CONFLUENCE
CONSULTING

Statement of Qualifications

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LET'S BUILD A BETTER ENVIRONMENT TOGETHER.

A look at what's in store:

Contact Us

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Confluence's Values

We deliver expertise that promotes wise stewardship of our natural environment.

Through scientific understanding, we seek and deliver answers to our client's questions.

Our love of nature is what inspires us, giving us passion for our work. This makes us naturally inspired people who strive to excel at what we do. When we're not at work, you can often find us out enjoying the natural world.

We know we can only give our best when work life is balanced with time for family, friends, and personal pursuits. While we appreciate hard work, we also take time for the most important things in life.

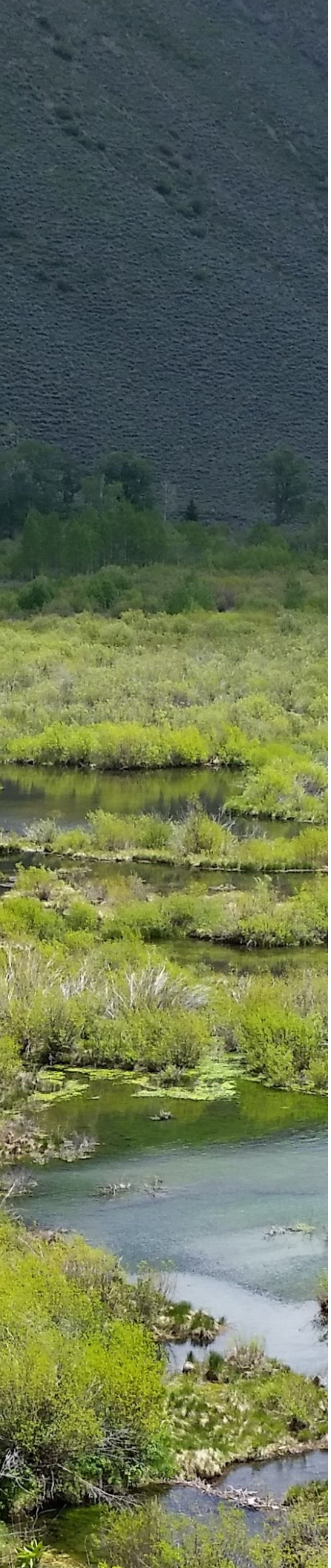
Our work is underpinned by science, which helps us to understand and solve problems in an objective, unbiased way.

We are proud of our work and take ownership of everything that we do. We approach our client's projects as if they were our own.

Confluence's Services

We offer a variety of planning, survey, design, permitting, and construction support services to meet each of our client's unique goals. Our aim is to promote the wise stewardship of our natural environment by providing innovative solutions that integrate ecological processes with sound engineering principles.

- **Stream Restoration and Channel Design**
- **Wetlands**
- **Water Resources Engineering**
- **Revegetation and Reclamation**
- **Pond Design and Management**
- **Ecological Assessments**
- **Construction Support Services**
- **Watershed and Land Use Planning**
- **Monitoring and Compliance**
- **Environmental Permitting**



STREAM RESTORATION AND CHANNEL DESIGN

Confluence restores streams and rivers through natural stream design and bioengineering services. In addition to restoring streams to improve fish and wildlife habitat, we have designed over a dozen stream remediation, relocation, and stabilization projects involving contaminated stream beds and floodplains. Our stream channel design services include:

- Geomorphic Channel Design
- Flood and Drought Resiliency
- Bank and Bed Stabilization
- Sediment Transport Modeling
- Fish and Aquatic Habitat Restoration
- Floodplain and Riparian Restoration
- Endangered Species Protection
- Erosion Control

WETLANDS

Confluence has in-depth expertise in wetland assessments, delineations, monitoring, mitigation, and permitting. Our wetland staff have worked throughout Montana, the northern Great Plains, and the Rocky Mountains. Between 2010 and 2025 Confluence staff monitored over 1,000 acres of mitigation wetlands annually for the Montana Department of Transportation. This work included habitat mapping, wetland delineations, waterfowl and wildlife observations, noxious weed mapping, groundwater monitoring, and wetland functional assessments.

- Wetland Delineation and Jurisdictional Determinations
- Wetland Mitigation Design
- Functional Assessments
- Army Corps 404 Permitting
- Mitigation Banking Planning and Design

WATER RESOURCES ENGINEERING

Our engineering team begins by understanding our client's vision, followed by developing clear and concise goals, identifying all constraints that may factor into achieving those goals, and utilizing defensible design criteria to justify our designs. Nearly all of Confluence's projects require close collaboration between our engineering and ecological staff, allowing us to generate solutions that are technically and scientifically sound.

- Bank Stabilization and Restoration
- Aquatic Organism Passages
- Irrigation Diversion Designs & Culvert Sizing
- Flood Studies
- Fish Barriers & Screens
- Water Elevation Control
- Hardened Livestock Crossings
- Topographic and Bathymetric Surveys
- Hydrologic and Hydraulic Modeling

REVEGETATION AND RECLAMATION

Confluence provides revegetation support on a variety of projects, including wetlands, post-development sites, roadside disturbances, and enhancement of wildlife and waterfowl habitat. When needed, we work with Conservation Districts and/or native plant nurseries to meet our client's custom revegetation needs.

- Vegetation Installation
- Installation of Pre-Planted Riparian Vegetation Mats
- Invasive Plant Management Plans
- Installation of Floating Biological Islands
- Soil Sampling and Testing
- Native Species Revegetation
- Tailored Native Seed Mixes
- Oversight of Planting Crews
- Long-term Monitoring
- Biodiversity Enhancement Plans

POND DESIGN AND MANAGEMENT

Whether you've been thinking about building a new fish pond, wish to improve an existing pond, or have an abundance of aquatic plants and algae that prevent the enjoyment of your pond, our team of aquatic ecologists and designers have the experience and knowledge to help achieve your vision.

- Recreational and Fish Pond Design
- Wetland/Waterfowl Habitat Design
- Construction Coordination and Supervision Services
- Seasonally Adapted Maintenance Programs
- Algal Identification & Treatment Protocols
- Advanced Water Quality Analyses
- Stocking of State Certified Fish
- Aeration System Management

ECOLOGICAL ASSESSMENTS

Confluence collects and analyzes relevant field data to evaluate the health of aquatic systems and establish baseline data for future monitoring. Through our environmental and ecological assessment services, we analyze the health of fish communities, macro-invertebrates, periphyton, riparian and wetland vegetation, and stream channel conditions.

- Periphyton, Riparian and Wetland Vegetation Assessment
- Discharge and Temperature Monitoring
- Habitat Inventories and Assessments
- Aquatic Macroinvertebrate Assays
- Fish Population, Invasive Plant, and Wildlife Surveys
- Raptor and Nest Surveys

CONSTRUCTION SUPPORT SERVICE

In addition to overseeing the construction phase of over 90% of our designs, Confluence offers construction support to larger construction contractors looking to fill specialty support roles.

- Construction Management and Oversight
- Construction Dewatering Design and Permitting
- Environmental Protection Planning
- Constructability Reviews
- Bypass Channel Design
- Staking and Layout

WATERSHED AND LAND USE PLANNING

Confluence provides comprehensive services to address watershed planning and management needs. We offer our services at various levels of involvement, from field sampling and monitoring to complete watershed planning and restoration assistance. Confluence can help:

- Study floodplains and delineate wetlands
- Provide water quality planning and management
- Develop cost-effective best management practices
- Assist with grant writing
- Provide public outreach and education
- Gather field data and prepare analysis and studies to meet EPA mandates

MONITORING AND COMPLIANCE

Confluence works tirelessly to ensure environmental compliance throughout all project phases. Our expertise in environmental monitoring, reporting, and adaptive management helps minimize regulatory challenges while maintaining project integrity. By integrating proactive compliance strategies with rigorous field monitoring, we help clients meet permit conditions, mitigate environmental impacts, and ensure sustainable project outcomes.

- Stream and Wetland Mitigation Monitoring
- Discharge and Temperature Monitoring
- Water Quality Monitoring
- Development of Project Success Criteria and Monitoring Methods

ENVIRONMENTAL PERMITTING

Confluence works closely with our clients and regulatory agencies to minimize potential conflict and streamline the permitting process. The integrity of our environmental planning and permitting services has earned the respect of federal, state, and local regulatory agencies, allowing for quick approval to meet client timelines and budgets.

- SWPPP Administration and Inspections
- Storm Water Discharge Permits
- Floodplain Mapping and Permitting
- Clean Water Act (CWA) Permitting:
    - Section 404, Nationwide 27 and Individual Permits
- Montana Stream Protection Act (SPA 124)
- Montana Streambed and Land Preservation Act (310 Permits)
- Environmental Impact Assessments

Get to Know Our Team

Since our inception, we have hired an exceptional crew of dedicated ecologists, engineers, and administrative staff to best serve our clients. We pride ourselves on going the extra mile to surpass basic customer satisfaction and exceed our clients' expectations.

JAMES A. LOVELL

PRRINCIPAL RESTORATION SPECIALIST

Jim Lovell, an international expert in aquatic restoration, is the founder and president of Confluence Consulting, Inc. Jim's technical skills include design and construction of fish habitat projects, restoration for threatened and endangered species, geomorphic assessments of stream channels, and relocation of streams and rivers for fisheries conservation, highway construction, and property development. Jim's passion for nature, personality for innovation, and strong communication skills drive his success. He currently focuses on integrating drought resiliency planning with natural water storage and water quality improvements.

"Working at Confluence allows me to put my love for nature to work, restoring damaged ecosystems for fish and wildlife and leaving the world a better place one project at a time."

MIKE SANCTUARY

PRINCIPAL STREAM GROUP LEAD

Mike incorporates his wildlife, fisheries, hydrology, and watershed science background into Confluence's stream and river assessment projects. As one of Confluence's principals and most experienced project managers, Mike leads multi-disciplinary teams of engineers, scientists, and construction contractors to accomplish various projects. His project experience includes several large watershed inventories, mitigation planning and design, bank stabilization, irrigation infrastructure modifications, stream channel restoration, revegetation, drought mitigation, stakeholder facilitation, and cost estimation.

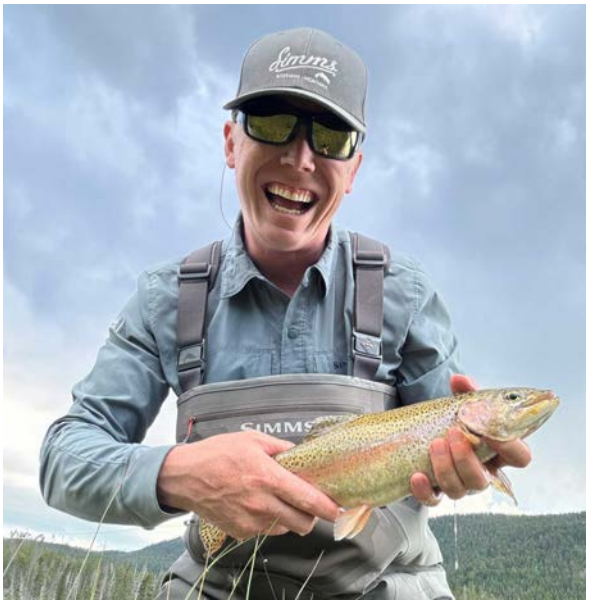
"Leaving a legacy of projects that improve habitat and water quality for the benefit of fish, wildlife, and future generations keeps me motivated and continuously wanting to find new opportunities to work with conservation and restoration partners."

RICH MCELDOWNEY, PWS

PRINCIPAL WETLAND / RIPARIAN ECOLOGIST

Rich is a certified professional wetland scientist (#1439) and a returned Peace Corps volunteer (Philippines 1994-1996). For over 25 years, he has managed and contributed to riparian-, wetland-, floodplain, and stream-related projects throughout Wyoming and the Rocky Mountain West. His passion is process-oriented wetland restoration that emphasizes wetland function, such as flood flow attenuation, water quality improvement, and habitat interspersion. He has developed/co-authored three rapid wetland assessment methods for use in different areas of the western U.S. (e.g. Montana Wetland Assessment Method).

"I believe with every fiber in my being that through thoughtful consideration, use, and restoration, natural systems will support the human journey indefinitely."



KRISTIAN GANDRUD

STREAM RESTORATION CONSTRUCTION SUPERVISOR

Kris combines his education and professional work experience to implement successful restoration projects and provide technical construction services to contractors and clients. Kris has over a decade of experience implementing stream, wetland, floodplain, and environmental remediation projects throughout the intermountain west. Kris serves as a technical expert to construction contractors and design engineers acting as a facilitator between consultants, agencies, organizations and constructors. As someone with an educational background in hydrology, experience as a water resources consultant, and as an experienced construction practitioner, Kris lends a unique perspective to all phases of projects.

"The bitterness of poor quality remains long after the sweetness of low prices is forgotten."
- Benjamin Franklin

RONDA BURNS, PE

SENIOR WATER RESOURCES ENGINEER AND HYDROLOGIST

Ronda has over 25 years of consulting and agency experience in water resources engineering and holds an M.S. in Civil Engineering from Colorado State University. She has been a Certified Floodplain Manager since 2007 and her extensive experience includes assessing hydraulics and scour at bridges, river and stream restoration, flood hazard studies, and permitting. Ronda specializes in hydrology, hydraulics, and sediment transport modeling. As Confluence's most experienced hydrologist, Ronda takes the lead role in many of our technical projects that utilize hydraulic modeling as a design and planning tool. Ronda is a licensed professional engineer in Montana, Wyoming, Colorado, Utah, Nevada, Maryland, Idaho, and Oregon.

"I enjoy working in a collaborative environment on complex projects that require a blend of creativity and technical know-how."

MIGUEL LEY, PE

WATER RESOURCES ENGINEER

Miguel is a professional engineer with an extensive background in construction, surveying, design, and hydraulic modeling. Miguel's expertise covers a wide spectrum of projects, including floodplain management, bank stabilization, irrigation diversion systems, and stream restoration. Miguel is adept at designing fish screens that support aquatic life and developing sophisticated hydraulic models to ensure the effectiveness and sustainability of water systems. Miguel's approach ensures that each project is well-planned and executed, meeting regulatory standards, environmental quality, and client goals. In addition to technical skills, Miguel excels in construction management, overseeing projects from inception to completion. He works closely with multidisciplinary teams to deliver high-quality results.

"The things of nature do not really belong to us, we should leave them to our children as we have received them" - Oscar Wilde

KEEGHAN LAUVER, EIT

WATER RESOURCES ENGINEER

Keeghan is a recent civil engineering graduate from Montana State University. Currently pursuing his Master's degree in civil engineering with a specialization in ecohydrology. Keeghan has gained valuable project experience in fish habitat design, stream channel restoration, stream and wetland monitoring, bank stabilization, and cutthroat trout research. His expertise in these areas has been honed through hands-on work in Montana, where he has consistently demonstrated a commitment to environmental stewardship and sustainable engineering practices. As a native to Montana, Keeghan has many secret fishing holes.

"Being part of such a diverse team, united by a shared passion for preserving and improving the natural environment, is an incredible experience that allows me to learn how to better care for the environment beyond my engineering mindset."

COLE BULLER, EIT

WATER RESOURCES ENGINEER

Cole is an engineer on Confluence's stream restoration team, where he works to combine ecology and hydraulics to produce effective designs. He holds an M.S. in Civil Engineering from Montana State University, where his research focused on westslope cutthroat trout passage in scaled Denil fishways. Cole specializes in hydraulics, hydrology, and geomorphology. His experience at Confluence includes GPS data collection and analysis, hydraulic modeling, river monitoring, and Civil3D drafting. In his free time, you'll find Cole skiing, biking, fishing, and more in the areas around Montana.

"This world is so beautiful! Why not keep it that way?"

HANNAH CANTÚ

AQUATIC BIOLOGIST

Hannah graduated from Montana State University, where she found her passion for protecting and enhancing aquatic resources. Her experience spans from stream and wetland restoration projects to native species revegetation and multitudes of biological assays. She has supervised the construction of ponds and streams, along with the maintenance of freshwater ecosystems' health. She has successfully navigated extensive federal, state, and local permitting along with Reserved Water Rights projects. She is also an FAA Certified Remote Pilot and a licensed Private Applicator for Aquatic Herbicide & Piscicide.

"I am thankful to be working for a company that holds the same values as I do, and proactively supports their staff in both new and continued endeavors."

BRYCE PEASE

WETLAND SCIENTIST II / BOTANIST

Bryce is a wetland scientist and enthusiastic botanist with years of experience with Montana flora, plant science, and identification. Having graduated from Montana State University with a broad background in environmental sciences, her experiences include riparian and alpine vegetation monitoring, wetland delineation, floral scent and pollinator research, teaching plant identification labs, technical report editing, and soil science writing. Bryce is a former long-distance hiker, but these days she prefers to take her hikes slowly and look at the flowers.

"I am excited that I not only get to work with plants, but also apply botany to make a difference for our landscapes and the people

ELISE REYNAUD

WETLAND SCIENTIST

Elise's love for the outdoors has led to her involvement in a wide variety of environmental work throughout the Greater Yellowstone Ecosystem. As a wetland scientist at Confluence Consulting, she has executed numerous wetland delineations both individually and as part of a team. Her position includes a wide variety of responsibilities such as wetland mitigation monitoring, aquatic resource inventories, GIS mapping, and scientific report writing. Previously, she participated in soil-borne disease research with Montana State University and plant-pollinator research at the U.S. Forest Service's Rocky Mountain Research Station. She also performed land surveys and trumpeter swan monitoring for the Teton Regional Land Trust.

"My work at Confluence has shaped my ability to contribute meaningfully to the environmental science field."

RICHARD (RJ) BAUMGARTEN

WETLAND SCIENTIST

RJ is a well-rounded environmental scientist with an interest in soil microbiology, who recently graduated from MSU. RJ's experience at Confluence includes wetland delineations, functional assessments, monitoring, and technical report writing. RJ has participated in multiple conservation efforts including land cleanup around Gallatin Valley and large carnivore preservation in Zambia.
Additionally, he has diverse research experience ranging from implementation of anaerobic metabolism studies to data entry and statistical analysis. He is an avid fly fisher and outdoors enthusiast.

"I love having a job that gets me outside every day, and where I can use my skills to benefit the environment."

RONDA CREIGLOW

OFFICE MANAGER

Ronda C. is the glue that holds the Confluence team together. As our office manager, Ronda stays on top of payroll, accounts payable, human resources, inventory, supplies, preparing financial reports, and 3,258 other things that can happen on any given day. Ronda spent nearly 20 years working on projects in Yellowstone National Park including historic building renovation and advising Park personnel as a member of the Safety and Environmental Committee. Her love of the outdoors finds her frequently paddle boarding, hiking, and enjoying all that Montana has to offer.

"I feel so proud when I tell my friends and family that I work for an environmental company. I love the outdoors, and everyone here feels the same – it makes it even better."

Confluence's Projects

We understand the importance of protecting our natural resources and preserving recreational and economic opportunities.

Confluence strives to design and implement projects based on the ecological and physical processes found in nature. Our reputation for innovation has allowed us to restore rivers, streams, and wetlands in 16 states across the US.

We have designed and implemented hundreds of successful environmental restoration projects, working hand-in-hand with ranchers, conservation groups, state and federal agencies, nonprofit groups, and public citizens to promote a healthy environment for the benefit of all.

These projects not only improve habitat for fish and wildlife but also improve water quality, increase native plant species diversity, promote environmental health, and preserve land values for future generations.

We aim to restore our natural landscape and preserve our natural heritage, recreation, and quality of life through delivering expertise in aquatic design and restoration and promoting the wise stewardship of our natural environment.

Jarbridge River Emergency Bull Trout Habitat Reconstruction

BEFORE

AFTER

THE PROBLEM

Following a major flood event and unauthorized river reconstruction, the resident population of bull trout in the Jarbridge River declined to endangered under the emergency provisions section of the Endangered Species Act.

OUR SOLUTION

- Divert the entire Jarbridge River flow around the project site in a lined diversion ditch
- Intercept groundwater in a series of dewatering trenches and sumps upstream of construction activities
- Pump turbid water onto the floodplain to allow it to filter through vegetation and infiltrate into the ground
- Install nearly 3,000 feet of silt fence along haul roads, the diversion ditch, and other construction areas
- Schedule construction so that multiple activities with the potential to produce sediment would not occur simultaneously

THE OUTCOME

Confluence restored over 2,000 feet of channel and floodplain within 2.5 months of contract execution.

Poindexter Slough Fisheries Enhancement

THE PROBLEM

The Beaverhead Watershed Committee retained Confluence to survey and develop restoration recommendations for improving fish habitat and water quality along four miles of Poindexter Slough. At one time, Poindexter Slough was a natural side channel of the Beaverhead River, but is currently controlled by a head gate.

OUR SOLUTION

Potential improvements identified by Confluence included:

- Restoring appropriate width-to-depth ratios for riffles and pools
- Restoring or isolating fine sediment deposits from the stream bed
- Encouraging natural recruitment of willows and other woody riparian vegetation

CONSTRUCTION OVERSIGHT

Construction of the Poindexter Slough Fisheries Enhancement Project began in January 2015. Confluence provided oversight to ensure the project was built according to the specified design. Oversight included staking all project reaches, inspecting elevations of the diversion structures and headgates, and ensuring the proper gradient throughout the re-graded channel segments.

This project ranked in the top five to be funded by the Montana Legislature in 2011. In 2016, Montana Fish, Wildlife, and Parks (MFWP) awarded Confluence with the Award of Excellence for our role in this project!

Poindexter Slough Fisheries Enhancement, cont.

THE OUTCOME

The Beaverhead Watershed Committee extended a second contract with Confluence to produce final designs and construction specifications for the preferred alternative from the Feasibility Study. The final design plans included:

- Re-grading 5,700 feet of the channel to improve pool and riffle habitats and reduce fine sediment accumulation
- Modifying channel width and depth throughout the 4.75 miles of the channel to encourage fine sediment transport and improve angling
- Re-sloping vertical banks and transplanting 130 willows to reduce bank erosion
- Upgrading diversion structures on the Beaverhead River and the Dillon Canal to enable flushing flows, eliminate backwatering, and improve fish passage

BEFORE

Over-wide and eroding channel segments causing slow water and fine sediment accrual prior to construction.

AFTER

Narrowed and stabilized channel segment immediately following construction.

Goose Creek Restoration and Westslope Cutthroat Trout Conservation

THE PROBLEM

During the 1950s, Goose Creek, a tributary of the West Branch of the Priest River in the Idaho Panhandle, was channelized to maximize agricultural land use and drain adjacent wetland meadows. The Kalispell Tribe of Indians retained Confluence stream restoration specialists and water resource engineers to develop conceptual plans and restore four miles of Goose Creek and several hundred acres of adjacent wetlands to historic levels.

OUR SOLUTION

Confluence Consulting, Inc. developed Phase 1 final design components including a 600-acre wetland delineation, geotechnical analysis, structural design for a fish barrier, and the initial 3,400 feet of channel relocation. The fish barrier and associated floodplain dike were constructed in 2011, while the first phase of channel relocation was constructed in 2012.

OUR SOLUTION, CONT.

The fish barrier was designed to pass a 100-year flood event (770 cfs) and prevents upstream migration of non-native fish by dropping over a five feet vertical concrete wall. We excavated several test pits to determine soil engineering properties and groundwater depth in the vicinity of the barrier. Results of these geotechnical investigations necessitated moving the structure to the south end of the meadow to allow it to tie into bedrock formations 12 feet underground. Helical piers were then installed where bedrock formations were too deep, providing a sound foundation to construct the concrete footers.

THE OUTCOME

Confluence finalized designs for Phase 2 of the project, which entailed relocating an additional 4,500 feet of channel and establishment of 2.8 acres of wetlands. The Kalispell Tribe of Indians expressed great satisfaction with the results and hopes to build on the success of this project with new projects in the area.

WETLAND DELINEATION, PERMITTING, AND MITIGATION

Shutts Flats Aquatic Resource Mitigation

THE PROBLEM

Confluence provided the Wyoming Department of Transportation (WYDOT) with full design services for a wetland mitigation site located in the floodplain of the South Tongue River in the Bighorn National Forest in Sheridan County, Wyoming. Shutts Flats consists of interspersed dry and wet meadow along the South Fork Tongue River. Previous impacts to the system changed the floodplain elevation, disconnecting it from the river. Identified by the US Forest Service (USFS), the project restored over 15 functional units (based on the Montana Wetland Assessment Method) by reconnecting the river to its floodplain.

OUR SOLUTION

The four main project elements included low-flow sedge benches, floodplain reconstruction, development of a wetland swale, and increased habitat diversity.

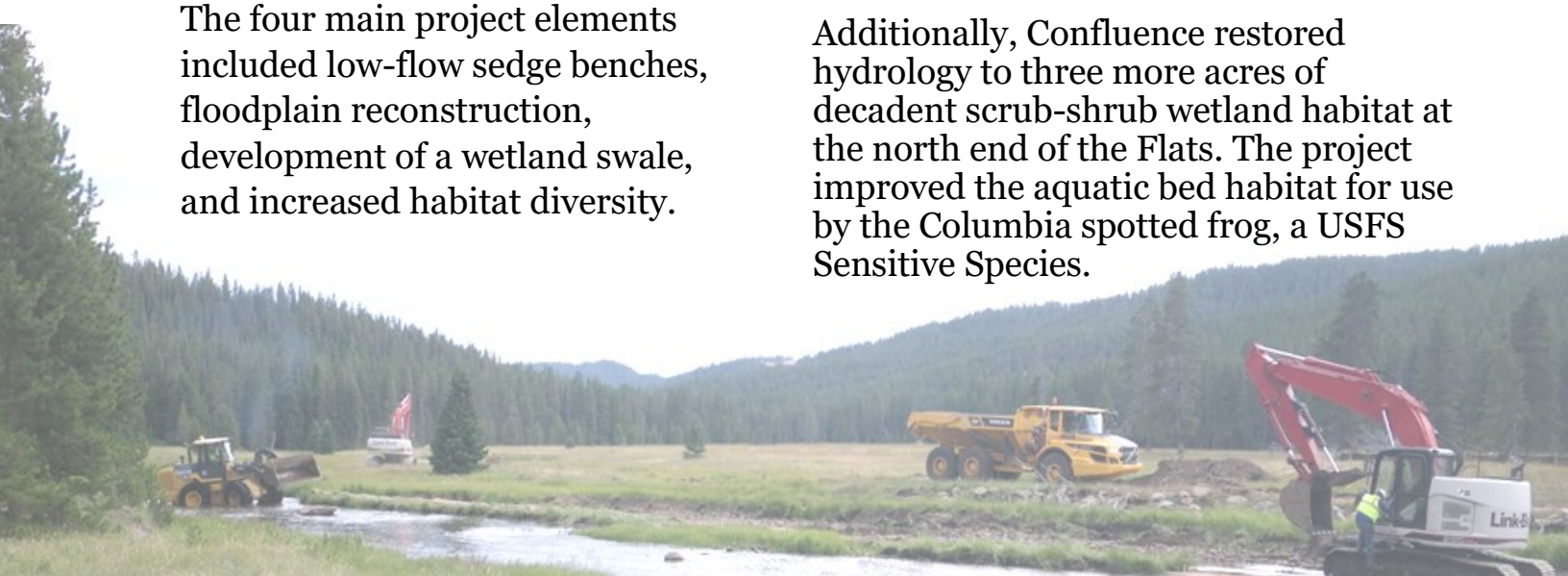
OUR SOLUTION, CONT.

In addition to conceptual designs and a full PS&E package (in hardcopy and Microstation and GeoPak formats), Confluence developed 1D and 2D hydraulic models of the mitigation site using HEC-RAS and a mitigation master plan that included restoration goals and objectives, performance metrics, and a monitoring plan.

THE OUTCOME

Within seven months, our staff had permits in hand and had completed conceptual to full designs through a process of multiple review cycles by the Interagency Technical Team. To ensure proper construction, Confluence staff directly oversaw the project, restoring and creating approximately 2.5 acres of wetland habitat.

Additionally, Confluence restored hydrology to three more acres of decadent scrub-shrub wetland habitat at the north end of the Flats. The project improved the aquatic bed habitat for use by the Columbia spotted frog, a USFS Sensitive Species.



Livingston South Project

Confluence completed a Biological Resources Report/Biological Assessment for the Montana Department of Transportation (MDT) to evaluate potential impacts to biological resources that may result from the reconstruction of United States Highway 89 South (US 89S) south of the City of Livingston, Montana.

The report included an evaluation and assessment of the proposed project's effects on the fish, wildlife, critical habitats, rare and/or sensitive plants, threatened and endangered species (T&E), species of concern (SOC), wetlands, streams and other water resources located along the project corridor.

Conservation measures and other relevant mitigation to avoid, minimize, or compensate for adverse impacts to potentially affected natural resources were also included in the report. Confluence also completed an animal detection systems feasibility analysis due to a disproportionate number of vehicle collisions near the project area.

Arrington Ranch Wetland and Waterfowl Habitat Enhancement

Confluence conducted a wetland delineation and survey for Ute ladies' tresses (*Spiranthes diluvialis*), and provided survey, design, hydrologic/hydraulic analyses, reporting, permitting, and construction oversight for this wetland and waterfowl enhancement project on the Arrington Ranch, adjacent to the Beaverhead River in Twin Bridges, MT.

The waterfowl habitat design plans included:

- Inlet and outlet structures for the oxbow reactivation
- Grading plans for open water areas within the oxbow and for the waterfowl pond enhancements
- Revegetation design customized to include native species beneficial for waterfowl

Bear Creek Habitat Restoration

THE PROBLEM

Several decades of poor land management led to a degraded segment of Bear Creek, which exhibited significant bank erosion and poor habitat for adult trout. An aquatic habitat assessment identified only four pools in over 4,200 feet of stream channel. Previous overgrazing and woody vegetation removal efforts had also depleted the riparian corridor of nearly all woody species.

These land use practices widened the stream bed considerably, covered it with fine sediment, and eliminated many of the habitat features essential to a healthy trout population.

OUR SOLUTION

Confluence restored Bear Creek by constructing over 40 pools and runs, creating spawning bed, adding woody debris for cover, and restoring the riparian corridor with 600 native shrubs and trees.

THE OUTCOME

Bear Creek has a rapidly recovering riparian corridor and a growing brown trout fishery. It has become a significant spawning tributary to the Madison River, a world-renowned trout fishery.

Spring Creek Fish Habitat Restoration

THE PROBLEM

Confluence conducted a thorough inventory and analysis of stream conditions to determine that the spring creek fishery was grossly under potential due to an excessive fine sediment supply and a lack of spawning habitat and adult trout cover.

OUR SOLUTION

Confluence developed a restoration plan providing complete habitat evaluation, design, and construction oversight services on the restoration of over three miles of spring creek and a side channel to the Green River in central Wyoming.

THE OUTCOME

Confluence has since converted the spring creek into a trophy fishery supporting trout up to 27 inches.

Thompson Creek Stream / Wetland Restoration and Fisheries

BEFORE

AFTER

THE PROBLEM

The Thompson Creek stream and fishery near Belgrade, MT, was significantly affected by erosion, overgrazing, fine sediment covering the stream bed, high summer temperatures, and a lack of spawning and deep pool habitat.

OUR SOLUTION

Confluence coordinated with private landowners, provided consultation, surveying, design, permitting, and construction oversight services to:

- Reduce channel widths
- Isolate and stabilize over 35,000 cubic yards of fine sediment, reducing sediment transport to the East Gallatin River
- Install bioengineered bank stabilization treatments, new culverts, and livestock crossings
- Increase deep pool, rearing, and spawning habitat for trout
- Stabilize seasonal water temperatures
- Expand floodplain and wetland habitat
- Restore and revegetate adjacent wetlands with native sod and seed
- Improve aesthetics and wildlife habitat features

Diamond O Ranch Aquatic Resource Enhancement

The Diamond O Ranch, located near Dillon, MT, retained Confluence to evaluate the potential for habitat restoration and improvement on this 516 acre property. Confluence:

- Optimized water quality by installing an infiltration system along the channel to increase groundwater flows
- Relocated existing irrigation infrastructure to isolate groundwater in the new channel from warm turbid surface irrigation water
- Constructed a new channel to provide high quality trout habitat, convey design discharge, and meet hydraulic design criteria for trout spawning and efficient sediment transport
- Constructed a pond to provide gravel for stream construction and to filter surface irrigation water through, supplying additional water to the new channel
- Expanded an existing pond and created wetland habitat beneficial for waterfowl migrations and use by other wildlife species

Prior to site construction, Confluence identified a population of the federally threatened Ute ladies' tresses orchid (*Spiranthes diluvialis*). The orchid responded well to the wetland enhancement project, with an expanded habitat boundary observed post-construction.

Private Pond near Big Sky, MT

Confluence provided survey, design, construction management, and oversight services for the construction of a half acre pond near Big Sky.

This challenging project included preparation of a grading plan for the expansion of two small, shallow marshes into one large deep pond with surrounding wetlands.

The pond design included connection to intermittent inlet and outlet channels, a liner with a subsurface drainage system, and piping for the possible future addition of a re-circulating pump.

East Duck Creek Restoration

The MacMillan Ranch, located on the southern end of the Crazy Mountains, retained Confluence to improve fishing opportunities throughout the ranch. A segment of Duck Creek was not exhibiting pools capable of supporting over-wintering trout, limiting the fishery's production and population of large, catchable trout.

Efforts to improve fish habitat included a full inventory of aquatic resources followed by the restoration of pool habitat to benefit native Yellowstone cutthroat trout in approximately one mile of East Duck Creek. Some of the stream restoration involved the construction of boulder step-pools through a high-gradient canyon section of the stream. In addition, we created a small but very fishable and aesthetic streamside pond that was stocked with Yellowstone cutthroat trout. The project has experienced a 100-year flood and has maintained its pool morphology and sediment transport characteristics.

MDT Stream Mitigation Monitoring

Since 2013, the Montana Department of Transportation (MDT) has contracted Confluence to conduct annual, statewide monitoring of MDT's stream mitigation sites. The US Army Corps of Engineers (USACE) requires MDT to conduct mitigation actions to offset any permanent impacts to streams and riparian corridors resulting from highway construction projects.

Confluence is responsible for collecting and interpreting data as specified in monitoring plans prepared by MDT as well as preparing annual monitoring reports for each mitigation site. Confluence summarized the results of statewide annual monitoring from 2013 to 2019 into technical reports documenting conditions at each site in accordance with MDT and USACE monitoring requirements.

MDT Wetland Mitigation Monitoring

The Montana Department of Transportation (MDT) retained Confluence to complete two consecutive three-year monitoring term contracts involving a comprehensive environmental monitoring program for 29 mitigation wetland projects. Monitoring activities included: soil and water chemistry sampling, wetland delineation per US Army Corp of Engineers (USACE) guidance, functional assessment of wetland conditions per the Montana Wetland Assessment Method, vegetation community assessment, bird and other wildlife observations, groundwater monitoring, stream channel mensuration and assessment, weed infestation inventory, and infrastructure maintenance assessment.

Quantitative monitoring methods included GPS and aerial photogrammetry-based vegetation community mapping, and permanent vegetation transects. Confluence prepared annual monitoring reports for each mitigation site monitored. These reports documented mitigation wetland performance and earned mitigation credit approval from USACE. The project included a wetland scientist team of 13 specialists monitoring 29 mitigation sites throughout Montana. Confluence completed detailed wetland reporting for MDT, in addition to monitoring avian species and aquatic resources, and verifying wetland boundaries. All work was completed in compliance with USACE standards.

Beartooth Highway Project

Confluence provided the Federal Highway Administration - Central Federal Lands Highway Division (FHWA-CFLHD) with permitting support and construction oversight of wetland mitigation sites within the Shoshone National Forest in Park County, Wyoming. They also conducted annual wetland mitigation site monitoring and designed and implemented revegetation efforts for both wetland mitigation sites and adjacent roadside habitat. Confluence continues to service this ongoing project.

Stone Creek North Project

Confluence completed a Biological Resources Report/Aquatic Resource Delineation for the Montana Department of Transportation (MDT) to analyze potential impacts to existing biological resources associated with proposed improvements to MT Hwy 41. MDT proposed the reconstruction of roughly 7.2 miles of MT Hwy 41 near Beaverhead Rock. Confluence evaluated the existing conditions and the project's potential impacts on terrestrial and aquatic plants and animals, wetlands, species of concern (SOC), and threatened and endangered (T&E) species.

These reports were prepared in compliance with the environmental review process associated with the National Environmental Policy Act (NEPA), the Montana Environmental Policy (MEPA), the US Endangered Species Act of 1973 (ESA), and the US Army Corps of Engineers (USACE). MDT requested that Confluence verify the wetland delineation performed in 2013 and extend the wetland boundary delineation. This included a survey and report for state and federally listed plant species, as well as a hydrogeological site evaluation report associated with the fen within the project area.

WETLAND DELINEATION, PERMITTING, AND MITIGATION

Green Mountain Wetland Project

Confluence provided wetland delineation and permitting services for a 320-acre land development project located in the Bangtail Mountains near Bozeman, Montana.

Due to the size of the project and the rugged terrain, we took an innovative approach by combining on-the-ground, site-specific delineation and detailed aerial photography. This method allowed us to complete the work in a timely manner which met the client's budget and schedule.

The developer used our delineation maps, along with wildlife studies, to produce a site plan that minimized wetland impacts and preserved critical wildlife habitat.

Confluence designed, constructed, and monitored the creation of 1.7 acres of mitigation wetlands. The newly created wetland satisfied requirements for the U.S. Army Corps of Engineers 404 permit and provided attractive wildlife habitat within an extensive open space, complete with nature trails and interpretive signage.

Confluence took an innovative approach to the wetland permitting process that incorporated the developer's project vision and budget constraints while exceeding regulatory requirements.

O'Dell Creek Wetland Monitoring

O'Dell Creek, one of Montana's most famous trout streams, rises from the Madison River floodplain near Ennis, MT. The Granger Ranch encompasses much of the headwaters of O'Dell Creek and over 1,000 acres of adjacent wetlands. Partially drained by ditching decades ago, the wetland complex was recently restored by plugging drain ditches and elevating the groundwater table, resulting in ecological benefits to the immediate area and the entire Madison River ecosystem.

Confluence was retained by Montana Fish, Wildlife, and Parks (MFWP)to monitor the restored wetlands,documenting their functional recovery over three years. Confluence staff completed wetland, open water, and vegetation mapping in addition to gathering soils data. All of our work was completed following the US Army Corps of Engineers' mitigation monitoring requirements.

This project received a City of Bozeman Beautification Award.

1001 Oaks Stream Restoration and Wetland Mitigation Project

Confluence conducted a jurisdictional wetland delineation for an innovative office and retail development in a commercially zoned district in Bozeman,Montana. The delineation aided an overall effort to enhance the functions and values of a highly impacted creek, and to ease the planning and permitting process for office and retail building sites.

Confluence worked closely with he client, the project landscape architect, local landscaping services, and regulatory representatives to develop an attractive pedestrian / recreational corridor surrounding a healthy,perennial stream.

Valley West Subdivision

Confluence developed final designs and provided construction oversight for 38 acres of mitigation wetlands for the Valley West subdivision complex. Wetland features included three lakes totaling 12.5 acres and an additional 25.5 acres of emergent wetlands. Wetland design tasks included groundwater monitoring, soil and subsurface investigations, developing final grading plans, and coordinating with civil and architecture project team members.

Tasks associated with lakes included developing grading plans, designing screened inlet and outlet devices, designing water control structures, and overseeing all construction phases.

All plans were developed to maximize waterfowl production and nesting sites, while providing recreational features for the public. Confluence's detailed mitigation plans included over-excavating lake and wetland areas, then placing 6 to 12 inches of topsoil for wetland vegetation establishment. Confluence worked on a team that included landscape architects, engineers, and development specialists.

Stanley, Idaho
Wetland Mapping and Delineation

Bisected by the Salmon River, the City of Stanley, Idaho is surrounded by floodplains. As the town expanded outward, the city drafted a wetland protection ordinance in May, 2008. The ordinance called for landowners to utilize wetland maps during project planning to maintain a 50 to 75 foot setback from wetland boundaries, and to seek a permit for any development that would affect wetlands.

Confluence's wetland scientists delineated nearly 250 acres within the city limits, verified previous wetland delineations, surveyed ephemeral and intermittent streams, and mapped aquatic resources. Confluence worked closely with local landowners, the City of Stanley, and the U.S. Environmental Protection Agency to complete the project.

Upper Missouri Stream, Riparian, and Wetland Mitigation Bank

THE PROBLEM

Confluence was retained to develop a concept plan for stream, riparian, and wetland mitigation banking opportunities along the Beaverhead, Ruby, Big Hole, and Jefferson river corridors on the Hamilton Ranch.

OUR SOLUTION

Confluence's wetland scientists observed existing conditions of over 1,000 acres of wetlands on the property to determine mitigation potential and prioritize areas in a phased banking approach.

Identified mitigation banking opportunities included:

- Removing hard bank armor, riprap, and junk from stream banks
- Converting croplands to native riparian vegetation
- Restoring adequate channel dimensions
- Improving riparian vegetation composition within buffer zones
- Removing floodplain berms and levees
- Improving spawning habitat
- Grazing management
- Increasing elevation of groundwater tables

THE OUTCOME

The final deliverable contained a 250-page concept plan outlining all enhancement and restoration options for each stream, riparian zone, and wetland within the designated study area of the ranch. We generated over 100 maps , illustrating existing conditions for each surveyed reach.

Final data collected for the effort included:

- 150 test pits for wetland delineation
- 15 surface water flow monitoring sites
- Topographic surveys of channel cross sections and longitudinal profiles
- Culvert invert elevations

Upon completion of the mitigation plan, the U.S. Army Corps certified the Upper Missouri Mitigation Bank for credit sales.

Jefferson Slough Eurasian Watermilfoil Management Plan

BEFORE

AFTER

THE PROBLEM

In 2011, a 20-acre infestation of invasive Eurasian watermilfoil (*Myriophyllum spicatum*; EWM), was identified within a 4-mile segment of Jefferson Slough near Whitehall, MT.

OUR SOLUTION

- Work with a technical advisory committee to develop and implement a detailed management plan
- Apply aquatic herbicide to the infested segment of the slough
- Relocate the slough through a newly constructed and narrower channel adjacent to the existing channel and backfill any remaining EWM in the abandoned channel
- Modify irrigation infrastructure along the slough to enable periodic flushing flows and reduce the accumulation of fine sediments
- Install a sediment trap on Sheep Rock Creek to eliminate large sediment pulses during intermittent flows

THE OUTCOME

Monitoring efforts from 2016 to 2018 have indicated success in eliminating EWM.

Big Hole River

Confluence worked with Montana Fish, Wildlife, and Parks, the U.S. Fish and Wildlife Service, local ranchers, the Big Hole Watershed Committee, and Montana DEQ to develop a water quality plan for streams in the upper Big Hole River watershed in Southwest Montana. In addition, Confluence completed dozens of projects with the Arctic Grayling Recovery Program to restore habitat critical to the survival of arctic grayling in Montana. These projects have included large channel restoration and revegetation projects, upgrades to irrigation infrastructure, installing fish passage devices, and reconnecting tributary streams to the Big Hole River to improve habitat connectivity.

Silver Bow Creek

Confluence worked with the Montana Department of Environmental Quality, the Montana Department of Justice Natural Resource Damage Program, and consultants to monitor remediation and restoration activities on Silver Bow Creek. Parameters included surface water quality, metals in stream bed substrate, groundwater sampling, biological communities, and geomorphic adjustments of the reconstructed segments. Water quality and biological monitoring show a significant improvement in the highly toxic waters of Silver Bow Creek.

Silver Bow Creek, Cont.

Today it is a meandering stream that has the potential to become excellent habitat for trout and other aquatic life, revitalizing recreational and economic factors in Butte and Silver Bow County.

Clark Fork River

Confluence assisted the Montana Department of Justice Natural Resource Damage Program in developing its restoration plan for the Clark Fork River. This work included developing alternative bank stabilization concepts, evaluating floodplain stability and revegetation needs, and considering various fish habitat restoration opportunities.

In addition, Confluence staff created and managed large GIS databases for the Milltown Dam and Clark Fork River Operable Units, and participated in the remedial design for the Milltown Dam removal, including stream channel design and sediment transport modeling.

The remediation and restoration of the Clark Fork River will bolster the ecological and economical conditions of southwest Montana, including a drastically improved fishery, more stable wildlife habitat, and increased land values. Confluence is proud to be a part of the restoration planning effort for this magnificent resource.

Private Ecological Assessment

Confluence provided fisheries expertise to a private ski resort to develop a high quality recreational fishery in a constructed lake. Confluence developed stocking and feeding rates to promote excellent growth and vigor of fish, while protecting against development of nuisance algal blooms which reduce aesthetic values and clog intakes and outlets. Confluence also developed additional measures to prevent algal growth through the use of non-toxic algae controls.

BLM Mountain Streams Study

Confluence collected, processed, analyzed, and reported a consortium of data to develop a baseline report on the existing conditions of select mountain streams within Fergus, Judith Basin, Cascade, Teton, Lewis and Clark, Pondera, and Meagher counties of central Montana. Confluence surveyed 28 sites on 15 streams. GIS maps were completed for each site and used in accordance with biologic, geomorphic, and anthropomorphic data to evaluate relative stability and trends for the functional conditions of these systems.

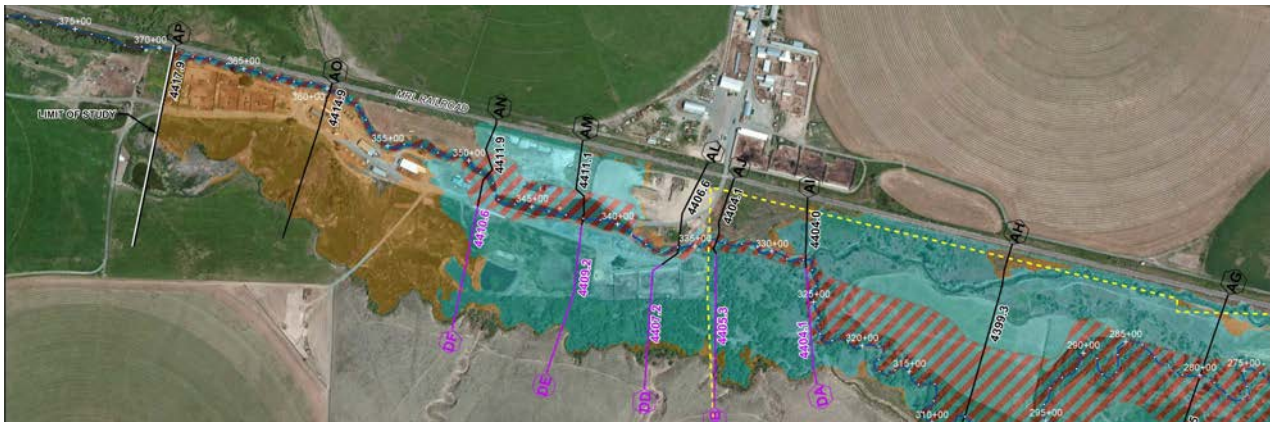
BLM Mountain Streams Study, Cont.

Aquatic habitat monitoring, stream survey, and lotic survey data were completed at each study site. Results of the study are being used by the BLM to determine suitability for conserving native westslope cutthroat trout populations.

Yellowstone Club Water Quality Monitoring

The Yellowstone Club retained Confluence to conduct water quality sampling and stream flow measurement at sites on Second Yellow Mule Creek, the South Fork of the West Fork of the Gallatin River, the West Fork of the Gallatin River, and the main stem of the Gallatin River to assess potential ongoing water quality impacts that may have resulted from the Yellowstone Club reclaimed water storage facility spill into Second Yellow Mule Creek in 2016. Monitoring activities included assessment of four parameters: field turbidity, laboratory total suspended solids (TSS), water temperature, and stream discharge.

The resulting data were compiled into a report compliant with the Montana DEQ's monitoring requirements and used to develop natural resource management recommendations.



GNP Floodplain Study

Confluence assisted in the development of a flood-plain study near Glacier National Park. The National Park Service commissioned the study to determine whether existing housing units should be replaced or relocated.

Confluence identified appropriate cross section locations for the development of a hydraulic model and 100-year flood map for the project area. General observations regarding stream corridor condition, evidence of active geomorphic processes, and ongoing management efforts in the river corridor and adjacent floodplain areas were made.

Confluence reviewed the existing flood studies by the US Army Corps of Engineers and the National Park Service in addition to other relevant studies to gain an understanding of the results and conclusions of those efforts. Confluence reviewed recent published literature on alluvial fan formation, sediment transport, stability, and flooding. Confluence also explored channel relocation as an option to lessen effects on property.

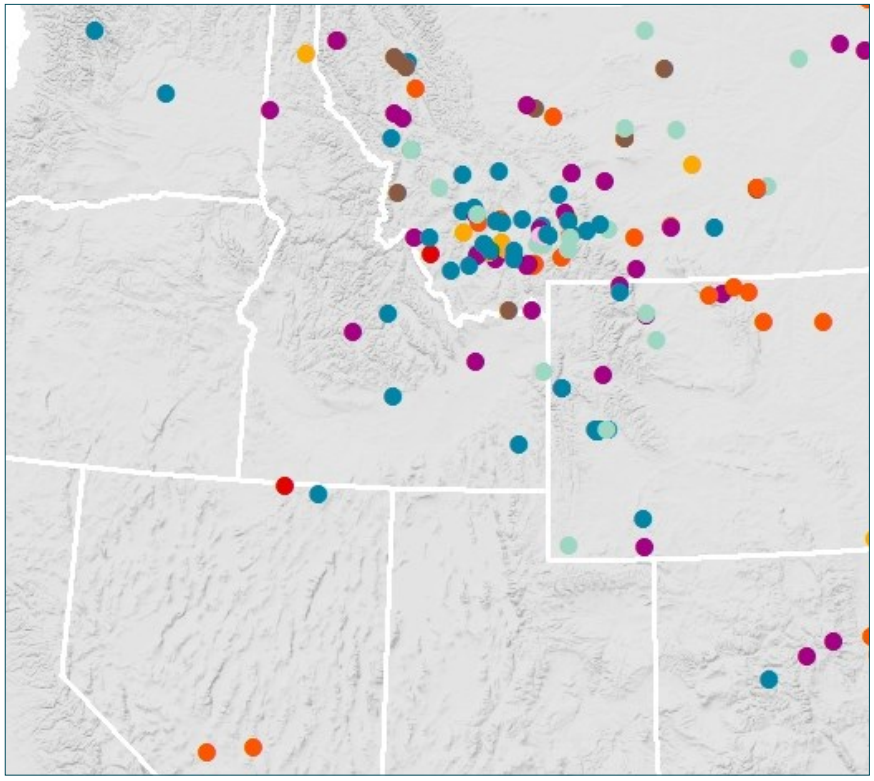
Pipestone Floodplain Re-mapping

Confluence assisted Jefferson County to prepare designs for restoring a 12,300 foot segment of Pipestone Creek to its historic alignment to reduce chronic bank erosion and sediment delivery downstream. Pipestone Creek runs through a detailed, FEMA-mapped floodplain, which required Confluence to re-map the new floodplain boundaries resulting from the restoration.

Our project engineers conducted additional surveying, HEC-RAS modeling, and GIS mapping to re-map extents of the proposed 100-year and 500-year floods. The results of this analysis were submitted with a Conditional Letter of Map Revision (CLOMR) application to FEMA and the Montana DNRC for review prior to initiation of the project.

Confluence's Regional Impact

Based out of Bozeman, MT, we have directly shaped the region through our variety of environmental consulting services. We work closely with our clients to ensure their finished projects reflect a confluence of creative ideas, thoughtful planning, effective communication, and quality implementation. While commonly used to define the meeting of two streams, we also believe the term confluence best describes the manner in which we provide our clients with superior, cost-effective solutions. Using this method, we have directly impacted the environment for the better.



- Stream Restoration and Channel Design
- Environmental and Ecological Services
- Water Resources Engineering
- Wetlands
- Permitting and Compliance Services
- Watershed and Land Use Planning

Thousands of Acres and Linear Feet Restored

In our home state of Montana, land has always been a treasured resource. We believe the same at Confluence, which is why we aim to bring the land back to its most natural and efficient state through our variety of services. While we consider land to be a treasured resource, we consider water to be its lifeblood. Each linear foot of restored water means more fish, greater efficiency, and healthier ecosystems, improving the environment of the entire region.

500+ Projects Completed

Since our founding in 1997, we have successfully completed over 500 projects in multiple states across the Rocky Mountain Region of the United States.