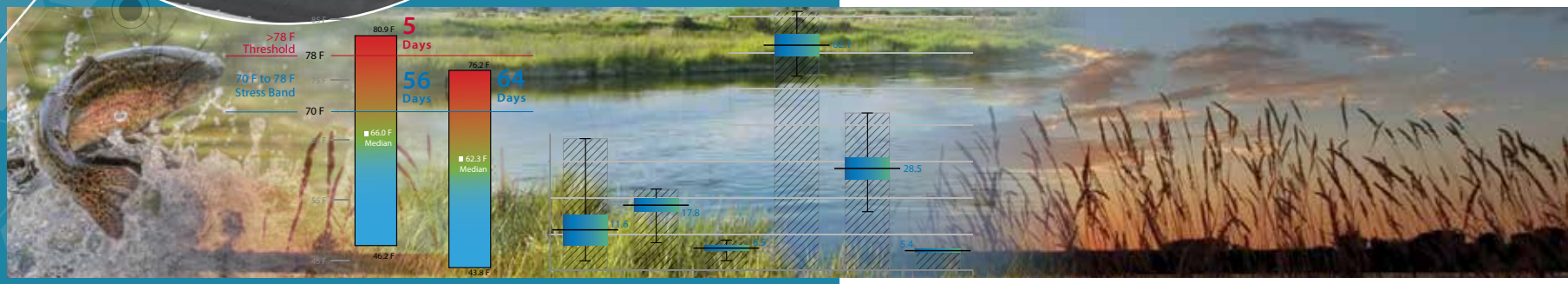
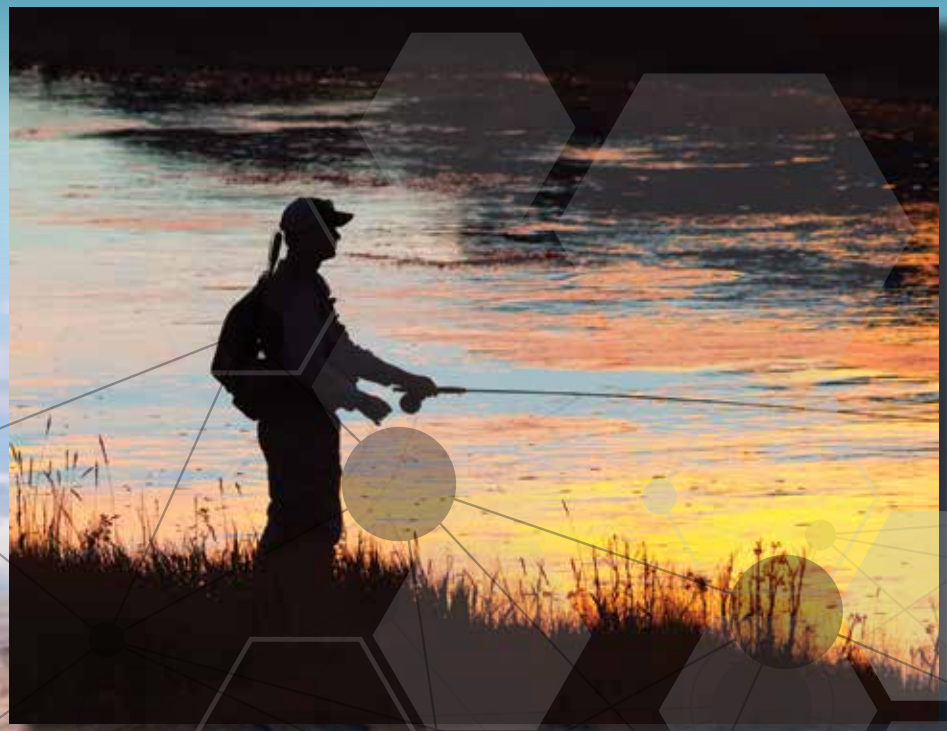
Silver Creek

Annual Report

2022

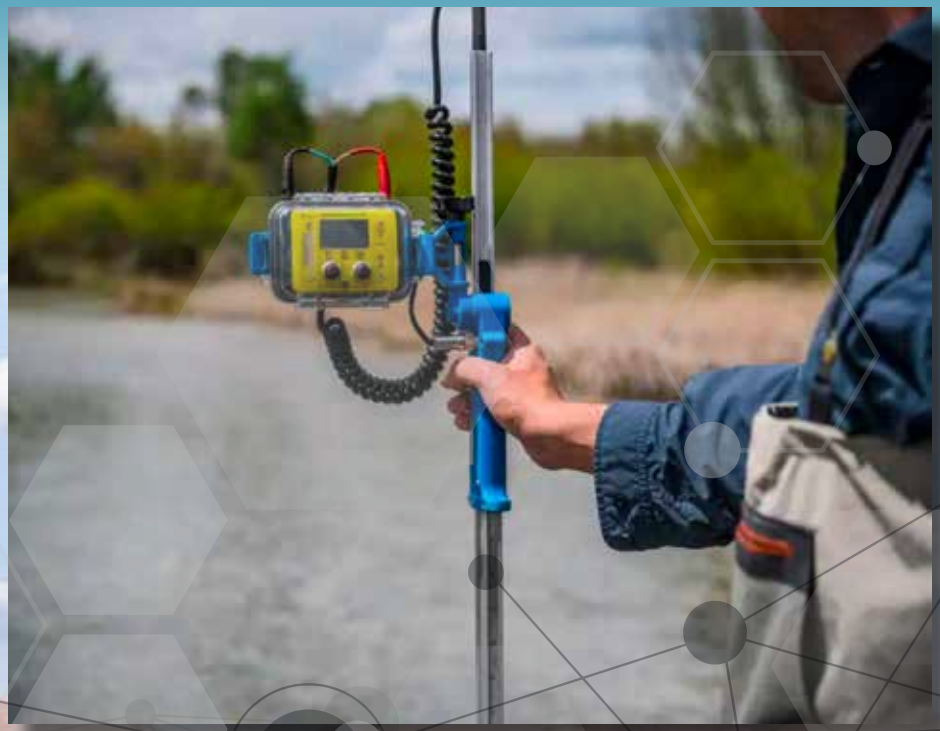


Ecosystem Sciences Foundation



Ecosystem Sciences Foundation

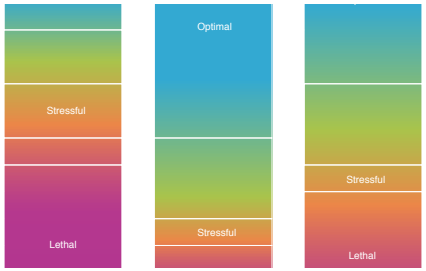
Produced by: Ecosystem Sciences Foundation 202 N. 9th St Suite 400 Boise, Idaho 83702 Phone 208.383.0226



Silver Creek Watershed

2022 Annual Monitoring Report

Contents



Silver Creek Watershed

Ecosystem Sciences Foundation (ESF) has been working in the Silver Creek watershed since 2009, when it partnered with The Nature Conservancy to develop a Restoration and Enhancement Strategy for the Silver Creek watershed. The strategy identified numerous actions to be taken, including addressing data gaps on stream flow, temperature, and sediment conditions. To address these data gaps, ESF began its monitoring program in 2010 to increase our understanding of the Silver Creek system. This past year, ESF and its partners continued to gather critical data on stream flows, temperature, and dissolved oxygen. In addition, ESF participated in a two-year project that will integrate water quality and water quantity monitoring data into an interactive stream flow forecast model for the Wood River Valley.

To date, the Silver Creek program has enjoyed support from numerous stakeholders. Most of the land within the watershed is privately owned. These landowners have recognized the need to protect the ecological health of the watershed, as well as their rights as landowners. Our partners and stakeholders have been integral in helping us achieve our vision of providing direction for stewardship of the Silver Creek Watershed and in designing and promoting appropriate stream restoration and enhancement actions.

The significant conclusions and findings from 2022 are:

- In 2022, Silver Creek flows were below the historic average discharge within the system. The Big Wood Basin's weak snowpack, contrasted with a relatively wet spring and fall, resulted in slightly lower-than-average stream volume in all stream tributaries.
- With some exceptions, stream temperatures in the Silver Creek system were similar to, but slightly colder than those from the last several years. Fewer areas experienced stream temperatures that remained above the stressful limit for fish for prolonged periods than were observed in 2021. The number of days observed to have stream temperatures above the 70 °F stress band threshold decreased from those that were observed in 2021.
- Dissolved oxygen (DO) monitoring indicated that in some areas of Silver Creek, DO concentrations have become so low that they stress all life stages of trout, especially in Butte Creek and Grove Creek. However, these conditions are generally limited to early morning hours. In the afternoon, DO levels typically rise rapidly.

For more details please visit: www.savesilvercreek.com

The information that is presented in this report reflects summarized analysis of all data. We are presenting the most important aspects of the past season's work in a way that tells a story of the stream system and watershed. The information presented here is the result of detailed, scientific analyses, and reflects a considerable amount of field work to collect. The website, which has been recently updated and redesigned, has additional information on programs in the watershed, including raw and tabulated data.

Big Wood River Groundwater Management Area

Since 1991, with the creation of the Big Wood River Groundwater Management Area (BWRGWMA), regulatory agencies and stakeholders have recognized that the surface and ground waters of the Big Wood River drainage are interconnected and complex. Due to diminishing surface water flows from groundwater diversions, the Idaho Department of Groundwater Resources (IDWR) restricted the approval of new groundwater appropriations for non-consumptive uses unless a new application could show an ability to mitigate for depletions that would injure senior water users. The restrictions minimized new depletions within the BWRGMWA, but concerns from stakeholders over the relationship between surface and ground water interactions in the Big Wood River drainage continued over the ensuing years.

In order to better understand the complexity of surface and ground water interactions in the Big Wood River drainage, a number of initiatives were undertaken by various agencies and stakeholders to address various knowledge gaps. Examples include an expansion of the existing hydrological monitoring network in the Wood River Valley, the development of a groundwater flow model for the Wood River Valley, and the creation of two

distinct groundwater monitoring districts within the Wood River Valley—the Galena Groundwater District (GGWD) and the South Valley Groundwater District (SVGWD). These efforts led to the drafting of a BWRGWMA groundwater management plan, which was created by the GGWD and the SVGWD and submitted to IDWR in 2020. An advisory committee was formed later that year to evaluate the various management options proposed in the draft BWRGWMA groundwater management plan.

Severe drought conditions in 2021 caused water supply shortages to occur in the Big Wood River drainage. Junior groundwater users in the SVGWD were ordered to curtail their use to increase water supply to senior water rights holders in the Silver Creek and Little Wood River drainages. Following the curtailment, the advisory committee and IDWR approved the BWRGWMA groundwater management plan. Its primary goal of the plan is, "to manage the effects of groundwater withdrawals on the aquifers from which the withdrawals are made and any other hydraulically connected sources of water." In practice, the plan will ensure that a four-day moving average streamflow of 32 cfs is maintained from May 1 through September 30 at the Station 10 stream gage on the Little Wood River near Richfield. Through such actions, and in conjunction with a continuation of meetings on surface water and groundwater use, stream health in the Silver Creek drainage can be supported.

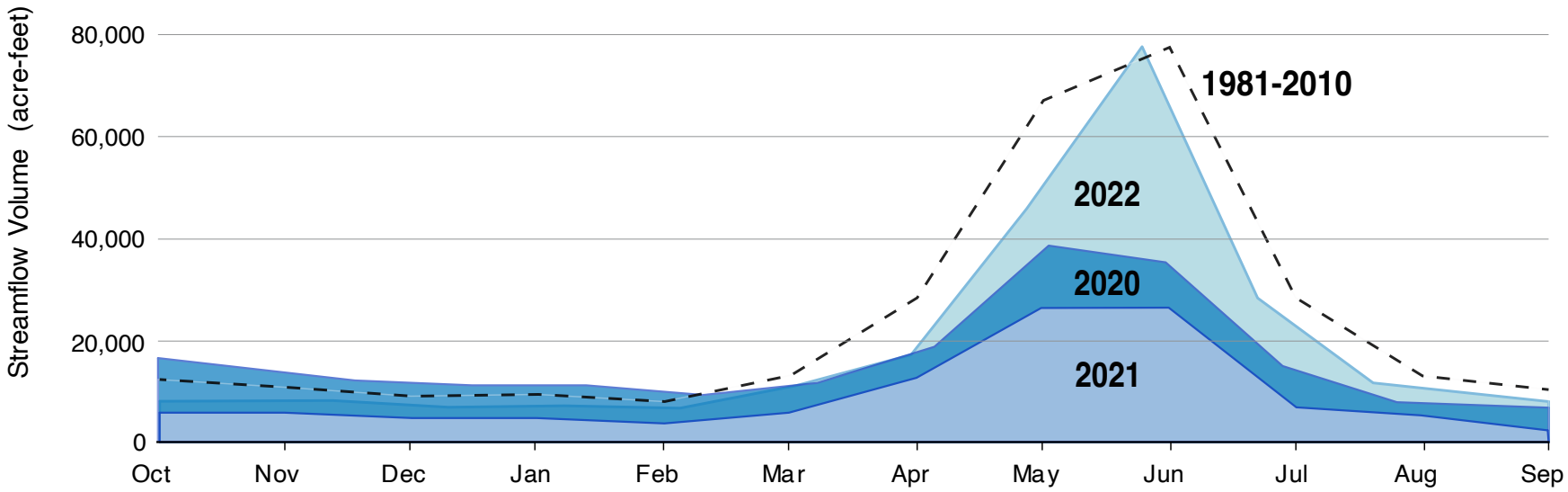
Additional Information on the BWRGWMA can be found at:

https://idwr.idaho.gov/water-rights/groundwater-management-areas/big-wood-ground-advisory-committee/

Winter Snow + 2022 Water Year

The early part of the 2022 water year (late 2021) featured snowpack levels that tracked above the most recent 30-year (1991-2020) median levels. However, new snow accumulation leveled off for much of the remainder of the 2022 water year. By the start of April 2022, snow water equivalent (SWE) levels within the Big Wood Basin were measured at 64% of recent historical median. The total stream flow volume for the 2022 water year, as measured at the Big Wood River at Hailey (USGS gauge #13139510), was observed to be 83% of the recent 30-year median stream flow. In 2022, the Big Wood River at Hailey gage recorded a peak stream flow that was near the historical median peak; however, the 2022 peak had a shorter duration. Accumulated precipitation, as measured at the Picabo Agrimet Weather Station, was higher than in the previous two years due to a relatively wet spring and fall in 2022. This is good news for the Silver Creek system, which relies almost entirely on groundwater levels within the Wood River Valley Aquifer system.

As a spring-fed system, Silver Creek's water comes from groundwater upwelling at springheads and streambed groundwater inputs. In 2022, monitoring within Silver Creek's tributaries showed an increase in stream flows from those that were recorded 2021. Well water monitoring within the South Valley Groundwater District (SVGWD) found that groundwater depth and artesian pressure was sustained at most wells throughout the May to October 2022 timeframe. The consistent, cool groundwater inputs that continued throughout the summer months led to a reduction in average and maximum stream temperatures at most locations when compared to some recent monitoring years. These benefits underscore the importance of groundwater as the ecological driver of the Silver Creek ecosystem.



Big Wood River stream flows (measured in acre-feet) for 2022 as compared to the 30-year median (1981-2010).

April 1, 2022

Idaho Water Supply Outlook Report

Big Wood Basin
64%
of median snowpack

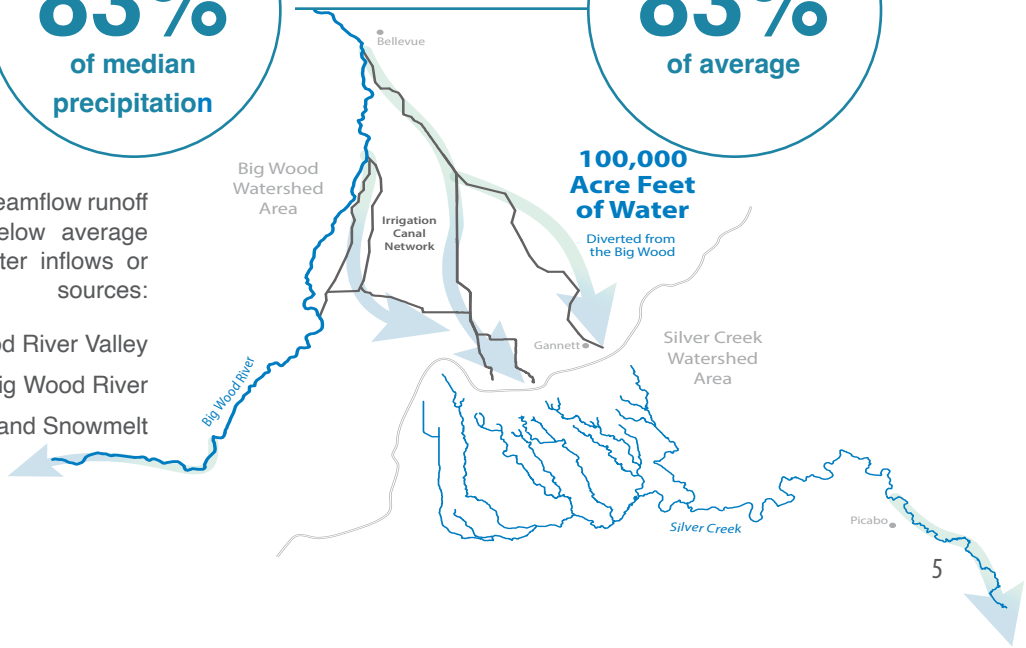
Big Wood Basin
83%
of median precipitation

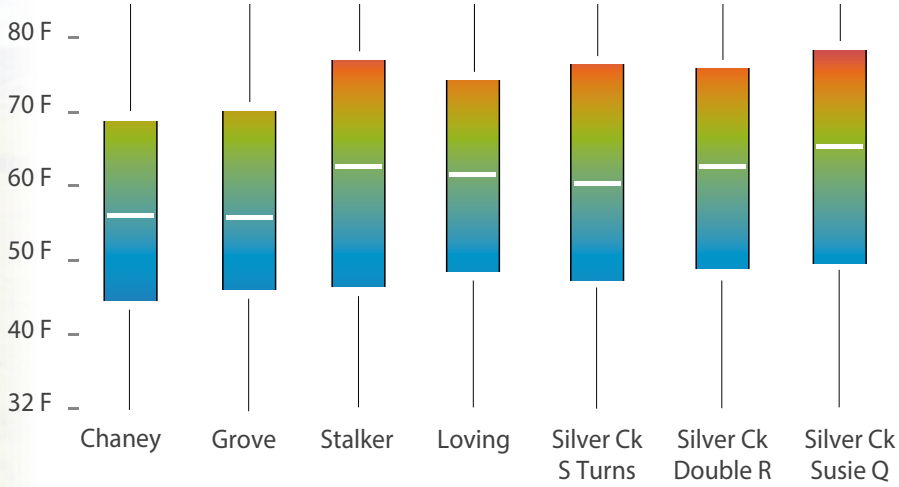
Streamflows up to
83%
of average

In 2022, the Big Wood Basin received below average precipitation between Oct 1 and April 1.

Snowpack conditions, forecast streamflow runoff and groundwater flows were below average in 2021. Major Silver Creek water inflows or sources:

1) Groundwater inflows, Wood River Valley
2) Irrigation diversions from the Big Wood River
3) Precipitation and Snowmelt





Summer Stream Temperatures: The graph above indicates the maximum, average and minimum summer water temperatures on selected areas of Silver Creek over a 12-year period (2011-2022). This year, 39 stream temperature loggers and 3 springhead loggers were monitored throughout Silver Creek and on each tributary to record critical information and track changes in the system.

Stream Temperature

It is important to monitor the springs that feed Silver Creek because they are the primary source of water to the system and these springs provide consistent, cool water to Silver Creek's tributaries that can mitigate against changes in air temperature and climatic conditions. In 2022, a total of three springhead temperature loggers and 39 stream temperature loggers were deployed in key locations throughout the Silver Creek Watershed. For the three springhead loggers, median temperatures stayed near 48°F throughout the summer of 2022. The below average 2021 water year carried over somewhat to the 2022 water year; the below average water year in 2022 and a relatively dry spring and summer in 2022 in terms of precipitation did not allow for near-normal groundwater levels to return to the valley like they did in 2021. As a spring-driven system, these springs are critical to the health and persistence of Silver Creek.

Temperature monitoring within Silver Creek and its tributaries found that median and maximum stream temperatures were above average at most locations, with a few exceptions in tributaries throughout the Silver Creek subbasin. Cumulative median stream temperatures recorded in 2022 were similar to cumulative median stream temperatures

recorded in 2021 – there was a 0.1-degree Fahrenheit difference between the two years across all temperature loggers. This illustrates the connection between the below average water-year in 2022 and carry-over from 2021, which led to a decrease in the duration and quantity of groundwater. The most notable increase in temperature was measured at the Mid Mud Creek logger, which observed temperatures above the fish stress threshold (70°F) for 60 days throughout the 2022 monitoring period and saw an increase in median temperature by 1.6°F from 2021. Other tributaries where increases in median temperatures from 2021 were observed, include—Upper Stalker Creek (4.3°F), Lower Grove Creek (1.3°F), and East Fork Loving Creek (0.8°F). Tributaries where decreases in median temperatures from 2021 were observed, include—Upper Chaney Creek (1.4°F), Mid Loving Creek (4.7°F), and Grove Creek (0.5°F).

A Twelve-Year Review of Stream Temperature Monitoring

This year marks the 12th year of accumulating stream temperature data from tributaries across the Silver Creek subbasin. Here, we return to a discussion that began in 2015 with a review of cumulative stream temperature monitoring data.

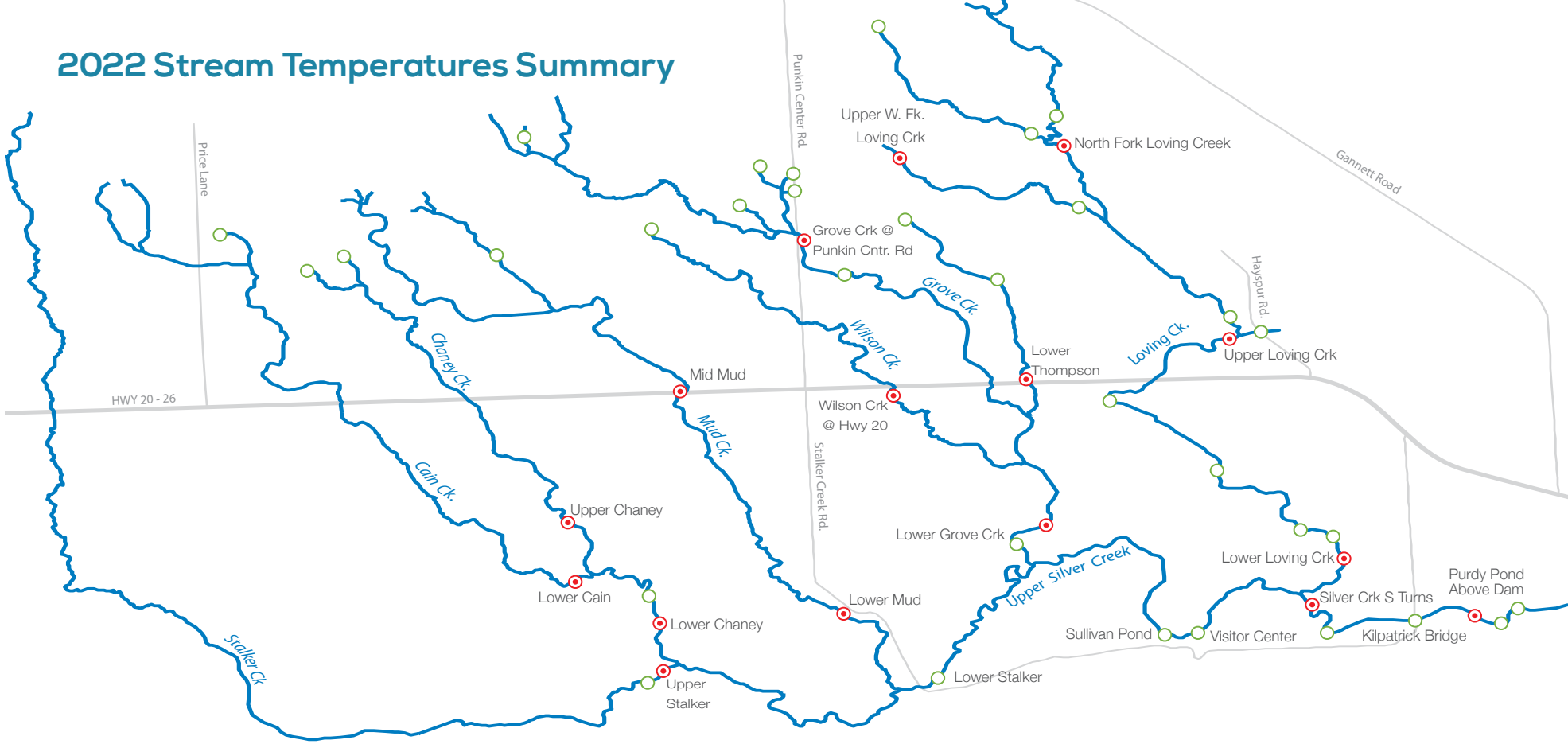
Perennial hot spots across all years of temperature data monitoring in the Silver Creek system include Silver Creek at Highway 93, Silver Creek at Susie Q, Silver Creek at Priest Bridge, Mid Mud Creek, Lower Mud Creek, and North Fork Loving Creek. Many of these sites are located at the far downstream end of the monitoring array, and consequently, more likely to experience warm water inputs. In contrast, none of the three springhead loggers that were monitored observed median daily temperatures that were above the 70 °F temperature fish stress threshold.

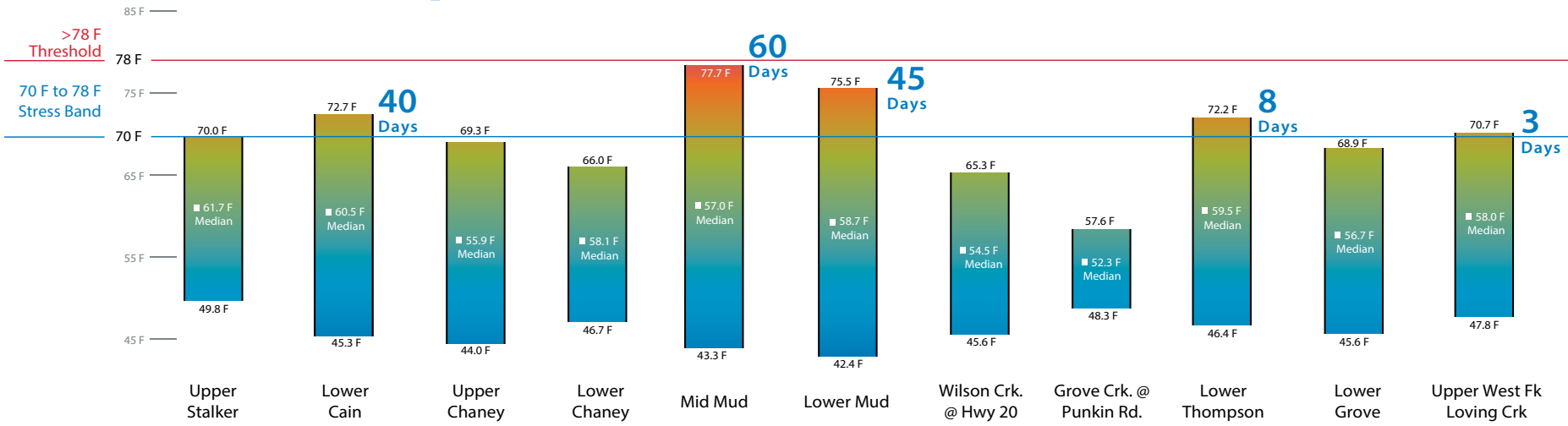
From 2011 to 2022, the data shows a decreasing trend in stream temperatures across the Silver Creek and its tributaries. In the first six years of temperature monitoring, from 2011-2016, daily median stream temperatures exceeded 70°F for an average of 21.9 days. From 2017-2022, the average number of days that stream temperatures exceeded 70°F dropped to 15.9 days. Average median stream temperatures in 2022 increased from those of the previous five years; however, the average number of days that temperatures were recorded to be above the 70 °F temperature fish stress threshold decreased from 34.4 days in 2021 to 16.5 days in 2022.

The highest recorded average median stream temperature occurred within the first six years of temperature monitoring, which was 60.3°F in 2013. In the last six years, the average median temperature across all streams has hovered around 58.8°F. In 2022, the average median temperature across all tributaries increased to 59.6°F.

In 2016, an analysis of stream temperatures and stream flows within the Silver Creek system indicated that stream flows were more closely related to stream temperature than ambient air temperature. While it is unclear if the relationship between stream flows and stream temperatures remains as prevalent today, the two years with the fewest average number of days that exceeded the 70°F temperature during the period of record, 8 days in 2017 and 5.1 days in 2019 respectively, occurred during years of above average stream flows in the Silver Creek and Big Wood River systems.

2022 Stream Temperatures Summary





Stream temperature bands The above graphic depicts the summarized stream temperature data for the entire summer season for a selected group of data loggers and locations. The data were analyzed for the summer season to illustrate the high temperatures that occurred throughout the stream system for the period of June through the end of September 2022. Each graph displays the total temperature range for the period of record; the absolute high and low temperatures are given, and the median stream temperature is shown for that particular stream temperature logger.

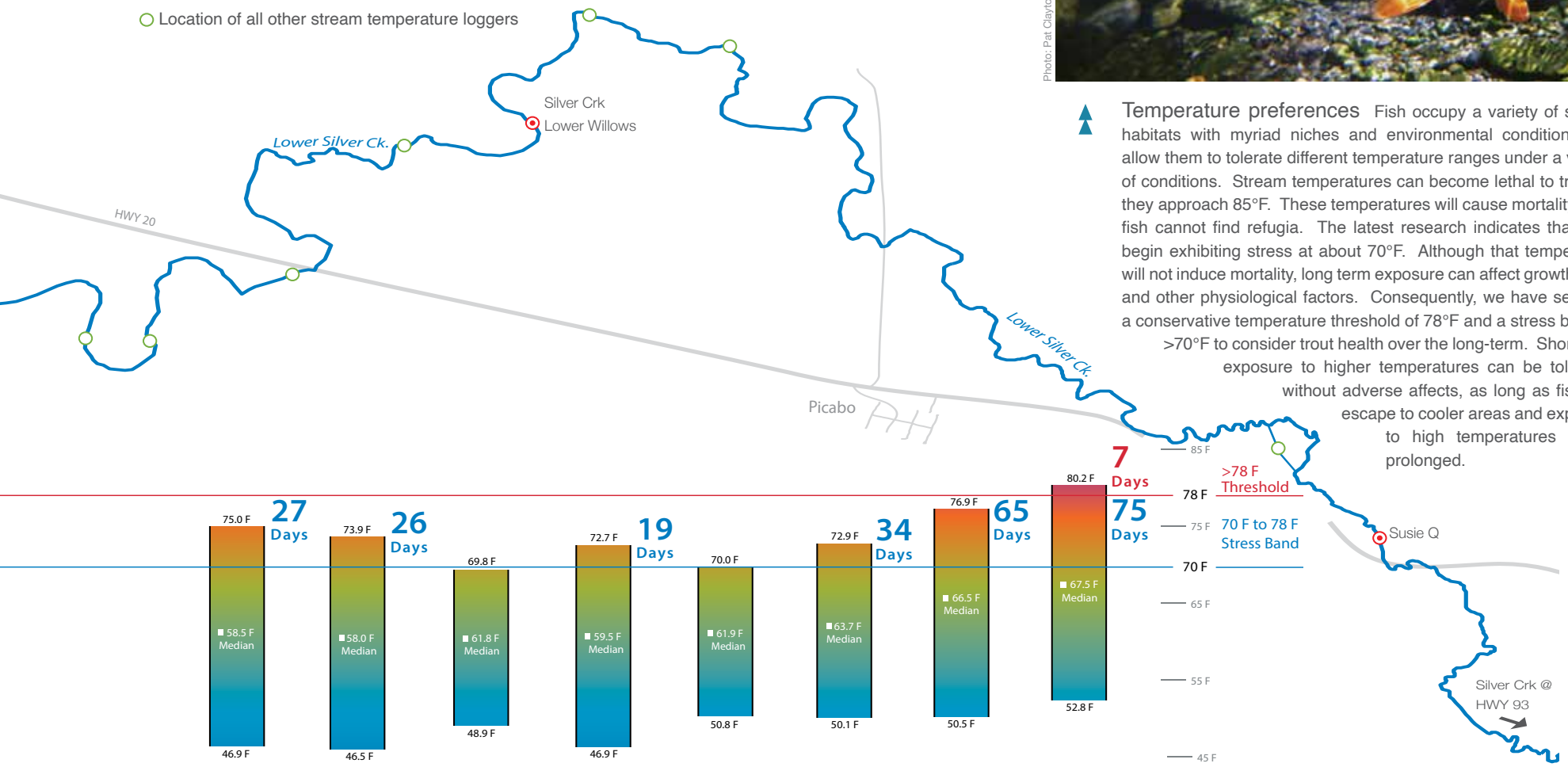
Locations of Stream Temperature Logger Array

This map illustrates the Silver Creek stream and tributary system along with the locations of the stream temperature loggers. The temperature loggers are expressed in two categories for discussion and analysis purposes:

- Location of stream temperature loggers illustrated in bottom graphic of seasonal temperatures
- Location of all other stream temperature loggers

Stream temperatures are logged continuously at one-hour intervals. The array of stream temperature loggers in the Silver Creek system is designed to capture temperature differences for each stream and tributary segment, from the spring source to Lower Silver Creek at the Highway 93 crossing.

Photo: Pat Clayton



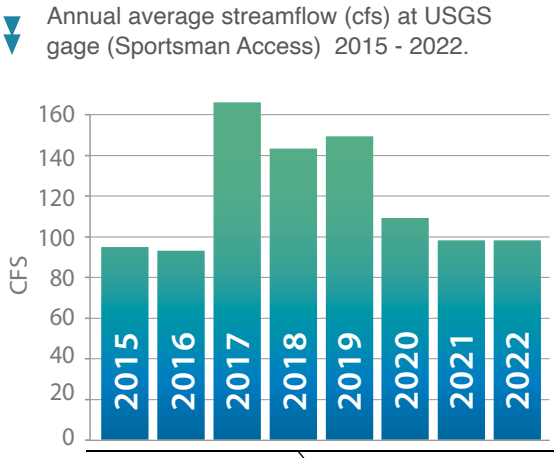
Temperature preferences Fish occupy a variety of stream habitats with myriad niches and environmental conditions that allow them to tolerate different temperature ranges under a variety of conditions. Stream temperatures can become lethal to trout as they approach 85°F. These temperatures will cause mortality if the fish cannot find refugia. The latest research indicates that trout begin exhibiting stress at about 70°F. Although that temperature will not induce mortality, long term exposure can affect growth rates and other physiological factors. Consequently, we have selected a conservative temperature threshold of 78°F and a stress band of >70°F to consider trout health over the long-term. Short-term exposure to higher temperatures can be tolerated without adverse affects, as long as fish can escape to cooler areas and exposure to high temperatures is not prolonged.

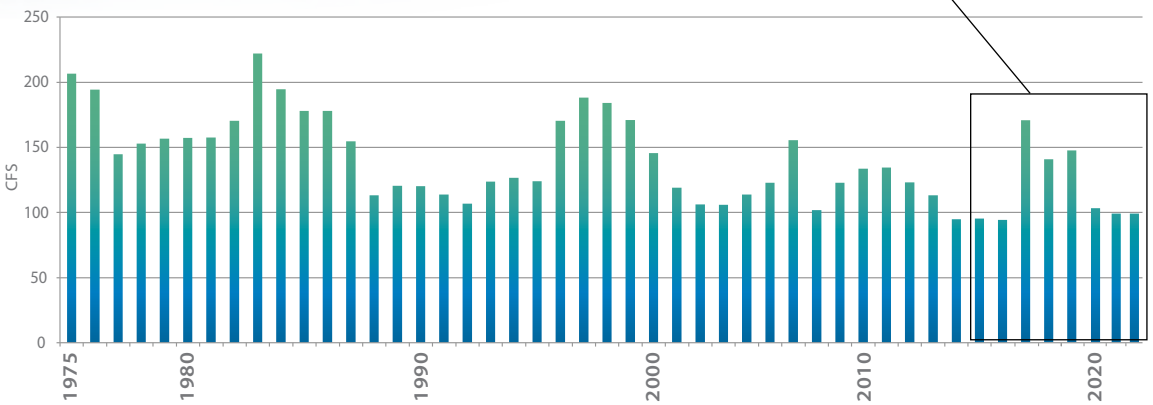
The overall median temperatures throughout the summer were within the preference range for trout (around 55-60 degrees) in Chaney (56-58F), Mud (57-59F), Wilson (55F), Grove (52F), Thompson (59F), the upper reaches of Loving Creek (58F), and S-Turns at Silver Creek (59F). Cain, Stalker Creek and Lower Loving Creek all had median temperatures above 60°F. The number of days that temperatures were within the stress band for trout (70°F-78°F) decreased compared to measurements taken in 2021. In 2022, only one site (Silver Creek at Highway 93 Bridge) had temperatures that exceeded the upper stress threshold (78°F) for trout.

Stream Hydrology

Monitoring stream flows within Silver Creek's tributaries helps build our understanding of the volume and origin of the water that enters Silver Creek and the potential influence that stream flows have on water temperature, dissolved oxygen and other water quality parameters.

Total annual discharge at Sportsman's Access in 2022 was below average and flows were below the 30-year average. Stream flows in Silver Creek's tributaries varied slightly but, in general, were below the averages recorded since monitoring began in 2011. It was a below average water year for Silver Creek and its tributaries. The Big Wood River had a below average annual discharge in 2022.





Silver Creek annual average streamflow (cfs) at USGS gage (Sportsman Access) 1975 - 2022.

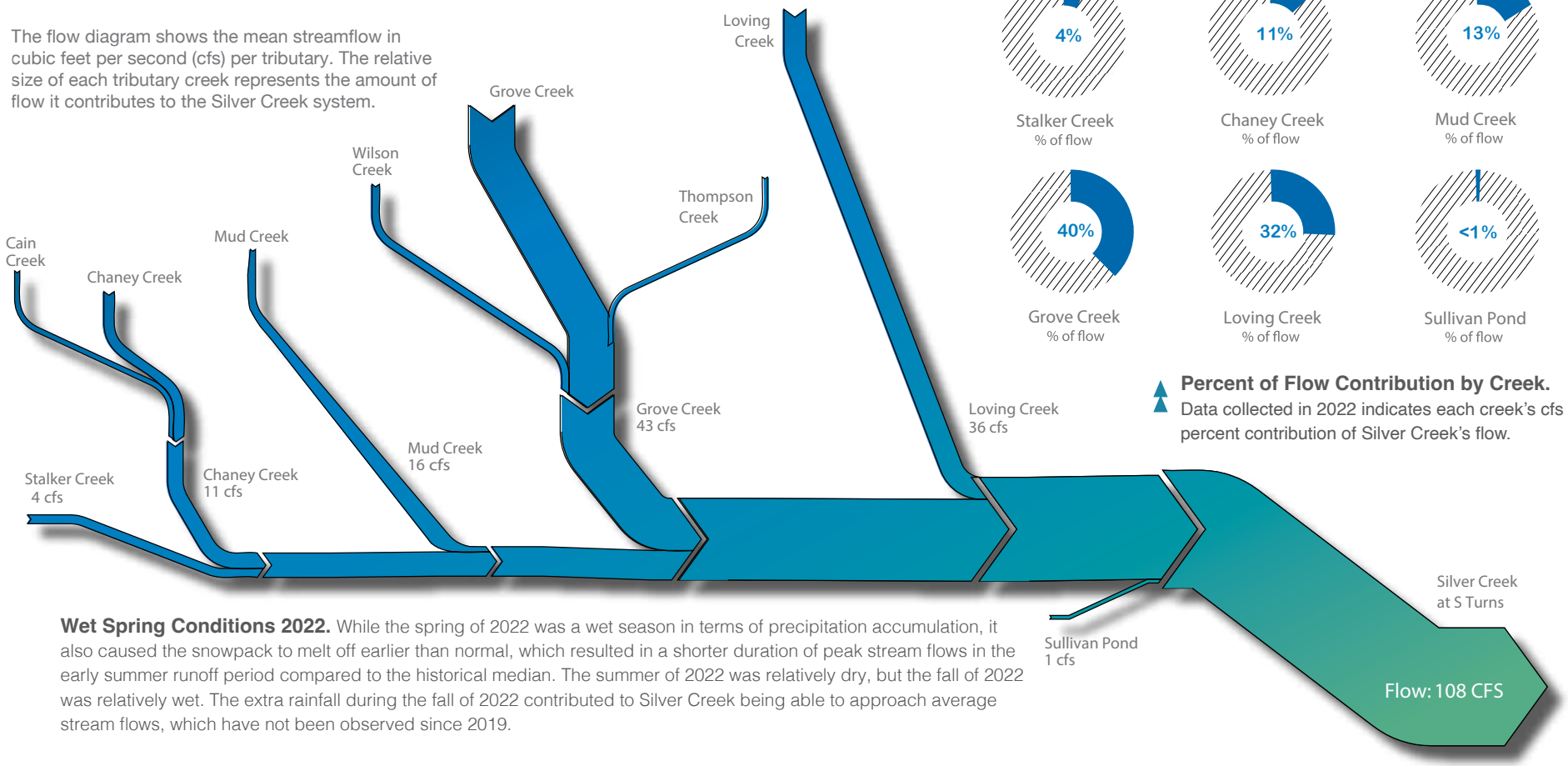
Big Wood River Average Annual Discharge at Hailey gage (cfs):

2016	**406.4**
2017	**1,003.0**
2018	**478.6**
2019	**598.9**
2020	**253.9**
2021	**188.2**
2022	**331.1**

The 2022 water year resulted in below-average flows in the Wood River, as well as below-average flows in Silver Creek and its tributaries. However, stream flows in the Big Wood River at Hailey were higher than they were in 2020 and 2021. This is likely due to the weak snowpack that the Big Wood Basin experienced during the winter of 2021-2022, in contrast with the relatively wet spring with above-average rainfall within the basin during the months of March and April.

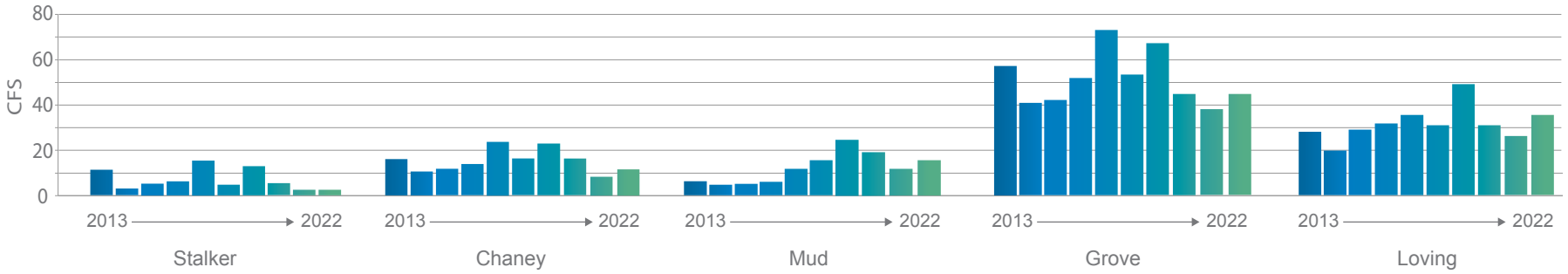
2022 Streamflow

The flow diagram shows the mean streamflow in cubic feet per second (cfs) per tributary. The relative size of each tributary creek represents the amount of flow it contributes to the Silver Creek system.



Percent of Flow Contribution by Creek. Data collected in 2022 indicates each creek's cfs and percent contribution of Silver Creek's flow.

Wet Spring Conditions 2022. While the spring of 2022 was a wet season in terms of precipitation accumulation, it also caused the snowpack to melt off earlier than normal, which resulted in a shorter duration of peak stream flows in the early summer runoff period compared to the historical median. The summer of 2022 was relatively dry, but the fall of 2022 was relatively wet. The extra rainfall during the fall of 2022 contributed to Silver Creek being able to approach average stream flows, which have not been observed since 2019.



Annual average streamflow by creek for 2013-2022. Data collected from 2013 - 2022 shows each creek's average flow. Recent decreases in overall streamflow affects many critical components of the aquatic ecosystem. Measurements were not continuous, but were distributed throughout the spring, summer, and fall.

Dissolved Oxygen

Since 2017, dissolved oxygen (DO) has been measured continuously from June through September at 7 sites. Data is recorded using optical sensors that record DO and temperature values every 15 minutes.

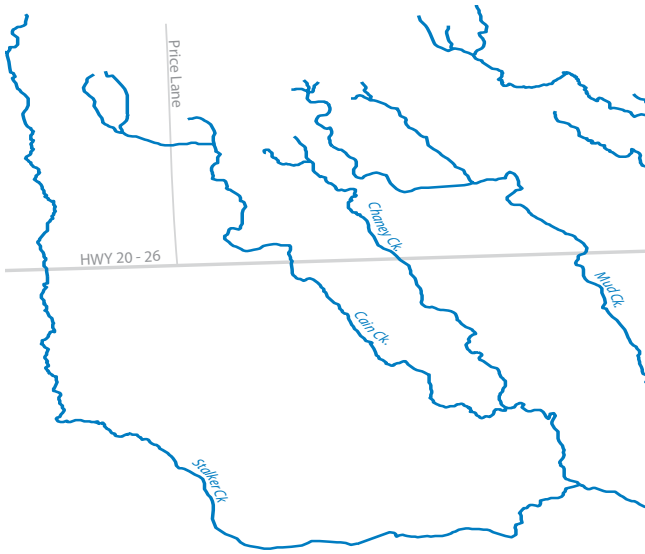
Similar to past year's results, the data indicated that not all of Silver Creek's waterways exhibit the same pattern of DO values and that DO levels stress fish in certain locations at certain times of the day. Seasonal fluctuations also occur, as changes in sunlight, temperature, streamflow and aquatic plant growth vary throughout the year.

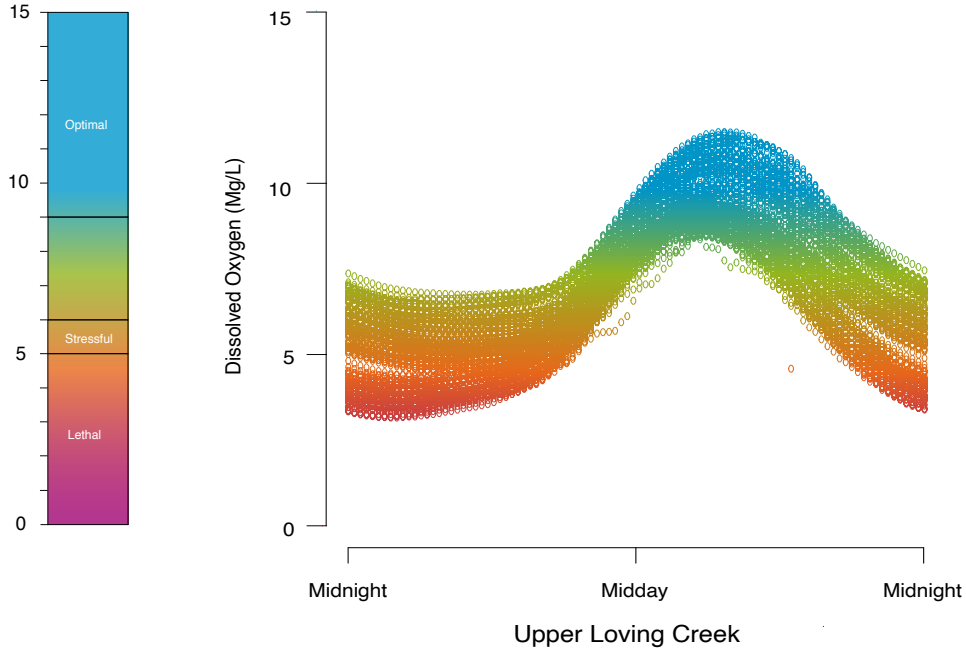
In many areas within the Silver Creek system, the daily fluctuations in DO are significant, which points to a productive biological engine in the aquatic ecosystem. As aquatic plants within the stream utilize light from the sun to grow (a process known as photosynthesis), oxygen is produced as a byproduct and released as DO. This process results in increased DO levels during the afternoon and decreased DO levels from the evening-to-morning hours.

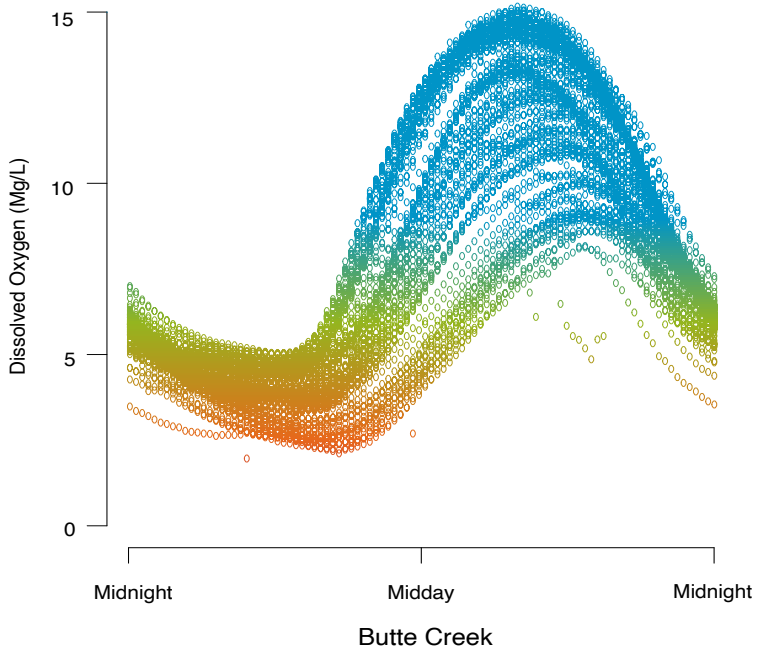
Aquatic plants do, however, continue to respire oxygen overnight without photosynthesis occurring. This part of the process requires oxygen (i.e., biological oxygen demand), which is taken directly from the water. The process causes DO levels to fluctuate throughout the day and exhibits a distinct diurnal cycle. As shown by the diurnal graphs presented, not all cycles are the same. The sensor placed at Lower Loving Creek exhibits much different diurnal characteristics as compared to the Butte Creek location, even though Butte Creek is tributary of Loving Creek. Despite their close proximity in geographic space, their DO levels vary significantly (see diurnal plots on the facing page). This is due to a combination of factors, including streamflow magnitude, temperature, nutrient concentrations, and aquatic plant life, among others.

When DO readings fall into the stressful range for fish, they will seek refuge in areas that have higher DO concentrations. Fish eggs, which are often buried within gravel substrate in the streambed, lack the mobility to escape these conditions.

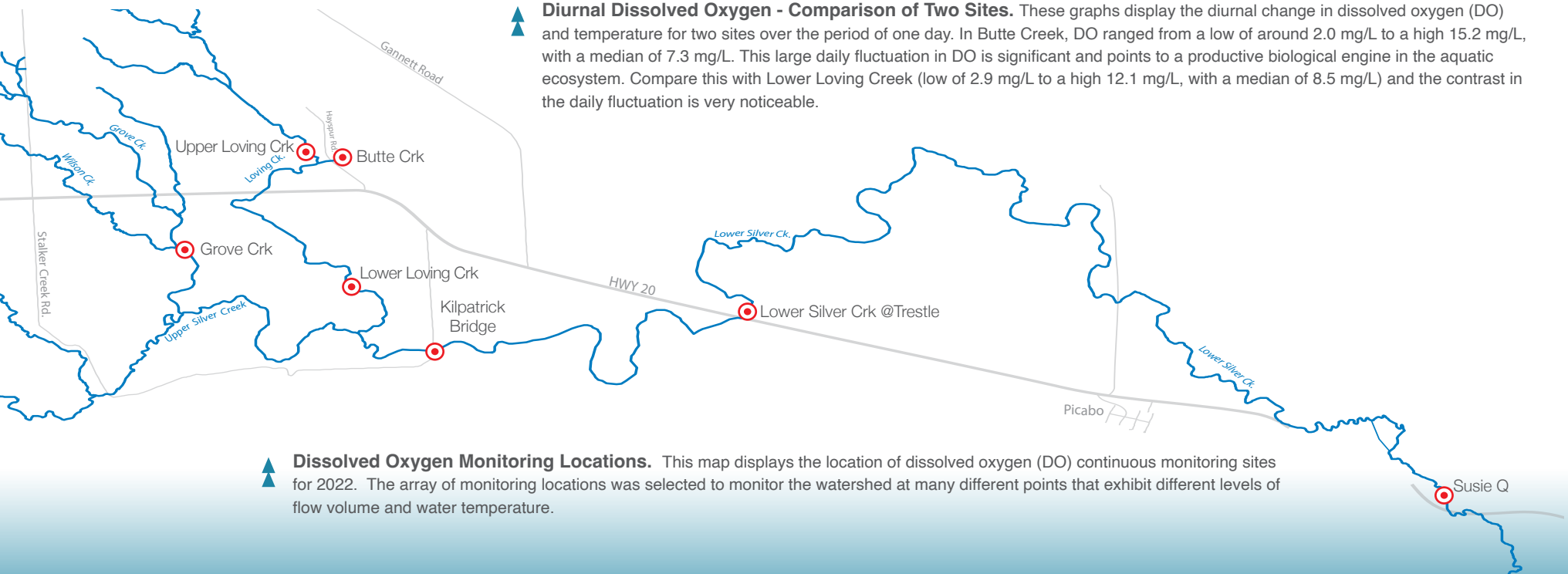
At the selected sites, 23% of all measurements made were between stressful to lethal levels for fish and their eggs (1st quartile at Suzie Q: 5.1 mg/L; Butte: 4.2 mg/L; Lower SC at the Trestle: 6.2 mg/L). The seasonal graphs present all the data points that were taken during the 2022 season. During the 2022 season, vegetation surrounding the sensors at the Butte Creek and Grove Creek collection sites caused some measurements to be lower than they otherwise would have been.





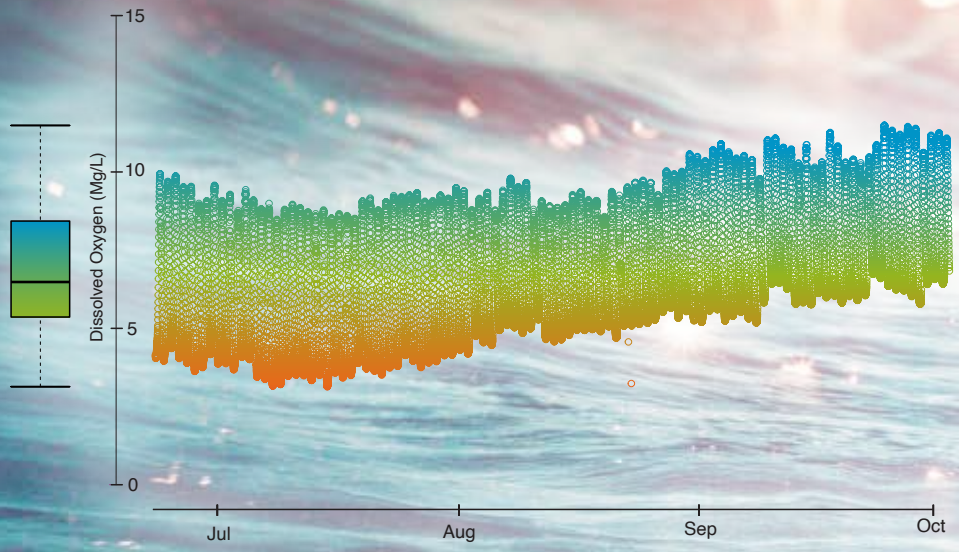


Diurnal Dissolved Oxygen - Comparison of Two Sites. These graphs display the diurnal change in dissolved oxygen (DO) and temperature for two sites over the period of one day. In Butte Creek, DO ranged from a low of around 2.0 mg/L to a high 15.2 mg/L, with a median of 7.3 mg/L. This large daily fluctuation in DO is significant and points to a productive biological engine in the aquatic ecosystem. Compare this with Lower Loving Creek (low of 2.9 mg/L to a high 12.1 mg/L, with a median of 8.5 mg/L) and the contrast in the daily fluctuation is very noticeable.

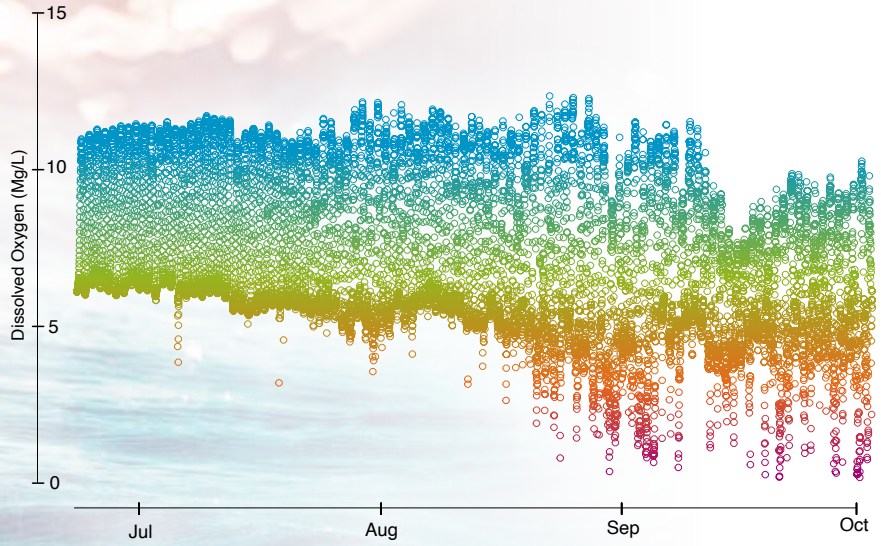


Dissolved Oxygen Monitoring Locations. This map displays the location of dissolved oxygen (DO) continuous monitoring sites for 2022. The array of monitoring locations was selected to monitor the watershed at many different points that exhibit different levels of flow volume and water temperature.

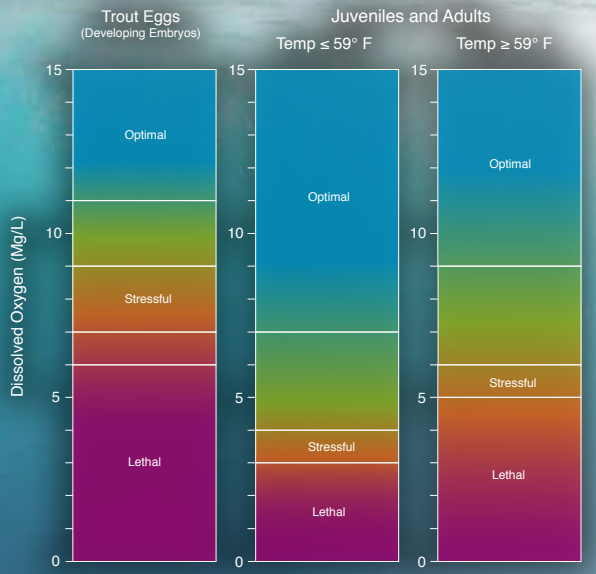
Dissolved Oxygen Results



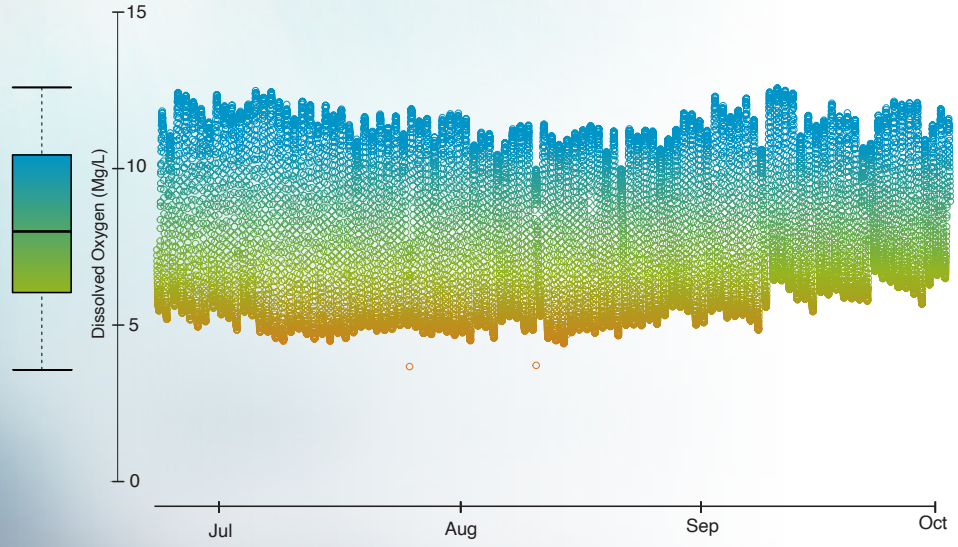
Upper Loving Creek



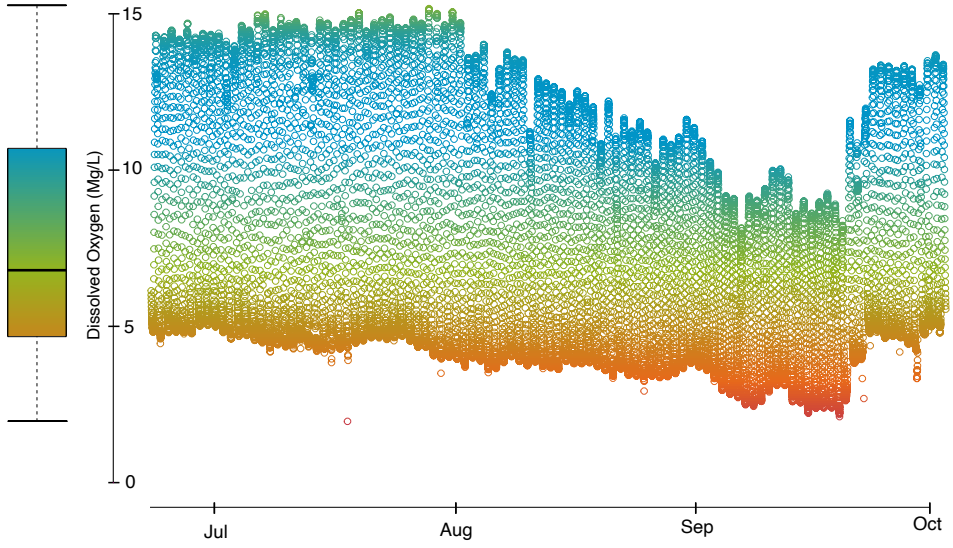
Grove Creek



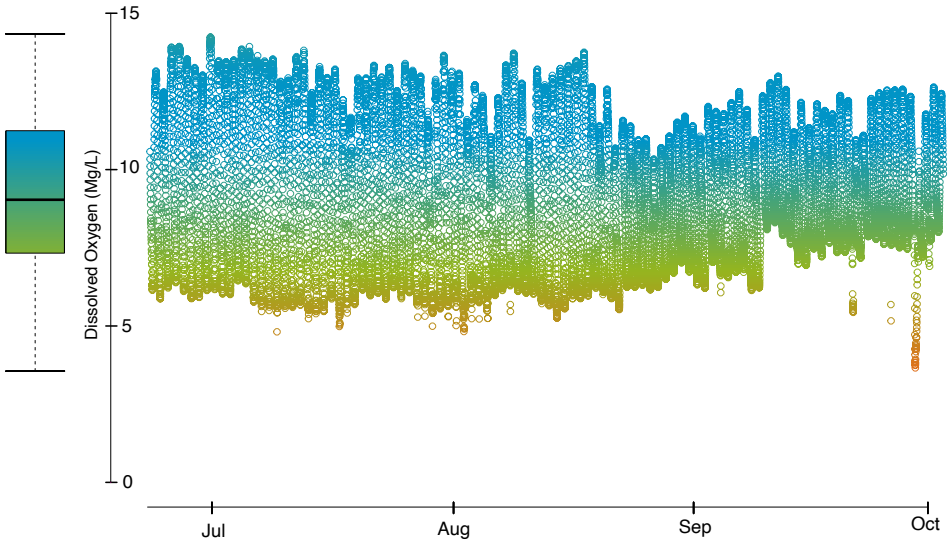
Average Dissolved Oxygen Requirements for Salmonids. Trout, depending on their particular life stage (egg, Juvenile, Adult), have differing requirements and thresholds for dissolved oxygen levels. Water temperature also plays a major role in dissolved oxygen levels. (Adapted from EPA's Chapman, 1986, and USFWS's Raleigh et al 1984, and Raleigh et al 1996).



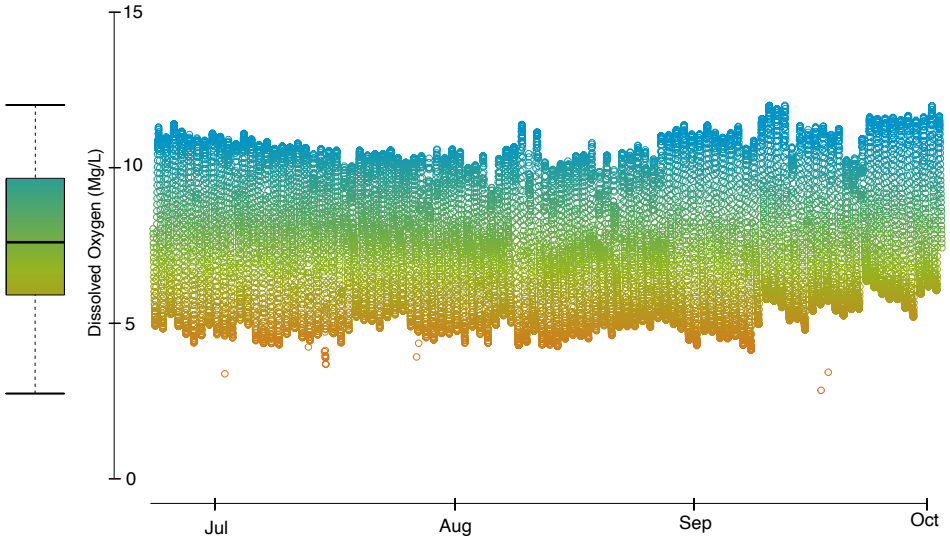
Kilpatrick Bridge Silver Creek



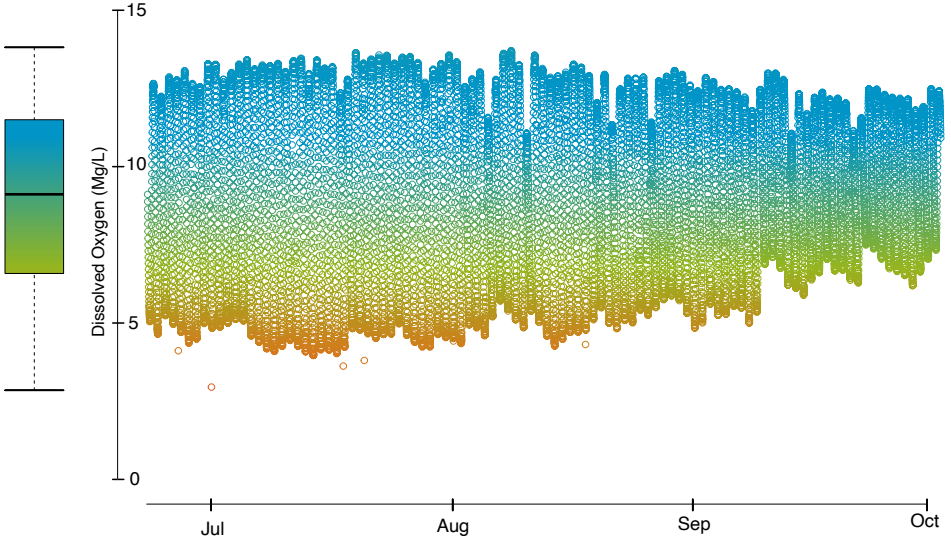
Butte Creek



Lower Silver Creek at Trestle



Lower Loving Creek

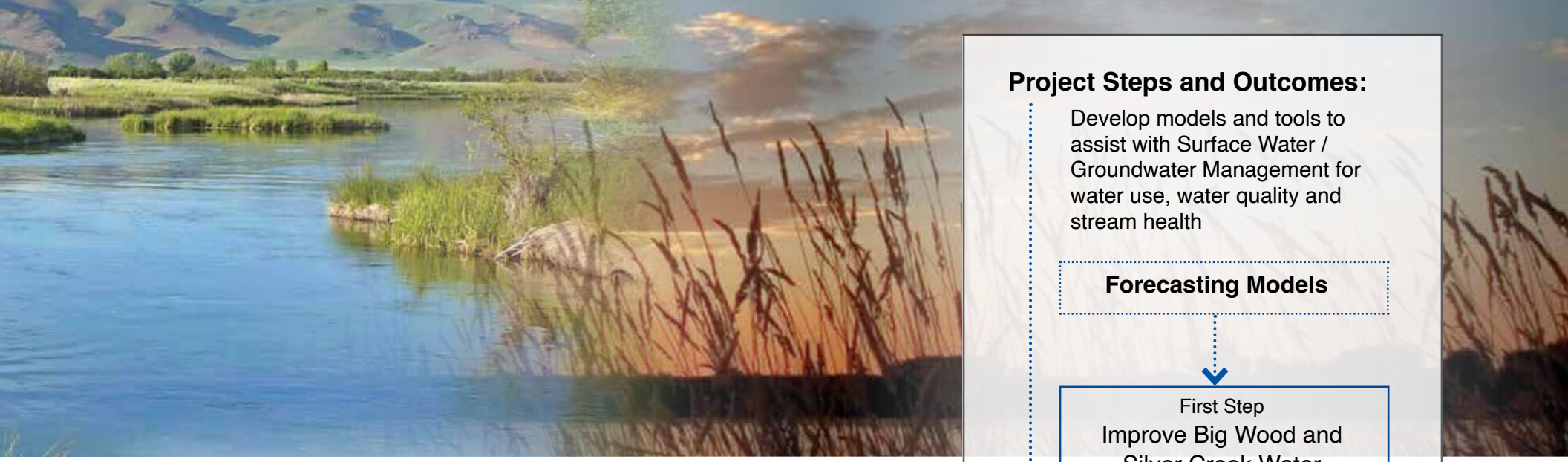


Susie Q

Water Quantity and Water Quality Forecast Tools

Comprehensive management of water resources is fundamental to the water allocation needs and conservation efforts of the stakeholders within the Silver Creek and Big Wood River watersheds. The management of surface water and groundwater resources is particularly challenging due to several factors, including—hydrologic extremes, water availability, irrigation needs, and water quality issues. For example, due to the severe drought conditions recorded in 2021, water curtailment orders were sent to junior water users in the Silver Creek Valley. In addition, during this dry period in 2021, the average number of days that experienced stream temperatures above 70 degrees throughout the tributaries of Silver Creek increased notably, especially when compared to previous years of stream temperature data.

In 2022, Ecosystem Sciences Foundation partnered with additional expertise at Boise State University, Montana State University, and the Wood River Land Trust to analyze and model relationships between surface and groundwater interactions, water availability, and aquatic ecosystem health in the Big Wood River and Silver creek watersheds. The primary aim of this two-year long project collaboration is to gain



a better understanding of management approaches that can balance agricultural and ecological needs.

By the spring of 2024, an interactive, online interface should be available to interested stakeholders and surface water/groundwater users in the Big Wood River and Silver Creek watersheds. This website will help facilitate better understanding of water quantity and stream health through modeling tools that will be developed by the team. The project will leverage a variety of water quantity resource data for the entire Big Wood River Management Area, including eleven years of water quality temperature and dissolved oxygen data collected by Ecosystem Sciences Foundation.

Ultimately, the project will help facilitate and further inform stakeholders about methods and strategies that can be used to mitigate late summer low flows and associated impacts on stream health within the context of a working agriculture landscape. In addition, it is hoped that this project results in each stakeholder having an improved understanding of the overall processes (e.g., the metrics and techniques) that are required to successfully manage water within the Big Wood River and Silver Creek watersheds.

For more information please visit: www.boisestate.edu/redi/nifa/

Project Steps and Outcomes:

Develop models and tools to assist with Surface Water / Groundwater Management for water use, water quality and stream health

Forecasting Models

First Step
Improve Big Wood and Silver Creek Water Forecasting Models

Second Step
Stream Temperature and Dissolved Oxygen Model

Third Step
Online, Interactive Tools and Data Visualization

Synthesis:
Outreach, Guidance and Information to Stakeholders

Next Steps

Stream Restoration

Stream restoration that balances water conservation values with agricultural land use is vital to the preservation of many fish. Stream restoration using natural channel design methods can be implemented to address these issues. Water conservation and stream restoration have become increasingly important to sustainable water resource management and finding equitable solutions that help reduce conflicts and solve complex economic and environmental problems. In the face of climate change, increased water demand and intensive land uses, adverse impacts to water quality and quantity are evident in Silver Creek. Among dwindling water supplies, competition for water has increased, especially within this arid watershed. Silver Creek has impaired stream and ecological functioning in many areas of the watershed that can be addressed through targeted restoration.

Silver Creek offers many opportunities to improve the in-stream conditions and restore an ecological balance. Restoration goals should include: (1) reconstruction of self-maintaining and resilient streams that connect to historical floodplains and contain high-quality, diverse habitats; (2) creation of off-channel oxbow ponds and restoration of productive wetlands and riparian habitats; (3) raising the groundwater table to improve subsurface saturation conditions; (4) enhancement of hydrological connections and baseflows to maintain fish habitat and ecological functioning; and, (6) improvement of wild trout populations and increasing diversity of non-salmonid fish and benthic invertebrate species in stream reaches identified as problematic.

Fish Habitat Analysis and Mapping

Fish habitat features and redd counts were surveyed on nearly all the tributaries of Silver Creek during fall 2015 and spring 2016. However, due to lack of funding, the mainstem of Silver Creek has not been surveyed yet. ESF is seeking funds to conduct redd counts in the mainstem of Silver Creek during the spring season and fall seasons in 2023. Our goal is to create a geodatabase with redd locations for brown trout and rainbow trout, as well as a map that identifies redd locations and delineates habitat such as: spawning areas, early rearing and nursery areas, side channels, pools, undercut banks, resting and feeding zones, and streambank conditions.

Monitoring and Maintenance

Over the past 12 years, the Silver Creek Program has monitored stream hydrology, water temperature, sedimentation, and most recently dissolved oxygen. Combined, these parameters are indicators of ecosystem health—much like checking our own body temperature and circulatory system. Monitoring is paramount to understanding ecological processes and relationships, identifying trends and establishing effective strategies for enhancement. However, monitoring is a long-term scientific tool that must be done consistently over time; the more data collected, the more meaningful the results. As our monitoring program continues, it is necessary to periodically replace temperature sensors, redeploy DO sensors, and upgrade stream flow measurement equipment, all of which come at a capital cost. We are seeking additional funding to maintain our monitoring equipment to continue these important programs.

Funding

To continue our ongoing monitoring work and perform new analyses, as described above, our Silver Creek Program needs additional funding. Our program is heavily based on monitoring and data analysis; we have found that these activities alone are rarely funded through traditional grant programs. Please consider a donation to continue this important work. A substantial volunteer effort goes into the Silver Creek program each year and your donations directly support the Program. Thank you for your support!

Please send donations to:

Ecosystem Sciences Foundation

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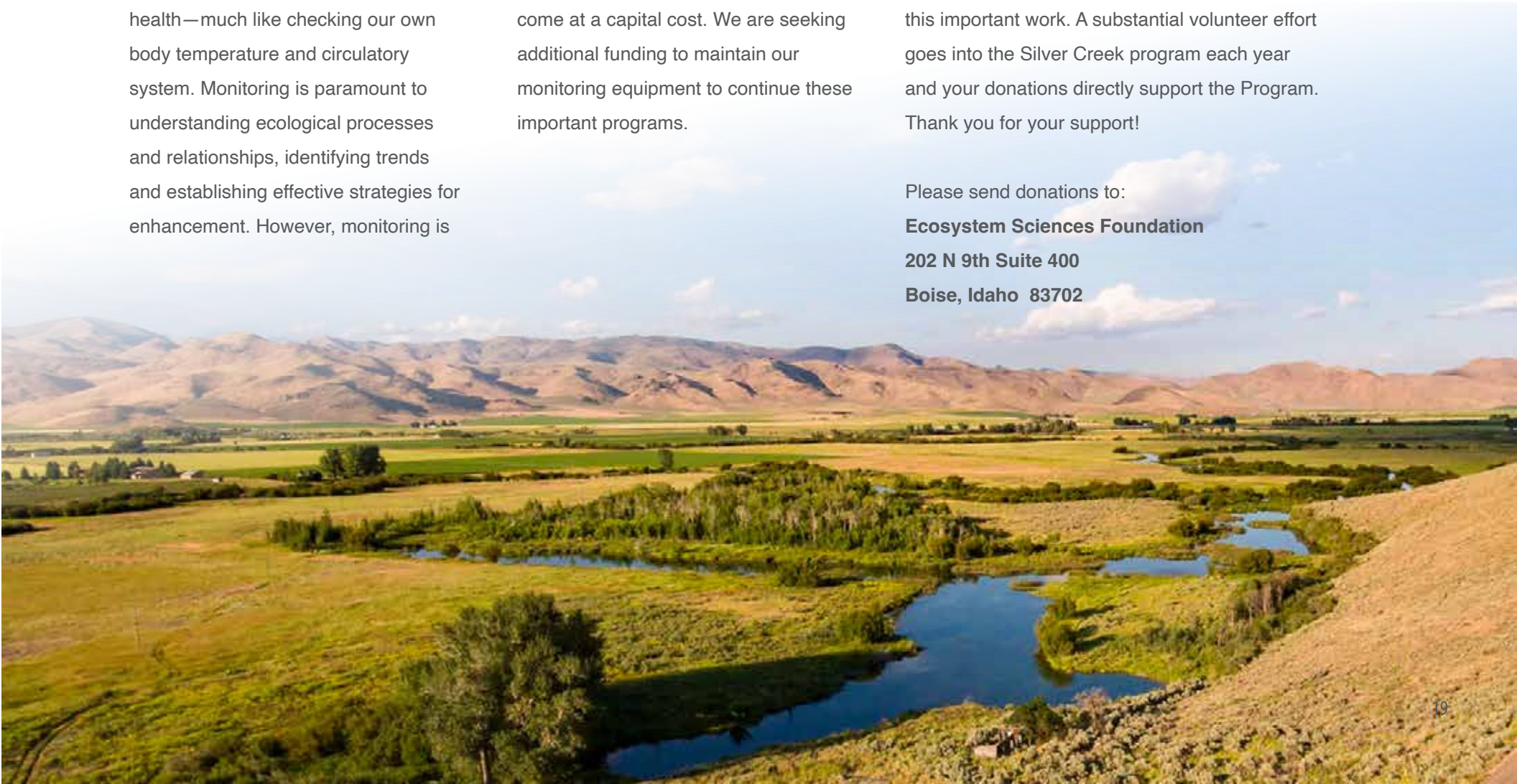

2022

Silver Creek Annual Report

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