

Bear Lake Diversions Project

DEQ NPS Sub-Grant S597

Final Report

December 2021



Above: This photo is taken from the field adjacent to the St Charles Diversion structure. This was from the fall of 2021. BLD Photos.

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In Cooperation with:

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Idaho Soil and Water Conservation Commission Idaho
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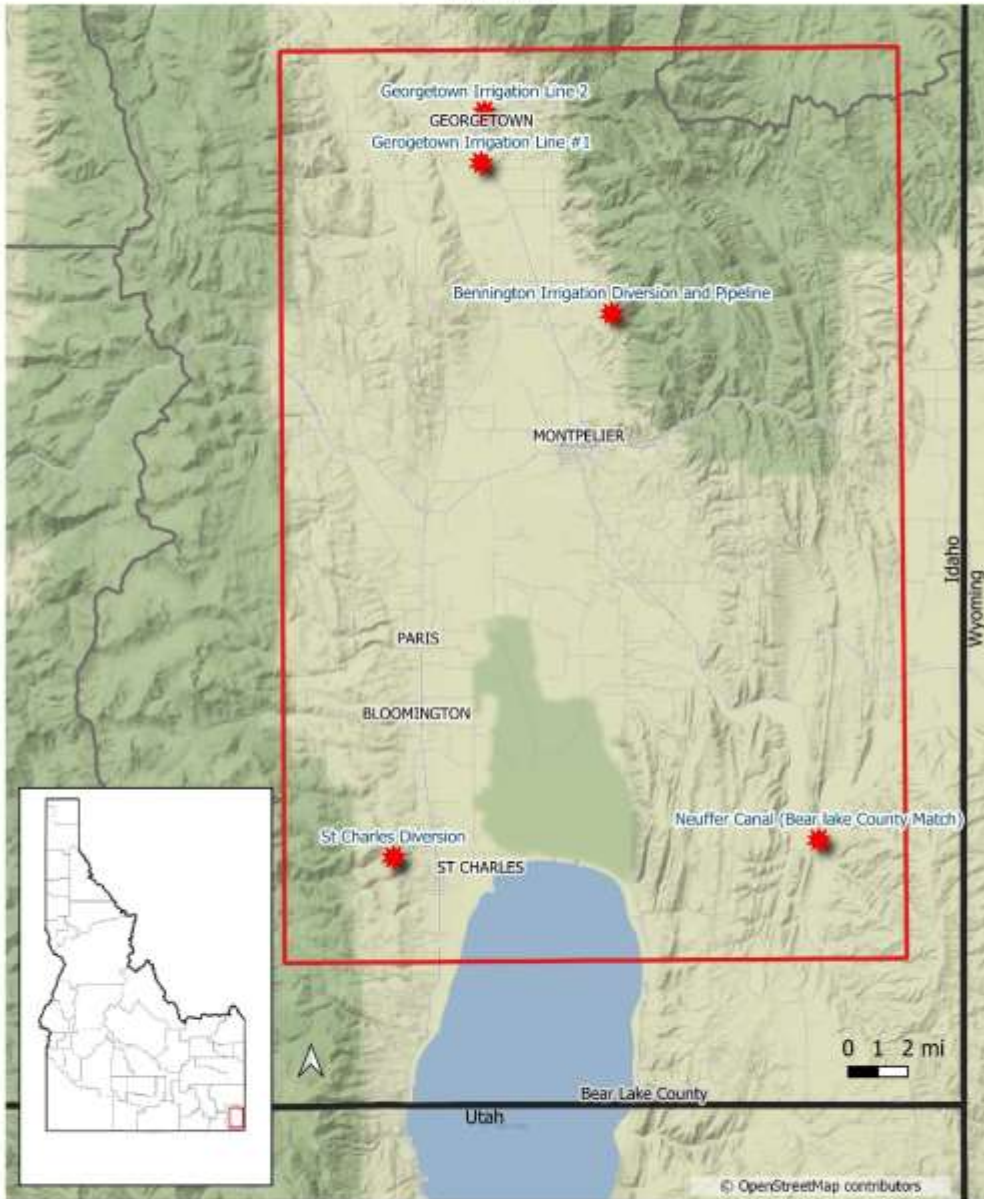
Abbreviations

Idaho Soil and Water Conservation Commission - ISWCC
 Conservation Basics LLC-CBLLC
 USDA Natural Resources Conservation Service - NRCS
 Idaho Department of Environmental Quality - IDEQ
 Environmental Protection Agency – EPA
 Total Maximum Daily Load – TMDL
 Hydrologic Unit Code - HUC
 Best Management Practices – BMPs
 Stream Evaluation Control Indicator-SECI
 Stream Visual Assessment Protocol- SVAP
 Bonneville Cutthroat Trout-BCT

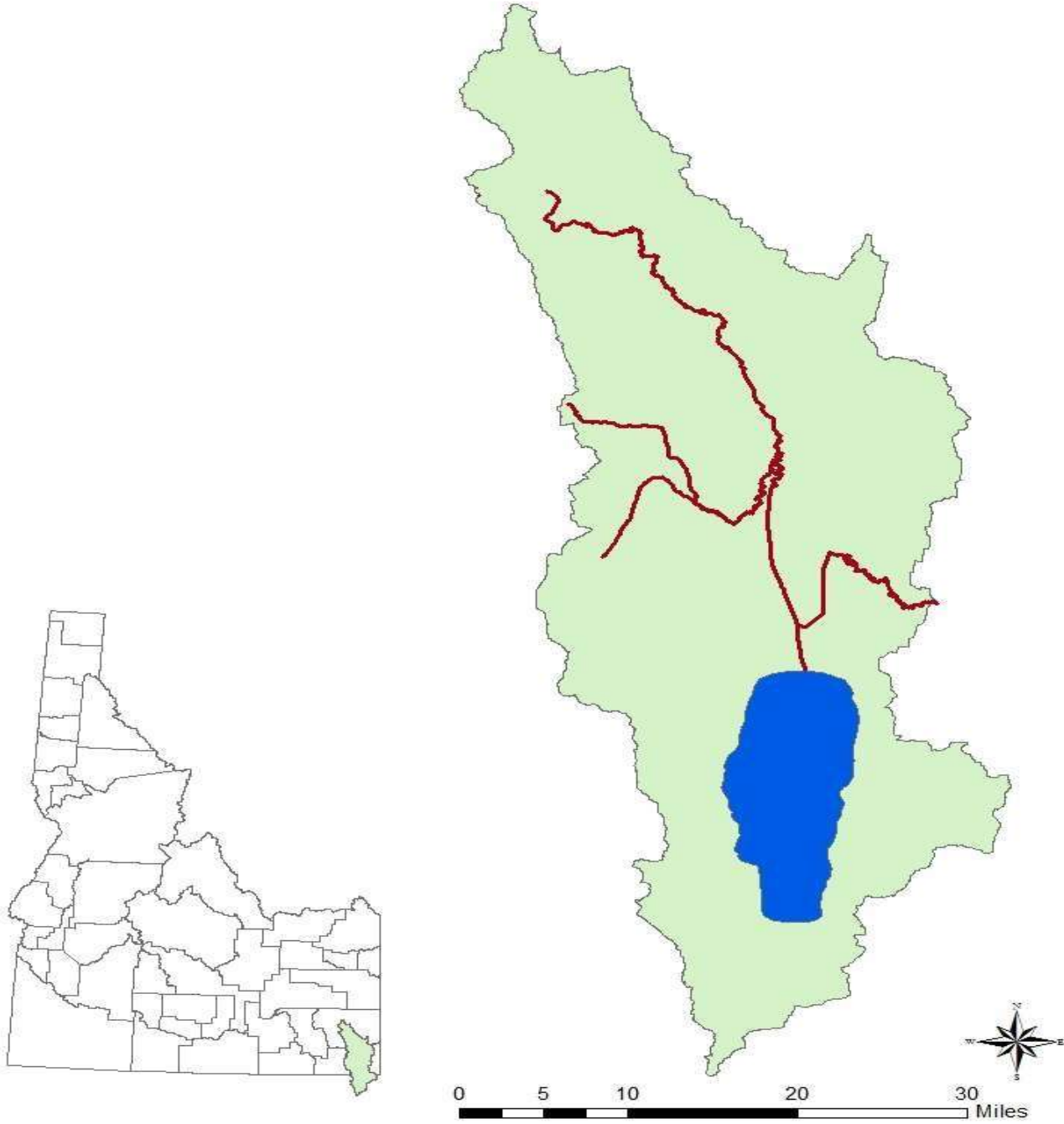
St Charles Diversions §319

DEQ NPS Sub-Grant S-Project Location Map

Bear Lake Diversions Project Location



**Bear Lake Diversions Project
Project Map 2021**



Project Overview

The idea for the Bear Lake Diversions Project arose when four irrigation companies approached the Bear Lake Soil and Water Conservation District (SWCD) about improving two (3) diversions, and converting an irrigation ditch to a piped system, and streambank stabilization.

Photo 1. This Photo shows where the Neuffer Canal empties back into the Bear River. The bank had eroded severely and was threatening this diversion structure. Bear Lake County assisted the landowner with this project. BLD Photos.





The Old St Charles Diversion Structure was washing out from the downstream side. In the above photo it is visible to see how one of the pillars of the structure was no longer connected to its base. BLD Photos.

Below: A view lookin from North to South across the old St Charles Diversion Structure. BLD Photos.



Project Goals

The goals of the Bear Lake Diversions Project were to remove barriers for spawning BCT, improve irrigation methods for landowners, and stabilize streambank on the Bear River to prevent further lateral erosion. The Bear Lake Diversions Project also worked to reduce sediment by:

- Removing fish migration barriers in St. Charles Creek.
- Eliminate the need for continued instream work at diversion locations.
- Stabilize the channel and streambank below old diversion points and newly installed diversion points, by utilizing toe rock and willows.
- Improve irrigation efficiencies for landowners through the installation of Diversion structures, irrigation mainline, and improved headgates.

Photo 4. This Photo shows mainline laid out along a trench ready for installation. BLD Photos.



Bennington Creek, St Charles Creek and the Bear River have HIGH priority rankings for sediment. These projects are in the Tier 1 category for treatment units in the Bear Lake TMDL Agricultural Implementation Plan (ISCC, 2008).

Background

The decline of BCT populations and habitat in the western United States is well documented. These declines have led to BCT being considered as a potential candidate for federal listing and protections under the Endangered Species Act (ESA). Not only does St Charles Creek provide an ideal opportunity to support BCT conservation efforts in the Bear River Basin, it supports the following criteria which are not only part of Bear Lake SWCD's five-year plan and goals, but it adheres to the agendas of our participating partners as well.

Protect

- Native trout watersheds
- Stream habitat and riparian zones

Restore

- Native trout
- Riparian habitat and water quality

Sustain

- Trout fisheries through land conservancy
- Education and outreach

Conservation Impact

Southeast Idaho represents some of the last remaining critical habitat for BCT, and improving diversion structures, increasing riparian vegetation, and reducing erosion and the transport of Total Suspended Sediments provides increased spawning opportunities for fluvial Bear River adults and works toward restoring resident populations in Stauffer Creek, Paris Creek, St. Charles Creek and other tributaries within the Bear River Basin. Improvements in riparian habitat and water quality benefit not only the streams within the focus of this project, but the entire Bear River Basin.

Other projects which have been completed or that are expected to be implemented are listed below:

Completed-

PBJ Diversion Project
Georgetown SRF
Dingle CAFO
Martin Mast River Stabilization

Ongoing-
Bear Lake Nutrient Reduction Project
Bear Lake Water Improvement Project

Future or anticipated projects-
Eborn Island

Organizational Structure

The Bear Lake SWCD is comprised of five locally elected board supervisors who serve on a voluntary basis. There is one, part time district employee who is non-voting and serves in an advisory capacity. Technical assistance for this grant was provided by Conservation Basics LLC., and the Idaho Soil and Water Conservation Commission.

The Bear Lake SWCD set a goal to implement BMPs within the Bear River Basin, as part of their five-year plan established in 2014. The district wanted to address animal feeding operations, overgrazed range and pasture issues, riparian degradation, fish barriers, and sediment inputs to the Bear River and its tributaries.

The Bear Lake SWCD would like to continue the work in the upper Bear River Basin with other water quality projects and they are actively seeking funding sources to be able to accomplish those efforts. Bear Lake SWCD values voluntary conservation and believes it is the vehicle of success when it comes to putting conservation on the ground.

Accomplishments

The Bear Lake Diversions Project saw the implementation of: Two (2) Diversion Structures, one (1) with fish passage, ~7000 feet of irrigation mainline, and approximately 200 feet of streambank stabilization including toe rock. The project also installed 2 scour pools for instream stability.

Cumulative Load Reductions

A Stream Erosion Control Inventory (SECI) was completed in the fall of 2021. The 2021 inventory estimates showed the Stauffer Creek Project will reduce sediment loading in St. Charles Creek, Bennington Creek and the Main Stem of the Bear River by approximately 23.44 tons/year.

Cumulative Total Suspended Sediments, Nitrogen and Phosphorous reductions:

Contract Number	Nitrogen Reduction (lbs./yr.)	Phosphorous Reduction (lbs./yr.)	Total Suspended Sediment (Tons/yr.)
BLD-19-001	N/A	N/A	2.12 Tons/year
BLD-19-002	N/A	N/A	1.84 Tons/Year
BLD-19-003	N/A	N/A	18.23 Tons/Year
BLD-19-004	N/A	N/A	1.25 Tons/Year
Total Cumulative Savings	N/A	N/A	23.44 Tons/Year

** The calculations for the inorganic nitrogen and phosphorous were taken from the Nutrient Management Manure Calculation Sheet from the Department of Agriculture.*

Monitoring

Monitoring of the Bear Lake Diversions Project consisted of two parts: photo points, and BMP Effectiveness Monitoring. Monitoring took place through the help of ISWCC technical assistance, ISWCC Engineer, and the Project Coordinator.

Photo Points

Photo points were established to show the progress of each BMP before, during, and after installation. These photo points will also be used to track the condition of the BMPs throughout the life span of each project. Photos will also be used in this final report document, as well as, in future presentations about this project to showcase to other landowners who might be interested in participating in future 319 projects, what type of projects can be done to not only improve the environment. The photos shared in this document captured the great work which has taken place through this concerted effort to improve water quality in Bennington Creek, St. Charles Creek, and the Bear River. Photos were taken extensively during the entire project. These photos will be used to show the before, during, and after aspects of the project.

Tours & Outreach

The Bear Lake board has held smaller scaled tours the past two seasons due to Covid-19. The board is planning to tour the entire Bear Lake Diversions Project next year 2022.

Bear Lake SWCD honors participating landowners each year for their efforts in preserving Agriculture and Natural Resources. This year the Cooperator of the year is James Hardcastle. James has served on the Bear Lake SWCD board for 31 years and has been an example for good in all he does. James has been an advocate for Agriculture and Conservation and continually seeks out programs for all Bear Lake County Landowners to Participate in.



Above: James and Shannon Hardcastle recognized as Cooperator of the year 2021.

Financial Summary

319 Payment	Match Amount	Description
\$164,901.23	\$140,051.17	Sub Contractual Cost
\$6,037.50	\$0	Administrative
\$1,838.98	\$0	Travel
\$183,988.11	\$141,051.17	\$325,039.28 Total

Conclusions

The Bear Lake diversions Project has been successful with its focus to improve BCT habitat, remove barriers, and to improve irrigation efficiencies. The project improved riparian habitat through the installation of fencing to reduce livestock impacts in sensitive areas along t Charles Creek. This project worked with 4 willing landowners to implement best management practices which not only improved and protected natural resources, but that also improved the participating landowner's operations as well.

The 319 program has gained traction in southeast Idaho, mainly because of the success landowners have had through participating in the program, and then in-turn talking with their neighbors about the program. The enthusiasm of the participants in completing their projects on time, the hard work of the project coordinator, and the dedication of the engineer helped to make sure project was completed in a timely matter.

Acknowledgements

Current Bear Lake SWCD Board Members Jennifer Jensen, James Hardcastle, Mark Parker, Todd Lloyd, and Devon Boehme wish to thank the project participants, and cooperating agencies, cities, and Bear Lake County for their assistance and hard work enabling the design, implementation, and completion of the Bear Lake Diversions Project.

The willingness of the participants to undertake these projects allowed for a great deal of work to be accomplished in the watershed over the past two years. Thanks to Julia Achabal, Bonnie Riccord, Lynn Van Every, and Steven Smith of IDEQ for their support and assistance.

The Bear Lake Soil and Water Conservation District thanks Chris Banks, project coordinator of Conservation Basics, LLC. The Bear Lake SWCD wishes to thank Larry Mickelsen, Bear Lake County District Conservationist, our invaluable NRCS partner.

Photo Documentation of BMPS as they were installed



These photos show the end of another segment of the mainline which was installed as part of this project. A technician is making sure everything is level and then pouring a thrust block. BLD Photos.





The above photo shows the end of one of the sections of mainline after it was installed. It was prepped for a thrust block to be poured to hold it in place. The lower photo shows the same pipeline after the thrust block was poured. BLD Photos.





Both of these photos show the bennington diversion. The upper photo is the old diversion before implementation. The lower photo shows the newly installed diversion structure. BLD photos.





The upper photo shows what the two smaller sides of the bennington Diversion look like. These two side diversions are made to handle smaller amounts of water. The Bottom photo shows the junction box which splits water from the trunk line and sends it two different directions. BLD Photos.





The photos on this page show the St Charles Diversion Structure in St Charles Creek. The above photo shows the dilapidated old structure. The old diversion was about one large runoff event from washing downstream. The lower photo shows the newly installed diversion structure. Both photos show the diversion from South to North BLD Photos.





This photo shows the forms set in before the cement pour and how the openings for water flow were established. BLD Photos.



This photo shows the forms as they were set in place to pour the diversion structure on St Charles Creek. BLD Photos.



These two photos show the two channels as they spit from the newly installed diversion. The top photo show the irrigation canal and the lower photo shows the main channel. Two step pools were installed below the diversion to be able to slow the water enough for BCT to travel up and down the stream. BLD Photos.