

# THE SILVER CREEK

# SYMPOSIUM



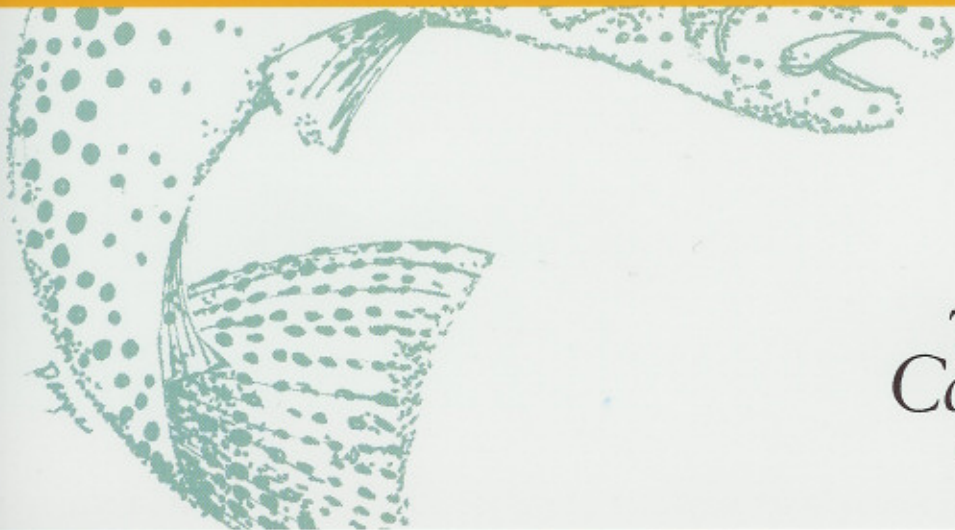
**SILVER CREEK: today and tomorrow**

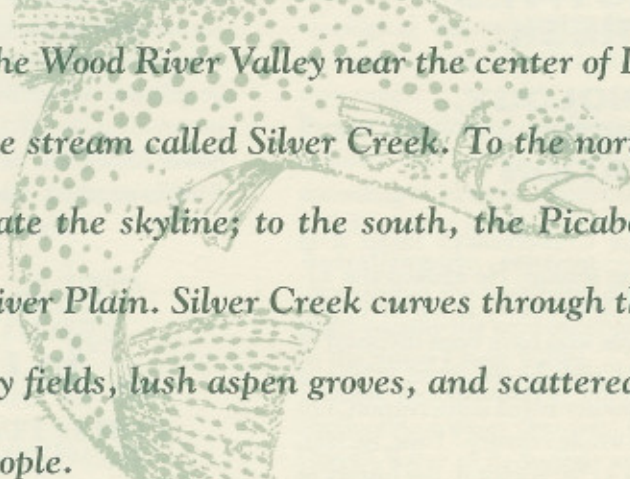
## PROCEEDINGS

*A report of the  
community conference  
held November 15, 2003,  
in Sun Valley, Idaho*

*The Nature  
Conservancy* 

SAVING THE LAST GREAT PLACES ON EARTH





*At the southern end of the Wood River Valley near the center of Idaho, water quietly gathers in the thread of the stream called Silver Creek. To the north, the Pioneer and Smoky Mountains punctuate the skyline; to the south, the Picabo Hills roll into the high desert of the Snake River Plain. Silver Creek curves through this valley of gnarled sagebrush, sweeping barley fields, lush aspen groves, and scattered houses, drawing a diversity of wildlife and people.*

## **Background**

The Nature Conservancy became involved with Silver Creek in 1976, when, at the urging of Idaho Fish and Game Commissioner Jack Hemingway, the non-profit agency purchased 479 acres in the heart of the Silver Creek Valley from the Sun Valley Company. That purchase formed the initial Silver Creek Preserve. Since then, the Conservancy has expanded the original preserve to include a total of 882 acres. Additionally, local landowners have worked with the Conservancy to protect approximately 9,272 acres through

*Many people with diverse interests and different perspectives are invested in Silver Creek and care about its future.*

conservation easements. These cooperative efforts have helped safeguard the spring water, open space, and rich wildlife that characterize Silver Creek.

Over the past three decades, The Nature Conservancy of Idaho has managed Silver Creek Preserve to protect the unique spring creek and its diverse wildlife and plant communities while also keeping it accessible to the public. The Conservancy has established various scientific monitoring programs and research projects, often

collaborating with other agencies to gather specific information on the workings of the creek in order to inform land management decisions. The Conservancy also operates a Visitors Center to educate the thousands of tourists, local residents, and schoolchildren who come to the preserve each year to fish, hike, birdwatch, canoe, or simply enjoy the view from the Visitors Center porch. Many people with diverse interests and different perspectives are invested in Silver Creek and care about its future.

## **The Symposium**

On November 15, 2003, The Nature Conservancy of Idaho hosted a day-long symposium on the status of Silver Creek. The goal was to share information, stimulate a productive public dialogue, and develop management strategies to address common concerns. Approximately 140 people gathered at the Sun Valley Inn for the event.

The morning session consisted of a panel of five speakers from different fields: hydrologist Lee Brown, biologist Terry Maret, attorney Jeff Fereday, economist Lee Norman, and conservationist Mark Davidson. Each panelist spoke for about 20 minutes, highlighting critical issues on the various dimensions of Silver Creek. At lunch, Tim Palmer, an acclaimed writer and photographer of America's rivers, gave the keynote presentation, "Lifelines: The Case for River Conservation." The afternoon session consisted of three smaller breakout discussion groups, in which the audience had the opportunity to raise questions and discuss issues with teams of experts, community members, and Conservancy staff.

## FIVE PERSPECTIVES ON SILVER CREEK:

### HYDROLOGY, BIOLOGY, LAW, ECONOMICS, AND CONSERVATION

Geoff Pampush, The Nature Conservancy's Idaho state director, opened the morning session. He evoked the 27-year history of The Nature Conservancy at Silver Creek, pointing to the range of people who have been involved in the creek's protection. Silver Creek, he remarked, is "one of the great hallmarks of community-based conservation, not just in Idaho, but across the whole country." Now, he said, "It's time to check in. This is a checkpoint in the history of conservation and in our use and enjoyment of the creek."

Pampush raised several key questions that would become focal points throughout the day:

- How do changing land use patterns affect Silver Creek?
- What is the status of the creek's fishery?
- What are the implications of the appearance of the New Zealand mudsnail in the creek?
- How should sediment conditions be addressed?
- What are the dynamics of the various fish populations (brown trout vs. rainbow trout vs. native fish)?

Pampush then turned the time over to the panelists to address the hydrologic, biologic, legal, economic, and conservation dimensions of Silver Creek.

#### The Hydrologic Dimension

As a unique high desert cold spring ecosystem, Silver Creek is defined by its hydrology. Water, and how it moves through the Big Wood River watershed, determines Silver Creek's form and vitality. Lee Brown, professor emeritus of San Diego State University and Grossmont College and hydrology consultant for The Nature Conservancy and Blaine County, began his discussion of Silver Creek's waterworks by explaining the watershed dynamics of the Wood River Valley. The Big Wood River watershed spans 881 square miles, draining the basins of the Pioneer, Boulder, Smoky, and Timmerman mountain ranges. The Big Wood River begins at Titus Lake near Galena Summit and travels 45 miles south to

Stanton Crossing and into Magic Reservoir. The average annual flow of the Big Wood River at Hailey is about 407 cubic feet per second per day. Approximately 20,000 people live within this watershed.

Silver Creek lies at the southern end of the Big Wood River watershed. Silver Creek's water can be attributed to

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five sources: 1. natural precipitation and runoff, 2. the underflow of water from the upper valley, 3. seepage from the Big Wood River, 4. irrigation diversions, and 5. springs and runoff from the Timmerman and Picabo hills. Stalker, Grove, and Loving Creeks are the primary spring-fed tributaries that form Silver Creek.

**Hydrologic Research** – The Nature Conservancy's framework for protecting native species and ecological systems is called "conservation by design." It involves rigorous scientific research to guide management decisions. Over the past 27 years, the Conservancy has worked with numerous agencies and individuals to gather information



about Silver Creek's water. Brown summarized the major hydrologic studies conducted over this time period:

**Groundwater model** – Chuck Brockway, Ph. D., began a project for the Conservancy in 1993 to develop a computerized model of the Big Wood River groundwater basin as a way to hypothesize about the relationship between land use changes and water flows in Blaine County, particularly in the Bellevue triangle.

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**Synthetic-organic compound study** – In the late 1990s, the Conservancy asked Brown to catalogue every chemical, such as fertilizers and pesticides, applied in the Silver Creek area and to determine the possible water quality threats posed by each.

**Augmented water study** – Brown continues to work with the Conservancy to investigate the various sources of Silver Creek's flows (how much comes from groundwater, how much from natural precipitation, how much from irrigated agriculture, etc.).

**Water quality monitoring network** – In 2000, the Conservancy developed a water monitoring protocol to standardize the collection of water quality data over time. Three transect sites and a Hydrolab have been established on Silver Creek Preserve where dissolved oxygen, temperature, pH, sediments, and other variables are measured year-round. The goal is to collect data that can be compared to data from the past and in the future in order to assess water quality and quantity trends.

**Tributary evaluations** – The Conservancy currently is extending its water monitoring program to gather flow and sediment data from Silver Creek tributaries, including Loving Creek and Grove Creek.

**Water table database** – Brown and the Conservancy have compiled data for approximately 500 wells in the Upper

Big Wood River watershed from Brockway's study, the U.S. Geological Survey, and other independent researchers, creating a comprehensive database of water table levels over time.

**Proper functioning condition** – In 2001, the Conservancy assessed the health of Silver Creek's riparian corridor according to parameters established by an interagency team of federal land managers.

**Aerial/remote sensing** – The Conservancy has investigated the possibility of using aerial photography to chart visually the land use changes and habitat fluctuations in the Silver Creek Valley.

**Isotopic geochemistry** – The Conservancy has considered conducting a water chemistry study that could trace Silver Creek's water to its various sources, giving a more precise representation of what percentage of Silver Creek's flows comes from groundwater, precipitation, irrigation, etc.

The goal of much of this research is to develop a more detailed historical perspective on Silver Creek, providing a sound basis for management decisions that will impact the creek's future. "One of the things we're trying to do is to monitor the heartbeat [of Silver Creek] with baseline data to make sure the [hydrologic] values of Silver Creek don't decrease," Brown said.

**Flows, Precipitation, and Irrigation** – To understand Silver Creek's hydrology requires understanding the relationship between stream flows, precipitation, and irrigation diversions. Brown summarized Silver Creek's streamflow by saying, "If there's one thing that's a constant, it's variability." According to data gathered by USGS at the Fisherman's Access at Silver Creek West since 1975, Silver Creek's average flow is 156 cfs (see figure 1). However, "variability is certainly the name of the game," Brown said. The flows go up and down in response to various environmental factors.

"I think one of the biggest sins we tend to do around here is that we forget we live on the edge of a desert," Brown said. "The precipitation is pretty scant." Local rainfall varies greatly from year to year, and, in terms of the last 25 years, the overall trend has been a decrease in precipitation (see figure 2). It might be, Brown argued, that we are coming out of an exceptionally wet period and returning to more normal arid conditions. We don't know, because we don't have extensive historic precipitation records to compare to the present day.

In addition, irrigation diversions in the Silver Creek Valley are changing. Currently, about 35,000 acres are cultivated in the Bellevue triangle. Increasingly, however, agriculture

is giving way to development, and less and less water is being diverted for agricultural purposes (see figure 3). Interestingly, in recent years, Silver Creek's flows have been higher in the same years when irrigation diversions have been higher. According to Brown, this presents a conundrum: The dynamics of the connections between irrigation diversions and streamflows is still not clearly understood, so it is difficult to know what kinds of conclusions to draw from comparing the two sets of data.

#### **Population Growth and Citizen Responsibility –**

"We know we're going to grow," Brown said. Blaine County's population could expand by as much as 15,000 people in the next several decades. The recreational and commercial demands of this changing demographic will drive development in the valley, which will in turn impact the water resource. "Everybody. . . needs to take a certain amount of personal responsibility as citizens," Brown said. For us to make informed decisions about resource management, we should all have a certain level of environmental literacy: We should understand that variable aridity is normal to this region; we should understand the differences between consumptive and non-consumptive uses of water, and between domestic and agricultural uses; we should have a "working vocabulary" to understand water law and how water is appropriated. Finally, Brown said, we need to be aware of how our cultural expectations affect our land management and policy decisions. Brown explained, "If we move to an arid area like this from an area that is not arid, and we try to bring that same set of cultural values with us, then we. . . can create a lot of problems."

**Looking to the Future –** Brown concluded by identifying key hydrologic questions for Silver Creek's future:

- How will changes in land use patterns affect the headwaters of the Big Wood River and Silver Creek?
- What is the optimal design and implementation of conservation strategies?
- How do we address climate changes like global warming and expanded drought periods?
- How do we develop supportive public attitudes about biodiversity, such that biodiversity is seen as a justifiable goal in and of itself?
- How do we balance public policies and private incentives to build good, supportive habitat?

## **The Biologic Dimension**

The spring-fed waters of Silver Creek sustain a rich and

diverse range of life. Terry Maret, a biologist with the U.S. Geological Survey, presented findings from his own and others' research on Silver Creek's insect and fish populations, to show "where we are in our understanding of the biological system of Silver Creek."

*Silver Creek's biology is linked intimately to its water conditions, and the amount of water in the creek fluctuates greatly over time.*

**Previous Research –** Maret's own work on Silver Creek began in 2001, but he said a survey of scientific research on Silver Creek reveals studies dating back at least to 1963. The USGS, Idaho Department of Fish and Game, The Nature Conservancy, and private scholars have conducted a range of insect and fish population studies and water quality assessments over the last several decades. Resource management philosophies have varied greatly over that time. For example, a 1963 Idaho Fish and Game creel survey indicated that 73% of the fishing on Silver Creek was bait fishing, while 25% was fly fishing. At that same time, IDFG recommended planting hatchery fish as the best way to enhance fishing on Silver Creek. Now, Silver Creek sustains a wild fish population without stocking.

**Water Quantity and Quality –** Silver Creek's biology is linked intimately to its water conditions, and the amount of water in the creek fluctuates greatly over time. Maret emphasized the cyclic pattern of Silver Creek's flows: In the past 25 years, the mean annual discharge of Silver Creek has been as high as 220 cfs in 1983, and as low as 105 cfs in 1992 and 2002 (see figure 1). In 1992, the low water conditions and low dissolved oxygen levels contributed to the deaths of about 50 large trout near the Point of Rocks access area. Such variability in flows is normal for streams in this area, Maret said, and the aquatic life is going to respond to these patterns.

Silver Creek's water quality is characterized by a number of significant factors. The water primarily emerges from

groundwater sources. As a result, the water temperature remains relatively constant year-round, averaging between 5°C and 15°C (about 40°F to 60°F) – though the lack of significant riparian shading may result in higher temperatures during low flow drought conditions. According to Maret, Silver Creek's waters are highly productive, supporting a diversity of plant and animal life. There is an abundance of in-stream plants and algae, which cause fluctuations in the

stream's dissolved oxygen levels. The plants also provide essential habitat for insects and other creatures.

***Invertebrate Communities*** – Invertebrates are "the fuel that drives the fishery engine," Maret said; insects are the primary food source for trout. A healthy, non-polluted



EPT taxa were found at a riffle site on Silver Creek Preserve (see figure 4). Mayflies, baetis, caddisflies, and midges are the predominant insects in Silver Creek. Compared to other Idaho streams, Maret said, Silver Creek's insect life is excellent in numbers and diversity. He concluded that food does not appear to be a limiting factor for fish in Silver Creek. However, in drought years, there will be less water and therefore fewer plants in the stream, which will affect insect populations.

An aggressive invasive invertebrate, the New Zealand mudsnail, is spreading through rivers throughout the West. It is present in the whole Snake River system from Yellowstone to Brownlee Reservoir, and it recently has been found in small numbers in Silver Creek as well. Mudsnails are tiny (about 100 can fit on a dime), and they are easily transported by such means as birds and anglers. Mudsnails are very prolific asexual breeders, and they are difficult to control. When they enter a stream system, they can outcompete other insects and quickly take up most of the space available for insect life, creating a monoculture of snails. Because Silver Creek has a lot of good insect habitat, there appears to be strong potential for the mudsnail to spread in the Silver Creek system.

***Fish Species and Populations*** – In 2001, Maret and USGS sampled Silver Creek's fish population using an electrofishing method at two similar reaches on the creek, one near Picabo and one on Silver Creek Preserve. They collected eight fish species: brown trout, rainbow trout,

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stream typically contains 10-15 taxa of mayflies, caddisflies, and/or stoneflies (EPT taxa). When Maret and USGS sampled Silver Creek's insect population in 2001, 13 EPT taxa were found at a riffle site near Picabo, and 15

mountain whitefish, speckled dace, longnose dace, redbreasted shiner, Paiute sculpin, and bridgelip sucker (see figure 5). "The fish in general were in very good condition," Maret surmised. "We saw no evidence of whirling disease. . . [and only] a few fish with hook scars."

As a result of the 2001 fish population survey, Maret estimated an average of 1,610 trout/km at the Picabo site and 1,681 trout/km at the preserve site. By comparison, the

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Big Wood River near Boulder Creek had approximately 80 trout/km according to a 1993 survey. In the 2001 Silver Creek survey, brown trout constituted the majority of the fish collected. Data collected over the last few decades indicate a shift in the proportion of various fish species in Silver Creek. According to Maret, there has been a "huge change from rainbows to browns, [and] whitefish are pretty much dropping out of the picture" (see figure 6). Due to inconsistencies in sampling methods over time, Maret could not draw conclusions about trends in overall fish numbers. Maret emphasized that "we must standardize collection methods and location in order to have confidence that there is a true trend" in fish populations.

**Monitoring and Evaluation Needs** – Maret concluded that the good news for Silver Creek is that it is a self-sustaining wild fishery with good numbers of catchable trout. The fish sampled appeared to be healthy, and there was no evidence of whirling disease. The bad news is the presence of the New Zealand mudsnail and the possibility of a continued drought. In order to continue to monitor the pulse of Silver Creek and to establish a better sense of the creek's biologic trends, Maret recommended evaluating the creek's ecological health every three years at the same time of year (preferably the fall) and at the same locations.

Specifically, Maret said, ongoing studies should:

- collect trout population estimates using consistent methods and at the same locations (the Picabo site and the Silver Creek Preserve site).
- evaluate the relative abundance of fish and invertebrate species.
- collect water quality samples, including annual dissolved oxygen measurements and continuous water temperature readings in the summer months.
- conduct creel surveys to assess angler use and satisfaction.
- catalog the various aquatic plant species and their abundance.

Already, many agencies – such as USGS, IDFG, The Nature Conservancy, and others – are working together to increase the knowledge base on the biology of Silver Creek. By continuing to cooperate and to develop more consistent research methods, a larger historical picture of Silver Creek will emerge, providing the basis for informed management decisions.

### **The Legal Dimension**

Given the arid nature of the West, water issues in the region are complex and often controversial, and Silver Creek is no exception. Jeff Fereday, an attorney with the Boise firm Givens Pursley and an expert in western water law, offered insight into the legal context of Silver Creek. He characterized Silver Creek as one of Idaho's most fascinating hydrologic areas. "It's at the end of a basin where a lot of groundwater daylights as surface water, forming a beautiful series of spring creeks," he said. This hydrologic system presents unique legal issues because of the linkage between surface water and groundwater. Fereday identified three factors that will affect water management in the Silver Creek and Big Wood River watersheds: growth and urbanization in Blaine County, new legal tools for conjunctive management of groundwater and surface water, and the Snake River Basin adjudication process.

**Growth and Urbanization** – The rapid population growth of Blaine County is causing substantial changes in how water is used in the Silver Creek Valley. Increasingly, irrigated agricultural land is being converted to non-agricultural uses (such as ranchettes and subdivisions). As a result, Fereday explained, the consumptive use of water is decreasing, because municipalities generally use less water than agriculture. However, agriculture returns more water to Silver Creek's recharge zone because irrigation spreads water over a larger area where some of it seeps back into the aquifer. So, as agricultural land changes to municipal uses, the creek's recharge zone shrinks. This means that

while less water may be used by the subdivisions than the barley fields, less water, ultimately, may move through the recharge zone and make its way into Silver Creek.

Fereday said that some regulations are already in place to manage the area's groundwater and thus Silver Creek's recharge zone. In 1991, the Department of Water Resources, recognizing the potential for problems with groundwater use in the Big Wood River and Silver Creek Valleys, established a groundwater management area for a significant portion of the watershed. This enabled DWR to regulate groundwater development. No new groundwater development has been allowed since then, except around domestic wells (which are exempt from regulation) and wells for which mitigation can be provided (such as a transfer of a water right from one use to another). Since Silver Creek is primarily a groundwater-fed stream, this should help protect its flows; however, the creek is still vulnerable to changing land use patterns that impact how much water returns to the recharge zone.

In addition, the legislature passed the Municipal Water Rights Act in 1996, establishing new entitlements for the development of water rights for municipal purposes. Now a city can obtain water rights that it does not intend to use for many years, allowing it to safeguard its water portfolio as it develops its plans for growth. (Typically, under the

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prior appropriation doctrine of Idaho law, owners lose their water rights if they do not use them within five years.) Fereday said this 1996 statute could prove to be helpful for this valley, because it encourages local lawmakers to plan for how water will be used in the future, and it allows them to ensure that the water will still be there when they need it to accommodate growth.

**Conjunctive Management** – According to Fereday, surface water and groundwater used to be treated as separate resources. Recognizing their interconnectedness is today's major insight for water resource management. Now the question is, "What do we do about managing these two

resources together?" This is a growing struggle in Idaho. The Snake, Boise, and Big Wood River watersheds are embroiled in controversy over the effects of groundwater withdrawals on surface water flows and on surface water rights.

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Fereday explained that groundwater rights are invariably very junior to surface water rights in Idaho's appropriation system. In the Silver Creek Valley, for example, senior surface water rights date back to the 1880s, but most of the groundwater rights are post-World War II. Even a 1920 irrigation water right is very rarely filled on the Big Wood River, so there is a lot of demand on surface flows. Controversy arises in drought years when a senior surface water right cannot be filled due to low flows, but groundwater can still be pumped for a more junior right. This leads to questions of fairness and an obligation to mitigate groundwater uses; otherwise, the continued extraction of groundwater could diminish the overall surface water flows. Fereday predicted that a much more rigorous water regulation system will need to be established to address these complex conjunctive management decisions.

**Snake River Basin Adjudication** – The Snake River Basin adjudication process began in 1987, stemming from a lawsuit between Idaho Power and the state of Idaho as a result of the over-allocation of water on the Snake River. The adjudication process involves settling every water right in the Snake River Basin. The Big Wood River region, which includes Silver Creek, will be one of the last to be addressed within the next few years. Fereday predicts a lot of interesting issues will emerge in this process due to past illegal enlargements of water rights, accomplished water transfers that did not follow proper procedures, and



questions about forfeitures of water rights. Because Blaine County has witnessed dramatic changes in land use in the past several decades, there are likely to be lots of questions about what water rights are still valid. For example, what

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happens to a water right that is now under a parking lot? However, the adjudication process will only look at water rights as they existed in 1987, so "the last 16 years of activity in this valley are really not on the table."

All of these legal issues "speak to the tensions of moving water through changing times," Fereday said. Silver Creek's unique hydrologic system is enmeshed in a complex legal context of water rights and regulations, and those same rights and regulations depend on natural processes. Ultimately, Fereday concluded, "You can talk a lot about water law, about relationships between rights legally, about the validity of rights legally, but a lot of it boils down to the laws of physics . . . and, of course, the weather."

### **The Economic Dimension**

Silver Creek attracts thousands of tourists each year who contribute to the local economy as they pursue their recreational activities. Lee Norman, professor of economics at Idaho State University, provided data from three surveys that measured the economic impact of Silver Creek on the economy of the Wood River Valley. He began, however, with a caveat: Economic studies can often be problematic, he said, because they attempt to translate aesthetic and environmental values into dollars and cents. Monetary figures alone, he said, may not adequately represent those other values.

At the request of The Nature Conservancy, Norman surveyed economic expenditures related to Silver Creek in 1988, 1996, and 2003. For each of these studies, he designed surveys that asked Silver Creek visitors how much money they spent on things such as food, fishing gear, lodging, etc., in connection with their activities on Silver Creek.

Norman estimated that in 1988, Silver Creek visitors contributed approximately \$2 million to the local economy (however, due to methodological problems, Norman stated that this number was probably high). In 1996, Norman again estimated a \$2 million impact of Silver Creek on the local economy. In 2003, Norman estimated that Silver Creek visitors contributed at least \$3 million to the local economy. He summarized that, in the summer of 2003, local residents spent an average of \$26 per person related to their Silver Creek activities. That same season, visitors for whom Silver Creek was their primary destination spent an average of \$591 per person related to their Silver Creek activities.

### **The Conservation Dimension**

Protection of Silver Creek's ecological, aesthetic, and recreational values requires a concerted effort. Mark Davidson, central Idaho conservation manager for The Nature Conservancy and former Silver Creek Preserve manager, discussed The Nature Conservancy's goals and practices in terms of protecting the biodiversity of the Silver Creek Valley. "Silver Creek is not an easy place," he said. "It's complex in its hydrology, biology, and in its people. . . and the complexities are not contained within our own little watershed." One of the Conservancy's goals is to bring together the various sources of information on Silver Creek and the people who care about it in order to see the big picture of the place. "We're trying to look at Silver Creek as a whole," Davidson said, "and that compels us to look beyond the creek itself."

**Conservation Priorities** - The mission of The Nature Conservancy is to preserve the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. At Silver Creek, Davidson said, protecting biodiversity translates into protecting several vital ecological elements:

- the high desert cold springs aquatic community, which includes the water itself and the species contained within the water.
- the riverine shrublands and marshes, which include the willows, dogwoods, sedges, and other plants that form the riparian corridor stretching along the creek.
- the groundwater-fed marshes, shrublands, and forests, which include offstream sites of lush vegetation.
- the avian community, which includes about 150 species of birds that use the creek and its surrounding habitat for nesting, feeding, and shelter.

"All of these things together make Silver Creek what it is - a unique ecological area," Davidson said. The

Conservancy's research, restoration, and protection work in the Silver Creek Valley aims to conserve the health and vitality of these ecological elements.

**Monitoring and Research** – Davidson explained that while a lot of information exists about Silver Creek from recent years, there is not much data that shows what is happening over the long term. "We get a lot of anecdotal evidence from people," Davidson said, "but we also need to base our decisions on sound science so we can make good management decisions. [The Conservancy's] job is to look at the long term." As a result, the Conservancy has established a water monitoring program on Silver Creek with the intent of establishing more consistent, comparable, historical data. The Conservancy also has collaborated with agencies such as USGS and IDFG to conduct regular fish and insect population surveys, in order to assess the fish and insect populations over time.



**Restoration Program** – The Conservancy analyzes its monitoring and research data to understand the Silver Creek system, and that understanding becomes the basis for restoration projects, Davidson said. A snapshot of a present-day healthy section of Silver Creek should probably reveal a tight, meandering stream corridor with a diverse mix of lots of vegetation in the stream, and a mosaic of gravel and sediment on the stream bottom. Recent restoration projects have aimed to enhance this kind of habitat. Past restoration work has included planting willows along the creek to solidify the bank and to enhance the shady corridor along the creek which keeps the stream appropriately cool and provides habitat for a diversity of wildlife. In addition, sections of the stream have been dredged to address heavy sediment conditions. Currently,

the Conservancy is working on a project on Stalker Creek, one of the major tributaries of Silver Creek. The stream corridor is being narrowed and its natural curves enhanced through the addition of solid biodegradable materials; sediment is being dredged from the creek and used to build up the stream banks; and native willows and sedges are being planted to enhance the riparian area.

**Groundwater and Surface Water Protection** – Water is the key at Silver Creek, Davidson said, so the Conservancy has sponsored a range of hydrologic research (as summarized by Brown) to aid land use planning by local governments.

**Land Protection and Management** – Silver Creek is a tremendous example of a community-based stream conservation effort. Many individuals have helped protect land in the Silver Creek Valley by giving up development rights and adapting conservation practices on their own property, such as restricting cattle grazing to off-stream sites and planting willows along the stream corridor. Many partnerships between private individuals and public and private agencies have been formed in the process. This is important, Davidson said, because effective land management requires cooperative efforts, particularly on issues such as weed management and habitat improvement.

**Recreation Management** – Recreation is one of the most important aspects of the area in terms of its economic and ecological implications. The Conservancy operates Silver Creek Preserve to keep the creek accessible to the many people who enjoy it while also protecting the creek's ecological integrity. Therefore, Davidson said, the "impact from humans is important to consider in our discussion of the management of this area." Currently, the Conservancy asks visitors to sign in at the Visitors Center and to make a five dollar voluntary contribution to the preserve. The Conservancy has considered implementing rod limits and stricter user fees in order to protect the creek and the kind of peaceful experience sought by most visitors.

**Science and Stewardship Committee** – In order to continue to foster a community-based approach to

protecting Silver Creek, the Conservancy proposes establishing a science and stewardship committee to help monitor and shape decision-making about the creek. Davidson said the working committee would consist of various members of the community who represent different interests in the creek, such as scientists, anglers, farmers, and others. The purpose of the committee would be to influence how things happen on the ground at Silver Creek. Davidson encouraged anyone interested in such a committee to contact the Conservancy. Ultimately, Davidson said, Silver Creek's future is "going to depend on the individual choices we make."

## **A COMMUNITY CONVERSATION:**

### **PUBLIC QUESTIONS, COMMENTS, AND GOALS**

In the afternoon, the symposium participants divided into three groups for the sake of audience interaction and discussion. Three teams of experts, community members, and Conservancy staff rotated through each breakout group to address audience questions and comments.

### **TEAM ONE – Hydrologic and Ecological Issues at Silver Creek**

**Facilitator:** David Parrish, regional supervisor, Idaho Department of Fish and Game

**Support:** Lee Brown, professor emeritus and hydrology consultant; Lou Lunte, director of conservation programs, The Nature Conservancy of Idaho; Terry Maret, biologist, USGS; and David Richards, biologist, Ecoanalysts and Montana State University

**Fish Population** – Audience discussion focused to a great extent on the status of Silver Creek's fish population. Many audience members shared personal anecdotal evidence suggesting a decline in the trout fishery. Maret and Parrish responded that, relative to other streams, the fish population at Silver Creek is very strong and the stream system is healthy. Whether or not the overall numbers of trout are declining is unclear due to the lack of consistent historical data. Many audience members stated their concern over the fact that the brown trout population appears to be increasing while other species decline. Some audience members expressed a desire to remove the brown trout population to protect the rainbows; other anglers said

they prefer catching the larger brown trout. Other audience members expressed concern about the focus on browns and rainbows – two non-native species – and said they would like more emphasis on protecting and/or

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variety of ways.*

restoring the native fish populations, such as the redband (the disputed native trout of Silver Creek), sculpin, whitefish, and dace.

**New Zealand Mudsail** – Concern about the potential threat of the New Zealand mudsnail on the Silver Creek ecosystem was voiced. Biologist David Richards, who surveyed the creek for the mudsnail this fall, estimated that the mudsnail had been present in Silver Creek for about a year. He said the mudsnail could thrive in Silver Creek because it is such a productive stream and the mudsnails are tremendously prolific. The mudsnail could outcompete other invertebrates and take over much of the aquatic habitat. This could limit the food source for other creatures. In other streams in the West, there is some evidence that fish growth is diminished as the mudsnail population increases. Right now, there is no known control for mudsnails, though some researchers are investigating possible biological controls.

**Sediment** – Some audience members said there appears to be a growing sediment problem in Silver Creek, and they wondered how this could be addressed. Brown and Maret stated that some sediment is normal for this type of spring creek. While dredging has been used in the past to address what seems to be excess sediment, it is not an unproblematic solution. Both Brown and Maret said that dredging can deplete the stream of vegetation that some fish, particularly small ones, depend on for habitat. In addition, insects such as brown drakes prefer sediment conditions.

**Biodiversity** – Data from the last few decades suggest that some native fish to Silver Creek, such as mountain

whitefish, are declining, while non-native species, such as brown trout, are thriving. For many audience members, this was a point of real concern. Some individuals said they would like to see redband trout in the Silver Creek system, since the redband may have been the one trout species native to the creek. Others said they would like more attention given to the bird and mammal populations that use the creek. They argued that anglers, who form a high percentage of all visitors to the creek, often place too much emphasis on the creek as a fishery and try to influence management decisions to promote the trout species, without taking into consideration the many other species that use the creek. Some individuals proposed devoting more research to understanding these other species, such as birds and reptiles.

## **TEAM TWO – Economic and Development Issues in the Silver Creek Region**

**Facilitator:** Dennis Wright, Blaine County commissioner  
**Support:** Jeff Fereday, attorney, Givens Pursley LLP; Jed Gray, realtor, Sun Valley; Lee Norman, professor of economics, Idaho State University; Nicola Potts, owner of the Grinder, Ketchum; and Will Whelan, director of government relations, The Nature Conservancy of Idaho

**Growth and Overuse** – While Blaine County's population is currently about 20,000 people, predictions suggest it could reach 80,000 under current zoning laws. As more people live and recreate in the Silver Creek Valley, the creek will be impacted in a variety of ways. Many individuals expressed concern that the public would "love Silver Creek to death." Audience members debated the measures that could be taken to regulate the number of people who use the creek. Some proposed rod limits on the preserve; others suggested that the preserve self-regulates because after a few extremely crowded seasons of 10,000 plus visitors in the late 1990s, fewer visitors came to the preserve. In 2003, approximately 4,500 people visited the preserve. Wright and others advocated for responsible citizen involvement in shaping the future of Silver Creek.

**Agriculture** – Audience members discussed the significance of maintaining agricultural land in the Silver Creek Valley. Some argued that agriculture should be maintained for cultural purposes, to preserve the valley's heritage. They worried about second homes and ranchettes replacing working farms and ranches. Others decried the habitat fragmentation caused by development. Many

expressed concern that as agricultural land is lost, the recharge zone of Silver Creek will diminish, and the creek's flows may suffer.

**Water Protection Options** – Many individuals were interested in finding new ways to protect Silver Creek's water in light of the tremendous population growth of

*The Silver Creek landscape reveals how the flow of a river and the contours of a high desert valley shape the dynamics of a community – the people, animals, and plants whose lives become intertwined on common ground.*

Blaine County. People discussed the possibility of developing legal mechanisms that would make it possible to donate water rights to in-stream uses. As it is now, Fereday explained, if a water user leaves his or her water in the stream for environmental purposes, then it may simply be extracted by the person with the water right that is next in priority. Using a water right to enhance stream flows is not considered a beneficial use under current Idaho law. Whelan pointed out that it could be a disadvantage to Silver Creek if more water is held in the Big Wood River because then less water would be spread over the recharge zone that feeds Silver Creek.

## **TEAM THREE – Conservation Practices and Goals for Silver Creek**

**Facilitator:** Scott Boettger, executive director, Wood River Land Trust

**Support:** Mark Davidson, central Idaho program manager, The Nature Conservancy; and Geoff Pampush, Idaho state director, The Nature Conservancy

**Biodiversity**- Participants expressed a desire to keep a

broad view of Silver Creek's biodiversity as management decisions are made. Most agreed that Silver Creek is special because of the range of wildlife it harbors, not because of any single species. While some said they simply want to see more and bigger trout in the stream, others said they do not want trout managed at the expense of biodiversity. Some said they would like more native plants and animals restored to their pre-settlement conditions. Some individuals said they would like the Conservancy's focus to continue to expand beyond Silver Creek to consider more upland habitat and the larger Wood River watershed area.

**Community Involvement** – Audience members proposed increasing the volunteer program at Silver Creek Preserve, getting more people involved with restoration projects and fundraisers. Some said they would like to see the annual February auction fundraiser re-established.

**Research and Restoration** – Audience members voiced support for both ongoing research and active restoration projects on Silver Creek. Some felt that more monitoring needs to be done to establish a broader historical perspective for engaging in restoration work. Others said that there is enough data to engage in significant restoration work now. Most agreed that solid science needs to form the basis of all management decisions.

## Conclusion

The Silver Creek landscape reveals how the flow of a river and the contours of a high desert valley shape the dynamics of a community – the people, animals, and plants whose lives become intertwined on common ground. In turn, the way the human community works and plays affects the land and water. In Blaine County, Silver Creek is a defining ecological and cultural landscape, one that is used by farmers, ranchers, anglers, birders, schoolchildren, waterfowl, eagles, deer, bobcats, moose, trout, mayflies, and more. Silver Creek is valued in many ways by many individuals, and it has a history of inspiring people to engage in conservation efforts. Private landowners have donated easements to limit development and preserve open space in the valley. Volunteers have helped count birds, plant willows, measure water quality, pull weeds, and contribute funds to keep the preserve open to the public. These efforts help ensure the ongoing vitality of Silver Creek.

The Silver Creek Symposium provided a forum for the many people who care about Silver Creek to gather together and share information, with the purpose of

## *Every individual – you – can help with the ongoing protection of Silver Creek.*

sketching a vision for Silver Creek's future. The conversation that unfolded was, ultimately, not just about The Nature Conservancy's Silver Creek Preserve or a single waterway, but about a range of ecological, social, political, and cultural issues and values. It was a conversation about a diverse community and what holds it together. One common theme that surfaced again and again was the need for the conversation to continue.

As Geoff Pampush concluded at the close of the symposium, "It has been heartening to feel this palpable energy to keep this place healthy." The Nature Conservancy, he said, is committed to continuing this conversation, and to continuing to use Silver Creek as a platform for learning and for engaging a wide range of people. To this end, as an outcome of the symposium, The Nature Conservancy is forming a steering committee of technical advisors and community members to help steward Silver Creek Preserve and to guide conservation work in the larger watershed.

Every individual – you – can help with the ongoing protection of Silver Creek. Learn more about water allocation in the Wood River Valley. Attend public land use meetings. Call The Nature Conservancy to find out about volunteer opportunities. Make a donation at the Silver Creek Preserve Visitors Center. Think about how you use the creek. Keep the conversation – and the conservation – going.

### Symposium Committee

Terry Baird, Scott Boetgger, Lee Brown, Mark Davidson, Jed Gray, Glenn Janss, Matt Miller, David Parrish, Nicola Potts, Terry Ring, Larry Schoen, Gene Steiner, John Stevenson, Rob Struthers, Bob Wilkins, Dennis Wright

### Sponsors

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Silver Creek Preserve  
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The Nature Conservancy of Idaho  
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(208) 788-8988

Appendix – Figures

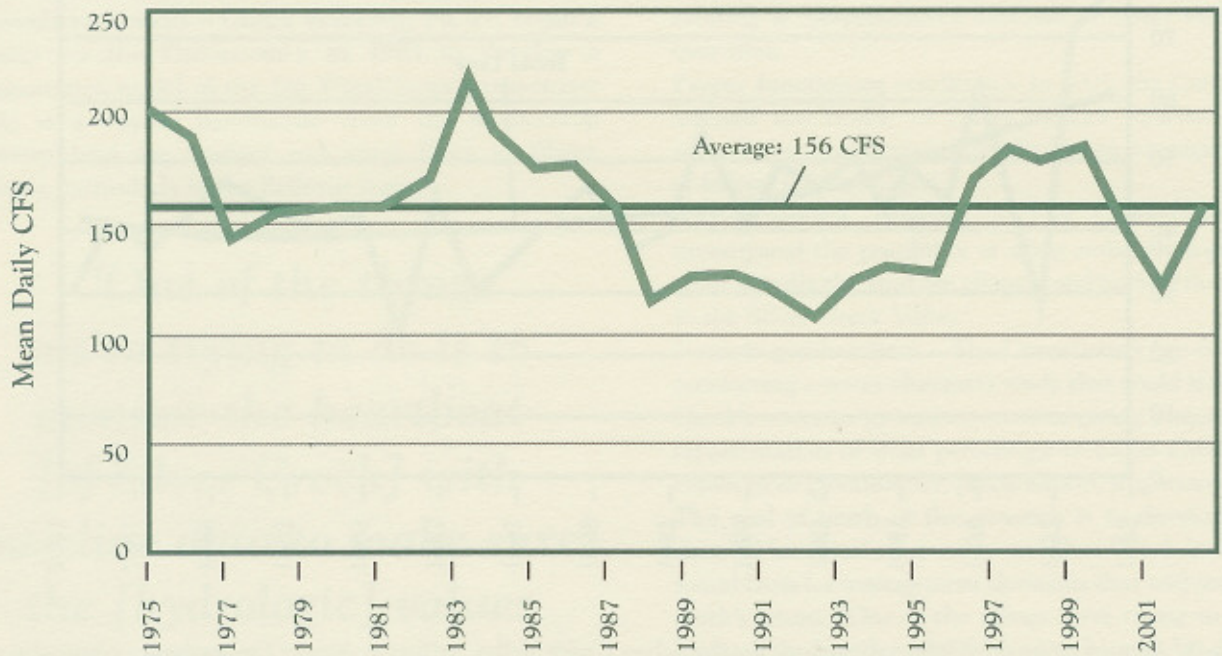


Figure 1. Mean daily flows of Silver Creek (in cubic feet per second) at the Silver Creek West access site from 1975 to 2003.

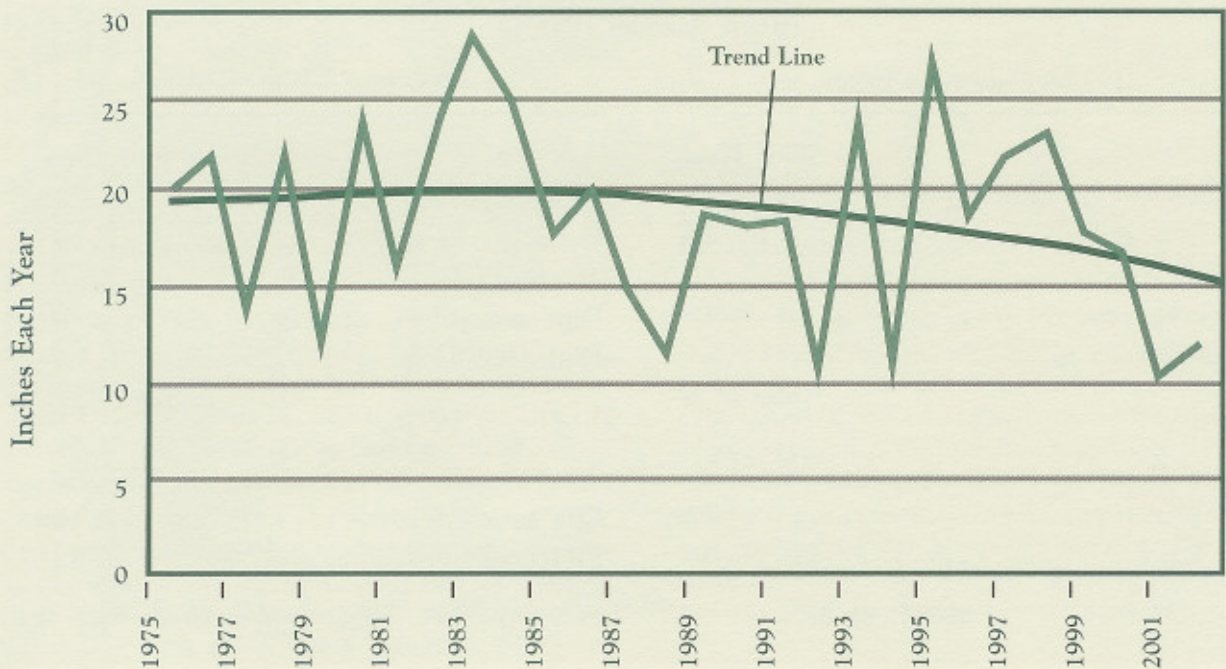


Figure 2. Average precipitation at the Ketchum Ranger Station in inches per year from 1975 to 2003.

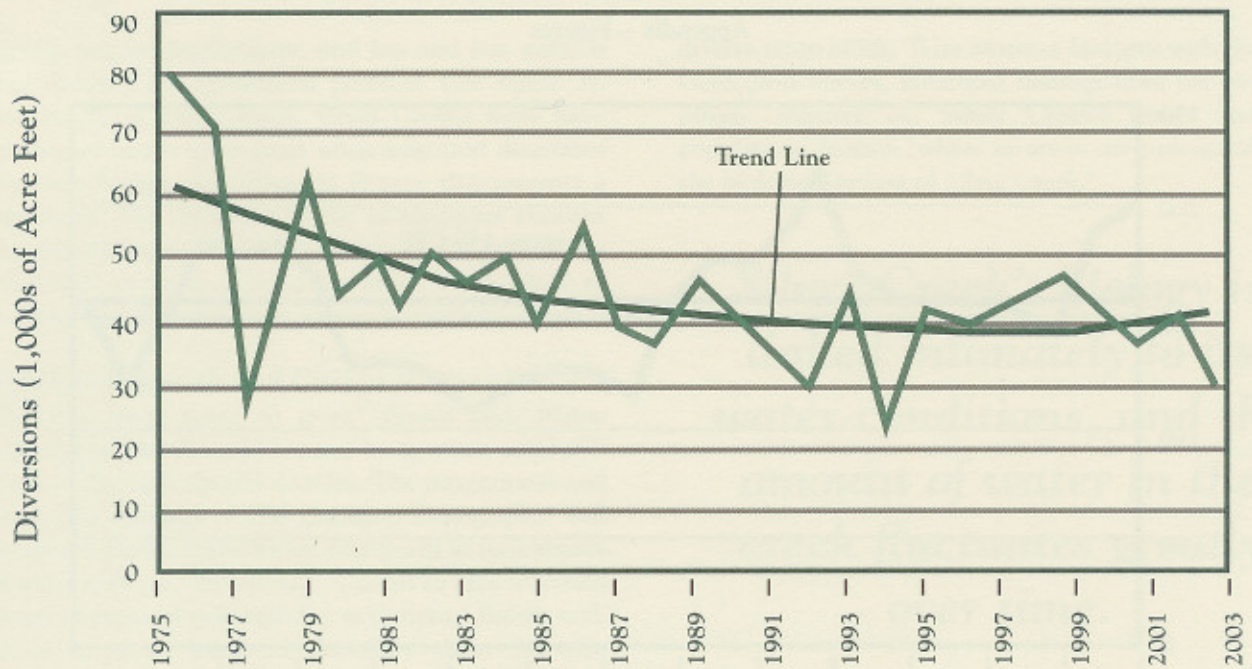


Figure 3. Average annual irrigation diversions for the Silver Creek Valley irrigation district (an aggregate composite of District 45 and the Baseline Canal) from April through September each year between 1975 and 2003.

### 5 - Dominant Invertebrate Taxa (Riffle Samples - 2001)

#### USGS Gage near Picabo

	% of Total
Baetis sp.	28
Chironomidae	16
Tricorythodes sp.	12
Helicopsyche sp.	10
Ephemerella sp.	7
<b>Total</b>	<b>73%</b>
<b>Total Density</b>	<b>1,971/m<sup>2</sup></b>
EPT taxa	13
EPT taxa	34

#### TNC near Visitor Center

	% of Total
Ephemerella sp.	21
Helicopsyche sp.	13
Tricorythodes sp.	6
Dipheter sp.	6
Helicopsyche sp.	4
<b>Total</b>	<b>50%</b>
<b>Total Density</b>	<b>5,770/m<sup>2</sup></b>
EPT taxa	15
EPT taxa	33

Densities in vegetation can be much higher than riffles 10,000 to 20,000/m<sup>2</sup> (Minshall and others, 1982)

Figure 4. Invertebrate taxa collected at riffle sites at two locations on Silver Creek, one near Picabo and the other on Silver Creek Preserve, in June 2001.

**USGS Fish Collection - June 2001**  
230 m reaches

**USGS Gage near Picabo**

Brown Trout .....	348 (44%)
(331 - juveniles)	
Speckled Dace .....	201
Bridgelip Sucker.....	117
Longnose Dace.....	88
Redside Shiner.....	21
Rainbow Trout .....	10 (1%)
(3 - juveniles)	

**Total 785**

Total of 5 trout with hook scars

**TNC near Visitor Center**

Brown Trout .....	389 (76%)
(42 - juveniles)	
Rainbow Trout .....	53 (10%)
(18 - juveniles)	
Paiute Sculpine .....	33
Longnose Dace .....	29
Bridgelip Sucker .....	7
Speckled Dace .....	2

**Total 513**

Total of 1 trout with hook scars

Figure 5. Fish species and numbers collected by USGS from two 230 meter stretches of Silver Creek, one near Picabo and the other on Silver Creek Preserve, in June 2001.

**Trends in Silver Creek Game Fish 1977 - 2001**

Relative Abundance (all sizes)

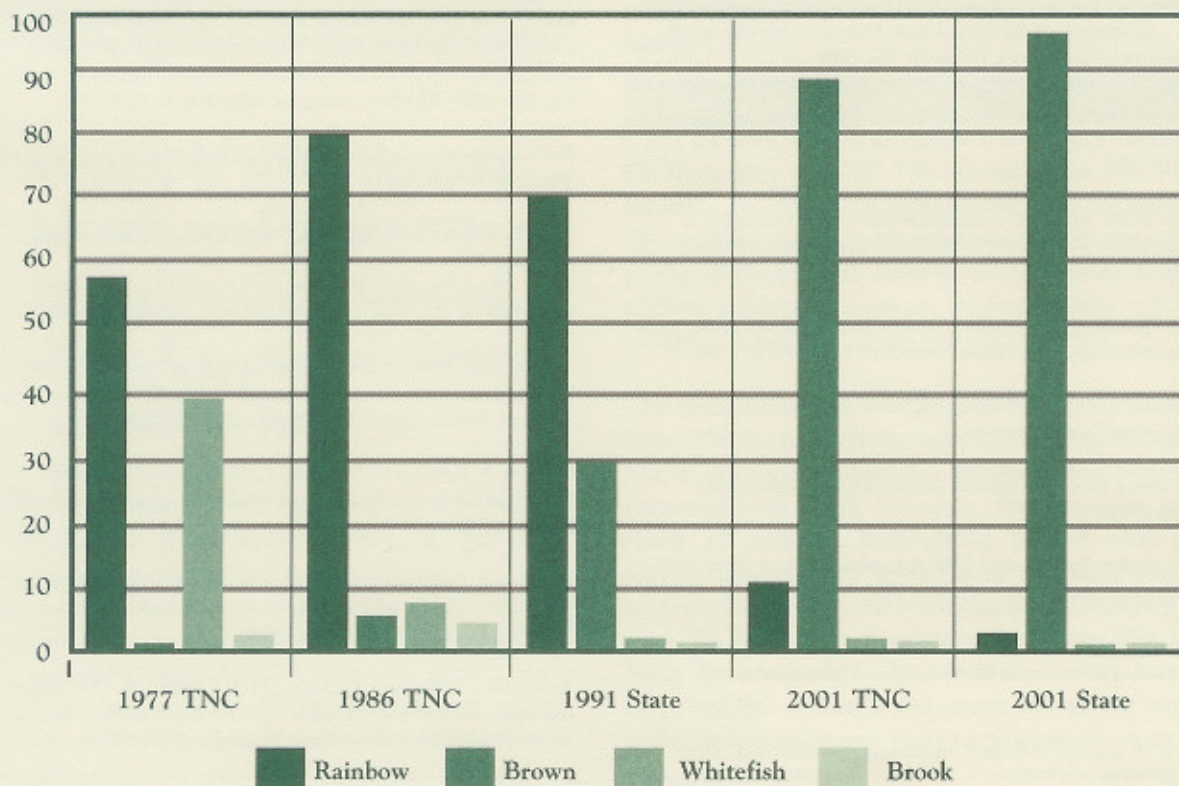


Figure 6. Fish population trends on Silver Creek between 1977 and 2001.



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