Project Title
Middle Green River Floodplain Sampling and Management

Bureau of Reclamation Agreement Number:
R20PG00024

Project/Grant Period:
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Is this the final report? Yes _____ No X

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Abstract:
Flooding of wetlands managed and/or sampled in this project was negligible in 2021 due to below average runoff in the Green River downstream of the Yampa River confluence. March sampling of Sheppard Bottom did not yield any Razorback Suckers. Although the Green River briefly connected to Old Charley Wash, Razorback Sucker were not captured between five nights of larval fish sampling during runoff and one day of seining post-runoff in 2021. Most of the work conducted in this project in 2021 involved attempting to seal the water control structure and fish kettle at Old Charley Wash prior to peak runoff. Unfortunately, the repairs did not prevent leakage of wetland water to the Green River after peak flows, and it has become apparent that this ageing infrastructure will need to be replaced.

Study Schedule:
2012-Ongoing

Relationship to RIPRAP:
Green River Action Plan: Mainstem

II.A.5. Manage and/or modify priority floodplain sites for nursery habitat for endangered fishes
II.A.5.b. Johnson Bottom
II.A.5.c. Old Charley Wash
II.A.5.d. Sheppard Bottom
II.A.5.e. Stirrup
II.A.5.f. Other sites
V.D.1. Implement razorback sucker monitoring plan

Accomplishment of FY 2021 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Larval Trigger and Spring Peak Flow Hydrology

U.S. Fish and Wildlife Service monitors larval Razorback Sucker *Xyrauchen texanus* (RZB) drift with light traps, starting each spring in May or as water temperatures indicate spawning is imminent. Larval light trap sampling began this year on 17 May and commenced on 10 June. A total of 138 samples were collected from five sites including the Stewart Lake Outlet, Walker Hollow, Baeser Wash, Cliff Creek, and Old Charley Wash. The first detection of RZB larvae was on 18 May at the Stewart Lake outlet, when mean daily flow at Jensen, UT was 3,910 cfs and mean water temperature was 16.9 °C (USGS gauge # 09261000, located near Jensen, UT).

The U.S. Bureau of Reclamation increased Flaming Gorge Dam releases to 4,760 cfs on 23 May (USGS gauge # 09234500, located near Greendale, UT) in response to increasing discharge in the Yampa River. In contrast to recent years when the presence of larval RZB in the Green River drove the timing of increased dam releases, in 2021 dam releases were intended to increase, not extend, peak runoff in the Green River near Jensen, Utah following recommendations from Muth et al. (2000). During this period, the Green River near Jensen peaked at a paltry 9,800 cfs on 25 May, far below the bank full target of 18,600 cfs (Muth et al. 2000). In comparison, discharge at Jensen remained above 18,000 cfs for nine days in 2019. Details of spring larval sampling can be found in the annual report for project 22f, but much of the larval identification and final data are still pending laboratory verification, which is currently in process.

Johnson Bottom Wetland Management and Sampling Results

Water Management

Water management was not necessary at Johnson Bottom in 2021 due to well below average runoff. Water control structure gates were not opened because the minimum discharge for flooding this wetland was not realized (LTSP ad hoc committee 2012).

Fish Sampling

Fish sampling was not conducted at Johnson Bottom in 2021 due to a lack of flooding.

Old Charley Wash Wetland Management and Sampling Results

Water Management

Green River Basin Fish and Wildlife Conservation Office personnel attempted to repair leaks in the Old Charley water control structure gates and fish kettle in April and May 2021. These leaks became apparent during and after the 2020 filling period. If the leaks were not created in 2021, they were exacerbated when plywood boards sealing a decommissioned filling culvert failed during peak flows of 2020. After the boards failed, a high velocity stream of water scoured the wetland side of the fish kettle. Repairs included the replacement of a gate seal, filling a large scour hole with large cobble, and sealing known leaks with bentonite and/or concrete.

Floodplain connection occurs at a lower river stage at Old Charley Wash in comparison to the other wetlands managed in this project. Since we anticipated a short filling period in 2021 and resulting insufficient water volume to provide suitable nursery habitat for RZB, we decided to forego managing this wetland throughout summer 2021. However, Ouray National Fish Hatchery (ONFH) had expressed interest in acclimating hatchery Bonytail *Gila elegans* in an off-channel pond immediately prior to introduction in the Green River. In addition, allowing the wetland to flood to a lesser degree would provide an opportunity to test the previously mentioned repairs. Accordingly, the gates at Old Charley were opened on 21 May, when discharge near Jensen measured ~4,500 cfs, and closed when the wetland elevation equilibrated with the Green River on 28 May. The Bonytail of interest were not stocked at Old Charley by ONFH because growth of this cohort was less than anticipated. Despite the attempted repairs, the Old Charley Wash wetland continued to leak into the Green River after peak runoff in 2021.

Fish Sampling

Larval light traps were deployed outside of the water control structure at Old Charley Wash for five nights between 26 May and 10 June to determine presence of larval RZB in the filling channel. Razorback Suckers were not detected during this sampling period. Upon return to Old Charley on 30 June, GRB FWCO personnel reported very little water remaining in the wetland, and their seine hauls yielded no RZB.

Sampling Results for Other Wetlands

Leota Bottom

Evaporative water losses in Leota Bottom in 2020 combined with a lack of connection to the Green River during 2021 runoff negated the utility of sampling this wetland in 2021.

Above Brennan

Fish sampling was not conducted in the Above Brennan wetland in 2021 because it did not fill during the runoff season.

Stirrup

The Stirrup wetland did not flood in 2021 and was dry in May (M.T. Jones, personal communication), thereby precluding any opportunities for fish sampling. In addition, U.S. Bureau of Reclamation construction crews were building a water control structure at this site during the summer of 2021 that will allow management of water in this wetland in the future.

Sheppard Bottom

Three fyke nets were set in Sheppard Bottom unit three (S3) from 17-19 March. This effort was intended to determine if Razorback Sucker entrained into S3 in 2019 were still present in the wetland. Seining was also conducted in addition to fyke netting. Razorback Sucker were not captured during this sampling event. Wetland depth was shallow (~0.7 m max), and the catch was noted as being sparse (total biomass= 4.4 kg) and comprised entirely of Fathead Minnows and Green Sunfish. Floodplain connection did not occur at Sheppard Bottom in 2021, and given the conditions encountered in March, sampling was not conducted after runoff.

Additional noteworthy observations:

Although the dry hydrological condition of 2021 prevented endangered fish production in managed wetlands in 2021, it also eliminated all nonnative fishes within these nursery habitats. It is possible the 2021 reset of these habitats will benefit endangered fish recovery efforts in the future.

Recommendations:

We recommend continuing light trapping to evaluate the entrainment of wild RZB, as well as other native fish species, under the Larval Trigger Study Plan. This work provides information on presence of larval RZB in monitored floodplain habitats, which has not historically been part of the long-term light trapping study under Project 22f. This information also informs which site we might sample later in summer.

The addition of remote water level monitoring equipment in managed wetlands could provide more knowledge of wetland water storage dynamics. This equipment would allow managers to document water height in wetlands throughout the summer and could greatly aid in the determination of when to add supplemental water.

Continue discussions with Ouray National Wildlife Refuge concerning improvements at Johnson Bottom and Old Charley Wash. More specifically, filling breaches that allow nonnative fishes to enter these wetlands in moderate to moderately high runoff years should be given serious consideration.

Investigate techniques to control or eliminate nonnative fish populations that might overwinter in wetlands in order to reduce their numbers before river connection, including genetic or chemical methods. The species composition in the wetlands sampled is similar, and comprised of fish species not commonly observed in the main channel. Wetlands can serve as preferred habitat where these species will reproduce and persist in the basin. They can also become a source to reintroduce these species back into main channel habitats where they might not otherwise occur.

Project Status:
On track and ongoing.

FY 2021 Budget Status
Funds Provided: $67,080
Funds Expended: $11,541
Difference: $55,359
Percent of the FY 2021 work completed, and projected costs to complete: 17.2%
Recovery Program funds spent for publication charges: $0
Status of Data Submission:: Data will be uploaded into STReaMS by the end of December 2021.

Signed:

Christian Smith
Principal Investigator
19 November 2021

Dave Beers
Principal Investigator
19 November 2021

References

Larval Trigger Study Plan Ad Hoc Committee. 2012. Study Plan to Examine the Effects of Using Larval Razorback Sucker Occurrence in the Green River as a Trigger for Flaming Gorge Dam Peak Releases. March, 2012.

Muth, R.T., L.W. Crist, K.E. LaGory, J.W. Hayse, K.R. Bestgen, T.P. Ryan, J.K. Lyons and R.A. Valdez. 2000. Flow and Temperature Recommendations for Endangered Fishes in the Green River Downstream of Flaming Gorge Dam. Project FG-53, Upper Colorado River Endangered Fish Recovery Program. Denver, CO.

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