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

AQUATIC HABITAT MANAGEMENT PROGRAM

2019 UTAH ACCOMPLISHMENT REPORTING

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Aquatic Habitat Management Program
2019 Utah Accomplishment Reporting

The BLM Aquatic Habitat Management Program (AHM) is responsible for the stewardship, management and conservation of the physical, chemical and biological integrity of BLM managed water resources, aquatic ecosystems and habitats. The following report is a summary of BLM UT AHM projects (by District), 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 AHM Program.

Compiled by: Justin Jimenez, BLM Utah AHM Program Lead

Contents

Canyon Country District, Moab, UT

Primary Contact: Gabe Bissonette, Canyon Country District Aquatic Ecologist, gbissone@blm.gov

The Dolores Berm Site Project

The Dolores River flows through Utah for about 24 miles before joining the Colorado River near Dewey Bridge. Most of the river corridor in Utah is a narrow canyon with thin bands of riparian vegetation along the river. Interspersed above and below the narrow canyon in Utah are alluvial fans, or wide bottom areas, associated with mouths of tributaries such as Beaver Creek, Granite Creek, etc. In the 1940s or 50s, near the Utah/Colorado state line in a braided reach, the main channel of the Dolores River (Figure 1) was blocked with an extensive gravel/cobble berm by a farmer trying to protect his hay fields (Figure 2). The Dolores is an important river for native fish that naturally has populations of sensitive fish including roundtail chub, flannelmouth sucker, and bluehead sucker as well as Endangered Species Act (ESA) listed fish such as Colorado pikeminnow and bonytail chub.

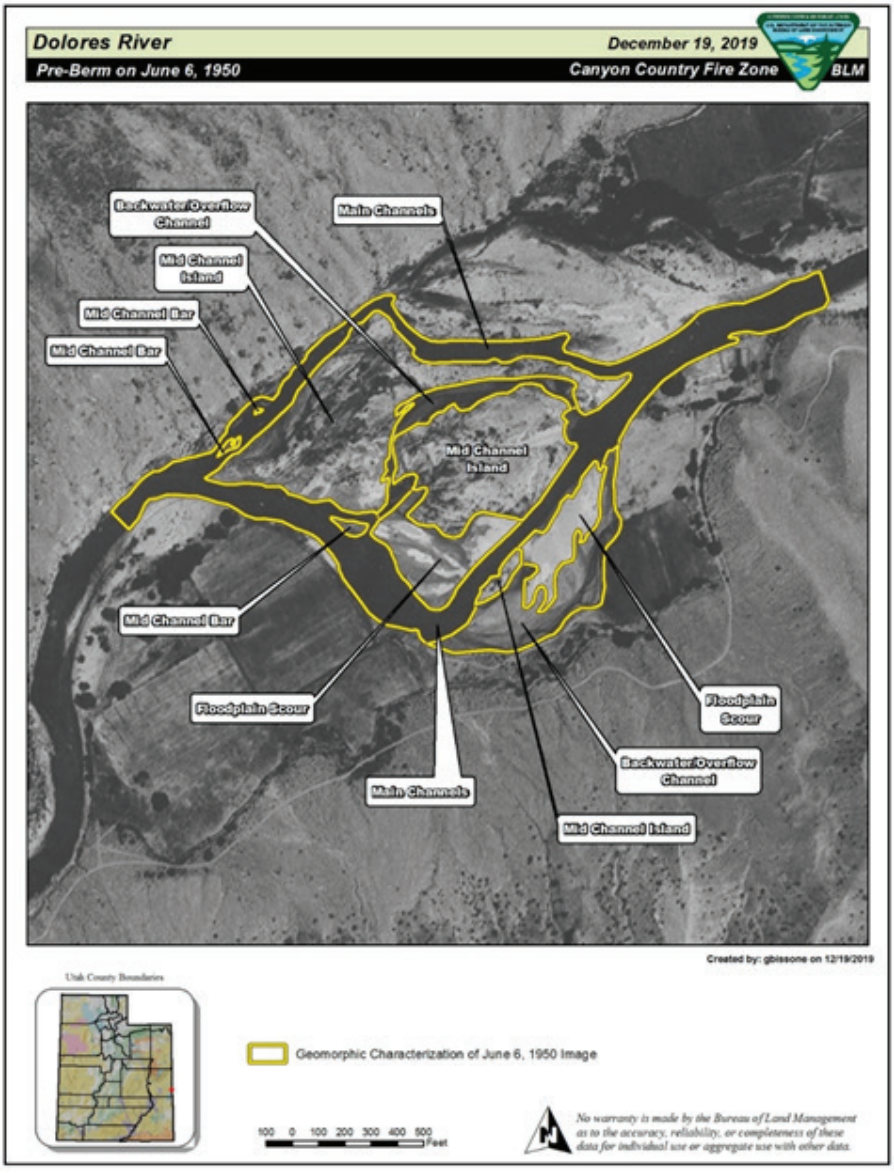

Figure 1. Pre-berm river geomorphology in 1950.

This berm has persisted over the years dramatically changing the hydrology of the 38-acre site (Figure 3) and diminishing nursery habitat for native fish. Historically, the Dolores River would convey large flood discharges in the spring, with a high discharge of 17,000 cfs measured in the 1970's. In the 1980's, McPhee Dam was constructed upstream in the watershed, significantly reducing historical peak flood flows.

There is little evidence this historic channel and associated floodplain has been inundated during high flows since McPhee Dam was constructed.

Figure 2 – Historic gravel/cobble berm.

There is evidence of shallow ground water in historic floodplain, demonstrated by a small perennial wetland located just upstream of the hay field.

Work to remove tamarisk and Russian olive before the removal of the berm was completed over the last decade by the Canyon Country Youth Corps, Utah Conservation Corps, Western Colorado Conservation Corps, and BLM employees in collaboration with the BLM Aquatic Habitats, BLM Fire/Fuels Program, the Watershed Restoration Initiative, and the Dolores River Restoration Partnership.

The Environmental Assessment for the berm removal was part of a larger project effort lead by the BLM Grand Junction Field Office in collaboration with the Moab Field Office Hydrology staff. In February 2019, a portion of the gravel/cobble berm was successfully removed at the upstream end using heavy equipment over the course of 4 days. Peak 2019 flows (~5,0000-6,000 cfs) reestablished hydrologic connectivity of the historic channel, floodplain, and wetland habitat at the contemporary bankfull discharge, for the first time in 50-60 years (Figures 4 and 5). This marks the beginning of periodic inundation of this area which transitions from a lotic system to a lentic pond as flows recede.

The site is already exhibiting signs of improved riparian/wetland production, nutrient cycling,

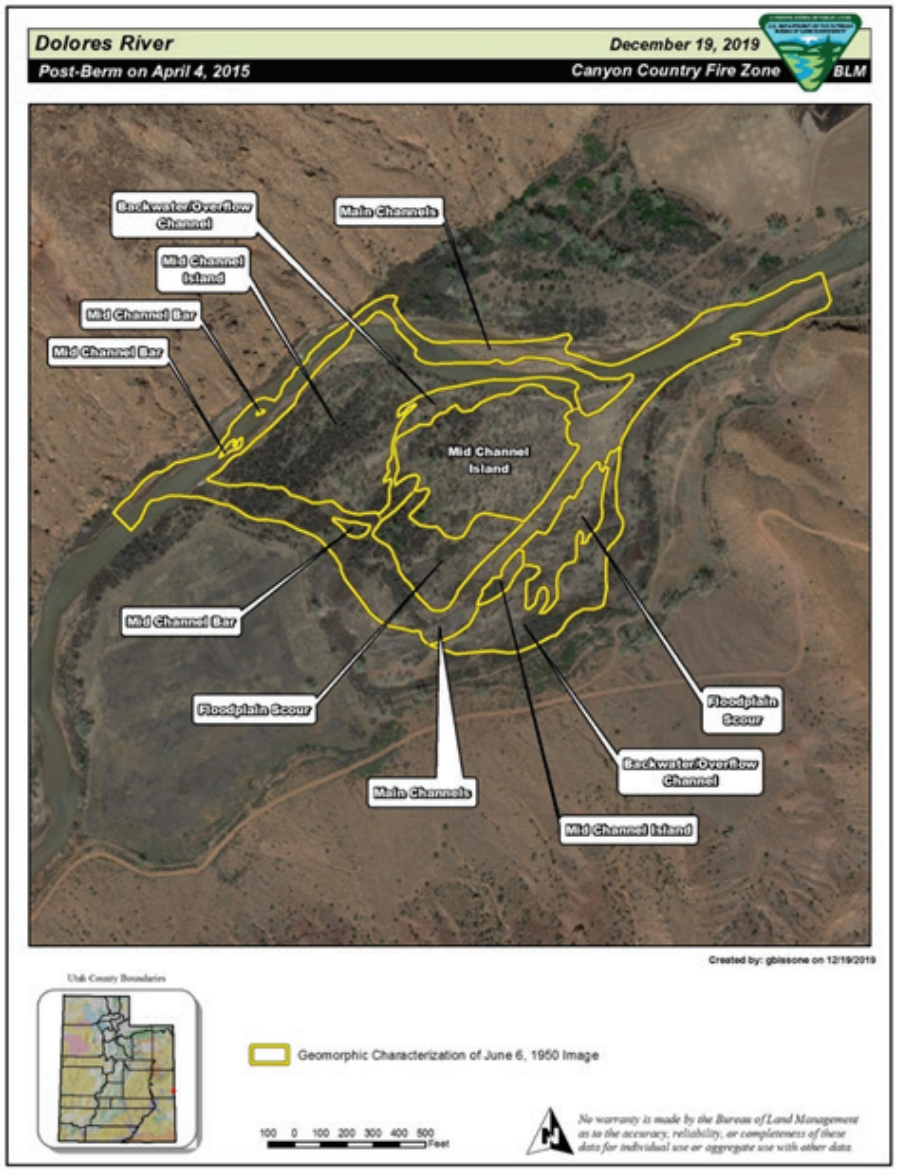

Figure 3. Post-Berm River in 2015 with pre-berm features overlain.

Figure 4. Inundation on June 17, 2019 at ~5400 cfs at upstream berm removal area.

Figure 5. Inundation on June 17, 2019 at ~5400 cfs at downstream end looking upstream.

water cycling, plant and animal production and hydrologic connectivity. Sedges, rushes, and cottonwood seedlings have begun to colonize the site (Figures 6 and 7). The perennial wetland area was inundated by surface waters (Figure 8). Fine sediments are being removed at the downstream-end exposing cobble and gravel channel substrates improving aquatic habitat for macroinvertebrates and fish (Figure 9).

Woodhouse toads, red-spotted toads, waterfowl, bears, mountain lion, and beaver are actively using this area since inundation. Catfish were spotted in remnant pools in August and native fish are also likely to utilize this habitat. Fish sampling will occur in 2020, flows permitting, in conjunction with the UDWR to determine use by native fish.

Figure 6. New sedge and rush colonization.

Figure 7. New cottonwood seedlings.

Figure 8. Inundated wetland area resulting from reestablishment of hydrolologic connectivity.

Figure 9. Cleaning fine sediments and exposing gravel and cobble substrates noticed during WRI project planning site visit with partners from the Western Conservation Corps, Canyon Country Youth Corps, and the Dolores River Restoration Partnership.

Colorado River - Side Channel Restoration Project Above New Rapid

This project area is located upstream of New Rapid on the Colorado River Daily section and is part of the larger Colorado River WRI project. The site contains three seasonally inundated side channel habitats one of which runs approximately 940 meters. These habitats provide important spawning and nursery habitat for threatened, endangered, and sensitive native fish species. This area is within critical habitat for Colorado pikeminnow and the razorback sucker. There are relatively few seasonally inundated side channel habitats in this section of the Colorado river as many of these habitats have been impacted by reductions in peak flows and the invasion of woody invasive species like tamarisk. These channels were last inundated during the high water season in 2011.

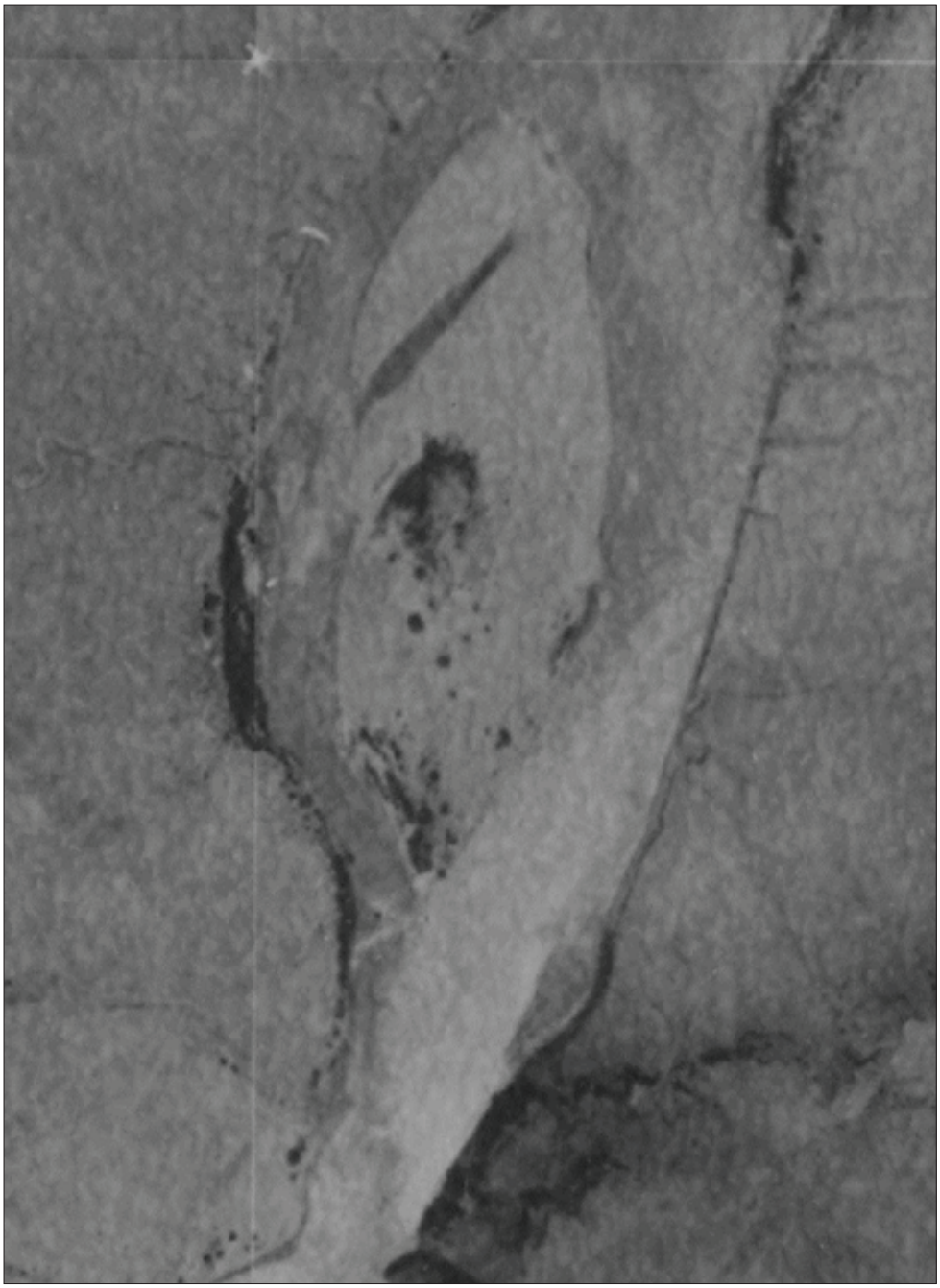

Figure 10. Above New Rapid Side Channel in July 15, 1937.

This project area was historically a mid-channel island with perennial flow in both the main and side channel and was characterized by little vegetation in 1937 (Figure 10). Tamarisk has since invaded the island and in the absence of scouring flow events has become well established (Figure 11). Woody invasive species create roughness in these channels that slows water velocity and causes sediment to deposit and fill in the channel. Today the primary side channel has significantly narrowed (Figure 11) and is only seasonally inundated during very high water events like 2011. This encroachment also decreases the native vegetation's rate of succession and degrades wildlife habitat. Additionally this stand of tamarisk has succumbed to the defoliation effects of the tamarisk leaf beetle, which increases the risk of wildfire adjacent to a popular lunch stop for rafters.

Figure 11. Above New Side Rapid Side Channel in July 27, 2015.

The primary goal of this project is to remove woody invasive species within and adjacent to all side channel habitats so that natural hydrologic processes can be restored. High water scouring is more effective at naturally maintaining side channel habitat when the "roughness" associated with woody invasive species is removed. The secondary goal of this project is the restoration of the riparian vegetation community through the reduction in woody and herbaceous invasive species.

Since 2018, the main side channel and part of the secondary side channel have been cleared of tamarisk (Figures 12-14) and a buffer cleared around native cottonwoods (Figure 12). This work was funded through the Watershed Restoration Initiative (WRI) and completed by the Utah Conservation Corps (UCC) and Rim to Rim Restoration for the BLM Canyon Country Aquatic Habitats program. Future work will include clearing the smaller side channels and potentially streambank alteration to allow inundation at lower flows.

Figure 12. Completed work. White areas showed cleared side channel areas. Yellow shows areas cleared around native cottonwoods and shrubs.

Figures 13 and 14. Side channel cleared of tamarisk.

San Juan River Side Channel Restoration Project

This project area is part of the larger San Juan River WRI project and divided into six separate units totaling 46 acres and is located approximately 0.5 miles downstream of the San Juan River Highway 191 river bridge west of Bluff and across from the Tiger Wall on river right. The site contains three seasonally inundated side channel habitats, one of which runs approximately 840 meters (Figure 15) and all of which are heavily invaded by high densities of Russian olive. These habitats provide important spawning and nursery habitat for threatened, endangered, and sensitive native fish species. Many seasonally inundated side channel habitats in this section of the San Juan River have been reduced in size or completely lost by reductions in peak flows and the proliferation of woody invasive species like Russian olive (Figures 16-20). This site also has a cottonwood gallery in the center and native privet and willows scattered throughout. The combination of a large multi-storied canopy adjacent to functioning side channels provide important areas for the southwestern willow flycatcher and the yellow-billed cuckoo, listed as endangered and threatened respectively, under the ESA. The project area falls within critical habitat for ESA listed Colorado pikeminnow, razorback sucker, southwestern willow flycatcher, and the yellow-billed cuckoo.

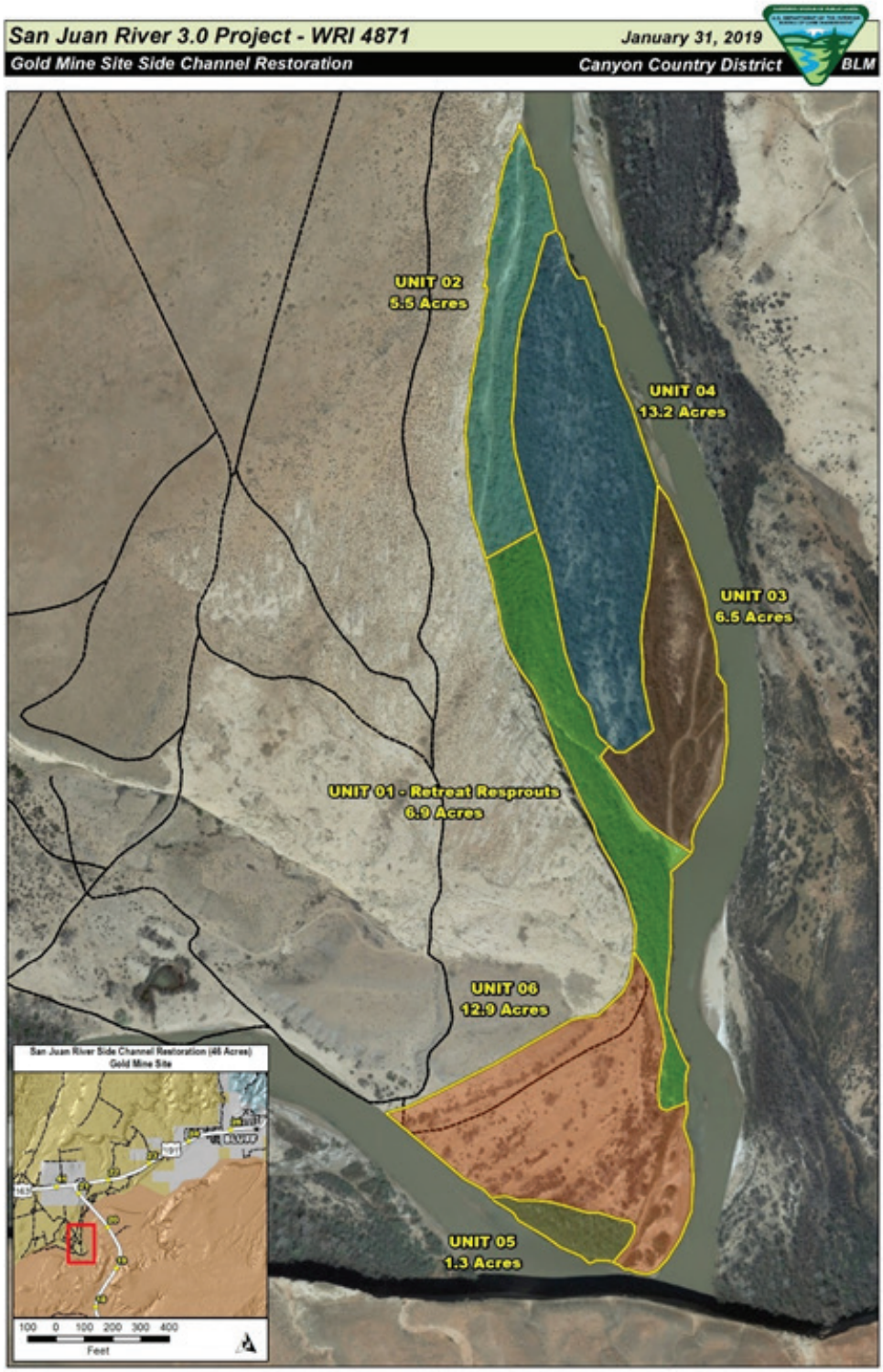

Figure 15. Map of Project Area.

The primary goal of this project is to remove Russian olive species within and adjacent to all side channel habitats so that natural hydrologic processes can be restored. High water scouring is more effective at naturally maintaining side channel habitat when the surface roughness and root systems associated with woody invasive species is removed. In the absence of woody invasive species, the current hydrology should support maintenance of these side channel habitats. Peak flows of ~7000 cfs have occurred in three of the last five years with peak flows reaching 11,000 cfs in 2019. The side channels and floodplains are connected at these flows. Another goal of this project is the protection of the cottonwood gallery and ultimately the restoration of the riparian vegetation community through the reduction of woody and herbaceous invasive species. Units 1 and 2 (Figure 15) have been treated with a frill cut method by the Canyon Country Youth Corps and the Utah Conservation Corps. This method provides for a very targeted application of herbicide while the tree is actively drawing resources from the canopy to the root system. Killing the root system is essential since they will resprout vigorously if only top-kill is achieved. Any living roots within the top 3-4 inches of soil can also resprout vigorously creating future treatments requiring less targeted herbicide applications. Once mortality of Russian olive is confirmed, and pending an Environmental Assessment (EA), a whole tree extraction methodology is desired to completely remove and pile the invasive trees in an area for future burning. Complete removal of Russian olive above and below ground biomass in and adjacent to side channels will allow these habitats to widen and reach equilibrium with the current flow regime.

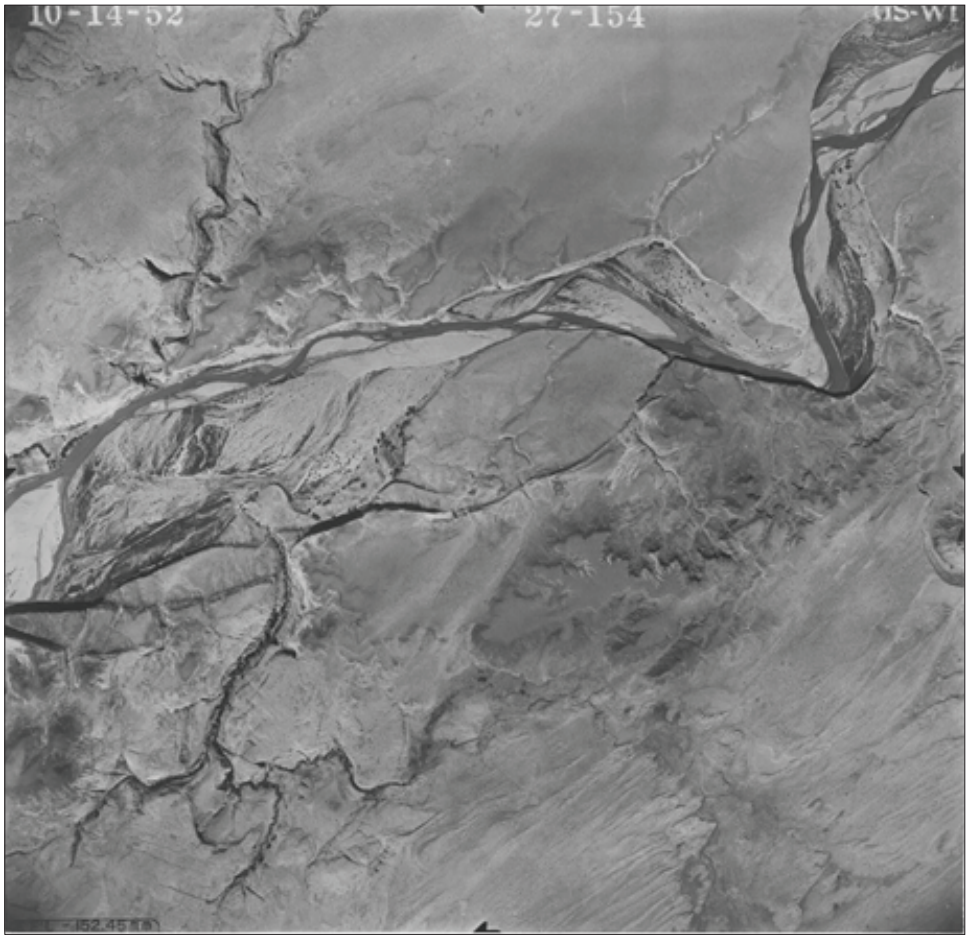

Figure 16. Historical Photo of Project Area in Oct. 14, 1952, note lack of vegetation encroachment on river channel.

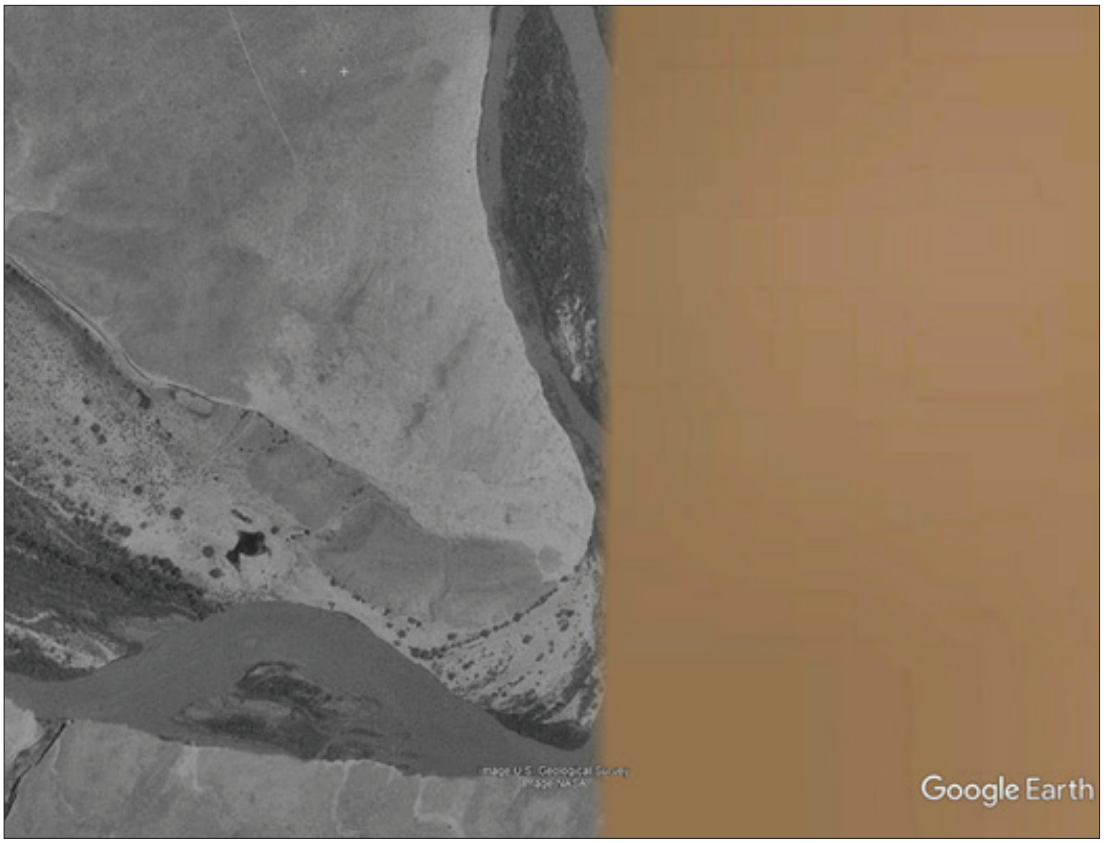

Figure 17. Historical Photo of Project Area in June 13, 1993. (Incomplete Image Mosaic).

Figure 18. May 3, 2017 photo of project area showing channel narrowing and vegetation encroachment on the river channel.

Figure 19. Senesced canopies of frill cut Russian olive along side channel (Oct. 2019).

Figure 20. UCC and CCYC work site discussion.

West Desert District, Salt Lake City, UT

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

West Box Elder Beaver Dam Analogs – Kimball Creek Project

Beaver dam analogue structures were installed along 1.5 miles of Kimball Creek in West Box Elder county October 2018. Goals of the project were to improve riparian condition, decrease incision, increase floodplain connectivity, and increase establishment of native woody riparian vegetation. Structures were built using only on-site materials such as junipers, willow, rocks, and sediment. Structures were monitored with photopoints after construction and using aquatic AIM before and one year after construction (Figures 21 and 22). One year post construction shows structures filling with sediment, willows recruiting in new sediment bars and floodplain surfaces.

Figure 21. Kimball Creek before structures -- note minimal riparian vegetation.

Figure 22. Kimball Creek after structures -- note dead junipers from structure and willow recruitment covering majority of structure.

Big Creek Bonneville Trout Restoration Project

Completion of four year effort to remove non-native brook trout and restore native Bonneville cutthroat trout took place in 43 miles of streams on BLM, private, and USFS lands in the Big Creek – Bear River watershed (Figures 23 and 24). This is a partnership project between Utah Division of Wildlife Resources, Trout Unlimited, U.S. Forest Service, and private landowners.
Project work included:

- Construction of two barriers to prevent non-native fish from re-invading from the mainstem Bear River
- Culvert replacement to improve fish passage
- Irrigation diversion modification to improve water users irrigation and allow fish passage
- Multiple rotenone treatments
- Restocking streams with native Bonneville cutthroat trout and northern leatherside chub

Figure 23. Habitat with brook trout removed.

Figure 24. Juvenile Bonneville cutthroat trout reintroduction.

BLM UT AFS Hutton Scholar Intern

The best internships provide opportunities for interns to learn and grow while meaningfully contributing to their office. This summer, BLM Utah's fisheries program and the Salt Lake Field Office were lucky to have high school intern Cristina Chirvasa join the office as a Hutton Scholar from the American Fisheries Society. As part of the Hutton Junior Fisheries Biology program, Cristina supported aquatic assessment inventorying and monitoring programs, completed riparian restoration projects, and participated in a week-long fish sampling trip with the Utah Division of Wildlife Resources (Figures 25-27).

"Cristina asked thoughtful questions and enthusiastically learned about and helped monitor spring systems, fish, wetland habitats, and stream habitats," said BLM Salt Lake Field Office Ecologist and Fisheries Biologist Cassie Mellon. "I really enjoyed mentoring Cristina."

Cristina's experience with the BLM gave her an opportunity to learn about fish and wildlife conservation and habitat management, while also developing professional skills. She also brought great ideas, enthusiasm, and energy to her eight week BLM internship. While we hope that Cristina will choose to share her skills with the BLM in the future, whatever she does, we know her future is bright.

The American Fisheries Society Hutton Scholar Program is a paid summer mentoring program to educate and inspire high school students in fisheries science and management. The program pairs high school interns with professional mentors and is sponsored by the American Fisheries Society. Find out more about the program at https://hutton.fisheries.org/.

Figure 25. Cristina assisting with Bonneville Cutthroat Trout monitoring on a stream in the Salt Lake Field Office.

Figure 26. Christina participating in BLM UT and Utah Division Wildlife Resources cooperative fish monitoring.

Figure 27. Christina and team monitor Bonneville cutthroat trout on a stream in the Salt Lake Field Office.

Green River District, Vernal, UT

Primary Contact: Jerrad Goodell, Green River District Aquatic Ecologist, jgoodell@blm.gov

White River Restoration Project

This project involves working with youth Utah Conservation Corps (UCC) to remove non-native vegetation along the White River riparian area (Figure 28). Four 5-person crews based out of Logan and Cedar City, UT conducted chainsaw training and project work on the White River. Crews cut and treated non-native vegetation on remote sites which were accessed by rafting on the White River. Crews worked in eight day periods from April 28 - May 25, 2019 and were based out of remote backcountry spike camps. The crews treated an area which was previously treated by 2017 crews who frill cut 100% of the Russian Olive in the area with approximately 80% success rate as some resprouting was observed. Spring 2019 crews removed both dead and living Russian Olive and Tamarisk stems under and around existing cottonwood stands to reduce hazardous fuel loads and increase stand resiliency in the event of a wildfire (Figures 29-32). A mixed biomass disposal prescription was implemented that consisted of habitat piles, lop and scatter.

Project Objectives:

1. Improve water quality of the White River.
2. Decrease the stems/acre of Russian olive and tamarisk.
3. Restore Cottonwood galleries.
4. Reduce Hazardous fuel loads.
5. Restore natural geomorphic process, and improve instream fish habitat.

White River Native Fishes:

- Colorado Pikeminnow
- Razorback sucker
- Flannelmouth sucker
- Bluehead sucker
- Roundtail Chub

Figure 28. UCC Ccrews on the White River.

Project Photos:

Figure 29. Before: Non-native tamarisk and Russian Olive on native cottonwood stands along the White River riparian corridor.

Figure 30. After: Non-native tamarisk removed from native cottonwood stands alon the White River riparian corridor.

Figure 31. Before: Non-native tamarisk and Russian Olive on native cottonwood stands along the White River riparian corridor.

Figure 32. After: Non-native tamarisk removed from native cottonwood stands along the WhiteRiver riparian corridor.

Pelican Lake Restoration Project

Pelican Lake is a Blue Ribbon Bluegill Fishery located 20 miles southwest of Vernal, Utah in Uintah County, BLM Vernal Field Office (VFO). It is a 1,680 surface acre, 15,850 acre foot, irrigation storage reservoir (Figure 33) and was intensively sampled in 2013 to evaluate largemouth bass and bluegill relative abundance, growth, and health. Results determined that growth rates for juvenile bluegill are much slower than during the last intensive sampling performed in the 1970s due to an invasion of common carp. In 2015 an advisory committee was formed to provide public input to the management of the Pelican Lake fishery. Members of the committee were selected from government agencies with management responsibilities for the lake and from the angling public that indicated an interest in serving on the committee. A management plan was created. Objective one was to eradicate common carp from Pelican Lake.

Figure 33. Pelican Lake, photo provided by UDWR.

In October 2018 the BLM, UDWR, and Ouray Irrigation company worked cooperatively to treat Pelican Lake with Rotenone. This treatment eradicated all fish species in the lake except black bullhead which are highly tolerant of rotenone. Largemouth bass and bluegill from a local source were used to repopulate Pelican Lake. UDWR plans to purchase fingerling bluegill in 2019 and fingerling largemouth bass in 2020. Channel catfish will continue to be stocked as needed to support management goals.

These efforts are a huge step in and achieving the goals set forth in the Vernal RMP. WL-4: The VFO will assist in implementing the strategic plan for Utah's Initiative on Blue Ribbon Fisheries by managing Pelican Lake for a quality warm water sport fishery.

Color Country District, Cedar City, UT

Primary Contact: Meghan Lyons, Color Country District Aquatic Ecologist, mlyons@blm.gov

Color Country and Paria River Districts Aquatic AIM Project

In FY2019, Color Country District began the first year of the Aquatic Assessment, Inventory and Monitoring (AIM) random sample design. During the first year, 43 random sites were sampled throughout the four field offices in the districts (Figures 34 and 35). Sites were stratified by stream order and Field Office to produce a statistically valid sample design for the entire District. Two targeted sites were also sampled in 2019 for use in future stream restoration planning and monitoring.

Figure 34. Sampling the East Fork Virgin River in the Kanab Field Office.

Figure 35. Sampling Birch Creek in the Cedar City Field Office.

Escalante River Restoration Project

The Escalante River Watershed Partnership (ERWP) formed in 2009 and consists of local businesses, federal and state agencies, and non-profit organizations. This collaboration includes the Bureau of Land Management (BLM), the Utah Conservation Corps (UCC), Grand Staircase Escalante Partners (GSEP). Each group has an important and specific role in working to restore the riparian areas of the Escalante River and its tributaries. In 2019, the ERWP reached a milestone – the completion of all initial Russian olive treatments along the entire 90-mile length of the Escalante River. This includes treating all of the targeted areas on Grand Staircase-Escalante National Monument (GSENM). This is an accomplishment over ten years in the making – and marks the tenth anniversary of the ERWP.

In addition to the completion of primary Russian olive treatments, the ERWP worked with BLM on retreatments of regrowth on GSENM during the summer months of 2019. BLM funded this effort through an assistance agreement. A five-person UCC crew, supervised by GSEP staff, traveled to multiple areas across the GSENM and retreated approximately 528 acres. As part of the BLM's continued support

Figure 36. UCC crews accessing Escalante River.

of work on the GSENM, the ERWP received $42,500 of funding to conduct Russian olive primary treatments along the Escalante River in fall 2019. This support provided ten weeks of a five-person crew during the fall backcountry treatment season. Work was based from a backcountry camp, supplied by horsepackers.

For eight days at a time, crews worked and lived in the backcountry (Figure 36). As part of four UCC chainsaw crews, this team completed 42 acres of treatment along the Escalante, which was the final mile of treatment remaining on the river (Figure 37). This work was chainsaw heavy with herbicide application, both cut stump and frill cut methods. The UCC field supervisor for both crews and stated, " It was incredible to be part of the final leg of primary treatment for a effort that has been ongoing for years, has had loads of people from different backgrounds pouring their blood, sweat and tears toward a common goal." This goal being removing an invasive species opening the river corridor, allowing native species a chance to repopulate the area and improving the recreation opportunities in this beautiful area.

Figure 37. UCC crews working along Escalante River removing Russian olive.

Utah State Office, Salt Lake City, UT

Primary Contact: Justin Jimenez, Aquatics Program Lead, jjimenez@blm.gov

Escalante River Watershed Assessment and Story Map Project

The BLM Utah State Office completed a case study on the Escalante River Watershed (Figure 38 and 39), in partnership with Utah State University, Grand Staircase-Escalante National Monument, and the BLM National Operations Center. The case study integrated multiscale assessment data on watershed condition from a Rapid Ecoregional Assessment (REA); the Assessment, Inventory, and Monitoring (AIM) Strategy; and the Riparian Condition Assessment Tool (R-CAT).

Data collected using different methods and at different scales often tell different stories about resource condition. Integrating such data into a coherent picture to guide management is a challenge but can provide insights that are difficult to obtain from one data set alone.

By integrating REA, AIM and R-CAT data, BLM managers can obtain a more complete picture of conditions, and determine whether direct agency action or collaboration with local partners and other state and federal land managers is needed to improve conditions in the watersheds we manage. Typical management questions that can be better understood using this integrated assessment include: Where is aquatic degradation occurring? Where are threatened but currently intact reaches and watersheds? Where should restoration or conservation programs be located?

Figure 38. The BLM Utah State Office recently completed a case study on the Escalante River Watershed

To learn more, try exploring the Story Map describing this project - Integrating Multiscale Assessment Data to Inform Resource Management: The Escalante Watershed Case Study. (*https://blm-egis.maps.arcgis.com/apps/MapJournal/index.html?appid=a999cf42c6624373a2f6318fa4b446ec*) Story maps can be an effective tool to summarize and share complex information, and for non-specialists to interact with geospatial data.

Figure 39. Escalante River (Photo by BLM Utah).

"The real power of the story map comes when people interact with it," said Kevin H. Miller, Landscape Ecologist/REA Applications, BLM NOC.

The Colorado Plateau and Utah Landscape Assessment, developed from the Colorado Plateau REA, modeled the effects of various stressors on watershed condition measured by aquatic intactness. Aquatic intactness summarizes watershed condition based on the presence of stressors that affect habitat quality, water quality and hydrology.

The AIM Strategy measures aquatic condition through field measurements and laboratory analysis of chemical, physical, and biological parameters collected at individual points (stream reaches) throughout the watershed. The AIM program provides more detailed data on condition at a finer spatial scale than does REA data.

AIM data identifies areas of poor water quality, such as where salinity is higher than expected, and REA data identify those subwatersheds where stressors known to contribute to high salinity are present. Correlation between locations of high salinity data with the presence of salinity-contributing stressors suggest possible causes for high salinity.

Utah State University, working with the BLM, developed the R-CAT, which is a set of tools to assess riparian condition. These tools delineate valley bottoms, assess the departure of riparian vegetation from historic coverage, evaluate floodplain fragmentation, and estimate the recovery potential of riparian areas. Collectively, these tools provide a comprehensive description of riparian condition at the reach scale.

When the three types of data are considered together, they provide an integrated assessment covering multiple spatial scales. For example, subwatersheds in which intactness is limited only by riparian vegetation are likely to respond favorably to riparian restoration. Watersheds in which intactness is affected by other stressors, including those not managed by BLM, such as dams and other hydrologic alterations, are less likely to see substantial improvement from riparian restoration alone.

Figure 40. Stevens Arch looking upstream from the Escalante River near the mouth of Coyote Gulch (Photo by Matthew Panunto).

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