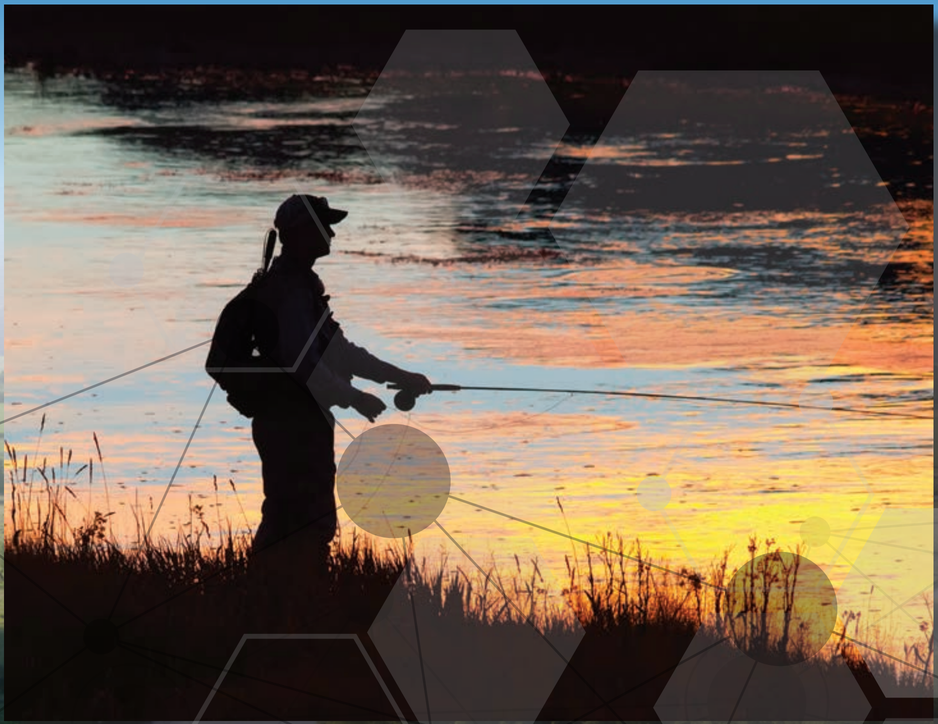
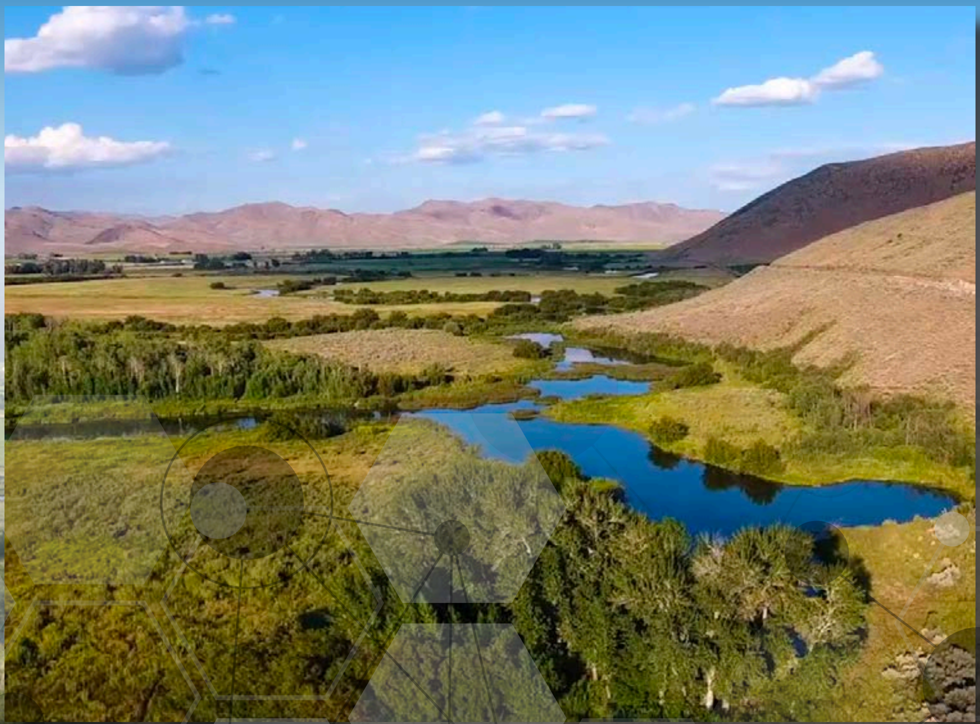
Silver Creek

Annual Report

2024

Ecosystem Sciences Foundation





Ecosystem Sciences Foundation

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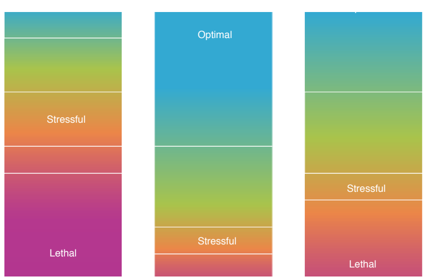
Silver Creek Watershed

2024 Annual Monitoring Report

Contents



Silver Creek Watershed

2024 Report

The Ecosystem Sciences Foundation (ESF) has been involved in the Silver Creek watershed since 2009, when it partnered with The Nature Conservancy to develop a Restoration and Enhancement Strategy. This strategy outlined several actions to address existing data gaps regarding stream flow, temperature, and sediment conditions. To tackle these gaps, ESF initiated a monitoring program in 2010 aimed at enhancing our understanding of the Silver Creek system. Over the past year, ESF and its partners have continued to gather essential data on stream flows, temperature, and dissolved oxygen levels. Additionally, ESF participated in a three-year project that integrates water quality and water quantity monitoring data into an interactive stream flow forecast model for the Wood River Valley.

To date, our Silver Creek monitoring program has received support from numerous stakeholders. Given that most of the land in the watershed is privately owned, landowners recognize the importance of protecting the ecological health of the watershed while also respecting their rights. Our partners and stakeholders have been crucial in helping us achieve our vision of guiding stewardship for the Silver Creek Watershed and in designing and promoting effective stream restoration and enhancement initiatives.

The significant conclusions and findings from 2024 are:

- The flow levels in Silver Creek were close to the historic average for the system. The Big Wood Basin benefitted from a series of late-winter and early-spring storm cycles that slightly increased water availability within the Silver Creek system. The stream volumes in all of Silver Creek's tributaries were also near average.
- Stream temperatures in the Silver Creek system reached higher levels compared with the previous year, and spring temperatures were the warmest since 2021. More areas experienced temperatures sustained above the stressful limit for fish for extended periods compared to 2023. The number of days when temperatures exceeded the 70 °F stress band threshold increased from the previous year.
- Dissolved oxygen monitoring revealed that in certain areas of Silver Creek, dissolved oxygen concentrations became critically low, putting stress on all life stages of trout, particularly in Butte Creek and lower Silver Creek. However, these low oxygen levels were generally limited to the early morning hours. In the afternoons, dissolved oxygen levels tended to 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.

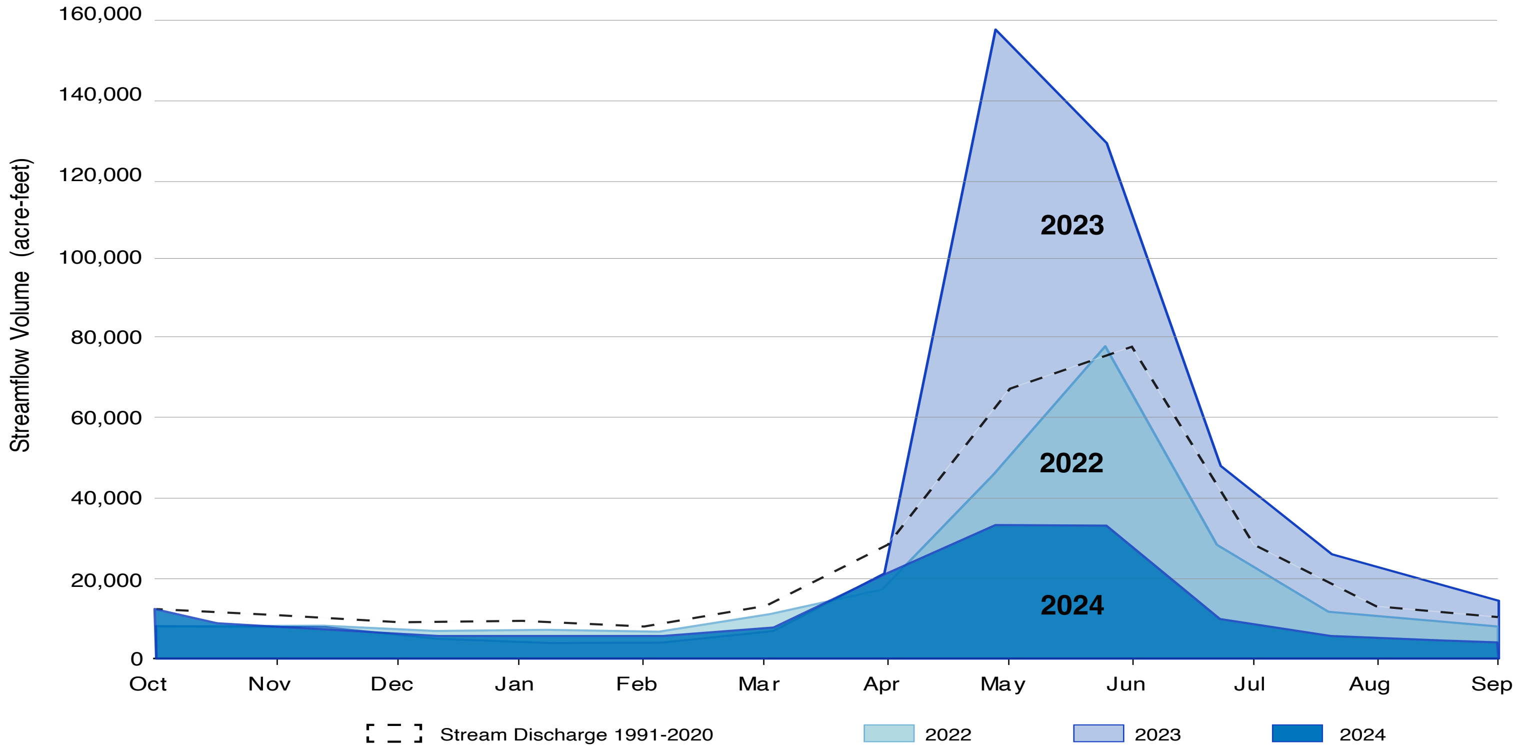
The water year for 2023-2024 featured snowpack levels that were close to the recent 30-year average. In April 2024, the snow water equivalent (SWE) levels in the Big Wood Basin were measured at 97% of the median (1991 to 2020). We calculated the total streamflow volume for the Big Wood River at Hailey (USGS gauge #13139510) to be 5% below the median based on streamflow data from 1991 to 2020. Throughout 2024, the Big Wood River at Hailey experienced streamflows near the historical median for most of the monitoring period.

The accumulated precipitation measured at the Picabo Agrimet Weather Station was the second highest in the last five years, following 2023. This is positive news for the Silver Creek system, which relies almost entirely on groundwater levels within the Wood River Valley Aquifer and summer precipitation.

As a spring-fed system, Silver Creek receives its water from groundwater upwelling at springheads and streambed inputs, ensuring consistent flow.

In 2024, monitoring of Silver Creek's tributaries revealed a decrease in spring and stream flows compared to 2023. Well water monitoring within the South Valley Groundwater District showed that groundwater depth and artesian pressure were sustained at most wells from May to October 2024. The consistent, cool groundwater inputs during the summer months contributed to lower average and maximum stream temperatures at most locations compared to previous monitoring years. These benefits highlight the significance of groundwater as the ecological driver of the Silver Creek ecosystem.

Winter Snow + Water Year 2024



Big Wood River stream flows (measured in acre-feet) for 2024 as compared to the 30-year median (1991-2020).

April 1, 2024

Idaho Water Supply Outlook Report

Big Wood Basin
97%
of median snowpack

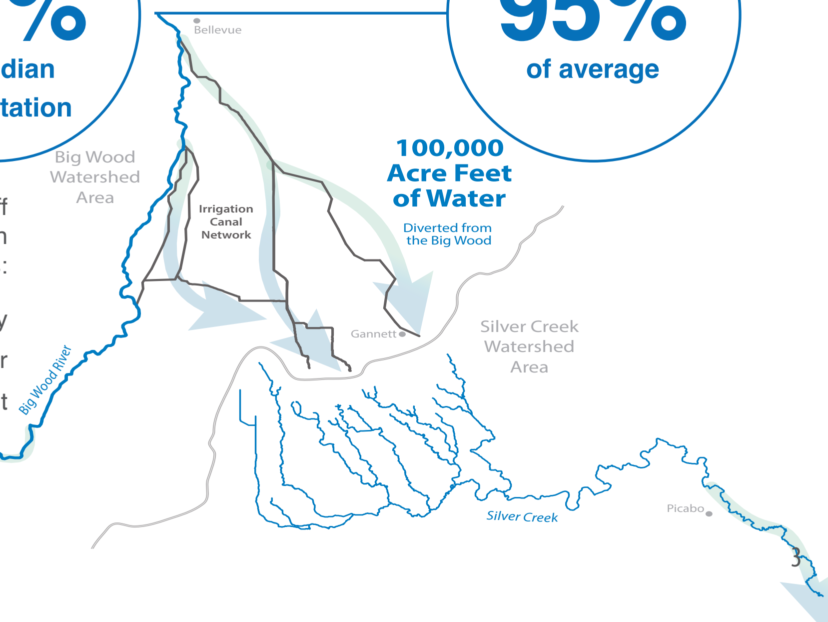
Big Wood Basin
91%
of median precipitation

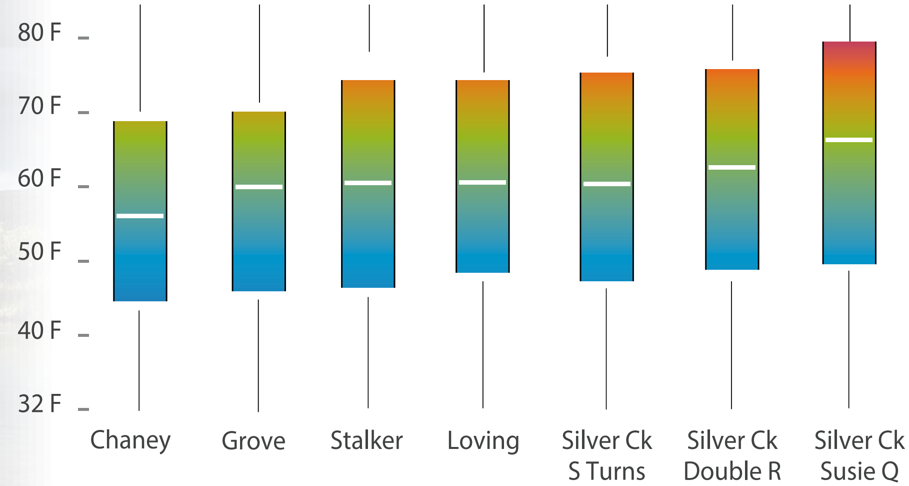
Streamflows up to
95%
of average

In 2024, the Big Wood Basin received average precipitation between October and April. Picabo Accumulated Precipitation Average was 9.98 inches (April - Sept.)

Snowpack conditions, forecast streamflow runoff and groundwater flows were above average in 2023. 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 presents the maximum, average, and minimum summer water temperatures recorded in various areas of Silver Creek over a fourteen-year period from 2011 to 2024. This year, 37 stream temperature loggers and 13 springhead loggers were used to monitor conditions throughout Silver Creek and its tributaries. These loggers collected essential data to track changes in the system.

Stream Temperature

In 2024, we deployed 13 springhead loggers and 37 stream temperature loggers in key locations throughout the Silver Creek Watershed. Monitoring the springs that feed Silver Creek is important because they are the primary source of water for the system. These springs provide consistent, cool water to Silver Creek's tributaries, helping to mitigate changes in air temperature and climatic conditions.

The 13 springhead loggers recorded median temperatures remaining around 50°F throughout the summer of 2024. The above-average water year in 2023 contributed to increased flows into 2024, resulting in only slight increases in spring and stream temperatures compared to 2023. The average water year in 2024 helped maintain near-normal groundwater levels in the valley, similar to those in 2023. As a spring-driven system, these springs are critical to the health and sustainability of Silver Creek.

Temperature monitoring within Silver Creek and its tributaries revealed that median and maximum stream temperatures were above average at most locations. In fact, the cumulative median stream temperatures recorded in 2024 saw a 2.6°F increase in the average median temperature from 2023 to 2024. This increase illustrates the relationship between the average water year in 2024 and the benefits carried over from the above-average water year in 2023, which helped maintain near-normal groundwater levels.

A few locations in our Silver Creek monitoring array experienced decreases in median temperatures from 2023, including Upper Stalker (decrease of 0.8°F), Mid Mud Creek (decrease of 2°F), and Upper NF Loving Creek (decrease of 0.2°F). Conversely, tributaries that recorded increases in median temperatures from 2023 included Lower Wilson Creek (increase of 1.3°F), Lower Loving Creek (increase of 0.8°F), and Upper Chaney Creek (increase of 1.2°F).

A Fourteen-Year Review of Stream Temperature Monitoring

This year marks the 14th year of accumulating stream temperature data from tributaries across the Silver Creek subbasin. We continue the discussion we began in 2015 regarding a review of cumulative stream temperature monitoring data.

Perennial hot spots for elevated temperatures across all monitored years 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 far downstream in our monitoring array, making them more susceptible to warm water inputs. In contrast, none of the 13 headwater springs we monitor recorded median daily temperatures above the 70°F threshold, which is known to induce stress in fish.

From 2011 to 2024, our data indicates a decreasing trend in stream temperatures across Silver Creek and its tributaries. In the first seven years of monitoring (2011-2017), the daily median stream temperatures exceeded 70°F an average of 20.2 days per year. From 2018 to 2024, this average decreased to 14.7 days. Notably, the average median stream temperatures in 2024 were the warmest they have been since 2015, with the number of days during which temperatures surpassed the 70°F stress threshold increasing from 8.1 days in 2023 to 9.7 days in 2024.

Throughout the 14-year temperature monitoring period, the three highest recorded average median stream temperatures occurred in 2015 (60.5°F), 2013 (60.3°F), and 2024 (60.2°F). In the last seven years, the average median temperature in the streams rose to 59.0°F, primarily due to the warmer temperatures observed in 2024. This year, the average median temperature across all tributaries increased as compared to 2023 averages in all tributaries.

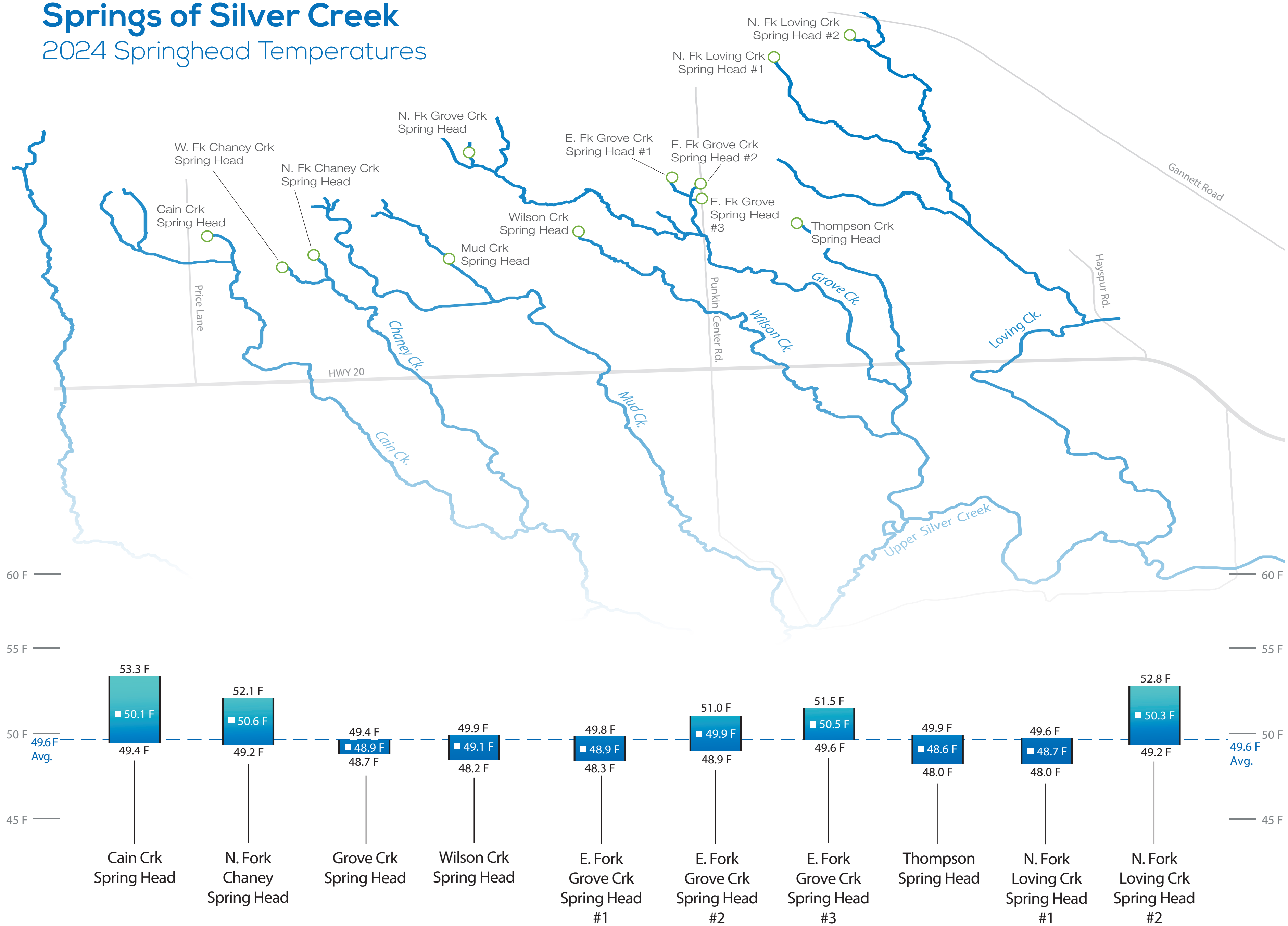
In 2016, our analysis showed that the relationship between stream temperature and stream flow was more closely related than the relationship between stream temperature and ambient air temperature. While it remains uncertain if this relationship still holds today, near-average stream flows in the Silver Creek and Big Wood River systems in 2024 contributed to the fourth-lowest average number of days (7.2 days) exceeding the 70°F temperature threshold recorded during this entire period.

The hydrology of Silver Creek basin consists of a complexly interconnected surface water - ground water system. Silver Creek rises from a series of springs in the Gannett area, south of Baseline Road, and flows south and eastward out of the basin.

These springs are formed as a result of recharge from snowmelt and runoff entering the groundwater system; by application of irrigation water in amounts in excess of consumptive use requirements of crops; and, upward pressure from the underlying artesian aquifer system. The artesian groundwater system contributes to the spring flow by means of upward leakage through the overlying sediments to the surface.

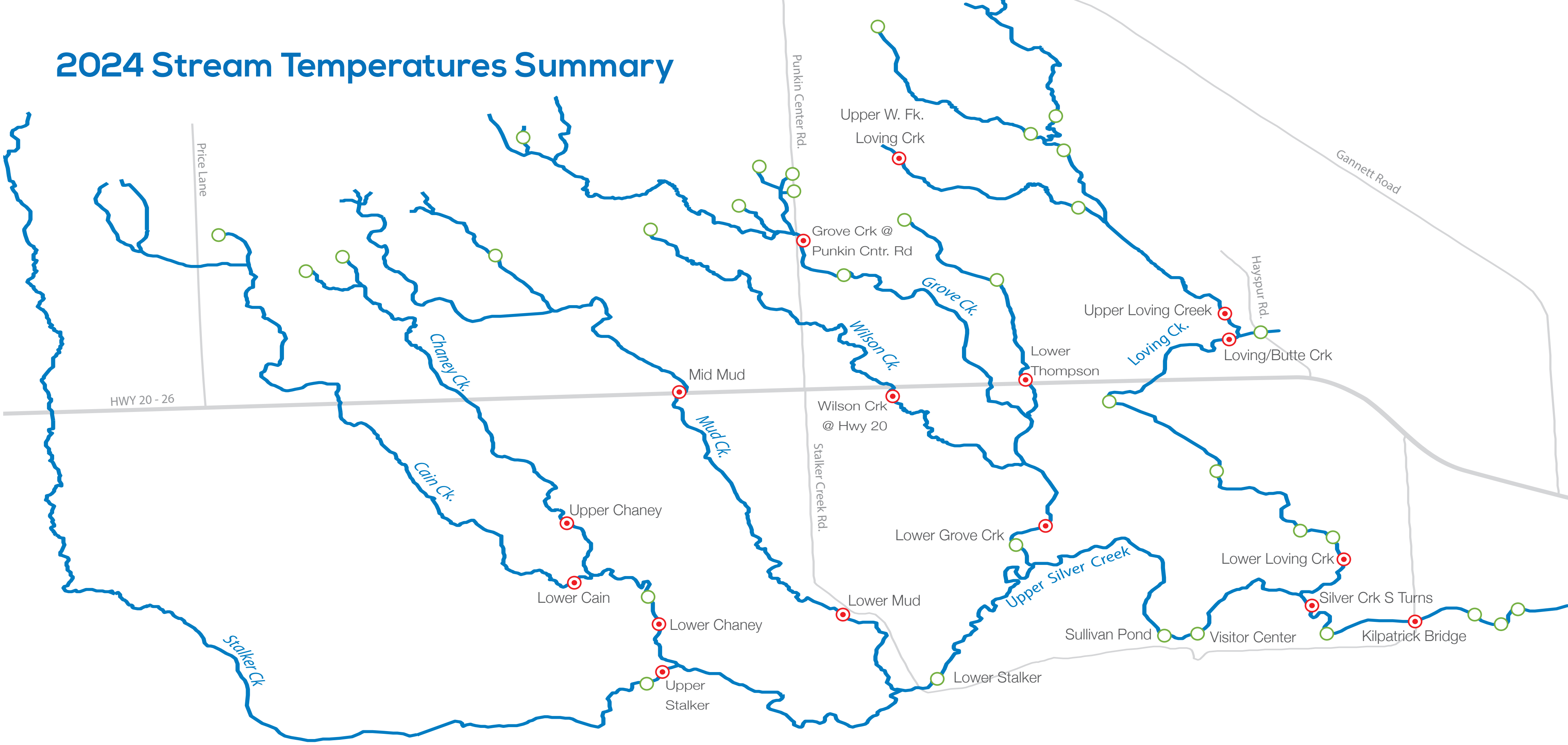
Springs of Silver Creek

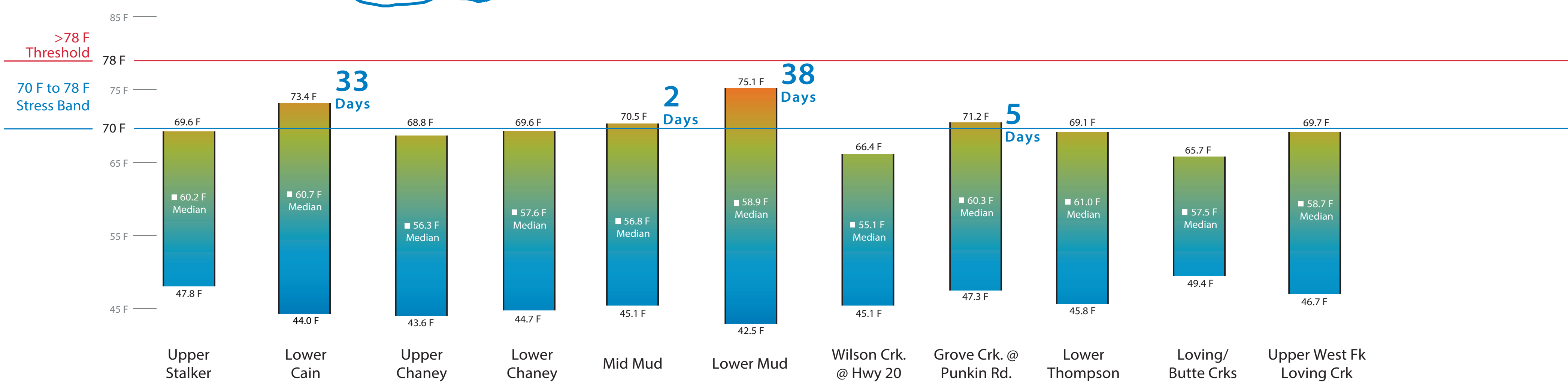
2024 Springhead Temperatures



Springhead Temperature Bands The graphic above summarizes the spring head temperature data collected throughout the summer season. The data covers the period from June to September 2024, highlighting the spring temperatures observed during that time. Each graph illustrates the total temperature range from June 1 to September 30, including the absolute high and low temperatures, as well as the median water temperature for the spring.

2024 Stream Temperatures Summary





Stream temperature bands The graphic above summarizes the stream temperature data for the entire summer season from a selected group of data loggers and locations. This data, analyzed for the summer months of June through September 2024, illustrates the high temperatures recorded throughout the stream system. Each graph displays the total temperature range over the period of record, including the absolute high and low temperatures, as well as the median stream temperature for each specific 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:

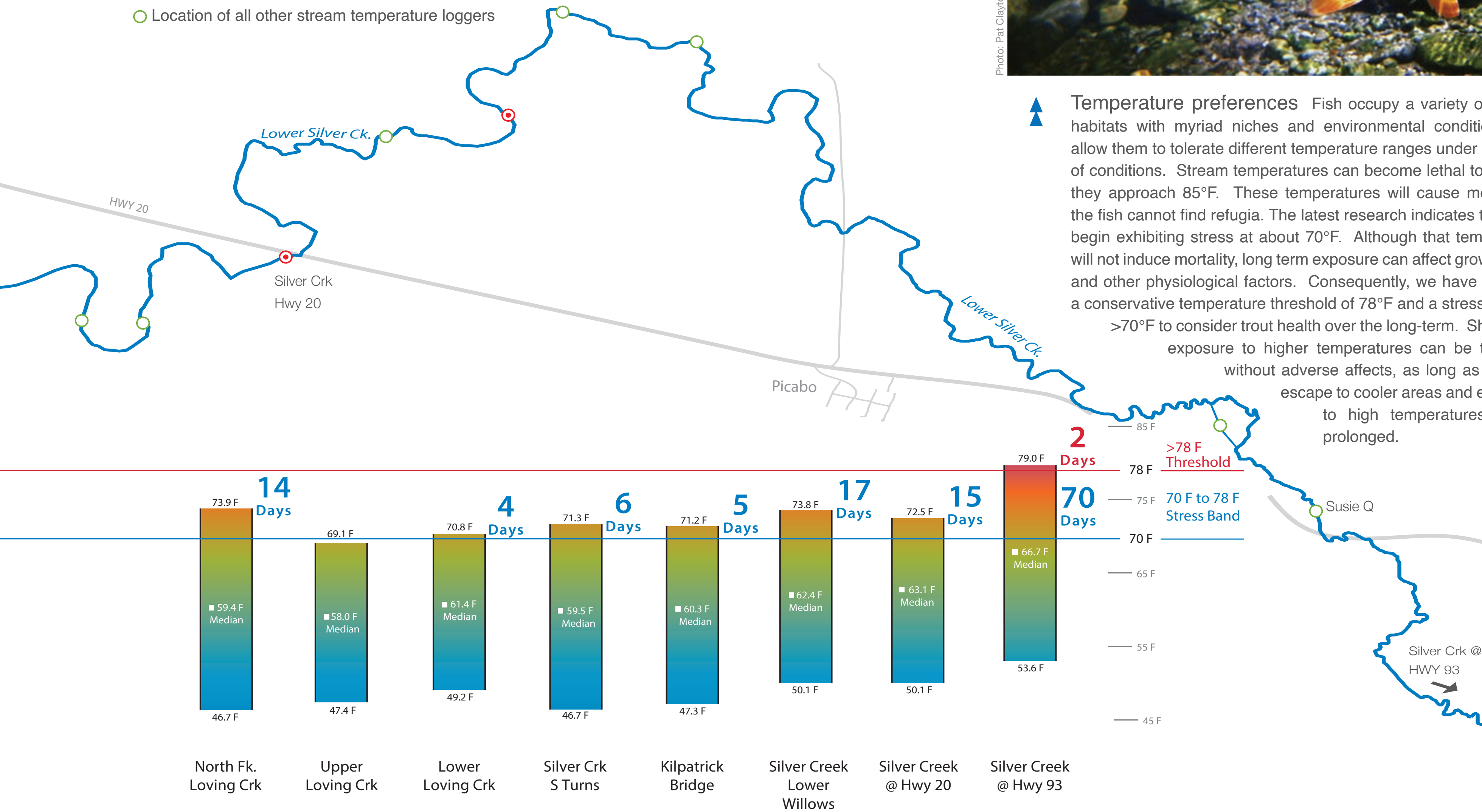
Location of stream temperature loggers illustrated in bottom graphic of seasonal temperatures

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

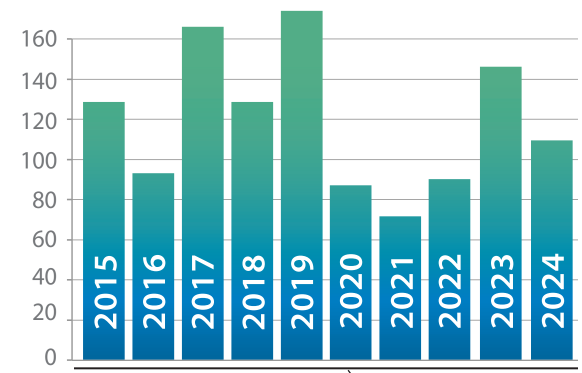
Temperature preferences Fish occupy a variety of stream habitats with myriad niches and environmental conditions that allow them to tolerate different temperature ranges under a variety of conditions. Stream temperatures can become lethal to trout as they approach 85°F. These temperatures will cause 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.

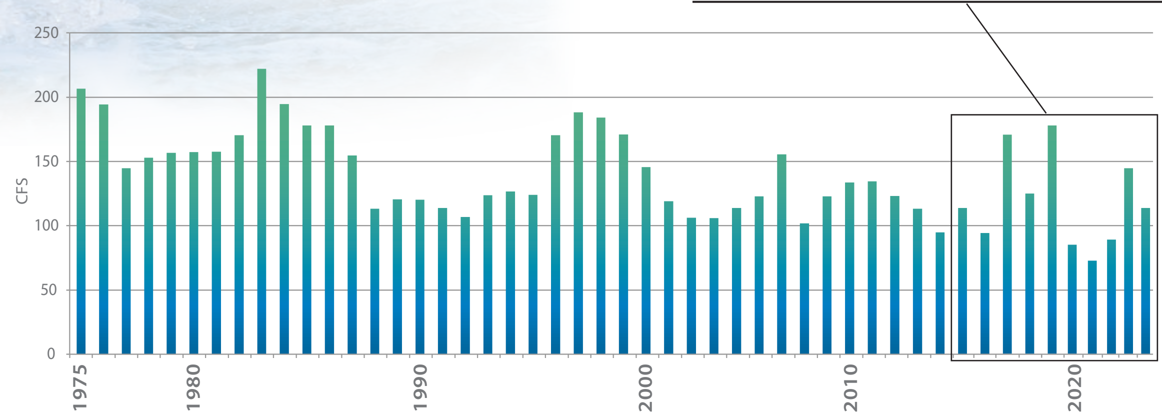


Throughout the summer, the overall median temperatures were within the reference range for trout, which is around 55 to 60 degrees Fahrenheit. The medians for specific locations were as follows: Chaney (56-58°F), Mud (55-59°F), Wilson (55°F), North Fork Loving Creek (59°F), and Upper W Fork Loving Creek (58°F). Compared to measurements taken in 2023, the number of days that temperatures fell within the stress band for trout (70°F-78°F) increased in 2024. The only temperature monitoring site where temperatures exceeded the upper stress threshold of 78°F for trout was Silver Creek at Highway 93.

Stream Hydrology

Annual average streamflow (cfs) at USGS gage (Sportsman Access) 2015 - 2024.





Silver Creek annual average streamflow (cfs) at USGS gage (Sportsman Access) 1975 - 2024.

Monitoring stream flows is crucial for understanding the volume and origin of water flowing into Silver Creek's tributaries, as well as its potential impact on water temperature, dissolved oxygen levels, and other water quality parameters.

In 2024, the total annual discharge at Sportsman's Access was close to the average for the past 1991-2020 30 years. The flow volumes in Silver Creek's tributaries during 2024 were lower compared to 2023 but higher than those in 2022, 2021, and 2020, indicating an average water year for the creek and its tributaries. Notably, the flow in Silver Creek and its tributaries was particularly lower in the latter half of the summer of 2024 compared to the same period in 2023. Additionally, the Big Wood River also experienced a below average annual discharge in 2024.

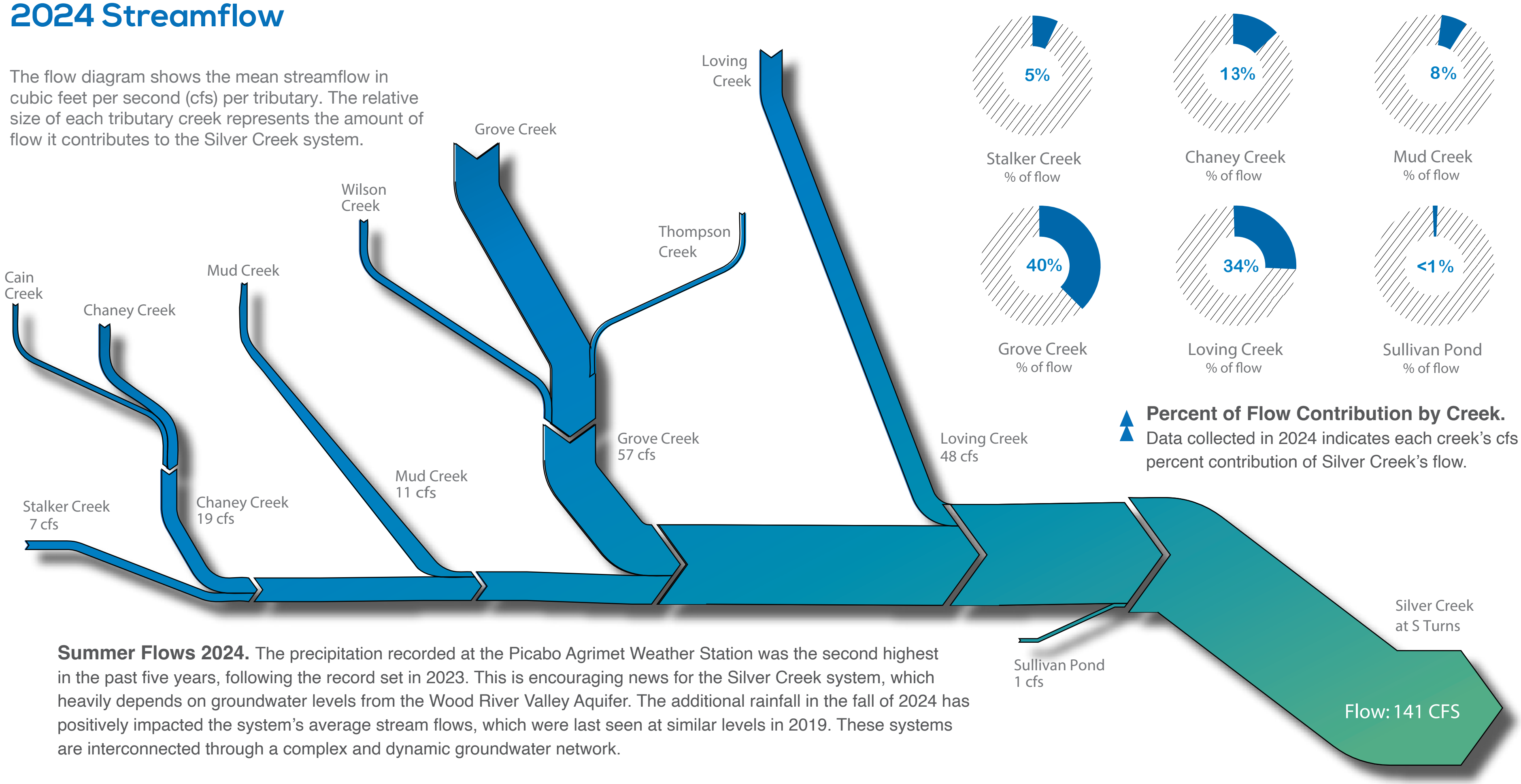
Big Wood River Average Annual Discharge at Hailey gage (cfs):

2015	**311.5**
2016	**406.4**
2017	**1,003.0**
2018	**478.6**
2019	**598.9**
2020	**253.9**
2021	**188.2**
2022	**331.1**
2023	**689.6**
2024	**364.0**

The 2024 water year experienced average stream flows in Silver Creek. In the Big Wood River flows at Hailey were lower than in 2023 and similar to 2018 levels. Unlike 2023, there was no extended cold precipitation period in late spring to enhance streamflows. While the spring was cool and wet, it was less pronounced than in 2023, leading to initially above-average flows that later fell slightly below average. The summer was hot and dry until a significant storm in late September. As a result, stream flows were average, and slightly below those of 2018.

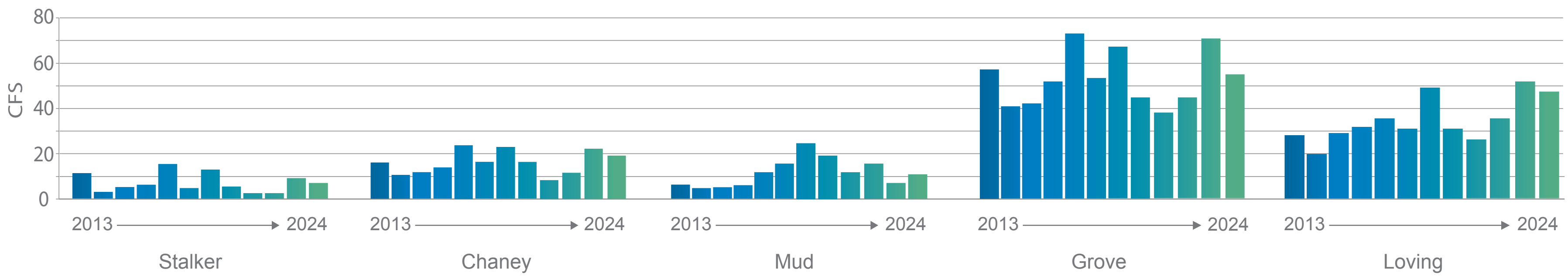
2024 Streamflow

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 2024 indicates each creek's cfs and percent contribution of Silver Creek's flow.

Summer Flows 2024. The precipitation recorded at the Picabo Agrimet Weather Station was the second highest in the past five years, following the record set in 2023. This is encouraging news for the Silver Creek system, which heavily depends on groundwater levels from the Wood River Valley Aquifer. The additional rainfall in the fall of 2024 has positively impacted the system's average stream flows, which were last seen at similar levels in 2019. These systems are interconnected through a complex and dynamic groundwater network.



Annual average streamflow by creek for 2013-2024. Data collected from 2013 - 2024 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

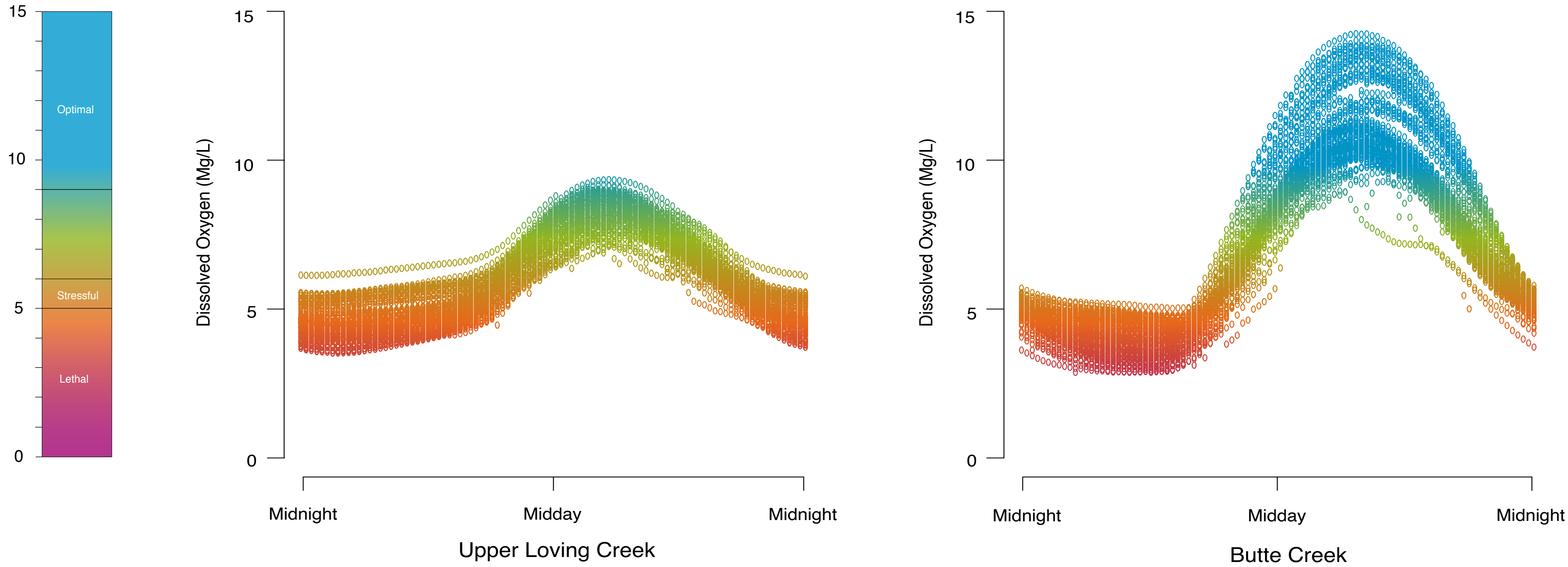
Since 2017, dissolved oxygen (DO) levels have been continuously measured from June through September at seven sites. Data is recorded using optical sensors that capture DO and temperature values every 15 minutes. In 2024, DO was measured at two additional sites.

As in previous years, the data shows that not all of Silver Creek's waterways exhibit the same patterns of DO values, and that DO levels can stress fish in certain locations at specific times of the day. Seasonal fluctuations also occur due to variations in sunlight, temperature, streamflow, and aquatic plant growth throughout the year.

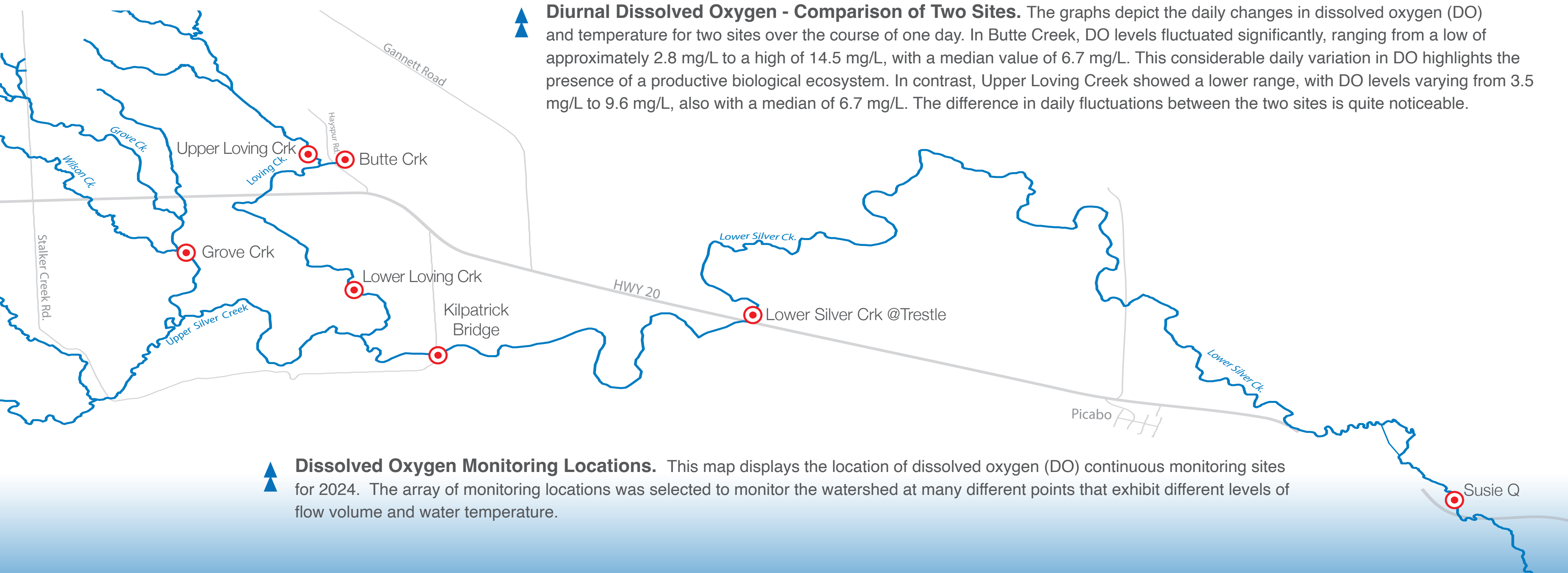
In many areas of the Silver Creek system, daily fluctuations in DO are significant, highlighting a productive biological engine within the aquatic ecosystem. As aquatic plants within the stream use sunlight for growth—a process known as photosynthesis—they produce oxygen as a by-product, which is released into the water as DO. This leads to increased DO levels during the afternoon and decreased levels from evening to morning.

However, aquatic plants continue to respire oxygen overnight, despite the absence of photosynthesis. This respiration process consumes oxygen (known as biological oxygen demand), which is drawn directly from the water. Consequently, DO levels fluctuate throughout the day, creating a distinct diurnal cycle. The diurnal graphs presented indicate that not all cycles are identical. For instance, the sensor placed at Upper Loving Creek shows many different diurnal characteristics compared to the Butte Creek location. Despite their close geographic proximity, their DO levels vary significantly due to a combination of factors, including streamflow magnitude, temperature, nutrient concentrations, and aquatic plant life.

When DO readings fall into a stressful range for fish, they seek refuge in areas with higher DO concentrations. Fish eggs, often buried within the gravel substrate of the streambed, lack the mobility to escape these conditions. At the selected sites, 30% of all measurements taken were within the stressful to lethal range for fish and their eggs (1st quartile at Suzie Q: 5.1 mg/L; Butte: 4.1 mg/L; Lower SC at the Trestle: 5.0 mg/L). The seasonal graphs display all the data points collected during the 2024 season.

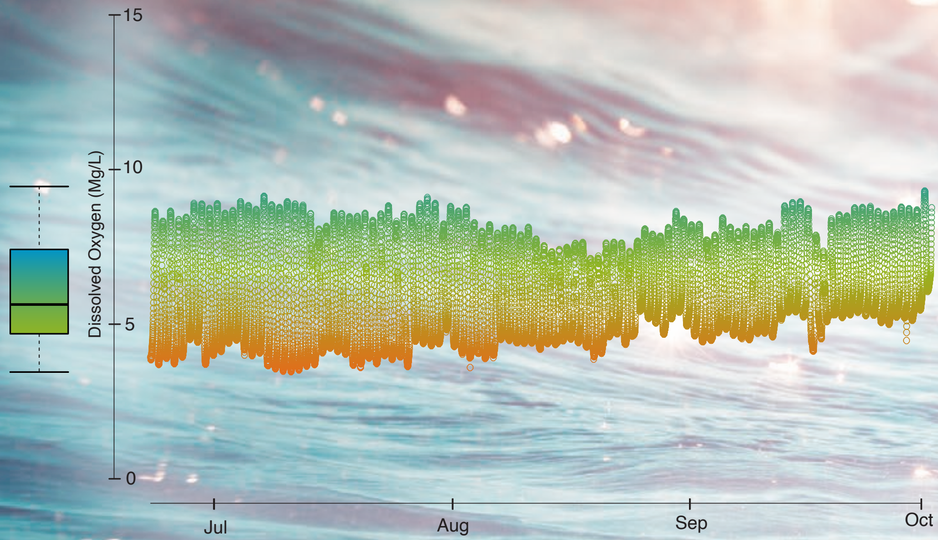


Diurnal Dissolved Oxygen - Comparison of Two Sites. The graphs depict the daily changes in dissolved oxygen (DO) and temperature for two sites over the course of one day. In Butte Creek, DO levels fluctuated significantly, ranging from a low of approximately 2.8 mg/L to a high of 14.5 mg/L, with a median value of 6.7 mg/L. This considerable daily variation in DO highlights the presence of a productive biological ecosystem. In contrast, Upper Loving Creek showed a lower range, with DO levels varying from 3.5 mg/L to 9.6 mg/L, also with a median of 6.7 mg/L. The difference in daily fluctuations between the two sites is quite noticeable.

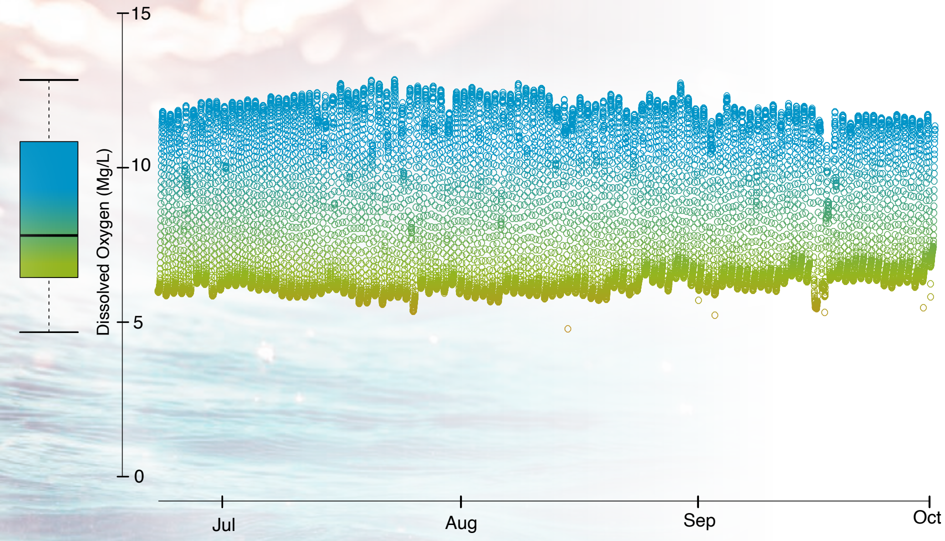


Dissolved Oxygen Monitoring Locations. This map displays the location of dissolved oxygen (DO) continuous monitoring sites for 2024. The array of monitoring locations was selected to monitor the watershed at many different points that exhibit different levels of flow volume and water temperature.

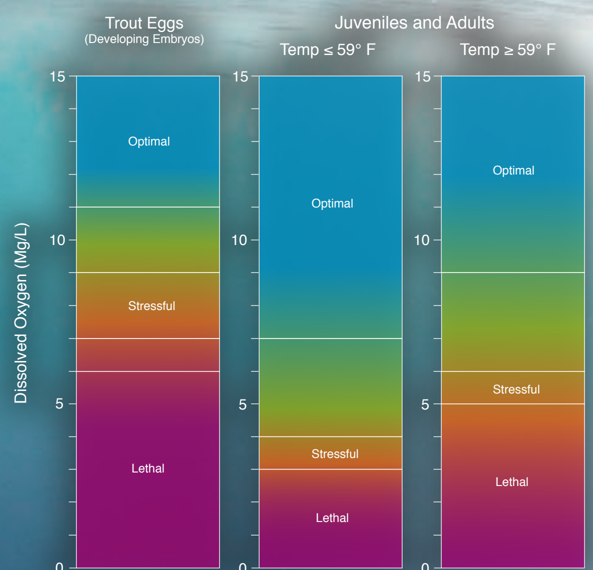
Dissolved Oxygen Results



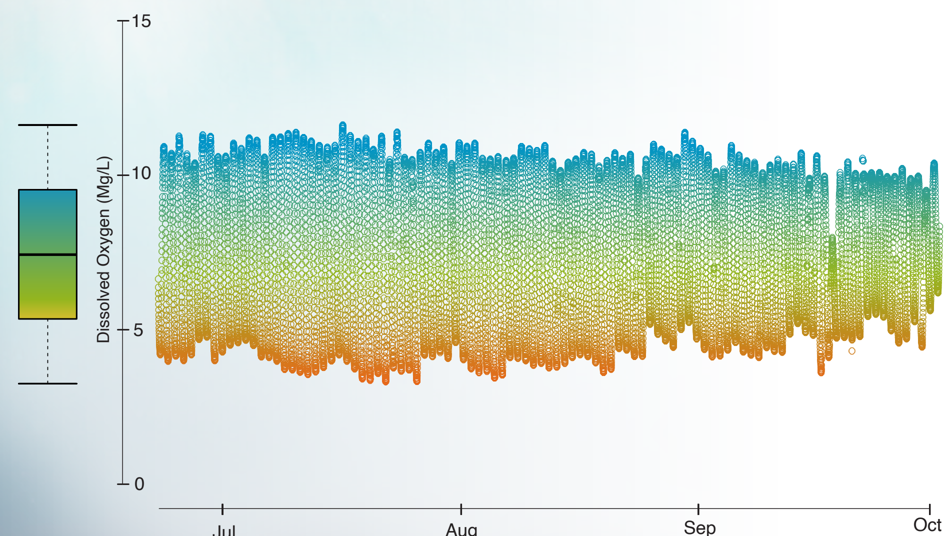
Upper Loving Creek



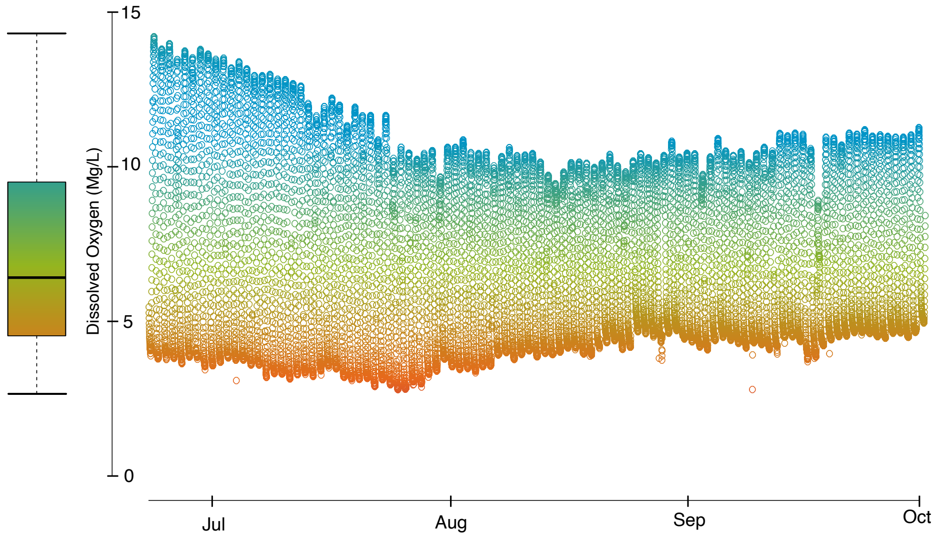
Grove Creek



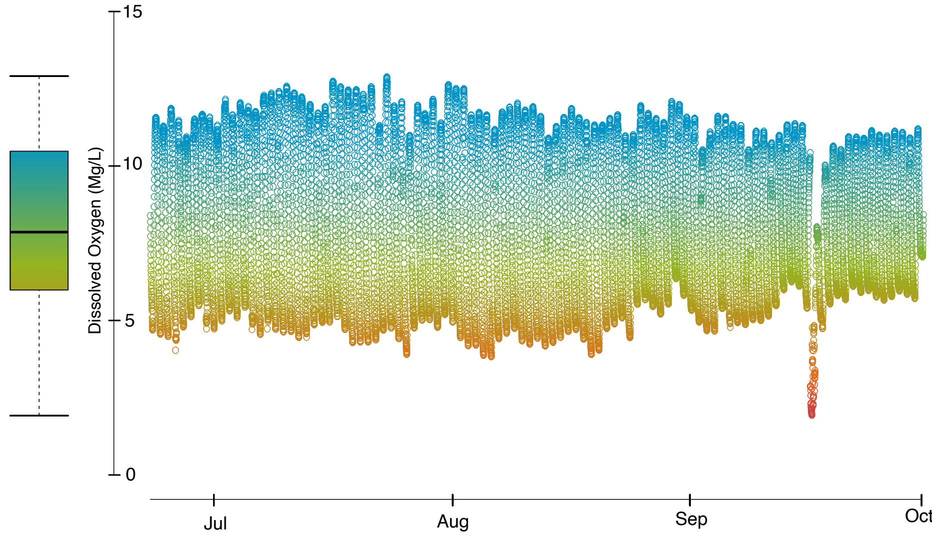
Average Dissolved Oxygen Requirements for Salmonids. Trout, depending on their particular life stage (egg, Juvenile, Adult), have differing requirements and thresholds for dissolved oxygen levels. Water temperature also plays a major role in dissolved oxygen levels. (Adapted from EPA's Chapman, 1986,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



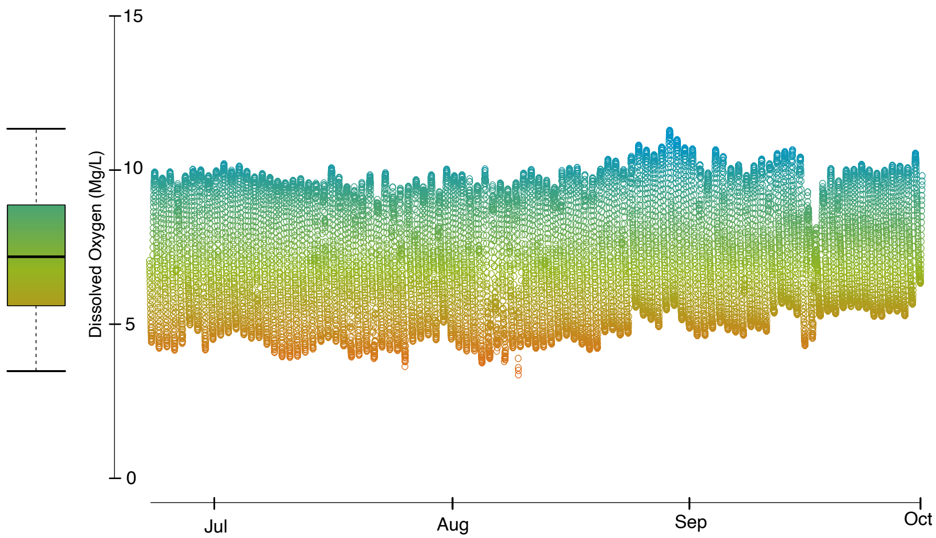
Kilpatrick Bridge Silver Creek



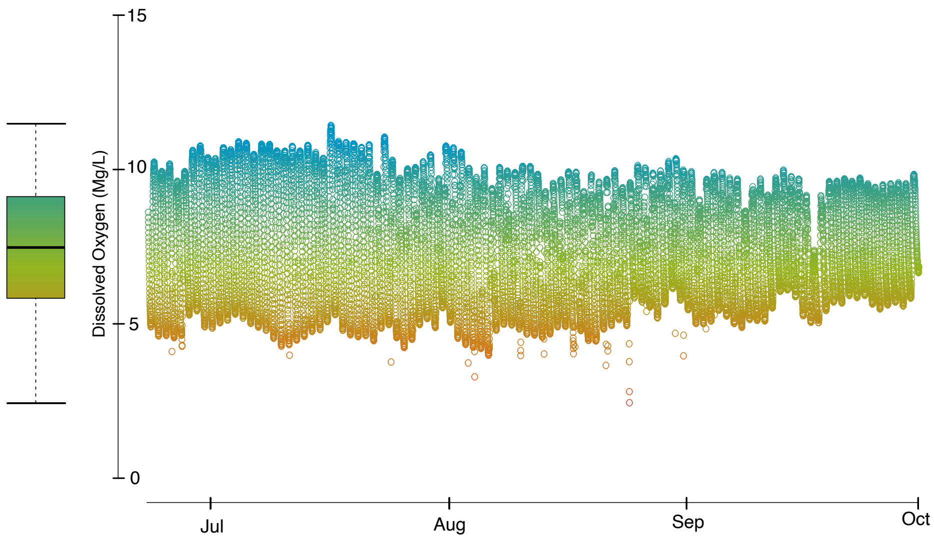
Butte Creek



Lower Silver Creek at Trestle



Lower Loving Creek

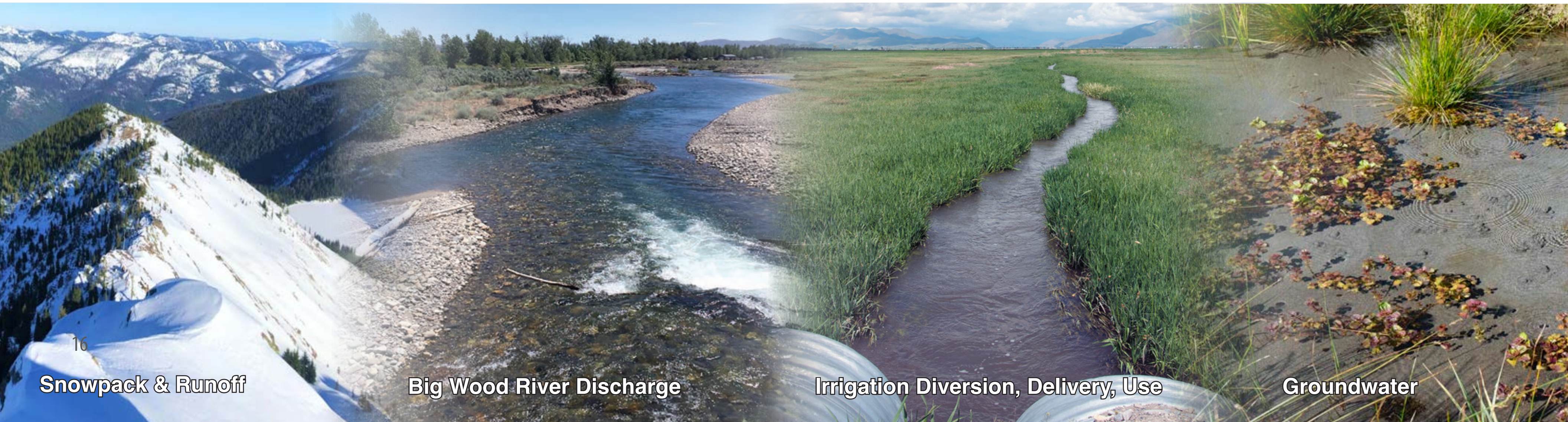


Susie Q

Big Wood River Groundwater Management Area

Since 1991, when the Big Wood River Groundwater Management Area (BWRGWMA) was established, regulatory agencies and stakeholders have recognized the interconnectedness and complexity of the surface and ground waters in the Big Wood River drainage. To address diminishing surface water flows caused by groundwater diversions, the Idaho Department of Water Resources (IDWR) imposed restrictions on the approval of new groundwater appropriations for non-consumptive uses. New applications must now demonstrate the ability to mitigate depletions that would negatively impact senior water users. These restrictions have helped minimize new depletions within the BWRGWMA, but concerns among stakeholders regarding the interactions between surface and groundwater in the Big Wood River drainage persisted over the years.

To gain a better understanding of these interactions, several initiatives were undertaken by various agencies and stakeholders to fill knowledge gaps. Initiatives included expanding the existing hydrological monitoring network in the Wood River Valley, developing a groundwater flow model for the area, and creating two distinct groundwater monitoring districts within the Wood River Valley: the Galena Groundwater District (GGWD) and the South Valley Groundwater District (SVGWD).



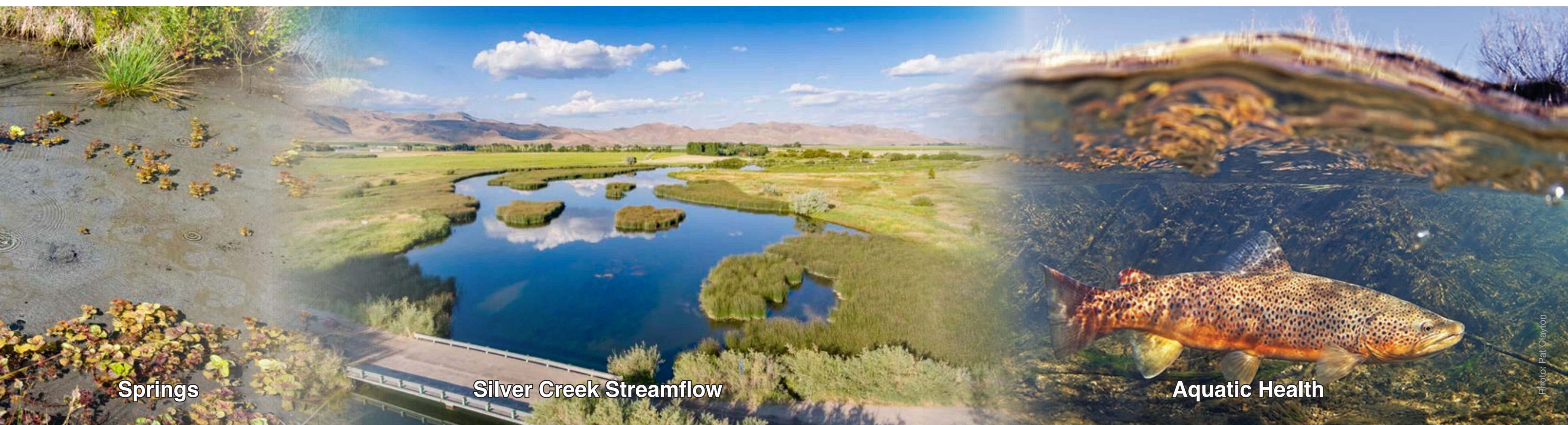
These efforts culminated in the drafting of a BWRGWMA groundwater management plan, which was created by the GGWD and SVGWD and submitted to IDWR in 2020. An advisory committee was formed later that year to evaluate the different management options proposed in the draft plan.

In 2021, severe drought conditions led to water supply shortages in the Big Wood River drainage. Junior groundwater users in the SVGWD were ordered to reduce their usage to increase water supply for senior water rights holders in the Silver Creek and Little Wood River drainages. Following this curtailment, the advisory committee and IDWR approved the BWRGWMA groundwater management plan. The primary goal of the plan is "to manage the effects of groundwater withdrawals on the aquifers from which the withdrawals are made, as well as any other hydraulically connected sources of water." Practically, the plan aims to maintain a four-day moving average streamflow of 32 cubic feet per second (cfs) from May 1 to September 30 at the Station 10 stream gauge on the Little Wood River near Richfield.

Through these actions and ongoing discussions about surface water and groundwater use, the health of streams in the Silver Creek drainage can be supported.

The initial plan has been extended for an additional three years and will be in effect until 2027. A long-term management plan is currently being developed for the Big Wood River basin to manage groundwater use and surface water availability over the next 20 years.

Additional Information on the BWRGWMA can be found at: **https://idwr.idaho.gov/water-rights/groundwater-management-areas/big-wood-ground-advisory-committee/**



Cycles of Drought

Projected changes in Idaho's climate indicate a strong likelihood of warming trends, with limited changes in total annual precipitation. However, there is expected to be a significant reduction in the amount of precipitation that falls as snow, along with a high potential for increased frequency of certain types of droughts.

Additionally, natural climate variability, including phenomena such as the El Niño-Southern Oscillation, is expected to continue influencing Idaho's climate throughout the 21st century. The interaction between natural climate variability and the new baselines established by climate change is likely to result in substantial changes to specific climate and weather extremes. These changes present significant challenges to the state's economic and cultural reliance on snow, water resources, forests, agriculture, and outdoor recreation.

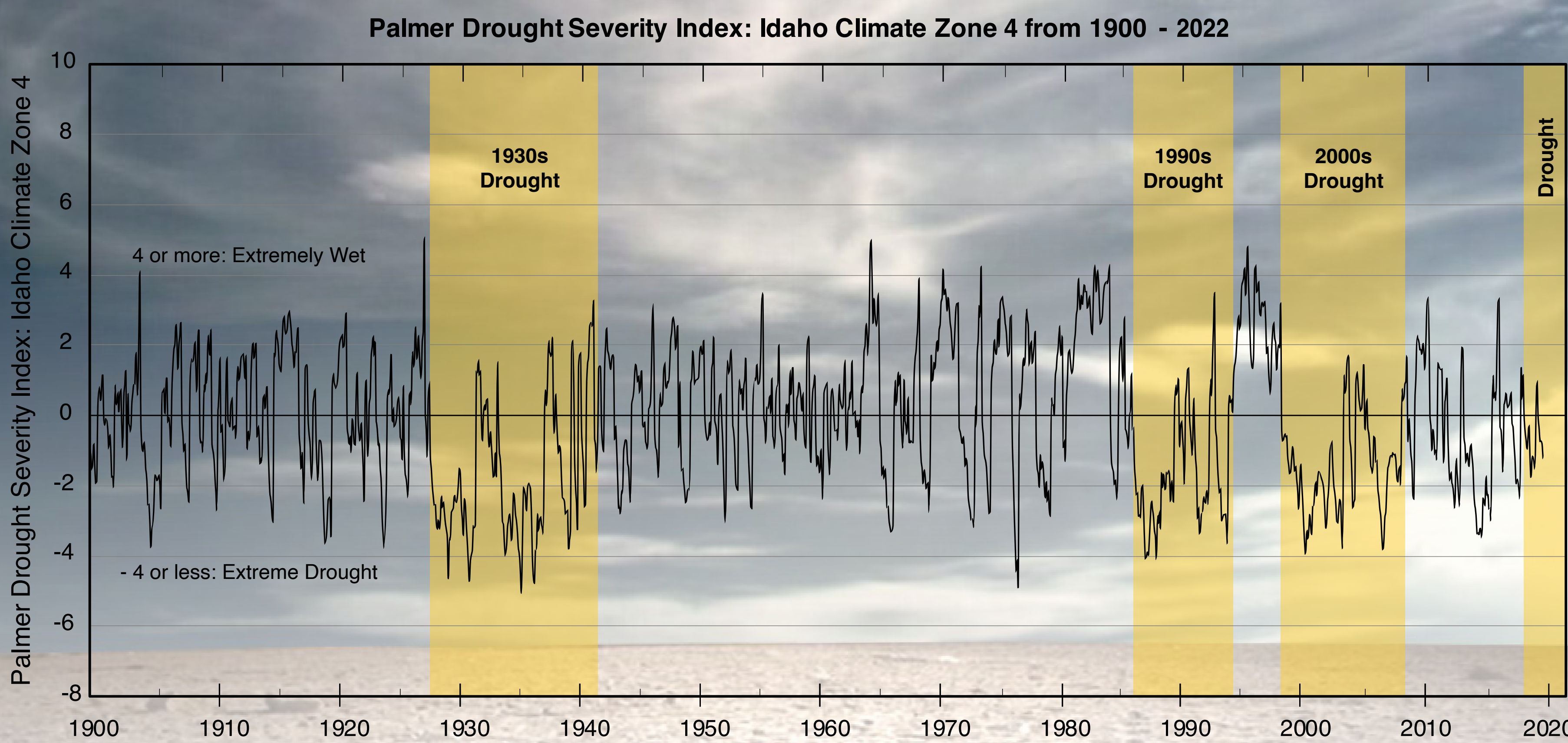
Idaho's dry, warm summers necessitate water storage to sustain water for multiple needs. Snow delays the release of mountain moisture and serves as a natural reservoir, with snowmelt in the spring and early summer providing a buffer to compensate for the seasonal mismatch in water demands.

The Silver Creek watershed has experienced numerous periods of drought in the last fifty years, in addition to periods of relatively high precipitation and above-average stream flows. The watershed exists within a semi-arid, high-desert climate that is characterized by relatively low rates of precipitation and humidity, and relatively high rates of evapotranspiration. Previous studies have shown that the Lower Wood River Valley experiences considerable variability in precipitation, particularly in comparison to the upper reaches of the Big Wood and Little Wood River watersheds.

Drought is a recurring issue in the arid west, and the historical data illustrates that it is a condition that happens with some frequency. It is important to understand and monitor climatological and hydrologic trends in the Silver Creek area to better manage and work to protect the ecological health of the watershed.

One way to assess climate conditions in an area is by examining the Palmer Drought Severity Index (PDSI), calculated by the National Climatic Data Center. The PDSI measures long-term drought by factoring in precipitation, temperature, soil moisture, and other elements to produce a monthly value. Significant drought periods occurred in Idaho in the 1930s, early 1990s and 2000s, and from 2019 to 2022.

Forecasting models are crucial for understanding climate changes. Scientists use numerical models based on physical principles to analyze how natural and human factors impact climate. The forecast models for Idaho indicate strong confidence in warming trends, limited changes in annual precipitation, a decline in snow precipitation, and an increased frequency of certain droughts. Idaho's climate will continue to be influenced by natural climate variability throughout the 21st century, presenting significant challenges to the state's economic and cultural reliance on snow, water resources, forests, agriculture, and outdoor recreation.

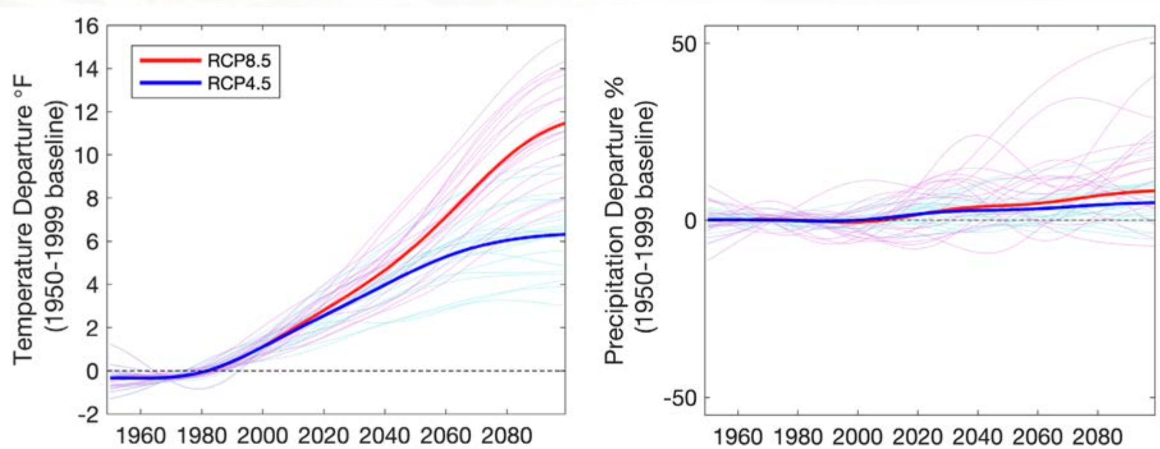


Palmer Drought Severity Index (PDSI) Value

- 4 or less: Extreme Drought	- 1 to - 0.5: Incipient Dry Spell	1 to 2: Slightly Wet
- 4 to - 3: Severe Drought	- 0.5 to 0.5: Near Normal	2 to 3: Moderately Wet
- 3 to -2: Moderate Drought	0.5 to 1: Incipient Wet Spell	3 to 4: Very Wet
- 2 to - 1: Mild Drought		4 or more: Extremely Wet

Climate projections indicate significant warming ahead - Annual mean temperature anomalies and precipitation departures for Idaho are compared to a 1950-1999 averages under two scenarios: moderate warming (RCP4.5, blue) and high warming (RCP8.5, red). The figures showcase results from 20 CMIP5 models, with thick lines representing the multi-model ensemble mean. These models, developed by international research groups, improve our understanding of climate processes and inform adaptation and mitigation efforts. The Fifth Coupled Model Intercomparison Project (CMIP5) gathered output from over 40 models, providing valuable data for scientific studies.

(Abatzoglou, J. T., Marshall, A. M., Harley, G. L. 2021. Observed and Projected Changes in Idaho's Climate. *Idaho Climate-Economy Impacts Assessment.*)



Next Steps

Stream Restoration

Stream restoration that balances water conservation values with agricultural land use is vital to the preservation of many aquatic species, and a healthy fishery. 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 function in many areas of the watershed that can be addressed through targeted restoration.

Silver Creek offers many opportunities to improve in-stream conditions and restore ecological integrity. 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.

Riparian Buffers

Riparian buffer zones need to be evaluated as permanent solutions to address sediment reduction and removal. A field effort to collect data on the riparian buffer systems will help to prioritize areas that need improvement, protection and restoration.

Monitoring and Maintenance

Over the past 14 years, the Silver Creek Program has monitored stream hydrology, water temperature, sedimentation, and 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, continue field data collection and data analysis for 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:

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2024

Silver Creek Annual Report

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