Zone Fish Program 2002-2003 Accomplishment Report



Lost River and Challis Ranger Districts
Salmon-Challis National Forest

April 2004

<u>Overview</u>

The Lost River and Challis Ranger district's Zone Fish Program (ZFP) is responsible for managing the Forest Service fish program on the Lost River and Challis ranger districts of the Salmon-Challis National Forest. The mission of the ZFP is to:

Sustain the health, diversity, and productivity of fish resources to meet the needs of present and future generations

Our efforts to accomplish our mission are focused in nine areas. These are:

- 1) Protecting fish resources
- 2) Restoring fish resources
- 3) Enhancing user opportunities
- 4) Improving our understanding of fish resources
- 5) Understanding the publics desires
- 6) Informing others about fish resources
- 7) Mentoring those interested in natural resource related professions
- 8) Providing high quality support to other Forest Service programs
- 9) Cooperating with partners to sustain the health, diversity, and productivity of fish resources.

This report summarizes the major accomplishments of the ZFP during 2002 and 2003.

<u>Personnel</u>

ZFP personnel during 2002 and 2003 included:

Bart Gamett – Zone Fish Biologist

Jessica Bartel – Biological Technician

Jason Pyron – Biological Technician

Matt Haroldson - Biological Aid

Sharlyn Moss - Biological Aid

Colin Wakefield - Biological Aid

Paul Wanstrom – Biological Aid

Dustin Webster – Biological Aid

Cassie Wood - Biological Aid

Matt Foster - Volunteer (2002) and Biological Aid (2003)

Shiloh Mangan – Hutton Student (2002) and Biological Aid (2003)

Erin Grinde – Hutton Student (detailed from the Payette National Forest for part of 2003)

Thad Brewer – YCC Crewmember

Royce Nelson – YCC Crewmember

Danielle Pope – YCC Crewmember

Hannah Wainright – YCC Crewmember

Partners

The success of the ZFP is largely dependent on numerous partners. Organizations collaborating with the ZFP during 2002 and 2003 included the following:

Idaho Department of Fish and Game
Bureau of Land Management
U.S. Fish and Wildlife Service
Caribou-Targhee National Forest
Idaho Department of Environmental Quality
University of Idaho
Idaho State University
Utah State University
University of Montana
Mackay High School
Trout Unlimited
The Nature Conservancy
American Fisheries Society
Gregory Aquatics

Protection/Restoration/Enhancement

Swauger Lake #2 Restoration Project

Swauger Lake #2 is a small mountain lake located in the Lost River Mountain Range (Figure 1). A poorly located trail and heavy recreation use resulted in significant damage to the lake shoreline and lake outlet (Figure 2 and 3). Erosion associated with these impacts could have eventually resulted in the loss of the entire lake. This project corrected this problem by relocating

the trail away from the lake, closing the old trail, and restoring the damaged areas along the shoreline and outlet (Figure 4). This project allowed for continued recreation, including OHV use, while reducing the environmental impacts associated with recreation. This project also supported the Chief's direction to address OHV impacts.



Figure 1. Swauger Lake #2.



Figure 3. Resource damage in the lake outlet associated with a trail crossing.



Figure 2. Trail and associated resource damage along lake shoreline.



Figure 4. Restored lake outlet (same area shown in Figure 3) following the completion of the project.

Fish Passage Restored to Camp Creek

In 2003, the ZFP completed a project restoring natural fish passage into Camp Creek. Camp Creek is a headwater stream in the Little Lost River basin that contains bull trout. Historically bull trout were able to migrate into Camp Creek. However, a poorly designed road closure (likely constructed in the 1970's) resulted in a degraded stream channel and created a fish barrier (Figures 5 and 6). This barrier isolated the Camp Creek bull trout population and prevented migratory fish from

entering the stream to spawn. Restoring fish passage in Camp Creek is important for the protection and recovery of bull trout in the Little Lost River basin and was recommended by the draft Little Lost River bull trout recovery plan. This project accomplished this task by restoring the stream to a natural condition and eliminating the barrier (Figures 7 and 8). Now bull trout can once again move from Timber Creek to Camp Creek.



Figure 5. Fish barrier created by a poorly designed road closure.



Figure 7. Newly constructed stream channel that bypassed the barrier and restored fish passage.



Figure 6. Degraded stream channel created by a poorly designed road closure.



Figure 8. Newly constructed stream channel (same area shown in Figure 6).

Squaw Creek Bull Trout Restoration Project

Squaw Creek is a small stream located in the Little River basin that contains bull trout. Lost Unfortunately, non-native brook trout are eliminating bull trout from Squaw Creek. project, which was a cooperative effort between the Idaho Department of Fish and Game and the Salmon-Challis National Forest, had two main First, remove brook trout from that portion of Squaw Creek above North Fork Squaw Creek and second, evaluate electrofishing as a tool for removing brook trout from small headwater

streams. In 2001, a barrier was installed in Squaw Creek immediately above North Fork to prevent brook trout from accessing the treatment area (Figure 9). This was followed by intensive electrofishing efforts to remove brook trout in 2001, 2002, and 2003 (Figure 10). Following the final removal effort in 2003, 85 bull trout from adjacent streams were released into the treatment area to supplement the small existing bull trout population. Monitoring will continue over the next several years to evaluate the success of the project.



Figure 9. Squaw Creek fish barrier that was installed in 2001 to prevent brook trout from reinvading the treatment area.



Figure 10. ZFP personnel electrofishing to remove brook trout from the upper portion of Squaw Creek.

Mill Creek Trailhead Update

Mill Creek Trailhead was relocated in 2001 to reduce impacts to bull trout habitat in Mill Creek. This project involved closing the old trailhead and

Figure 11. Mill Creek Trailhead in 2001 prior to restoration.

rehabilitating the area. Reviews of the area in 2003 indicated the area is recovering (Figure 11-12).



Figure 12. Mill Creek Trailhead two years after restoration.

Inventory and Monitoring

Field Work Completed for Challis Ranger District Fish Population Assessment

During 2003, crews completed the field work for the Challis Ranger District fish population assessment. The purpose of this three year project was to describe fish species distribution and abundance over the entire ranger district. Over the three year period crews assessed a total of 475 sites. Perennial water was found at 197 sites and fish were present at 117 sites. Species found include bull trout, cutthroat trout, rainbow trout, brook trout,

mountain whitefish, and sculpin. The ZFP is currently preparing a summary report of the project which includes GIS maps showing fish distribution (Figure 13). The information collected during this project will be used for forest plan revision, NEPA, consultation, and the development of protection and recovery plans. Collaborators on this project included the U.S. Fish and Wildlife Service and the Idaho Department of Fish and Game.

Challis Ranger District Fish Population Assessment

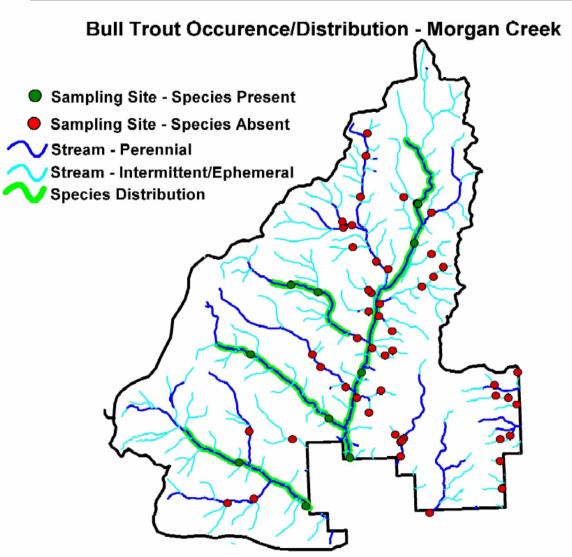


Figure 13. Bull trout occurrence and distribution within the Morgan Creek drainage. This map, which was constructed with a Geographic Information System, is an example of the maps being produced with the data collected as part of the Challis Ranger District Fish Population Assessment.

Mountain Lake Work Continues

The Lost River Ranger District has over 100 mountain lakes (Figures 14-17). These lakes are often popular destinations for hikers, backpackers, riders, and anglers. Since 1990, the ZFP has been working closely with the Upper Snake River Region of the Idaho Department of Fish and Game to improve management of these lakes. This collaborative work has included inventorying and cataloging the lakes, completing habitat and fish population assessments, implementing protection and restoration projects, conducting creel surveys, and revising fish management plans. Since 2002,

the ZFP and the Idaho Department of Fish and Game have been working to develop an informal management plan for these lakes. The goal of this plan is to provide quality recreation opportunities while maintaining the health of the natural communities. As part of this effort, Forest Service and Fish and Game crews have visited about 40 of the lakes to collect the needed data (Figure 18-19). This information will be used to revise management plans and to develop resource protection measures such as the Swauger Lake #2 restoration project described above.



Figure 14. Wildhorse Lake #7.



Figure 16. Bellas Lake #1



Figure 15. Washington Lake.



Figure 17. Long Lake



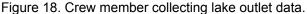




Figure 19. Personnel deploying a gill net in Green Lake.

Little Lost River Bull Trout Sediment Assessment

Stream sediment levels can have a strong influence on the success of trout egg incubation. The draft bull trout recovery plan for the Little Lost River basin concluded that roads, trails, and grazing may have increased sediment levels in bull trout spawning areas within the Timber Creek, Iron Creek, Wet Creek, and Badger Creek drainages. If sediment levels are above natural levels in these streams the survival of bull trout eggs may be reduced. The purpose of this project was to 1) evaluate bull trout spawning and rearing areas within these drainages to determine if sediment were above natural levels, 2) determine why sediment levels were above natural levels, and 3) recommend management actions to reduce

unnatural levels of sediment. During 2003, we completed the first two objectives. While data indicate that most stream reaches examined have normal sediment levels, sediment does appear elevated in some streams. The cause of the elevated sediment levels varied. For example, elevated sediment levels in the upper reach of Timber Creek appear to be caused primarily by a poorly located trail and associated OHV use (Figure In contrast, the elevated sediment levels observed in Coal Creek appear to be associated with a poorly located road and grazing (Figure 21). During 2004, the ZFP will be recommending management actions to reduce elevated sediment levels.



Figure 20. Stream erosion in Timber Creek associated with a poorly located OHV trail.



Figure 21. Stream erosion in Coal Creek associated with livestock grazing.

Culvert Barriers Identified

Over the last year crews completed a stream crossing assessment on the Lost River and Challis Ranger Districts. Culverts at road stream crossings can block upstream fish passage resulting in serious impacts to fish populations. The purpose of this assessment was to inventory and evaluate all road stream crossings in streams containing bull trout, cutthroat trout, steelhead, and chinook salmon over the two districts. Stream crossings

were identified using a combination of field surveys, aerial photographs, maps, and GIS. Each stream crossing was geo-referenced, photographed, and classified as a bridge, culvert, or ford. Each culvert was then surveyed to determine whether it was a barrier (Figure 22). Several projects are now being developed to fix culverts that are barriers to fish passage.





Figure 22. Some culverts such as the one on the left in Garden Creek can completely block upstream fish passage whereas other culverts such as the one on the right in Mill Creek do not interfere with fish passage.

Diversion Assessment Completed

The ZFP has completed a multi-year project to inventory and survey all stream diversions on the Lost River and Challis Ranger Districts. Diversions can impact fish populations by altering stream flows and habitat, blocking fish passage, and entraining fish in ditches, pipelines, and streams. This project involved systematically surveying the districts to

identify all diversions and then collecting data needed to evaluate the impact of the diversions on fish populations (Figure 23). The data collected during this project will be used for consultation and to develop projects to reduce the impact of the diversions on fish populations.





Figure 23. Diversions such as these often impact fish populations.

Research

Work Continues on Status of Big Lost River Mountain Whitefish

The Lost Streams, which includes the Big Lost River, Little Lost River, Birch Creek, Medicine Lodge Creek, and Camas-Beaver Creek drainages. are a series of isolated drainages partially located on the Lost River Ranger District. Since 1995, the ZFP has been working to evaluate the native fish of This work has focused on these streams. determining which species are native, how and when these species were established, and how much change has occurred in the native species since they became isolated. A major element of this work has focused on the mountain whitefish in the Big Lost River drainage (Figure 24). Evidence indicates that these fish entered the Big Lost River basin sometime between 10,000 and 1 million years ago from the Snake River drainage. Genetic work undertaken by the University of Montana and the ZFP indicates that these fish are genetically

distinct from other mountain whitefish populations and may constitute an endemic species or In 2002, the ZFP and the Idaho subspecies. Department of Fish and Game initiated an intensive assessment of the Big Lost River mountain whitefish to determine the status of the population. The work indicates that the fish has experienced major declines in both distribution and abundance. For example, it appears that mountain whitefish occupy only about 27% of their historical range within the Big Lost River basin. Major factors contributing to the declines appear to be dewatered streams, habitat fragmentation, flow alteration, habitat alteration, and drought. Work is continuing to obtain data needed to formulate protection and recovery measures. Other partners in this work have included The Nature Conservancy, U.S. Fish and Wildlife Service, and Trout Unlimited.



Figure 24. A mountain whitefish from the Big Lost River basin. Evidence suggests these fish may constitute an endemic species or subspecies.

Fish Entrainment in Helibuckets Evaluated

Concerns over fish entrainment in helibuckets have led to policies in some areas that prevent helibuckets from being filled from lakes and streams. While these policies are intended to protect fish they can severely limit the effectiveness of fire suppression efforts. The purpose of this study was to quantify fish entrainment in helibuckets filled by Type III helicopters from streams. The study was conducted at 29 locations in central Idaho. Helicopters dipped five times at

each site and released the water into a portable tank (Figure 25). The water in the tank was then examined for fish (Figure 26). Although the study involved 145 independent dips only two small sculpin were found in the bucket during the entire study. The study concluded that in circumstances similar to those in the study, concerns over fish entrainment do not warrant restricting Type III helicopters from filling helibuckets from central Idaho streams.



Figure 25. Helicopter releasing water into portable tank.



Figure 26. Crew examining portable tank for fish.

Impact of Livestock Grazing on Bull Trout Redds Evaluated

Some managers have expressed concerns over livestock stepping on bull trout redds. In many cases, these concerns have led to the removal of livestock from areas where bull trout spawn once spawning begins. While these actions are intended to protect fish populations, limited data prohibit whether such restrictions determining biologically warranted. During 2002 and 2003, the ZFP, Mackay Action Center, and Gregory Aquatics completed a study to collect some of the data needed to make this determination. The study, which was conducted in three allotment pastures in the Little Lost River basin, evaluated the number of bull trout redds stepped on by livestock. The study used simulated bull trout redds constructed with clay shooting targets (Figure 27). The simulated redds were evaluated following the grazing period (treatment) and following a non-grazing period (control). Estimates indicate that cattle disturbed 12, 33, and 78% of the simulated redds in the three pastures, respectively. These data will be used in combination with bull trout population data to

determine when the removal of livestock from bull trout spawning areas is biologically warranted.



Figure 27. Simulated bull trout redd constructed with clay shooting targets.

Work on Brook Trout x Bull Trout Hybrid Identification Progressing

Brook trout, which are native to eastern North America, have been introduced into many streams in the western United States. In many cases, introduced brook trout have caused serious problems for native species such as cutthroat trout and bull trout. One problem associated with brook trout is hybridization with bull trout (Figure 28). In the past, positive identification of the hybrids has relied on genetic analysis. This method is relatively expensive, time consuming, and can involve complete significant time to the analysis. Subsequently, a method for identifying hybrids in the field based on visual appearance would be very useful. For the last several years, the ZFP has been working to develop a methodology to do this. Preliminary work indicates that hybrids can be identified with a high degree of accuracy based on visual appearance. It is anticipated that this work will be completed in 2004. Partners in this effort include the University of Montana and the U.S. Fish and Wildlife Service.



Figure 28. Bull trout (top), bull trout x brook trout hybrid (center), and brook trout (bottom).

Information and Education

The ZFP has been working hard to inform the public and other fish professionals about fish resources. These activities have included:

- Sinks Symposium The Lost Streams (also called Sinks Drainages) are a series of isolated stream basins located along the northern rim of the Snake River Plain. The Sinks Symposium, which was held in February 2002 in Pocatello, explored the native fishes of these isolated drainages. The symposium was sponsored by the Idaho Chapter of the American Fisheries Society and was co-chaired by Bart Gamett, (Caribou-Targhee Jim Capurso National Forest), and Rob Van Kirk (Idaho State University). The three co-chairs also authored proceedings paper summarizing symposium. The ZFP also assisted with the symposium by providing funding, assisting with logistical support, and developing a webpage promoting and summarizing the event. Bart also authored or co-authored three papers presented at the symposium.
- Professional Paper: The Distribution and Potential Origin of Sculpin Species in the Sinks Drainages of Southeastern Idaho – This paper was co-authored by Bart Gamett and Donald W. Zaroban (Idaho Department of Environmental Quality) and was presented by Bart at the Sinks Symposium.
- Professional Paper/Presentation: Genetic Analysis to Infer the Origin of Mountain Whitefish <u>Prosopium</u> <u>williamsoni</u> in the Big Lost River – This paper was co-authored by Bart Gamett and Andrew Whiteley (University

- of Montana) and was presented by Andrew at the Sinks Symposium.
- Professional Paper/Presentation: A
 Summary: The Origin of Fishes in the Sinks
 Drainages of Southeastern Idaho This
 paper was authored by Bart Gamett and was
 presented by Bart at the Sinks Symposium
- Professional Paper/Presentation: Fish Entrainment Rates into Helibuckets Filled from Central Idaho Streams During Fire Suppression Activities – This paper was coauthored by Jason Pyron and Bart Gamett and was presented by Jason at the Idaho Chapter of the American Fisheries Society's 2003 annual meeting in Boise.
- Butte County High School Career Class A
 presentation about careers in natural resource
 management is made to the career class each
 semester.
- Fish Sampling Field Trip The ZFP took a class from Mackay High School on a fish sampling trip to a nearby stream.
- Where Do The Fish Live? The ZFP made a presentation to the Mackay Elementary 2nd Grade Class about where fish live. This involved bringing live rainbow trout and speckled dace into the classroom in an aquarium. Students were taught basic information about the fish and then conducted a simple observation study to determine what type of habitat each species used. The presentation was designed to compliment the skills the students were learning in the classroom.

Mentoring

The ZFP has been actively involved with several mentoring activities. This has included the following:

- Idaho Chapter American Fisheries Society
 Mentoring Committee Bart Gamett is
 currently serving as the chairman of the Idaho
 Chapter American Fisheries Society's
 Mentoring Committee. The purpose of the
 committee is to promote mentoring among
 chapter members.
- Hutton Junior Fisheries Biology Program –
 The Hutton Program is a mentoring program sponsored by the American Fisheries Society.
 The purpose of the program is to "promote greater diversity within the fisheries profession by exposing minority and women high school students to career opportunities in the field of fisheries science." Shiloh Mangan, a student from Mackay High School, was selected as a Hutton Scholar to work with Bart Gamett during the summers of 2001 and 2002.
- National Hutton Award Shiloh Mangan and Bart Gamett were both nationally recognized for their work in the Hutton Program. They were presented with awards by Forest Service Chief Dale Bosworth during the annual Rise to the Future awards ceremony held in June 2003 in Washington D.C (Figure 29-30).
- Endangered Species Act Internship Jessica Bartel, a Senior at Idaho State University and a biological technician in the ZFP, completed an Endangered Species Act



Figure 29. Bart Gamett is presented a Hutton Mentor Award by Forest Service Chief Dale Bosworth during the annual Rise to the Future awards ceremony held in June 2003 in Washington D.C.

- Internship with the ZFP during the fall of 2003. Her work included assisting with the Little Lost Bull Trout Sediment Assessment, developing a process to analyze the affects of diversions on listed fish species, and writing the Upper Salmon River Watershed Diversion Biological Assessment.
- Senior Thesis Jessica Bartel also is working on a Senior Thesis through the ZFP. Her research is focusing on the zoogeography of mountain whitefish within the Big Lost River basin. Her work will assist the Forest Service in understanding this unique whitefish population.
- Independent Problems Jason Pyron, a Senior at the University of Idaho, completed two Independent Problem projects through the University of Idaho. Jason's projects were the helibucket fish entrainment study and an assessment of the current status of bull trout in the Pahsimeroi River Basin. These projects allowed Jason to complete important work for the Forest Service while gaining valuable experience and earning college credit.
- School-to-Work Matt Foster, a junior at Mackay High School, participated in a schoolto-work program with the ZFP. This program allows Matt to complete Forest Service work while earning high school credit and gaining work experience.
- Fish and Wildlife Ecology Course Matt Foster is also completing a Fish and Wildlife Ecology course through the ZFP. This course is supervised by Bart Gamett.



Figure 30. Shiloh Mangan is presented a Hutton Student Award by Forest Service Chief Dale Bosworth during the annual Rise to the Future awards ceremony held in June 2003 in Washington D.C.

Supporting Other Forest Service Programs

The ZFP provided considerable support to other Forest Service programs during 2002 and 2003. This included the following:

- Range Management The ZFP has been working with various forest personnel to develop a forest wide strategy for managing livestock grazing in riparian areas. The goal of this plan is to "manage livestock grazing so as not to prevent the attainment and maintenance of healthy aquatic and riparian communities." The plan is an adaptive management approach that focuses on achieving and maintaining desired resource conditions.
- Fire Suppression/Prescribed Fire Assisting with fire suppression and prescribed fire is a high priority for the ZFP. Over the years we have worked hard to ensure personnel are well trained and available to support the fire organization. During 2002 and 2003 we continued to provide support to the fire organization. During this time personnel from

- the ZFP were involved with initial attack on eight fires, three prescribed burns, and one off forest assignment (20 person crew). Personnel also conducted fire training and spent considerable time patrolling and working standby for initial attack.
- Law Enforcement The ZFP assisted Forest Service law enforcement by providing expertise to an investigation involving illegal OHV use (Figure 31). The ZFP also completed a project to restore the resource damage associated with the illegal ATV use (Figure 32). The ZFP also completed law enforcement patrols.
- YCC The ZFP was responsible for organizing and supervising a YCC program on the Lost River Ranger District during 2003. The program included two students from Mackay High School and two students from Butte County High School. The students worked in the range, recreation, facilities, and fish programs.



Figure 31. Resource damage being caused by ATV use. The ZFP assisted Forest Service law enforcement by analyzing this and other photographs to establish the location, timeline, and the extent of resource damage caused by the individuals.



Figure 32. Damaged area following the completion of the restoration project.

Cooperation

The ZFP collaborated with numerous other organizations to sustain the health, diversity, and productivity of fish resources to meet the needs of present and future generations. This included the following:

- Little Lost Bull Trout Barrier Assessment This project identified barriers to bull trout movement in streams in the Little Lost River basin off national forest lands. The project was a collaborative effort between Trout Unlimited, the Idaho Department of Fish and Game, the Bureau of Land Management, and the Forest Service. The ZFP provided expertise with aerial photo interpretation and assisted with field surveys.
- Little Lost Fish Screens This project involves screening several diversions located on private lands that have the potential to entrain bull trout. This is a collaborative effort between Trout Unlimited, the Idaho Department of Fish and Game, Gregory Aquatics, and the Forest Service. The ZFP assisted with identifying and inventorying the diversions. The ZFP also conducted research on bull trout morphology to determine the minimum size of the screen openings.
- Little Lost Bull Trout Movement Study This project is identifying bull trout movement patterns within the Little Lost River basin and is a collaborative effort between the Bureau of Land Management and the Forest Service. The study uses radio telemetry to track bull trout movements and the data collected will assist managers in planning bull trout protection and recovery actions. The ZFP assisted with study design, fish collections, and surgeries to install the transmitters.
- Little Lost Whirling Disease Study This
 project evaluated the role of whirling disease in
 bull trout declines in Wet Creek and was carried
 out by the Idaho Department of Fish and Game.

- The ZFP assisted with selecting study sites and field work.
- Upper Big Lost River Fish Population
 Assessment This project evaluated the status of fish populations in the upper Big Lost River basin and was carried out by the Idaho Department of Fish and Game. The ZFP assisted with project planning and fish population sampling.
- Badger Creek and Williams Creek Stream Reconnection Projects - Badger Creek and Williams Creek have been isolated from the Little Lost River as a result of irrigation diversions. This has isolated bull trout populations above the diversions and prevented migratory bull trout from entering these streams to spawn. These two projects will reconnect these two streams to the Little Lost River. Trout Unlimited is taking the lead on both of these projects and collaborators include the Idaho Department of Fish and Game, the Bureau of Land Management, and the Forest Service. The ZFP has assisted with this project by facilitating work with landowners and providing technical expertise.
- Brook Trout Temperature Relationships -Work completed by the ZFP suggests that water temperature may play an important role in whether brook trout replace populations. This project further examines how temperature affects brook distribution in the presence and absence of bull trout on the Lost River Ranger District. This information is critical to understanding how and where non-native brook trout replace bull trout populations. The study is being conducted by Sarah Chamberlain as part of her PhD program at Utah State University. The ZFP has assisted project by providing technical expertise, assisting with study design and field work, and providing equipment and facilities.

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