

COLORADO RIVER RECOVERY PROGRAM
FY 2015 ANNUAL PROJECT REPORT

RECOVERY PROGRAM
PROJECT NUMBER: 123a

I. Project Title: Nonnative fish control in the Green River

II. Bureau of Reclamation Agreement Number(s):

USFWS Vernal: R13PG40020

UDWR Moab: R14AP00007

Project/Grant Period:

Start Date: 05/01/2014

End Date: 09/30/2018

Reporting period end date: 10/31/2015

Is this a final report? Yes No

III. Principal Investigator(s):

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IV. Abstract:

This project consisted of three components: **a)** remove smallmouth bass on the Green River in Dinosaur National Monument between Echo Park and Split Mtn. (RM 344.5-319.5) **b)** remove smallmouth bass in Desolation/Gray Canyons (Green River RM 215.3-129.8) and **c)** remove walleye and other nonnative fishes in the lower Green River from Tusher Diversion to Ruby Ranch (RM 128-97) and in the lower Colorado River between Westwater Ranger Station and Take-Out Beach (RM 127.7-74.2). All components were completed. Combined, the United States Fish and Wildlife Service (USFWS) and the Utah Division of Wildlife Resources (UDWR) completed twelve passes and two targeted sampling passes for spawning bass in the Echo-Split reach, resulting in the removal of 787 smallmouth bass. UDWR also tagged and released smallmouth bass on the first pass in order to estimate abundance in this reach. The Lincoln-Petersen model produced a point estimate of 3,041 bass ≥ 100 mm, or 122 bass/mile. UDWR-Moab completed removal passes in Desolation and Gray Canyons and removed 1626 bass; catch rates were lower than 2014 and bass distribution continued to encompass the entire reach. Seventeen walleye were removed by UDWR during targeted walleye removal on the Green River. Both the number of walleye encountered and catch rates were lower than 2014.

V. Study Schedule: 2004-ongoing

VI. Relationship to RIPRAP:

GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN

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

GREEN RIVER ACTION PLAN: MAINSTEM

- III. Reduce impacts of nonnative fishes and sportfish management activities (nonnative and sportfish management).
- III.A. Reduce negative impacts to endangered fishes from sportfish management activities.
- III.A.4. Develop and implement control programs for nonnative fishes in river reaches occupied by the endangered fishes to identify required levels of control. Each control activity will be evaluated for effectiveness, and then continued as needed.

VII. Accomplishment of FY 2015 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1 & 2: Smallmouth bass removal-Echo Park to Split Mtn.

The two agencies completed twelve full passes, plus two earlier “surge” passes designed to target spawning adults in Island Park once temperatures reached 16°C. On the first pass, UDWR tagged 73 bass (26 adults¹, 47 sub-adults²) with green Floy tags in order to estimate smallmouth bass abundance in this reach. The subsequent eleven passes consisted only of removal, and crews were able to remove 714 bass, including 34 fish <100 mm, 337 sub-adults, and 343 adults (Table 1). None of the fish <100 mm appeared to be young of year from 2015. Out of the 343 adults captured, only five were large enough to be considered piscivores³ posing a competitive threat to Colorado pikeminnow. The size class catches reported above were based on total length at the time of capture.

The catch rate for all bass across passes was 3.15 fish/hour. This is much lower than 2014 and comparable to 2009-2012 (Figure 1). We captured 1.48 adults/h and 1.54 sub-adults/h when using absolute size classes based on a 200 mm threshold for adult size. If corrected for within season growth, the catch rates for adults and sub-adults were 1.08 and 1.85 fish/h, respectively. Catch rates were highest during the first 6 passes and two surge passes, and decreased beginning in late July (Fig. 2). A single pass (pass 11) where rain storms increased turbidity during the pass showed much higher catch rates, double that of the preceding passes.

¹Total length (TL) ≥200mm

² TL=100-199mm

³ TL ≥325mm

Length-frequency histograms show most bass started the season as sub-adults, but had grown into adult size during the last half of the summer (Figs. 3a-b). For all passes combined, 53% of the bass caught were <200 mm and 47% were >200 mm. If the size classes are adjusted for growth during the season based on recaptures (see below), then 66% of bass captured this year were sub-adults at the beginning of sampling. Comparing length-frequency data from 2015 to that of 2010 showed very similar patterns (Fig. 4). Both years were three years after a large year class of bass were spawned (2012 and 2007, respectively), and suggest that as these large cohorts approach adult size, their numbers decrease significantly. Very few piscivore sized bass were captured this year (n=5) compared to previous years.

After tagging 73 bass on the first pass, we were able to recapture a total of 16 fish (11 sub-adults and 5 adults). The tagging and recapture data allowed us to estimate the abundance of bass in this reach (Table 2). The first six passes occurred within a month, so we used data only from those passes in order to generate a Lincoln-Petersen estimate to minimize the possibility of violating the assumption of closure in the reach. The six pass data produced a point estimate of 3,041 bass ≥ 100 mm, or 122 bass/mile. We grouped sub-adult and adult size classes together to increase the number of recaptures, and because many sub-adult fish were in the larger size groups and grew into adult size during the summer (see below). The bass abundance estimates are compared to previous years' in Figure 5. No estimates were conducted in 2011-2014. We also generated preliminary estimates using Program MARK using the Huggins estimator and based on the first six passes. The top models incorporated variable capture probabilities based on size and water temperature. The weighted average estimate derived from all of the models was 3,742 bass ≥ 100 mm (150 bass/mile). Based on this estimate, we were able to remove 18% of the fish ≥ 100 mm. If calculated based on tag returns (% tags recaptured), we removed 22% of the marked bass. Exploitation rates were similar for estimates derived by Lincoln-Petersen (22%) and based on capture rates derived from Program MARK (26%). The consistency in abundance estimates and exploitation rates suggest these estimates are reasonable. Low probabilities of capture and low exploitation rates match field observations, where bass were difficult to catch as the season progressed. During base flows the water became clearer, and fish appeared to move into deeper water. Turbidity caused by flash floods on pass 11 doubled the catch rate compared to other passes late in the summer, suggesting there were more bass available for capture, but they were not readily sampled with electrofishing.

Tagging fish this year also allowed the analysis of movement and growth. Three of the sub-adult fish recaptured grew into the adult size class during the season, as early as pass six. The mean growth rate for all recaptured bass was 0.537 mm/day, with a slightly higher growth rate for sub-adults than adults. Assuming a conservative growth rate of 0.5 mm/day, bass that were 157 mm on the first pass would be in the adult size class by mid-September. Eight fish moved downstream after tagging, one moved upstream, and eight were recaptured in the same reach. One fish had moved downstream into the reach just downstream of Split Mountain.

We also captured five other species of nonnative fish this year (Table 3), including black bullhead, green sunfish, northern pike, walleye, and white sucker and their hybrids. All fourteen walleye were large enough to be classified as piscivores, as well as all five of the northern pike captured.

Island Park “surge”

This was the second year where we attempted to disrupt and remove spawning adult bass by conducting passes in Island Park during water temperatures conducive to spawning. These passes were a collaborative effort between UDWR-Moab, USFWS, and UDWR-Vernal. UDWR-Vernal sampled the reach June 1, 3, 8, 10, and 15 using hard-bottomed boats (details reported in 123b annual report). USFWS sampled the reach June 5 and 12 as an extension of Yampa Canyon smallmouth bass removal passes. UDWR-Moab started work in that reach as part of the typical sampling, June 16-22. The combined passes just for this reach yielded 103 adults with a catch rate of 4.6 adults/h, three times that of the rest of the season.

Task 3: Smallmouth bass removal- Desolation and Gray Canyons

Two removal passes were completed by UDWR-Moab (5/19-5/25/2015, 6/1-6/8/2015). There were 286 smallmouth bass removed during 115 hours of electrofishing by UDWR Moab (Table 4). Of the bass captured, <1% were young-of-year (<100 mm), 56% were sub-adults (100 mm to ≤199 mm), and 44% were adults (>199 mm); 15% percent (n=17) were over 325 mm and are considered piscivorous, posing a competitive threat to adult Colorado pikeminnow. Smallmouth bass capture rates were higher (3.0 f/h) during the first pass when discharge was between 12,000-15,400 (USGS gauge Jensen, UT) cubic feet per second (CFS) and water temperatures ranged between 13-15.2°C; almost 70% of bass captured were encountered during the first pass. During the second pass when discharge ranged between 9,780-11,400 CFS and water temperatures ranged between 17.4-20.9°C catch rates were 1.6 fish per hour.

Smallmouth bass catch rates declined in 2015 compared with record highs recorded in 2014 in Desolation and Gray canyons. Overall catch rates decreased by approximately 85% from 16.22 fish per hour to 2.28 fish per hour in 2015, resulting in the lowest catch rates on record in this reach (Fig. 6). Adult catch rates declined from 3.7 in 2014 to 2.0 bass per hour in 2015. Sub-adult catch rates also declined from 13.1 in 2014 to 2.6 bass per hour in 2015. The majority of bass captured in 2015, 75%, ranged in total length between 150-225 mm and had a median total length of 198 mm. These fish are believed to have belonged to the 2012-2013 cohorts that were captured in large numbers in 2014 in this reach; 76% of bass captured in 2014 ranged in total length between 125-200 mm and had a median total length of 165 mm (Fig. 7). The decline in catch rates of bass from the 2012-2013 cohorts is encouraging; continued removal efforts within this reach should prevent large numbers of those cohorts from reaching maturity.

During the first few years of this project (2004-2006) the distribution of smallmouth bass within Desolation and Gray Canyons extended approximately 35 miles downstream from

the put-in at Sand Wash (RM 215.3); smallmouth bass were found in less than half of the roughly 80 mile reach. Smallmouth bass distribution as illustrated by sampling in 2014 and 2015 has extended downstream and encompasses the entire 80 mile reach from Sand Wash to Swasey's boat ramp (RM 131.8; Fig. 8).

In addition to the smallmouth bass in the reach, numerous other nonnative and native species were captured (Table 5). Walleye (n=45) were distributed throughout the reach with the majority captured during the first pass (73%); the number of walleye captured increased slightly from 2014 (n=39). Walleye ranged in total length from 253-595 mm with a median total length of 482 mm. All but two walleye were over 375 mm and are considered piscivorous. Common nonnatives like channel catfish and carp were present throughout the reach but were not netted, however, channel catfish over 400 mm, considered piscivorous and a threat to endangered fishes, were removed (n=2).

All species of endangered fish were encountered, with razorback sucker being the most common, followed by humpback chub, pikeminnow, and bonytail (Table 5).

Task 4: Walleye Removal-Lower Green River

Targeted walleye removal on the Lower Green River was completed during nine days of sampling between 27 March and 12 September 2015 (3/27-3/29/15, 4/7, 4/20, 5/13 and 9/10-9/12/2015). Sampling efforts were focused from Tusher Diversion to Ruby Ranch (RM 128-97). This segment was chosen for targeted removal due to a high frequency of walleye encounters in past years, high value walleye habitat (when compared to downstream segments), and convenient access points. Sampling equipment was determined by water level. Catacraft mounted electrofishing units were used below 6,000 CFS, Jon boats above. Discharge on the Green River, measured by the USGS gauge at Green River, Utah ranged from 11,000 to 2,150 CFS during sampling.

A total of 17 walleye were removed during 64 hours of effort. Catch per unit effort (CPUE) for 2015 was 0.27 fish per hour; catch rates were higher in spring (0.38) than fall (0.05). The number of walleye captured and CPUE were lower in 2015 than in 2014 when 149 walleye were captured and CPUE was 3.2 fish per hour. Catch rates were considerably higher, however, in the two mile segment downstream of Tusher Diversion (RM 128-126; Fig. 9); six walleye were removed within this segment during spring sampling (CPUE=1.5 fish per hour). The median total length of walleye encountered was 460 mm and ranged from 408-505 mm. Length frequency distribution for 2015 was similar to that of 2014; however the length interval in 2015 was narrower, with fewer smaller walleye encountered (Fig. 10). All walleye captured were considered piscivorous (total length >375 mm). Twenty four percent of walleye captured during spring sampling were ripe males, no gravid females were encountered.

Other nonnative fishes encountered and removed during sampling include green sunfish (n=10) and smallmouth bass (n=1). Native fishes encountered were scanned for PIT tags, weighed, measured and released and include bonytail (n=51), Colorado pikeminnow (n=8) and razorback sucker (n=275) (Table 6).

VIII. Additional noteworthy observations:

Echo-Split Reach

Bonytail were stocked into this reach in August, and we waited three weeks before handling any of these fish encountered. Starting on pass 11, we captured and processed all bonytail. We were able to recapture 28 bonytail from this year's stocking.

We also captured three razorback sucker in the reach this year. One of these fish was stocked in 2009 at the Split Mtn. boat ramp. It was then recaptured in 2012 and 2013, in lower Desolation Canyon. It was recaptured this year in Island Park in July. Another of the razorbacks was also stocked at Split Mtn. in 2009, recaptured near Jensen in 2012, and recaptured in Island Park this year in September.

Desolation and Gray Canyons

During this project humpback chub captures were high compared to previous years (n=32); of the 32 captured chub only 4 were recaptures. Humpback chub ranged in total length from 184-375 mm with a median total length of 260 mm. Juvenile humpback chub (<200 mm) have been difficult to document in Desolation and Gray canyons during fall sampling trips; however during the summer/spring bass removal electrofishing effort 9% of the chub caught were juveniles.

IX. Recommendations:

Echo-Split Reach

- Continue smallmouth bass removal at current levels.
- Continue multi-agency "surge" effort to target spawning bass in Island Park. The surge effort yielded much higher catch rates and removed a significant number of adults relative to passes later in the summer.
- Continue marking smallmouth bass. Although abundance estimates yielded imprecise estimates of the bass population, it did allow some comparison to previous years. With only one marking pass devoted to tagging fish, this project has several consecutive passes where removal can be accomplished, and we are not constrained by flows in this reach.

Desolation and Gray Canyons

- Continue targeted removal of smallmouth bass and other predatory fishes in Desolation/Gray Canyons by UDWR-Moab in spring when water temperatures are 16°C±2°C and discharge is favorable. Monitoring and removal of invasive predatory fishes in this reach may delay a downstream distribution shift into the lower Green River which is considered critical endangered species spawning and rearing habitat.

Lower Green River

- Continue walleye removal as a component of Project 128: Abundance estimates

for Colorado pikeminnow in the Green River. Additional effort should be applied between Tusher Diversion and Green River State Park (RM 128-120) as this segment is not currently sampled under project 128a. Removal should be conducted in early spring (as early as flows allow) through mid May. Due to low walleye catch rates achieved during fall sampling in both 2014 and 2015 we recommend reducing fall removal work.

- The contribution of Lake Powell to the fluvial walleye populations in the upper basin should be investigated.

X. Project Status:

Tasks 1-4: on track and on-going.

Task 5: on track and on-going. progress and results reported under Project #126b.

XI. FY 2015 Budget Status

A. Funds Provided: \$217,600

B. Funds Expended: \$217,600

C. Difference: -0-

D. Percent of the FY 2015 work completed: 100%

E. Recovery Program funds spent for publication charges: -0-

XII. Status of Data Submission:

USFWS-data are compiled and will be submitted to database manager by December 2015.

XIII. Signed:

M. Tildon Jones, Chris Michaud, Julie Howard

Principal Investigator

13 Nov. 2015

Date

Table 1. Total bass caught in Echo-Split reach by pass and size group, 2015. Piscivores are adult fish above the 325mm threshold. Adults and sub-adults were tagged and released on pass 1.

| Pass | <100mm | Sub-adults | Adults | Piscivores | Total |
|------------------------|--------|------------|--------|------------|-------|
| Surge-FWS, June 5 & 12 | | 3 | 4 | 1 | 7 |
| 1-UDWR, 16-19 June | 3 | 47 | 26 | | 76 |
| 2-UDWR, 19-22 June | 7 | 48 | 21 | 1 | 76 |
| 3-UDWR, 1-4 July | 8 | 62 | 42 | 1 | 112 |
| 4-UDWR, 4-7 July | 12 | 57 | 39 | | 108 |
| 5-FWS, 8-10 July | 1 | 37 | 33 | | 71 |
| 6-FWS, 14-16 July | 1 | 41 | 39 | | 81 |
| 7-FWS, 29-31 July | 1 | 25 | 24 | | 50 |
| 8-FWS, 11-13 August | | 15 | 24 | | 39 |
| 9-FWS, 18-20 August | | 17 | 26 | 1 | 43 |
| 10-FWS, 25-27 August | | 9 | 23 | | 32 |
| 11-FWS, 1-3 Sept. | 1 | 21 | 54 | 1 | 76 |
| 12-FWS, 9-11 Sept. | | 2 | 14 | | 16 |
| Totals | 34 | 384 | 369 | 5 | 787 |

Table 2. Abundance estimates for smallmouth bass, 2015.

| Size class | Method | Abundance | 95% CI | SE | Fish/mile |
|-----------------------|------------------|-----------|-------------|-------|-----------|
| Sub-adult | Lincoln-Petersen | 1,344 | 612-2,076 | 366 | 53.8 |
| Adult | Lincoln-Petersen | 1,530 | 384-2,676 | 573 | 61.2 |
| All bass \geq 100mm | Lincoln-Petersen | 3,041 | 1,230-4,853 | 906 | 121.7 |
| All bass \geq 100mm | Program MARK | 3,742 | 1,442-6,042 | 1,150 | 149.7 |

Table 3. Ancillary fish captures in the Echo-Split study reach, 2015. Piscivores are northern pike >450mm and walleye >375mm.

| Species | Number Captured | Piscivores |
|--|-----------------|------------|
| Black bullhead (<i>Ameiurus melas</i>) | 3 | |
| Green sunfish (<i>Lepomis cyanellus</i>) | 94 | |
| White sucker and hybrids (<i>Catostomus commersonii</i>) | 139 | |
| Northern pike (<i>Esox lucius</i>) | 5 | 5 |
| Walleye (<i>Sander vitreus</i>) | 14 | 14 |
| Colorado pikeminnow (<i>Ptychocheilus lucius</i>) | 16 | |
| Bonytail (<i>Gila elegans</i>) | 28 | |
| Roundtail chub (<i>Gila robusta</i>) | 3 | |
| Razorback sucker (<i>Xyrauchen texanus</i>) | 3 | |

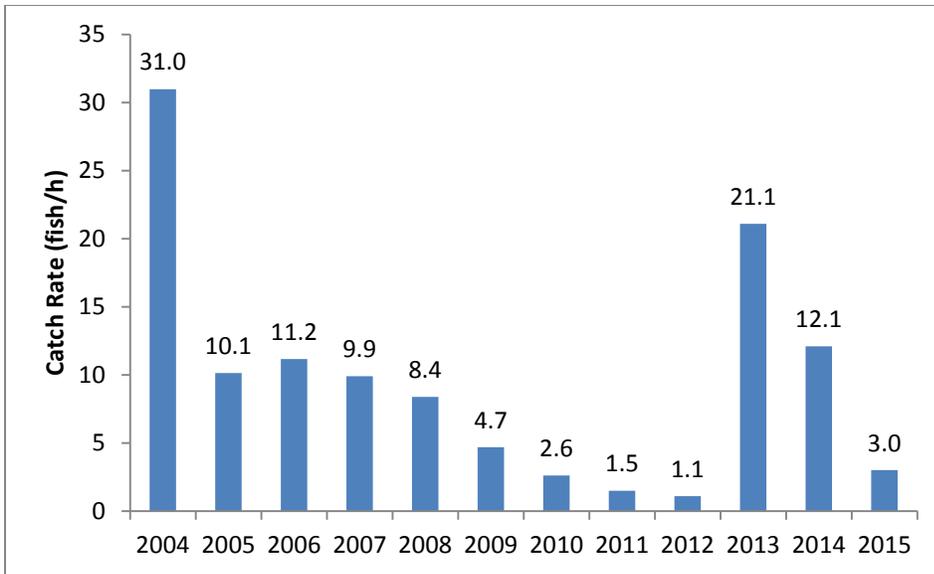


Figure 1. Catch rates for all bass ≥ 100 mm in the Echo-Split reach, 2004-2015.

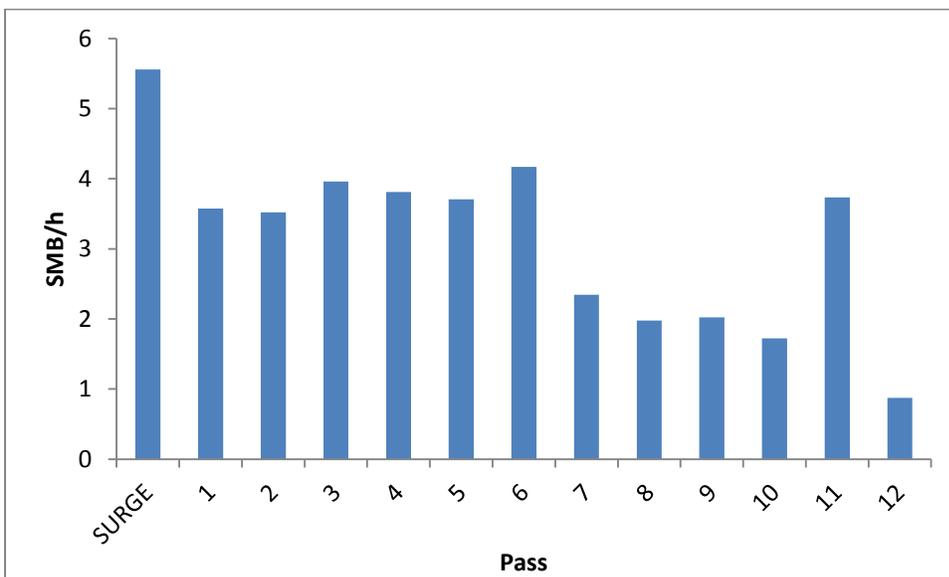


Figure 2. Catch rates by pass for all bass ≥ 100 mm, Echo-Split reach.

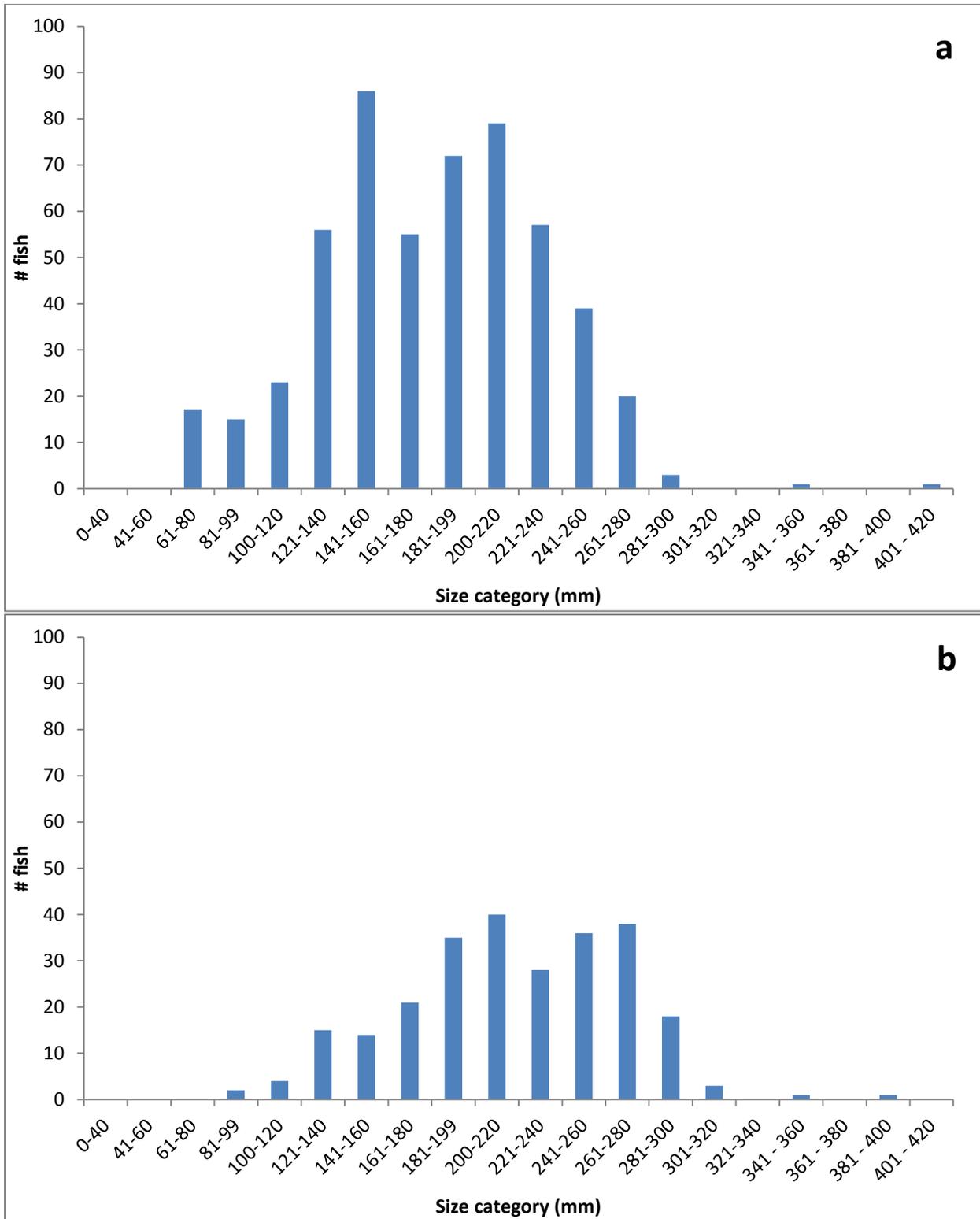


Figure 3a-b. Length-frequency histograms for smallmouth bass captured in passes 1-6 (a) and passes 7-12 (b), Echo-Split reach 2015.

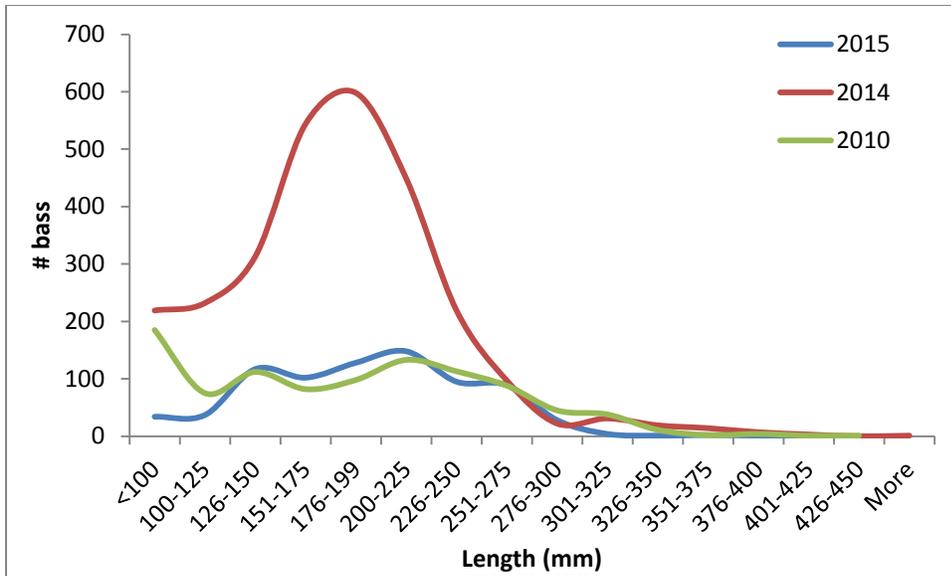


Figure 4. Length-frequency of smallmouth bass in Echo-Split for 2010 and 2014-2015.

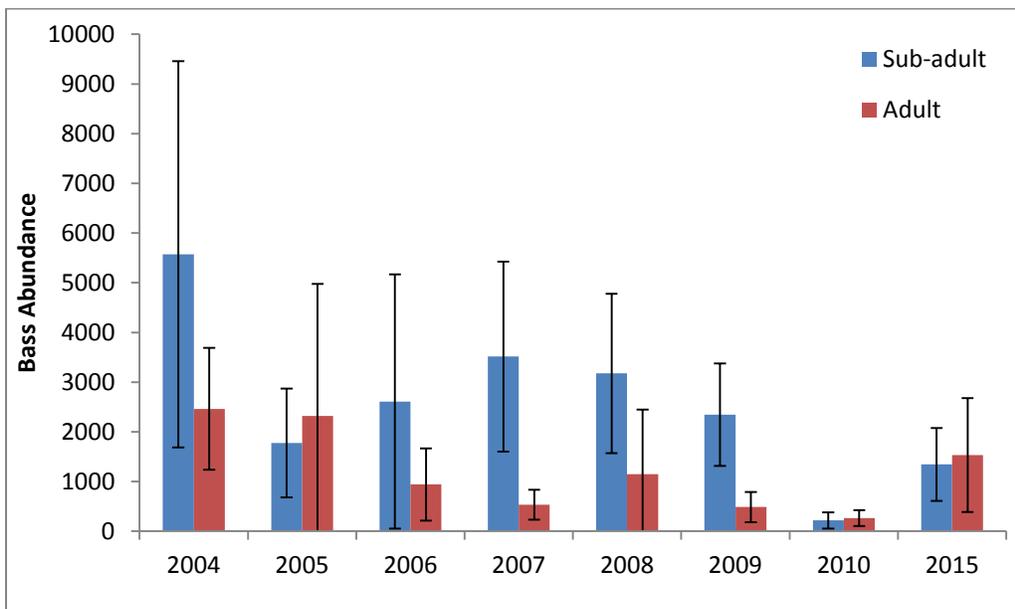


Figure 5. Abundance estimates with 95% confidence intervals for smallmouth bass sub-adults and adults in the Echo-Split reach, 2004-2010 and 2015.

Table 4. Total smallmouth bass captured by pass and size class in Desolation/Gray Canyons, 2015. *no total length or weights were collected for these fish.

| Pass | <100mm | Subadults | Adults | Total |
|--------------|--------|-----------|---------|---------|
| 1-UDWR Moab | 0 | 100 | 74(10) | 174+22* |
| 2- UDWR Moab | 1 | 47 | 42(7) | 90 |
| Totals | 1 | 147 | 116(17) | 264+22* |

Table 5. Ancillary species encountered in Desolation/Gray Canyons 2015.

| Species | Number Captured (piscivores) | CPUE (fish/hr) |
|---|------------------------------|----------------|
| Green sunfish (<i>Lepomis cyanellus</i>) | 8 | 0.07 |
| Walleye (<i>Sander vitreus</i>) | 45(43) | 0.39 |
| Black crappie (<i>Pomoxis nigromaculatus</i>) | 13 | 0.11 |
| Black bullhead (<i>Ameiurus melas</i>) | 1 | 0.01 |
| Northern pike (<i>Esox lucius</i>) | 1(1) | 0.01 |
| Colorado pikeminnow (<i>Ptychocheilus lucius</i>) | 17 | 0.15 |
| Razorback sucker (<i>Xyrauchen texanus</i>) | 230 | 2 |
| Flannelmouth x Razorback sucker hybrid | 1 | 0.01 |
| Bonytail (<i>Gila elegans</i>) | 2 | 0.02 |
| Humpback chub (<i>Gila cypha</i>) | 32 | 0.28 |

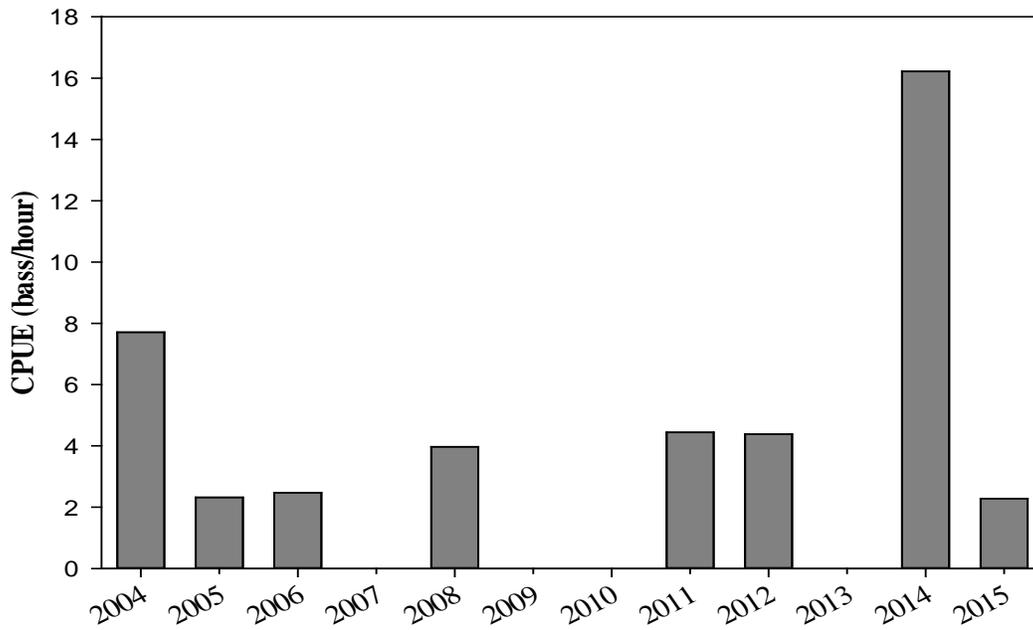


Figure 6. Smallmouth bass (sub-adult and adult) annual catch rate in Desolation/Gray Canyons, 2004-2015.

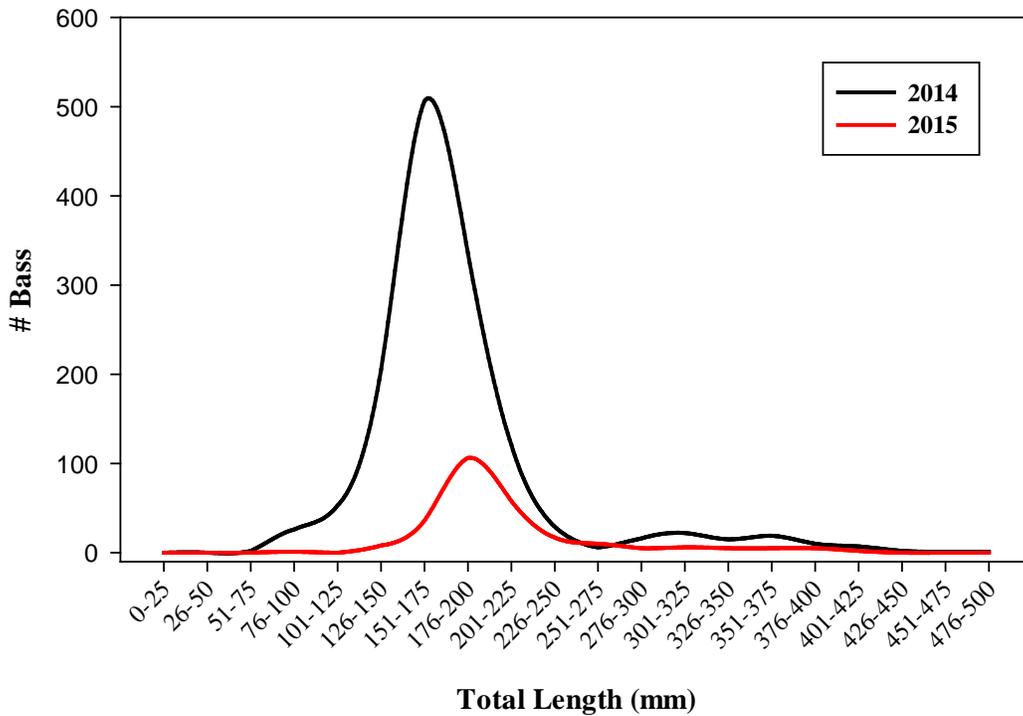


Figure 7. Smallmouth bass length frequency distribution in Desolation/Gray Canyons, 2014-2015.

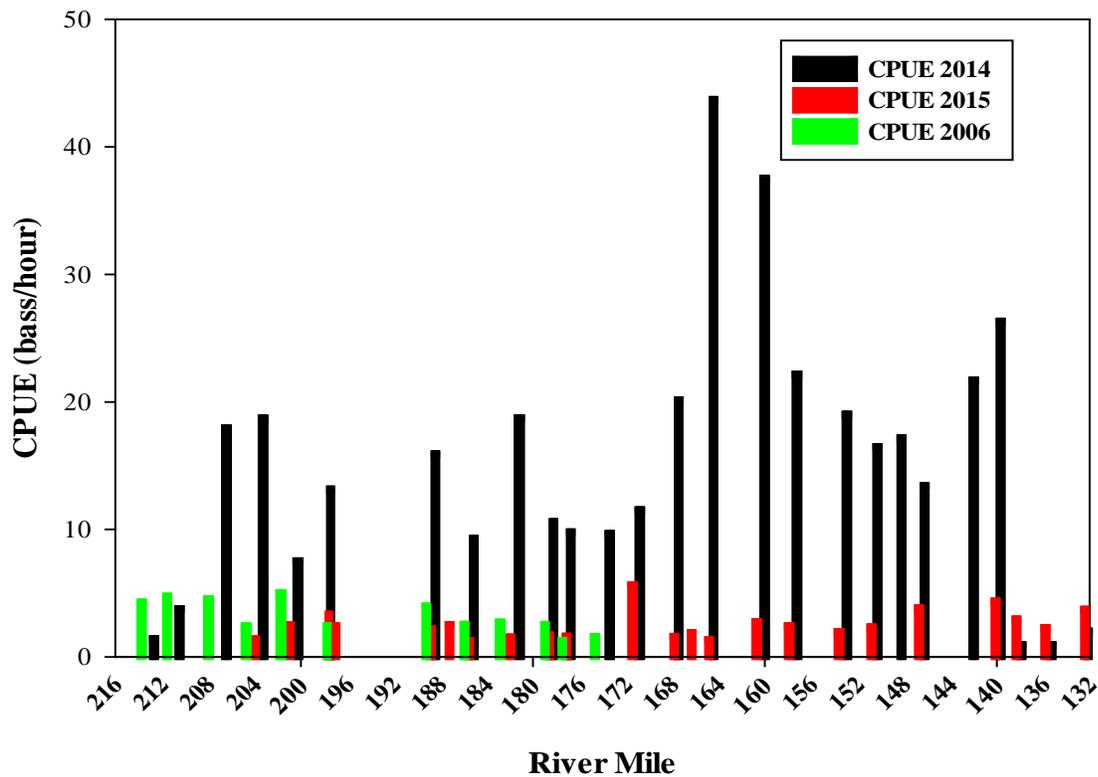


Figure 8. Smallmouth bass catch per unit effort (CPUE) by river mile in Desolation/Gray Canyons, 2006, 2014-2015.

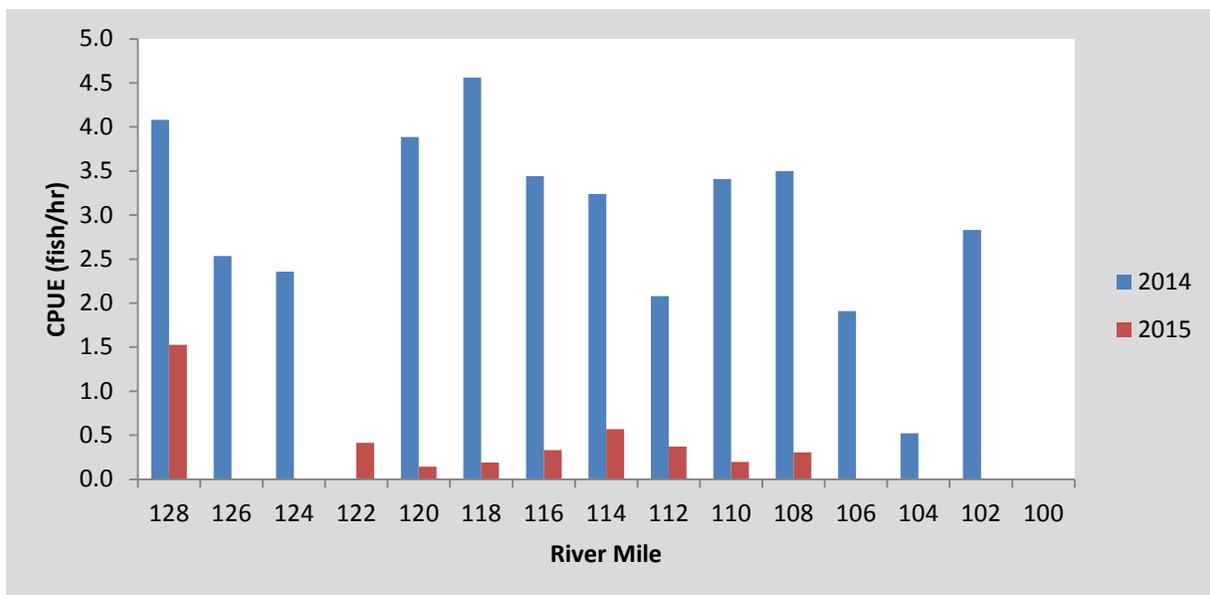


Figure 9. Walleye catch per unit effort by river mile on the lower Green River (RM 128-97), 2014 and 2015.

Table 6. Ancillary fish captures for electrofishing passes on the lower Green River (RM 128-97), 2015.

| Species | Number Captured | CPUE (fish/hr) | Median Total Length (mm) | Range (mm) |
|---|-----------------|----------------|--------------------------|------------|
| Green sunfish (<i>Lepomis cyanellus</i>) | 10 | 0.16 | | |
| Smallmouth bass (<i>Micropterus dolomieu</i>) | 1 | 0.02 | | |
| Colorado pikeminnow (<i>Ptychocheilus lucius</i>) | 8 | 0.13 | 335 | 140-535 |
| Razorback sucker (<i>Xyrauchen texanus</i>) | 275 | 4.32 | 408 | 318-535 |
| Bonytail (<i>Gila elegans</i>) | 51 | 0.8 | 291 | 217-392 |

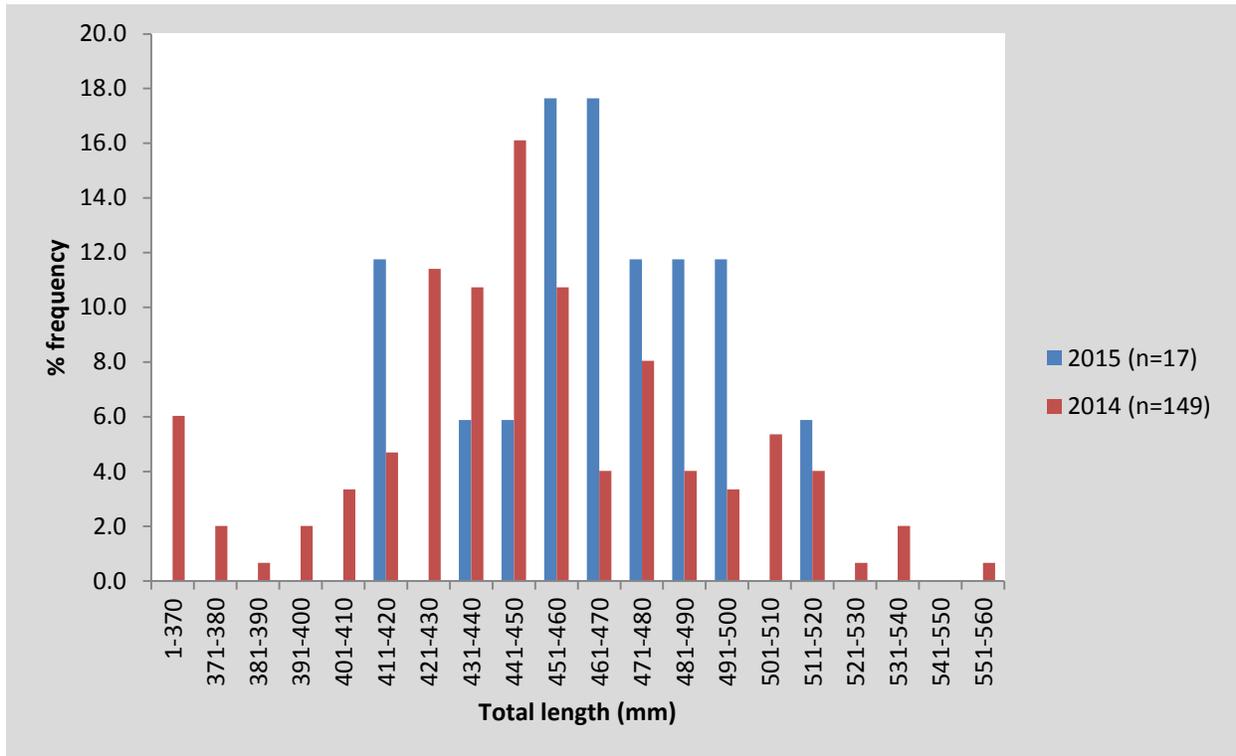


Figure 10. Walleye length frequency distribution on the lower Green River (RM 128-97), 2014 and 2015.

ANNUAL PERFORMANCE PROGRESS REPORT (PPR)

BUREAU OF RECLAMATION AGREEMENT NUMBER: R13PG40020

UPPER COLORADO RIVER RECOVERY PROGRAM PROJECT NUMBER: 123a

Project Title: Smallmouth bass control in the Green River

Principal Investigator: M. Tildon Jones
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Project/Grant Period: Start date: 10/01/2013
End date: 09/30/2015
Reporting period end date: 09/30/2015
Is this the final report? Yes X No _____

Performance:

Task 1, eight removal passes, was completed between 8 July and 11 September. We removed all smallmouth bass encountered during these passes, as well as five other nonnative species or hybrids. We were also able to document endangered and native fish species that were encountered during these passes. With the submission of this report, Task 6 is complete. There is no outstanding work remaining for which USFWS is responsible.

ANNUAL PERFORMANCE PROGRESS REPORT (PPR)

BUREAU OF RECLAMATION AGREEMENT NUMBER: R14AP00007

UPPER COLORADO RIVER RECOVERY PROGRAM PROJECT NUMBER: 123a

Project Title: Smallmouth bass control in the Green River

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435-259-3781/435-259-3784

Project/Grant Period: Start date: 05/01/2014
 End date: 09/30/2018
 Reporting period end date: 10/30/2015
 Is this the final report? Yes _____ No X

Performance:

Task 2 was completed: *Four removal passes were successfully completed (6/16-6/19/15, 6/19-6/22/15, 7/1-7/4/15, 7/4-7/7/15) on the Green River from Echo Park (RM 344.5) to Split Mountain (RM 319.5). A total of 374 smallmouth bass were removed with total lengths ranging from 62 mm to 402 mm with a median total length of 179 mm. Of the bass captured 8% were YOY (<100 mm), 57% were sub-adults (100 mm to ≤199 mm), and 35% were adults (>199 mm) where <1% (n=2) were over 325 mm and considered piscivorous occupying the same trophic level as adult Colorado pikeminnow. A total of 60 white sucker were removed with total lengths ranging from 68-355 mm with a median total length of 158 mm. These data were reported to the PI in September of 2015. These data were analyzed and reported within the annual report for project #123a by November of 2015 (task 6 was completed).*

Task 3 was completed: *Two removal passes were successfully completed (5/19-5/25/2015, 6/1-6/8/2015) in Desolation and Gray Canyons on the Green River from Sand Wash boat ramp (RM 215.3) to Swasey's boat ramp (RM 129.8). Approximately 286 smallmouth bass were removed with total lengths ranging from 85 mm to 415 mm with a median total length of 196 mm. Of the bass captured, <1% were YOY (<100mm), 56% were sub-adults (100 mm to ≤199 mm), and 44% were adults (>199 mm) where 15% (n=17) were over 325 mm and considered piscivorous, occupying the same trophic level as adult Colorado pikeminnow. A total of 45 walleye were captured ranging in total length from 253 mm to 595 mm with a median total length of 482 mm. A total of 230 razorback sucker were captured ranging in total length from 235 mm-570 mm with a median total length of 425 mm. A total of 32 humpback chub were captured ranging in total length from 184 mm-375 mm with a median total length of 260 mm. A total of 17 Colorado pikeminnow were captured ranging in total length from 207 mm to 734 mm with a median total length of 470 mm. These data were analyzed and reported within the annual report for project #123a by November of 2014 (task 6 was completed).*

Task 4 was completed: *Nine removal days were completed on the lower Green River between Tusher Diversion and Ruby ranch (RM 128-97) (3/27-3/29/15, 4/7, 4/20, 5/13 and 9/10-*

9/12/2015). Seventeen walleye were removed over 64 hours of effort yielding a catch rate of 0.27 fish per hour. All walleye encountered had total lengths greater than 375 mm, the length at which this species is considered piscivorous and a threat to endangered fishes. Walleye median total length was 460 mm with lengths ranging from 408 mm to 505 mm. Three species of endangered fishes were encountered during sampling, Colorado pikeminnow ($n=8$) with lengths ranging from 140 mm to 535 mm (median total length=335 mm), razorback sucker ($n=275$) with lengths ranging from 318 mm to 535 mm (median total length=408 mm) and bonytail ($n=51$) with lengths ranging from 217 mm to 392 mm (median total length=291). These data were analyzed and reported within the annual report for project #123a by November of 2015 (task 6 was completed).

Task 5 was completed: Seven removal days (10/6-10/8/2015 and 10/13-10/16/2015) were completed on the lower Colorado River between Westwater Ranger Station and Take-Out Beach (RM 127.7-74.2). One walleye was encountered and removed (573 mm total length) during 45 hours of electrofishing effort (CPUE=0.02 fish per hour). Humpback chub ($n=10$, median total length=277.5, range=199-373), razorback sucker ($n=4$, median total length=457, range=436-457), bonytail ($n=1$, total length=320) and Colorado pikeminnow ($n=1$, total length=495) were also encountered. These data were analyzed and reported within the annual report for project 126b by November of 2015 (task 6 was completed).