

COLORADO RIVER RECOVERY PROGRAM  
FY 2014 ANNUAL PROJECT REPORT

RECOVERY PROGRAM  
PROJECT NUMBER: 167

I. Project Title: Smallmouth bass control in the White River

II. Bureau of Reclamation Agreement Number(s): R14AP00007 (UDWR)  
R13PG40020 (USFWS)

III. Principal Investigator(s):

Aaron Webber / Tildon Jones  
U. S. Fish and Wildlife Service  
Colorado River Fish Project  
1380 S. 2350 W.  
Vernal, UT 84078  
(435) 789-4078 ext 14  
[tildon\\_jones@fws.gov](mailto:tildon_jones@fws.gov)

Matthew J. Breen / Robert C. Schelly  
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](mailto: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. This population was first detected in 2011, and removal projects began in 2012. This year a total of 1,677 smallmouth bass were removed between Taylor Draw Dam and river mile 24 (Enron boat ramp). Catch rates were lower this year than the last two years, and exhibited a similar trend of decreasing bass catch moving downstream. Two size classes of bass were predominant and represented sub-adult bass spawned in 2012 and 2013. One walleye was captured this year, representing the first documented occurrence of this species.

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 2014 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

**Task 1: Smallmouth bass removal from Taylor Draw Dam to the Colorado/Utah border**

U.S. Fish and Wildlife Service and Colorado Parks and Wildlife worked collaboratively to remove smallmouth bass from this reach between 13 June and 14 July (Table 1). The majority of effort was expended in the 11 miles below Taylor Draw Dam, as previous years' data suggested this was the area of highest bass densities, and likely supported spawning. High spring flows and a lack of access only allowed for raft electrofishing in the upper 3.5 miles when sampling began in June. This resulted in 14 sampling passes between RMIs 104.3-102.6, 10 passes from RMI 102.6-93.4, and three passes from RMI 93.4-87.5. In total, 1,357 smallmouth bass were removed, consisting of 605 adults ( $\geq 200\text{mm}$ ), 617 sub-adults (100-199mm), and 135 fish  $< 100\text{mm}$  (likely age-1). Of the 605 adults captured, 36 were large enough to be considered piscivores ( $\geq 325\text{mm}$ ) posing a competitive threat to Colorado pikeminnow.

The overall catch rate for smallmouth bass this year was 10 fish/hour. We compared this to catch rates only for bass removal passes in 2012 and 2013 (Figure 1), since bass were also captured during Colorado pikeminnow estimates in those years. The catch rate for bass this year was much lower than previous years, as was the overall number of bass captured. Catch rates by pass were variable, and reflected the fact that passes were conducted over different reaches of river due to restricted access at higher flows. Early passes were concentrated in the upper reach, which has consistently produced the highest densities of bass since removal efforts began (Breen et al. 2012; Webber et al. 2013b). The size structure of bass caught in 2014 revealed two size classes that correspond to fish spawned in 2012 and 2013 (Fig. 2). The number of larger adults ( $> 300\text{mm}$ ) captured in 2014 was similar to 2013 (Fig. 3), but suggests this control program may be shifting size structure to smaller individuals, as has been seen elsewhere (Zipkin et al. 2008).

Smallmouth bass continued to exhibit a gradient of decreasing catch rates moving downstream (Fig. 4). The proportion of adults to subadults also decreased in a downstream direction, with subadults comprising a larger percent of the catch.

**Task 2: Two smallmouth bass removal passes from the Colorado/Utah border to Enron boat launch**

Two electrofishing passes (71.15 hrs of combined effort) were completed from 23–26 June and 30 June–3 July 2014. 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 upstream field observations by Vernal-CRFP. Spring peak discharge in 2014 was closer to average than in the previous two drier years in the White River, thus the timing and conditions of bass removal differed from 2012 and 2013. Although removal occurred several weeks later (i.e., late June/early July vs.

late May/early June), average sampling temperatures were similar to previous efforts (2012 – 19.4°C; 2013 – 19.3°C; 2014 – 19.3°C for pass 1, 20.7°C for pass 2). However, average daily discharge and turbidity differed in 2014 (1,042 cfs; 18.1 cm of visibility) compared to 2013 (511.9 cfs; 22.1 cm of visibility), possibly reducing capture efficiency in 2014.

During this effort, 320 smallmouth bass were removed from this reach (mean  $\pm$  SE = 168.6  $\pm$  3.0 mm TL; range = 47–375 mm TL; Figure 5). Catch consisted of 259 sub-adults ( $\leq$  199 mm TL), 57 adults (200–324 mm TL), and four piscivores ( $\geq$  325 mm TL). Adult bass were dissected for sex determination and gamete expression. Fifty-five of the 61 adult bass (201–375 mm TL) were reproductively mature (27 females, 28 males), but only one male bass (TL = 256 mm) was ripe at the time of collection. Combining passes (95.2 miles electrofished in two passes), 3.4 bass/mile were removed on average, which represents a substantial decrease over 2013 when 10.4 bass were removed per mile (Webber et al. 2013b; Figure 6). Separating our data by pass, we removed 152 bass on pass one (CPUE = 4.32 fish/hr) and 168 bass on pass two (CPUE = 4.67 fish/hr), clearly demonstrating that depletion was not observed. Notably, only 12 adult smallmouth bass were captured in 2013 (2.2% of the total; Webber et al. 2013b), whereas 61 adults were removed in 2014 (19.1% of the total). This indicates smallmouth bass population stabilization in the lower White River, with an increasing number of 2013 sub-adults from the strong 2012 cohort shifting into the adult category (Figure 5). Additionally, a successful spawn in 2013 is apparent with the presence of smaller size classes, now reflecting a population structure where all size classes are represented (Figure 5).

Catch-per-unit-effort of smallmouth bass in this sampling reach has varied considerably during the first three years of this project. Not only has overall CPUE shifted substantially from year to year, but dramatic changes in bass distribution along an upstream to downstream gradient are evident. More specifically, 2012 represents CPUE influenced by distance to an upstream source population (Breen et al. 2012; Figure 6a), 2013 CPUE reflects population expansion from excellent recruitment in 2012 (Webber et al. 2013b; Figure 6b), and the 2014 CPUE gradient is most likely influenced by environmental factors. River mile 61.5 is the end of a 5-mile sample reach as well as the location of the Evacuation Creek confluence. The Evacuation Creek watershed was devastated by a 20,000 acre wildfire in July of 2012, leaving a barren landscape that has since been subject to increased erosion and high sediment loads during severe rainstorms. Following an irregular monsoon season in late summer of 2013, young-of-year surveys revealed significant changes in marginal, low-velocity habitats that were nearly or completely filled in with sediment, ash, and debris (Fiorelli and Breen 2014). Given a clear break in CPUE at RM 61.5 (Figure 6c), we suspect that 2013 sub-adult bass downstream of the Evacuation Creek confluence experienced poor survival rates or moved out of the reach to seek more suitable habitat. Regardless, 2012 cohort bass remain in this sample reach, have achieved greater size, and now present a greater threat in terms of piscivory and reproductive capacity.

### **Overall observations of smallmouth bass on the White River from Taylor Draw Dam to the Enron Boat Ramp:**

When the data are combined between both sampling efforts, fewer bass were captured in 2014 than previous years, and catch rates were much lower. Sub-adult bass from a year class spawned in 2012 continued to grow and recruit into small adult sizes, and an additional year class spawned in 2013 was evident, particularly in the upper reach. These sub-adults were collected throughout the reaches sampled, and represented the majority of bass captured. Adult catch rates were highest near Taylor Draw Dam and showed a decreasing trend moving downstream (Fig. 4), but adults did comprise a larger proportion of bass captured in the Utah reach (Fig. 5). These data are consistent with previous years' observations suggesting that a large population of adults near Rangely successfully spawn, and young fish either disperse or are displaced downstream. The increase of adults in the Utah reach suggests the population may still be expanding within the river. Observations of reduced bass numbers downstream of major intermittent tributaries, like Evacuation Creek, further suggest that turbidity and/or sediment from flash flooding may help suppress bass numbers. A similar trend is evident below Douglas Creek at river mile 97.1, where adult bass catch rates over the last three field seasons have declined dramatically compared to the clearer tail race reach below Taylor Draw Dam. Frequent monsoonal rains caused regular flash flooding and turbidity events in August and September, after sampling ceased, and data from 2015 may help determine if these events did impact smallmouth bass in these reaches.

### **Task 3: Data entry, analysis, and reporting**

Recovery Program annual progress report submitted November 2014.

#### **VIII. Additional noteworthy observations:**

The Larval Fish Lab at Colorado State University also conducted one day of electric seining on Sept. 23 near the outflow of Taylor Draw Dam. During that time they collected 939 small bass (TL=40-268mm). The majority of these fish (n=930) were young of year bass <100mm. They were also able to collect small flannelmouth sucker, green sunfish, white sucker, fathead minnow and red shiner. This confirms smallmouth bass are spawning in this area, which consists of braided, shallow channels and riprap banks.

Several nonnative species other than smallmouth bass were captured during this project (Table 2). Of particular interest, walleye have been observed in the White River during previous sampling efforts (Webber et al. 2013b); however, work conducted for this project in 2014 documents the first capture of a walleye in this system (a large adult collected near RM 35). In addition, northern pike captures have been extremely rare in the White River (Breen and Hedrick 2012; Webber et al. 2013b), yet another northern pike adult was captured between RM 31.5–26.5 in 2014. Upon dissection, we determined that this fish had recently consumed an adult *Gila* spp. (unidentifiable). It is

not clear whether walleye and northern pike are capable of maintaining populations in the White River, but the presence of species that were previously undocumented (walleye) or rare (pike) is quite concerning for this native fish community given the impacts these voracious piscivores have had elsewhere in the Upper Colorado River basin (e.g., Nonnative Fish *ad hoc* Committee, In Prep.).

Despite negative implications of recent nonnative captures, the White River continues to provide examples of habitat conditions conducive to native fish proliferation. Although successful integration of stocked bonytail has been limited (Integrated Stocking Plan Revision Committee, In Prep.), fish that were stocked near the Bonanza Bridge last fall were observed in nearly all reaches of the lower White River approximately nine months post-stocking (assumption based the fact that bonytail were absent from 2013 surveys–PIT tag query pending). With the exception of the first 15.1 miles sampled on pass one, we opted to ignore bonytail captures in order to ensure completion of our main objective of smallmouth bass removal because bonytail were too abundant (~150-200 bonytail were observed) and individual workups are time consuming. All bonytail captured or observed were in excellent condition and found utilizing a variety of habitat types available in the White River. In addition, we collected an adult razorback sucker between RM 56.5–51.2, further emphasizing the importance of this system for range expansion of stocked razorbacks to complete important life history processes (Webber et al. 2013a). Finally, one of our Colorado pikeminnow captures was a ripe male, providing additional documentation that reproduction by this species occurs in the White River (Webber et al. 2013a).

IX. Recommendations:

- We recommend maintaining current levels of smallmouth bass removal effort in both Colorado and Utah portions of this study. Although decreasing catch rates have been observed, continued pressure is important at this juncture.

X. Project Status: On track and ongoing

XI. FY 2014 Budget Status

- A. Funds Provided: \$57,095
- B. Funds Expended: \$57,095
- C. Difference: \$0
- D. Percent of the FY 2014 work completed: 100%
- E. Recovery Program funds spent for publication charges: \$0

XII. Status of Data Submission:

We will submit all data to the database manager by December 2014.

XIII. Signed: Tildon Jones & Matthew J. Breen November 7, 2014  
Principal Investigators Date

## References:

- Breen, M.J., and T.N. Hedrick. 2012. Conservation activities for three species in four drainages of northeastern Utah, 2010. 2010 Statewide Monitoring Summary, Publication No. 12-05. Utah Division of Wildlife Resources, Salt Lake City, Utah.
- 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.
- Fiorelli, M.D. and M.J. Breen. 2014. Conservation activities for three species in northeastern Utah, 2013. 2013 Statewide Three Species Monitoring Summary, Publication No. 14-19. Utah Division of Wildlife Resources, Salt Lake City, Utah.
- Integrated Stocking Plan Revision Committee. In Prep. Revised integrated stocking plan for razorback sucker and bonytail. Draft prepared for the Upper Colorado River Endangered Fish Recovery Program, September 2014. Denver, CO.
- Lanigan, S.H. and C.R. Berry Jr. 1981. Distribution of fishes in the White River, Utah. *Southwestern Naturalist* 26:389-393.
- Martinez, P.J., T.E. Chart, M.A. Trammell, J.G. Wullschleger, and E.P. Bergersen. 1994. Fish species composition before and after construction of a main stem reservoir on the White River, Colorado. *Environmental Biology of Fishes* 40: 227-239.
- Nonnative Fish *ad hoc* Committee. In Prep. Upper Colorado River basin nonnative and invasive aquatic species prevention and control strategy. Draft prepared for the Upper Colorado River Endangered Fish Recovery Program, December 2012. Denver, CO.
- Webber, P.A., K.R. Bestgen, and G.B. Haines. 2013a. Tributary spawning by endangered Colorado River basin fishes in the White River. *North American Journal of Fisheries Management* 33: 1166-1171.
- Webber, A., M.J. Breen, and J.A. Skorupski Jr. 2013b. Smallmouth bass control in the White River. Annual Report to the Upper Colorado River Endangered Fish Recovery Program. Denver, CO.
- Zipkin, E.F., P.J. Sullivan, E.G. Cooch, C.E. Kraft, B.J. Shuter, and B.C. Weidel. 2008. Over-compensatory response of a smallmouth bass (*Micropterus dolomieu*) population to harvest: release from competition? *Canadian Journal of Fisheries and Aquatic Sciences* 65: 2279-2292.

**Table 1. Sub-adult and adult smallmouth bass caught for each pass. River miles (RMI) and dates sampled are also indicated for each pass.**

<b>Pass</b>	<b>RMI</b>	<b>Sub-adults</b>	<b>Adults</b>	<b>Total</b>
1-CPW, 13-15 May	93.4-87.5	2	13	15
2-CPW, 20 May	93.4-87.5		6	6
3-CPW, 13 June	104.3-101	29	52	81
4-CPW, 16 June	104.3-101	39	62	101
5-CPW, 17 June	104.3-101	41	47	88
6-CPW, 18 June	104.3-101	62	48	110
7-FWS, 23 June	104.3-93.4	29	29	58
8-FWS, 24 June	104.3-93.4	35	19	54
9-FWS, 25 June	104.3-93.4	37	42	79
10-FWS, 26-27 June	104.3-87.5	77	65	142
11-FWS, 30 June	104.3-93.4	35	36	71
12-FWS, 1 July	104.3-93.4	59	43	102
13-FWS, 2 July	104.3-93.4	98	43	141
14-CPW, 10 July	104.3-93.4	50	27	77
15-CPW, 11 July	104.3-93.4	93	53	146
16-CPW, 14 July	104.3-95.8	66	20	86
1-UDWR, 23-26 June	71.6–24.0	116	36	152
2-UDWR, 30 June-3 July	71.6–24.0	143	25	168
<b>Totals</b>		<b>1,011</b>	<b>666</b>	<b>1,677</b>

**Table 2. Ancillary captures from the White River, 2014.**

<b>Species</b>	<b>Total Captured</b>	<b>Length Range (mm)</b>
Black crappie	116	71-260
Bluehead x WS hybrid	28	174-329
Bonytail**	8	124–259
Colorado pikeminnow	19	303-832
Flannelmouth x WS hybrid	22	255–360
Green sunfish	407	29–182
Northern pike	1	605
Rainbow trout	1	252
Roundtail chub**	26	138–382
Razorback sucker	1	442
Walleye	1	544
White sucker	51	156–384

\*\*Chubs ignored with the exception of the first 15.1 miles on pass 1 (UDWR)

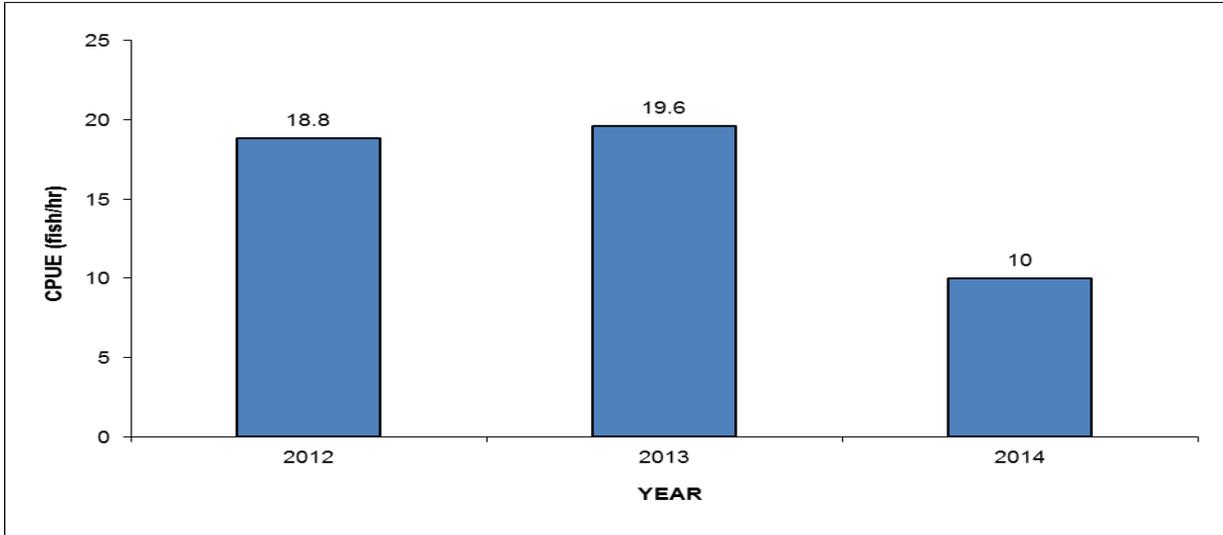


Figure 1. Catch rate for all smallmouth bass captured during nonnative fish passes in the White River in Colorado (RMI 104.3-87.5), 2012-2014.

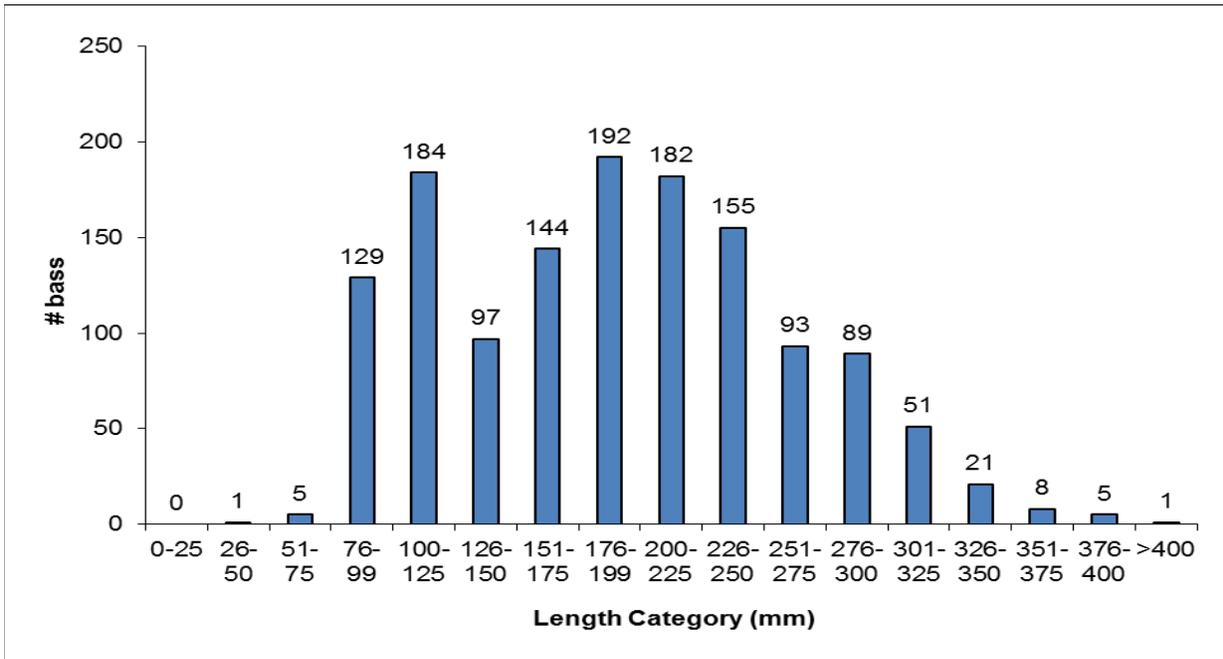


Figure 2. Length frequency of smallmouth bass removed from the White River in Colorado, 2014.

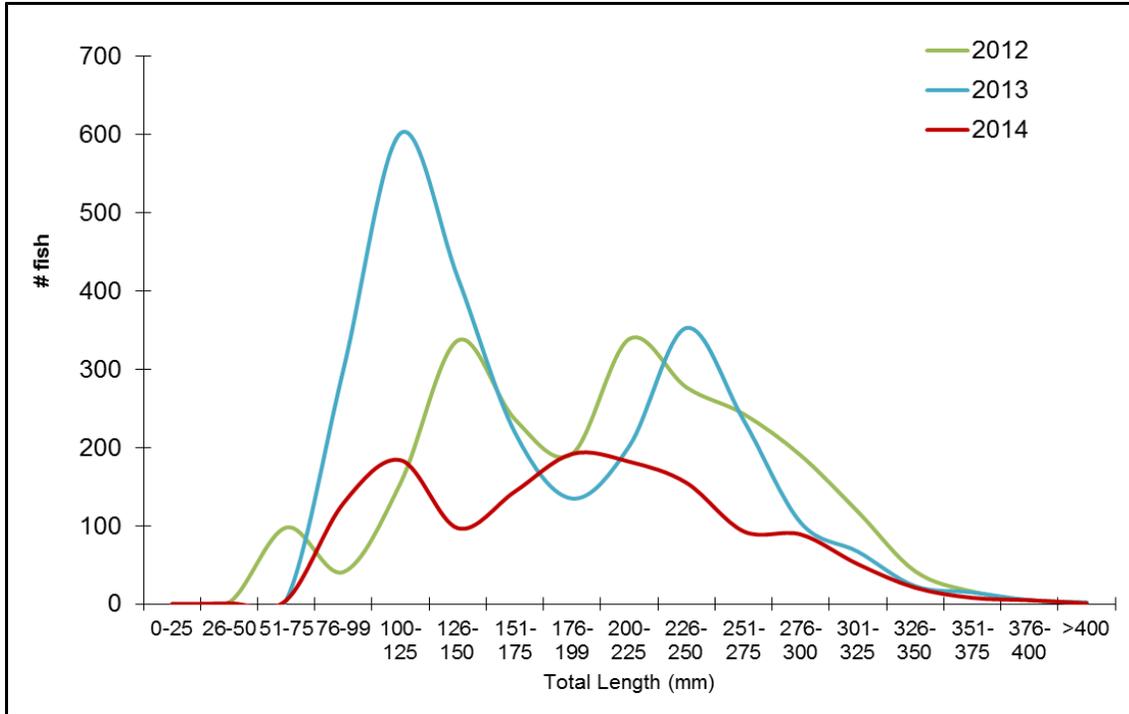


Figure 3. Length frequency of smallmouth bass removed from the White River in Colorado, 2012-2014.

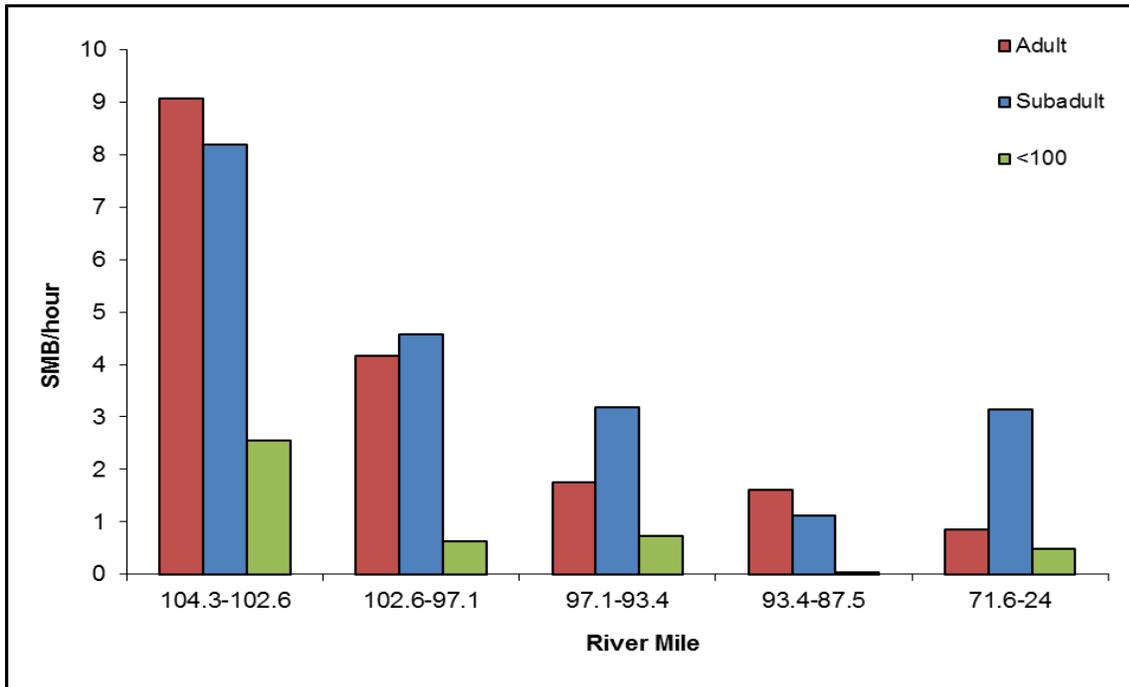


Figure 4. Catch rates for different size classes of smallmouth bass, by river reach, 2014.

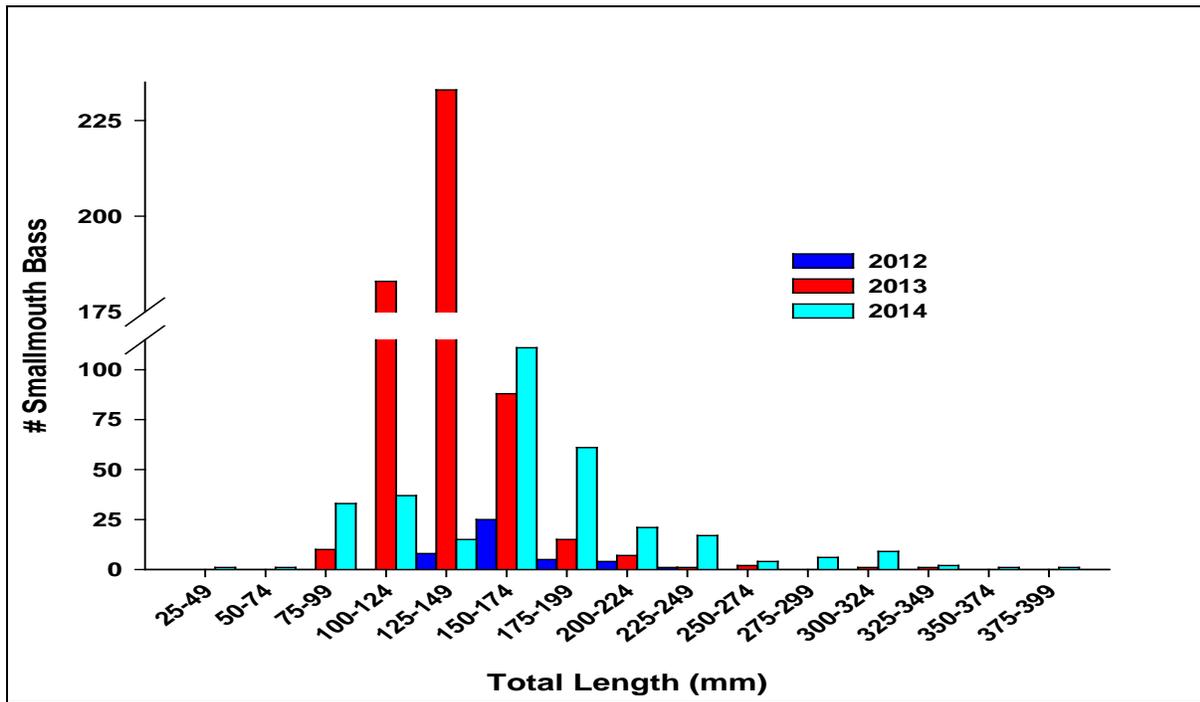


Figure 5. Length-frequency distribution of smallmouth bass collected in the Utah portion of the White River. Three passes of cataraft electrofishing were conducted from RM 66.5–24 in 2012, one pass was conducted from RM 75.8–24.0 in 2013, and two passes were conducted from RM 71.6-24.0 in 2014.

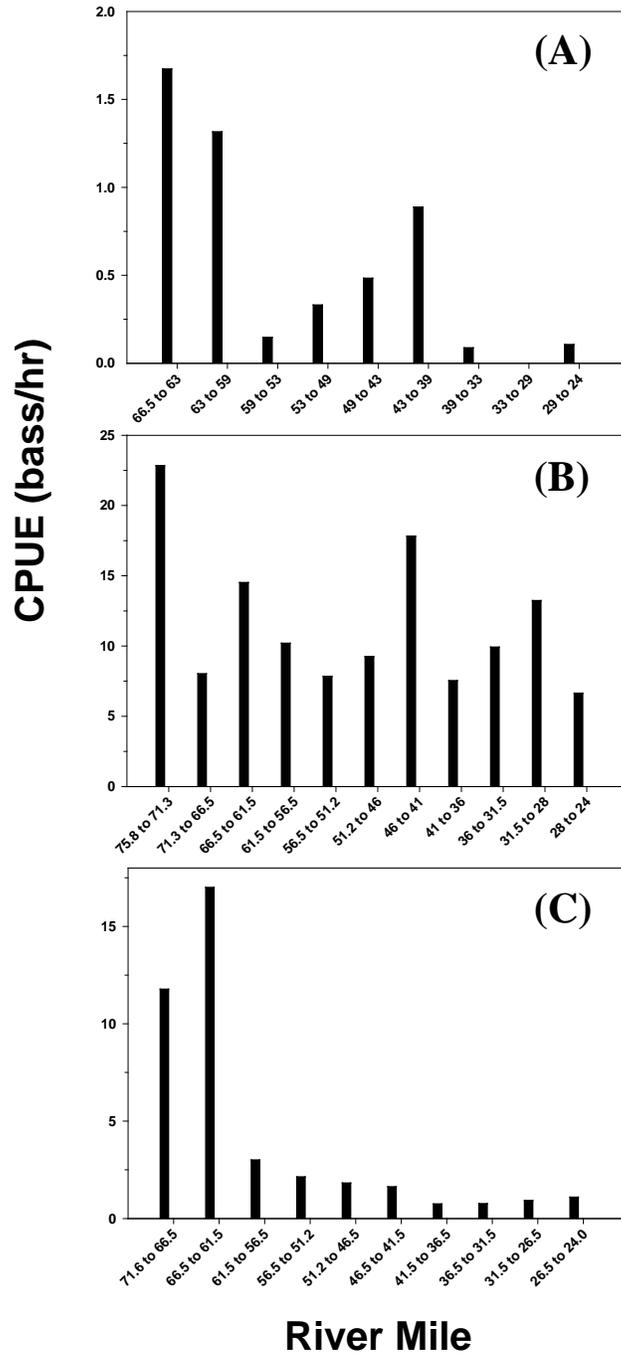


Figure 6. Catch-per-unit-effort (CPUE) of smallmouth bass collected during cataraft electrofishing in the White River from (A) three passes conducted in 2012 from RM 66.5–24, (B) one pass conducted in 2013 from RM 75.8–24, and (C) two passes conducted in 2014 from RM 71.6–24. Note the difference in the Y-axis scale when comparing panels.

## ANNUAL PERFORMANCE PROGRESS REPORT (PPR)

BUREAU OF RECLAMATION AGREEMENT NUMBER: #R14AP00007

UPPER COLORADO RIVER RECOVERY PROGRAM PROJECT NUMBER: 167

Project Title: Smallmouth bass control in the White River

Principal Investigator:

Matthew J. Breen / Robert C. Schelly  
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](mailto:mattbreen@utah.gov)

Project/Grant Period:           Start date (Mo/Day/Yr): 5/1/2014  
  End date: (Mo/Day/Yr): 9/30/2018  
  Reporting period end date (Mo/Day/Yr): 9/30/2014  
  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 two passes of cataraft electrofishing from RM 71.6–24.0 and determined that bass densities in the lower White River have decreased from initial range expansion of the strong 2012 cohort. However, a greater abundance of adult bass will continue to pose a challenge. We removed a total of 320 smallmouth bass, 19% of which were adults. Annual reporting is complete under task 3 and nonnative data will be submitted to Recovery Program personnel before the Nonnative Workshop in December 2014.

**ANNUAL PERFORMANCE PROGRESS REPORT (PPR)**

BUREAU OF RECLAMATION AGREEMENT NUMBER: # R13PG40020

UPPER COLORADO RIVER RECOVERY PROGRAM PROJECT NUMBER: 167

Project Title: Smallmouth bass control in the White River

Principal Investigator:

Aaron Webber/Tildon Jones  
U.S. Fish & Wildlife Service  
1380 S 2350 W  
Vernal, Utah 84078  
Phone: 435-789-0351  
E-mail: tildon\_jones@fws.gov

Project/Grant Period:           Start date: 10/01/2014  
  End date: 09/30/2015  
  Reporting period end date (Mo/Day/Yr): 9/30/2014  
  Is this the final report? Yes \_\_\_\_\_ No   X  

Performance: USFWS completed tasks 1 and 3 under this scope of work. We conducted eight days of electrofishing in order to remove smallmouth bass from the White River downstream of Taylor Draw Dam (task 1). This report fulfills task 3, data analysis and reporting.