

- I. Project Title: Smallmouth bass control in the White River
- II. Bureau of Reclamation Agreement Number(s): R12PG40027; R12AP40032
- III. Principal Investigator(s):

Aaron Webber
U. S. Fish and Wildlife Service
Colorado River Fishery Project
1380 S. 2350 W.
Vernal, UT 84078
(435) 789-4078 ext 21
aaron_webber@fws.gov

Matthew J. Breen / Joseph A. Skorupski Jr.
Utah Division of Wildlife Resources
Northeast Regional Office
318 North Vernal Avenue
Vernal, Utah 84078
435-781-9453; Fax: 435-789-8343
mattbreen@utah.gov

- IV. Abstract:

U.S. Fish and Wildlife Service, Utah Division of Wildlife Resources, and Colorado Parks and Wildlife worked collaboratively to remove an emerging population of smallmouth bass from the White River in 2013. This population was first detected in 2011, and removal projects began in 2012. This year 3,413 bass were removed from the river, comprised mainly of sub-adult fish (100-199 mm) spawned in 2012. Densities of adult bass were highest near Taylor Draw Dam and diminished exponentially moving downstream. Fish spawned in 2012 were captured further downstream into Utah, resulting in a large increase in fish captured in that reach during 2013.

- V. Study Schedule: 2012-2016

- VI. Relationship to RIPRAP:

GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN

- III. Reduce negative impacts of nonnative fishes and sportfish management activities.
 - III.A. Reduce negative interactions between nonnative and endangered fishes.
 - III.A.2. Identify and implement viable active control measures.

GREEN RIVER ACTION PLAN: WHITE RIVER

- III. Reduce negative impacts of nonnative fishes and sportfish management activities.
 - III.A. Reduce negative interactions between nonnative and endangered fishes.
 - III.B.2. Preclude new nonnative species introductions, translocations or invasions to preserve native species dominance within critical habitat.

VII. Accomplishment of FY 2013 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1: Two smallmouth bass removal passes from Taylor Draw Dam to the Colorado/Utah border

U.S. Fish and Wildlife Service crews used two electrofishing rafts to sample the White River from Taylor Draw Dam (RM 104) to RM 87.5, with the assistance of Colorado Parks and Wildlife. Based on results from 2012, we focused removal efforts primarily in the most upstream reaches to maximize the removal of bass, particularly adults. For RM 104-97.1 (Douglas Creek), we conducted 13 passes. For RM 97.1-93.4, we conducted 8 removal passes, and from RM 93.4-87.5, we conducted 3 passes. These passes occurred 30 May to 28 June 2013, and data presented here include FWS and CPW passes combined. We removed a total of 2,872 (26-435 mm; 1,750 \leq 199 mm, 1,060 \geq 200 mm, 62 \geq 325 mm) smallmouth bass from this effort. We observed a concentration of all sizes of smallmouth bass from Taylor Draw Dam to Douglas Creek, and then a steady decline of smallmouth bass downstream (Figure 1). Adult smallmouth bass were concentrated in the upper reaches below Taylor Draw Dam and declined to lower densities downstream. Smallmouth bass \geq 325 mm were concentrated from Taylor Draw Dam to Douglas Creek, and only one was captured downstream of the BLM takeout in Colorado (RM 87.5; Figure 2). The concentration of larger adults in this reach corresponds to what appeared to be spawning behavior and suitable spawning habitat in that area. We did not achieve a depletion in any reach we sampled (Figure 3). The total catch rate during all passes in all reaches during the entire project 167 was 8.9 smallmouth bass per hour. The length frequency of all smallmouth bass captured in the project is shown in Figure 4. It appears that a significant number of bass spawned in 2012 successfully recruited, and represent the largest age class of the catch. Total catch of bass in size classes >150 mm was slightly lower in 2013 than 2012.

Task 2: One smallmouth bass removal pass from the Colorado/Utah border to Enron boat launch

One electrofishing pass was completed from 18–21 June 2013. We selected this time frame, which was on the descending limb of the hydrograph, to maximize the removal of spawning adults based on preferred temperatures and real-time field observations by Vernal-CRFP upstream. During this effort, 541 smallmouth bass were removed from this reach (mean \pm SE = 135.2 \pm 1.1 mm TL; range = 73–345 mm TL; Figure 5). Catch consisted of 529 sub-adults (\leq 199 mm TL), 11 adults (200–324 mm TL), and one piscivore ($>$ 325 mm TL). On average, 10.4 bass were removed per river mile, which is a drastic increase over 2012 when only 43 bass (1.01 fish/mile) were removed during three electrofishing passes (Figure 6). Overall, age-1 fish from the strong 2012 cohort dominated total catch (Figures 4 and 5). Although there was a difference in the timing of bass removal in 2012 and 2013 (i.e., several weeks later in 2013), sampling conditions were very similar. For example, average daily discharge and temperature was 592.2 cfs and 19.4 °C in 2012 respectively, and 511.9 cfs and 19.3 °C in 2013.

Catch-per-unit-effort of smallmouth bass increased substantially between the first two years of this project, primarily from an increase in sub-adult bass. Considering the entire sample reach, which included 9.3 additional miles in 2013, CPUE was 12.05 bass/hr in 2013 compared to 0.49 bass/hr in 2012. As expected given that it is closer to the likely source population, the highest catch rates were observed in the farthest upstream reach (RM 75.8–71.3; Figure 6B). River mile 72.1–66.5 was not sampled in 2012; however, focusing specifically on RM 75.8–71.3, which was sampled last year by Vernal–CRFP, catch rates increased more than nine-fold (Figure 6B; Breen et al. 2012). Peaks in catch rates were also observed in middle (RM 46–41) and lower (RM 31.5 –28) reaches (Figure 6B). More importantly though, smallmouth bass CPUE has increased several orders of magnitude over 2012 observations regardless of the sample reach (Figure 6A-B).

Adult bass were dissected for sex determination and gamete expression. Five of the 12 adults (229–345 mm TL) were reproductively mature and ripe, but no fish were spent at the time of collection. It is important to note that suitable spawning habitat exists in this reach. Although it appears most reproduction is occurring in the tailrace reach between Taylor Draw Dam and Douglas Creek, offspring from that spawning area are being collected much further downstream and could pose a threat to the entire river.

Overall observations of smallmouth bass on the White River from Taylor Draw Dam to the Green River confluence:

Smallmouth bass of all sizes are very abundant from Taylor Draw Dam to Douglas Creek, and then decrease substantially downstream. Adults, and especially large adults, are in high densities above Douglas Creek, and decrease downstream. Sub-adult bass were captured throughout removal reaches and appear to have moved or been displaced downstream of areas where spawning is believed to occur, as evidenced by the large increase in fish removed in 2013 in the lower sections of the river. There was a very successful smallmouth bass spawn in 2012 that accounted for the majority of our catch in 2013. Despite extensive effort to remove bass in the upper reaches of the White River in both 2012 and 2013, smallmouth bass densities remain quite high.

Task 3: Data entry, analysis, and reporting

Recovery Program annual progress report submitted November 2013.

VIII. Additional noteworthy observations:

Several species other than smallmouth bass were captured during the project. Nonnative species other than smallmouth bass removed from the entire sample reach are recorded in Table 1. In addition, UDWR observed one grass carp (approximately 30 lbs) that was not captured between RM 28-24, and USFWS personnel observed two walleye.

We are concerned with the potentially negative impacts of electrofishing on native fishes

References:

Breen, M.J., J.A. Skorupski Jr., A. Webber, and T. Jones. 2012. Smallmouth bass control in the White River. Annual Report to the Upper Colorado River Endangered Fish Recovery Program. Denver, CO.

Table 1. Ancillary captures from the White River, 2013. All fish were removed except Colorado pikeminnow, which were released alive.

Species	Total Captured	Length Range (mm)
Black bullhead	5	140-237
Black crappie	207	64-277
Bluegill	5	88-117
Bluehead x white sucker	20	128-164
Brown trout (removed in Utah)	3	152-228
Flannelmouth x white sucker	5	134-207
Green sunfish	306	48-224
Northern pike	1	586
White sucker	65	90-430
Yellow perch	2	97-112
Colorado pikeminnow	16	450-820

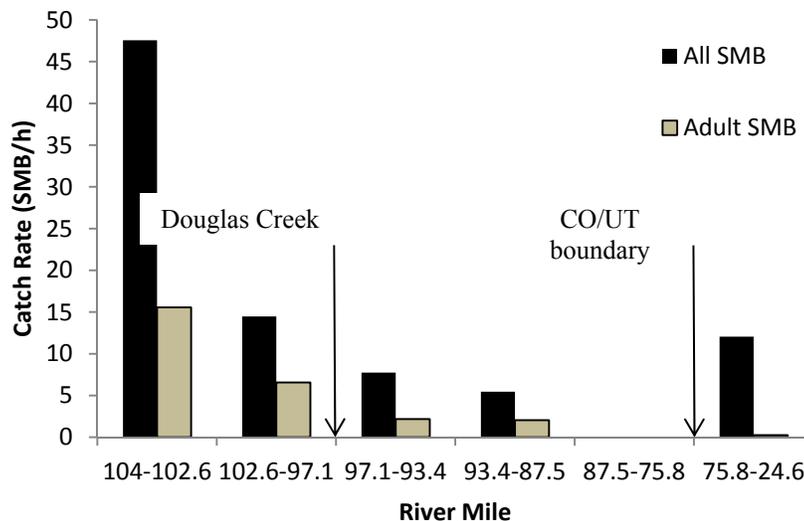


Figure 1. Catch rate for all bass and adult bass captured from the White River, 30 May-28 June 2013.

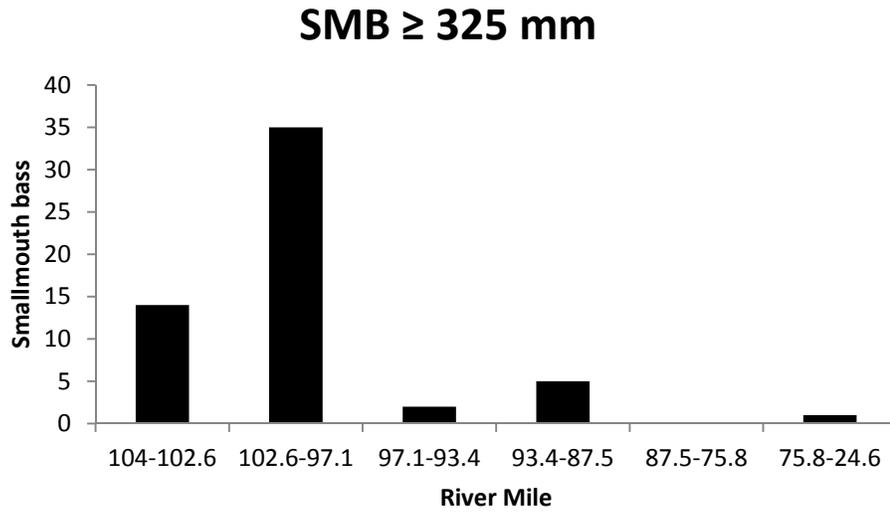


Figure 2. Smallmouth bass \geq 325 mm captured in the White River, 2013.

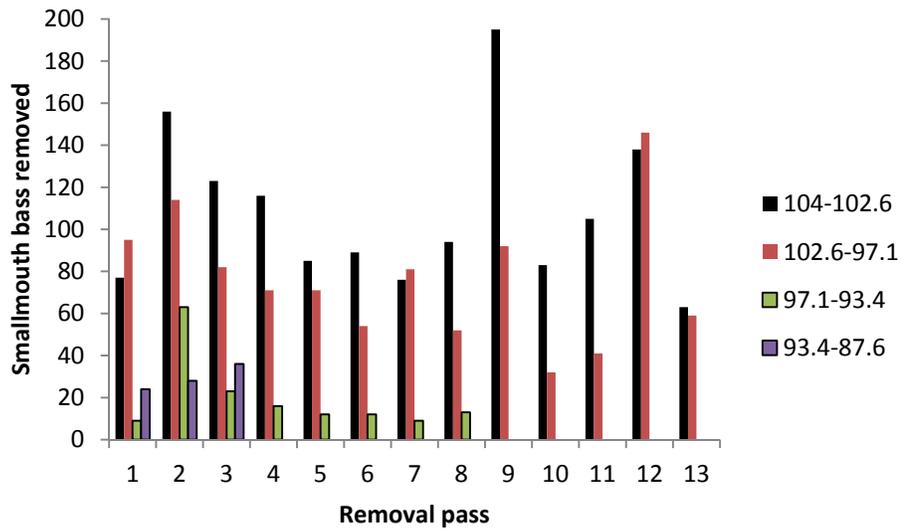


Figure 3. Smallmouth bass removed in each pass by river miles in the White River.

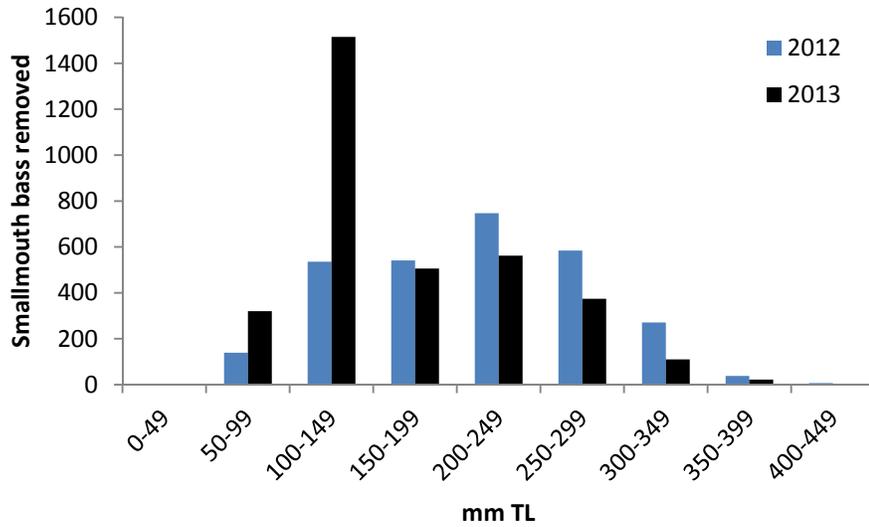


Figure 4. Length frequency of all smallmouth bass removed from the White River during 2012 and 2013.

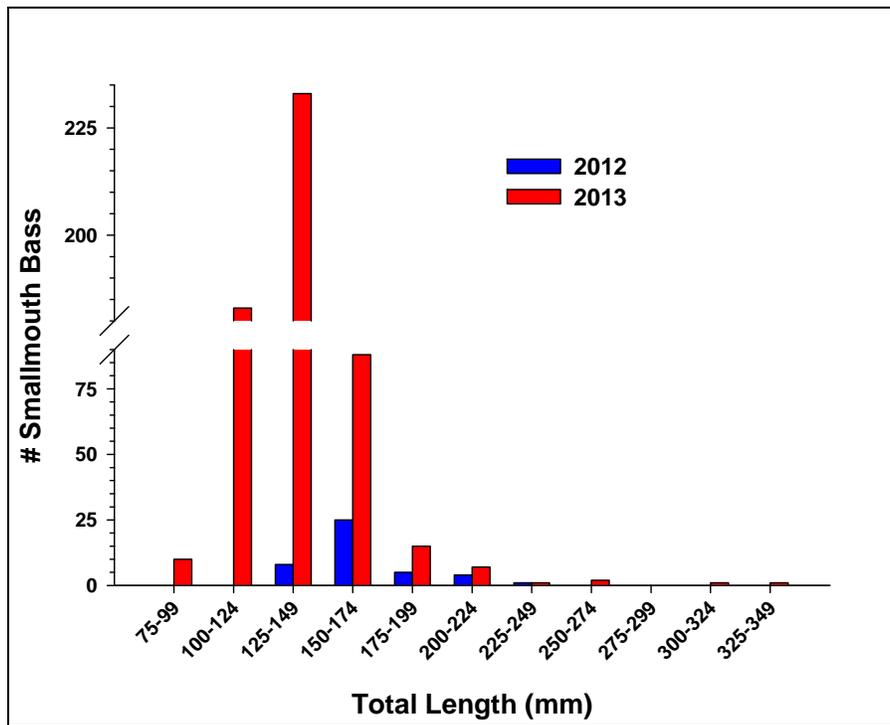


Figure 5. Length-frequency distribution of smallmouth bass collected in the lower White River. In 2012, three passes of cataraft electrofishing were conducted from RM 66.5–24, whereas one pass of electrofishing was conducted from RM 75.8–24.0 in 2013.

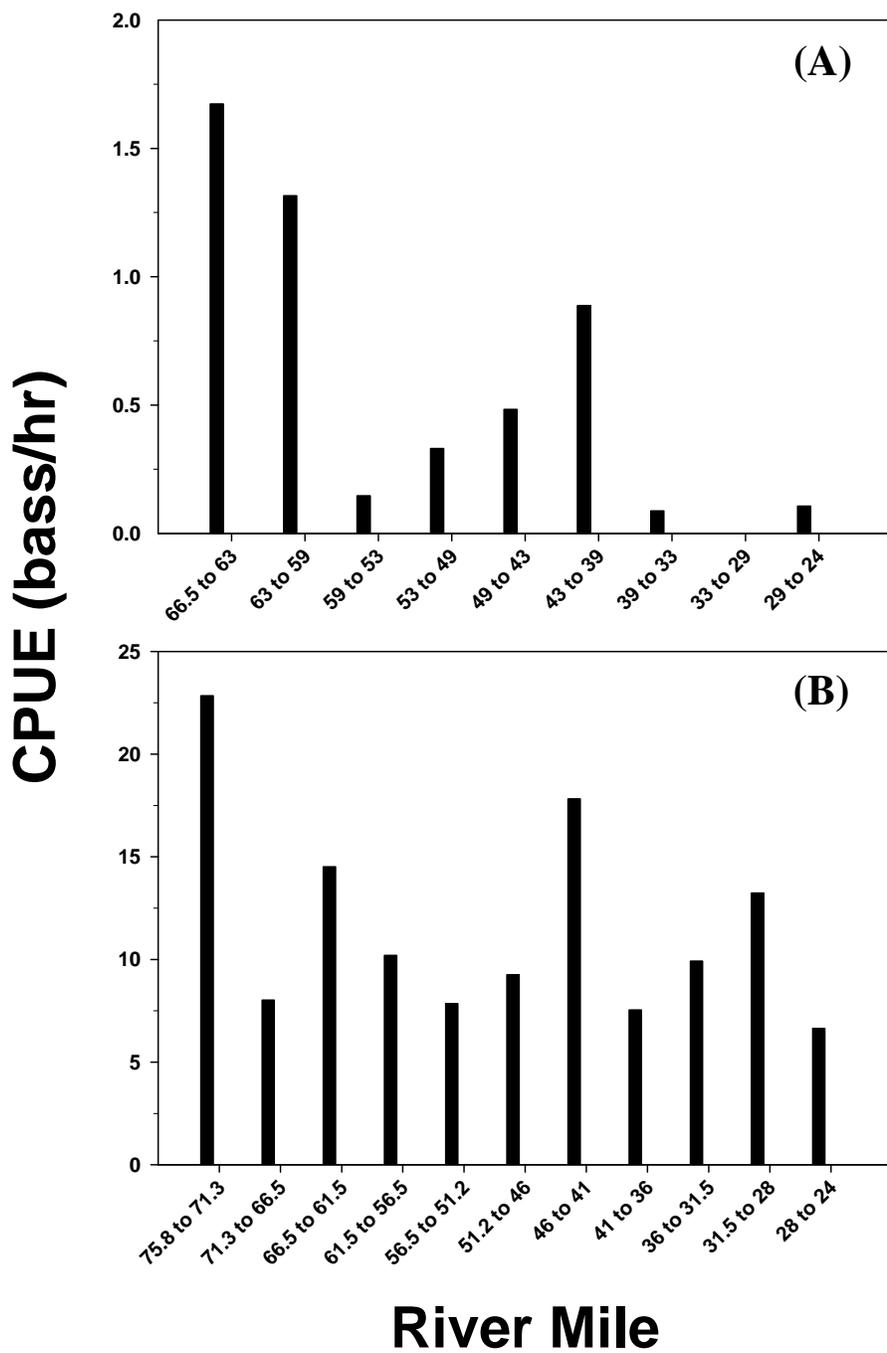


Figure 6. Catch-per-unit-effort (CPUE) of smallmouth bass collected during cataraft electrofishing in the White River from (A) three passes conducted in 2012 from RM 66.5–24 and (B) one pass conducted in 2013 from RM 75.8–24. Note the difference in the Y-axis scale when comparing the top and bottom panels.

ANNUAL PERFORMANCE PROGRESS REPORT (PPR)

BUREAU OF RECLAMATION AGREEMENT NUMBER: R12PG40027

UPPER COLORADO RIVER RECOVERY PROGRAM PROJECT NUMBER: 167

Project Title: White River smallmouth bass control

Principal Investigator: Aaron Webber
U.S. Fish and Wildlife Service
1380 S 2350 W, Vernal, UT 84078
aaron_webber@fws.gov; (435) 789-0351

Project/Grant Period: Start date (Mo/Day/Yr): 07/17/2012
 End date: (Mo/Day/Yr): 03/30/2016
 Reporting period end date (Mo/Day/Yr): 09/30/2013
 Is this the final report? Yes _____ No X

Performance: USFWS completed task 1, removing bass from Taylor Draw Dam to the Utah state line between 23 May and 28 June 2013. We concentrated effort on the uppermost reaches, where bass catch rates were highest and where we were able to capture more adult bass. This report completes task 3, and data will be submitted to the database manager by the end of 2013.

ANNUAL PERFORMANCE PROGRESS REPORT (PPR)

BUREAU OF RECLAMATION AGREEMENT NUMBER: #R12AP40032

UPPER COLORADO RIVER RECOVERY PROGRAM PROJECT NUMBER: 167

Project Title: Smallmouth bass control in the White River

Principal Investigator:

Matthew J. Breen and Joseph A. Skorupski Jr.
Utah Division of Wildlife Resources
Northeast Regional Office
318 North Vernal Ave.
Vernal, Utah 84078
Phone: 435-781-9453; Fax: 435-789-8343
E-mail: mattbreen@utah.gov

Project/Grant Period: Start date (Mo/Day/Yr): 8/16/2012
 End date: (Mo/Day/Yr): 11/30/2016
 Reporting period end date (Mo/Day/Yr): 9/30/2013
 Is this the final report? Yes _____ No X

Performance:

Tasks 2–3 were accomplished as outlined in the scope of work for this project. We completed one pass of cataraft electrofishing from RM 75.8–24.0 and determined that bass densities in the lower White River have increased substantially due to further range expansion of the strong 2012 cohort. With only one pass of electrofishing to complete, we focused on ideal conditions to maximize catch (i.e., descending limb of the hydrograph with preferred temperatures) and removed a total of 541 smallmouth bass, the majority of which were age-1 sub-adults. Annual reporting is complete under task 3 and nonnative data will be submitted to Recovery Program personnel before the Nonnative Workshop in December 2013.