U.S. Department of the Interior
Bureau of Land Management

AQUATIC HABITAT MANAGEMENT PROGRAM

2021 UTAH ACCOMPLISHMENT REPORTING

Photo by: Justin Jimenez, BLM UT Aquatic Habitat Management Program Lead

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Aquatic Habitat Management Program
2021 Utah Accomplishment Reporting

The following report is a summary of FY 2021 projects (by District) that maintain and restore fisheries, riparian, water quality, surface and groundwater resources, as well as the physical, chemical, and biological processes of aquatic habitat. These projects would not be possible without the hard work of field staff, as well as the many partnerships that ensure success. Not every project is included, but a variety of projects that fit under the integrated Aquatic Habitat Management (AHM) Program.

Compiled by: Justin Jimenez, BLM Utah Aquatics Program Lead

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Green River District

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Lower Price River Riparian Corridor Habitat Improvement

Figure 1. Building instream structures (Photo credit: Kegen Benson)

Project need:

The physical condition of the lower Price River has been severely degraded over time through a combination of impacts including altered flow regimes, stream channel narrowing, instream habitat simplification and non-native vegetation encroachment. Much of the riparian corridor is occupied by dense stands of tamarisk and Russian olive, native vegetation recruitment is low, particularly for cottonwood trees. The lack of sufficient instream and riparian habitat in the lower Price River threatens the persistence of native riparian vegetation, fish, and wildlife within these important riverscapes.

Project goals:

1) Improve instream habitat for 2 conservation agreement species, and 2 endangered fish.
2) Create and improve shallow wetland habitat for birds, herpetofauna, and bats.
3) Create and expand existing multi-storied stands of native vegetation for migratory birds and other wildlife.
4) Increase the activity and abundance of beavers.
5) Conduct sufficient monitoring of restoration impacts to quantitatively assess whether the restoration actions are accomplishing the restoration goals and objectives and to determine the causes of success or failure.

Project Outcomes:

- Removed invasive tamarisk on 63.5 acres of riparian habitat along the Price River.
- Constructed 70 instream structures (beaver dam analogues) in the lower Price River to enhance fish habitat for conservation agreement and endangered fish species (Figure 1.).

- Native vegetation planting (~850) including cottonwoods, three leaf sumac, New Mexico privet, fourwing saltbrush, silver leaf buffalo berry and desert holly.
- Multiple beaver translocation and releases into the project area (Figure 2).
- Effectiveness monitoring

Figure 2. Release of translocated beaver (Photo credit: Kegen Benson)

Project Partners:
Bureau of Land Management, Utah Division of Wildlife Resources (UDWR), Utah State University, Utah's Watershed Restoration Initiative and the Utah Conservation Corps (Figure 3).

Figure 3. Site visit with project partners, local landowners, and interested NGO's (Photo credit: Justin Jimenez)

Upper Colorado River Basin Native Fish Monitoring

Figure 4. Fish Sampling (Photo credit: Matt Breen)

Project need:
The Upper Colorado River Basin (UCRB) holds important populations of four threatened and endangered fish species, Humpback Chub (Gila cypha), Bonytail (Gila elegans), Colorado Pikeminnow (Ptychocheilus Lucius), and Razorback Sucker (Xyrauchen texanus). It is also home to three species, Roundtail Chub (Gila robusta), Bluehead Sucker (Catostomus discobolus), and Flannelmouth Sucker (Catostomus latipinnis) that are on the BLM's sensitive species list. These species make long distance migrations from BLM mainstem habitat on the Colorado and Green Rivers in to BLM tributaries habitats such as the Dolores, White, San Rafael, and Price Rivers for various life history needs. These tributaries have recently had remote Passive Integrated Transponder (PIT) antennas installed on them which allow for the tracking of PIT tagged fish through the system. Tracking movement of these fish throughout these UCRB is providing valuable insight into habitat use and life history adaptations for both the endangered and sensitive species. The more tagged fish in the system the more knowledge gained to inform management of these species and their habitats.

Project goals:
This proposal, submitted jointly by the Canyon Country and Green River Districts works towards the goals and objectives for special status species as listed in the Moab, Monticello, Vernal, and Price Field Office Resource Management Plans (RMP), the recovery plans for the endangered species, and three species management and conservation plans. Increased and consistent sampling frequency will allow for additional insight into life history adaptations, and populations trends of the fish inhabiting this area. The data collected on sampling trips in combination with tracking tagged fish using the PIT tag antennae technologies will allow for computer based modeling analysis (i.e. survival analysis) which will help guide future conservation activities. The information gained from this project will also help inform current and future restoration activities that are taking place on the Dolores, White, San Rafael, and Price Rivers
This project was implemented in collaboration with Ute Tribal biologist and the UDWR with in-kind contributions of electrofishing equipment, PIT tagging gear, personnel, and logistical support. During a weeklong sampling event in September the following fish we tagged or recaptured.

Flannlemouth sucker	360 new tags	12 recaptures
Bluehead Sucker	158 new tags	1 recapture
Roundtail Chub	1 new tag	0 recapture
Colorado Pikeminnow	6 new tags	2 recapture

Data was collected on fish health, population trends, age structure, basic water quality characteristics, and occupancy throughout the reach (Figures 5 and 6). Sampling was conducted by continuous shoreline cataraft electrofishing of both shores through Desolation Canyon (Figure 4).

Project partners:
Bureau of Land Management, Utah Division of Wildlife Resources, and Ute Tribe Biologist

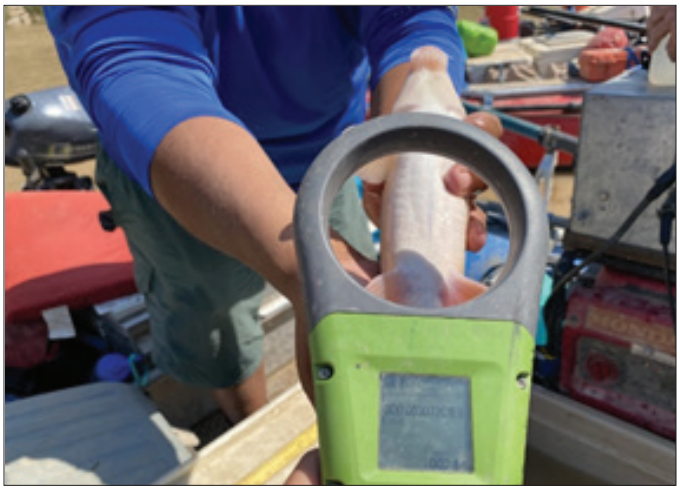

Figure 5. Tagging Flannlemouth Sucker and Figure 6. Verifying tag number (Photo credits: Jordan Detlor)

Color Country and Paria River Districts

Contact: Meghan Krott, Color Country and Paria River Districts Aquatic Ecologist, mkrott@blm.gov

Districts-wide AHM Accomplishments

- Lotic AIM: In FY 2021, Color Country District (including the Kanab Field Office) completed the third and final year of the lotic Aquatic Assessment, Inventory and Monitoring (AIM) random sample design. During FY 2021, 46 random and targeted sites were sampled throughout the four field offices in the districts (including Kanab FO which is now a part of Paria River District). Sites were stratified by stream order and Field Office to produce a statistically valid sample design for the entire District. An additional 24 sites were visited but ultimately field rejected, most of them due to extreme drought conditions.
- Lentic AIM: Color Country and Paria River Districts also participated in lentic AIM sampling in FY 2021. A total of 11 lentic sites were sampled in the districts.
- Temperature Monitoring: In FY 2021, stream temperature monitoring was conducted at 23 sites throughout both Color Country and Paria River Districts. Sites include: 8 probes on Otter Creek, 2 probes on Bear Creek, 5 probes on Birch Creek, Ranch Canyon Creek, Manning Creek, Leeds Creek, Quail Creek, Calf Creek, 3 Mile Creek, Little Creek, and East Fork Sevier River. This temperature monitoring supports restoration efforts on Otter Creek, Bear Creek, Ranch Canyon Creek and Birch Creek and provides critical mean August temperature data for use in statewide temperature modeling.
- Hosted two national trainings: Color Country District was honored to be able to host two national BLM trainings in FY 2021. Lotic AIM training occurred in April and was attended by 30 participates, including a separate Train-the-Trainer group (Figure 7). In August, the National Riparian Service Team came to Cedar City to provide PFC for Professionals training. Both trainings adhered to local Covid-19 safety guidelines and were very successful.

Figure 7. Lotic AIM crew members performing stream substrate surveys at the Cedar City AIM training.

Cedar City Field Office

Accomplishments

- Fencing was completed around 0.88 miles of riparian area in the Rice Canyon area, with .29 miles within the Big Summit fire that burned in 2020 (Figures 8 and 9).

Figure 8. Newly constructed fence around a riparian area.

Figure 9. Newly constructed fence around a riparian area that was burned in 2020.

- Tamarisk treatment, including cutting and herbicide application, was conducted along 0.2 miles of desert spring in Modena Canyon.
- Maintenance was conducted on the beaver dam analogue (BDA) and post assisted log (PAL) structures on Birch Creek, including adding more branches and sediment to make the structures taller.
- Approximately 35 new BDA/PAL structures were constructed on Cottonwood Creek to add in in-stream restoration and raise the water table.
- Approximately 35 new BDA/PAL structures were constructed on Ranch Canyon Creek to add in in-stream restoration and raise the water table (Figure 10). The structures were put in Fall 2020 and some additional maintenance was completed in late summer 2021.

Figure 10. Newly constructed BDA on Ranch Canyon Creek.

- In May/June 2021, 10 retention basins and islands were excavated and constructed in Quichapa Lake, a terminal wetland (Figures 12 and 13). Additionally, tamarisk removal was initiated by pulling and piling using an excavator in a 10-acre ephemeral area (Figure 11). Additional tamarisk removal is scheduled to continue in fiscal year 2022. The Field Office also organized a clean-up day and removed tires, metal, several dump sites from the wetland area.

Figure 11. Clearing tamarisk near Quichapa Lake.

Figure 12. Excavator beginning work on a retention pond in the dry lakebed of Quichapa Lake.

Figure 13. A newly construction retention pond filled with water after a monsoon event in summer 2021.

Richfield Field Office

Accomplishments

- BLM partnered with the State of Utah Department of Environmental Quality and Utah State University for the Black Canyon Water Quality Sampling Plan. Chemistry, nutrients, and metals are sampled ten times per year at five sites in the East Fork Sevier River Watershed. Water temperature dataloggers are also deployed. This is the final year of sampling and results should be forthcoming.

Kanab Field Office

Accomplishments

- Photo plot monitoring was done on 3 Mile Creek to assess recovery following the 2017 Brianhead Fire that burned a large portion of the upper watershed. Summer of 2021 brought several monsoons systems that caused 25-year flood events on 3 Mile Creek. This resulted in a large amount of sediment transport in the system and deposition on the adjacent banks.
- Several riparian fences were maintained throughout the Kanab Field Office including: Sevier riparian fence and pasture, Hawkins Wash, Pine Springs, Slime Dog Spring and Sand Spring.

- The non-native fish barrier on 3 Mile Creek was maintained. It had been filled with sediment and debris from high flows.
- A four-strand barbed wire fence was constructed around an unnamed spring on Harris Mountain in May 2021. The spring was heavily impacted by cattle. The excluded area is approximately .25 acres.

Figure 14. Photo plot from 3 Mile Creek showing sediment deposits on stream banks from summer flood events.

Grand Staircase-Escalante National Monument

Accomplishments

- Grand Staircase-Escalante National (GSENM) Water Quality Monitoring: GSENM completed year 3 of a 5-year water quality monitoring contract in FY 2021. Under an MOA with UT DWQ, data is being collected by RedFish Environmental with the help of the GSENM Soil Scientist. Water quality field parameters (i.e. discharge, water temperature, pH, specific conductivity, and dissolved oxygen) and water chemistry samples were collected at 9 sites across GSENM once a month from May to October. Bacteriological E. coli samples were collected at 4 sites once a month from May to October (Figure 15). Water temperature sensors were also located at three sites along Calf Creek from May to October. Sample collection follows procedures found in the UDWQ Quality Assurance and Standard Operating Procedures Manual and is consistent with standard practices accepted by the EPA. Ongoing project data will be utilized in PFC and rangeland health determinations, as well as influence management decisions in both Natural Resources and Recreation management.

- Spring Stewardship Institute (SSI) Springs Inventory: Under an agreement with GSENM, Spring Stewardship Institute wrapped up the springs inventory and monitoring project in FY 2021. The

collected data and assessment of these springs was then input into the Springs Online database that was created by SSI. This project will result in a baseline inventory of springs/seeps across GSENM, additional inventory of springs/seeps, input of data into the Springs Online database, and training for local specialists to continue inventory and monitoring efforts into the future. Larry Stevens, of SSI, lead a field trip for the public and BLM staff demonstrating SSI's springs monitoring protocol to fulfill the education portion of the agreement (Figure 16). This trip had a great turn out and lasted longer than expected due to participant engagement. Data from SSI inventory will be used alongside Lentic AIM data when conducting monitoring efforts and will influence future management decisions.

Figure 15. WQ Monitoring Site on Paria River

Figure 16. SSI Leaders demonstrating the springs monitoring protocol.

Canyon Country District

Primary Contact: Gabriel Bissonette, Canyon Country District Aquatic Ecologist, gbissone@blm.gov
Aquatic Habitats Web App

A significant amount of aquatic and riparian related data exists within the BLM (e.g. AIM, PFC, MIM, water quality, species distribution, eDNA, stream temperature, etc.). However, these datasets are collected and stored in a variety of mediums and platforms. There is a need to see the spatial relationships and to summarize these data relative to different management units (e.g. watersheds, allotments, field offices, etc). This multi-year ongoing project focuses on creating an Aquatic Habitats Web Mapping Application that provides streamlined access to important datasets while automating calculation of basic summary statistics. The intent is to provide for quick data exploration to facilitate day-to-day operations of specialists within BLM Utah.

Automated summary statistics for both Aquatic and Terrestrial AIM data have been developed in FY 2021. Our Aquatic AIM crew lead created code within AGOL that calculates the mean of important variables using all plots and reaches within a selected watershed, allotment, or field office and returns the values within the pop-up (Figure 17). Additionally, I configured the infographic widget to return individual reach data in graphical form. Data is returned based on what is in the current view or based upon specific data queried by the user. Additional refinements will be added as necessary in FY 2022.

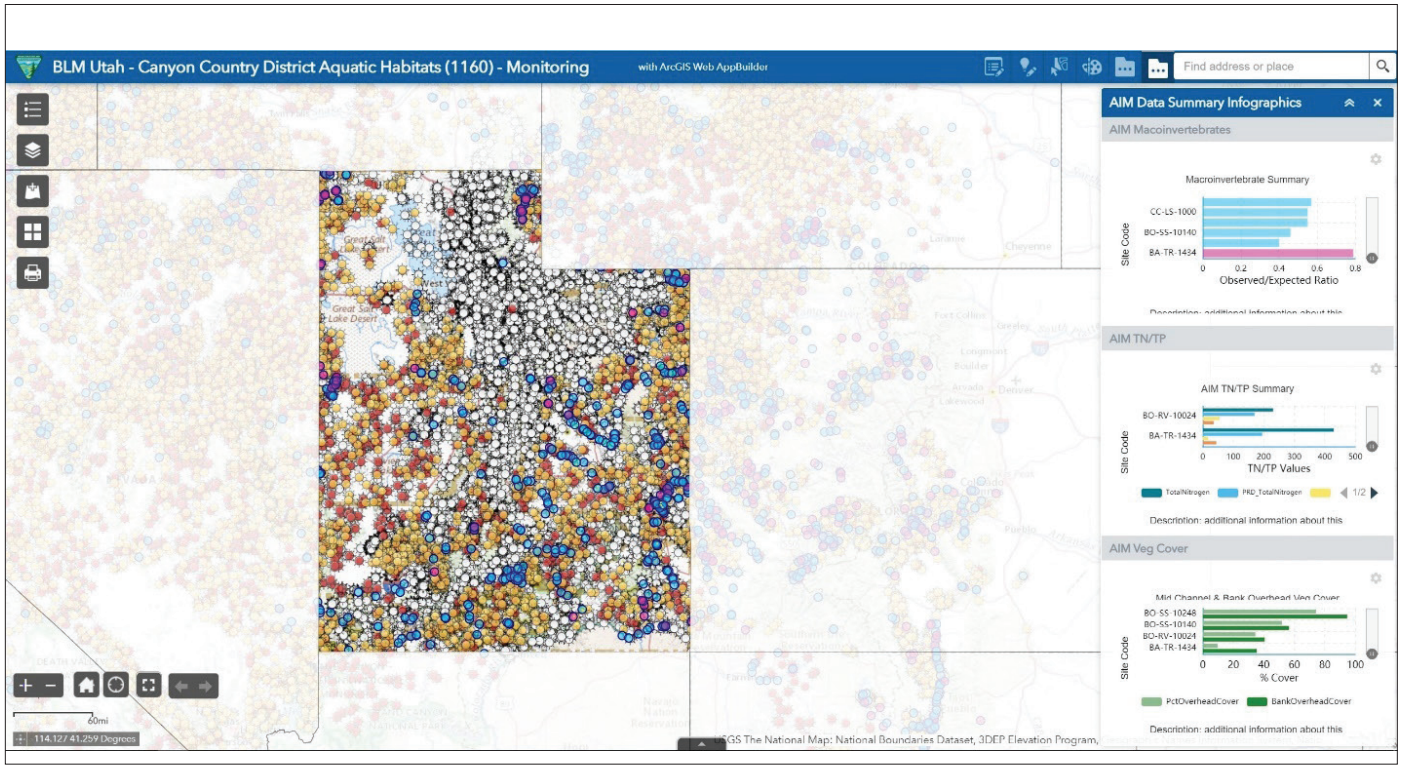

Figure 17. Current state of the Web Application.

Emergent Properties from Collaboration

The BLM has collaborated with a variety of partners in our efforts to restore habitat along the San Juan River. One of those partners, the Canyon Country Youth Corps (CCYC), is an organization that operates out

of San Juan County, the 22nd poorest county in the western United States and frequently drawing from the Navajo Nation for its members. These members are engaged in tangible on-the-ground restoration work on our public lands and learn skills that will assist them in becoming the natural resource leaders of tomorrow. The collaboration has led to many acres and miles of riparian restoration funded by BLM and the Watershed Restoration Initiative (WRI) which were highlighted in previous iterations of this report. However, the partnership has also produced some positive outcomes that were not part of the original funded scope of work.

Elissa Rothman, started with CCYC as a crew member working on the San Juan River projects and eventually becoming a field boss and ultimately the CCYC Program Coordinator. Elissa's role as the program coordinator with extensive knowledge of the BLM San Juan project put her in a unique position to develop a poster presentation discussing how the partnership addressed Covid-related delays and the results of some newly employed treatment methodologies (Figure 18). She took the initiative to create and present the poster at the Upper Colorado River Basin Water Forum and plans to present it at the River's Edge West Riparian Conference, at no cost to BLM. It provides a wonderful synopsis of this portion of the project and shows how continued collaboration leads to greater project engagement, career development opportunities, better restoration outcomes, and unintended benefits to BLM.

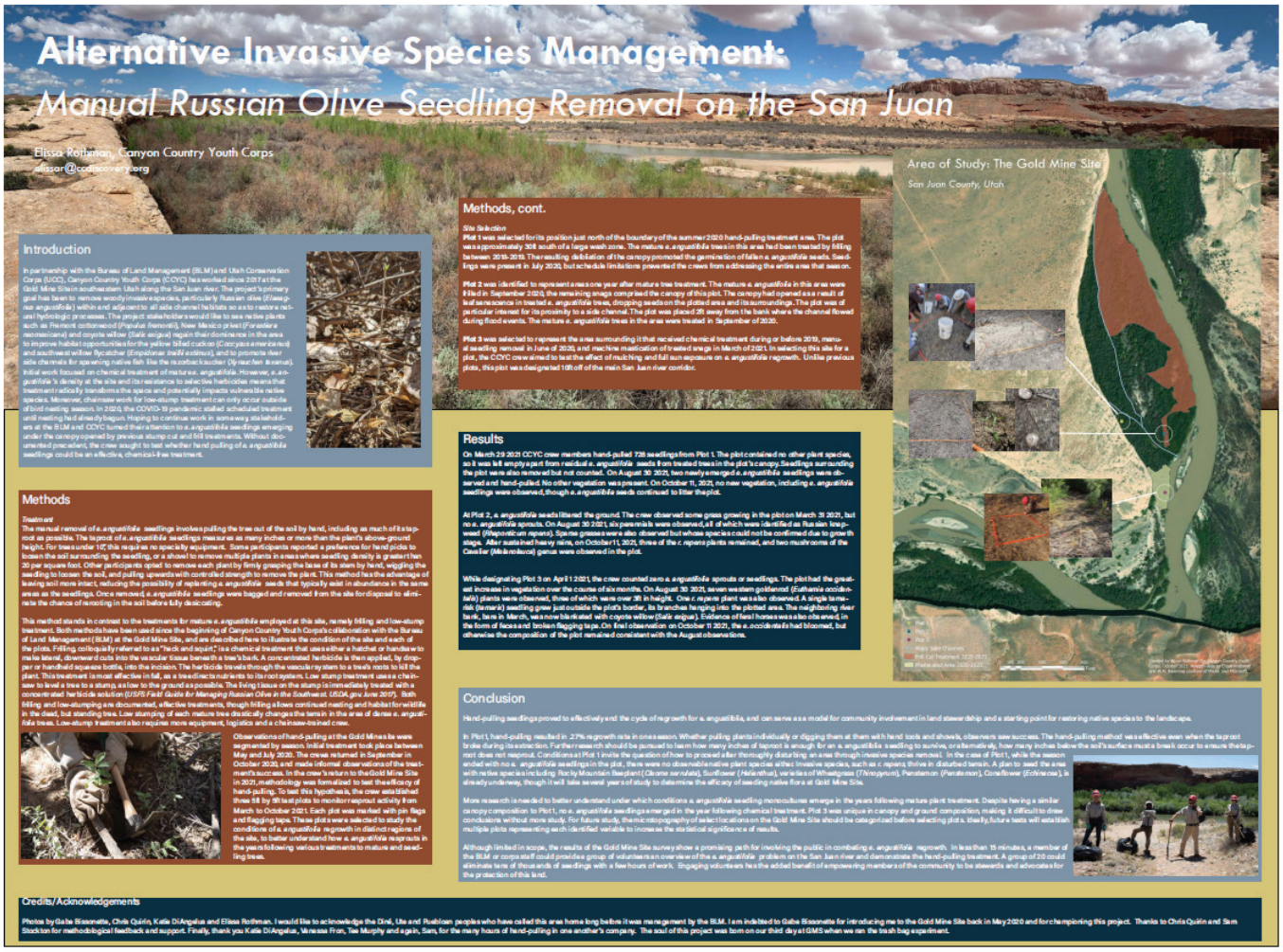

Figure 18. Alternative Invasive Species Management Poster

West Desert District

Primary Contact: Cassie Mellon, West Desert District Aquatic Ecologist, cmellon@blm.gov

Hall's Meadow water right – successful protest

Hall's Meadow is a spring on BLM land that supports a 13-acre wetland (Figure 19). This habitat supports sensitive aquatic springsnail species as well as wildlife such as elk, antelope, waterfowl, and migratory birds. BLM holds a water right on the spring for 0.03 cfs for stock watering and wildlife uses with a priority date of 1903.

The Salt Lake Field Office works closely with the State Office to monitor and review new water right applications that may impact BLM water rights. In November 2020 an application was filed to drill a well approximately one-half mile upslope of the spring source that would pump up to 646 acre feet per year. BLM UT worked with the Office of the Solicitor to file a timely protest, and participate in a hearing on the subject application. An analysis completed by the U.S. Geological Survey, indicated that the proposed pumping would likely reduce groundwater levels by several feet within 5 years, and that moving the point of diversion one mile from the spring would not mitigate the adverse effects. In August 2021, the UT State Engineer determined that the proposed new uses would impair existing water rights and rejected the application to appropriate groundwater.

Figure 19. Hall's Meadow and Pilot Peak

This effort along with ongoing springsnail population and water quality monitoring and continued evaluation of new water developments will help ensure this unique habitat and species that rely on it will continue to persist into the future (Figure 20).

BLM Utah is a signatory to the recently develop Conservation Agreement and Strategy for Springsnails in Utah and Nevada. This type of conservation action or threat abatement is documented in the strategy as an important action in springsnail conservation that will help ensure these species and their habitats persist.

Figure 20. Springsnails on a rock

Kimball Creek Riparian Area Restoration

Work began on Kimball Creek in 2018 with goals to improve riparian condition, decrease incision, increase floodplain connectivity, and increase establishment of native woody vegetation (Figure 21). These restoration efforts were not intended to be a one-time fix and maintenance and monitoring is needed to reach long-term project goals. Maintenance efforts occurred in 2020 both to build up existing structures and extend the reach upstream.

Figure 21. Kimball Creek pre-treatment. Showing single thread channel, limited riparian vegetation.

Figure 22. Kimball Creek August 2021.

Showing recruitment of woody and herbaceous riparian vegetation and increased habitat complexity. Photos are examples of changes, not photo points of the same location.

There is no one tool to analyze the effectiveness of LTPBR. We utilized a combination of monitoring the results at individual structures, aerial imagery, aquatic AIM, PFC, and photopoints, as well as anecdotal comparisons from non-treated streams.

Analysis of individual structures showed an increase in number of structures forcing overland flow from 8 in 2020 to 13 in 2021. Imagery analyzed from drone flights estimate the area of inundation increased from 3062-4593 m2 pre-restoration to 7305 m2 in 2021 (Shahverdian, S. and Macfarlane, W.). AIM monitoring shows an improvement in floodplain connectivity from a major departure from reference conditions – or poor connectivity -- in 2018 to minimal departure from reference condition in 2021. PFC assessments show an improvement from one portion of the treatment reach

rated as Functioning at Risk in 2006 and another portion of the treatment reach rated as Not Functioning in 2006 to both reaches rated as Properly Functioning in 2021 (Figure 22).

A high intensity rainstorm fell on the area in August 2021. Visual assessments of the treatment reach of Kimball Creek showed that sediment had been deposited behind the LTPBR structures and in the willows that had recruited in the reach (Figure 23). This is in contrast to Little Pole Creek, a nearby stream with no restoration work where incision and overland flow were apparent following the storm in this stream (Figure 24).

Beavers have not yet moved into this reach although the habitat is increasingly suitable. Additional maintenance will likely be needed until beavers are active in this area.

Figure 23. Storm effects on Kimball Creek showing sediment deposited among intact willows.

Figure 24. Storm effects on Little Pole Creek showing overland flow and movement of sediment.

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