

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

FY 2023 ANNUAL REPORT

PROJECT: 158

Project Title

Assessment of larval Colorado Pikeminnow presence and survival in low-velocity habitats in the middle Green River

Bureau of Reclamation Agreement Number:

R19AP00059 (UDWR)

R20PG00024 (USFWS GRBFWCO)

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Is this the final report? No

Principal Investigators:

Michael S. Partlow, Native Aquatics Project Leader

Utah Division of Wildlife Resources

Northeastern Regional Office

318 North Vernal Ave.

Vernal, UT 84078

Phone: (435) 781-9453

Fax: (435) 789-8343

Email: mpartlow@utah.gov

Christian Smith, Supervisory Biologist

Green River Basin Fish and Wildlife Conservation Office

U.S. Fish and Wildlife Service

1380 S 2350 W

Vernal, UT 84078

Phone: (435) 789-0351

Fax: (435) 789-4805

E-mail: christian_t_smith@fws.gov

Abstract:

To document age-0 recruitment of Colorado Pikeminnow (*Ptychocheilus lucius*) in the middle Green River, the Utah Division of Wildlife Resources Vernal and the U. S. Fish and Wildlife Service Green River Basin Fish and Wildlife Conservation Office (GRB-FWCO) conducted a variety of seining efforts in backwater nursery habitats in 2023. Sampling during the summer base flow period was conducted to relate age-0 Colorado Pikeminnow persistence to experimental Flaming Gorge Dam releases (pre-ISMP sampling), while fall collections were undertaken for development of a broodstock. No Colorado Pikeminnow were encountered during pre-ISMP seining efforts in backwater habitats. Other age-0 native fishes were collected during these, but in low abundance. Although all samples were visually scanned for native fishes, samples with large numbers of nonnative fishes were preserved for laboratory identification since small Colorado Pikeminnow can be difficult to distinguish from nonnative cyprinids in the field. Processing of these samples has yet to occur. Fall collections were undertaken for

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broodstock development and encompassed 15 days of effort on the Green and Colorado Rivers, during which 412 Colorado Pikeminnow were collected and transferred to Ouray National Fish Hatchery and Southwestern Native Aquatic Resources and Recovery Center.

Study Schedule:

2009-Ongoing

Relationship to RIPRAP:

GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN

- IV. Conserve genetic integrity and augment or restore populations.
- IV.A.4.d.(1) Upper Colorado River Basin (Broodstock currently represented at Southwest Native ARRC and by wild fish in the river.)

GREEN RIVER ACTION PLAN: MAINSTEM

- I.D.2.c. (2) Implement base flow study plan

Accomplishment of FY 2023 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1. Age-0 Colorado Pikeminnow presence, densities, and community composition in backwaters.

To document age-0 recruitment success of Colorado Pikeminnow (CPM) in relation to experimental Flaming Gorge Dam releases and to inform questions raised in the summer flow evaluation report (Bestgen et al. 2020), the Utah Division of Wildlife Resources Vernal seined backwater nursery habitats in the middle Green River throughout the summer base flow period. The first presence of larval CPM was detected by drift net sampling conducted at the Echo Park site for Recovery Program Project #22f on July 10, 2023 (preliminary data; E. Kluender, Colorado State University Larval Fish Laboratory, personal communication). Our sampling efforts began approximately six weeks after first larval CPM emergence, and at approximately two-week intervals from August 14, 2023 until September 13, 2023. Additional sampling after September 18, 2023 was conducted under the Inter Agency Standardized Monitoring Program (ISMP; Project #138; Partlow and Amidon, 2023).

Seining efforts for pass one of this task took place from August 14-16, 2023 and pass two occurred from September 5-13, 2023. Beginning at Split Mountain boat ramp (river mile [RM] 319.3) and concluding at Sand Wash (RM 215.3), we sampled backwater habitats in each 5-mile sub-reach (when available) and collected associated habitat information. We selected backwaters in accordance with ISMP backwater selection criteria (USFWS 1987). However, given the main goal of pre-ISMP was to document age-0 CPM captures over time, investigators exercised flexibility in applying ISMP sampling protocols (USFWS 1987). For example, seining locations within backwaters were selected using our best judgment. We avoided deep, difficult-to-sample areas in favor of shallower areas where we could seine more effectively, and we often targeted the warmer tail end of backwaters. We documented backwater sediment condition for potential future comparisons (i.e., three transects in each backwater to characterize sediment depth). In 2023, we sampled 36 backwater habitats (16 on pass one and 20 on pass two), yielding a total sampling area of 4942.8 m² (Table 1). Samples from each seine haul were visually scanned for native fishes which were measured and returned alive whenever possible. When manageable, all fishes from seine hauls were identified and enumerated in the field. When larger numbers of fishes were collected, fish were preserved in 100% ethanol for later identification by Colorado State University's Larval Fish Laboratory (LFL) under Recovery Program Project #22f. The

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preservation of these larger samples was necessary to avoid desiccation in the field and to ensure that smaller age-0 CPM were not overlooked in large numbers of nonnative cyprinids. As such, until preserved samples are fully identified, enumerated, and incorporated into our data set, all data from pre-ISMP sampling reported below should be considered incomplete and preliminary.

We encountered no age-0 CPM during pre-ISMP sampling in 2023 (Table 2). Other fish species collected during this effort are described in Table 2, as well as length data summaries for native fishes. Additional age-0 native fishes were collected during this effort (Table 2): five Bluehead Sucker (*Catostomus discobolus*) and 12 Flannelmouth Sucker (*C. latipinnis*). Ten nonnative fish species were captured.

Task 2. Collect age-0 Colorado Pikeminnow from backwaters during fall and transfer them to SNARRC.

The GRB-FWCO with assistance from American Southwest Ichthyological Researchers (ASIR), the Grand Junction FWCO, and Bureau of Reclamation targeted age-0 CPM over the course of 15 days in 2023. Other than avoiding flow-through backwaters with noticeable current and those too deep to seine, our collection protocol was flexible and focused on maximizing the likelihood of capturing CPM. Field crews conducted 241 seine hauls (area = 18,855.8 m²; Table 1) within 46 backwaters between the Brush Creek confluence (RM 305.0) and the Ouray bridge (RM 248.1) of the middle Green River from September 26-29. The only CPM collected in this reach was captured in the fifth seine haul on the first day. In the Colorado River from the Cisco boat ramp (RM 111.8) to Dewey Bridge (RM 95.9), 140 seine hauls (area = 9,317.7 m²; Table 1) were conducted within 14 different backwaters from October 3-5. A total of 58 age-0 CPM (CPUE = 0.62 fish/100 m²) were collected within six backwaters in this stretch. Additional effort was expended on the Colorado River the following week from the Moab boat ramp (RM 64.2) to Lathrop Canyon (RM 23.7) from October 10-13, when 353 CPM were collected. All of the Colorado River fish were transferred from the river to the Southwestern Native Aquatic Resources and Recovery Center (SNARRC) in Dexter, New Mexico, and the Green River CPM is currently being held at the Ouray National Fish Hatchery in Ouray, Utah. Unfortunately, 180 fish collected in Colorado River did not survive the transfer to SNAARC.

Additional noteworthy observations:

During pre-ISMP sampling in the middle Green River, we caught 94 Smallmouth Bass (*Micropterus dolomieu*). Bass were present in 17 out of 49 seine hauls. Due to the ease of identifying Smallmouth Bass and the immediate value of knowledge relating to Smallmouth Bass recruitment, we counted all Smallmouth Bass regardless of whether the sample was preserved.

Recommendations:

- Determine with SNARRC whether Task 2, the broodstock collection effort, will be conducted in 2024 as soon as possible. Fieldwork planning and coordination is challenging given that this project overlaps with others at the GRB FWCO and warrants more time than provided in 2023.
- The survival of collected CPM is the priority of this project and supersedes data collection and logistical concerns whenever possible. As such, focus should remain on properly tempering water that these fish are held in post capture. We recommend that changes in water temperature from the location of capture to holding tanks should not exceed 0.2° C per hour.

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- Avoid seining backwaters before they are warmer than the main channel of the Green River in future collection efforts. Consider camping as an option so that crews spend less time launching boats and traveling on roads during field days.
- Consider changing pre-ISMP (Task 1) sampling protocol to increase the number of seine hauls performed. This could be accomplished without an increase in personnel time by reducing the amount of habitat measurements performed and by eliminating all field identifications of shiners and Fathead Minnows. The value of these data should be weighed against the need to increase sampling effort to detect Colorado Pikeminnow in low densities.

Project Status:

On track and ongoing

FY 2023 Budget Status

Funds Provided: \$108,449

Funds Expended: \$108,449

Difference: -0-

Percent of the FY 2023 work completed, and projected costs to complete: 100%

Recovery Program funds spent for publication charges: -0-

Status of Data Submission

Data are formatted, have been QA/QC checked, and will be submitted to the database manager by January 2023.

Signed:

Michael S. Partlow & Christian Smith

Principal Investigators

11/16/2023

Table 1. Summary of 2023 seining efforts in the middle Green River (MGR) and Colorado River (CR). Information from October 10-13 is not included in this table because seine haul measurements were not collected that week.

Purpose	Seine Dimensions	# Seine Hauls	Total Area Seined (m ²)	# Samples Preserved
Pre-ISMP	1/8" Mesh x 15'	49	4,942.8	19
Broodstock Collection: MGR	1/8" Mesh x 15'	238	18,179.2	NA
Broodstock Collection: MGR	1/8" Mesh x 30'	3	676.7	NA
Broodstock Collection: CR	1/8" Mesh x 15'	140	9,317.7	NA
TOTALS		430	33,116.4	19

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Table 2. Seine haul results during 2023 summer sampling efforts in the middle Green River. Note that this table only accounts for fishes that were identified and enumerated in the field; samples preserved for later identification are not included. All native fish and Smallmouth Bass were enumerated in the field.

Species	Total	Mean TL (mm) & Range
Black Crappie	16	–
Brook Stickleback	1	–
Bluehead Sucker	5	56.8 (42-63)
Channel Catfish	4	–
Common Carp	40	–
Fathead Minnow	2	–
Flannelmouth Sucker	12	53.1 (46-75)
Green Sunfish	12	--
Red Shiner	552	–
Smallmouth Bass	94	–
Sand Shiner	454	–
White Sucker	5	–
White Sucker X Flannelmouth Sucker	1	--

Literature Cited

- Bestgen, K.R., T.E. Chart, D.M. Anderson, and M.T. Jones. 2020. Evaluate effects of summer flow management on recruitment of age-0 Colorado Pikeminnow in the middle Green River, Utah. Final report to the Upper Colorado River Endangered Fish Recovery Program. Denver, Colorado. Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins. Larval Fish Laboratory Contribution 216.
- Partlow, M.S. and A. Amidon. 2023. Annual fall monitoring of young of year Colorado Pikeminnow and small-bodied native fishes. Annual report of Utah Division of Wildlife Resources to Upper Colorado River Endangered Fish Recovery Program. Denver, CO.
- USFWS. 1987. Interagency standardized monitoring protocol handbook. U.S. Fish and Wildlife Service, Colorado Fisheries Project Office, Grand Junction, CO.