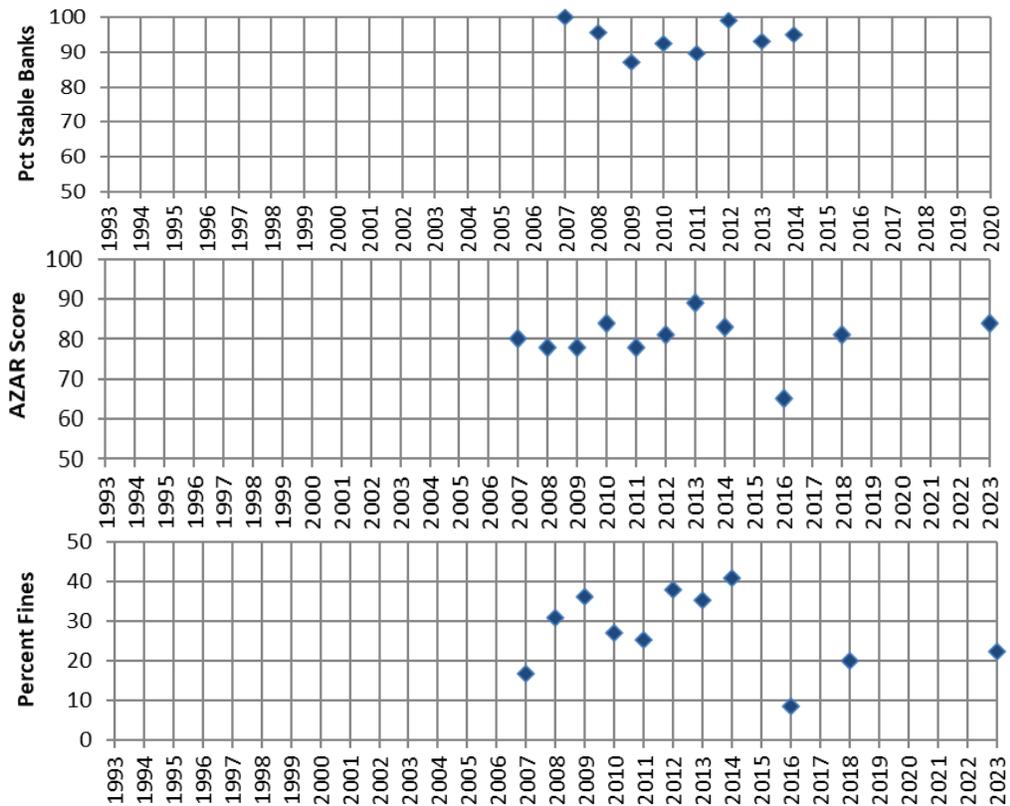
**ANTELOPE CREEK 2R**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007	100	16.9	80
2008	95.5	30.9	78
2009	87.0	36.1	78
2010	92.5	27.0	84
2011	89.5	25.3	78
2012	99.0	38.0	81
2013	93.0	35.2	89
2014	95.0	40.8	83
2015			
2016		8.6	65
2017			
2018		20.1	81
2019			
2020			
2021			
2022			
2023		22.4	84
n	8	11	11
Mean	93.9	27.4	80.1
St Dev	4.4	9.9	6.0
n	1	4	4
Mean	95.0	23.0	78.3
StDev	-	13.3	8.9

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Channel gradient (%)	Sinuosity	Substrate	Channel Type
2015	31.4	9.6	22.4	4	1.1	Cobble	C3b
2016	16.2	1.9	20.8	1	1.2	Cobble	C3

**Reviewed Channel Type** **C3**

**REMARKS**

This site has been sampled most years since 2007, when it was established as a replacement for Antelope Creek 1R. Bank stability has been high. Depth fines have varied greatly, with low values in recent years. The source of high fines from 2008 to 2014 is unknown. Site is located near a prevalent and heavily used dispersed camping area.

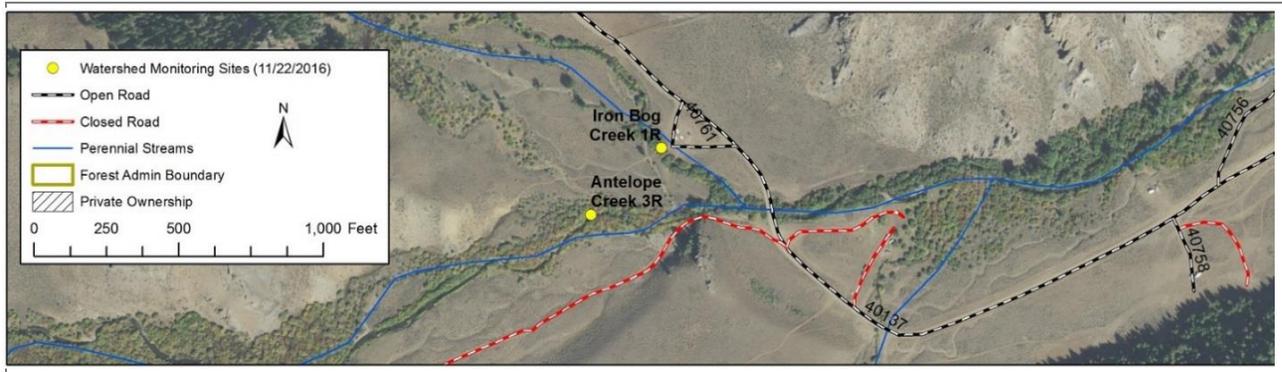
**ANTELOPE CREEK 3R**

**Last Year Sampled: 2021**

**SITE INFO**

<b>Site Name</b>	Antelope Creek 3R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Big Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located a short distance upstream of the confluence with Iron Bog Creek, about 650 feet upstream of the Antelope Creek bridge. Access is via the Antelope Creek Road FS137, about 5 miles upstream of the FS boundary.		
<b>GPS Coordinates</b>	N 43.62886 (2021)	W -113.73059 (2021)	
<b>Site Comments</b>	Site established in 2015. Beaver dams upstream. 5-year sampling frequency.		

**SITE MAP**



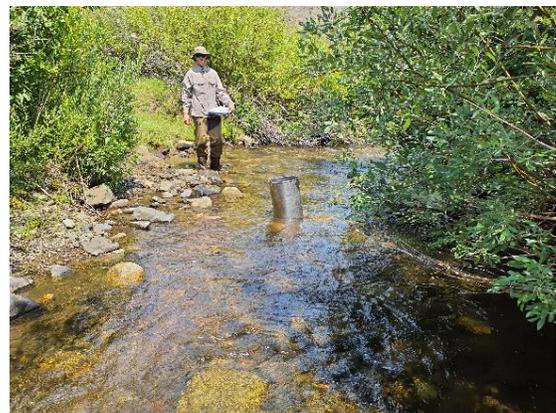
**BASIN DATA**

<b>Drainage Area at Site</b>	18.8 sq mi 12,056 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	53.3 cfs	<b>Mean Annual Flow</b> (Streamstats)	11.6 cfs
<b>5th-level Watershed</b>	Antelope Creek/1704021806				
<b>Mean Basin Elevation</b>	8350 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	43%
<b>Length of Road</b>	0.8 mi	<b>Road Density</b>		0.04 mi/mi <sup>2</sup>	
<b>Landtype Geology</b>	<b>Granitic</b>	14.0%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	78.2%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	1.6%	<b>Alluvium</b>	6.2%	
<b>% of Watershed in Active Allotment</b>	97.4%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (7/21/2021)



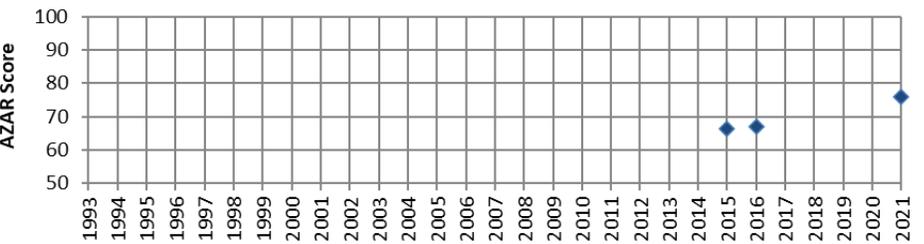
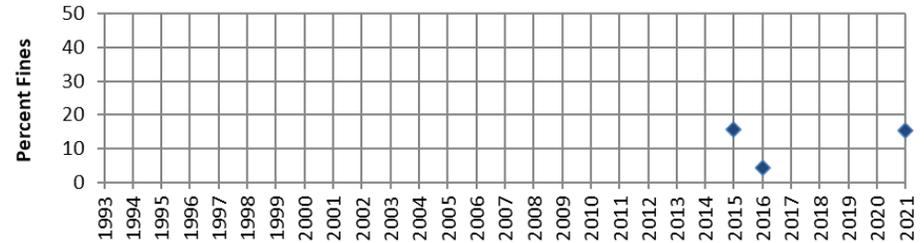
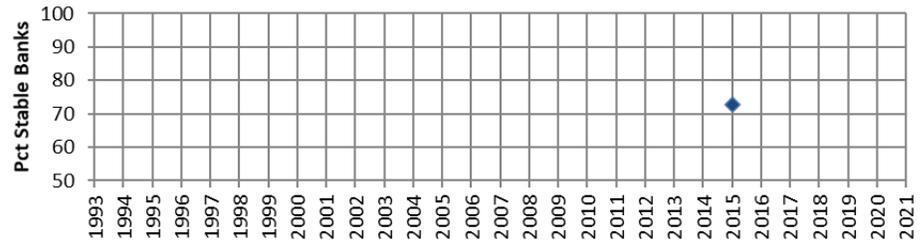
View Downstream (7/21/2021)

**ANTELOPE CREEK 3R**

**Last Year Sampled: 2021**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015	72.6	15.8	66.5
2016		4.3	67
2017			
2018			
2019			
2020			
2021		15.3	76
2022			
2023			
<b>n</b>	1	3	3
<b>Mean</b>	72.6	11.8	69.8
<b>St Dev</b>	-	6.5	5.3
<b>10YR n</b>	1	3	3
<b>10YR Mean</b>	72.6	11.8	69.8
<b>10YR St Dev</b>	-	6.5	5.3



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Channel gradient (%)	Sinuosity	Substrate	Channel Type
2015	31.4	9.6	22.4	4	1.1	Cobble	C3b
2016	16.2	1.9	20.8	1	1.2	Cobble	C3

**Reviewed Channel Type** **C3**

**REMARKS**

This site was established in 2015 in order to begin collecting baseline data. Initial data indicate low fines and low bank stability.

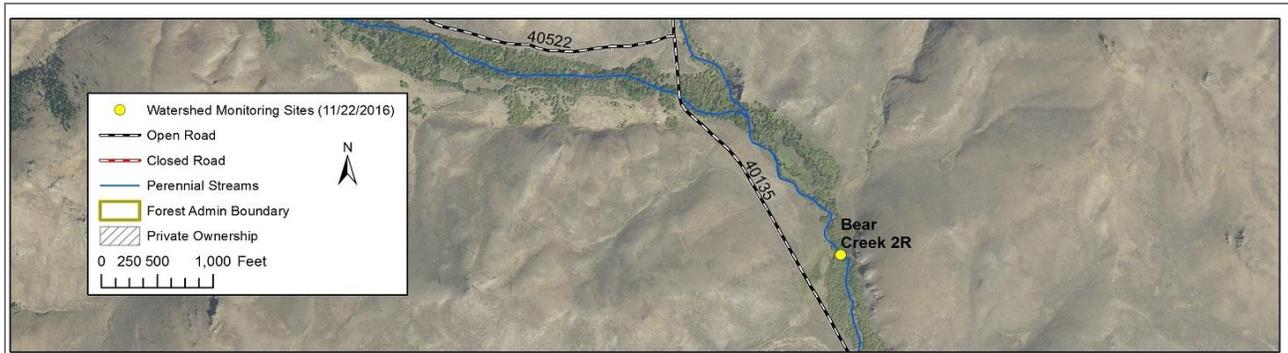
**BEAR CREEK 2R**

**Last Year Sampled: 2021**

**SITE INFO**

<b>Site Name</b>	Bear Creek 2R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Big Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located approximately 2.4 miles upstream of the confluence with Antelope Creek. Access is via Highway 93, the Antelope Creek Road FR137 (19 miles), and the Copper Basin Road FR135 (2.6 miles).		
<b>GPS Coordinates</b>	N 43.68571 (2021)	W -113.70254 (2021)	
<b>Site Comments</b>	This is the new Bear Creek site established in 2010, replacing Bear Creek 1R, which is impacted by beaver dams. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	15.9 sq mi 10,159 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	26.3 cfs	<b>Mean Annual Flow</b> (Streamstats)	8.1 cfs
<b>5th-level Watershed</b>	Antelope Creek / 1704021806				
<b>Mean Basin Elevation</b>	8251 ft	<b>Basin Aspect</b>	SE	<b>Mean Basin Slope</b>	37%
<b>Length of Road</b>	8.5 mi	<b>Road Density</b>		0.54 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	34.6%	<b>Quartzite</b>	0.9%	
	<b>Volcanic</b>	51.8%	<b>Mixed</b>	10.3%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	2.4%	
<b>% of Watershed in Active Allotment</b>	100%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (7/13/2021)**



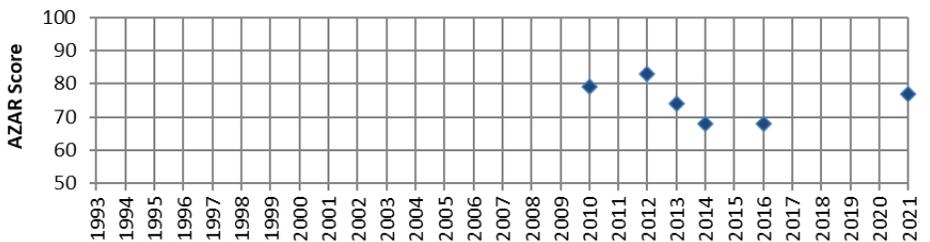
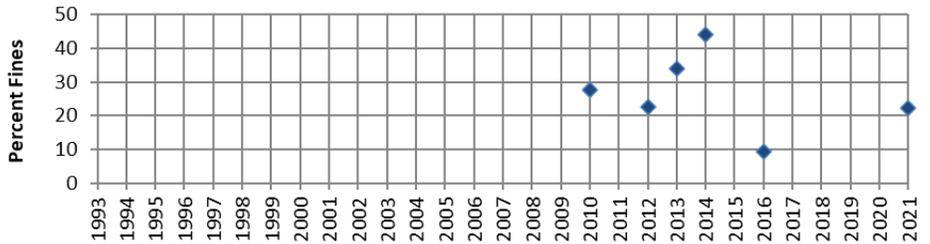
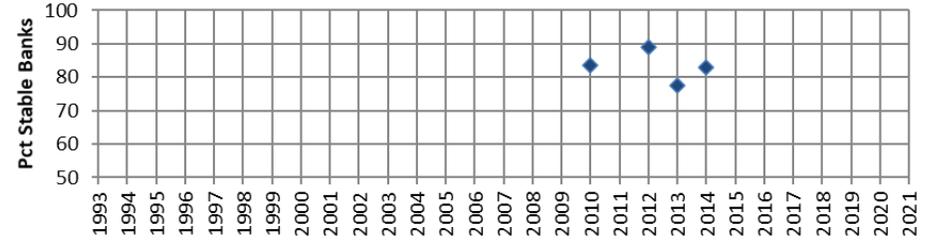
**View Downstream (7/13/2021)**

**BEAR CREEK 2R**

**Last Year Sampled: 2021**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009			
2010	83.5	27.7	79
2011			
2012	89.0	22.6	83
2013	77.6	34.0	74
2014	83.1	44.1	68
2015			
2016		9.5	68
2017			
2018			
2019			
2020			
2021		22.4	77
2022			
2023			
n	4	6	6
Mean	83.3	26.7	74.8
St Dev	4.7	11.7	6.0
n	1	3	3
Mean	83.1	25.3	71.0
St Dev	-	17.5	5.2



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Channel gradient (%)	Sinuosity	Substrate	Channel Type
2016	32.3	2.0	24.3	2	1.2	Cobble	B3

**Reviewed Channel Type** **B3**

**10YR ALL**

**REMARKS**

This site shows generally high bank stability and variable depth fines, with measurements greater than 30% in 2 out of 5 years sampled. Although depth fines were much lower in 2016, further investigation may be needed on a watershed scale to determine the source of high fines.

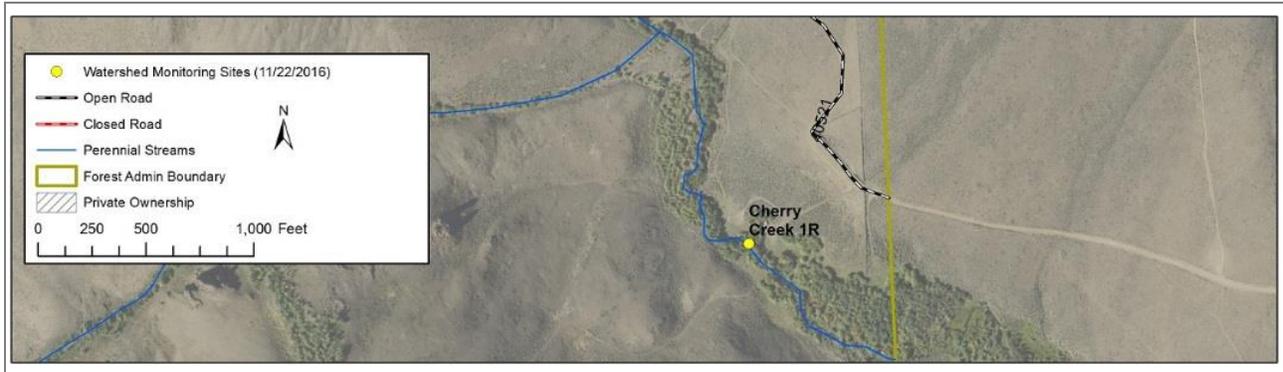
**CHERRY CREEK 1R**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Cherry Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Big Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located just upstream of the Forest boundary. Access is via Highway 93, the Antelope Creek Road FR137 (11 miles), and the Cherry Creek Road FR521 (6.2 miles).		
<b>GPS Coordinates</b>	N 43.73450 (2023)	W -113.65773 (2023)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	34.9 sq mi 22,342 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	36 cfs	<b>Mean Annual Flow</b> (Streamstats)	19.9 cfs
<b>5th-level Watershed</b>	Antelope Creek / 1704021806				
<b>Mean Basin Elevation</b>	7793 ft	<b>Basin Aspect</b>	SE	<b>Mean Basin Slope</b>	41%
<b>Length of Road</b>	27.2 mi	<b>Road Density</b>		0.78 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.5%	<b>Quartzite</b>		0%
	<b>Volcanic</b>	78.7%	<b>Mixed</b>		4.4%
	<b>Sedimentary</b>	14.2%	<b>Alluvium</b>		2.2%
<b>% of Watershed in Active Allotment</b>	98.5%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

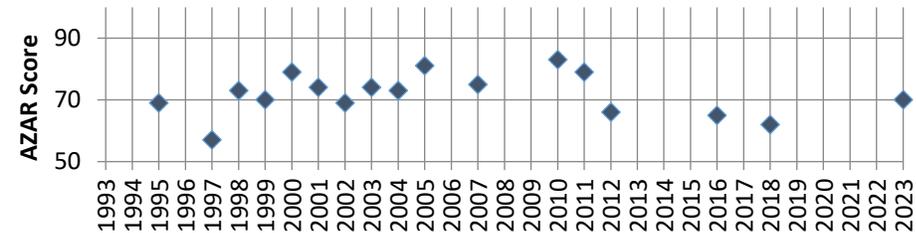
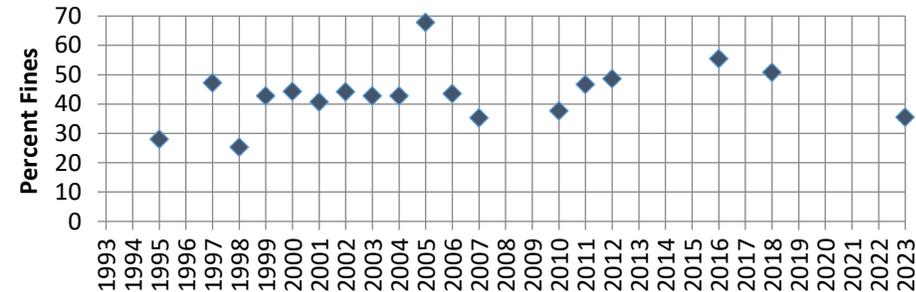
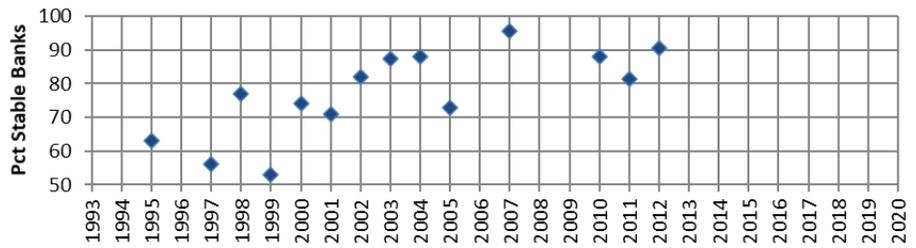
**CHERRY CREEK 1R**

**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	63.0	28.0	69
1996			
1997	56.0	47.2	57
1998	77.0	25.3	73
1999	53.0	42.8	70
2000	74.0	44.3	79
2001	71.0	40.7	74
2002	82.0	44.2	69
2003	87.5	42.8	74
2004	88.0	42.8	73
2005	73.0	67.9	81
2006		43.6	
2007	95.5	35.3	75
2008			
2009			
2010	88.0	37.7	83
2011	81.5	46.7	79
2012	90.6	48.7	66
2013			
2014			
2015			
2016		55.5	65
2017			
2018		50.8	62
2019			
2020			
2021			
2022			
2023		35.5	70
n	14	18	17
Mean	77.2	43.3	71.7
St Dev	13.0	9.7	6.9
n	0	3	3
Mean	-	47.3	65.7
St Dev	-	10.5	4.0

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	15.5	2.9	12.4	1.4	0.5	Gravel	C4
2007	16.2	2.2	10.0	1.85	2	Silt	B6
2016	18.5	1.8	18.1	1.2	<2	Gravel	C4
2018	14.4	1.7	12.4	>1.5	0.5-2.0	Gravel	C4

**Reviewed Channel Type** **C4**

**REMARKS**

This site has been sampled nearly continuously since 1995. Bank stability has shown an increasing trend. Depth fines have been consistently high at around 50% with recent values showing a decreasing trend. The site appears to be impacted by recreational use and cattle grazing. Pools include abundant silt. The site should be assessed on a reach scale to help determine the source of the fines.

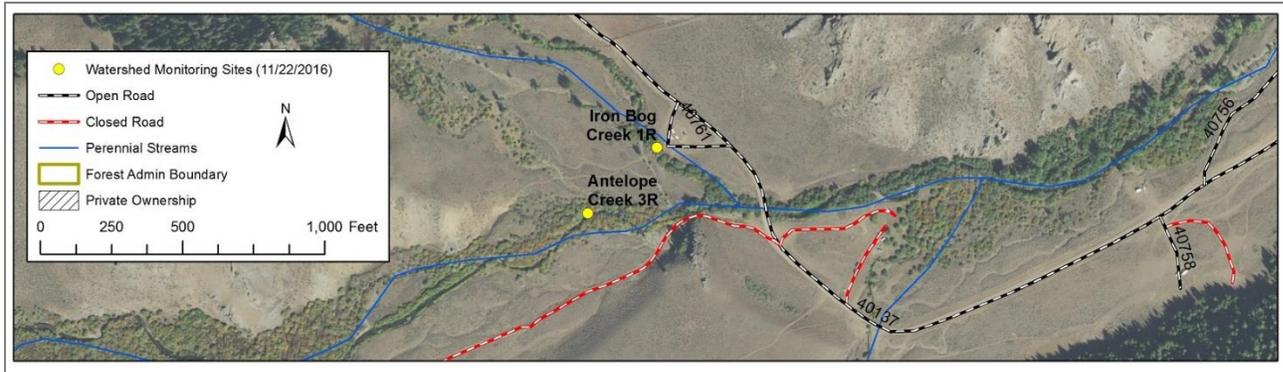
**IRON BOG CREEK 1R**

**Last Year Sampled: 2021**

**SITE INFO**

<b>Site Name</b>	Iron Bog Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Big Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located near the mouth of Iron Bog Creek at Antelope Creek, about 400 feet upstream of the bridge. Access is via the Antelope Creek Road (FS#137) about 5 miles upstream of the FS boundary.		
<b>GPS Coordinates</b>	N 43.62947 (2021)	W -113.72964 (2021)	
<b>Site Comments</b>	Site established in 2015. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	23.3 sq mi 14,928 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	69.4 cfs	<b>Mean Annual Flow</b> (Streamstats)	15.9 cfs
<b>5th-level Watershed</b>	Antelope Creek/1704021806				
<b>Mean Basin Elevation</b>	8760 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	47%
<b>Length of Road</b>	12.2 mi	<b>Road Density</b>		0.53 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	32.6%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	46.9%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	11.3%	<b>Alluvium</b>	9.2%	
<b>% of Watershed in Active Allotment</b>	100%	<b>% of Watershed Burned (2018-2022)</b>		0.2%	

**SITE PHOTOS**



View Upstream (7/20/2021)



View Downstream (7/20/2021)

**IRON BOG CREEK 1R**

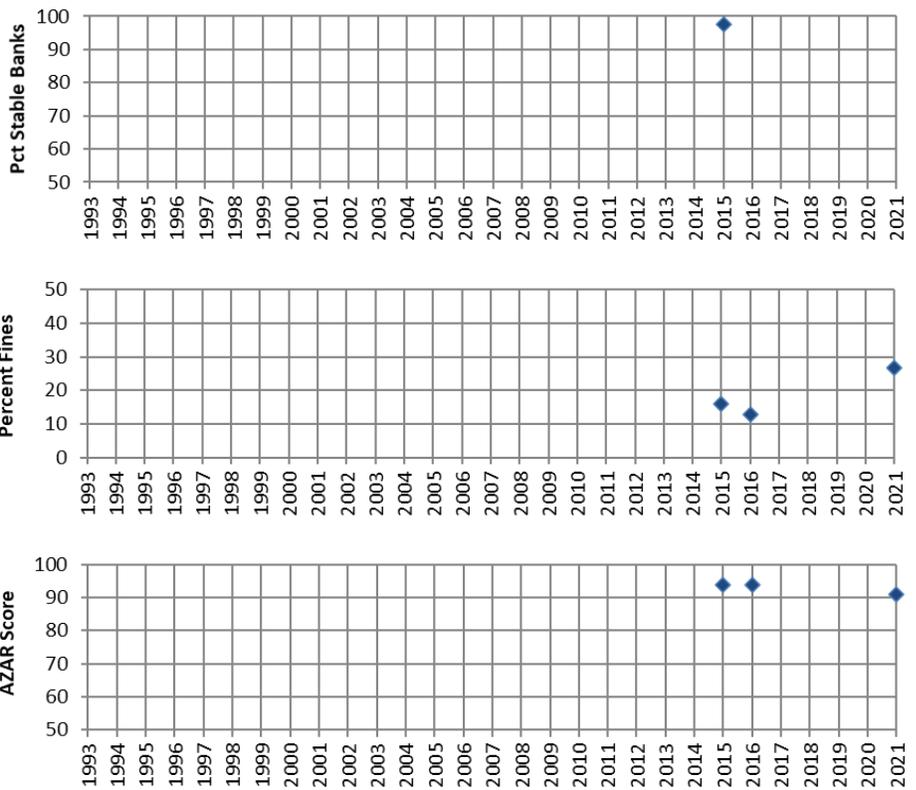
**Last Year Sampled: 2021**

**SITE DATA**

Year	% Stable	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015	97.5	16.0	94
2016		12.8	94
2017			
2018			
2019			
2020			
2021		26.6	91
2022			
2023			
<b>n</b>	1	3	3
<b>Mean</b>	97.5	18.5	93.0
<b>St Dev</b>	-	7.2	1.7
<b>n</b>	1	3	3
<b>Mean</b>	97.5	18.5	93.0
<b>St Dev</b>	-	7.2	1.7

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	21.2	1.3	21.2	1.4	1.5	Cobble	F3
2016	14.8	1.2	16.4	1.1	2	Cobble	F3

**Reviewed Channel Type** **F3**

**REMARKS**

This site was established in 2015 to begin collecting baseline data. Initial data indicate low fines and high bank stability.

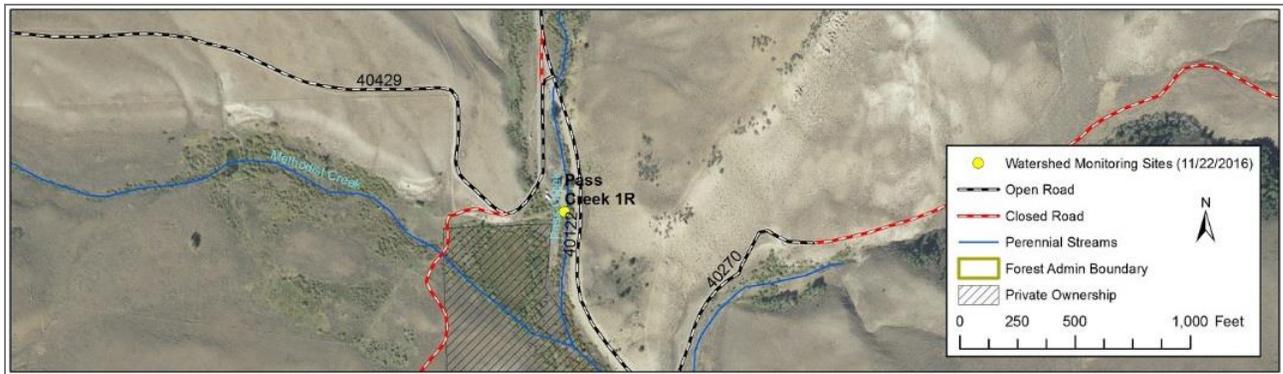
**PASS CREEK 1R**

**Last Year Sampled: 2023**

**SITE INFO**

<b>Site Name</b>	Pass Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Big Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located about 0.2 miles upstream of the Mud Lake Road and 0.1 mile upstream of the confluence with Methodist Creek. Access is via the Pass Creek Road (FR122).		
<b>GPS Coordinates</b>	N 43.97775 (2023)	W -113.44680 (2023)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	10.7 sq mi 6,818 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	41 cfs	<b>Mean Annual Flow</b> (Streamstats)	8.4 cfs
<b>5th-level Watershed</b>	Middle Big lost River / 1704021807				
<b>Mean Basin Elevation</b>	8336 ft	<b>Basin Aspect</b>	SE	<b>Mean Basin Slope</b>	52%
<b>Length of Road</b>	11.7 mi	<b>Road Density</b>		1.10 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>	0.0%	
	<b>Volcanic</b>	100%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	0.0%	
<b>% of Watershed in Active Allotment</b>	99.8%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2023)**



**View Downstream (2023)**

**PASS CREEK 1R**

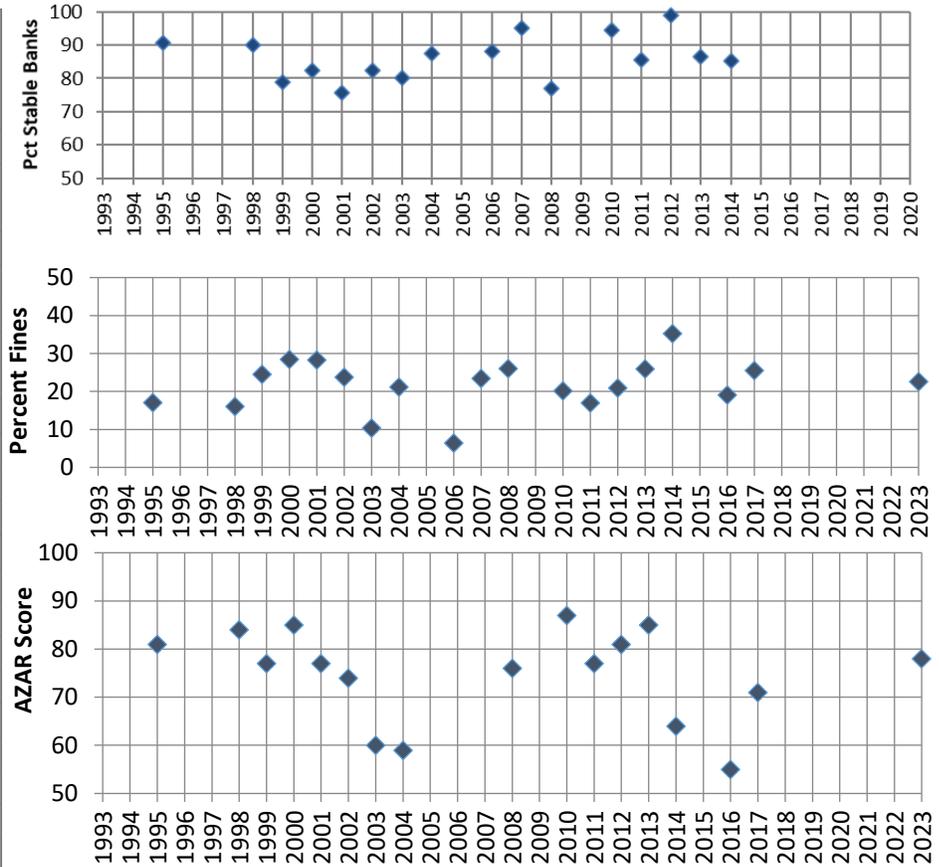
**Last Year Sampled: 2023**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	90.5	17.0	81
1996			
1997			
1998	90.0	16.0	84
1999	79.0	24.5	77
2000	82.5	28.4	85
2001	75.5	28.2	77
2002	82.5	23.7	74
2003	80.0	10.3	60
2004	87.5	21.1	59
2005			
2006	88.0	6.4	
2007	95.0	23.4	47
2008	77.0	26.0	76
2009			
2010	94.5	20.1	87
2011	85.5	16.9	77
2012	99.0	20.9	81
2013	86.5	25.9	85
2014	85.2	35.2	64
2015			
2016		19.0	55
2017		25.5	71
2018			
2019		19.5	86
2020			
2021			
2022			
2023		22.5	78
n	16	19	18
Mean	86.1	21.6	73.2
St Dev	85.9	6.6	11.5
n	1.0	4.0	4.0
Mean	85.2	25.6	67.0
St Dev	-	6.96	9.83

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1998	10.5	1.28	12.35	1.54	1	Gravel	G4c
2016	12.2	1.6	20.9	1.3	2	Gravel	C4
2017	15.5	7.7	20.4	1.2	1	Gravel	C4
2019	10.2	15.4	15.0	<1.2	2.0	Gravel	C4

**Reviewed Channel Type** **C4**

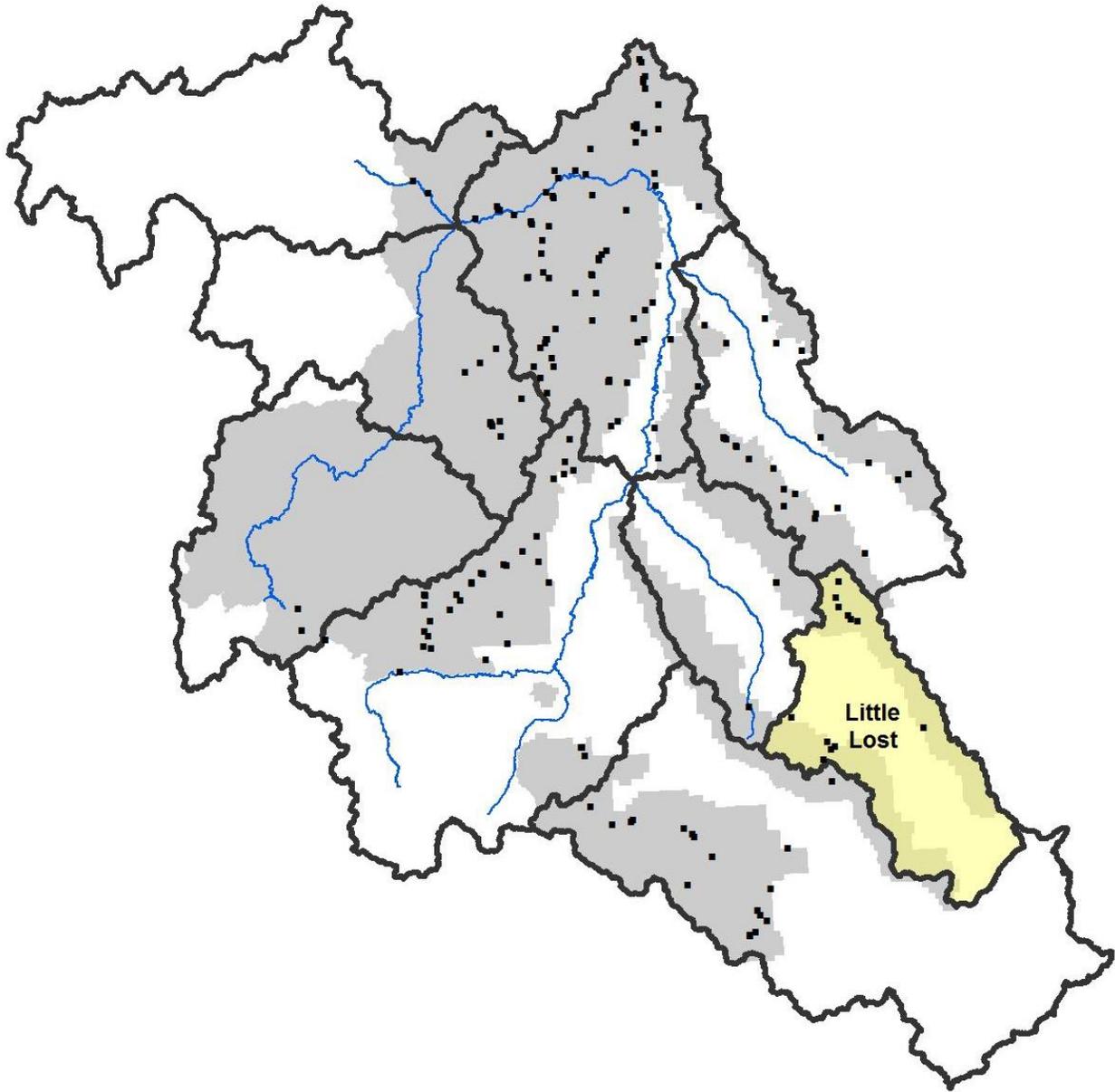
**REMARKS**

This site has been sampled nearly continuously since 1995. Bank stability has been generally greater than 80%. Depth fines have been generally less than 30%, with an increase to 35% seen in 2014. 2023 notes indicate multiple cattle crossings and site being in close proximity to main FS road and primitive camping sites.



## LITTLE LOST SUB-BASIN

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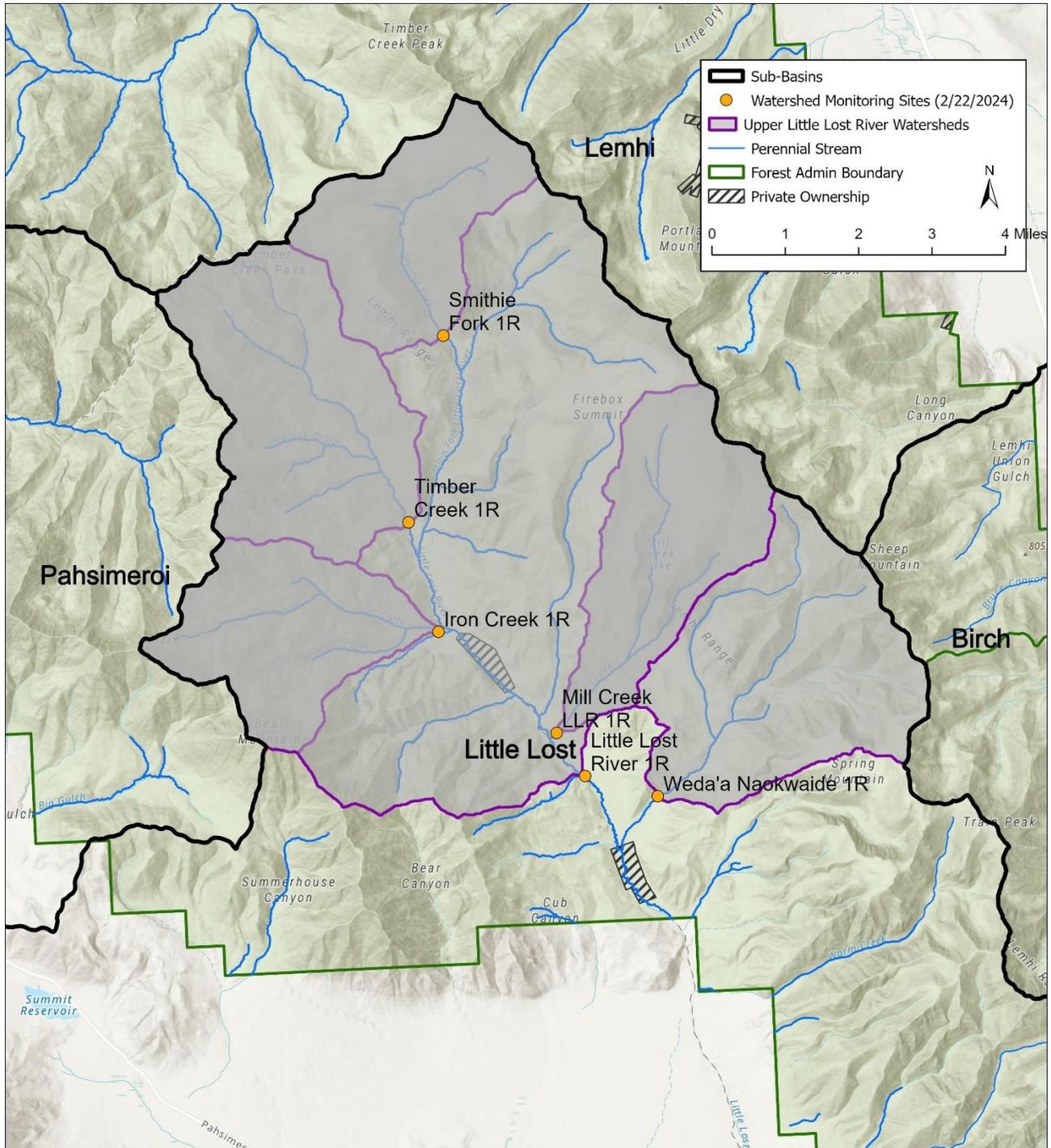


<b>Total acres within sub-basin</b>	<b>617,615</b>
<b>Percent of sub-basin within SCNF</b>	<b>44%</b>
<b>Active Monitoring Sites</b>	<b>10</b>
<b>Discontinued Monitoring Sites</b>	<b>3</b>
<b>Sites Monitored in 2023</b>	<b>0</b>



## Upper Little Lost River - Sawmill Canyon

A total of 6 active monitoring sites are located in the upper portion of the Little Lost River Watershed, in the Sawmill Canyon area.



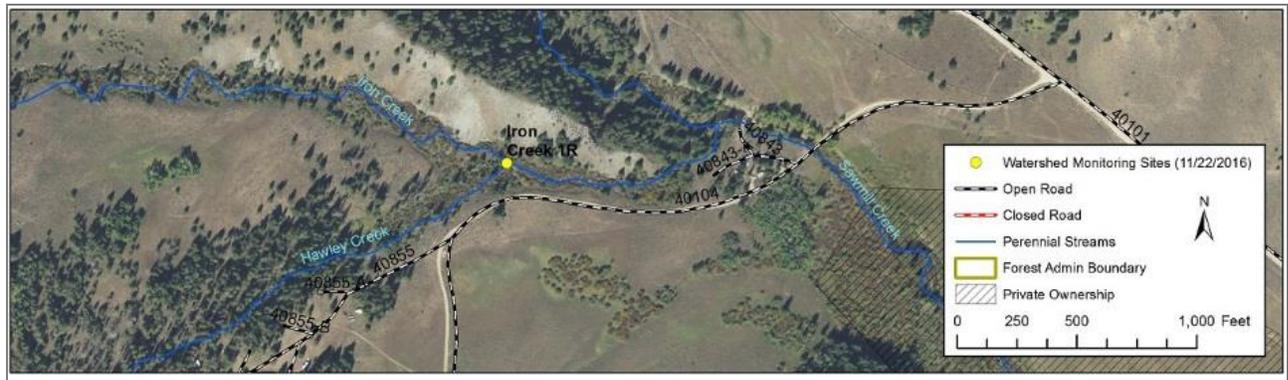
**IRON CREEK 1R**

**Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	Iron Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Little Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located 0.2 miles upstream of mouth of Iron Creek at Sawmill Creek. Access is via the Sawmill Canyon Rd (FR101) and the Iron Creek Rd (FR104). Site is about a half mile up the Iron Creek Road, just upstream of Hawley Creek.		
<b>GPS Coordinates</b>	N 44.37890 (2022)	W -113.40400 (2022)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	6.3 sq mi 4,010 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	23 cfs	<b>Mean Annual Flow</b> (Streamstats)	4.0 cfs
<b>5th-level Watershed</b>	Sawmill Creek / 1704021702				
<b>Mean Basin Elevation</b>	8550 ft	<b>Basin Aspect</b>	E	<b>Mean Basin Slope</b>	41%
<b>Length of Road</b>	3.6 mi	<b>Road Density</b>		0.57 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>		33.4%
	<b>Volcanic</b>	66.6%	<b>Mixed</b>		0.0%
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>		0.0%
<b>% of Watershed in Active Allotment</b>	99.9%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (6/30/2022)**



**View Downstream (6/30/2022)**

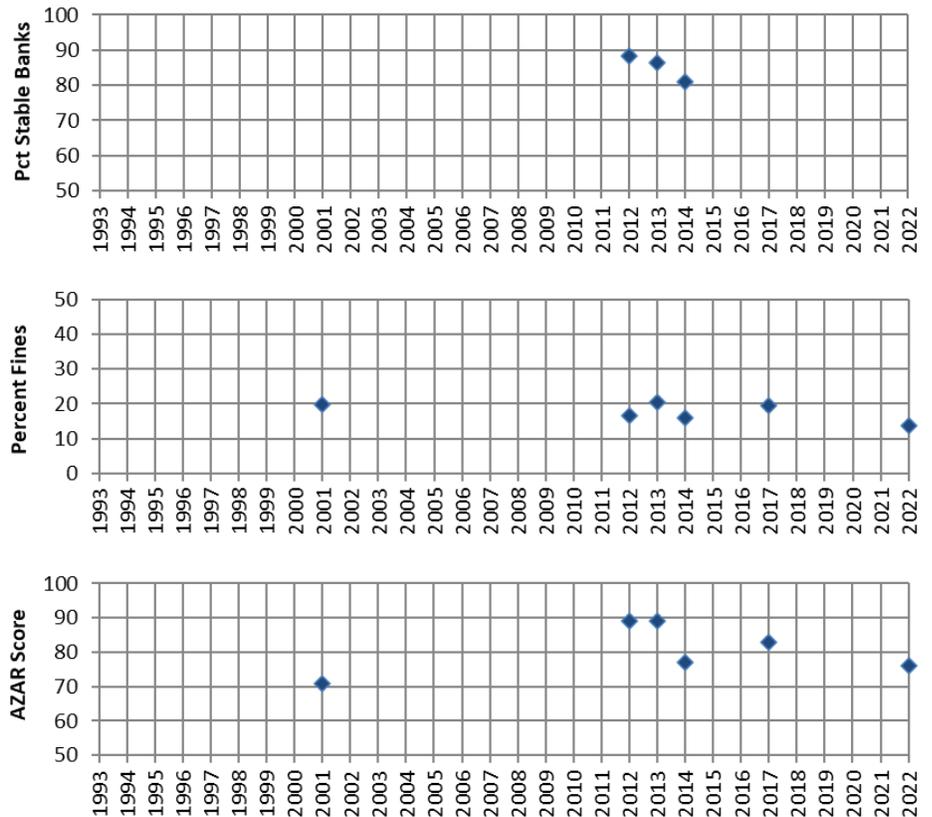
**IRON CREEK 1R**

**Last Year Sampled: 2022**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001	44.5	19.9	71
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012	88.2	16.6	89
2013	86.5	20.4	89
2014	81.1	15.9	77
2015			
2016			
2017		19.4	83
2018			
2019			
2020			
2021			
2022		13.7	76
2023			
<b>n</b>	4	6	6
<b>Mean</b>	75.1	17.7	80.8
<b>St Dev</b>	20.6	2.7	7.4
<b>n</b>	1	3	3
<b>Mean</b>	81.1	16.3	78.7
<b>St Dev</b>	-	2.9	3.8

**10YR ALL**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2001	13	-	7.8	-	2	VC Gravel	-
2017	14.1	5.7	17.6	1.2-1.5	2-4	Gravel	C4b

**Reviewed Channel Type**

**C4b**

**REMARKS**

This site has only been sampled 6 times, beginning in 2001. Bank stability has been moderate, and depth fines have been low. High flow in 2022 at time of sampling.

**LITTLE LOST RIVER 1R**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Little Lost River 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Little Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located in Sawmill Canyon about 1 mile north of the Fairview Guard Station. Access is via the Sawmill Creek Road (FR101) and the Horse Lake Road (FR451).		
<b>GPS Coordinates</b>	N 44.34919 (2019)	W -113.36548 (2019)	
<b>Site Comments</b>	This stream is called "Sawmill Creek" in NHD. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	52.8 sq mi 33,768 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	164 cfs	<b>Mean Annual Flow</b> (Streamstats)	24.4 cfs
<b>5th-level Watershed</b>	Sawmill Creek / 170402172				
<b>Mean Basin Elevation</b>	8451 ft	<b>Basin Aspect</b>	SE	<b>Mean Basin Slope</b>	35%
<b>Length of Road</b>	82.0 mi	<b>Road Density</b>		1.55 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>	54.3%	
	<b>Volcanic</b>	45.3%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.4%	<b>Alluvium</b>	0.0%	
<b>% of Watershed in Active Allotment</b>	99.5%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2019)



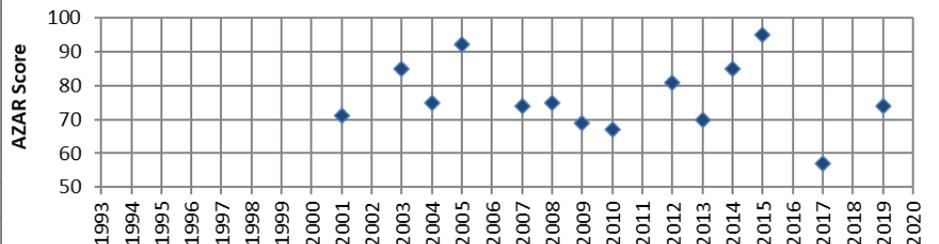
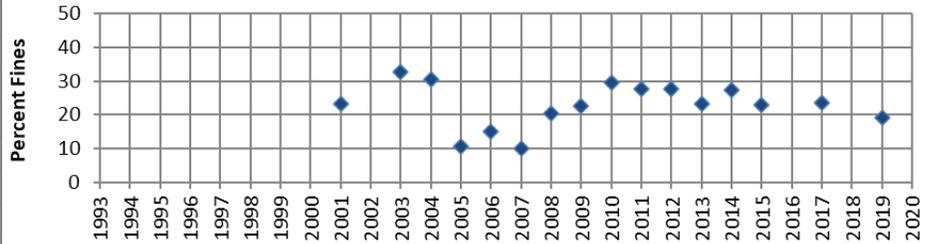
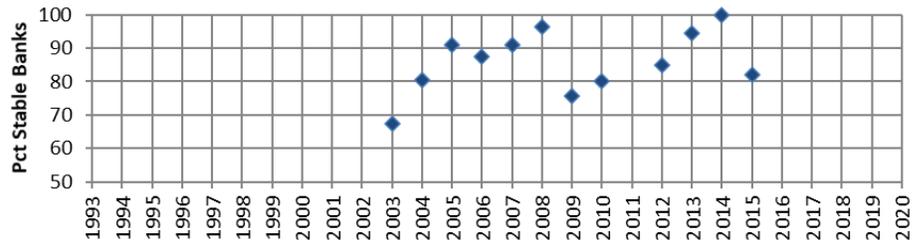
View Downstream (2019)

**LITTLE LOST RIVER 1R**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001	45.0	23.2	71
2002			
2003	67.5	32.6	85
2004	80.5	30.4	75
2005	91.0	10.7	92
2006	87.5	15.1	
2007	91.0	9.9	74
2008	96.5	20.5	75
2009	75.5	22.6	69
2010	80.0	29.5	67
2011		27.7	
2012	85.0	27.8	81
2013	94.5	23.3	70
2014	100	27.4	85
2015	82.0	23.0	95
2016			
2017		23.7	57
2018			
2019		19.2	74.0
2020			
2021			
2022			
2023			
n	13	16	14
Mean	82.8	22.9	76.4
St Dev	14.5	6.6	10.2
n	2	4	4
Mean	91.0	23.3	77.8
St Dev	12.7	3.4	16.3



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	38.5	2.1	44.8	1.3	2.5	Crs gravel	B3
2017	49.1	2.7	30.7	1.3	1.5	Gravel	C4
2019	24.7	1.6	32.5	1.2-1.5	2.0	Cobble	C3

**Reviewed Channel Type** **C3**

**ALL**

**10YR**

**REMARKS**

This site has been sampled continuously since 2001. Bank stability has varied, with recent values greater than 80%. Depth fines have recently been between 20 and 30%.

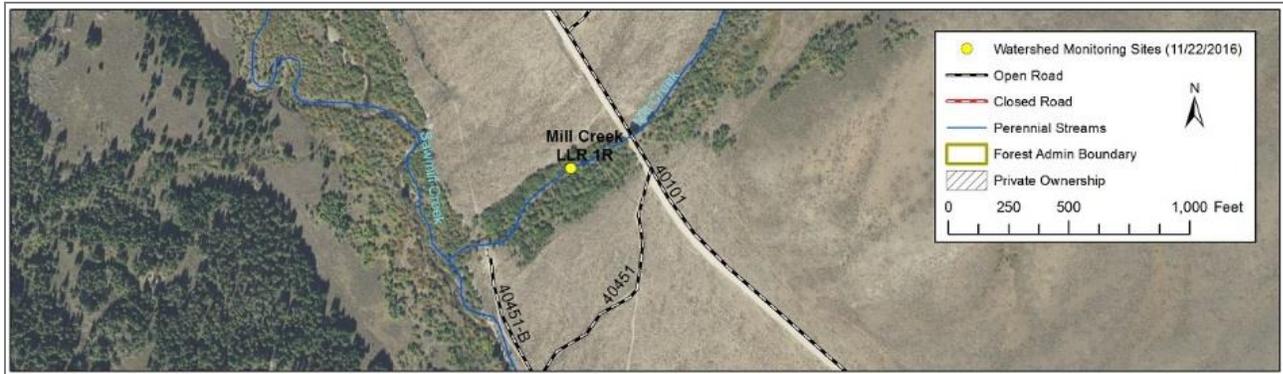
**MILL CREEK LLR 1R**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Mill Creek LLR 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Little Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located 0.2 miles upstream of the mouth of Mill Creek, in Sawmill Canyon about 2 miles north of Fairview Guard Station. Access is via the Sawmill Creek Road (FR101). Site is downstream of the road and jack fence.		
<b>GPS Coordinates</b>	N 44.35798 (2019)	W -113.37282 (2019)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	7.2 sq mi 4,577 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	31 cfs	<b>Mean Annual Flow</b> (Streamstats)	3.2 cfs
<b>5th-level Watershed</b>	Sawmill Creek / 1704021702				
<b>Mean Basin Elevation</b>	8655 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	33%
<b>Length of Road</b>	4.6 mi	<b>Road Density</b>		0.65 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>	68.4%	
	<b>Volcanic</b>	28.4%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	3.2%	<b>Alluvium</b>	0.0%	
<b>% of Watershed in Active Allotment</b>	100%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2019)**



**View Downstream (2019)**

**MILL CREEK LLR 1R**

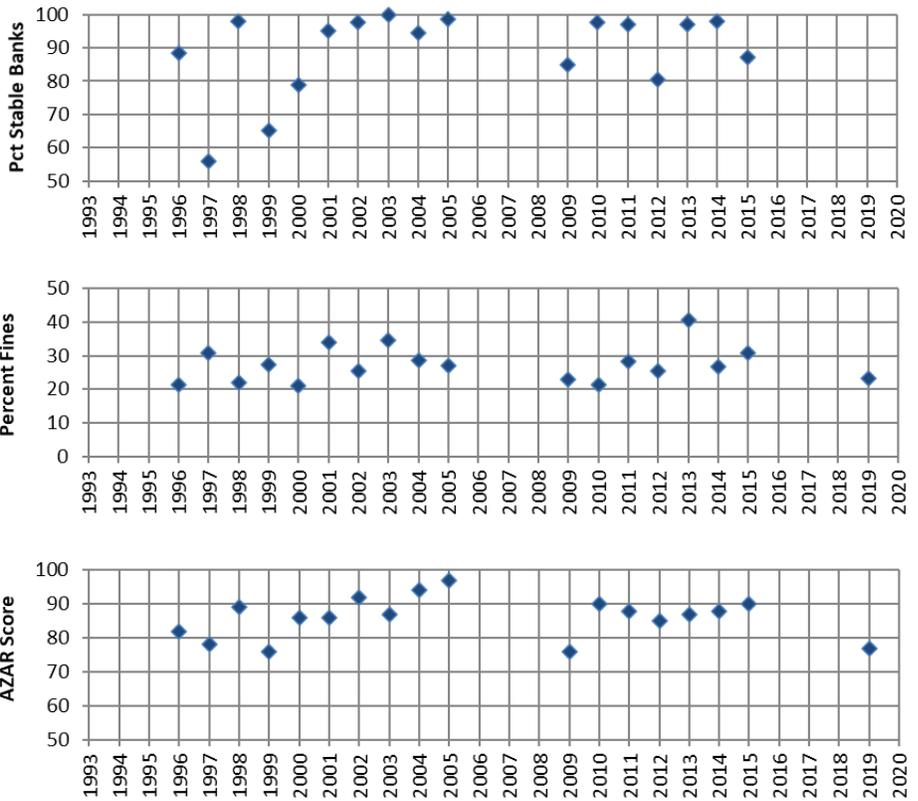
**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996	88.5	21.3	82
1997	56.0	30.9	78
1998	98.0	21.9	89
1999	65.0	27.4	76
2000	79.0	21.0	86
2001	95.0	34.0	86
2002	97.5	25.3	92
2003	100	34.5	87
2004	94.5	28.5	94
2005	98.5	27.1	97
2006			
2007			
2008			
2009	85.0	23.0	76
2010	97.5	21.3	90
2011	97.0	28.4	88
2012	80.4	25.4	85
2013	97.0	40.7	87
2014	98.0	26.8	88
2015	87.0	30.7	90
2016			
2017			
2018			
2019		23.2	77
2020			
2021			
2022			
2023			
n	17	18	18
Mean	89.1	27.3	86.0
St Dev	12.7	5.4	6.1
n	2	3	3
Mean	92.5	26.9	85.0
St Dev	7.8	3.8	7.0

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	14.5	17.6	25	1.1	2.5	Gravel	C4b
2019	20.4	4.9	48.6	<1.2	3.0	Sand (grav)	C4b
Reviewed Channel Type							C4b

**REMARKS**

This site has been sampled nearly continuously since 1996. This is a small channel with heavy influence from riparian vegetation. Bank stability has shown an increasing trend. Depth fines have been consistently around 30%, with some values greater than 30%.

**SMITHIE FORK CREEK 1R**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Smithie Fork Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Little Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located about 0.4 miles upstream of mouth. Access is via the Sawmill Canyon Road (FR101). Site is 0.25 miles upstream from the locked gate at the end of the road.		
<b>GPS Coordinates</b>	N 44.43720 (2019)	W -113.39912 (2019)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	6.1 sq mi 3,922 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	33 cfs	<b>Mean Annual Flow</b> (Streamstats)	2.8 cfs
<b>5th-level Watershed</b>	Sawmill Creek / 1704021702				
<b>Mean Basin Elevation</b>	8836 ft	<b>Basin Aspect</b>	S	<b>Mean Basin Slope</b>	33%
<b>Length of Road</b>	4.9 mi	<b>Road Density</b>		0.81 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>	91.5%	
	<b>Volcanic</b>	8.5%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	0.0%	
<b>% of Watershed in Active Allotment</b>	100%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2019)



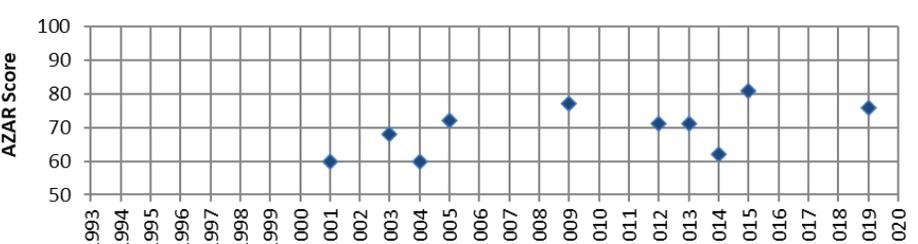
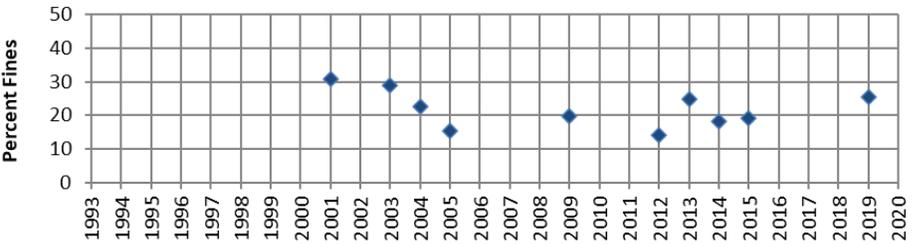
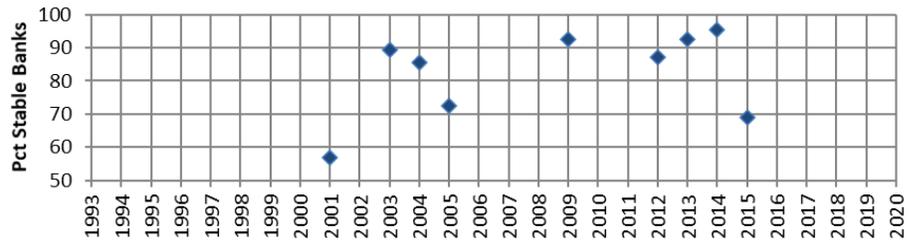
View Downstream (2019)

**SMITHIE FORK CREEK 1R**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001	57.0	30.8	60
2002			
2003	89.5	29.0	68
2004	85.5	22.6	60
2005	72.5	15.2	72
2006			
2007			
2008			
2009	92.5	19.9	77
2010			
2011			
2012	87.1	14.2	71
2013	92.5	24.8	71
2014	95.5	18.3	62
2015	69.0	19.1	81
2016			
2017			
2018			
2019		25.6	76.0
2020			
2021			
2022			
2023			
n	9	10	10
Mean	82.3	22.0	69.8
St Dev	13.1	5.6	7.3
n	2	3	3
Mean	82.3	21.0	73.0
St Dev	18.7	4.0	9.8



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2003	10.5	7.6	8.6	1.3	1.5	Sm cobble	E4
2015	15.5	5.1	22.1	1.3	3.0	Gravel	C4b
2019	13.4	3.2	9.6	1.2-1.5	2.5	Gravel	C4b

**Reviewed Channel Type** **C4b**

**10YR ALL**

**REMARKS**

This is a small channel with abundant woody debris. This site has been monitored nearly continuously since 2001. Bank stability has been variable, with 2015 showing a sharp decrease. Depth fines have been consistently less than 30%.

**WEDA'A NAOKWAIDE 1R**

**Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	Weda'a Naokwaide 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Little Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located 0.7 miles upstream of the mouth of Weda'a Naokwaide, about a half mile north of the Fairview Guard Station. Access is via the Sawmill Canyon Road (FR101) and Forest Road 40102.		
<b>GPS Coordinates</b>	N 44.34459 (2022)	W -113.34576 (2022)	
<b>Site Comments</b>	5-year sampling frequency. Site moved about 50ft downstream in 2022 due to impacts from cattle and ATV crossing.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	10.3 sq mi 6,563 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	42 cfs	<b>Mean Annual Flow</b> (Streamstats)	5.7 cfs
<b>5th-level Watershed</b>	Sawmill Creek / 1704021702				
<b>Mean Basin Elevation</b>	8581 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	39%
<b>Length of Road</b>	15.1 mi	<b>Road Density</b>		1.47 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>	50.9%	
	<b>Volcanic</b>	23.0%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	26.1%	<b>Alluvium</b>	0.0%	
<b>% of Watershed in Active Allotment</b>	100%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (6/2/2022)



View Downstream (6/2/2022)

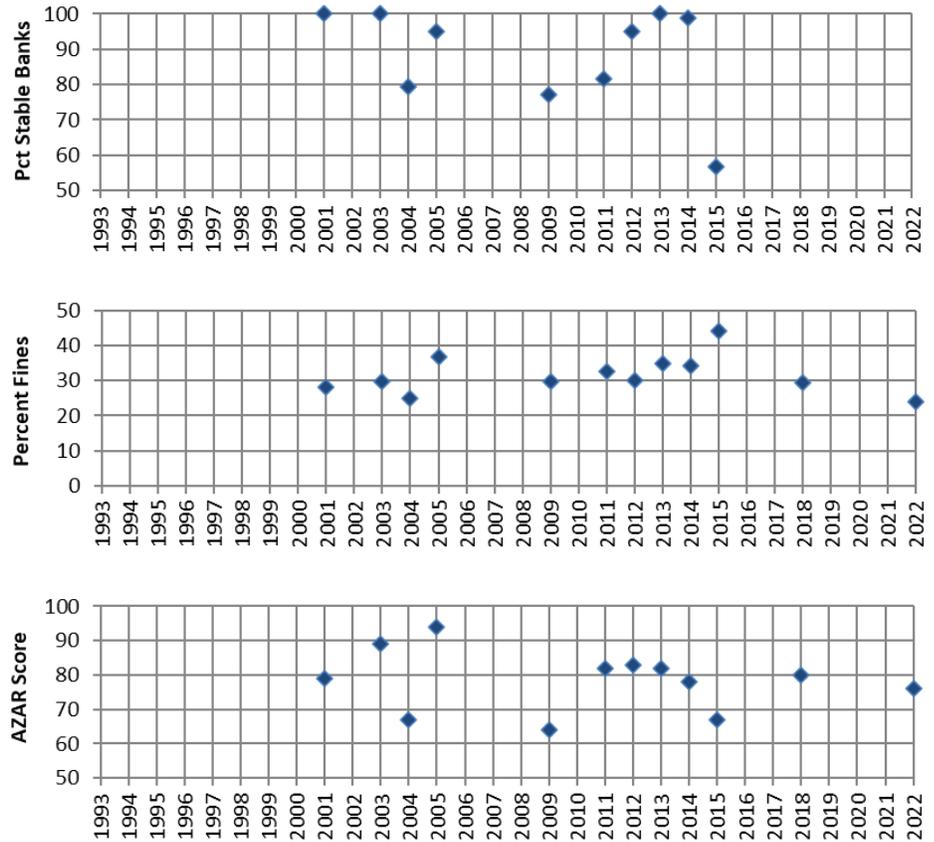
WEDA' A NAKWAIDE 1R

Last Year Sampled: 2022

SITE DATA

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001	100	28.1	79
2002			
2003	100	29.9	89
2004	79.5	24.9	67
2005	95.0	36.7	94
2006			
2007			
2008			
2009	77.0	29.7	64
2010			
2011	81.5	32.7	82
2012	95.0	30.1	83
2013	100	34.8	82
2014	99.0	34.2	78
2015	56.8	44.3	67
2016			
2017			
2018		29.3	80
2019			
2020			
2021			
2022		23.9	76
2023			
n	10	12	12
Mean	88.4	31.6	78.4
St Dev	14.4	5.5	8.9
n	2	4	4
Mean	77.9	32.9	75.3
St Dev	29.8	8.7	5.7

10YR ALL



CHANNEL MEASUREMENTS

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2003	12.6	2.4	20.2	2	1.5	Crs gravel	C4
2015	10.5	4.6	21.0	1.4	2	Crs gravel	C4
2018	11.2	3.2	10.1	1.2-1.5	2-4	Gravel	C4
Reviewed Channel Type							C4

REMARKS

This site has been sampled nearly continuously since 2001. Bank stability has varied, with a sharp decrease in 2015. Depth fines have been consistently around 30% with some higher values. Notes indicate heavy grazing impacts, and sampling site may be an old ford.

**TIMBER CREEK 1R**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Timber Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Little Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located 0.5 mile upstream of the mouth of Timber Creek, near Timber Creek CG. Access is via the Sawmill Canyon Rd (FR101), the Timber Creek Rd (FR105), the Timber Creek CG Rd (FR422), and the Timber Creek Meadow Cutoff Rd (FR849-A).		
<b>GPS Coordinates</b>	N 44.40076 (2019)	W -113.41090 (2019)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	9.8 sq mi 6,297 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	35 cfs	<b>Mean Annual Flow</b> (Streamstats)	5.3 cfs
<b>5th-level Watershed</b>	Sawmill Creek / 1704021702				
<b>Mean Basin Elevation</b>	8451 ft	<b>Basin Aspect</b>	SE	<b>Mean Basin Slope</b>	38%
<b>Length of Road</b>	22.6 mi		<b>Road Density</b>		2.30 mi/sq mi
<b>Landtype Geology</b>	<b>Granitic</b>	0.0%	<b>Quartzite</b>	14.8%	
	<b>Volcanic</b>	85.2%	<b>Mixed</b>	0.0%	
	<b>Sedimentary</b>	0.0%	<b>Alluvium</b>	0.0%	
<b>% of Watershed in Active Allotment</b>	99.9%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2019)



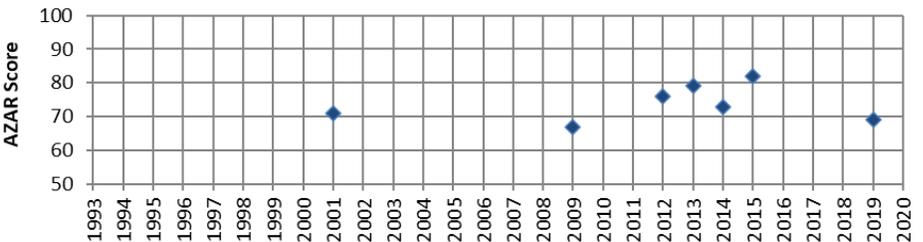
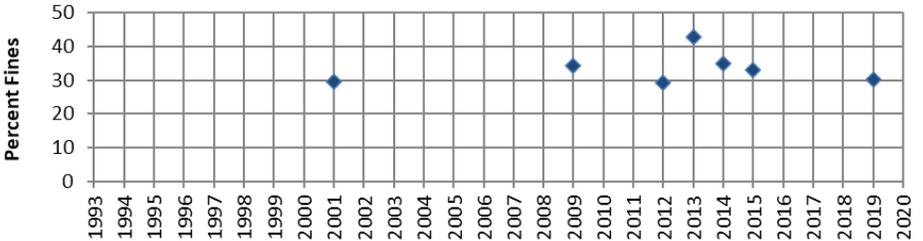
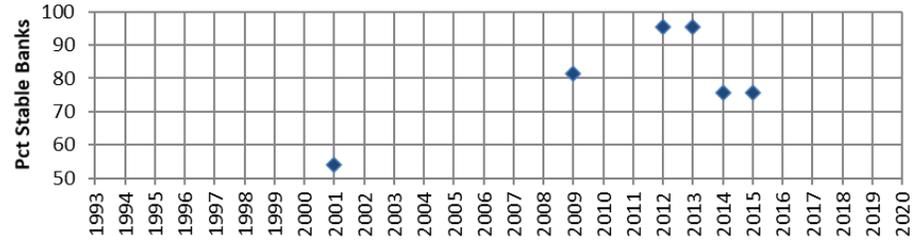
View Downstream (2019)

**TIMBER CREEK 1R**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001	54.0	29.4	71
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009	81.5	34.3	67
2010			
2011			
2012	95.5	29.2	76
2013	95.5	42.8	79
2014	75.5	34.8	73
2015	75.5	32.9	82
2016			
2017			
2018			
2019		30.1	69.0
2020			
2021			
2022			
2023			
n	6	7	7
Mean	79.6	33.4	73.9
St Dev	15.5	4.8	5.4
n	2	3	3
Mean	75.5	32.6	74.7
St Dev	-	2.4	6.7



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2015	19.2	1.9	19.2	1.3	2	Gravel	B4
2019	28.8	1.5	41.7	1.1	3.5	Sand (grav)	B4
<b>Reviewed Channel Type</b>							<b>B4</b>

**ALL**

**10YR**

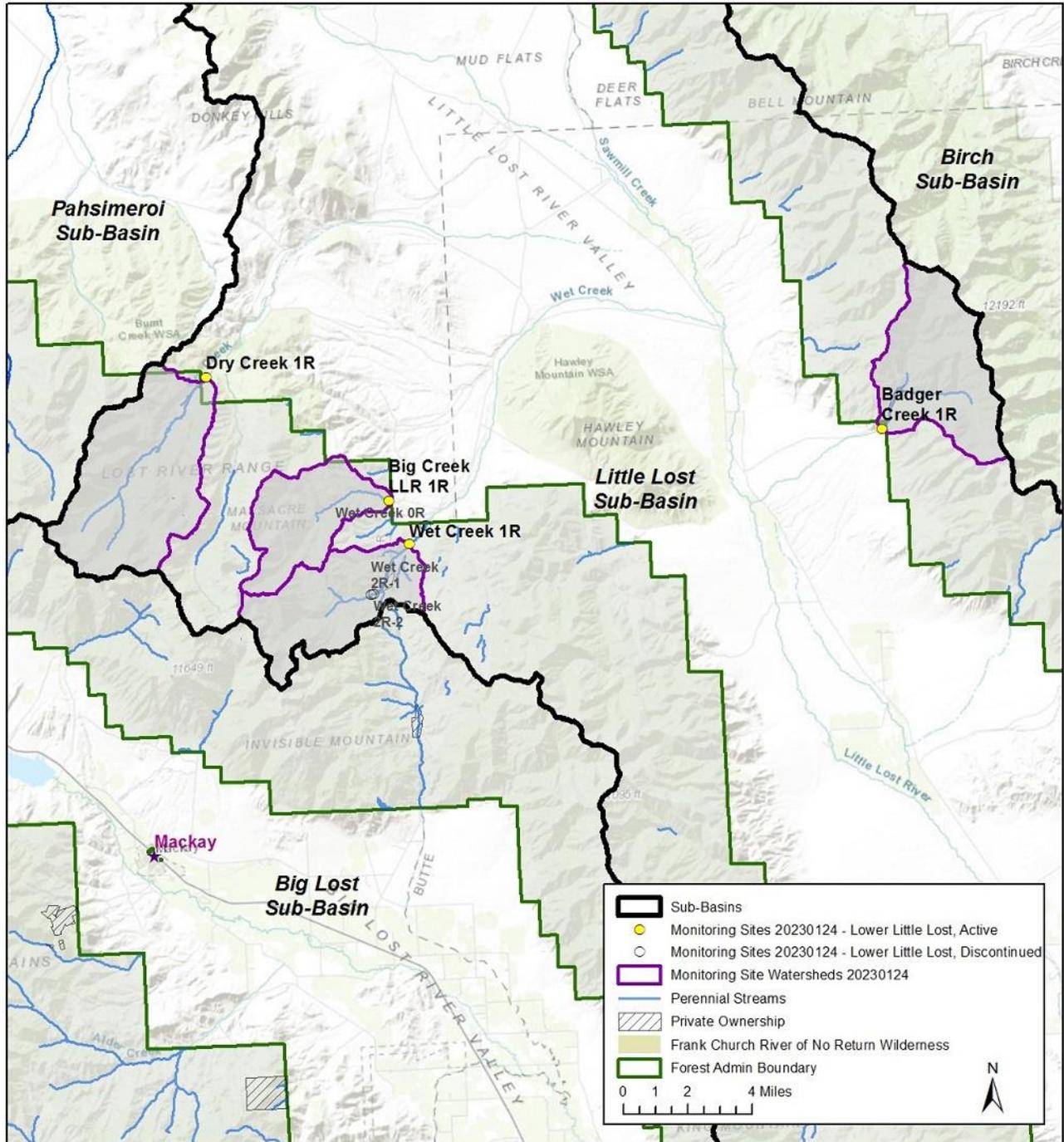
**REMARKS**

This site has been sampled 7 times, beginning in 2001. Bank stability has varied, with recent values around 75%. Depth fines have been consistently 30% or greater.



## Lower Little Lost River

A total of 4 active monitoring sites are located in the lower portion of the Little Lost River watershed.



**BADGER CREEK 1R**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Badger Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Little Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Access is via the Badger Creek road (FR 148), 4.9 miles upstream of the Little Lost River Highway.		
<b>GPS Coordinates</b>	N 44.09233 (2019)	W -113.14885 (2019)	
<b>Site Comments</b>	Site is 0.2 miles downstream of Forest boundary. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	15.4 sq mi 9,879 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	45 cfs	<b>Mean Annual Flow</b> (Streamstats)	14.7 cfs
<b>5th-level Watershed</b>	Upper Little Lost River/ 1706020106				
<b>Mean Basin Elevation</b>	8977 ft	<b>Basin Aspect</b>	SW	<b>Mean Basin Slope</b>	61%
<b>Length of Road</b>	4.5 mi	<b>Road Density</b>		0.29 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>		9.1%
	<b>Volcanic</b>	0%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	90.9%	<b>Alluvium</b>		0%
<b>% of Watershed in Active Allotment</b>	98.9%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (2019)



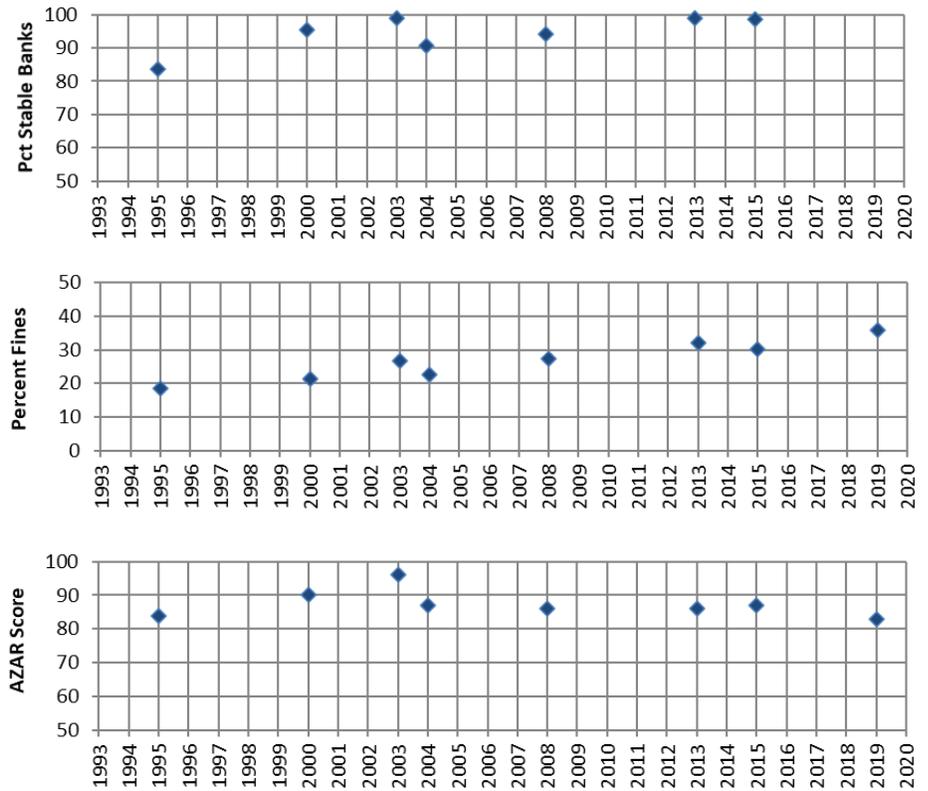
View Downstream (2019)

**BADGER CREEK 1R**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	83.5	18.4	84
1996			
1997			
1998			
1999			
2000	95.5	21.2	90
2001			
2002			
2003	99.0	26.8	96
2004	90.5	22.7	87
2005			
2006			
2007			
2008	94.0	27.4	86
2009			
2010			
2011			
2012			
2013	99.0	32.0	86
2014			
2015	98.5	30.3	87
2016			
2017			
2018			
2019		35.7	83
2020			
2021			
2022			
2023			
n	7	8	8
Mean	94.3	26.8	87.4
St Dev	5.7	5.8	4.1
n	1	2	2
Mean	98.5	33.0	85.0
St Dev	-	3.8	2.8



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2003	12.8	3.1	16.5	-	1.5	Crs gravel	C4
2015	10.6	2.5	15.1	1.1	2.5	Crs gravel	C4b
2019	15.6	2.6	26.4	<1.2	5.0	Sand (grav)	C4b
<b>Reviewed Channel Type</b>							<b>C4b</b>

**10YR ALL**

**REMARKS**

This site has been sampled periodically since 1995. Bank stability has been consistently high. Depth fines have shown a slight increasing trend, with recent values around 30%. Consider alternate sampling locations upstream of the Forest boundary, if suitable sampling habitat exists.

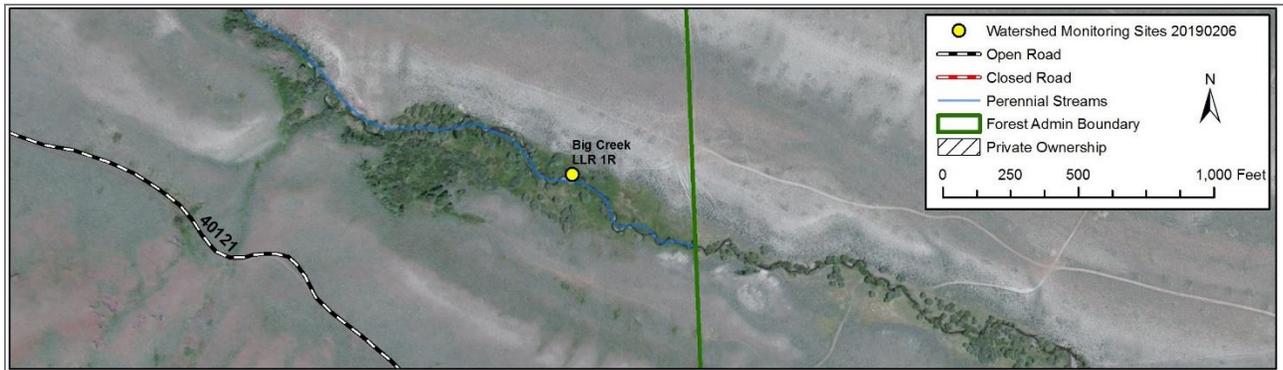
**BIG CREEK LLR 1R**

**Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	Big Creek LLR 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Little Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located at the Forest boundary. Access is via the Pass Creek Road (FR122), then an unmarked dirt road just north of Big Creek. Site is 1.3 miles from the Pass Creek Road.		
<b>GPS Coordinates</b>	N 44.06999 (2022)	W -113.45822 (2022)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	10.4 sq mi 6,628 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	45 cfs	<b>Mean Annual Flow</b> (Streamstats)	8.2 cfs
<b>5th-level Watershed</b>	Wet Creek / 1704021704				
<b>Mean Basin Elevation</b>	8806 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	36%
<b>Length of Road</b>	2.8 mi	<b>Road Density</b>		0.27 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	0%	
	<b>Volcanic</b>	85.0%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	15.0%	<b>Alluvium</b>	0%	
<b>% of Watershed in Active Allotment</b>	99.0%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (7/5/2022)



View Downstream (7/5/2022)

**BIG CREEK LLR 1R**

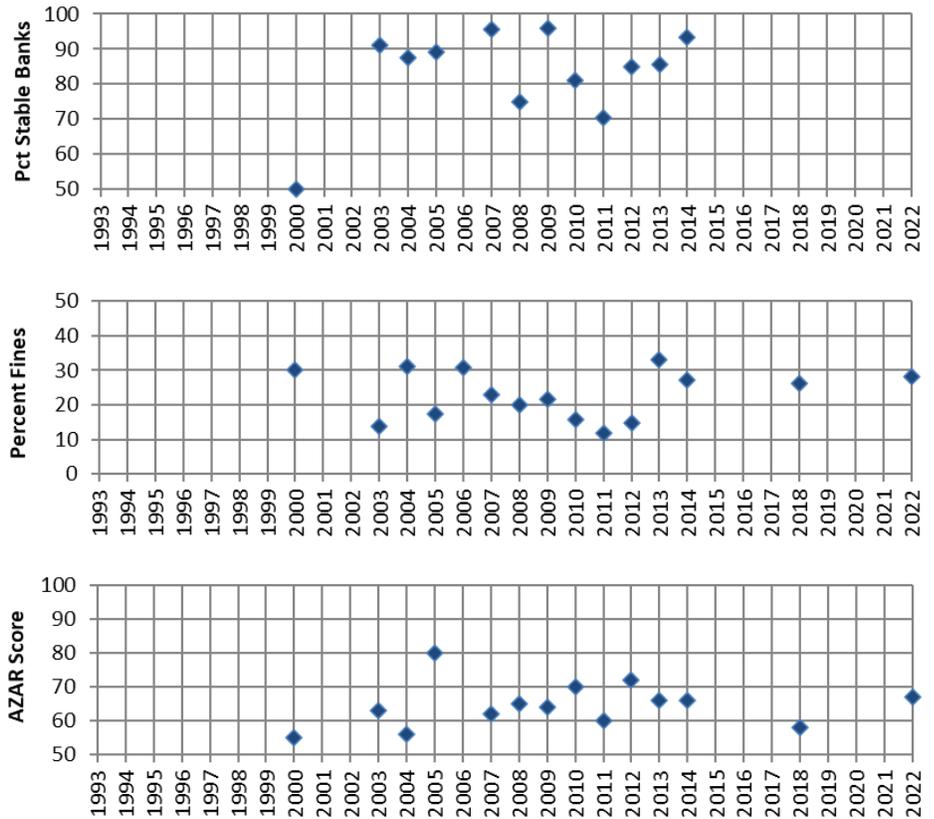
**Last Year Sampled: 2022**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000	50.0	30.0	55
2001			
2002			
2003	91.0	13.7	63
2004	87.5	31.1	56
2005	89.0	17.5	80
2006		30.7	
2007	95.5	23.0	62
2008	75.0	20.0	65
2009	96.0	21.6	64
2010	81.0	15.8	70
2011	70.5	11.7	60
2012	85.0	14.8	72
2013	85.6	33.0	66
2014	93.5	27.1	66
2015			
2016			
2017			
2018		26.1	58
2019			
2020			
2021			
2022		28.3	67
<b>n</b>	12	15	14
<b>Mean</b>	83.3	23.0	64.6
<b>St Dev</b>	13.1	7.1	6.6
<b>n</b>	1	3	3
<b>Mean</b>	93.5	27.2	63.7
<b>St Dev</b>	-	1.1	4.9

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2003	5.4	4.4	8.3	1.5	2.0	Crs gravel	E4
2018	10.0	16.7	8.9	1.5	2.2	Gravel	E4

<b>Reviewed Channel Type</b>	<b>E4</b>
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**REMARKS**

This site has been sampled almost continuously since 2003. Bank stability has varied from moderate to high, and depth fines have varied from 12 to 33%. Impacts to channel/banks from cattle grazing noted.

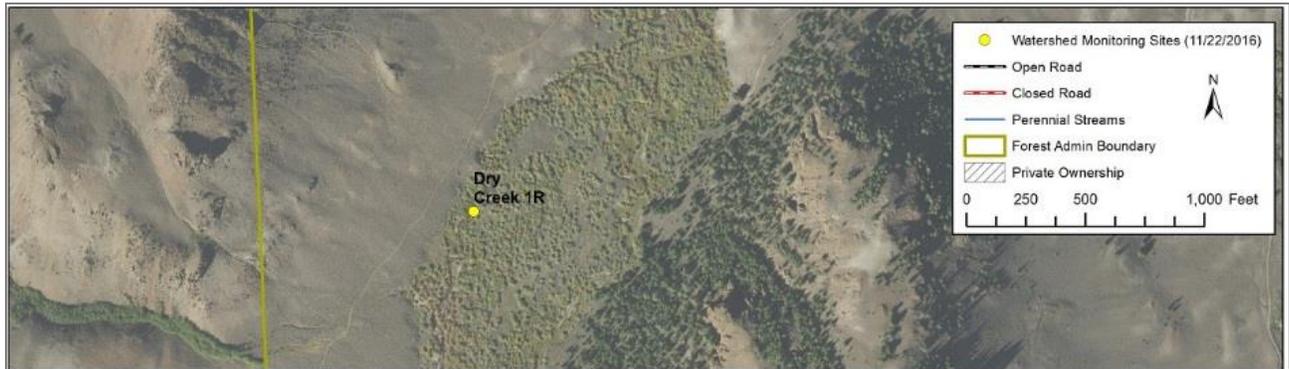
**DRY CREEK 1R**

**Last Year Sampled: 2019**

**SITE INFO**

<b>Site Name</b>	Dry Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Little Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located 0.2 miles downstream of the Forest boundary. Access is via the Dry Creek Road (FR119), 10.8 miles from the turn-off from Pass Creek Road. Park at the trailhead 0.6 miles past the ford of Dry Creek.		
<b>GPS Coordinates</b>	N 44.12902 (2019)	W -113.56873 (2019)	
<b>Site Comments</b>	This site is 0.2 miles downstream of the Forest boundary. 5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	22.0 sq mi 14,052 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	216 cfs	<b>Mean Annual Flow</b> (Streamstats)	19.9 cfs
<b>5th-level Watershed</b>	Dry Creek / 1704021703				
<b>Mean Basin Elevation</b>	9447 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	59%
<b>Length of Road</b>	0.1 mi		<b>Road Density</b>	0.01 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>	1.5%	
	<b>Volcanic</b>	82.7%	<b>Mixed</b>	0%	
	<b>Sedimentary</b>	13.3%	<b>Alluvium</b>	2.4%	
<b>% of Watershed in Active Allotment</b>	0%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



**View Upstream (2019)**



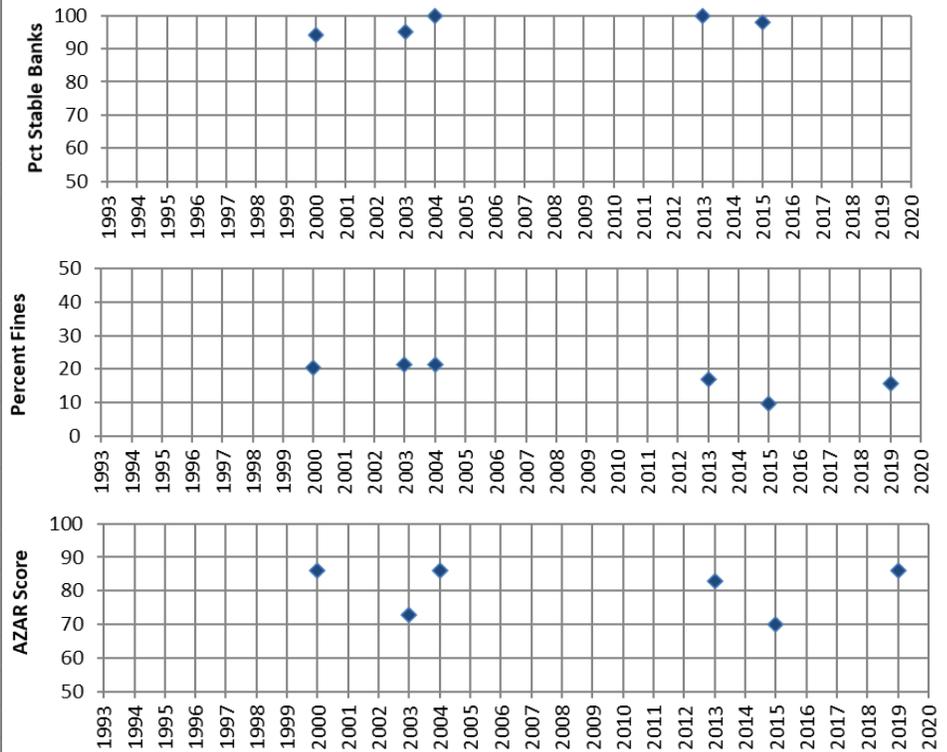
**View Downstream (2019)**

**DRY CREEK 1R**

**Last Year Sampled: 2019**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000	94.0	20.4	86
2001			
2002			
2003	95.0	21.5	73
2004	100	21.4	86
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013	100	16.9	83
2014			
2015	98.0	9.8	70
2016			
2017			
2018			
2019		15.8	86.0
2020			
2021			
2022			
2023			
n	5	6	6
Mean	97.4	17.6	80.7
St Dev	2.8	4.5	7.3
n	1	2	2
Mean	98.0	12.8	78.0
St Dev	-	4.2	11.3



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
2003	15.9	4.4	18.2	1.4	0.5	VC Gravel	C4
2015	15.6	10.6	18.4	1.2	1.5	VC Gravel	C4
2019	16.7	13.7	15.6	1.2	3.0	Gravel	C4

**Reviewed Channel Type** **C4**

**ALL**

**10YR**

**REMARKS**

This site has been sampled 6 times, beginning in 2000. Bank stability has been very high, and depth fines have been low. Consider moving site to alternate location upstream of Forest boundary, if suitable sampling habitat exists.

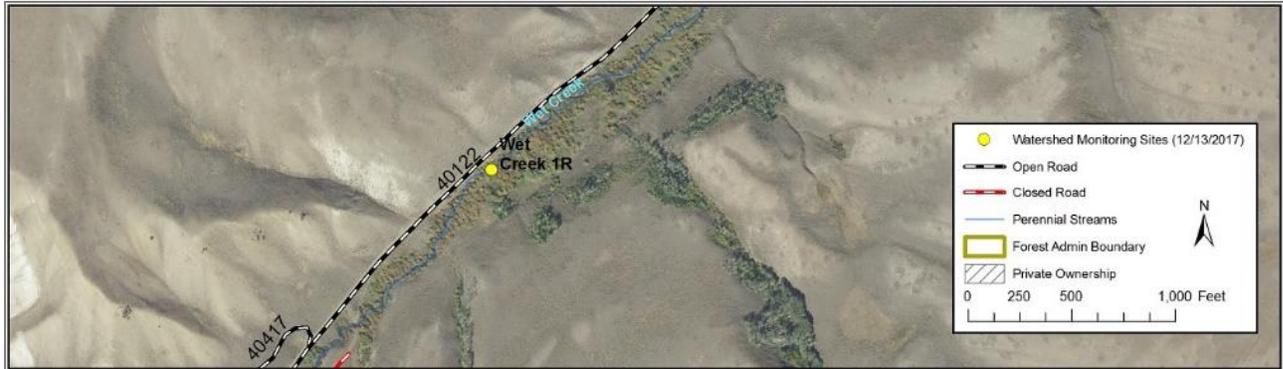
**WET CREEK 1R**

**Last Year Sampled: 2022**

**SITE INFO**

<b>Site Name</b>	Wet Creek 1R	<b>Site Type</b>	Resident
<b>Sub-Basin</b>	Little Lost	<b>Ranger District</b>	Lost River
<b>Site Location</b>	Site is located about 0.9 miles upstream of the Forest Boundary, accessed via the Pass Creek Road (FR122).		
<b>GPS Coordinates</b>	N 44.04994 (2022)	W -113.44633 (2022)	
<b>Site Comments</b>	5-year sampling frequency.		

**SITE MAP**



**BASIN DATA**

<b>Drainage Area at Site</b>	13.2 sq mi 8,454 ac	<b>Approx Bankfull Flow</b> (Streamstats Q1.5 regression est.)	64 cfs	<b>Mean Annual Flow</b> (Streamstats)	8.4cfs
<b>5th-level Watershed</b>	Wet Creek / 1704021704				
<b>Mean Basin Elevation</b>	8783 ft	<b>Basin Aspect</b>	NE	<b>Mean Basin Slope</b>	44%
<b>Length of Road</b>	20.3 mi	<b>Road Density</b>		1.53 mi/sq mi	
<b>Landtype Geology</b>	<b>Granitic</b>	0%	<b>Quartzite</b>		0%
	<b>Volcanic</b>	100%	<b>Mixed</b>		0%
	<b>Sedimentary</b>	0%	<b>Alluvium</b>		0%
<b>% of Watershed in Active Allotment</b>	97.8%	<b>% of Watershed Burned (2018-2022)</b>		0%	

**SITE PHOTOS**



View Upstream (9/12/2022)



View Downstream (9/12/2022)

**WET CREEK 1R**

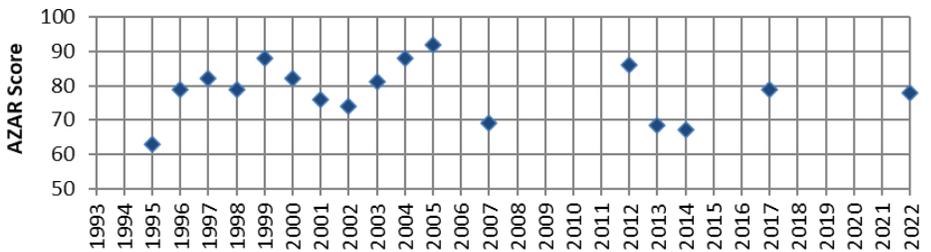
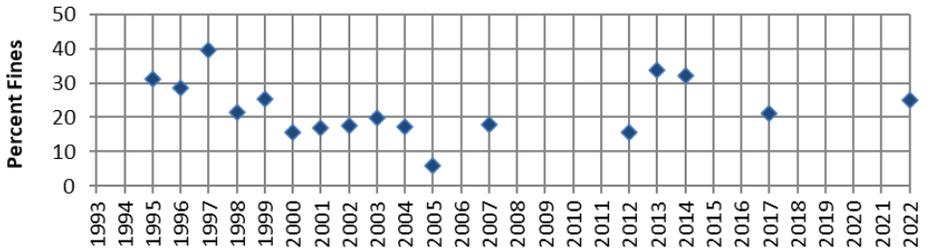
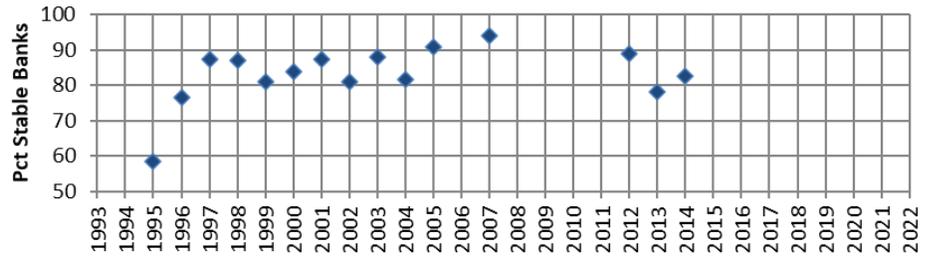
**Last Year Sampled: 2022**

**SITE DATA**

Year	% Stable Banks	Percent Fines	AZAR Score
1993			
1994			
1995	58.5	31.2	63
1996	76.5	28.4	79
1997	87.5	39.5	82
1998	87.0	21.5	79
1999	81.0	25.3	88
2000	84.0	15.5	82
2001	87.5	17.0	76
2002	81.0	17.7	74
2003	88.0	19.9	81
2004	81.5	17.3	88
2005	91.0	6.1	92
2006			
2007	94.0	18.0	69
2008			
2009			
2010			
2011			
2012	89.0	15.5	86
2013	78.3	33.8	69
2014	82.5	32.0	67
2015			
2016			
2017		21.2	79
2018			
2019			
2020			
2021			
2022		25.1	78
<b>n</b>	15	17	17
<b>Mean</b>	83.2	22.6	78.3
<b>St Dev</b>	8.4	8.3	8.1
<b>n</b>	1	3	3
<b>Mean</b>	82.5	26.1	74.7
<b>St Dev</b>	-	5.5	6.7

**ALL**

**10YR**



**CHANNEL MEASUREMENTS**

Year	Bankfull Width (ft)	Entrenchment ratio	Width-to-depth ratio	Sinuosity	Channel gradient (%)	Substrate	Channel Type
1995	10.2	1.5	11.3	-	2	Gravel	B4
2015	-	-	-	-	-	-	E4
2017	9.4	3.4	7.2	1.2	2.0	Gravel	E4b
<b>Reviewed Channel Type</b>							<b>E4b</b>

**REMARKS**

Bank stability has been moderate (mostly greater than 80%). Depth fines have varied, with some recent values greater than 30%. Continuous sampling may not be necessary at this site in addition to Wet Creek OR (see remarks under Wet Creek OR). 2022 notes indicated visible increase in ungulate bank damage based on 2017 photos and some beaver dams 60m upstream of site.



## ANALYSIS

A total of 192 monitoring sites have been established on the Salmon-Challis National Forest, and monitoring has been conducted since 1993. A summary of sites by sub-basin is shown in the table below. Of those 192 sites, 127 sites are active monitoring sites. 65 sites have been discontinued and will no longer be sampled in the future.

These sites were discontinued because they are no longer important for tracking conditions, they no longer represent a valid sample site because conditions have changed, they were replaced with a new site, or they are redundant with another more suitable site. See **Appendix B** for a list of discontinued sites.

Sub-basin	Total # of sites	Active Sites	Discontinued Sites
Middle Salmon-Chamberlain	3	1	2
Middle Salmon-Panther	79	49	30
Upper Salmon	37	22	15
Lower Middle Fork Salmon	10	6	4
Upper Middle Fork Salmon	2	2	0
Lemhi	26	20	6
Pahsimeroi	4	2	2
Big Lost	18	15	3
Little Lost	13	10	3
<b>TOTAL</b>	<b>192</b>	<b>127</b>	<b>65</b>

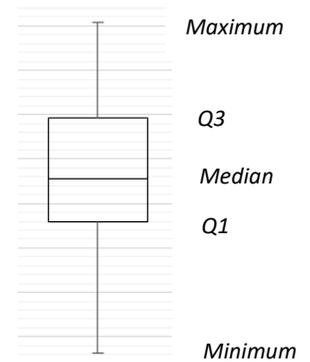
### Analysis Approach

The analysis in this report considers only the 127 active monitoring sites. Because conditions are known to change over time as a result of many factors and most sites are only sampled every 5 to 10 years, the data collected during the most recent 10-year period (2014-2023) is thought to provide a snapshot of current conditions. The 10-year average is used to examine relationships between current conditions, watershed characteristics, and land use factors.

Box and whisker plots are presented in this analysis to show the distribution of data and comparisons between categories. These box plots depict minimum, Q1 (25<sup>th</sup> percentile), median, Q3 (75<sup>th</sup> percentile), and maximum values.

The level of analysis in this report provides basic characterization of the data and relationships between various variables. Statistical analysis of the dataset has not been conducted at this time. All data used in the analysis have been updated for 2023.

All active monitoring sites have been sampled at least once in the last 10 years, and channel types have been assigned for all active monitoring sites. Bank stability data are not included in the 2023 analysis because bank stability monitoring was discontinued in 2016.

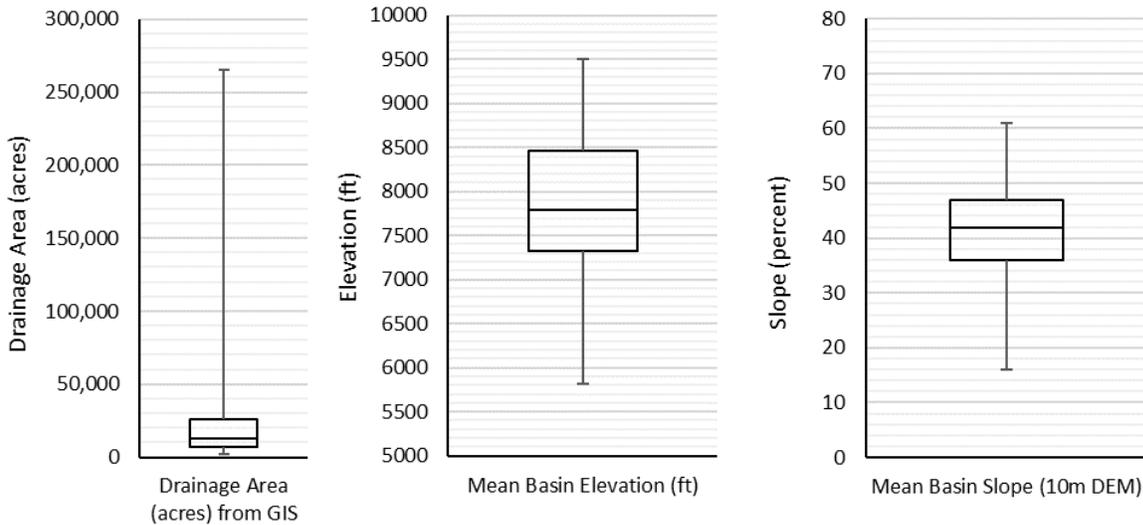


## Watershed Characterization

The table below provides a summary of watershed characteristics for the drainage basins of the 127 active monitoring sites.

*Monitoring Site Watershed Characteristics*

	Drainage Area (acres) - GIS	Mean Basin Elevation (ft) - Streamstats	Mean Basin Slope (10m DEM) - Streamstats
<b>Minimum</b>	2297	5820	16
<b>Q1</b>	6742	7320	36
<b>Median</b>	12,797	7793	42
<b>Q3</b>	25,926	8462	47
<b>Maximum</b>	264,995	9500	61
<b>Count</b>	127	127	127

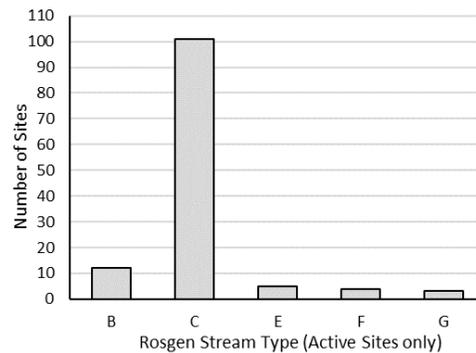


Site watersheds for the 127 active monitoring sites vary greatly in size, elevation, aspect, and lithology. The majority of sites are in watersheds with quartzite and volcanics as the dominant lithology. The distributions of watershed drainage area and approximate bankfull flow values are highly skewed, with the maximum values being an order of magnitude greater than the Q3 values.

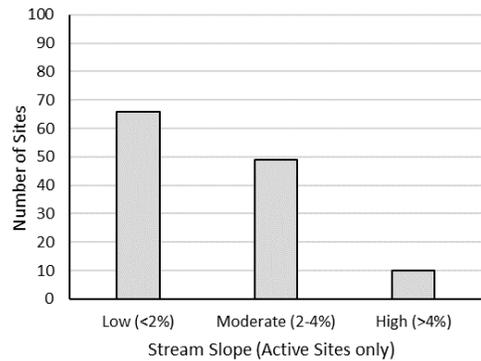
## Summary of Channel Types

Channel types have been collected for 125 of the active monitoring sites using Rosgen channel classification methodology (Rosgen, 1994) within the past 8 years. Channel type information is summarized for the current monitoring sites by stream type (A, B, C, E, F, or G), stream slope (less than 2%, 2 to 4%, or greater than 4%), and dominant stream material (cobble, gravel, or sand). Although stream slope is a factor used to determine channel type, in some cases, a site with a moderate gradient channel type such as C4b may have a gradient greater than 4% because some variance in the determining factors is allowed within a channel type. The following tables summarize channel types and channel characteristics for the 127 active monitoring sites.

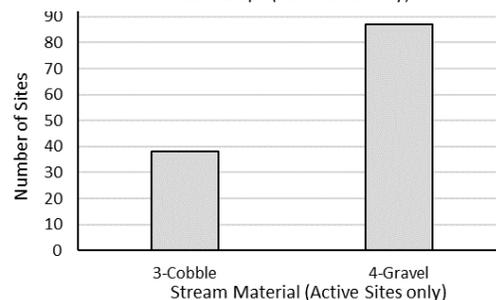
Stream Type - number of sites	Active sites
No channel type	2
A	0
B	12
C	101
E	5
F	4
G	3
<b>Total</b>	<b>127</b>



Stream Slope - number of sites	Active sites
No channel type	2
Low (<2%)	66
Moderate (2-4%)	49
High (>4%)	10
<b>Total</b>	<b>127</b>



Stream Material - number of sites	Active sites
No channel type	2
3-Cobble	38
4-Gravel	87
<b>Total</b>	<b>127</b>



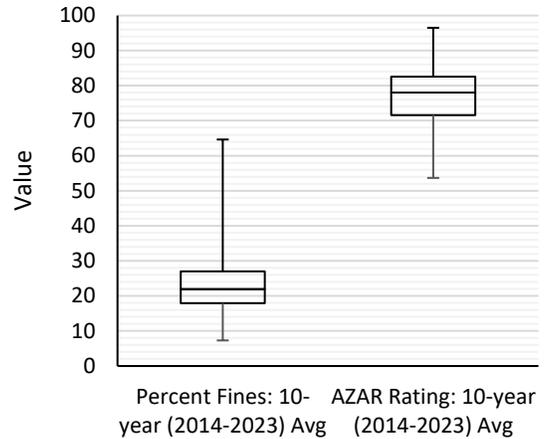
The most common stream type of the monitoring sites is the C channel, of which the most common channel type is C4. C4 channels are the most typical low gradient channels on the Salmon-Challis National Forest that provide spawning habitat. C3b and C4b channels are also very common and can be described as high gradient C channels. Monitoring sites with low gradient (less than 2%) channels are the most common, as these typically provide the most suitable spawning habitat for sampling.

## Summary of Watershed Monitoring Data

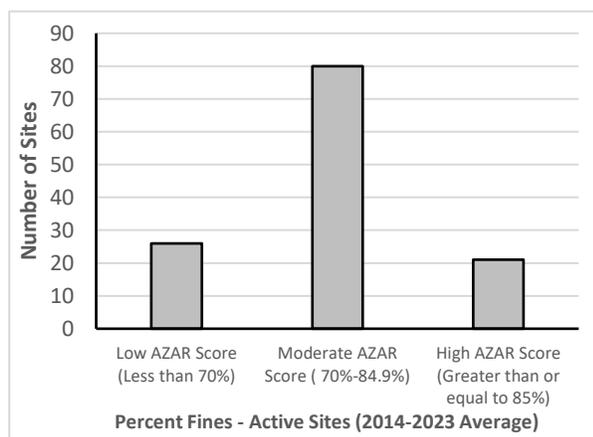
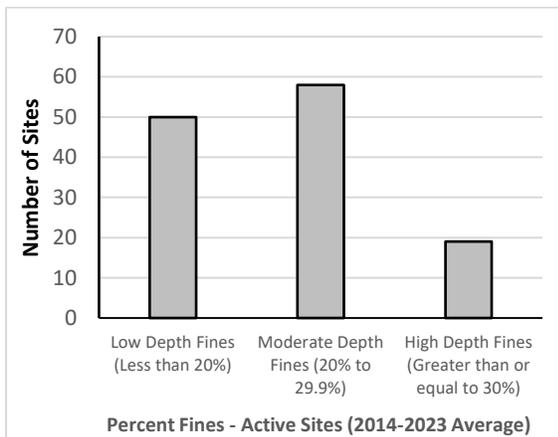
Watershed monitoring data currently collected at each site include percent depth fines and AZAR rating. For each active monitoring site, the most recent 10-year average was calculated for each of these measures. Because not every site is monitored every year, and some sites go multiple years without monitoring, the number of years of data used to calculate the 10-year average ranges from 1 to 7 and averages 3.1. For sites that were sampled twice in a given year (to monitor changes after flood events), only the first yearly sample was included in the 10-year average.

### Watershed Monitoring Site Data

	2014-2023 Average (10-Year)	
	Percent Fines	AZAR Rating
<b>Minimum</b>	7.3	35.8
<b>Q1</b>	18.0	85.5
<b>Median</b>	21.9	90.5
<b>Q3</b>	27.0	96.1
<b>Maximum</b>	64.6	100.0
<b>Count</b>	127	105



Depth fines and AZAR data were categorized as low, moderate, and high based on thresholds for each measure. The high value threshold for depth fines (>30%) is based on Forest Plan standards in the Challis National Forest Land Resource Management Plan (USDA Forest Service, Challis National Forest, 1987). The low value threshold for AZAR rating (<70%) is an arbitrary value. A total of 20 active monitoring sites (16%) have high depth fines, and 26 active monitoring sites (20%) have low AZAR rating.



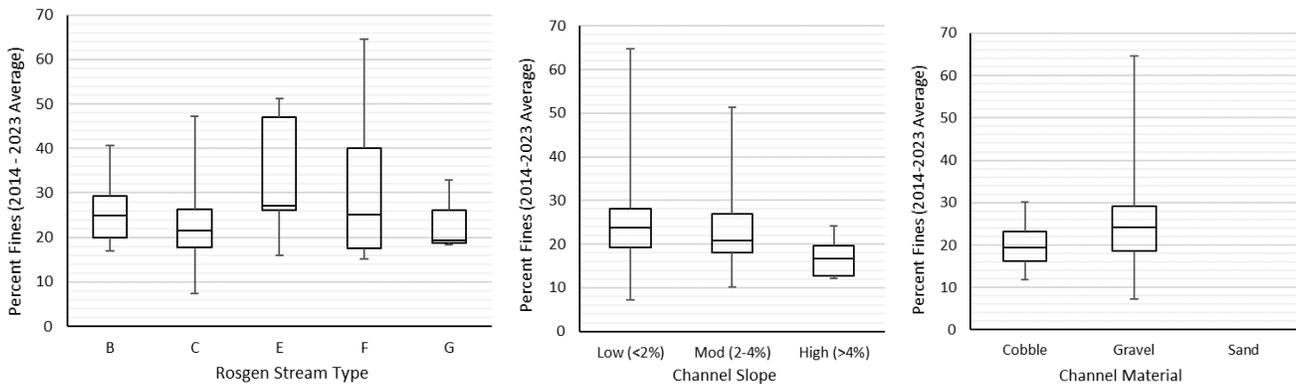
## Analysis – Percent Fines

The relationships between percent fines and many different factors defining channel characteristics, watershed characteristics, and land use have been analyzed in past Watershed Monitoring reports. This 2023 Watershed Monitoring Report takes an updated look at only a few of those factors that appear to have some influence on the data parameters that have been collected.

For visual representation of these relationships, box and whisker plots are provided for categorical data, and scatter plots are provided for continuous data. Statistical analysis has not been completed at this time.

### Percent Fines by Channel Characteristics

Percent fines appears to be influenced by some channel morphology variables. No generalizations can be made for the influence of channel type on percent fines using the 2014-2023 data averages, primarily because of the small sample sizes of the channel types other than C. However, high gradient sites (>4%) appear to have the lowest percent fines, rarely exceeding 30%, and cobble substrate sites appear to have the lowest percent fines, never exceeding 30%. High gradient and/or cobble substrate sites tend to represent high flow energy, where conditions are less suitable for deposition of fine sediments. These trends are similar to those reported in past monitoring reports.



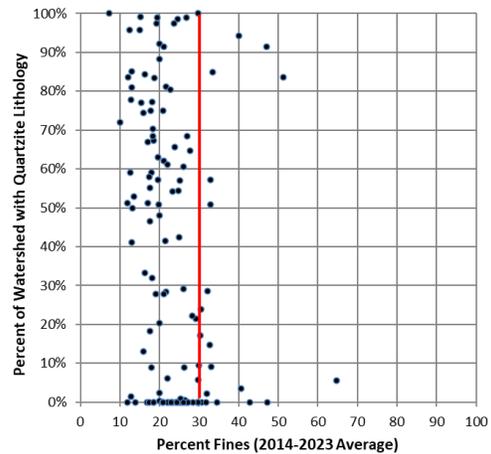
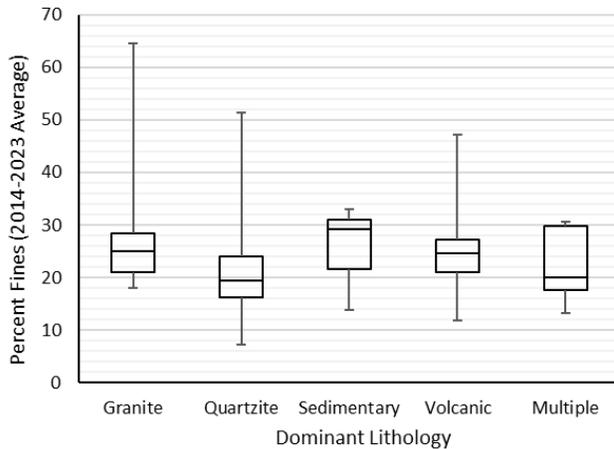
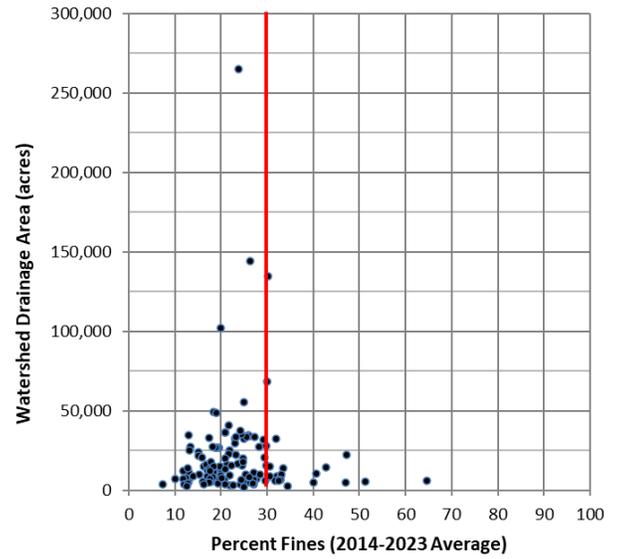
Percent Fines (2014-2023 Average) by Channel Characteristics

	Stream Type					Stream Slope			Stream Material		
	B	C	E	F	G	Low (<2%)	Mod (2-4%)	High (>4%)	3-Cobble	4-Gravel	5-Sand
<b>Minimum</b>	17.0	7.3	15.9	15.1	18.3	7.3	10.1	12.1	11.8	7.3	-
<b>Q1</b>	20.0	17.7	26.1	17.6	18.8	19.2	18.0	12.8	16.2	18.7	-
<b>Median</b>	24.9	21.6	27.2	25.1	19.3	23.8	20.9	16.7	19.4	24.2	-
<b>Q3</b>	29.3	26.4	47.1	40.0	26.1	28.1	26.9	19.6	23.2	29.1	-
<b>Maximum</b>	40.7	47.3	51.3	64.6	32.9	64.6	51.3	24.2	30.3	64.6	-
<b>Count</b>	12	101	5	4	3	66	49	10	38	89	0

**Factors that influence Percent Fines**

Previous Watershed Monitoring Reports showed little or no correlation between percent fines and watershed characteristics. Drainage area, mean basin elevation, and mean basin slope do not appear to influence percent fines, although it does appear that sites with small drainage areas have the widest range of percent fines (*right*). These small streams may be more heavily influenced by other site-specific factors.

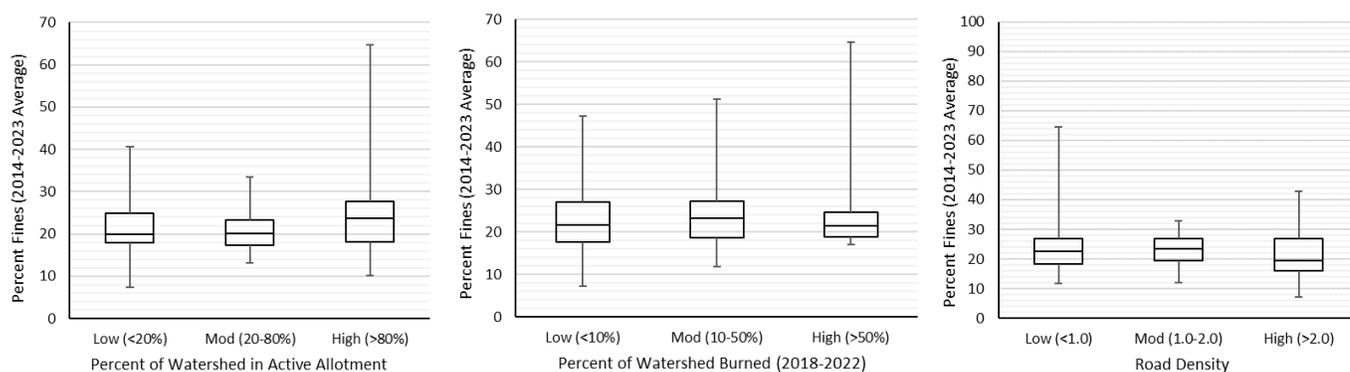
Dominant lithology appears to have some influence on percent fines. The highest fines are in watersheds dominated by granitic, sedimentary, and volcanic landtypes, while quartzite landtypes tend to produce lower fines (with some exceptions). However, despite this apparent trend, very little correlation exists between depth fines and percent of watershed with quartzite lithology.



*Percent Fines (2014-2023 Average) by Dominant Watershed Lithology*

	Granite	Quartzite	Sedimentary	Volcanic	Multiple
<b>Minimum</b>	18.0	7.3	13.9	11.8	13.2
<b>Q1</b>	21.0	16.3	21.5	21.0	17.7
<b>Median</b>	25.0	19.5	29.1	24.6	20.0
<b>Q3</b>	28.5	24.0	31.1	27.1	29.8
<b>Maximum</b>	64.6	51.3	33.0	47.3	30.5
<b>Count</b>	13	56	3	42	13

The relationships between percent fines and percentage of watershed within active grazing allotments, percentage of watershed burned by wildfire in the last 5 years, and watershed road density were analyzed. Similar to the analysis in previous Watershed Monitoring reports, few trends are apparent. The median percent fines increases slightly with percentage of watershed in active grazing allotments, and the highest percent fines occur at sites with a high percent of the watershed in active grazing allotments, but this simple analysis does not consider grazing intensity, timing, or management. Although wildfire is known to increase levels of fine sediment in streams, the data do not show any correlation between percent fines and the percentage of the watershed burned within the last 5 years. Likewise, roads are known to be a contributor to fine sediment in stream channels, but the data do not show any such trends. This simple analysis does not consider road type, condition, gradient, location on the hillslope, layout, or surface geology.



Percent Fines (2014-2023 Average) by Land Use Factors

	Percentage of Watershed in Active Grazing Allotments			Percentage of Watershed Burned (2018-2022)			Road Density		
	Low (<20%)	Mod (20-80%)	High (>80%)	Low (<10%)	Mod (10-50%)	High (>50%)	Low (<1.0)	Mod (1.0-2.0)	High (>2.0)
<b>Minimum</b>	7.3	13.2	10.1	7.3	11.9	17.0	11.8	11.9	7.3
<b>Q1</b>	18.0	17.4	18.2	17.7	18.7	18.9	18.2	19.3	16.0
<b>Median</b>	19.9	20.2	23.7	21.7	23.2	21.4	22.5	23.5	19.3
<b>Q3</b>	24.9	23.4	27.7	27.0	27.2	24.7	26.9	26.8	26.8
<b>Maximum</b>	40.7	33.5	64.6	47.3	51.3	64.6	64.6	32.9	42.7
<b>Count</b>	30	18	79	103	13	11	64	38	25

### Analysis – AZAR Rating

The relationships between AZAR rating and many different factors for channel characteristics, watershed characteristics, and land use have been analyzed in past Watershed Monitoring Reports. As with these previous analyses, the updated 2023 dataset shows very little correlation between these factors and the 10-year average AZAR scores. Furthermore, because AZAR is a more subjective measure than depth fines, additional “error” may exist. This 2023 analysis does not take a detailed look at the relationships between AZAR scores and watershed/land use factors.

## SYNTHESIS

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The Salmon-Challis National Forest now has a 30-year watershed monitoring dataset. Fine sediment and bank stability data and trends have been used for a number of years to help inform land management decisions and characterize the quality of stream habitat. The linkage between land use impacts and the quality of instream habitat is not clearly defined, nor is it easily understood (Lisle and Hilton, 1992). Spatial and temporal variations in depth fines, bank stability, and AZAR rating are the result of complex relationships between a number of factors, including channel characteristics, watershed characteristics, land use characteristics, climatic fluctuations, sediment supply, and sediment transport capacity.

This monitoring report examines a variety of channel characteristics, watershed characteristics, and land use characteristics, and their relation to the watershed monitoring dataset. While the dataset is not complete and the frequency of data collection varies between sites, data collected in 2023 has helped to fill data gaps and provide additional context to the dataset. The following discussion highlights some of the conclusions that have become apparent in the dataset regarding variables that appear to have the greatest impact on depth fines, as well as additional data gaps and research opportunities.

### Factors Influencing Depth Fines

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#### The Importance of Channel Gradient

Channel gradient may be the most important factor influencing depth fines at a sample site. While inherently related to channel type, channel gradient is essentially a measure of stream transport energy. Data show that high gradient sites (channel reach gradients greater than 4%) rarely show high levels of depth fines. Of the active sites, 10 sites have gradients greater than 4%, and 10-year average depth fines at these sites do not exceed 32%. A number of high gradient sites have been discontinued in the past, generally because suitable sampling habitat does not exist.

Sampling should continue at the remaining high gradient sites, and although it is not expected that high fines will be measured at these sites regardless of changes in sediment supply, these sites typically have limited areas of spawning habitat in which changes in sediment distribution could be detected. At some point, monitoring data may be able to be used to determine an appropriate range of depth fines values to be expected in streams based on categorical values of reach gradient. This could be used to develop thresholds for management.

#### The Importance of Channel Type

Channel type is another factor, in addition to channel gradient, that influences stream transport energy. All active sampling sites have recent channel type data. The large majority of active monitoring sites are in C channels, as appropriate spawning habitat for sampling is most likely to exist in this stream type. C channels have the widest range of depth fines in the dataset because they occur in a variety of settings, and because of the large sample size. Typically, high entrenchment ratios associated with wide floodplains in C channels result in depositional environments in the pool tail, or glide areas. These glide areas are therefore sensitive to changes in sediment supply and are good indicators for monitoring watershed conditions. Steeper channels such as B channels, on the other hand, are typically associated

with lower fines. These channels lack continuous floodplains, resulting in high energy during high flows, flushing of fine sediment, and often development of armor layers.



*Owl Creek 1A*

*Example of a confined B channel*



*Bear Valley Creek 1A*

*Example of an unconfined C channel*

The sample sizes for E, F, and G channels in this dataset are too small to draw any substantive conclusions, but G channels do appear to have higher fines based on 3 samples. It would be beneficial to use this dataset to stratify expected depth fines values based on channel type, but this may be difficult because of the unequal distribution between channel types.

### **The Influence of Stream Channel Size**

Stream channel size is most often quantified by bankfull width, but it is also directly related to drainage area and bankfull flow. Analysis of the correlation between depth fines and drainage area and bankfull flow suggests that smaller stream channels have a wider range of depth fines, while the larger stream channels (greater than 25,000-acre drainage areas) have a narrower range with depth fines generally less than 30%. Many sites with very small stream channels have been discontinued because of inadequate sampling habitat. Active monitoring sites with small stream channels are more heavily influenced by riparian vegetation, woody debris, and channel bedforms than larger channels. Small channels are therefore more responsive to changes and may exhibit higher variability than in larger channels, where these effects can be averaged out. High fines in small stream channels, therefore, may occur as a result of different mechanisms than in larger stream channels. Additional investigation is warranted. Bankfull width is the most suitable measure for channel size but has proven difficult for monitoring crews to repeat without extensive training. Future analysis may look at relationships between channel width and sediment.



*Comparison of a typical small stream (Wagonhammer Creek 1R – 8.4 square mile drainage area) and a typical large stream (Yankee Fork 1A - 164.4 square mile drainage area). Different channel processes occur at each of these sites, affecting the distribution of fine sediment in different ways.*

### **The importance of Geology**

Surface geology appears to have some influence on depth fines, with the highest fines in watersheds dominated by granitic, sedimentary, and volcanic landtypes, and the lowest fines in watersheds with quartzite landtypes. This is consistent with the ways in which parent geologic material is broken down over time. Granite in this area tends to readily weather into sand and small gravel sized particles, which can accumulate in streams under certain conditions. Volcanics also tend to weather quickly into fine particle sizes. Quartzites are more resistant to weathering, resulting in larger particle sizes in streams. As with gradient and channel type, it would be beneficial to be able to use this dataset to stratify expected depth fines values based on surface geology. However, this is complicated by the many other interrelated factors involved.

### **The Effects of Land Use on Depth Fines**

The analysis conducted to date has examined simple relationships between depth fines and wildfire, roads, and grazing.

Wildfire is known to cause minor to major increases in depth fines, depending on the occurrence of post-fire flood events and channel morphology. Past data (e.g., Colson Creek 1A, Owl Creek 1A, Challis Creek 1A) have shown that post-fire debris flows can result in one to three years of depth fines values in excess of 50%, with recovery occurring relatively quickly as flushing flows transport the excess sediment out of the system. However, these events are localized and do not occur everywhere that wildfire occurs on the landscape. Many other factors, such as channel type and gradient influence how excess sediment is routed through a stream reach. For example, after a large series of debris flow events occurred on Colson Creek following the 2012 Mustang Complex Fire, depth fines increased briefly, but quickly recovered because of the transport dominated nature of the channel. Also, only a small percentage of sites have watersheds with more than 10% burned by wildfire in the last 5 years.

Roads, and particularly road/stream crossings, are also known to be sources of sediment in streams, but this dataset does not indicate any relationship between road density and depth fines. As with other land use factors, there are many other variables that also influence depth fines, and road density in itself does not appear to be an indicator. However, a more in-depth analysis of how roads are contributing

sediment to streams (ie, examining road type, gradient, and use) would likely provide a better answer to this question than simply lumping all roads into a single road density score.

Grazing appears to have a potential influence on depth fines. The median percent fines (10-year average) increases slightly with percentage of watershed in active grazing allotments, and the highest percent fines occur at sites with a high percent of the watershed in active grazing allotments. As with other land use factors, many other interrelated factors also influence depth fines, making it difficult to draw conclusions. This simple analysis does not consider grazing intensity, timing, or management. Additional analysis could be conducted to consider these additional factors, as well as analyzing subsets based on geology, channel gradient, or channel type.

## Sites of Concern for Sediment

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### Management Thresholds

Management thresholds for depth fines are defined in the Salmon and Challis Forest Plans (USDA Forest Service, Salmon National Forest, 1988; USDA Forest Service, Challis National Forest, 1987):

- The Challis Plan indicates a standard of 30% depth fines: *Where existing levels are at 30% or above new activities that would create additional stream sedimentation would not be allowed.*
- The Salmon Plan does not indicate a management standard for depth fines, but references management indicators for anadromous and resident habitats based on different population levels. These have essentially become established as “standards” during the consultation process.

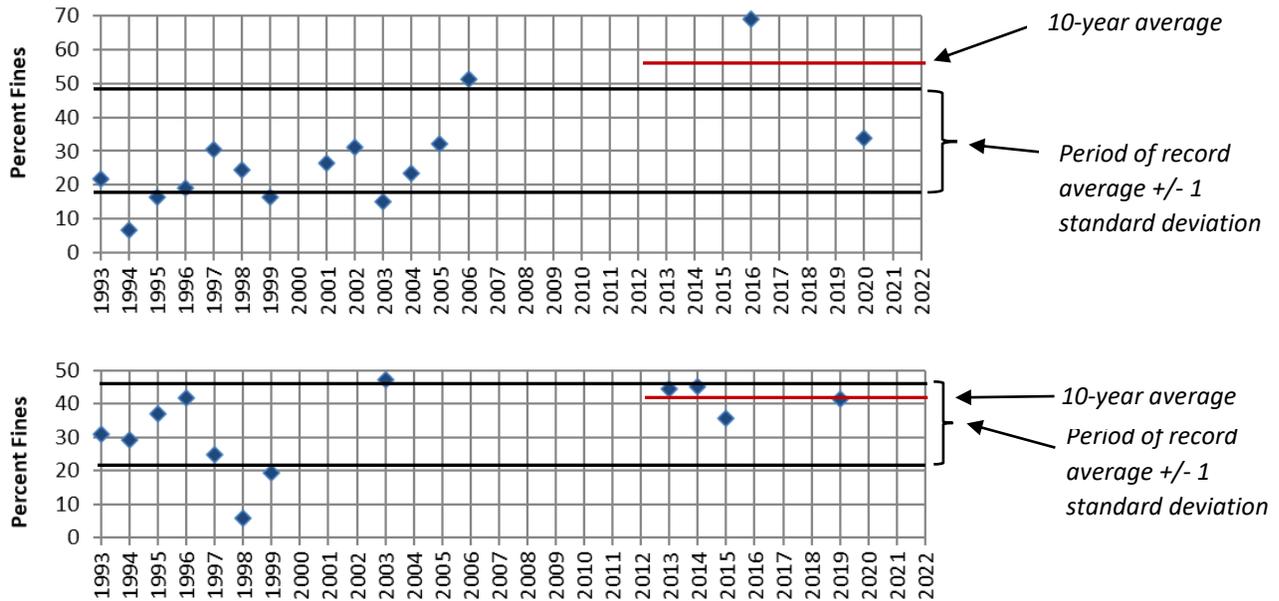
Anadromous Species	Viable and/or existing population level	<b>25% fine sediment</b> 6.3 mm in spawning gravels
	State goal and/or potential population level	20% fine sediment 6.3 mm in spawning gravels
Resident Species	Minimum population level	37.1% fine sediment
	State goal population level	<b>28.7% fine sediment</b>
	Maximum population potential	18.5% fine sediment

### Site Assessment for Depth Fines

The following approach is recommended for the assessment of monitoring sites in which depth fines measurements are above the management thresholds listed above. This approach has been developed over many years of analyzing depth fines data on the Salmon-Challis National Forest.

- 1) Compare the 10-year average: Natural variation in percent fines occurs from year to year as a result of changes in sample site selection, streamflow conditions (ie., flushing flows), and other environmental conditions. Rather than just looking at the most recent measurement, the 10-year average factors out some of the inherent natural variability in sediment supply versus transport from year to year. If the 10-year average is above the management threshold, this signifies that the site may be experiencing increased fine sediment as a result of land management, but further investigation is needed.
- 2) Compare the standard deviation: It is also informative to consider the standard deviation over the entire period of record. The percent of fine sediments at some sites fluctuates greatly as a result of site-specific conditions, while it is relatively steady at other sites. The range of values defined by the

average value over the period of record plus or minus one standard deviation represents typical conditions for a particular site. If the 10-year average is outside of this range, this is an indicator that the percent fines has experienced a departure from typical conditions. The first example shown below is for the Wagonhammer Creek 1R site, where the 10-year average exceeds this range. The second example is for the Horse Creek 2A site. Although the 10-year average exceeds the management threshold, it is still within the range defined by one standard deviation.



- 3) **Watershed analysis:** In most cases, it is difficult to attribute high percent fines at a particular site to a specific cause or land use, and it is likely the result of numerous natural and/or management-based factors. When fine sediment is shown to exceed management thresholds, and particularly if it exceeds the 1 standard deviation range with no indication that it might drop below the threshold as a result of a known natural process (eg., post-fire recovery), some level of watershed analysis is recommended to help determine the source of the high fines and any management actions that need to be taken.

**Monitoring Sites of Concern**

The tables below list current sites that are not meeting the Forest Plan standards based on the most recent 10-year average depth fines value (monitoring sites of concern). Some level of further analysis may be required at these sites to determine the cause of high fines, particularly those sites in which the 10-year average depth fines is greater than the average over the period of record plus the standard deviation. Additional monitoring will occur at these sites as scheduled.

*10-year average exceeds management threshold AND exceeds period of record average plus 1 standard deviation*

Site	Sub-basin	10-yr avg Depth Fines	5-yr count (sample years)	Average (period of record)	St Dev (period of record)	Per. of record avg +/- St Dev	Last year sampled	Forest Plan Standard
Wagonhammer Creek 1R	MSP	51.3	1	27.8	15.4	12.4 - 43.2	2020	Salmon 28.7%
Badger Creek 1R	LL	33	1	26.8	5.8	21.0 - 32.6	2019	Challis 30%
Little Eightmile Creek 1R	LEM	32.9	2	26.4	6.3	20.1 - 32.7	2019	Salmon 28.7%

*10-year average exceeds management threshold, but is within 1 standard deviation of period of record average*

Site	Sub-basin	10-yr avg Depth Fines	10-yr count (sample years)	Average (period of record)	St Dev (period of record)	Per. of record avg +/- St Dev	Last year sampled	Forest Plan Standard
East Boulder Creek 1R	MSP	64.6	3	63.2	7.4	55.8 – 70.6	2023	Salmon 28.7%
Cherry Creek 1R	BL	47.3	3	43.3	9.8	33.5 - 53.1	2023	Challis 30%
EF Hayden Creek 2R	LEM	47.1	2	43.8	5.2	38.6 – 49.0	2020	Salmon 28.7%
Silver Creek 2A	LMFS	42.7	3	35.7	7.0	28.7 - 42.6	2023	Salmon 25%
Horse Creek 2A	MSC	40.6	3	33.5	12.3	21.2 - 45.7	2019	Salmon 25%
Pierce Creek 1A	MSP	40.1	4	31.9	8.5	21.4 - 40.4	2018	Salmon 25%
Timber Creek 1R	LL	32.6	3	33.4	4.8	28.6 - 38.1	2019	Challis 30%
Tenmile Creek 1A	USR	34.5	5	35.3	3.9	31.4 – 39.2	2022	Challis 30%
Morgan Creek 3A	USR	31.8	3	34.9	10.2	24.7 - 45.1	2023	Challis 30%
Weda' a Naokwaide 1R	LL	32.9	4	31.6	5.5	26.1 - 37.1	2022	Challis 30%
Lake Creek 1R	MSP	32.2	2	40.0	7.7	32.3 – 47.7	2020	Salmon 28.7%
Eightmile Creek 1A	USR	30.7	5	29.8	5.1	24.7 – 34.9	2022	Challis 30%
Little Deep Creek 1R	MSP	29.65	2	29.7	7.3	22.4 – 37.0	2020	Salmon 28.7%
Big Bear Creek 1R	LEM	30.5	3	28.4	9.8	18.6 - 38.3	2019	Salmon 28.7%
Silver Creek 1A	LMFS	31.9	5	29.7	7.6	22.1 - 37.3	2023	Salmon 25%
Camas Creek 1A	LMFS	26.4	3	30.3	5.6	24.7 – 35.9	2023	Salmon 25%
Hull Creek 1A	MSP	26.8	4	25.1	7.6	17.5 - 32.7	2022	Salmon 25%
Bear Valley Creek 1A	LEM	33.5	3	23.2	6.7	16.5 - 29.9	2018	Salmon 25%
Owl Creek 1A	MSP	26.2	5	20.4	14.9	5.5 - 35.3	2023	Salmon 25%
EF Big Lost River 1R	BL	30.25	2	26.5	9.0	17.5 - 35.5	2023	Challis 30%
Canyon Creek 1R	LEM	29.1	3	24.2	8.3	15.9 - 32.5	2023	Salmon 28.7
SF Moyer Creek 1A	MSP	27.7	3	24.9	3.9	21.0 - 28.8	2022	Salmon 25%

## Opportunities for Further Investigation

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The analysis of the Watershed Monitoring dataset is far from complete. While some simple relationships between variables have been explored in this monitoring report and data gaps continue to be filled, it is clear that sediment is influenced by a variety of interrelated factors.

Continuation of depths fines monitoring at the current monitoring sites is recommended. Additional data and analysis may help to explain the factors that influence depth fines, further refine this monitoring program, better inform management decisions, and provide useful information for the Forest Plan revision process. The following is a list of potential opportunities for further investigation:

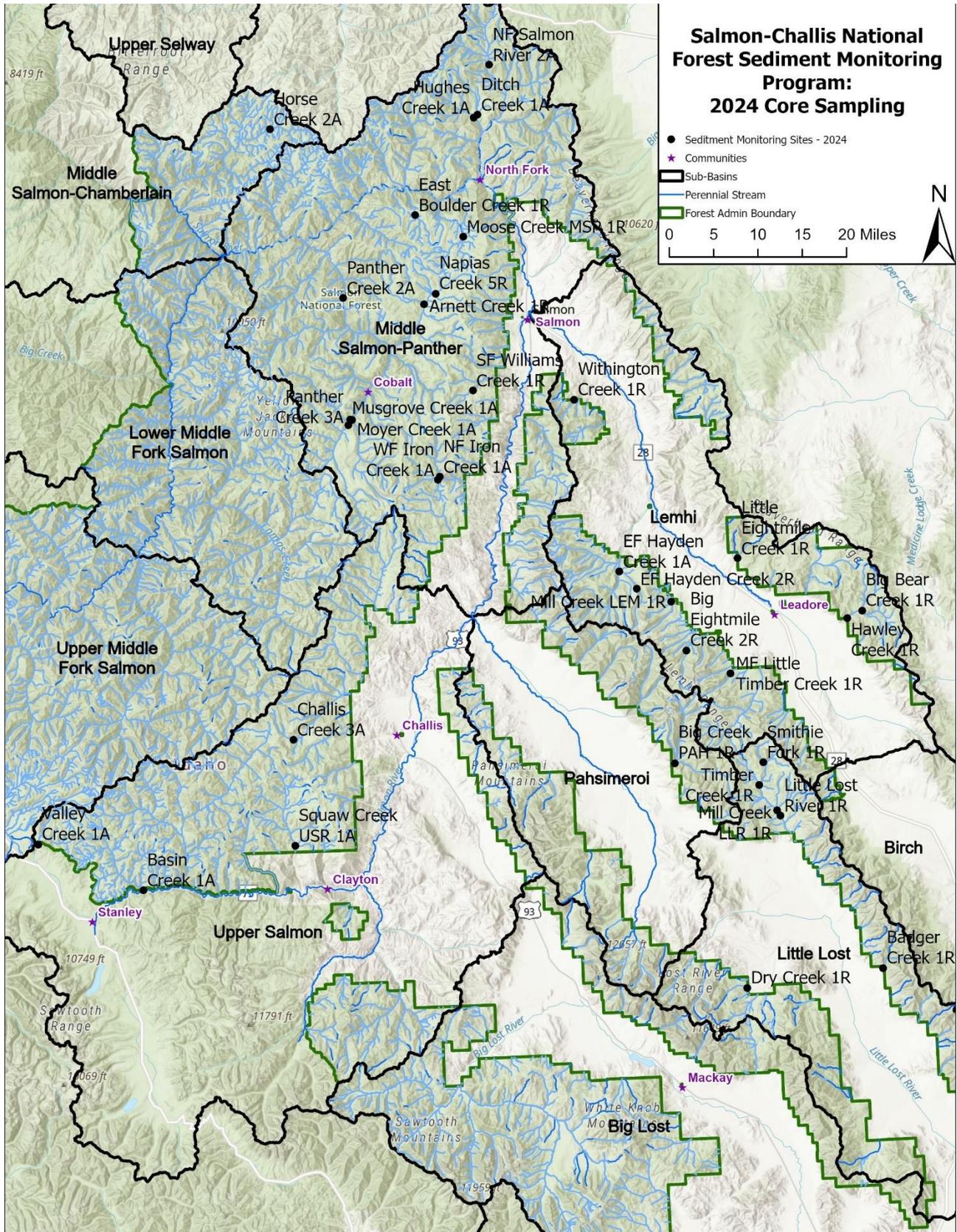
- Conduct statistical analysis of the relationships presented in this analysis to determine the significance of the factors that appear to influence depth fines.
- Consider ways to combine channel type and stream gradient into a more meaningful metric to stratify the data.
- Analyze the relationship of bankfull width to depth fines.
- Conduct a more in-depth analysis of the relationships between geology and depth fines, considering factors such as specific lithology, decomposition, soil composition, soil stability, and mass wasting.
- Determine the extent to which depth fines in small channels can be accurately sampled using the existing protocol. Determine minimum channel width/characteristics for accurate sampling.
- Consider the different mechanisms of sediment supply, transport, and storage in small versus large stream channels, and whether channel width correlates with depth fines.
- Consider how various land uses may affect sediment in streams having different gradients or channel types, given that moderate and high gradient streams may effectively flush out excess sediment.
- Conduct a more in-depth analysis of the potential effects of roads on sediment at monitoring sites by considering road type, gradient, stream crossings, proximity to streams, and use.
- Conduct a more in-depth analysis of the potential effects of grazing on sediment at monitoring sites by considering grazing intensity, timing, and/or management.
- Develop and collect data from a set of “reference sites,” in which land use factors such as roads, grazing, and wildfire are minimal or not present, and compare data from these sites to those in “managed sites.”
- Consider whether any additional sites would be useful to add to the dataset, and whether any current sites should be discontinued. Determine the most efficient number and distribution of monitoring sites to achieve the data needed for management.

### Sampling Priorities for 2024

High priority sites for monitoring during the 2024 monitoring season will include the 5-year monitoring sites that were last sampled in 2019 and 10-year sites last sampled in 2015. Several additional sites are included in order to sync the sampling schedule of nearby sites, and to look at specific effects from recent wildfire.

Site Name	Sub-Basin	Priority	Reason
Basin Creek 1A	Upper Salmon	High	5-year cycle
Challis Creek 3A	Upper Salmon	High	5-year cycle
Paasasikwana Naokwaide 1A	Upper Salmon	High	5-year cycle
Valley Creek 1A	Upper Salmon	High	5-year cycle
Big Creek PAH 1R	Pahsimeroi	High	5-year cycle
Ditch Creek 1A	Middle Salmon-Panther	High	5-year cycle
Hughes Creek 1A	Middle Salmon-Panther	High	5-year cycle
Moyer Creek 1A	Middle Salmon-Panther	High	5-year cycle
Musgrove Creek 1A	Middle Salmon-Panther	High	5-year cycle
NF Iron Creek 1A	Middle Salmon-Panther	High	5-year cycle
NF Salmon River 2A	Middle Salmon-Panther	High	5-year cycle
Panther Creek 2A	Middle Salmon-Panther	High	5-year cycle
Panther Creek 3A	Middle Salmon-Panther	High	5-year cycle
SF Williams Creek 1R	Middle Salmon-Panther	High	5-year cycle
WF Iron Creek 1A	Middle Salmon-Panther	High	5-year cycle
Arnett Creek 1R	Middle Salmon-Panther	Medium	Post 2022 Moose Fire Monitoring
East Boulder Creek 1R	Middle Salmon-Panther	Medium	Post 2022 Moose Fire Monitoring
Moose Creek MSP 1R	Middle Salmon-Panther	High	Post 2022 Moose Fire Monitoring
Napias Creek 5R	Middle Salmon-Panther	High	Post 2022 Moose Fire Monitoring
Horse Creek 2A	Middle Salmon-Chamberlain	High	5-year cycle
Badger Creek 1R	Little Lost	High	5-year cycle
Dry Creek 1R	Little Lost	High	5-year cycle
Little Lost River 1R	Little Lost	High	5-year cycle
Mill Creek LLR 1R	Little Lost	High	5-year cycle
Smithie Fork 1R	Little Lost	High	5-year cycle
Timber Creek 1R	Little Lost	High	5-year cycle
Big Bear Creek 1R	Lemhi	High	5-year cycle
Big Eightmile Creek 2R	Lemhi	High	5-year cycle
EF Hayden Creek 1A	Lemhi	High	5-year cycle
Hawley Creek 1R	Lemhi	High	5-year cycle
Little Eightmile Creek 1R	Lemhi	High	5-year cycle
MF Little Timber Creek 1R	Lemhi	High	5-year cycle
Mill Creek LEM 1R	Lemhi	High	5-year cycle
Withington Creek 1R	Lemhi	High	5-year cycle
EF Hayden Creek 2R	Lemhi	High	Post 2023 Hayden Fire Monitoring
<b>Total Number of Sites</b>		<b>36</b>	

2024 Monitoring Site Priorities



2024 High Priority Monitoring Site Map

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APPENDIX A: DATA

Percent Fines (<0.25 inches) at Depth – Data for All Monitoring Sites (1993-2023)

20230222 Version

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Corn Creek 1A	24.4	10.0																			20.3	8.7				13.4						
Horse Creek 1A	12.9	19.8	20.5	16.9																		21.6										
Horse Creek 2A	30.8	29.2	36.8	41.6	24.9	5.6	19.2				47.1										44.3	45.0	35.7				41.3					
Arnett Creek 1R	19.2	22.1	21.7	17.6	13.1	12.0	22.2	23.5	10.8	24.2	13.1	14.0	11.1		8.4									11.3				15.6			27.5	
Beaver Creek MSP 1A	37.8	14.8				10.9		28.5	19.6	28.0	13.4													12.5								
Big Deer Creek 1A	9.7	15.3	29.4		26.9		19.0		23.4																							
Big Deer Creek 2R									30.7	29.0	14.8	17.8	15.5	18.9	9.1											18.8				20.4		
Big Deer Creek 3R									23.5	29.6	26.1	24.5	20.9		14.2											24.7						
Big Hat Creek 1R	33.5	30.0		30.1							27.3							33.6						55.9		56.8						
Cabin Creek 1R			51.1																													
Carmen Creek 1R	16.7	13.9	21.2	21.8	14.5	13.5	17.1	19.0	19.2	18.4	12.0	10.1	8.0											11.3								
Carmen Creek 2R																																
Clear Creek 1A	34.3	31.2	14.3	24.8	5.5	8.7	17.2	14.3	82.5	24.2	25.2																					
Clear Creek 2A	13.1	29.5								75.3					32.1	30.8						25.0	26.8				23.1					
Colson Creek 1A	19.9	12.2	21.2	20.3	13.4	8.6	15.0	18.1				22.9										24.6	17.8	17.6	14.8				29.7			
Cow Creek 1R																		21.1				16.3									21.1	
Dahlonaga Creek 1A	30.7	34.0		27.0	24.8	16.1	14.3	20.3	27.0	26.8	27.2	31.2	21.6	25.9	35.3	24.7								20.9					28.3			
Deep Creek 1A	14.8	8.2	10.4	19.7	8.3	13.9	12.0	21.5	14.9	16.2	11.3	15.1	11.7	17.4	7.8	23.4							15.4			15.3					14.5	
Ditch Creek 1A			14.9	13.7													22.9										15.0					
East Boulder Creek 1R		67.0			52.9	59.5	62.3	59.6	64.2	74.1	58.8	60.3	68.4																		84.4	
Fourth of July Creek 1A	20.6	24.9		13.9	12.0	11.8	11.5			16.5	12.2												45.3									
Garden Creek MSP 1A	15.7								17.6	31.6		14.6	6.3												20.2							
Hat Creek 1R	16.7	21.8					15.1	27.6			23.7							20.3						9.6				16.4				
Hughes Creek 0A			22.2																													
Hughes Creek 1A	17.6	30.8	20.0	20.7	15.4	9.4	7.5	21.1	11.0		13.9	23.6	18.8	9.2	8.2	17.6	12.5	18.7	11.1	20.1	24.4	22.1	23.1		26.4		23.1					
Hull Creek 1A	17.6	14.4	26.8	23.7		18.6					27.3	28.2	18.5				32.4	35.7	12.5	23.4	40.1	23.6	32.9			21.4				29.3		
Indian Creek 1A	16.6	15.5	20.6	20.6	31.6	14.6	18.8	23.0	14.2	19.5	11.6	17.5	7.6	22.5	11.3	21.5					21.2	19.4	18.0	2.2								
Indian Creek 2A	7.5	14.2	20.6	21.5					12.0		17.0	22.0	13.9	22.5								10.4	19.0	18.8			17.4			21.4		
Iron Creek 1A	22.9	17.2	18.7	16.8	15.8	6.4	16.2	21.7	15.6	17.6	15.9						16.8					16.2		10.2			14.3				15.9	
Jesse Creek 1R	19.7	33.5				22.6		20.1		10.5	9.1			3.9			18.0	15.0						15.9					23.9			
Lake Creek 1R	42.7	52.0	53.8	39.7	50.0	44.6	35.9		29.8	38.6	38.7	32.4	32.8			44.0								32.9				31.5				
Lake Creek 2R							28.9		45.0								51.7															
Little Deep Creek 1R									35.1	29.4	35.9	27.9	16.6								33.0			21.9				37.4				
Little Deer Creek 1R										11.3	13.2	13.8	10.1	8.3												4.6					10.0	
McKim Creek 1R	15.5	19.7		20.2		11.3	17.4										17.9				7.2			4.0								
Moccasin Creek 1R								28.2																								
Moose Creek MSP 1R	27.3	22.8			13.2	15.3	10.1	14.6	19.7	21.9	8.3	10.5	5.8	7.0	15.1	18.4					13.2		22.0			20.1				23.8		
Moose Creek NFSR 1A			19.0	25.1	17.7	13.2	20.2	26.2	15.0	26.8							26.2							10.1								
Moyer Creek 1A	19.0	22.9	22.0	23.2	18.8	17.4	14.7	25.0	24.8	23.1	11.5	15.1	15.2		10.4							15.4		21.3		17.4		17.4				
Moyer Creek 2A	17.0	25.7		26.7	15.4	12.7	23.4															20.2		17.3				22.2				
Musgrove Creek 1A	13.2	17.8	24.5	28.0	12.4	4.9	10.6	21.4	15.9	17.2	14.4	21.8	10.9		26.2	27.8								8.9	16.0		24.2					
Napias Creek 1R	31.4	39.4	31.5	37.1	46.5	34.9	31.0	36.2	28.6	32.5	38.4	51.9	34.1	23.7	15.1	35.1								27.9		28.6				21.5		
Napias Creek 2R	22.5	24.1	23.3	27.1	13.1	24.4	25.8	28.8	29.4	28.2	28.3	21.5	8.0																			

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Napias Creek 3R	29.2	25.5	34.1	23.1	26.5	24.3	33.2	32.9	22.7	28.0	24.0		17.7						4.0				18.9				18.1					
Napias Creek 4R	21.1	11.5	22.1	18.3	18.9	19.4	21.0	23.6	17.3	16.9	19.3		12.1															16.4		23.6		
Napias Creek 5R	41.5	40.6	32.5	24.9	24.9	27.1	20.2	35.7	26.9	30.4	21.2	23.0	21.6												14.3					21.7		
NF Iron Creek 1A	20.7	19.7	19.2	19.0	21.9	9.6	22.4	23.8	17.9	21.8			7.7									17.8		19.1				17.7				
NF Salmon River 1A	16.2	20.5	17.6	22.0	10.2	13.8		19.4	21.8	16.7	17.3		23.4		10.4		23.9		21.2	13.8	33.8			14.2								
NF Salmon River 2A	21.3	22.7	26.0	48.6	17.5	19.7	7.3	23.8	27.3	22.9	17.1	19.5	16.6			21.7		20.1							18.1		15.8					
NF Salmon River 3A	24.6	19.5	22.5	28.4	17.2	16.5	12.5	22.3	19.8	23.2	18.4		24.3					21.9		11.5	29.5	12.3				21.6				25.2		
NF Salmon River 4A																		21.2	21.3					24.2				19.7				
Owl Creek 1A	19.5	19.4	13.0	17.4	16.1	17.8	16.6	29.7	29.7		4.9	9.1										23.4	70.2	15.9	8.0		17.8			19.1		
Owl Creek 2A	38.4																															
Owl Creek 3A	25.5	25.6																														
Panther Creek 0A								30.6	25.4	29.7	25.0	25.9	27.8	21.9	13.8	28.9	22.0			10.1	25.7											
Panther Creek 1A	32.8	25.2	23.8	23.0	16.4	25.2	31.5	27.5	27.0	32.6	33.4	22.2	23.4	27.4	19.1	32.7	25.6						32.0				32.7					
Panther Creek 2A	25.2	27.8	28.7	26.0	23.2	27.4	29.8	29.5	29.5	29.9	24.5	25.1	23.8									26.2		20.9				26.6				
Panther Creek 3A	27.7	24.2	28.0	30.3	19.6	18.0	23.6	24.0	19.3	18.4	22.9	17.7	11.4	20.4	10.6	20.1	25.4			17.6	24.3				15.1		28.1					
Panther Creek 4A			13.0	24.6	11.1	14.5	13.5	19.7	20.0	24.1	25.5	7.1	9.8									27.4	23.9				19.0			21.2		
Panther Creek 5A				22.6	12.8	13.7	16.4	19.8	22.9	18.0												14.6	19.4				13.0			18.6		
Perreau Creek 1R	22.9	20.5	19.0					7.9	3.5	9.4	4.7	1.9	3.0											3.8				16.4				
Phelan Creek 1R	34.8	28.9		24.7	32.4	23.8	15.8	35.6		29.5	32.6	19.1	12.4					30.1						11.9		12.1		22.1				
Pierce Creek 1A	31.2	29.0															16.8	27.4	26.4			27.7	36.6		34.8		47.8			41.0		
Pine Creek 1A	21.6	19.9		40.2	12.9	39.5	21.5	22.6	19.6	25.0	22.7											18.1					11.1					
Pine Creek 2A	31.1																															
Pine Creek 3A							21.5		31.4																							
Porphyry Creek 1A	20.8					10.4	15.3	22.3	16.1	17.0	11.9	18.1	8.5											17.4					21.8			
SF Iron Creek 1A	40.0	27.2		42.8	32.8	25.3	22.2		24.0		27.5																					
SF Moyer Creek 1A	26.2	23.6										18.6											23.1		29.1		23.7			30.2		
SF Williams Creek 1R																28.1	21.0	16.1	18.5	23.3			16.6	19.4			16.6					
Sheep Creek 1A	21.0	16.5	13.5	19.1	17.2	9.7	15.0	13.8	18.3	21.6	13.0	11.7	12.5		14.1										7.0			23.2				
Spring Creek 1A	14.0	25.6	16.2	12.8	13.6	5.6	16.6		24.4	15.9	15.5		11.7	19.0	10.4	23.5						21.1	3.4									
Spring Creek 2A	22.9																															
Bia Po'1 Naokwaide 1A	26.5	23.0	30.0	16.3	19.3	15.1	14.8	19.7	24.0	29.6	27.6	28.0	26.3														15.0		18.6			
Trail Creek MSP 1A	9.9	26.5							10.9	15.3	14.0		5.6																	22.9		
Twelvemile Creek 1R		29.4		26.9		12.6					17.9	24.7	12.2														15.0			27.6		
Twin Creek 1A	10.4	7.9		20.3	10.6	13.6	10.9	18.0		15.3		10.9	6.6	7.8		13.9	20.0	11.7		6.5	14.9	8.4			15.8			12.8				
Wagonhammer Creek 1R	21.9	6.7	16.4	19.0	30.4	24.5	16.3		26.6	31.2	15.2	23.6	32.0	51.1											68.8			33.8				
Warm Springs Creek 1R	41.1	40.1	41.7	40.9		39.2		37.3																								
WF Iron Creek 1A	11.5	10.7		18.1	21.7	16.0	16.7	19.5	14.9	11.2			6.3															10.4				
Williams Creek 1A	34.1	24.8	16.1	20.6	14.6	6.6	14.4	17.0	10.7	18.8	20.0	8.1	7.4	19.3	11.7	17.1									15.4				21.0			
Woodtick Creek 1A	9.7	9.0	10.8	10.6			17.2		18.3					8.0	8.6	25.3							15.2				7.9					
Basin Creek 1A			33.3	28.5	22.3	13.5	32.4	28.1	30.0	32.3	31.8	30.3		22.7	10.7							27.0	32.4	27.9		22.2		19.4				
Block Creek 1R					33.7		31.0	38.5																								
Challis Creek 1A			44.1	41.1	17.4	13.0	21.3	24.3	26.5	22.4	21.0	23.4	20.3	18.6	9.0	23.0	20.9	19.6					20.0	74.6	20.2		14.4		18.2			
Challis Creek 2A					29.2		22.0	25.7	29.8	33.4											16.1			30.8	7.6			11.5				
Challis Creek 3A										24.2		20.1	13.6	21.3	10.8	14.5	29.6	22.6						25.9				24.8				
Challis Creek 4A												18.2	27.0																			
East Pass Creek 1A			27.1	31.9	31.2	37.9	38.8	37.3	36.3	42.0								9.8							17.9							
Eightmile Creek 1A														32.5	21.8	28.3							32.2			22.4	30.9		28.7		36.0	35.3
Fivemile Creek 1A			14.3		20.8	28.8	11.7	18.2	23.4	27.5	28.3	20.8														28.0			28.3		24.9	
Garden Creek USR 1A			22.4		19.0	12.3	18.0	19.2	19.7	19.4	19.5	16.7		13.1		20.6	29.2	20.2					22.5				12.6			15.2		
Herd Creek 1A			30.1	31.0	32.5	28.4	30.7	32.5	43.2	36.0	26.4		23.4														18.4					
Herd Creek 2A													16.7																			
Jordan Creek 0A			26.2	32.1	18.4	13.9	15.3	16.5	17.9	18.2	17.5	24.3	12.9																		23.8	

Salmon-Challis National Forest 2023 Watershed Monitoring Report

April 08, 2024

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023					
Jordan Creek 1A			17.6												11.9																					
Jordan Creek 2A			16.0	22.5	18.0	17.5	21.1	17.7	16.1	22.5	16.9	13.7																								
Jordan Creek 3A			14.3	23.5	16.7	10.9	23.1	18.1	11.1	25.5	11.8	14.4											5.5					19.9								
Jordan Creek 4A			13.5																																	
McKay Creek 1A			19.0		29.3	33.2	30.1	38.9	29.4	31.3	24.8	33.7																								
Mill Creek USR 1R																																				
Morgan Creek 1A			38.5	34.3	29.3	22.8	24.8	25.5	21.8	25.2	26.7	30.1	18.4		16.8	29.5	34.4	23.9																		
Morgan Creek 2A			34.4	34.5	31.7	22.0	23.8	32.0	28.5	31.4	35.8	32.9	20.0																							
Morgan Creek 3A			42.3	27.7	41.3	31.4	39.4	40.7	34.6	41.2	61.4	52.1	38.8	32.5	28.2	24.9	34.6	22.7	23.7	15.9	39.9	30.9										31.4				
NF Rankin Creek 1R																																				
Rankin Creek 1R																																				
Paasasikwana Naokwaide 1A			25.9	24.2	27.4	23.5	30.5	34.0	23.5	33.9	31.5	33.9			16.4	29.0																				
Tenmile Creek 1A			32.3		36.9	28.5	33.7	34.3	35.3	45.0	35.6	39.5																								
Thompson Creek 1A			25.1	20.2	25.4	16.5	21.2	24.7	22.9	26.5	25.4	21.1	13.4	22.1	18.6	13.4																				
Trail Creek USR 1R		40.2		27.0																																
Valley Creek 1A			41.4				26.4	33.8	35.0	38.5	37.8					28.9	29.8	31.7	29.9																	
WF Herd Creek 1A			20.4	27.2	27.2	27.2	25.2																													
WF Morgan Creek 1A			36.2	33.0	23.4	11.4	25.6	24.5	21.1	26.1	25.5	23.6			22.6	17.2	33.2	23.3	20.2	28.8	25.5	19.3														
WF Yankee Fork 1A			21.9		27.5	18.1	25.1	27.8	26.1	25.6	25.4	25.2			10.6	30.5																				
Yankee Fork 1A			27.1	20.5	19.6	27.8	24.1	21.8	17.8	26.8	20.5	23.3	18.8	19.4	11.1	33.4																				
Yankee Fork 2A			15.6	29.5	14.9	22.6	27.5	25.6	31.4	29.7	21.8	31.3				36.5																				
Yankee Fork 3A			13.3	29.1	5.3	14.7	24.2	27.8	34.0	24.7	29.5	20.1	9.7																							
Yankee Fork 4A			40.1	36.1	27.4	25.2	32.7	28.9	20.8	29.4	32.3	27.0																								
Yankee Fork 5A			31.5	29.7	23.6	21.0	15.7	27.6	33.8	29.5	22.5	19.0																								
Camas Creek 1A	34.9	25.5	32.5	31.5	32.7	30.5	31.4	28.9	27.7	40.0	35.2	39.2	22.1	26.2	39.3		29.5	28.1																31.8		
Camas Creek 2A	21.2	25.1	29.8	29.2	17.0	23.5	28.1	29.8	27.1	31.1	32.1	28.8	22.4																							
Camas Creek 3A	29.1	19.1	14.7	21.1	12.0	20.1	24.7																													
Castle Creek 1A	23.5	24.5																																	26.7	
Hoodoo Creek 1A	21.2	17.6																																		
Silver Creek 1A	36.6	39.1	27.8		7.5	31.3	26.3	35.9	33.4	30.3	26.0	35.0			25.2	29.3																				
Silver Creek 2A																																				
WF Camas Creek 1A	19.8	10.8		27.9	26.2	21.4		37.9	28.8	36.1	22.7	22.8																								
Yellowjacket Creek 1A	29.7	22.9		21.9																																
Yellowjacket Creek 2A	20.9	30.2		28.8			27.0			31.6	25.8																									
Beaver Creek UMFS 1A																																			9.1	
Marsh Creek 1A																26.8	23.0	23.9	23.8	26.8															32.9	
Agency Creek 1R																																				
Bear Valley Creek 1A	16.5	20.3	28.2	26.8	34.5	19.4	11.6	19.2	19.7	26.5	15.9	18.8	16.5		12.0	29.9	20.7	27.4																	37.0	
Bear Valley Creek 2A	26.6	27.8																																		
Bear Valley Creek 3A	18.9	30.8	24.1	29.4																																
Bear Valley Creek 4A	9.4	14.0				23.0	25.3																													
Big Bear Creek 1R	20.1	46.9	54.6	32.1	27.5	39.7	15.1		29.9	33.7	22.0	18.4	13.4	21.9	27.9	36.3	20.7	23.4	31.2	18.2	29.4	31.7														
Big Eightmile Creek 1R	31.6	19.3		22.9	16.4	17.9	20.3	13.4	12.5																											
Big Eightmile Creek 2R	22.2	14.5	21.8	13.5	21.6	11.9		22.8																												
Big Timber Creek 1R	32.1	33.1	26.9	31.4	24.6	14.7	15.6	21.6	19.4	29.5	12.4	10.3																							18.8	
Big Timber Creek 2R																																				
Canyon Creek 1R	22.8	27.8	30.2	28.5	16.5	13.1	13.4	24.4	36.1	41.8	13.7	17.5	16.8	29.3		30.0																			30.6	
Deer Creek LEM 1R																																				
EF Hayden Creek 1A	28.2	21.3																																		
EF Hayden Creek 2R	34.0	40.5			34.2	40.5	46.5	43.1	48.8	43.7	52.7	46.9	44.4																							
Hawley Creek 1R	22.6	22.5	26.4	18.9	14.8	19.1	23.9	35.4	22.1	26.3	26.7	20.2	12.8		16.3	16.1	14.8	17.0																		
Hayden Creek 1A	14.8	21.8	16.8	15.8	20.5	12.7	13.5	17.4	19.3	13.7	8.7	23.6			7.3	23.6	27.1	24.8																		23.4

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Haynes Creek 1R	22.3	12.1									11.7	11.9	9.0								21.6			17.3				18.1				
Kenney Creek 1R	22.1	22.1												5.9							18.5	16.2										
Little Eightmile Creek 1R	26.2		26.1					20.8				32.5				20.0	19.8						37.2					28.6				
MF Little Timber Creek 1R	21.1	15.5										45.0				17.5	16.3	19.6	15.3		18.6	17.2	18.5				16.4					
Mill Creek LEM 1R	16.6	20.8					7.0	17.5	13.4		15.4	9.7				15.4				8.8		5.0					20.4					
NF Little Timber Creek 1R	25.1	23.7										13.5	9.5				30.5	25.1	30.8			46.1	19.3	7.1					18.1			
Pattee Creek 1R	18.1	30.3							18.2	11.7	19.0	22.3	13.3	18.4	19.2	15.8	13.8				9.2		19.2									
Reservoir Creek 1R	40.1	30.7	34.4	37.6	24.2	29.2		41.5		44.0	32.3	41.0		17.3	31.6	25.9	23.9	22.3	13.0	25.5	32.3	25.6				28.5				23.9		
Stroud Creek 1R																							26.8	17.9					30.4			
Withington Creek 1R	18.6	13.3										16.4			9.8	15.4	9.0	15.4		14.3	16.5							11.0				
Big Creek PAH 1R			17.7			17.4	21.5	22.2	25.6	28.2	25.8	27.1											13.3		12.7		13.1					
NF Big Creek 1R			10.9			9.5	20.4	23.6	19.7	22.5		21.7											11.1									
Pahsimeroi River 1R			20.9												26.7		20.6	9.8				22.8				19.6					22.2	
SF Big Creek 1R			13.2			11.7	24.6	29.9	23.6	30.0	28.1	31.2			8.8								14.7									
Alder Creek 1R																	28.9						40.5			8.4					25.5	
Antelope Creek 1R			18.9		25.0	22.1	24.0	25.5	25.0	24.3	20.3	23.8							30.1		32.1	19.1										
Antelope Creek 2R															16.9	30.9	36.1	27.0	25.3	38.0	35.2	40.8		8.6		20.1					22.4	
Antelope Creek 3R																							15.8	4.3							15.3	
Bear Creek 1R															25.1																	
Bear Creek 2R																																
Cherry Creek 1R			28.0		47.2	25.3	42.8	44.3	40.7	44.2	42.8	42.8	67.9	43.6	35.3				37.7	46.7	48.7			55.5		50.8					35.5	
EF Big Lost River 1R			10.6	24.8	36.7	25.6	30.4	30.0	29.7	40.9	29.8	29.0	16.0								9.6	23.4				31.9					28.6	
EF Big Lost River 2R														27.6	24.8				31.8						14.0						26.0	
EF Big Lost River 3R			23.5	28.7	28.9	24.4	23.7	22.7	20.5	22.6	16.5	19.0	15.9	29.3	24.3	27.2								9.7		15.5					22.5	
Iron Bog 1R																								16.0	12.8						26.6	
Muldoon Creek 1R			27.2		27.5	11.7	20.5	16.0	22.3	24.5	17.1	24.3	6.6							30.0		28.3			18.3					17.0		
NF Big Lost River 1R			24.8	21.9	28.6	16.0	31.2	28.2	32.2	33.3	32.0	27.6	17.7								26.0	22.8					29.8				30.1	
NF Big Lost River 2R			32.1	29.1	36.0	25.3	32.9	37.1	35.3	39.0	34.2	33.7	21.5	30.1	30.8	32.3		19.4	23.1	15.4				25.1		33.8		30.5				
Pass Creek 1R			17.0			16.0	24.5	28.4	28.2	23.7	10.3	21.1		6.4	23.4	26.0		20.1	16.9	20.9	25.9	35.2		19.0	25.5		19.5				22.6	
Star Hope Creek OR			21.9	23.4	32.3	17.5	30.6	23.0	22.9	24.6	22.4	20.4								32.6		29.7		16.3							21.8	
Star Hope Creek 1R			21.0		29.4	30.1	25.5	29.1	27.6	27.4	28.1	26.6	10.6		15.2																	
Wildhorse Creek 1R			24.5		36.0	18.5	30.2	28.0	32.8	37.8	27.6	27.6	24.4	9.3	27.8						28.3	34.6		22.7		15.9		24.4				
Badger Creek 1R			18.4					21.2			26.8	22.7				27.4						32.0		30.3				35.7				
Big Creek LLR 1R								30.0			13.7	31.1	17.5	30.7	23.0	20.0	21.6	15.8	11.7	14.8	33.0	27.1				26.1					28.3	
Dry Creek 1R								20.4			21.5	21.4										16.9		9.8				15.8				
Iron Creek 1R									19.9													16.6	20.4	15.9			19.4				13.7	
Little Lost River 1R									23.2		32.6	30.4	10.7	15.1	9.9	20.5	22.6	29.5	27.7	27.8	23.3	27.4	23.0		23.7		19.2					
Mill Creek LLR 1R				21.3	30.9	21.9	27.4	21.0	34.0	25.3	34.5	28.5	27.1					23.0	21.3	28.4	25.4	40.7	26.8	30.7				23.2				
Smithie Fork 1R									30.8		29.0	22.6	15.2							19.9		14.2	24.8	18.3	19.1			25.6				
Weda'a Naokwaide 1R									28.1		29.9	24.9	36.7							29.7		32.7	30.1	34.8	34.2	44.3		29.3				23.9
Timber Creek 1R									29.4												34.3		29.2	42.8	34.8	32.9			30.1			
Wet Creek OR								20.9			15.2	23.6								25.1	14.6	23.1	26.3	37.6	42.0			9.2		17.3		
Wet Creek 1R			31.2	28.4	39.5	21.5	25.3	15.5	17.0	17.7	19.9	17.3	6.1		18.0							15.5	33.8	32.0			21.2				25.1	
Wet Creek 2R-1				43.4	24.5	41.9	39.7	43.3	44.0	38.3	44.1															35.4						
Wet Creek 2R-2																30.6	20.1	20.0	16.5	11.9			19.7									
<b>Total # of sites measured</b>	<b>93</b>	<b>90</b>	<b>100</b>	<b>94</b>	<b>99</b>	<b>107</b>	<b>108</b>	<b>109</b>	<b>120</b>	<b>112</b>	<b>122</b>	<b>111</b>	<b>80</b>	<b>41</b>	<b>59</b>	<b>52</b>	<b>60</b>	<b>50</b>	<b>37</b>	<b>51</b>	<b>94</b>	<b>62</b>	<b>60</b>	<b>59</b>	<b>37</b>	<b>46</b>	<b>42</b>	<b>32</b>	<b>19</b>	<b>20</b>	<b>36</b>	

Percent Depth Fines - Repeat Measurements (2<sup>nd</sup> measurement in a given year)

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Clear Creek 1A (re-sample)										83.0																						
Colson Creek 1A (re-sample)																						54.3										
Owl Creek 1A (re-sample)																						62.0										
Basin Creek 1A (re-sample)																						21.0										
Challis Creek 1A (re-sample)																							48.5									

Percent Stable Banks – Data for All Monitoring Sites (1993-2016)

20200219 Version

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
Corn Creek 1A		97.5																			81.5	84.5			
Horse Creek 1A		98.0	100.0	96.5																		95.5			
Horse Creek 2A		89.5	99.5	92.0	83.5	97.5	89.5				91.5											84.8	94.5	93.5	
Arnett Creek 1R		96.5	95.5	92.0	79.0	93.5	86.0	88.0	99.5	77.5	96.0	91.5	93.0		96.0					97.5					
Beaver Creek MSP 1A		96.5				99.0		93.5	97.0	91.0	95.0														
Big Deer Creek 1A		97.5	97.0		87.0		98.0			63.0	90.5														
Big Deer Creek 2R									94.0	89.5	97.5	91.0	87.5		95.5										
Big Deer Creek 3R									87.5	94.5	98.5	94.5	93.5		100.0										
Big Hat Creek 1R		85.0		77.5							73.0						87.0								
Cabin Creek 1R			97.5																						
Carmen Creek 1R		100.0	100.0	96.5	95.0	97.5	100.0	95.0	100.0	93.0	95.0	98.0	98.0												
Clear Creek 1A		100.0	100.0	99.5	68.0	94.5	88.5	71.0	84.0	94.0	50.5														
Clear Creek 2A		100.0								17.5					87.5	49.5						68.5	26.0		
Colson Creek 1A		78.0	99.5	86.5	74.0	63.5	57.0	75.0														87.5	39.9	17.5	
Cow Creek 1R																	95.0					84.8			
Dahlonga Creek 1A		91.5		84.0	49.0	76.5	62.0	70.0	82.5	91.0	88.5	97.0	99.5		96.0	96.5									
Deep Creek 1A		96.0	99.0	95.5	93.0	95.0	96.0	90.5	97.5	97.5	95.5	98.0	95.5	92.0	90.0	99.0								87.0	
Ditch Creek 1A			99.5	96.5											100.0						99.0				94.5
East Boulder Creek 1R		81.5			63.0	83.0	78.0	81.5	76.0	85.5	87.5	87.5	87.0											35.8	
Fourth of July Creek 1A		100.0	94.5	64.5	76.0	89.5	82.5		94.5		74.0														
Garden Creek MSP 1A		97.5							93.5	98.0		31.5	25.0												
Hat Creek 1R		95.0					53.0	51.0			84.0						87.5								
Hughes Creek 0A			100.0																						
Hughes Creek 1A		94.0	94.5	85.5	28.0	55.5	80.5	68.5	61.0		89.0	95.0	92.0	82.0	95.0	98.0	83.0	90.0	87.5	100.0	95.0	85.2	91.0		
Hull Creek 1A		94.5	92.0	89.5		100.0					97.5	98.5	99.0				97.0	97.0	100.0	100.0	87.5	92.7	82.5		
Indian Creek 1A		94.5	98.5	88.5	68.0	63.5	62.0	92.0	96.0	92.0	91.5	95.0	95.5	100.0	100.0	81.0					87.9	94.0	61.5		
Indian Creek 2A		99.5	100.0	97.5					83.0		98.0	99.0	99.5	100.0								95.3	90.8	90.0	
Iron Creek 1A		99.0	99.0	89.5	79.0	90.5	86.0	83.0	100.0	96.0	97.5						100.0					98.0		64.5	
Jesse Creek 1R		90.5				91.0		98.5		93.0	97.5			89.0							96.0	99.5			
Lake Creek 1R		97.0	99.0	95.5	91.0		100.0		91.0	97.0	98.0	98.0	98.5				91.5								
Lake Creek 2R							99.0		96.0								73.0								
Little Deep Creek 1R									69.5	99.0	96.5	96.5	93.5									99.0			
Little Deer Creek 1R									21.5	57.5	76.0	83.5	84.0												
McKim Creek 1R		87.0		87.0		82.5	79.0										97.5					82.0			
Moccasin Creek 1R																									
Moose Creek MSP 1R		98.0			66.0	78.0	68.5	78.0	82.5	79.0	96.5	92.5	93.0	78.0	99.0	97.5					99.5		94.2		
Moose Creek NFSR 1A			99.5	89.0	98.0	99.5	94.5	94.5	100.0	84.5							100.0								
Moyer Creek 1A		93.0	91.0	86.0	96.0	99.0	90.5	80.5	88.5	90.5	96.0	91.5	96.0		100.0							96.0		90.0	
Moyer Creek 2A		74.5		76.0	84.0	93.0	71.0					91.0										82.5		93.5	
Musgrove Creek 1A		82.5	86.5	92.5	92.0	92.5	93.0	77.0	74.5	84.5	85.0	88.0	90.5		86.0										
Napias Creek 1R		92.0	82.5	66.0	67.0	56.0	31.0	61.5	69.5	89.0	45.5	73.5	69.0	52.0	88.5	41.5		74.5	53.0						

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Napias Creek 2R		100.0	97.5	87.0	76.0	89.5	80.0	90.0	89.5	94.5	84.0	98.0	92.5											
Napias Creek 3R		98.5	99.0	96.5	75.0	89.0	92.5	96.0	100.0	95.5	94.5		98.0							98.5				
Napias Creek 4R		97.0	99.5	91.0	54.5	93.5	88.5	89.0	97.5	85.5	49.5		98.5											
Napias Creek 5R		93.5	94.0	88.5	68.0	94.5	79.0	91.5	98.0	87.5	97.5	93.5	98.0											
NF Iron Creek 1A		94.0	100.0	94.5	92.0	98.0	86.5	92.0	93.0	96.5			100.0				99.0				98.0		99.5	
NF Salmon River 1A		96.0	100.0	93.0	82.0	94.0		97.5	95.0	91.5	93.5		93.0		93.0		100.0		96.5	100.0	99.0			
NF Salmon River 2A		84.5	100.0	89.0	71.0	95.5	78.0	84.0	95.5	93.0	86.5	98.0	96.0			77.5		97.5				94.5		
NF Salmon River 3A		88.5	96.5	94.0	85.0	86.5	65.5	67.5	76.5	66.5	46.5		83.0					95.5		99.0	86.1	76.5		
NF Salmon River 4A																		100.0	100.0		99.0			
Owl Creek 1A		99.5	100.0	99.0	96.0	97.0	85.0	97.5	92.5		98.5	98.0									89.6	85.5	49.5	
Owl Creek 2A																								
Owl Creek 3A		95.4																						
Panther Creek 0A								80.5	66.0	89.0	36.0	98.0	86.0	79.0	50.5	59.0	94.5			100.0	81.9			
Panther Creek 1A		100.0	100.0	97.5	99.0	97.0	80.5	99.5	97.5	98.0	94.5	99.0	100.0		99.0	91.5	99.0		96.0				88.8	
Panther Creek 2A		90.5	100.0	93.5	90.0	77.5	85.5	45.0	54.5	96.5	88.0	100.0	100.0								93.8		94.5	
Panther Creek 3A		95.5	94.5	91.5	70.0	92.0	75.0	75.5	92.5	80.5	86.5	95.5	89.0	100.0	93.0	90.5	90.0			99.5	94.4			
Panther Creek 4A			95.0	94.0	80.0	95.5	81.0	92.0	88.5	92.0	94.5	97.0	96.0				88.0				76.8	97.0		
Panther Creek 5A				94.5	87.0	67.5	48.5	77.0	80.0	81.0											93.6	92.6		
Perreau Creek 1R		96.0	93.5					95.0	96.5	93.5	97.5	97.0	97.5											
Phelan Creek 1R		82.5		79.0	60.5	88.5	68.0	75.5		75.0	67.5	89.0	93.5					80.5						
Pierce Creek 1A		80.0															90.0	96.5	99.0		91.8	90.5		
Pine Creek 1A		100.0		97.0	76.0	91.5		95.0	93.5	95.0	96.5										84.9			
Pine Creek 2A																								
Pine Creek 3A							90.5		95.5															
Porphyry Creek 1A		96.0				82.5	69.0	63.0	83.5	90.0	96.0	95.0	95.0											
SF Iron Creek 1A		96.0		80.5	97.0	99.5			95.5		99.5						97.0							
SF Moyer Creek 1A		88.0										92.5										76.6		
SF Williams Creek 1R																90.0	90.0	88.0	85.0	92.0		84.0	81.0	
Sheep Creek 1A		81.0	100.0	88.0	74.0	95.5	94.0	93.0	91.0	78.5	97.0	99.5	98.0		98.0									
Spring Creek 1A		94.5	100.0	93.5	87.0	92.0	84.0		90.0	96.0	95.5		99.5		100.0	96.0					86.4	90.5		
Spring Creek 2A																					75.8	70.0	64.0	
Bia Po'i Naokwaide 1A		62.5	100.0	90.5	77.0	93.0	88.5	91.0	93.0	94.5	83.5	83.5	99.5								91.0	93.0	69.5	
Trail Creek MSP 1A		99.0							77.5	98.5	97.0	99.0	99.5											89.0
Twelvemile Creek 1R		92.0	94.0	74.0		93.5					93.5	96.5	97.0					91.5	97.5		75.8	99.0		
Twin Creek 1A		73.5		96.5	70.0	97.5	94.5	83.5		78.0		96.0	89.5	94.0	92.5	91.0	85.5	87.5		100.0	99.0	72.3		
Wagonhammer Creek 1R		92.0	94.5	75.5	87.0	89.0	60.5		95.5	91.0	94.0	96.0	91.0	99.0										85.0
Warm Springs Creek 1R		50.0	91.5	84.0		85.5		71.5										97.5						
WF Iron Creek 1A		100.0		93.5	87.0	96.5	96.0	95.5	98.0	99.5			100.0				90.0				100.0		93.5	
Williams Creek 1A		94.0	100.0	80.5	81.0	86.0	96.0	91.0	83.5	96.0	78.0	99.0	98.5	100.0	100.0	100.0			90.5	97.5				
Woodtick Creek 1A		100.0	100.0	96.0			98.0		98.5	85.5		100.0		96.0	100.0	99.5					93.2			
Basin Creek 1A				94.0	87.5	100.0	71.0	90.0	87.5	95.5	100.0	98.0		92.5	98.5						98.5	100.0	95.0	
Block Creek 1R					71.5		89.5	86.0																
Challis Creek 1A			81.0	53.0	59.0	75.0	43.0	69.0	55.5	70.0	54.5	90.0	90.5		77.0	93.5	95.0	97.0				93.0	84.5	
Challis Creek 2A					56.5		41.0	52.0	74.0	71.5	84.5	95.0							94.0			95.5	91.5	
Challis Creek 3A										79.0		94.0	94.5	89.0	95.0	74.0	96.5	97.5						80.5

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
Challis Creek 4A												99.0	74.0												
East Pass Creek 1A			76.0	84.0	92.5	90.0	86.0	85.5	89.0	89.5															
Eightmile Creek 1A														57.5	54.5	27.5						89.3			
Fivemile Creek 1A			86.0		71.0	98.0	83.0	76.0	62.0	77.0	86.5	88.0								66.5					
Garden Creek USR 1A			90.0		93.0	98.0	96.0	97.0	100.0	100.0	97.5	99.0		93.5	100.0	98.5	98.0	98.0				100.0			
Herd Creek 1A			75.0	90.0	73.5	84.0	83.0	91.5	88.0	72.5	75.5		98.0				90.0					92.6			
Herd Creek 2A											91.5		99.0				95.5	97.5							
Jordan Creek 0A			91.0	87.5	89.0	83.0	70.5	81.0	70.5	92.0	90.0	100.0	100.0							100.0	100.0				
Jordan Creek 1A															100.0										
Jordan Creek 2A			91.0	77.5	62.5	96.0	80.5	85.5	89.5	76.0	97.5	94.0													
Jordan Creek 3A			83.0	82.5	68.0	94.0	78.0	71.0	73.5	76.0	78.5	94.5													
Jordan Creek 4A																									
McKay Creek 1A			73.0		89.0	86.5	92.0	86.0	91.5	97.5	95.5	96.0									98.5	95.1		88.5	
Mill Creek USR 1R																								85.5	
Morgan Creek 1A			88.0	91.5	68.5	99.0	81.0	73.0	94.0	81.0	81.5	87.5	90.0		95.0	79.0	86.5	88.5			99.5	92.7	81.0		
Morgan Creek 2A			50.0	64.0	62.0	74.0	63.5	69.0	70.0	69.0	72.0	67.0	71.0								90.0	92.0	85.9		
Morgan Creek 3A			86.0	86.0	78.0	84.0	81.5	67.0	86.0	88.0	87.5	82.0	90.0	90.0	86.0	94.5	93.5	83.5	83.0		92.5	85.3	75.4		
NF Rankin Creek 1R												94.5										95.5	96.0		91.5
Rankin Creek 1R												85.5											96.0		96.0
Paasikwana Naokwaide 1A			85.5	87.0	84.0	97.0	93.5	93.5	92.0	97.5	97.0	100.0			100.0	89.5						98.1			
Tenmile Creek 1A			91.5		90.5	88.0	69.0	72.0	87.0	82.5	82.0	88.5										95.5			
Thompson Creek 1A			93.5	91.5	83.0	91.0	94.0	99.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0									
Trail Creek USR 1R				91.5																				82.8	
Valley Creek 1A			94.5				82.0	81.5	87.0	83.0	91.5														
WF Herd Creek 1A			70.0	88.5	74.0	88.0	85.5																95.5		
WF Morgan Creek 1A			81.0	91.5	85.0	90.0	87.5	75.0	82.0	97.0	82.0	87.0			90.5	93.0	89.5	97.5	85.5	99.5	82.9	90.0			
WF Yankee Fork 1A			92.5		79.5	84.0	73.0	79.0	84.5	76.5	79.5	85.0			100.0	81.5						100.0		96.5	
Yankee Fork 1A			92.5	89.5	85.5	99.0	95.5	96.0	95.0	100.0	98.5	100.0	100.0	98.5	100.0	98.0		100.0							
Yankee Fork 2A			92.0	86.0	72.5	77.0	82.5	64.0	90.0	76.5	79.0	97.0				88.5		92.5					87.5		
Yankee Fork 3A			84.5	71.5	81.0	59.0	54.0	83.0	66.5	79.0	88.0	89.5	85.5							89.0			87.0	88.5	
Yankee Fork 4A			87.0	94.0	77.5	90.0	75.5	79.0	91.0	77.0	76.5	92.5							89.0				88.8	84.0	
Yankee Fork 5A			80.0	83.5	60.0	71.0	69.0	72.0	95.0	83.5	84.5	80.5										91.6		88.0	
Camas Creek 1A		53.0	94.0	85.5	68.5	72.5	70.0	53.0	73.5	75.5	72.0	91.5	94.5	90.0	89.5		70.0	87.5				88.1	74.0		
Camas Creek 2A		58.0	95.5	86.0	56.0	38.5	41.0	55.0	54.0	60.0	49.5	72.5	93.0							100.0				52.5	
Camas Creek 3A		81.5	93.0	60.5	44.0	34.0	38.5		37.5	55.0	63.0	89.0					80.0	91.5				86.9	77.5		
Castle Creek 1A		88.5							80.5	73.0	72.0	84.5						93.0				95.5	86.0		
Hoodoo Creek 1A		94.0									93.0														
Silver Creek 1A		80.5	98.5	93.5	59.0	57.5	39.0	73.5	84.5	75.5	88.5	93.5		84.0	97.0		95.5		80.5			96.5	95.0	84.5	
Silver Creek 2A								82.5	92.5	92.0	95.5	82.5						92.0				94.0	87.5		
WF Camas Creek 1A		84.5		55.0	48.5	20.5		29.0	22.5	21.5	36.5	89.0					78.5	82.5				97.0			
Yellowjacket Creek 1A		97.5		96.5																					
Yellowjacket Creek 2A		83.0		89.0			88.0		88.0	85.5															
Beaver Creek UMFS 1A																	96.0	94.0	88.0			92.2	100.0		
Marsh Creek 1A															95.0	87.5	97.5	97.5	93.0			97.4	95.5		
Agency Creek 1R																								53.5	

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Bear Valley Creek 1A		46.0	83.0	96.5	70.0	82.5	83.0	79.0	91.0	91.0	71.0	95.5	90.5		97.5	83.0	99.5	95.0			100.0			
Bear Valley Creek 2A		50.0																						
Bear Valley Creek 3A		78.0	90.0	93.0				72.0																
Bear Valley Creek 4A		92.0			85.0	88.0				74.5	65.0													
Big Bear Creek 1R		94.0	85.5	65.5	84.8	86.0	86.5	91.0	94.0	91.5	95.5	98.0	96.5	100.0	97.0	94.0	95.0	95.0	98.5	98.0	97.7	100.0		
Big Eightmile Creek 1R		100.0		91.0	79.0	88.5	69.0	84.0	86.0		88.5						97.5				97.5	99.0		
Big Eightmile Creek 2R		91.5	95.5	93.0	73.0	93.5		85.0		80.5	91.0	96.0					92.0				100.0	96.0		
Big Timber Creek 1R		89.0	97.0	96.0	88.0	99.0	100.0	92.0	89.5	79.5	90.0	97.5			100.0	92.5					98.0	100.0		
Canyon Creek 1R		99.0	98.5	95.0	88.0	84.0	80.0	81.0	92.5	87.0	98.5	88.5	99.0	100.0		99.0		93.5			97.5	83.0		
Deer Creek LEM 1R																								73.0
EF Hayden Creek 1A		98.0						90.0												99.5				75.0
EF Hayden Creek 2R		100.0			91.0	94.0	94.5	99.0	96.0	100.0	97.0	99.0	98.0							85.4				92.0
Hawley Creek 1R		88.0	97.0	89.0	91.1	96.0	99.0	94.5	91.0	92.0	96.0	93.5	94.5		100.0	96.0	97.0	98.0		98.5		99.0	95.1	
Hayden Creek 1A		93.5	98.0	93.5	84.0	80.0	84.5	87.0	89.0	80.0	99.0	95.5			100.0	97.5	92.0	97.5		94.1			84.7	
Haynes Creek 1R		92.0						55.0			86.5	92.5	76.5									84.3		
Kenney Creek 1R		91.5									74.5			95.0							96.5	92.0		
Little Eightmile Creek 1R			100.0				75.5					76.5				85.0	88.0							84.0
MF Little Timber Creek 1R		78.0										89.0					98.5	88.0	66.5		98.0	89.5	88.5	
Mill Creek LEM 1R		91.0					88.0	93.0	82.0		95.5	97.0				99.5				98.5			89.5	
NF Little Timber Creek 1R		95.0										98.5	96.0				92.5	96.5	78.0		93.2	99.5	94.5	
Pattee Creek 1R		86.5							76.0	86.0	80.0	91.5	83.5	81.0	88.0	85.0	73.0				88.6		51.9	
Reservoir Creek 1R		84.0	94.0	68.0	90.5	78.0		64.0		91.5	86.0	89.0		90.0	95.5	88.0	56.0	80.5	78.5	81.0	68.5	71.4		
Stroud Creek 1R																								83.5
Withington Creek 1R		98.0									76.5		92.5	85.0	84.5	79.0			94.0	98.5				72.2
Big Creek PAH 1R			85.5			86.0	86.5	91.0	94.0	91.5	92.0	95.5												90.5
NF Big Creek 1R			93.5			100.0	89.5	99.0	97.0	99.0		99.5												90.5
Pahsimeroi River 1R			66.0												99.0		93.0	97.0				94.4		
SF Big Creek 1R			80.0			92.0	86.0	75.5	85.5	73.0	93.0	97.5			99.0									91.0
Alder Creek 1R																	85.0							80.3
Antelope Creek 1R			64.5		53.5	65.0	29.0	56.0	57.0	70.0	65.0	84.0									88.6	66.0		
Antelope Creek 2R															100.0	95.5	87.0	92.5	89.5	99.0	93.0	95.0		
Antelope Creek 3R																								72.6
Bear Creek 1R															65.0					66.5				
Bear Creek 2R																					83.5	89.0	77.6	83.1
Cherry Creek 1R			63.0		56.0	77.0	53.0	74.0	71.0	82.0	87.5	88.0	73.0		95.5			88.0	81.5	90.6				
EF Big Lost River 1R			87.0	83.0	73.5	97.5	69.5	77.0	73.5	71.5	72.0	92.5	74.0							100.0	75.5			
EF Big Lost River 2R															90.0						82.0			
EF Big Lost River 3R			53.5	86.5	92.0	89.0	81.5	93.5	89.0	97.5	96.5	100.0	99.5	100.0	100.0	95.0			57.0					
Iron Bog 1R																								97.5
Muldoon Creek 1R			94.0		77.5	100.0	76.0	83.0	90.0	94.0	97.0	100.0	78.5						91.5		95.5			
NF Big Lost River 1R			60.0	52.0	27.5	38.0	30.0	14.0	20.5	26.0	46.0	47.0	55.5							80.0	88.0			
NF Big Lost River 2R			70.5	56.5	57.5	69.0	23.0	35.0	46.0	46.0	63.5	86.0	80.0	85.0	81.0	83.0		73.5	77.0	88.0				
Pass Creek 1R			90.5			90.0	79.0	82.5	75.5	82.5	80.0	87.5		88.0	95.0	77.0		94.5	85.5	99.0	86.5	85.2		
Star Hope Creek 0R			85.0	79.5	59.0	90.0	79.5	81.0	82.5	88.0	81.0	91.0							89.0		97.0			
Star Hope Creek 1R			95.0		77.5	96.5	75.5	89.5	70.5	74.5	86.0	95.0	93.0			95.5								

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Wildhorse Creek 1R			89.5		76.5	96.5	67.0	82.5	92.5	92.5	97.0	98.0	82.0		88.5					94.5	100.0			
Badger Creek 1R			83.5					95.5			99.0	90.5				94.0					99.0		98.5	
Big Creek LLR 1R								50.0			91.0	87.5	89.0		95.5	75.0	96.0	81.0	70.5	85.0	85.6	93.5		
Dry Creek 1R								94.0			95.0	100.0									100.0		98.0	
Iron Creek 1R									44.5												88.2	86.5	81.1	
Little Lost River 1R									45.0		67.5	80.5	91.0	87.5	91.0	96.5	75.5	80.0		85.0	94.5	100.0	82.0	
Mill Creek LLR 1R				88.5	56.0	98.0	65.0	79.0	95.0	97.5	100.0	94.5	98.5				85.0	97.5	97.0	80.4	97.0	98.0	87.0	
Smithie Fork 1R									57.0		89.5	85.5	72.5				92.5			87.1	92.5	95.5	69.0	
Weda'a Naokwaide 1R									100.0		100.0	79.5	95.0				77.0		81.5	95.0	100.0	99.0	56.8	
Timber Creek 1R									54.0								81.5			95.5	95.5	75.5	75.5	
Wet Creek 0R								92.0			84.5	91.5					92.0	92.0	90.5	85.8	92.0	91.5		
Wet Creek 1R			58.5	76.5	87.5	87.0	81.0	84.0	87.5	81.0	88.0	81.5	91.0		94.0						89.0	78.3	82.5	
Wet Creek 2R					79.0	44.0	59.0	64.0	66.5	33.5	35.5	56.5				79.0	94.0	99.0	90.0	100.0		88.0		
<b>Total # of sites measured</b>	<b>0</b>	<b>91</b>	<b>99</b>	<b>94</b>	<b>99</b>	<b>106</b>	<b>106</b>	<b>109</b>	<b>118</b>	<b>114</b>	<b>124</b>	<b>111</b>	<b>80</b>	<b>32</b>	<b>61</b>	<b>50</b>	<b>61</b>	<b>49</b>	<b>35</b>	<b>52</b>	<b>95</b>	<b>62</b>	<b>59</b>	<b>3</b>

**Percent Stable Banks - Repeat Measurements (2<sup>nd</sup> measurement in a given year)**

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Clear Creek 1A (re-sample)										18.0														
Colson Creek 1A (re-sample)																					53.7			
Owl Creek 1A (re-sample)																					44.6			
Basin Creek 1A (re-sample)																					98.5			
Challis Creek 1A (re-sample)																								

**AZAR Rating – Data for All Monitoring Sites (1993-2023)**

20230222 Version

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Corn Creek 1A	91	91																			78	86				84						
Horse Creek 1A	89	82	71	92																	85											
Horse Creek 2A	85	81	77	82	81	80	78				81										84	80	66				57					
Arnett Creek 1R	70	86	79	91	95	83	89	72	81	64	77	92	82		83					81				83			79			87		
Beaver Creek MSP 1A	56	81				89		92	93	80	88													72								
Big Deer Creek 1A	80	89	92		79		87		79	84																						
Big Deer Creek 2R									67	74	82	80	85		81											85					90	
Big Deer Creek 3R									76	93	83	82	95		76											64						
Big Hat Creek 1R	68	79		74							67						80							80		78						
Cabin Creek 1R			88																													
Carmen Creek 1R	72	89	76	98	83	82	80	85	78	90	94	94	97											88								
Carmen Creek 2R																																
Clear Creek 1A	88	77	81	75	86	92	73	70	62	70	60																					
Clear Creek 2A	60	66								46					58	69					71	59					60					
Colson Creek 1A	62	86	85	88	73	81	70	77													77	59	49	66				73				
Cow Creek 1R																	94				89										89	
Dahlonga Creek 1A	74	75		71	62	72	71	74	79	90	86	86	92		90	77								75						85		
Deep Creek 1A	81	91	96	89	88	93	91	95	95	87	86	99	95		93	89							94			84				84		
Ditch Creek 1A			95	95											95					91			97				85					
East Boulder Creek 1R	67	56			66	54	69	75	62	77	68	68	71												79					74		
Fourth of July Creek 1A	82	88	87	88	84	86	87		89		88													72								
Garden Creek MSP 1A	92	96							68	84		47	48																			
Hat Creek 1R	72	87					61	75			82						91							78				76				
Hughes Creek 0A			96																													
Hughes Creek 1A	80	88	97	87	63	70	82	87	74		74	84	83		94	83	77	84	88	79	86	89	93		92		86					
Hull Creek 1A	87	92	83	92		90					77	91	80				87	78	86	76						81				82		
Indian Creek 1A	84	89	80	93	77	78	70	93	82	72	80	73	77		98	83					86	75	77	64								
Indian Creek 2A	93	90	93	90					86		78	94	98				89					92	98				85				81	
Iron Creek 1A	96	95	97	91	85	83	91	90	98	83	94						85				85		88			69					76	
Jesse Creek 1R	84	88				87		93		89	89						81	84						79					79			
Lake Creek 1R	87	87	79	97	84	85			89	83	87	94	86			85								66				76				
Lake Creek 2R							82		84																							
Little Deep Creek 1R									72	86	75	87	80								97			83				86				
Little Deer Creek 1R									73	78	73	83	72													97					96	
McKim Creek 1R	75	84		91		84	92										87				88			83								
Moccasin Creek 1R																																
Moose Creek MSP 1R	76	83			76	64	76	75	75	86	81	85	83		93	73				81		83					73				89	
Moose Creek NFSR 1A			96	96	89	94	77	80	89	89							94							96								
Moyer Creek 1A	75	77	89	91	87	77	76	92	81	83	85	88	90		72						73		81		65		72					
Moyer Creek 2A	78	86			96	71	84					88									62		80					76				
Musgrove Creek 1A	66	81	61	82	88	73	74	70	74	69	78	89	84		73									54	74		71					
Napias Creek 1R	66	68	69	87	68	52	58	52	61	59	60	57	75		66	53			61					68		64					69	

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Napias Creek 2R	63	84	92	87	95	92	85	80	81	89	76	96	95																			
Napias Creek 3R	70	81	82	81	90	84	79	77	78	90	89		91							79				98				87				
Napias Creek 4R	85	83	82	83	68	73	83	82	62	86	58		85																80		84	
Napias Creek 5R	59	82	82	85	67	81	80	85	89	74	87	78	94												84						71	
NF Iron Creek 1A	83	86	88	89	95	83	96	91	90	96			94				73				95		96				92					
NF Salmon River 1A	78	84	83	92	83	76		82	79	86	82		93		71		79		82	73	83			76								
NF Salmon River 2A	75	84	87	76	73	88	90	90	94	88	81	88	92			92		92				86			76		85					
NF Salmon River 3A	68	75	76	94	92	70	71	87	69	84	82		88					76		88	91	91				76			81			
NF Salmon River 4A																		99	86		97			88			78					
Owl Creek 1A	77	80	80	88	87	76	83	78	86		78	72									88	52	71	59		66					65	
Owl Creek 2A	80																															
Owl Creek 3A	71	85																														
Panther Creek 0A								66	57	65	62	68	76		56	56	73			77	71											
Panther Creek 1A	76	65	75	93	81	68	67	77	76	64	69	87	77		76	71	66		74				88				73					
Panther Creek 2A	70	78	78	90	71	64	63	84	69	64	61	78	88								80		95				73					
Panther Creek 3A	85	99	79	84	79	79	80	86	77	75	70	86	84		91	74	82			81	86				81		68					
Panther Creek 4A			69	90	89	84	91	87	93	92	79	89	90				85				82	91				84					68	
Panther Creek 5A				92	82	65	88	85	86	84											83	66				83					80	
Perreau Creek 1R	68	93	84					96	96	77	94	91	96											80				82				
Phelan Creek 1R	53	52		79	81	62	62	59		52	51	71	72											45		74		65				
Pierce Creek 1A	63	70															74	85	79		87	84		79		77					75	
Pine Creek 1A	91	100		88	78	88		86	85	88	83										82					74						
Pine Creek 2A	88																															
Pine Creek 3A							91		87																							
Porphyry Creek 1A	86	92				81	72	75	84	83	83	92	83											72						79		
SF Iron Creek 1A	89	90		59	88	93			96		98						83															
SF Moyer Creek 1A	68	81										90										75				64					60	
SF Williams Creek 1R																89	89	88	87	82		86	90				74					
Sheep Creek 1A	84	86	91	96	88	81	85	84	81	83	94	95	92		95									93				94				
Spring Creek 1A	90	86	97	92	84	83	84		87	35	90		94		88	92					90	91										
Spring Creek 2A	74																					62	67	82	82			81				
Bia Po'I Naokwaide 1A	90	77	86	94	84	91	91	82	82	87	84	76	86									67	90	86		85	91					
Trail Creek MSP 1A	85	88							82	88	91	96	94												92				73			
Twelvemile Creek 1R	79	80	89	70		77				72	80	89							87	94			65	86			85				78	
Twin Creek 1A	84	84		96	74	86	81	96		82		94	94		85	87	84	86		94	86	93			81				87			
Wagonhammer Creek 1R	71	75	86	77	74	67	55		77	86	84	90	84	63										79				70				
Warm Springs Creek 1R	54	59	55	69		68		63										74														
WF Iron Creek 1A	80	90		94	87	87	90	99	93	97			95				82				94		100				87					
Williams Creek 1A	81	83	90	79	70	91	87	83	94	86	66	89	90		96	85			76	89					82					89		
Woodtick Creek 1A	76		96	97			98		94	87		100			81	87					89					84						
Basin Creek 1A				77	75	91	84	88	79	93	72	78			88						72	78	80		64		70					
Block Creek 1R					70		80	84																								
Challis Creek 1A			82	68	69	59	69	82	79	77	89	82	82		76	78	78	87				56	76	63		78		68				
Challis Creek 2A					66		67	71	66	66	68	75								87		84	78				71					
Challis Creek 3A										89		81	82		95	81	84	85						80				85				

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023			
Challis Creek 4A												92	88																					
East Pass Creek 1A			84	91	83	82	73	85	88	82								58						46										
Eightmile Creek 1A														58	58	46						55		70	69		69		75	72				
Fivemile Creek 1A			93		86	81	82	89	78	98	85	81								80					87			92		94				
Garden Creek USR 1A			97		91	96	96	94	97	98	99	97			84	86	81	90				91					77			87				
Herd Creek 1A			64	89	79	81	67	87	69	90	70		76				72					66				81								
Herd Creek 2A											81		82				78	86						61										
Jordan Creek 0A			75	76	80	81	74	77	91	86	90	88	88							92	77					81					82			
Jordan Creek 1A															90																			
Jordan Creek 2A			81	91	71	83	83	89	86	79	96	79																						
Jordan Creek 3A			84	86	73	83	79	92	88	83	91	77												81				78						
Jordan Creek 4A																																		
McKay Creek 1A			72		72	72	79	87	79	76	70	78								91	77		68	77	71			74	68	72				
Mill Creek USR 1R																							84	79				73						
Morgan Creek 1A			82	84	75	81	78	83	86	79	88	78	85		100	80	72	83		84	86	81		72		79	90							
Morgan Creek 2A			75	66	68	66	64	76	70	68	80	78	53							70	68	68												
Morgan Creek 3A			78	81	68	73	82	77	83	82	81	71	78		90	73	75	74	75	87	75	57				64					74			
NF Rankin Creek 1R											72									96	90		97											
Rankin Creek 1R											82											84		90										
Paasasikwana Naokwaide 1A			87	91	76	92	85	89	80	91	85	87			88	71						88				78		70						
Tenmile Creek 1A			82		83	82	86	85	82	89	93	83									90			67	79			81	87	83				
Thompson Creek 1A			87	86	67	88	94	95	94	97	88	98		97	88	97								93				91						
Trail Creek USR 1R				73																		64		68				76						
Valley Creek 1A			74				84	85	78	68	79				62	61	67	73	67			77	84	63			72							
WF Herd Creek 1A			82	87	84	91	79																											
WF Morgan Creek 1A			87	65	75	84	86	87	85	92	92	86			91	65	77	82	72	91	58	77												
WF Yankee Fork 1A			87		75	77	86	82	84	92	80	74			79	67							77					76						
Yankee Fork 1A			70	79	77	84	88	91	79	86	85	81	88	88	83	82										80								
Yankee Fork 2A			82	81	67	71	71	85	86	85	74	79				79		74								73		73				84		
Yankee Fork 3A			85	74	71	68	72	94	76	72	75	69	80						78				74			73			66	71	80			
Yankee Fork 4A			82	92	80	85	84	90	74	82		84							77			94		84		76			71	77	75			
Yankee Fork 5A			85	76	66	74	83	86	81	78	79	78										74		83	82	70			65	73	79			
Camas Creek 1A	52	62	78	77	79	56	74	66	71	75	66	71	84		63		65	73				77	74				70					75		
Camas Creek 2A	56	67	71	71	61	54	74	68	69	64	65	61	74							70				82				66						
Camas Creek 3A	62	67	60	71	67	58	62		66	81	58	68											86	83		69		68						
Castle Creek 1A	76	90							85	93	84	86											93	98			81						77	
Hoodoo Creek 1A	96	95								93																								
Silver Creek 1A	79	73	67	77	74	64	68	81	84	88	81	87			80		78					84	88	79		80		77				67		
Silver Creek 2A								82	81	81	77	86										87					80						57	
WF Camas Creek 1A	63	76		52	62	57		57	59	62	51	73					71	78				77					64							
Yellowjacket Creek 1A	77	84		84																														
Yellowjacket Creek 2A	78	77		71			85		80	84																								
Beaver Creek UMFS 1A																	69	69	63				73					83					75	
Marsh Creek 1A															72	61	67	73	71				62	73			54		68				58	
Agency Creek 1R																									43	65					79			

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Bear Valley Creek 1A	68	65	70	81	68	66	74	65	74	75	73	86	84		63	66	61	84			79			60		81					73
Bear Valley Creek 2A	55	70																													
Bear Valley Creek 3A	43	67	72	81				68																							
Bear Valley Creek 4A	58	88			79	64				75																					
Big Bear Creek 1R	59	71	77	91	70	73	70		74	71	76	88	74		70	69	69	76	70	81	92	76			77		80				
Big Eightmile Creek 1R	75	81		96	75	82	72	76	79		79						88				88	100									
Big Eightmile Creek 2R	76	78	88	71	84	77		71		75	82	90					77				80	99			72		83				
Big Timber Creek 1R	74	82	82	82	87	85	88	81	84	84	79	90			74	82					83	81				90				75	
Big Timber Creek 2R																													73		
Canyon Creek 1R		85	90	76	86	80	85	71	84	68	81	85	89			89		86			85	84				94				78	
Deer Creek LEM 1R																							83	72				82			
EF Hayden Creek 1A	64	95						87												88			88				74				
EF Hayden Creek 2R	75	65			72	79	73	81	67	79	78	87	83							71			87				70				
Hawley Creek 1R	63	76	78	82	76	87	78	82	72	65	75	84	78		92	87	89	88			86		79	92			82				
Hayden Creek 1A	78	90	85	93	79	71	75	80	77	77	84	92			97	87	85	86			84		82			73				79	
Haynes Creek 1R	61	85						62			93	79	86								76			80				81			
Kenney Creek 1R	61	77									77			98							79	90									
Little Eightmile Creek 1R	51		75				84					72				83	66						72				75				
MF Little Timber Creek 1R	79	86										65				81	87	86	73		72	86	93				76				
Mill Creek LEM 1R	93	90					77	80	78		88	97				90					88			83			80				
NF Little Timber Creek 1R	84	90										100	85				79	84	71			86	87	92	80				58		
Pattee Creek 1R	59	54							60	84	74	87	85		96	79	77						75								
Reservoir Creek 1R	46	66	71	69	72	65		57		71	62	85			81	71	43	75	73	75	62	66				73				77	
Stroud Creek 1R																															
Withington Creek 1R	67	66									82		91		88	81			94	78			87	83				81		63	
Big Creek PAH 1R			89			82	86	92	73	93	84	84											93		66		76				
NF Big Creek 1R			92			97	96	100	72	97		95											93								
Pahsimeroi River 1R			73												80		84	93				85				63				75	
SF Big Creek 1R			94			91	94	85	89	95	94	92			97								93								
Alder Creek 1R																	82							59			50				52
Antelope Creek 1R			66		63	74	72	77	82	82	83	73									79	51									
Antelope Creek 2R															80	78	78	84	78	81	89	83		65		81				84	
Antelope Creek 3R																							66.5	67						76	
Bear Creek 1R															82					69											
Bear Creek 2R																		79		83	74	68		68					77		
Cherry Creek 1R			69		57	73	70	79	74	69	74	73	81		75			83	79	66			65		62					70	
EF Big Lost River 1R			84	71	71	83	70	78	73	73	67	67	78							86	61				71					57	
EF Big Lost River 2R															65			66						53					70		
EF Big Lost River 3R			57	70	68	73	75	70	58	66	70	66	81		60	71								57		72				54	
Iron Bog 1R																							94	94					91		
Muldoon Creek 1R			70		65	84	78	81	71	82	75	73	88						82		65		64					74			
NF Big Lost River 1R			61	59	59	58	56	60	63	53	65	52	71							67	80					66				56	
NF Big Lost River 2R			65		61	70	64	68	62	60	63	60	87		67	70		71	60	66			52		82		60				
Pass Creek 1R			81			84	77	85	77	74	60	59			47	76		87	77	81	85	64		55	71		86			78	
Star Hope Creek OR			77	78	74	81	85	78	74	71	71	71								74		79		72					71		

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Star Hope Creek 1R			67		75		77	93	74	64	78	66	84		62																	
Wildhorse Creek 1R			66		68	84	75	80	71	66	64	66	79		63					82	73			68		77	62					
Badger Creek 1R			84					90			96	87				86						86		87			83					
Big Creek LLR 1R								55			63	56	80		62	65	64	70	60	72	66	66				58				67		
Dry Creek 1R								86			73	86									83		70				86					
Iron Creek 1R									71											89	89	77			83					76		
Little Lost River 1R									71		85	75	92		74	75	69	67		81	70	85	95		57		74					
Mill Creek LLR 1R				82	78	89	76	86	86	92	87	94	97				76	90	88	85	87	88	90				77					
Smithie Fork 1R									60		68	60	72				77			71	71	62	81				76					
Weda'a Naokwaide 1R									79		89	67	94				64		82	83	82	78	67			80				76		
Timber Creek 1R									71								67				76	79	73	82						69		
Wet Creek OR								84			70	81					65	68	71	76	60	60			76		87					
Wet Creek 1R			63	79	82	79	88	82	76	74	81	88	92		69					86	69	67			79					78		
Wet Creek 2R-1					64	50	65	67	73	57	61	58														59						
Wet Creek 2R-2																63	79	83	83	97			85									
<b>Total # of sites measured</b>	<b>94</b>	<b>90</b>	<b>99</b>	<b>92</b>	<b>99</b>	<b>106</b>	<b>105</b>	<b>108</b>	<b>118</b>	<b>114</b>	<b>122</b>	<b>111</b>	<b>79</b>	<b>5</b>	<b>61</b>	<b>51</b>	<b>59</b>	<b>48</b>	<b>34</b>	<b>51</b>	<b>91</b>	<b>61</b>	<b>59</b>	<b>59</b>	<b>37</b>	<b>46</b>	<b>42</b>			<b>36</b>		

**AZAR Rating - Repeat Measurements (2<sup>nd</sup> measurement in a given year)**

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Clear Creek 1A (re-sample)	77									46																						
Colson Creek 1A (re-sample)																						47										
Owl Creek 1A (re-sample)																						45										
Basin Creek 1A (re-sample)																						92										
Challis Creek 1A (re-sample)																																

### Rosgen Channel Type – Data for All Monitoring Sites (1993-2019)

20200219 Version

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Final CT	
Corn Creek 1A																										B3a		B3a	
Horse Creek 1A			B3																										C3b
Horse Creek 2A						C3																	B4				B4	B4	
Arnett Creek 1R						C4																		B3				B3	
Beaver Creek MSP 1A						B4																		E4b				E4b	
Big Deer Creek 1A																												A3	
Big Deer Creek 2R									C4																	C4		C4	
Big Deer Creek 3R									C4																	C4		C4	
Big Hat Creek 1R																								C4		C4		C4	
Cabin Creek 1R																													
Carmen Creek 1R						B3a																		B3a				B3a	
Clear Creek 1A																													
Clear Creek 2A																										C4		C4	
Colson Creek 1A						A4																	B3	B3				B3	
Cow Creek 1R																													
Dahlonga Creek 1A						C4b																		C4b				C4b	
Deep Creek 1A						B4																	B3c			F3b		F3b	
Ditch Creek 1A			A3																				C3b				C3b	C3b	
East Boulder Creek 1R						E4																				F4		F4	
Fourth of July Creek 1A						B4a																		B4				B4	
Garden Creek MSP 1A																													
Hat Creek 1R											A4													C4b				C4b	
Hughes Creek 0A																													
Hughes Creek 1A						C4b																	C3b		C3b		C4b	C4b	
Hull Creek 1A						E4b																	C4b			C4b		C4b	
Indian Creek 1A																							B3c	F4				F4	
Indian Creek 2A			B4																				B3			C4b		C4b	
Iron Creek 1A			B3a			B3a																	C4			C4		C4	
Jesse Creek 1R						B4																		B4				B4	
Lake Creek 1R						E4b																		C4				C4	
Lake Creek 2R																													
Little Deep Creek 1R											E4													B4				B4	
Little Deer Creek 1R																										C4		C4	
McKim Creek 1R						E4b																		C3b				C3b	
Moccasin Creek 1R																													
Moose Creek MSP 1R						C4																					C4	C4	
Moose Creek NFSR 1A						A3																		B3a				B3a	
Moyer Creek 1A						B3																	C4		C4		C4	C4	
Moyer Creek 2A						C4																	C3				C3	C3	
Musgrove Creek 1A						C4b																		C4	C4		C4	C4	
Napias Creek 1R						C4																		C4		C4		C4	

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Final CT	
Napias Creek 2R																												C4	
Napias Creek 3R						B4c																		B3				B3	
Napias Creek 4R																												C4	
Napias Creek 5R						E4																			C4b			C4b	
NF Iron Creek 1A																								C4			C4b	C4b	
NF Salmon River 1A						C4																		C4				C4	
NF Salmon River 2A						C4																				C3	C4b	C4b	
NF Salmon River 3A						C4b																					B4c	B4c	
NF Salmon River 4A																								C3b				C3b	
Owl Creek 1A																								B3a	B3		B3	B3	
Owl Creek 2A																													
Owl Creek 3A																													
Panther Creek 0A																												C4	
Panther Creek 1A						C4																		C3			C4	C4	
Panther Creek 2A						B4c																		B3c			B3c	B3c	
Panther Creek 3A						C3																				C4	C4	C4	
Panther Creek 4A						C3b																					C4b	C4b	
Panther Creek 5A						C4b																					B4	B4	
Perreau Creek 1R			C4b																						C4b			C4b	
Phelan Creek 1R						B4c																			C4		C4	C4	
Pierce Creek 1A																									C4		C4	C4	
Pine Creek 1A						B4a																					B3	B3	
Pine Creek 2A																													
Pine Creek 3A																													
Porphyry Creek 1A						C4b																			C4b			C4b	
SF Iron Creek 1A																												E4	
SF Moyer Creek 1A																										C4b		C4b	
SF Williams Creek 1R																								C3b			C3b	C3b	
Sheep Creek 1A						C4																			C3b			C3b	
Spring Creek 1A																												B4	
Spring Creek 2A																								B3	B4a			B4a	
Bia Po'i Naokwaide 1A						B4c																		G4			C4b	C4b	
Trail Creek MSP 1A									E4b																G3			G3	
Twelvemile Creek 1R			E4b			C4b																					C4b	C4b	
Twin Creek 1A						C4b																				C4b		C4b	
Wagonhammer Creek 1R			G4																						G4			G4	
Warm Springs Creek 1R																												E4	
WF Iron Creek 1A						E4b																		C3b			C3b	C3b	
Williams Creek 1A			C4b			B4																				C4b		C4b	
Woodtick Creek 1A			B4																								B3	B3	
Basin Creek 1A						C3																		B3		B4c	C3	C3	
Block Creek 1R																													
Challis Creek 1A						C3																			C4b	C4b		C4b	C4b
Challis Creek 2A																									B4			B4	B4
Challis Creek 3A																									C4			C4	C4

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Final CT	
Challis Creek 4A																													
East Pass Creek 1A			C4																					C4					C4
Eightmile Creek 1A																								C4	C4		C4		C4
Fivemile Creek 1A			C4b			C4																			C4				C4
Garden Creek USR 1A																		B3									C3b		C3b
Herd Creek 1A						C4																					C4		C4
Herd Creek 2A											B4													C4					C4
Jordan Creek 0A						B4																					C3b		C3b
Jordan Creek 1A																													
Jordan Creek 2A																													C3b
Jordan Creek 3A			C4																					C3b					C3b
Jordan Creek 4A																													
McKay Creek 1A						C4																		C4	C4	C4			C4
Mill Creek USR 1R																								F4	C4				C4
Morgan Creek 1A			F4b																						C4		C4		C4
Morgan Creek 2A						B3c																							B3c
Morgan Creek 3A						C4																					F4		F4
NF Rankin Creek 1R																													A3
Rankin Creek 1R											B4													G4					G4
Paasasikwana Naokwaide 1A			B3c			B3																				B3		B3	B3
Tenmile Creek 1A						C4																		C4	C4				C4
Thompson Creek 1A						C3																			C3b				C3b
Trail Creek USR 1R																								C4					C4
Valley Creek 1A																								C4				C4	C4
WF Herd Creek 1A																													C4
WF Morgan Creek 1A			C4																										C4
WF Yankee Fork 1A			B3c			C3																		C3				C3	C3
Yankee Fork 1A			B4c																							C4			C4
Yankee Fork 2A						C3			C4																	C4		C3	C3
Yankee Fork 3A																								C4		C4			C4
Yankee Fork 4A																								C3		C4			C4
Yankee Fork 5A																								B3c	C3	C4			C4
Camas Creek 1A			C4																								C4		C4
Camas Creek 2A																								C3				C3	C3
Camas Creek 3A			C3																							C4		C4	C4
Castle Creek 1A																											C4		C4
Hoodoo Creek 1A																													
Silver Creek 1A																								C4		C4		C4	C4
Silver Creek 2A								C4																			C4		C4
WF Camas Creek 1A						C4																					C4		C4
Yellowjacket Creek 1A																													
Yellowjacket Creek 2A																										C3			C3
Beaver Creek UMFS 1A																											C4		C4
Marsh Creek 1A																										C4		C4	C4
Agency Creek 1R																								B4	B4				B4

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Final CT	
Bear Valley Creek 1A			C4																					C4		C4		C4	
Bear Valley Creek 2A																													
Bear Valley Creek 3A																													
Bear Valley Creek 4A																													
Big Bear Creek 1R						C4																				C4b		C4b	C4b
Big Eightmile Creek 1R																													C3b
Big Eightmile Creek 2R						C4																				C4		C4	C4
Big Timber Creek 1R						C3b																					C3b		C3b
Canyon Creek 1R						B4c																					B4		B4
Deer Creek LEM 1R																								C3b	C3b				C3b
EF Hayden Creek 1A																								C3b				C3b	C3b
EF Hayden Creek 2R						E4																			E4				E4
Hawley Creek 1R						C4																		C3b				C4b	C4b
Hayden Creek 1A						C3																		C3b			C3		C3
Haynes Creek 1R																									C4b				C4b
Kenney Creek 1R																													B4
Little Eightmile Creek 1R							E4b																	G4			G4	G4	
MF Little Timber Creek 1R																								C4b			C4b	C4b	C4b
Mill Creek LEM 1R																								C3b				C4b	C4b
NF Little Timber Creek 1R																								C3b	C4b				C4b
Pattee Creek 1R																													C4b
Reservoir Creek 1R						C4																					C4		C4
Stroud Creek 1R																								C4b	C4b				C4b
Withington Creek 1R																								C3b			C3b		C3b
Big Creek PAH 1R																								B3c		C3		C3	C3
NF Big Creek 1R						C3																		C3					C3
Pahsimeroi River 1R			B3c																								C4		C4
SF Big Creek 1R																								C3					C3
Alder Creek 1R																											C4		C4
Antelope Creek 1R						C3																							C3
Antelope Creek 2R															C3												C3		C3
Antelope Creek 3R																								C3b	C3				C3
Bear Creek 1R																													
Bear Creek 2R																													B3
Cherry Creek 1R						C4									B6										C4		C4		C4
EF Big Lost River 1R						B3c																					C3		C3
EF Big Lost River 2R																													C3
EF Big Lost River 3R																											E4		E4
Iron Bog 1R																								F3	F3				F3
Muldoon Creek 1R						C3																			C4				C4
NF Big Lost River 1R						C3																					C3		C3
NF Big Lost River 2R			C4																						C4		C4		C4
Pass Creek 1R						G4c																			C4	C4		C4	C4
Star Hope Creek 0R						C3																			C3				C3
Star Hope Creek 1R																													C3

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Final CT			
Wildhorse Creek 1R						C3																		C3		C3		C3			
Badger Creek 1R											C4																C4b		C4b		
Big Creek LLR 1R											E4															E4		E4			
Dry Creek 1R											C4																	C4		C4	
Iron Creek 1R																										C4b			C4b		
Little Lost River 1R																												C3		C3	
Mill Creek LLR 1R																												C4b		C4b	
Smithie Fork 1R											E4																	C4b		C4b	
Weda'a Naokwaide 1R											C4																		C4		C4
Timber Creek 1R																													B4		B4
Wet Creek 0R											C4																		E4		E4
Wet Creek 1R				B4																									E4		E4b
Wet Creek 2R-1							F4																						F4		F4
Wet Creek 2R-2																															B4a
<b>Total # of sites measured</b>	<b>0</b>	<b>0</b>	<b>23</b>	<b>0</b>	<b>0</b>	<b>72</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>59</b>	<b>58</b>	<b>37</b>	<b>46</b>	<b>42</b>	<b>169</b>		

### Monitoring Site Location and Watershed Characteristics – All Sites

20230125 Version

Site Name	Latitude	Longitude	Drainage Area (sq mi)	Drainage Area (acres)	Mean Basin Elevation (ft)	Q1.5 (approx bankfull flow) (cfs)	Qa (Mean Annual Flow) (cfs)	Mean Basin Slope (10m DEM)	Basin Aspect	% of watershed Alluvium	% of watershed Granitic	% of watershed Mixed	% of watershed Quartzite	% of watershed Sedi-mentary	% of watershed Volcanic	Dominant lithology (>50%)
Corn Creek 1A	45.36901	-114.68292	6776	43.5	50.29	50.0	W	6776	43.5	0.0%	88.2%	0.0%	11.8%	0.0%	0.0%	G
Horse Creek 1A	45.39866	-114.73369	6698	914.0	304.00	46.0	SW	6698	914.0	1.5%	95.7%	0.0%	2.8%	0.0%	0.0%	G
Horse Creek 2A	45.50032	-114.47809	7103	141.0	14.89	37.0	W	7103	141.0		96.5%	0.0%	3.5%	0.0%	0.0%	G
Arnett Creek 1R	45.20626	-114.13489	7581	88.7	6.19	26.0	SE	7581	88.7	2.7%	20.0%	0.0%	77.3%	0.0%	0.0%	Q
Beaver Creek MSP 1A	45.28343	-114.29491	6604	47.0	9.67	52.0	W	6604	47.0			0.0%	100.0%	0.0%	0.0%	Q
Big Deer Creek 1A	45.17704	-114.31553	7237	216.0	32.40	49.0	NE	7237	216.0	2.8%	34.1%		63.1%			Q
Big Deer Creek 2R	45.16654	-114.36654	7356	214.0	29.10	48.0	NE	7356	214.0	3.1%	34.0%	0.0%	62.9%	0.0%	0.0%	Q
Big Deer Creek 3R	45.16580	-114.36996	7435	186.0	22.00	48.0	NE	7435	186.0	4.1%	41.4%	0.0%	54.5%	0.0%	0.0%	Q
Big Hat Creek 1R	44.81857	-114.11694	7312	23.0	6.35	34.0	E	7312	23.0	0.0%	0.0%	0.0%	12.9%	0.0%	87.1%	V
Cabin Creek 1R	44.96140	-114.35749	7239	62.6	4.11	36.0	E	7239	62.6	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	V
Carmen Creek 1R	45.31429	-113.80278	7623	148.0	12.40	49.0	S	7623	148.0	5.0%	34.9%	0.0%	60.1%	0.0%	0.0%	Q
Carmen Creek 2R	45.36716	-113.77612	8080	105.0	5.50	45.0	S	8080	105.0	5.2%	9.7%		85.1%			Q
Clear Creek 1A	45.29393	-114.35116	6889	279.0	40.20	54.0	NE	6889	279.0	4.1%	53.5%		42.4%			G
Clear Creek 2A	45.29368	-114.35042	6890	279.0	40.20	54.0	NE	6890	279.0	4.1%	53.5%	0.0%	42.4%	0.0%	0.0%	G
Colson Creek 1A	45.30741	-114.53185	6005	49.4	8.32	52.0	S	6005	49.4	0.0%	97.6%	0.0%	2.4%	0.0%	0.0%	G
Cow Creek 1R	44.73971	-113.96194	7741	26.9	16.50	47.0	W	7741	26.9	0.0%	0.0%	0.0%	62.2%	0.0%	37.8%	Q
Dahlonga Creek 1A	45.55684	-113.90164	6260	118.0	17.80	49.0	W	6260	118.0	0.0%	1.4%	0.0%	98.6%	0.0%	0.0%	Q
Deep Creek 1A	45.12593	-114.21537	7321	145.0	18.00	36.0	NW	7321	145.0	0.2%	0.4%	0.0%	95.8%	0.0%	3.6%	Q
Ditch Creek 1A	45.51225	-113.99537	6772	35.0	4.11	36.0	S	6772	35.0	12.9%		0.0%	74.5%	0.0%	12.6%	Q
East Boulder Creek 1R	45.35246	-114.14879	7405	26.8	4.13	32.0	N	7405	26.8	2.2%	92.2%		5.6%			G
Fourth of July Creek 1A	45.36785	-113.93803	6388	55.6	16.60	49.0	SW	6388	55.6	5.6%		0.0%	89.5%	0.0%	4.9%	Q
Garden Creek MSP 1A	45.31270	-114.40550	6100	35.7	8.13	50.0	NE	6100	35.7	0.0%	56.3%	0.0%	43.7%	0.0%	0.0%	G
Hat Creek 1R	44.82761	-114.09075	7615	42.0	8.61	35.0	SE	7615	42.0			0.0%	41.1%	0.0%	58.9%	V
Hughes Creek OA	45.50184	-113.99559	6412	140.0	21.20	41.0	SE	6412	140.0	5.1%			87.1%		7.8%	Q
Hughes Creek 1A	45.50793	-114.00481	6446	115.0	16.39	44.0	SE	6446	115.0	2.5%	0.0%	0.0%	97.4%	0.0%	0.1%	Q
Hull Creek 1A	45.47007	-113.99830	5820	22.6	9.35	48.0	E	5820	22.6	0.3%		0.0%	99.0%	0.0%	0.7%	Q
Indian Creek 1A	45.40090	-114.16796	6309	206.0	39.00	50.0	S	6309	206.0	2.0%	12.8%		85.2%			Q
Indian Creek 2A	45.45937	-114.14824	6610	235.0	28.70	48.0	S	6610	235.0	1.9%	0.6%	0.0%	97.5%	0.0%	0.0%	Q
Iron Creek 1A	44.91530	-114.05578	7484	131.0	24.10	41.0	E	7484	131.0	0.0%	0.0%	0.0%	52.8%	0.0%	47.2%	Q
Jesse Creek 1R	45.18360	-113.94244	7342	25.9	5.22	42.0	E	7342	25.9		11.1%	0.0%	88.3%		0.6%	Q
Lake Creek 1R	45.01581	-113.99264	7294	54.3	7.94	40.0	E	7294	54.3	0.0%	0.0%	0.0%	28.5%		71.5%	V
Lake Creek 2R	45.00895	-114.01714	7546	38.7	5.09	38.0	E	7546	38.7	0.0%	0.0%	0.0%	40.9%	0.0%	59.1%	V
Little Deep Creek 1R	45.06113	-114.16103	7457	49.1	3.82	31.0	N	7457	49.1	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	Q
Little Deer Creek 1R	45.16445	-114.29797	6614	22.9	4.46	48.0	N	6614	22.9	0.0%	0.0%	0.0%	100.0%			Q
McKim Creek 1R	44.80862	-113.97231	8127	14.6	8.88	47.0	W	8127	14.6	12.6%	0.0%	0.0%	70.8%	0.0%	16.6%	Q
Moccasin Creek 1R	45.12543	-114.14647	7690	21.4	1.76	26.0	NW	7690	21.4	0.0%	0.0%	0.0%	71.5%	0.0%	28.5%	Q
Moose Creek MSP 1R	45.31430	-114.03917	7531	58.7	4.05	22.0	NE	7531	58.7	4.0%	34.9%		61.1%			Q
Moose Creek NFSR 1A	45.65422	-113.97085	6900	34.3	2.11	37.0	S	6900	34.3	7.3%	72.6%	0.0%	20.1%	0.0%	0.0%	G

Site Name	Latitude	Longitude	Drainage Area (sq mi)	Drainage Area (acres)	Mean Basin Elevation (ft)	Q1.5 (approx bankfull flow) (cfs)	Qa (Mean Annual Flow) (cfs)	Mean Basin Slope (10m DEM)	Basin Aspect	% of water shed Alluvium	% of water shed Granitic	% of water shed Mixed	% of water shed Quartzite	% of water shed Sedimentary	% of water shed Volcanic	Dominant lithology (>50%)
Moyer Creek 1A	45.02154	-114.31036	7670	123.0	20.10	36.0	NW	7670	123.0	2.0%	0.0%	0.0%	83.4%	0.0%	14.6%	Q
Moyer Creek 2A	44.97916	-114.29743	7813	104.0	15.70	35.0	NW	7813	104.0	2.5%	0.0%	0.0%	81.3%	0.0%	16.2%	Q
Musgrove Creek 1A	45.02213	-114.31483	7421	99.0	15.30	45.0	SE	7421	99.0	1.0%	3.3%	0.0%	84.4%	0.0%	11.3%	Q
Napias Creek 1R	45.16925	-114.15867	7501	158.0	16.60	25.0	SW	7501	158.0	2.7%	24.0%	0.0%	60.6%	0.0%	12.6%	Q
Napias Creek 2R	45.20165	-114.13521	7581	141.0	12.80	24.0	SW	7581	141.0	2.8%	28.8%	0.0%	61.8%	0.0%	6.6%	Q
Napias Creek 3R	45.20581	-114.13340	7576	58.5	6.15	23.0	SW	7576	58.5	2.9%	40.7%	0.0%	46.8%	0.0%	9.5%	Multi
Napias Creek 4R	45.21420	-114.12565	7626	56.9	6.09	24.0	SW	7626	56.9	2.3%	43.4%	0.0%	48.0%	0.0%	6.3%	Multi
Napias Creek 5R	45.22265	-114.10771	7679	25.7	2.99	26.0	SW	7679	25.7	1.1%	90.1%	0.0%	8.9%	0.0%	0.0%	G
NF Iron Creek 1A	44.92393	-114.11295	7645	72.6	10.10	39.0	S	7645	72.6	0.0%	0.0%	0.0%	67.3%	0.0%	32.7%	Q
NF Salmon River 1A	45.48997	-113.97006	6462	399.0	89.60	47.0	S	6462	399.0	2.6%	8.3%	0.0%	87.3%	0.0%	1.8%	Q
NF Salmon River 2A	45.59312	-113.96396	6840	251.0	26.40	44.0	S	6840	251.0	4.2%	24.5%	0.0%	70.3%	0.0%	0.9%	Q
NF Salmon River 3A	45.61332	-113.96619	6746	147.0	14.19	43.0	S	6746	147.0	6.4%	41.2%	0.0%	50.8%	0.0%	1.6%	Q
NF Salmon River 4A	45.66155	-113.97906	7248	50.8	3.01	42.0	S	7248	50.8	0.1%	86.0%	0.0%	6.1%	0.0%	7.8%	G
Owl Creek 1A	45.32298	-114.45343	6625	282.0	34.90	46.0	S	6625	282.0	0.6%	90.5%	0.0%	8.9%	0.0%	0.0%	G
Owl Creek 2A	45.32739	-114.45890	6636	281.0	34.79	46.0	S	6636	281.0	0.6%	90.5%	0.0%	8.9%	0.0%	0.0%	G
Owl Creek 3A	45.33406	-114.46011	6661	285.0	34.40	46.0	S	6661	285.0	0.6%	90.4%	0.0%	9.0%	0.0%	0.0%	G
Panther Creek 0A	45.29542	-114.35206	7075	1220.0	272.00	41.0	N	7075	1220.0	1.5%	22.4%	0.0%	62.7%	0.0%	13.4%	Q
Panther Creek 1A	45.28955	-114.34970	7099	1040.0	238.00	38.0	N	7099	1040.0	1.2%	18.9%	0.0%	65.0%	0.0%	14.9%	Q
Panther Creek 2A	45.22096	-114.32119	7227	974.0	202.00	38.0	N	7227	974.0	1.3%	16.6%	0.0%	65.6%	0.0%	16.5%	Q
Panther Creek 3A	45.01323	-114.31886	7293	215.0	30.40	36.0	N	7293	215.0	1.7%	0.0%	0.0%	28.3%	0.0%	70.0%	V
Panther Creek 4A	44.93418	-114.33900	7776	87.5	12.19	36.0	NW	7776	87.5	2.7%	0.0%	0.0%	41.5%	0.0%	55.8%	V
Panther Creek 5A	44.89707	-114.31652	7980	106.0	10.90	39.0	NW	7980	106.0	2.6%	0.0%	0.0%	51.2%	0.0%	46.2%	Q
Perreau Creek 1R	45.09928	-113.96304	7100	45.1	7.71	47.0	SE	7100	45.1	0.0%	0.0%	0.0%	72.0%	0.0%	28.0%	Q
Phelan Creek 1R	45.16788	-114.15836	7563	57.9	6.05	29.0	W	7563	57.9	2.1%	2.7%	0.0%	77.0%	0.0%	18.1%	Q
Pierce Creek 1A	45.62221	-113.96200	6537	49.9	5.11	45.0	SW	6537	49.9	5.6%	0.0%	0.0%	94.4%	0.0%	0.0%	Q
Pine Creek 1A	45.35984	-114.29552	6367	63.5	20.60	48.0	NW	6367	63.5	1.0%	42.2%	0.0%	56.8%	0.0%	0.0%	Q
Pine Creek 2A	45.35351	-114.27847	6445	64.5	19.60	48.0	NW	6445	64.5	1.0%	39.2%	0.0%	59.8%	0.0%	0.0%	Q
Pine Creek 3A	45.34727	-114.27441	6516	63.8	18.10	47.0	NW	6516	63.8	1.1%	36.6%	0.0%	62.3%	0.0%	0.0%	Q
Porphyry Creek 1A	45.00424	-114.33686	7174	49.4	7.19	42.0	SE	7174	49.4	0.0%	0.0%	0.0%	57.1%	0.0%	42.9%	Q
SF Iron Creek 1A	44.91965	-114.11370	7229	18.6	3.72	38.0	N	7229	18.6	0.0%	0.0%	0.0%	6.9%	0.0%	93.1%	V
SF Moyer Creek 1A	44.95853	-114.29369	7677	28.9	4.09	28.0	NW	7677	28.9	7.4%	0.0%	0.0%	64.7%	0.0%	27.9%	Q
SF Williams Creek 1R	45.06286	-114.02987	7410	48.0	4.00	34.0	NE	7410	48.0	0.0%	0.0%	0.0%	55.2%	0.0%	44.8%	Q
Sheep Creek 1A	45.49832	-113.92426	6964	135.0	25.79	52.0	W	6964	135.0	0.4%	0.0%	0.0%	99.2%	0.0%	0.3%	Q
Spring Creek 1A	45.39375	-114.25764	6177	109.0	15.00	53.0	SE	6177	109.0	0.0%	98.5%	0.0%	1.5%	0.0%	0.0%	G
Spring Creek 2A	45.41217	-114.26964	6340	112.0	13.60	53.0	SE	6340	112.0	0.0%	98.4%	0.0%	1.6%	0.0%	0.0%	G
Bia Po'l Naokwaide 1A	45.41010	-114.20024	6416	74.6	11.39	52.0	SE	6416	74.6	0.0%	99.7%	0.0%	0.3%	0.0%	0.0%	G
Trail Creek MSP 1A	45.25044	-114.31681	6226	37.5	11.00	54.0	NW	6226	37.5	0.0%	31.5%	0.0%	68.5%	0.0%	0.0%	Q
Twelvemile Creek 1R	45.01279	-113.90428	7200	47.5	13.60	45.0	NW	7200	47.5	0.0%	0.0%	0.0%	75.0%	0.0%	25.0%	Q
Twin Creek 1A	45.60802	-113.96703	7255	66.8	8.03	46.0	E	7255	66.8	1.3%	2.9%	0.0%	95.7%	0.0%	0.0%	Q
Wagonhammer Creek 1R	45.39711	-113.94169	5919	12.8	7.11	55.0	SW	5919	12.8	0.0%	0.0%	0.0%	83.5%	0.0%	16.5%	Q
Warm Springs Creek 1R	44.90163	-113.82620	8047	6.3	0.75	22.0	NW	8047	6.3	0.0%	0.0%	0.0%	9.6%	0.0%	90.4%	V
WF Iron Creek 1A	44.91909	-114.11751	7800	49.8	6.67	41.0	E	7800	49.8	0.0%	0.0%	0.0%	51.2%	0.0%	48.8%	Q

Site Name	Latitude	Longitude	Drainage Area (sq mi)	Drainage Area (acres)	Mean Basin Elevation (ft)	Q1.5 (approx bankfull flow) (cfs)	Qa (Mean Annual Flow) (cfs)	Mean Basin Slope (10m DEM)	Basin Aspect	% of water shed Alluvium	% of water shed Granitic	% of water shed Mixed	% of water shed Quartzite	% of water shed Sedi-mentary	% of water shed Volcanic	Dominant lithology (>50%)
Williams Creek 1R	45.08179	-113.98720	7067	90.1	11.50	37.0	E	7067	90.1				32.0%		68.0%	V
Woodtick Creek 1A	45.04622	-114.28336	7426	71.4	8.48	38.0	NW	7426	71.4				100.0%			Q
Basin Creek 1A	44.26411	-114.81927	7522	205.0	64.00	39.0	SE	7522	205.0	4.3%	57.7%	0.0%	0.0%	0.0%	38.0%	G
Block Creek 1R	44.71693	-114.23980	7420	4.0	1.10	32.0	SW	7420	4.0		0.0%	0.0%	0.0%	0.0%	100.0%	V
Challis Creek 1A	44.56795	-114.36511	7923	152.0	17.39	39.0	NE	7923	152.0	5.5%					94.5%	V
Challis Creek 2A	44.53485	-114.41485	8077	114.0	9.67	37.0	E	8077	114.0	6.6%	0.0%	0.0%	0.0%	0.0%	93.4%	V
Challis Creek 3A	44.50289	-114.46780	8497	63.7	4.95	39.0	E	8497	63.7	7.1%	0.0%	0.0%	0.0%	0.0%	92.9%	V
Challis Creek 4A	44.50471	-114.47528	8577	56.1	4.17	38.0	SE	8577	56.1	7.4%					92.6%	V
East Pass Creek 1A	44.07644	-114.24467	8543	293.0	26.70	47.0	NE	8543	293.0	0.0%	46.4%	6.5%	0.0%	0.0%	47.1%	Multi
Eightmile Creek 1A	44.43855	-114.63122	8358	64.7	22.89	46.0	SE	8358	64.7	3.1%	0.0%	0.0%	0.0%	0.0%	96.9%	V
Fivemile Creek 1A	44.40312	-114.65398	8113	15.0	12.60	47.0	NW	8113	15.0	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	V
Garden Creek USR 1A	44.46194	-114.33141	8444	69.9	8.35	42.0	NE	8444	69.9	5.1%	0.0%	0.0%	0.0%	51.2%	43.7%	S
Herd Creek 1A	44.07695	-114.24469	8433	411.0	51.29	47.0	N	8433	411.0	0.0%	29.3%	6.8%	0.0%	0.0%	63.8%	V
Herd Creek 2A	44.07663	-114.24460	8319	159.0	24.80	46.0	N	8319	159.0	0.0%	11.0%	7.2%	0.0%	0.0%	81.8%	V
Jordan Creek 0A	44.41862	-114.73393	8259	47.0	19.60	47.0	S	8259	47.0	0.9%					99.1%	V
Jordan Creek 1A	44.43955	-114.73209	8434	29.0	12.69	46.0	SE	8434	29.0						100.0%	V
Jordan Creek 2A	44.44117	-114.73373	8455	29.4	12.39	46.0	SE	8455	29.4	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	V
Jordan Creek 3A	44.44229	-114.73414	8465	28.1	12.30	46.0	SE	8465	28.1	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	V
Jordan Creek 4A	44.44145	-114.73390	8457	29.4	12.39	46.0	SE	8457	29.4						100.0%	V
McKay Creek 1A	44.48581	-114.54404	8511	43.3	15.60	37.0	NW	8511	43.3	1.8%	0.0%	0.0%	0.0%	0.0%	98.2%	V
Mill Creek USR 1R	44.50859	-114.36388	8206	95.3	9.86	41.0	NE	8206	95.3	2.4%	0.0%	0.0%	0.0%	13.7%	84.0%	V
Morgan Creek 1A	44.71043	-114.27028	7399	127.0	27.00	38.0	S	7399	127.0	2.5%			0.0%		97.5%	V
Morgan Creek 2A	44.73764	-114.26596	7496	99.0	17.79	36.0	S	7496	99.0	2.8%			0.0%		97.2%	V
Morgan Creek 3A	44.78936	-114.24994	7535	31.2	5.19	40.0	SE	7535	31.2	2.2%	0.0%	0.0%	0.0%	0.0%	97.8%	V
NF Rankin Creek 1R	44.32129	-114.74100	7895	4.8	1.73	39.0	E	7895	4.8		0.0%	0.0%	0.0%	0.0%	100.0%	V
Rankin Creek 1R	44.31735	-114.71807	7624	8.1	4.15	42.0	E	7624	8.1	0.3%					99.7%	V
Paasasikwana Naokwaide 1A	44.32966	-114.47147	7870	214.0	29.20	39.0	S	7870	214.0	3.4%	0.0%	0.0%	0.0%	0.0%	96.6%	V
Tenmile Creek 1A	44.46574	-114.58263	8447	23.7	10.20	46.0	SE	8447	23.7		0.0%	0.0%	0.0%	0.0%	100.0%	V
Thompson Creek 1A	44.28720	-114.54431	7732	73.5	19.00	51.0	S	7732	73.5	1.8%				1.6%	96.6%	V
Trail Creek USR 1R	44.39084	-114.49211	8214	27.2	1.83	25.0	W	8214	27.2	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	V
Valley Creek 1A	44.34289	-115.05570	7706	123.0	29.90	33.0	SW	7706	123.0	8.4%	88.0%	0.0%	0.0%	0.0%	3.7%	G
WF Herd Creek 1A	44.05824	-114.23418	8459	154.0	15.69	49.0	NE	8459	154.0	0.0%	18.5%	12.2%	0.0%	0.0%	69.4%	V
WF Morgan Creek 1A	44.69958	-114.30597	7778	67.9	10.00	43.0	SE	7778	67.9	3.4%					96.6%	V
WF Yankee Fork 1A	44.35612	-114.73598	7940	246.0	86.90	44.0	SE	7940	246.0	5.1%	4.7%	0.0%	0.0%	0.0%	90.1%	V
Yankee Fork 1A	44.34588	-114.72416	8061	720.0	233.00	44.0	SW	8061	720.0	4.6%	1.7%	0.0%	0.0%	0.0%	93.8%	V
Yankee Fork 2A	44.38091	-114.71542	8207	389.0	116.00	42.0	SW	8207	389.0	3.4%					96.6%	V
Yankee Fork 3A	44.42617	-114.62070	8317	323.0	102.00	40.0	SW	8317	323.0	3.4%	0.0%	0.0%	0.0%	0.0%	96.6%	V
Yankee Fork 4A	44.46400	-114.58236	8406	217.0	70.19	36.0	SW	8406	217.0	2.3%	0.0%	0.0%	0.0%	0.0%	97.7%	V
Yankee Fork 5A	44.48866	-114.55097	8439	151.0	47.79	31.0	SW	8439	151.0	2.4%	0.0%	0.0%	0.0%	0.0%	97.6%	V
Camas Creek 1A	44.83538	-114.50769	7530	894.0	334.00	48.0	N	7530	894.0	3.8%	0.0%	0.0%	0.5%	0.0%	95.6%	V
Camas Creek 2A	44.83049	-114.50270	7543	753.0	289.00	47.0	N	7543	753.0	4.0%	0.0%	0.0%	0.6%	0.0%	95.4%	V
Camas Creek 3A	44.82477	-114.49973	7746	509.0	201.00	48.0	N	7746	509.0	4.7%	0.0%	0.0%	0.0%	0.0%	95.3%	V

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Castle Creek 1A	44.80141	-114.47071	7755	97.7	61.00	47.0	W	7755	97.7	5.2%	0.0%	0.0%	0.0%	0.0%	94.8%	V
Hoodoo Creek 1A	44.95299	-114.58228	7550	84.2	42.20	50.0	S	7550	84.2	2.5%	25.9%	0.0%	71.7%	0.0%	0.0%	Q
Silver Creek 1A	44.83587	-114.47428	7063	248.0	91.30	40.0	SW	7063	248.0	1.7%	0.2%	0.0%	2.1%	0.0%	96.1%	V
Silver Creek 2A	44.88793	-114.40104	7241	145.0	32.09	34.0	SW	7241	145.0	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	V
WF Camas Creek 1A	44.83055	-114.50523	7509	136.0	105.00	55.0	NE	7509	136.0	3.1%	0.0%	0.0%	0.0%	0.0%	96.9%	V
Yellowjacket Creek 1A	44.97197	-114.53294	7491	283.0	56.40	42.0	S	7491	283.0	3.5%	22.3%	0.0%	70.8%	0.0%	3.4%	Q
Yellowjacket Creek 2A	45.00345	-114.48003	7746	165.0	34.00	40.0	S	7746	165.0	6.1%	34.8%	0.0%	59.2%	0.0%	0.0%	Q
Beaver Creek UMFS 1A	44.41617	-115.14151	7678	360.0	84.40	31.0	SW	7678	360.0	8.3%	91.7%	0.0%	0.0%	0.0%	0.0%	G
Marsh Creek 1A	44.36479	-115.13070	6928	95.8	17.70	16.0	NW	6928	95.8	20.4%	79.6%	0.0%	0.0%	0.0%	0.0%	G
Agency Creek 1R	44.97335	-113.48434	7311	12.0	3.78	40.0	W	7311	12.0	0.0%	0.0%	0.0%	98.9%	0.0%	1.1%	Q
Bear Valley Creek 1A	44.77724	-113.74321	8604	76.5	14.19	46.0	E	8604	76.5	9.8%	0.0%	0.0%	84.9%	0.0%	5.3%	Q
Bear Valley Creek 2A	44.77877	-113.74698	8630	76.4	14.00	46.0	E	8630	76.4	9.8%	0.0%	0.0%	85.3%	0.0%	4.8%	Q
Bear Valley Creek 3A	44.77910	-113.74700	8632	76.4	14.00	46.0	E	8632	76.4	9.8%	0.0%	0.0%	85.3%	0.0%	4.8%	Q
Bear Valley Creek 4A	44.78206	-113.75144	8660	77.3	13.80	46.0	E	8660	77.3	9.8%	0.0%	0.0%	86.0%	0.0%	4.2%	Q
Big Bear Creek 1R	44.67699	-113.15830	8308	41.4	11.50	36.0	W	8308	41.4	0.3%	1.1%	0.0%	23.9%	49.1%	25.6%	Multi
Big Eightmile Creek 1R	44.64503	-113.52761	8742	114.0	14.50	44.0	NE	8742	114.0	13.8%	19.5%	0.0%	64.5%	0.0%	2.3%	Q
Big Eightmile Creek 2R	44.62481	-113.56344	8930	85.1	8.82	44.0	N	8930	85.1	15.3%	17.8%	0.0%	66.9%	0.0%	0.0%	Q
Big Timber Creek 1R	44.60693	-113.39309	8499	193.0	25.70	37.0	NE	8499	193.0	15.2%	3.5%	0.0%	46.6%	3.6%	31.2%	Multi
Big Timber Creek 2R	44.54677	-113.41320	8780	154.0	22.20	41.0	NE	8780	154.0	17.7%	4.5%	0.0%	49.9%	4.0%	23.8%	Multi
Canyon Creek 1R	44.70995	-113.28470	7834	22.8	19.89	31.0	S	7834	22.8	0.0%	2.7%	0.0%	21.5%	64.2%	11.6%	S
Deer Creek LEM 1R	44.50092	-113.30955	9064	30.1	4.29	49.0	NE	9064	30.1	12.0%	0.0%	0.0%	83.7%	4.3%	0.0%	Q
EF Hayden Creek 1A	44.75814	-113.70975	8456	45.1	6.58	39.0	NW	8456	45.1	7.5%	0.0%	0.0%	92.3%	0.0%	0.2%	Q
EF Hayden Creek 2R	44.72881	-113.67155	8870	44.2	5.07	44.0	N	8870	44.2	8.4%	0.0%	0.0%	91.5%	0.0%	0.1%	Q
Hawley Creek 1R	44.66605	-113.19285	8209	55.7	20.50	36.0	SW	8209	55.7	0.8%	0.9%	0.0%	22.3%	45.9%	30.2%	Multi
Hayden Creek 1A	44.75898	-113.71332	8271	136.0	21.60	43.0	N	8271	136.0	9.2%	0.0%	0.0%	81.1%	0.0%	9.7%	Q
Haynes Creek 1R	44.99783	-113.72863	7274	15.2	7.50	46.0	E	7274	15.2	0.0%	0.0%	0.0%	75.0%	0.0%	25.0%	Q
Kenney Creek 1R	45.05214	-113.60057	7540	37.3	9.00	39.0	SW	7540	37.3	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	Q
Little Eightmile Creek 1R	44.77174	-113.43751	8086	20.9	9.63	48.0	SW	8086	20.9	0.0%	0.3%	0.0%	57.2%	21.1%	21.4%	Q
MF Little Timber Creek 1R	44.58452	-113.46504	8993	38.1	5.25	48.0	NE	8993	38.1	13.6%	0.0%	0.0%	57.9%	25.3%	3.2%	Q
Mill Creek LEM 1R	44.70562	-113.59358	8719	29.4	4.30	45.0	NE	8719	29.4	13.5%	0.0%	0.0%	77.9%	0.0%	8.6%	Q
NF Little Timber Creek 1R	44.59584	-113.46466	9017	27.4	3.84	47.0	NE	9017	27.4	12.2%	0.0%	0.0%	80.4%	7.3%	0.2%	Q
Pattee Creek 1R	44.99283	-113.56610	7349	23.4	8.03	36.0	SW	7349	23.4	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	Q
Reservoir Creek 1R	44.67894	-113.15753	8274	16.2	6.32	35.0	S	8274	16.2	0.0%	0.0%	0.0%	29.1%	19.6%	51.3%	V
Stroud Creek 1R	44.65636	-113.56242	8788	17.3	2.49	46.0	E	8788	17.3	10.5%	0.0%	0.0%	57.0%	0.0%	32.6%	Q
Withington Creek 1R	45.04096	-113.79764	7319	6.0	3.14	51.0	NE	7319	6.0	0.0%	0.0%	0.0%	59.2%	0.0%	40.8%	Q
Big Creek PAH 1R	44.44186	-113.60110	8830	263.0	38.90	50.0	SW	8830	263.0	0.0%	0.0%	0.0%	81.1%	0.0%	18.9%	Q
NF Big Creek 1R	44.44201	-113.59984	9013	108.0	20.10	49.0	S	9013	108.0	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	Q
Pahsimeroi River 1R	44.16435	-113.70765	9500	250.0	26.00	55.0	N	9500	250.0	1.2%	0.0%	0.0%	0.0%	25.6%	73.2%	V
SF Big Creek 1R	44.44153	-113.59991	8641	87.3	19.00	50.0	W	8641	87.3	0.0%	0.0%	0.0%	60.5%	0.0%	39.5%	Q
Alder Creek 1R	43.82726	-113.59943	8146	54.8	17.39	44.0	NE	8146	54.8	0.0%	19.1%	2.4%	0.0%	6.7%	71.7%	V
Antelope Creek 1R	43.66210	-113.67463	8140	144.0	36.10	41.0	E	8140	144.0	7.0%	15.9%	0.0%	0.0%	6.0%	71.1%	V
Antelope Creek 2R	43.63492	-113.71241	8468	122.0	28.70	44.0	E	8468	122.0	7.7%	22.1%	0.0%	0.0%	6.4%	63.9%	V

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Antelope Creek 3R	43.62886	-113.73059	8347	53.3	11.60	43.0	NE	8347	53.3	6.2%	14.0%			1.6%	78.2%	V
Bear Creek 1R	43.67596	-113.69341	8128	27.0	8.72	36.0	SE	8128	27.0	3.5%	31.2%	9.3%	0.8%		55.3%	V
Bear Creek 2R	43.68571	-113.70254	8251	26.3	8.13	37.0	SE	8251	26.3	2.4%	34.6%	10.3%	0.9%		51.8%	V
Cherry Creek 1R	43.73450	-113.65773	7793	36.2	19.89	41.0	SE	7793	36.2	2.2%	0.5%	4.4%		14.2%	78.7%	V
EF Big Lost River 1R	43.90656	-114.08936	8649	573.0	94.19	35.0	NW	8649	573.0	3.9%	21.4%	2.7%	17.2%	19.6%	35.2%	Multi
EF Big Lost River 2R	43.87777	-113.92063	8776	464.0	69.40	34.0	NW	8776	464.0	5.1%	27.9%	3.6%	20.4%	19.0%	24.0%	Multi
EF Big Lost River 3R	43.82619	-113.85017	8637	82.1	11.40	28.0	NW	8637	82.1	23.0%	27.3%	10.8%	13.1%	7.5%	18.3%	Multi
Iron Bog Creek 1R	43.62947	-113.72964	8760	69.4	15.90	47.0	NE	8760	69.4	9.2%	32.6%			11.3%	46.9%	Multi
Muldoon Creek 1R	43.75089	-113.92052	9131	110.0	12.00	44.0	N	9131	110.0	0.0%	31.1%	0.0%	18.3%	45.5%	5.1%	Multi
NF Big Lost River 1R	43.89718	-114.15553	8737	621.0	70.30	47.0	NE	8737	621.0	0.0%	26.5%	4.4%	9.6%	30.2%	29.3%	Multi
NF Big Lost River 2R	43.93966	-114.22335	8888	356.0	28.60	46.0	E	8888	356.0	0.0%	26.6%	7.7%	5.8%	22.9%	37.1%	Multi
Pass Creek 1R	43.97775	-113.44680	8336	41.2	8.39	52.0	SE	8336	41.2						100.0%	V
Star Hope Creek 0R	43.86707	-113.89922	8939	288.0	37.40	55.0	N	8939	288.0	0.1%	43.8%	3.0%	27.9%	16.9%	8.3%	Multi
Star Hope Creek 1R	43.86062	-113.89604	8943	290.0	37.29	37.0	N	8943	290.0	0.1%	43.9%	3.0%	27.7%	16.9%	8.4%	Multi
Wildhorse Creek 1R	43.89991	-114.09663	9247	374.0	46.09	55.0	N	9247	374.0	0.0%	62.4%	1.9%	27.9%	4.5%	3.3%	G
Badger Creek1R	44.09233	-113.14885	8977	45.1	14.70	61.0	SW	8977	45.1	0.0%	0.0%	0.0%	9.1%	90.9%	0.0%	S
Big Creek LLR 1R	44.06999	-113.45822	8806	45.1	8.17	36.0	NE	8806	45.1	0.0%	0.0%	0.0%	0.0%	15.0%	85.0%	V
Dry Creek 1R	44.12902	-113.56873	9447	216.0	19.90	59.0	NE	9447	216.0	2.4%	0.0%	0.0%	1.5%	13.3%	82.7%	V
Iron Creek 1R	44.37890	-113.40400	8580	22.9	3.96	41.0	E	8580	22.9				33.4%		66.6%	V
Little Lost River 1R	44.34919	-113.36548	8451	164.0	24.40	35.0	SE	8451	164.0	0.0%	0.0%	0.0%	54.3%	0.4%	45.3%	Q
Mill Creek LLR 1R	44.35798	-113.37282	8655	31.1	3.24	33.0	SW	8655	31.1	0.0%	0.0%	0.0%	68.4%	3.2%	28.4%	Q
Smithie Fork 1R	44.43720	-113.39912	8836	33.3	2.79	33.0	S	8836	33.3	0.0%	0.0%	0.0%	91.5%		8.5%	Q
Weda'a Naokwaide 1R	44.34459	-113.34576	8581	42.4	5.67	39.0	SW	8581	42.4	0.0%	0.0%	0.0%	50.9%	26.1%	23.0%	Q
Timber Creek 1R	44.40076	-113.41090	8451	35.0	5.26	38.0	SE	8451	35.0	0.0%	0.0%	0.0%	14.8%	0.0%	85.2%	V
Wet Creek 0R	44.05823	-113.43586	8701	65.4	8.68	43.0	NE	8701	65.4	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	V
Wet Creek 1R	44.04994	-113.44633	8783	63.6	8.42	44.0	NE	8783	63.6	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	V
Wet Creek 2R-1	44.02790	-113.47156	9282	53.8	6.73	51.0	NE	9282	53.8	0.0%	0.0%	0.0%	0.0%	0.1%	99.9%	V
Wet Creek 2R-2	44.02830	-113.47003	9280	69.8	6.75	51.0	NE	9280	69.8	0	0	0	0	0.1%	99.9%	V

### Monitoring Site Watershed Land Use Characteristics – All Sites

20230125 Version

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Corn Creek 1A		0.0%	L		0.0%	L	8.6	0.96	L
Horse Creek 1A		0.0%	L	397	0.4%	L	68.6	0.48	L
Horse Creek 2A		0.0%	L		0.0%	L	44.0	2.61	H
Arnett Creek 1R	11,808	98.0%	H	6,906	57.3%	H	40.0	2.12	H
Beaver Creek MSP 1A	113	1.4%	L	7,797	99.0%	H	27.8	2.26	H
Big Deer Creek 1A		0.0%	L	18,627	63.4%	H	19.5	0.42	L
Big Deer Creek 2R		0.0%	L	16,504	61.1%	H	16.6	0.39	L
Big Deer Creek 3R		0.0%	L	12,094	59.6%	H	1.1	0.03	L
Big Hat Creek 1R	8,765	99.8%	H	4,065	46.3%	M	34.1	2.48	H
Cabin Creek 1R	5,190	99.5%	H		0.0%	L	7.3	0.90	L
Carmen Creek 1R	10,933	99.6%	H		0.0%	L	10.7	0.63	L
Carmen Creek 2R	5,296	99.9%	H		0.0%	L	0.5	0.06	L
Clear Creek 1A		0.0%	L	91	0.3%	L	0.0	0.00	L
Clear Creek 2A		0.0%	L	91	0.28%	L	0.0	0.00	L
Colson Creek 1A		0.0%	L		0.0%	L	48.8	4.63	H
Cow Creek 1R	14,950	96.8%	H		0.0%	L	6.1	0.25	L
Dahlonge Creek 1A		0.0%	L	10,378	65.43%	H	30.6	1.24	M
Deep Creek 1A	23,766	99.8%	H		0.0%	L	95.4	2.56	H
Ditch Creek 1A	3,053	58.4%	M		0.0%	L	21.8	2.66	H
East Boulder Creek 1R	6,081	99.8%	H	4,452	73.0%	H	5.7	0.59	L
Fourth of July Creek 1A	9,446	63.7%	M		0.0%	L	21.8	0.94	L
Garden Creek MSP 1A			L		0.0%	L		0.00	L
Hat Creek 1R	10,648	91.8%	H	4,861	41.9%	M	46.7	2.58	H
Hughes Creek 0A	21,448	89.9%	H		0.0%	L	112.4	3.02	H
Hughes Creek 1A	16,587	99.0%	H		0.0%	L	71.9	2.75	H
Hull Creek 1A	8,366	99.3%	H		0.0%	L	148.7	11.29	H
Indian Creek 1A	15,831	45.7%	M	7	0.0%	L	117.4	2.17	H
Indian Creek 2A	12,262	46.0%	M		0.0%	L	61.2	1.47	M
Iron Creek 1A	27,056	99.5%	H	2,356	8.7%	L	125.9	2.96	H
Jesse Creek 1R	55	1.0%	L	1,029	18.7%	L	7.4	0.86	L
Lake Creek 1R	8,897	99.0%	H		0.0%	L	35.6	2.53	H
Lake Creek 2R	6,025	99.0%	H		0.0%	L	24.1	2.54	H
Little Deep Creek 1R	5,872	100.0%	H		0.0%	L	21.1	2.30	H
Little Deer Creek 1R		0.0%	L	44	1.1%	L	18.1	2.94	H
McKim Creek 1R	8,124	99.1%	H		0.0%	L	1.5	0.12	L
Moccasin Creek 1R	3,347	100.0%	H		0.0%	L	14.8	2.83	H
Moose Creek MSP 1R	9,642	99.8%	H	7,886	81.6%	H	22.7	1.50	M

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Moose Creek NFSR 1A		0.0%	L		0.0%	L	8.2	2.04	H
Moyer Creek 1A	18,835	70.9%	M	5,211	19.6%	M	36.5	0.88	L
Moyer Creek 2A	13,704	64.0%	M	5,211	24.3%	M	30.5	0.91	L
Musgrove Creek 1A	2,383	15.7%	L		0.0%	L	63.5	2.68	H
Napias Creek 1R	34,021	97.7%	H	14,315	41.1%	L	96.7	1.78	M
Napias Creek 2R	27,606	98.0%	H	14,315	50.8%	L	78.8	1.79	M
Napias Creek 3R	13,773	98.3%	H	7,409	52.9%	H	35.6	1.62	M
Napias Creek 4R	12,966	98.5%	H	7,272	55.3%	H	30.8	1.50	M
Napias Creek 5R	5,666	99.0%	H	3,963	69.2%	H	10.4	1.16	M
NF Iron Creek 1A	11,728	98.8%	H		0.0%	L	63.1	3.40	H
NF Salmon River 1A	2,996	3.4%	L	10,595	12.1%	M	240.5	1.75	M
NF Salmon River 2A	0	0.0%	L	56	0.2%	L	46.2	1.08	M
NF Salmon River 3A		0.0%	L	56	0.4%	L	27.6	1.18	M
NF Salmon River 4A		0.0%	L		0.0%	L	2.2	0.44	L
Owl Creek 1A		0.0%	L	3,868	11.3%	L	101.7	1.89	M
Owl Creek 2A		0.0%	L	3,726	10.9%	L	101.7	1.90	M
Owl Creek 3A		0.0%	L	3,331	9.8%	L	101.4	1.92	M
Panther Creek 0A	171,250	52.5%	M	62,177	19.0%	M	789.4	1.55	M
Panther Creek 1A	171,250	58.3%	M	61,980	21.1%	M	786.6	1.71	M
Panther Creek 2A	170,805	64.5%	M	48,842	18.4%	M	743.3	1.80	M
Panther Creek 3A	35,719	87.8%	H	8,435	20.7%	M	113.4	1.78	M
Panther Creek 4A	12,522	78.7%	M	8,435	53.0%	H	30.0	1.21	M
Panther Creek 5A	9,504	74.3%	M	8,435	65.9%	H	13.9	0.70	L
Perreau Creek 1R	6,844	96.3%	H		0.0%	L	24.9	2.24	H
Phelan Creek 1R	9,144	89.5%	H		0.0%	L	37.4	2.34	H
Pierce Creek 1A		0.0%	L	56	1.1%	L	7.0	0.91	L
Pine Creek 1A	1,068	5.6%	L	18,959	100.0%	H	60.2	2.03	H
Pine Creek 2A	1,068	5.9%	L	18,025	100.0%	H	57.5	2.04	H
Pine Creek 3A	1,068	6.3%	L	16,961	100.0%	H	50.3	1.90	M
Porphyry Creek 1A	7,163	93.7%	H		0.0%	L	34.2	2.87	H
SF Iron Creek 1A	4,412	100.0%	H	1,244	28.2%	M	25.3	3.68	H
SF Moyer Creek 1A	4,104	57.3%	M	2,875	40.1%	M	16.2	1.45	M
SF Williams Creek 1R	5,346	97.1%	H		0.0%	L	25.8	3.00	H
Sheep Creek 1A	7	0.0%	L		0.0%	L	14.8	0.44	L
Spring Creek 1A		0.0%	L		0.0%	L	87.2	4.62	H
Spring Creek 2A		0.0%	L		0.0%	L	81.3	4.78	H
Bia Po'l Naokwaide 1A		0.0%	L		0.0%	L	20.5	1.41	M
Trail Creek MSP 1A	47	0.5%	L	640	7.5%	L	4.7	0.35	L
Twelvemile Creek 1R	13,418	100.0%	H	3	0.0%	L	49.5	2.36	H
Twin Creek 1A	0	0.0%	L		0.0%	L	6.8	0.57	L
Wagonhammer Creek 1R	5,350	99.8%	H		0.0%	M	7.2	0.86	L

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Warm Springs Creek 1R	1,693	97.7%	H		0.0%	L	5.7	2.09	H
WF Iron Creek 1A	7,282	100.0%	H	1,109	15.2%	M	18.5	1.63	M
Williams Creek 1R	14,284	98.9%	H		0.0%	L	46.1	2.04	H
Woodtick Creek 1A	10,284	100.0%	H		0.0%	L	30.4	1.89	M
Basin Creek 1A	4,953	14.7%	L		0.0%	L	88.7	1.68	M
Block Creek 1R	1,571	100.0%	H		0.0%	L	5.9	2.40	H
Challis Creek 1A	20,566	99.1%	H		0.0%	L	36.0	1.11	M
Challis Creek 2A	11,974	98.7%	H		0.0%	L	26.2	1.38	M
Challis Creek 3A	5,702	99.9%	H		0.0%	L	5.7	0.64	L
Challis Creek 4A	4,960	99.9%	H		0.0%	L	4.7	0.61	L
East Pass Creek 1A		0.0%	L		0.0%	L		0.00	L
Eightmile Creek 1A	8,742	99.2%	H		0.0%	L	3.2	0.23	L
Fivemile Creek 1A	3,687	99.5%	H		0.0%	L	0.1	0.01	L
Garden Creek USR 1A	8,815	99.1%	H		0.0%	L	23.3	1.68	M
Herd Creek 1A	46	0.1%	L		0.0%	L		0.00	L
Herd Creek 2A	46	0.2%	L		0.0%	L		0.00	L
Jordan Creek 0A	15	0.2%	L		0.0%	L	41.8	3.97	H
Jordan Creek 1A	9	0.2%	L		0.0%	L	19.2	3.38	H
Jordan Creek 2A	9	0.3%	L		0.0%	L	17.5	3.18	H
Jordan Creek 3A	9	0.3%	L		0.0%	L	17.2	3.16	H
Jordan Creek 4A	9	0.3%	L		0.0%	L	17.4	3.17	H
McKay Creek 1A	4,703	100.0%	H		0.0%	L	4.6	0.63	L
Mill Creek USR 1R	10,862	100.0%	H		0.0%	L	23.6	1.39	M
Morgan Creek 1A	32,416	96.4%	H	9,358	27.8%	M	54.2	1.03	M
Morgan Creek 2A	22,756	96.7%	H	9,358	39.8%	M	39.8	1.08	M
Morgan Creek 3A	5,658	97.6%	H	4,142	71.4%	H	13.6	1.50	M
NF Rankin Creek 1R		0.0%	L		0.0%	L	2.6	1.95	M
Rankin Creek 1R		0.0%	L		0.0%	L	7.8	2.36	H
Paasasikwana Naokwaide 1A	35,199	100.0%	H		0.0%	L	47.7	0.87	L
Tenmile Creek 1A	2,858	99.8%	H		0.0%	M		0.00	L
Thompson Creek 1A	24	0.1%	L		0.0%	L	11.1	0.44	L
Trail Creek USR 1R	3,628	100.0%	H		0.0%	L	6.7	1.18	M
Valley Creek 1A	240	1.5%	L		0.0%	L	14.0	0.58	L
WF Herd Creek 1A	9	0.1%	L		0.0%	L		0.00	L
WF Morgan Creek 1A	10,381	99.7%	H		0.0%	L	20.9	1.29	M
WF Yankee Fork 1A		0.0%	L		0.0%	L	7.1	0.12	L
Yankee Fork 1A	48,142	45.8%	M		0.0%	L	123.6	0.75	L
Yankee Fork 2A	48,127	87.1%	H		0.0%	L	50.7	0.59	L
Yankee Fork 3A	37,454	99.8%	H		0.0%	M	17.3	0.29	L
Yankee Fork 4A	22,298	99.9%	H		0.0%	M	8.4	0.24	L
Yankee Fork 5A	13,075	99.9%	H		0.0%	M	6.0	0.29	L

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Camas Creek 1A	72,319	50.1%	M	6,004	4.2%	L	109.2	0.48	L
Camas Creek 2A	61,914	52.1%	M	1,720	1.4%	L	106.3	0.57	L
Camas Creek 3A	29,037	34.0%	M	1,720	2.0%	L	22.5	0.17	L
Castle Creek 1A	8,543	55.2%	M	1,720	11.1%	M	5.0	0.21	L
Hoodoo Creek 1A		0.0%	L		0.0%	L	4.3	0.25	L
Silver Creek 1A	31,819	98.3%	H		0.0%	L	81.4	1.61	M
Silver Creek 2A	14,487	99.9%	H		0.0%	L	54.6	2.41	H
WF Camas Creek 1A	10,125	40.0%	M	4,284	16.9%	L	1.7	0.04	L
Yellowjacket Creek 1A	110	0.3%	L		0.0%	L	62.2	1.11	M
Yellowjacket Creek 2A	10	0.1%	L		0.0%	L	15.8	0.56	L
Beaver Creek UMFS 1A		0.0%	L	40	0.1%	L	21.2	0.42	L
Marsh Creek 1A	524	5.3%	L	2,193	22.1%	L	36.1	2.32	H
Agency Creek 1R	2,518	60.0%	M		0.0%	L	16.7	2.55	H
Bear Valley Creek 1A	5,585	40.8%	M		0.0%	L	10.6	0.49	L
Bear Valley Creek 2A	5,380	39.9%	M		0.0%	L	10.3	0.49	L
Bear Valley Creek 3A	5,368	39.8%	M		0.0%	L	10.3	0.49	L
Bear Valley Creek 4A	5,160	38.9%	M		0.0%	L	9.8	0.47	L
Big Bear Creek 1R	14,915	99.0%	H		0.0%	L	28.7	1.22	M
Big Eightmile Creek 1R	11,129	75.6%	M		0.0%	L	31.6	1.38	M
Big Eightmile Creek 2R	5,280	59.6%	M		0.0%	L	15.2	1.09	M
Big Timber Creek 1R	21,155	64.0%	M		0.0%	L	21.1	0.41	L
Big Timber Creek 2R	14,540	58.1%	M		0.0%	L		0.00	L
Canyon Creek 1R	31,259	97.8%	H		0.0%	L	60.4	1.21	M
Deer Creek LEM 1R	3,630	98.1%	H		0.0%	L	1.9	0.32	L
EF Hayden Creek 1A	7,636	100.0%	H		0.0%	L	15.9	1.34	M
EF Hayden Creek 2R	5,021	99.9%	H		0.0%	L		0.00	L
Hawley Creek 1R	26,876	98.9%	H		0.0%	L	47.6	1.12	M
Hayden Creek 1A	22,853	99.9%	H		0.0%	L	27.3	0.76	L
Haynes Creek 1R	6,711	94.4%	H	428	6.0%	L	20.0	1.80	M
Kenney Creek 1R	9,500	90.2%	H	1,352	12.8%	L	44.9	2.73	H
Little Eightmile Creek 1R	8,658	99.7%	H		0.0%	L	9.3	0.69	L
MF Little Timber Creek 1R	1,492	32.0%	M		0.0%	L	2.2	0.30	L
Mill Creek LEM 1R	4,130	99.8%	H		0.0%	L	9.3	1.44	M
NF Little Timber Creek 1R	3,464	99.6%	H		0.0%	L	0.5	0.10	L
Pattee Creek 1R	9,095	87.6%	H	65	0.6%	L	36.1	2.22	H
Reservoir Creek 1R	8,448	100.0%	H		0.0%	L	12.0	0.91	L
Stroud Creek 1R	2,289	99.7%	H		0.0%	L	4.1	1.13	M
Withington Creek 1R	2,412	94.9%	H	14	0.5%	L	5.6	1.41	M
Big Creek PAH 1R	10	0.0%	L		0.0%	L	0.1	0.00	L
NF Big Creek 1R	1	0.0%	L		0.0%	L		0.00	L
Pahsimeroi River 1R	19,868	98.3%	H		0.0%	L	14.9	0.47	L

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SF Big Creek 1R	11	0.1%	L		0.0%	L		0.00	L
Alder Creek 1R	17,344	97.3%	H		0.0%	L	21.8	0.78	L
Antelope Creek 1R	40,536	98.4%	H	27	0.1%	L	44.8	0.70	L
Antelope Creek 2R	29,390	98.9%	H	27	0.1%	L	16.4	0.35	L
Antelope Creek 3R	11,741	97.4%	H		0.0%	L	0.8	0.04	L
Bear Creek 1R	11,293	100.0%	H		0.0%	L	11.9	0.68	L
Bear Creek 2R	10,159	100.0%	H		0.0%	L	8.5	0.54	L
Cherry Creek 1R	22,006	98.5%	H		0.0%	L	27.2	0.78	L
EF Big Lost River 1R	133,948	99.3%	H	370	0.3%	L	193.7	0.92	L
EF Big Lost River 2R	101,878	99.6%	H	370	0.4%	L	161.0	1.01	M
EF Big Lost River 3R	20,153	98.9%	H		0.0%	L	45.8	1.44	M
Iron Bog Creek 1R	14,925	100.0%	H	27	0.2%	L	12.2	0.53	L
Muldoon Creek 1R	12,149	99.9%	H	41	0.3%	L	13.1	0.69	L
NF Big Lost River 1R	27,851	40.7%	M	383	0.6%	L	93.3	0.87	L
NF Big Lost River 2R	4,095	14.6%	L	383	1.4%	L	35.8	0.82	L
Pass Creek 1R	6,802	99.8%	H		0.0%	L	11.7	1.10	M
Star Hope Creek 0R	48,540	99.7%	H	370	0.8%	L	58.8	0.77	L
Star Hope Creek 1R	48,393	99.7%	H	370	0.8%	L	57.3	0.76	L
Wildhorse Creek 1R	7,589	20.9%	M		0.0%	L	23.7	0.42	L
Badger Creek1R	9,772	98.9%	H		0.0%	L	4.5	0.29	L
Big Creek LLR 1R	6,560	99.0%	H		0.0%	L	2.8	0.27	L
Dry Creek 1R	1	0.0%	L		0.0%	L	0.1	0.01	L
Iron Creek 1R	4,004	99.9%	H		0.0%	L	3.6	0.57	L
Little Lost River 1R	33,612	99.5%	H		0.0%	L	82.0	1.55	M
Mill Creek LLR 1R	4,577	100.0%	H		0.0%	L	4.6	0.65	L
Smithie Fork 1R	3,922	100.0%	H		0.0%	L	4.9	0.81	L
Weda'a Naokwaide 1R	6,561	100.0%	H		0.0%	L	15.1	1.47	M
Timber Creek 1R	6,293	99.9%	H		0.0%	L	22.6	2.30	H
Wet Creek 0R	8,787	97.9%	H		0.0%	L	21.5	1.53	M
Wet Creek 1R	8,268	97.8%	H		0.0%	L	20.3	1.53	M
Wet Creek 2R-1	5,536	99.4%	H		0.0%	L	7.9	0.91	L
Wet Creek 2R-2	5,553	99.4%	H		0.0%	L	8.0	0.92	L

## APPENDIX B: DISCONTINUED SITES

Site Name	Sub-Basin	Last sample	Rationale	Monit. Report
Corn Creek 1A	Middle Salmon-Chamberlain	2018	This site was discontinued because of high gradient (8%) and limited suitable spawning habitat.	2018
Horse Creek 1A	Middle Salmon-Chamberlain	2013	This site was sampled 5 times. This high energy channel is not likely to be a good indicator for fine sediment (transport dominated, 4% gradient, C3b channel), and depth fines have never exceeded 22%. The site drains mostly wilderness (76%), and access is difficult and time consuming (3.5 mile hike one-way). Discontinued in 2017.	2016
Beaver Creek MSP 1A	Middle Salmon-Panther	2016	Only 1 sample since 2003. Limited need for data from this stream for management. Discontinued in 2021.	2019
Big Deer Creek 1A	Middle Salmon-Panther	2001	This site was sampled 6 years (1993-2001) and was established to monitor any impacts associated with mine reclamation and development in the watershed. Data indicate this is an A3 channel with very limited spawning habitat. This transport-dominated channel is a poor indicator for fine sediments in the system.	2015
Big Hat Creek 1R	Middle Salmon-Panther	2018	Discontinued in 2020 as a result of channel changes related to beaver damming and fallen trees. No suitable sampling habitat was found in 2020.	2019
Cabin Creek 1R	Middle Salmon-Panther	1995	This site was only sampled once (1995). This is a relatively small channel (9.6-foot bankfull width), and additional sampling is not necessary to monitor conditions in this small watershed.	2015
Carmen Creek 1R	Middle Salmon-Panther	2016	This site has a high gradient (6%) with step-pool morphology controlled by large boulders. The high energy at this site is the controlling factor limiting the deposition of fines within the limited pool tail areas. The 14 measurements at this site showed consistently less than 22% fine sediment at depth. This site was discontinued in 2018.	2017
Clear Creek 1A	Middle Salmon-Panther	2003	This site experienced extreme sediment loads and channel shifting during post-fire flooding in 2001 and 2002 (following the 2000 Clear Creek Fire), and sampling was discontinued after 2003. This site was replaced by Clear Creek 2A, located a short distance upstream.	2015

Site Name	Sub-Basin	Last sample	Rationale	Monit. Report
Fourth of July Creek 1A	Middle Salmon-Panther	2016	This site was discontinued in 2021 because it is located downstream of 7 miles of developed private property and has little value as an indicator for management in the watershed. An alternate sampling site upstream of the private property was investigated in 2022, but no suitable sampling habitat was found (too steep).	2020
Garden Creek MSP 1A	Middle Salmon-Panther	2005	This site was sampled 6 years. A blowout following the 2000 Clear Creek Fire greatly altered channel morphology. 2017 site reconnaissance indicated that no suitable spawning habitat exists, and the channel is steep with embedded substrate. This site was discontinued in 2017.	2016
Hughes Creek 0A	Middle Salmon-Panther	1995	This site was only sampled once (1995). This site was established in 1995 specifically to monitor impacts related to the Ditch Creek Mine, and the site is on private property. This site is not summarized in any monitoring report. Hughes Creek 1A is a better sampling site, located a short distance upstream.	NA
Indian Creek 1A	Middle Salmon-Panther	2016	Discontinued in 2021. This site is highly influenced by bank levees, artificial instream structures, and human uses around the firefighter memorial, and it is downstream of several miles of developed private property.	2019
Lake Creek 2R	Middle Salmon-Panther	2009	This site was sampled 3 times (1999, 2001, 2009). This site is not necessary because the Lake Creek 1R site has a more complete record and is located just a short distance downstream.	2015
McKim Creek 1R	Middle Salmon-Panther	2016	This site was sampled 8 times (1993 through 2016). This high gradient (5%), high energy, transport-dominated channel is not likely to be a good indicator for fine sediment. Fines have been consistently less than 20%, with recent samples less than 7%. This site was discontinued in 2017.	2016
Moccasin Creek 1R	Middle Salmon-Panther	2000	This site was only sampled once (in 2000) for project-specific monitoring. Notes indicate that the sampling site was not ideal. The site was discontinued, although additional monitoring at this site or a newly established site on Moccasin Creek may occur in the future.	2015
Moose Creek NFSR 1A	Middle Salmon-Panther	2016	This site was sampled 10 times (1995 through 2016). This is a very steep and small channel, with a gradient of 8% or more and very limited sampling habitat. Fines have never exceeded 30% because of the high gradient/high energy at this site. The site is located on private property. This site was discontinued in 2017.	2016

Site Name	Sub-Basin	Last sample	Rationale	Monit. Report
Moyer Creek 2A	Middle Salmon-Panther	2019	Discontinued in 2021. This site is not needed in addition to the Moyer Creek 1A site.	2019
Napias Creek 2R	Middle Salmon-Panther	2005	This site was sampled 13 times (1993 through 2005). 5 sites were established on Napias Creek in 1993, but not all need to be monitored continuously. This site has been discontinued, while monitoring will continue at Napias Creek 1R, 4R, and 5R.	2016
Napias Creek 3R	Middle Salmon-Panther	2020	5 sites were established on Napias Creek in 1993, but not all need to be monitored continuously. This site is on private property and has been discontinued, while monitoring will continue at Napias Creek 1R,4R, and 5R. Discontinued as of 2021.	2020
NF Salmon River 1A	Middle Salmon-Panther	2016	Discontinued as of 2021. This site is located on a small parcel of NFS lands surrounded by private land, developed private land exists along the channel for 7+ miles upstream of the site, and additional sites exist on the NF Salmon River upstream. Conditions at the site may not represent land use occurring on National Forest.	2019
Owl Creek 2A	Middle Salmon-Panther	1993	This site was sampled only once (1993). Owl Creek 2A is not needed because Owl Creek 1A is sufficient to monitor conditions in the watershed.	2015
Owl Creek 3A	Middle Salmon-Panther	1994	This site was sampled only twice (1993 and 1994). Owl Creek 3A is not needed because Owl Creek 1A is sufficient to monitor conditions in the watershed.	2015
Panther Creek 0A	Middle Salmon-Panther	2013	This site was sampled 12 times (2000 through 2013) to monitor impacts following the 2000 Clear Creek Fire. This site is redundant with the Panther Creek 1A site, which has a more complete dataset and more suitable spawning habitat for monitoring.	2015
Panther Creek 1A	Middle Salmon-Panther	2019	This site was discontinued as of 2021. This site is downstream of several miles of developed private property along Panther Creek, and additional monitoring sites exist upstream.	2019
Pine Creek 1A	Middle Salmon-Panther	2018	This site was sampled in 2018, but then discontinued because of inadequate sampling habitat.	2018
Pine Creek 2A	Middle Salmon-Panther	1993	This site was only sampled once (depth fines only in 1993) and has little additional value over the Pine Creek 1A site.	2015
Pine Creek 3A	Middle Salmon-Panther	2001	This site was sampled twice (1999 and 2001), and has little additional value over the Pine Creek 1A site.	2015

Site Name	Sub-Basin	Last sample	Rationale	Monit. Report
SF Iron Creek 1A	Middle Salmon-Panther	2009	This site was sampled 10 times (1993 through 2009). This site was visited in 2015, but the crew was unable to sample due to a beaver dam at the site and no adequate monitoring site available. This site has been discontinued, but sampling could resume if site conditions change.	2015
Spring Creek 1A	Middle Salmon-Panther	2014	This site was sampled 16 years (1993 through 2014), but data indicate this is a high energy, constricted section of channel with limited spawning habitat. This site was discontinued in favor of the Spring Creek 2A site a short distance upstream.	2015
Spring Creek 2A	Middle Salmon-Panther	2020	This site was discontinued as of 2021. Limited need for data from this stream for management.	2020
Warm Springs Creek 1R	Middle Salmon-Panther	2010	This site was sampled 7 times (1993 through 2010). This is a very small channel (2.7 square mile drainage area, 5.4-foot channel width), and the sediment sampling protocol cannot be used to adequately sample this channel.	2015
Woodtick Creek 1A	Middle Salmon-Panther	2018	This site was discontinued in 2018. This site has high gradient and limited suitable spawning habitat.	2018
Block Creek 1R	Upper Salmon River	2000	This site was sampled 3 times (1997 through 2000). This is a very small, steep channel (2.5 square mile drainage area, 4.8-foot channel width, 10% gradient), and the sediment sampling protocol cannot be used to adequately sample this channel.	2015
Challis Creek 2A	Upper Salmon River	2019	This site was discontinued as of 2021. This site is redundant with Challis Creek 1A, and it is a short distance downstream of Mosquito Flat Reservoir, which captures all sediment from the upper portion of the Challis Creek watershed.	2019
Challis Creek 4A	Upper Salmon River	2005	This site was only sampled twice (2004-2005). Reconnaissance in 2015 indicated no reasonable sampling habitat at the 4A site because of abundant wood in the stream. Challis Creek 3A is in close proximity and is a more suitable sampling site.	2015
East Pass Creek 1A	Upper Salmon River	2002	This site was sampled 10 times (1995 through 2002). The East Pass Creek 1A site at the mouth of East Pass Creek, the Herd Creek 2A site just upstream of the East Pass Creek confluence, and the Herd Creek 1A site just downstream of the East Pass Creek confluence are somewhat redundant, as the 3 sites are within 100 feet of each other. Because access to these sites is time consuming and datasets for the 3 sites remain incomplete, sampling efforts should focus on the Herd Creek 1A site only, which adequately captures sediment conditions in East Pass Creek and Herd Creek upstream of the confluence. Discontinued in 2017.	2016

Site Name	Sub-Basin	Last sample	Rationale	Monit. Report
Herd Creek 2A	Upper Salmon River	2016	This site was sampled 5 times (2003 through 2016). The East Pass Creek 1A site at the mouth of East Pass Creek, the Herd Creek 2A site just upstream of the East Pass Creek confluence, and the Herd Creek 1A site just downstream of the East Pass Creek confluence are somewhat redundant, as the 3 sites are within 100 feet of each other. Because access to these sites is time consuming and datasets for the 3 sites remain incomplete, sampling efforts should focus on the Herd Creek 1A site only, which adequately captures sediment conditions in East Pass Creek and Herd Creek upstream of the confluence. Discontinued in 2017.	2016
Jordan Creek 1A	Upper Salmon River	2007	This site was only sampled 2 years (1995 and 2007). Baseline data at this site are limited, and this site is not needed in addition to the Jordan Creek 0A site to monitor impacts in the watershed.	2015
Jordan Creek 2A	Upper Salmon River	2004	This site was sampled continuously from 1995 to 2004 only. This site was established to monitor any impacts just downstream of the landslide at the Grouse Creek mine. The Jordan Creek 0A site is sufficient for monitoring conditions in this area, and the Jordan Creek 2A site is no longer needed.	2015
Jordan Creek 3A	Upper Salmon River	2020	This site was discontinued as of 2021. This site is not needed, as the Jordan Creek 0A site adequately characterizes conditions in Jordan Creek.	2020
Jordan Creek 4A	Upper Salmon River	1995	This site was only sampled once (1995). The Jordan Creek 2A, 3A, and 4A sites are all very close together. Reconnaissance at this site in 2015 indicated abundant woody debris, with limited suitable sampling habitat. The Jordan Creek 0A site is sufficient for monitoring conditions in this area.	2015
Morgan Creek 2A	Upper Salmon River	2014	No suitable spawning habitat was found at this site in 2018. Beaver dams recently inundated a large portion of the stream, including the previous core site location, and only marginal sampling habitat was found in the vicinity upstream or downstream of the site. Because two other monitoring sites exist on Morgan Creek, this site is not necessary to monitor sediment trends in the watershed. Morgan Creek 2A was discontinued in 2018 until site conditions change and the need arises for additional data on Morgan Creek.	2017
NF Rankin Creek 1R	Upper Salmon River	2015	This site was sampled 5 times (2001 through 2015). This is a very small channel (1.4 square mile drainage area, 7.5-foot channel width), and the sediment sampling protocol cannot be used to adequately sample this channel. Gradient is high (9.5%), and abundant organic debris is the major influence on fine sediment retention.	2015

Site Name	Sub-Basin	Last sample	Rationale	Monit. Report
Rankin Creek 1R	Upper Salmon River	2015	This site was sampled 4 times (2001-2015). Past depth fines measurements have not been above 30%. This is a very small channel, with a very small drainage area (3.3 sq miles). Thick riparian vegetation along the banks appears to have a large influence on sediment transport and retention processes in this small channel, and therefore this site is not a good indicator of stressors occurring in the watershed. This site was discontinued in 2017.	2016
WF Herd Creek 1A	Upper Salmon River	2013	This site was sampled 1995-1999 and 2013. Access requires a 3.4 mile hike, and the site is now located within Wilderness. Sampling is discontinued, as watershed conditions can be adequately monitored at the Herd Creek 1A site.	2015
WF Morgan Creek 1A	Upper Salmon River	2014	No suitable spawning habitat was found at this site in 2018. Beaver dams recently inundated a large portion of the stream, including the previous core site location, and no suitable sampling habitat was found in the vicinity upstream or downstream of the site. This site was discontinued in 2018 until site conditions change.	2017
Yankee Fork 1A	Upper Salmon River	2017	This site was discontinued as of 2021. This site is downstream of private property, and conditions may not represent management of National Forest lands. 4 other sites will continue to be monitored on the Yankee Fork.	2021
Camas Creek 2A	Lower Middle Fork Salmon	2019	This site was discontinued as of 2021. This site is not needed because the Camas Creek 1A site adequately characterizes conditions in Camas Creek.	2020
Camas Creek 3A	Lower Middle Fork Salmon	2019	This site was discontinued as of 2021. This site is not needed because the Camas Creek 1A site adequately characterizes conditions in Camas Creek.	2020
Hoodoo Creek 1A	Lower Middle Fork Salmon	2002	This site was sampled 3 times (1993, 1994, 2002). Limited need for data from this stream for management.	2015
Yellowjacket Creek 1A	Lower Middle Fork Salmon	1996	This site was sampled 3 times (1993-1996). Yellowjacket Creek 2A appears to be a better site for monitoring conditions on Yellowjacket Creek.	2015
Bear Valley Creek 2A	Lemhi	1994	This site was only sampled twice (1993-1994) and is located 1/4 mile upstream of the Bear Valley Creek 1A site.	2015
Bear Valley Creek 3A	Lemhi	2000	This site was sampled 5 times (1993-2000) and does not need additional sampling because the Bear Valley Creek 1A site has a long dataset and is sufficient to monitor conditions in the watershed.	2015

Site Name	Sub-Basin	Last sample	Rationale	Monit. Report
Bear Valley Creek 4A	Lemhi	2003	This site was sampled 6 times (1993-2003) and does not need additional sampling because the Bear Valley Creek 1A site has a long dataset and is sufficient to monitor conditions in the watershed.	2015
Big Eightmile Creek 1R	Lemhi	2014	This site was sampled continuously from 1993 to 2004, then periodically since 2004. Data indicate that this is a B3 channel (cobble/boulder substrate) with limited spawning habitat. The Big Eightmile Creek 2A site is more suitable for monitoring impacts in the watershed.	2015
Kenney Creek 1R	Lemhi	2013	This site was sampled 6 times since 1993. The site is located 0.8 miles downstream of the Forest boundary, on BLM lands. Reconnaissance in 2015 indicated no reasonable sampling site at or just upstream of the Forest boundary. This site is discontinued because it may be largely influenced by land use outside of the Forest boundary.	2015
Pattee Creek 1R	Lemhi	2015	This site was sampled 13 times (1993-2015). The site is located 1 mile downstream of the Forest boundary, on BLM lands. This site is discontinued because it may be largely influenced by land use outside of the Forest boundary.	2015
NF Big Creek 1R	Pahsimeroi	2015	This site was sampled 8 times (1995-2015). The NF Big Creek 1R site just upstream of the SF Big Creek confluence, the SF Big Creek 1R site just upstream of the NF Big Creek confluence, and the Big Creek PAH 1R site just downstream of the NF/SF confluence are somewhat redundant, as the 3 sites are all within 200 feet of each other. Because datasets for these 3 sites remain incomplete, sampling efforts should focus on the Big Creek PAH 1R site only, which adequately captures conditions in both the NF and SF of Big Creek. The Big Creek PAH 1R site also contains better sampling habitat than the NF or SF Big Creek sites. The NF Big Creek 1R site was discontinued in 2017.	2016
SF Big Creek 1R	Pahsimeroi	2015	This site was sampled 10 times (1995-2015). The NF Big Creek 1R site just upstream of the SF Big Creek confluence, the SF Big Creek 1R site just upstream of the NF Big Creek confluence, and the Big Creek PAH 1R site just downstream of the NF/SF confluence are somewhat redundant, as the 3 sites are all within 200 feet of each other. Because datasets for these 3 sites remain incomplete, sampling efforts should focus on the Big Creek PAH 1R site only, which adequately captures conditions in both the NF and SF of Big Creek. The Big Creek PAH 1R site also contains better sampling habitat than the NF or SF Big Creek sites. The SF Big Creek 1R site was discontinued in 2017.	2016

Site Name	Sub-Basin	Last sample	Rationale	Monit. Report
Antelope Creek 1R	Big Lost River	2014	This site was sampled 12 times (1995-2014). A bridge washout occurred in 2005, changing site characteristics and making this area unsuitable for monitoring spawning substrate. A new site was established upstream of Leadbelt Creek in 2007 (Antelope 2R). Sampling at Antelope Creek 1R was resumed in 2011. The 2013 sample location was in the ford, a possible reason for high fines recorded that year. 2017 reconnaissance indicated that no suitable spawning habitat exists for sampling at this site because of channel incision and bank erosion during 2017 high flows, and the site was not sampled in 2017. This site was discontinued in 2017.	2016
Bear Creek 1R	Big Lost River	2011	This site was sampled twice (2007 and 2011). This site was abandoned because of extensive beaver activity, and a new site was established upstream in 2010 (Bear Creek 2R) to monitor impacts in the watershed.	2015
Star Hope Creek 1R	Big Lost River	2007	This site was sampled from 1995 to 2007 and is only a short distance upstream of the Star Hope Creek OR site, which has similar conditions and a slightly longer dataset. Both sites are not needed.	2015
Wet Creek OR	Little Lost River	2019	This site was discontinued as of 2021. This site is redundant with and very close to Wet Creek 1R.	2019
Wet Creek 2R-1	Little Lost River	2017	Reconnaissance in 2017 determined that past samples at Wet Creek 2R had been taken at two different locations with different channel types and are not comparable, so the site was split into 2 separate sites. This site was sampled 9 times (1997-2004, and 2017). Sampling habitat at the Wet Creek 2R-1 site is present, but not ideal because the remnants of an old dam 90 feet downstream of the site influences channel morphology at the site. This site was discontinued in 2017, as the Wet Creek 1R and OR sites provide sufficient data for monitoring sediment in Wet Creek.	2017
Wet Creek 2R-2	Little Lost River	2014	Reconnaissance in 2017 determined that past samples at Wet Creek 2R had been taken at two different locations with different channel types and are not comparable, so the site was split into 2 separate sites. This site was sampled 6 times (2008-2014). It was determined that the 2R-2 site has no suitable spawning habitat for sampling because of the high gradient (5%) and coarse substrate. The Wet Creek 2R-2 site was discontinued in 2017, as this transport-dominated site is a poor indicator for fines in the system, and the Wet Creek 1R and OR sites downstream provide sufficient data for monitoring sediment in Wet Creek.	2017