

I. Project Title: **Smallmouth bass control in the lower Yampa River**

II. Bureau of Reclamation Agreement Number: R15PG00083
Project/Grant Period: Start date: 10/01/2014 End date: 09/30/2019
Reporting period end date: 09/30/2016
Is this the final report? Yes ___ No X

III. Principal Investigator:
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IV. Abstract:

USFWS completed three smallmouth bass removal passes in the lower Yampa River in 2016, removing 829 smallmouth bass. The majority of bass (66%) captured this year were adults over 200mm in length. Length frequency data for 2016 showed a unimodal distribution centered around the 200-225 mm group, representing fish spawned in 2012 and 2013. Catch rates were similar to 2015. Monitoring passes for overall fish community composition were also completed, and native suckers again were the most abundant species, as has been the case since these monitoring reaches were initiated.

V. Study Schedule: 2004-ongoing

VI. Relationship to RIPRAP:

Green River Action Plan: Yampa River
III.B.2 Control nonnative fishes via mechanical removal
III.B.2.a. Estimate nonnative abundance, status, trends, and distribution
III.B.2.e. Remove smallmouth bass
III.B.2.f(2) Remove channel catfish >400mm in Yampa Canyon
III.B.2.h. Monitor native and endangered fish response

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

Nonnative Fish Removal

We completed three electrofishing passes in the lower Yampa River between June 21 and July 15, 2016. During this time, flows ranged from 6,400 cfs to 715 cfs, and mean water temperatures increased from 18.9°C to 21.75°C. Mean water temperatures exceeded 16°C starting June 17, and we were able to conduct all removal passes after the river reached this temperature threshold when spawning is more likely to commence. We noted an increase in the numbers of ripe bass beginning pass 2 (June 28) and extending into pass 3. We also extended one sampling trip (July 15) through Island Park on the Green River in order to target spawning adult bass¹.

We were able to remove 829 smallmouth bass (SMB), including twenty-three fish

¹ Data from the Island Park passes are presented in the Project 123a report.

<100mm, 257 sub-adults (100-199mm), and 549 adults (\geq 200mm) (Table 1). Of these adults, five were large enough (\geq 325mm) to be classified as piscivores posing a competitive threat to adult Colorado pikeminnow. The total number of piscivore-sized bass was influenced by the small number of passes completed, but catch rates for these larger bass have decreased since 2014 and are the lowest since 2011.

Catch rates for 2016 were very similar to 2015 (Fig. 1). For all passes combined, the catch rate for bass \geq 100mm was 8.62 fish/hour. The total catch rate from this year consisted of 2.75 sub-adults/h and 5.87 adults/h. The catch rate for adult bass increased after the first pass (Fig. 2), as did catch rates for other size classes (not shown).

Length frequency data for 2016 showed a unimodal distribution centered around the 200-225 mm group (Fig. 3). This distribution most likely reflects two large year classes of bass spawned in 2012 and 2013. Using length-frequencies to track these two year classes, it appears most of the fish have grown into adult size, but fewer of them remain compared to 2014 (Fig. 4). This is consistent with observations of a year class produced in 2007, where a large cohort of fish were observed in the reach, but subsequently decreased—or left the reach—as they grew into adult sizes (Jones 2015).

Bass distribution shifted from what has been observed in past years (Fig. 5). First, adult bass had the highest catch rates in all reaches except the most upstream, and these catch rates were relatively similar in most reaches. Second, sub-adult catch rates were highest in the most upstream reaches, and generally declined moving downstream, as has been the case in most years. The catch rates for adults in each reach are similar to those observed in 2014, and comparable or slightly higher than sub-adult catch rates from 2015. This suggests sub-adults from the 2012-2013 year classes moved into the reach in large numbers in 2014, and have survived to maintain adult densities within this section of river this year.

A component of this project is to remove channel catfish >400mm. This is the length at which catfish are believed to transition to a higher level of piscivory, making them a competitive threat to Colorado pikeminnow and a predatory threat to native fishes. We removed 32 channel catfish meeting this size threshold, which is more than last year. The highest number were captured during the last pass, likely due to the low flows at that time.

Sampling for fish community composition

We sampled five, one-mile subreaches during pass 3 (July 12-14) in order to monitor fish community species composition (Fig. 6). As in previous years, native suckers (flannelmouth and bluehead) were the two most abundant species captured (Fig. 7). Other species captured, in decreasing abundance, were channel catfish, roundtail chub, smallmouth bass, common carp, white x flannelmouth hybrids, and one white x bluehead hybrid.

We also collected several other nonnative fish species over the course of the five passes, including black bullhead, northern pike, walleye, and white sucker and white sucker hybrids (Table 2). All eight northern pike and three walleye were large enough to be classified as piscivores. Six of the eight pike were captured in the most downstream

reach. One walleye was captured in reach 3, and we observed, but could not net, at least one walleye as far upstream as Tepee Rapid. Finally, we encountered seventeen Colorado pikeminnow this year. Ten of the pikeminnow were recaptures that already had tags. Nine of the pikeminnow were tuberculated at capture, but these captures ranged across passes.

Roundtail chub monitoring

In order to accommodate the chub sampling this year, along with other components of the project, we split chub sampling into two passes. On pass 1, we collected all the chub encountered in odd numbered reaches, and during pass 2 we sampled the even reaches. We also processed all chub encountered in the monitoring reaches. We were able to capture 96 roundtail chub, consisting of 94 adults and two sub-adults, and tagged 83 of these. We recaptured nine roundtails that were previously tagged. All of these fish were previously encountered in the Yampa River, spanning from 2009 to 2015. Six of these fish were tuberculated and/or ripe, and these fish were found between river miles 25.2 and 34.5. An additional 32 fish captured were tuberculated or ripe. All of the fish in reproductive condition were observed in the last two weeks of June. In general, these fish were between river miles 25-39 and 15-22. We also collected four small chub that were not identified to species.

VIII. Additional noteworthy observations:

We recaptured two adult Colorado pikeminnow that had old frequency PIT tags dating back to 1999 and 2003.

IX. Recommendations:

- Continue nonnative fish removal at current levels, focusing on time period when water temperatures are likely to initiate bass spawning (>16°C).
- Continue to monitor chub. Data collected over the last five years indicate that long term data is needed to assess movement and to allow for recaptures of marked fish. Colorado Parks and Wildlife has stocked bonytail in this reach at Deerlodge Park and Hell's Canyon Ranch (formerly Mantle Ranch) after our sampling season, and monitoring chubs may assist in estimating survival and movement of these fish.

X. Project Status: On track and ongoing

XI. FY 2016 Budget Status

- A. Funds Provided: \$ 100,547
- B. Funds Expended: \$ 100,547
- C. Difference: -0-
- D. Percent of the FY 2016 work completed: 100%
- E. Recovery Program funds spent for publication charges: -0-

XII. Status of Data Submission: Data are compiled and will be submitted to the database manager by December 2016.

XIII. Signed: M. Tilden Jones 11/18/2016
Principal Investigator Date

Literature Cited

Jones, M.T. 2015. Smallmouth bass control in the lower Yampa River. Project #110. Annual report to the Recovery Implementation Program, U.S. Fish and Wildlife Service, Denver, CO.

Table 1. Sampling passes and smallmouth bass captured by size class, 2016.

Pass	Date	<100mm	Sub-adults	Adults	Piscivores
1	21-24 June		27	85	1
2	28 June- 1 July	14	104	226	2
3	12-15 July	9	126	238	2
Total		23	257	549	5

Table 2. Other species captured during removal passes in Yampa Canyon.

Species	Number captured	Piscivores
Northern pike	8	8
White sucker and hybrids	29	
Walleye	3	3
Channel catfish	79	32
Black bullhead	1	
Green sunfish	1	
Creek chub	1	
Colorado pikeminnow	17	
Roundtail chub	97	
Small, unidentified <i>Gila</i>	4	

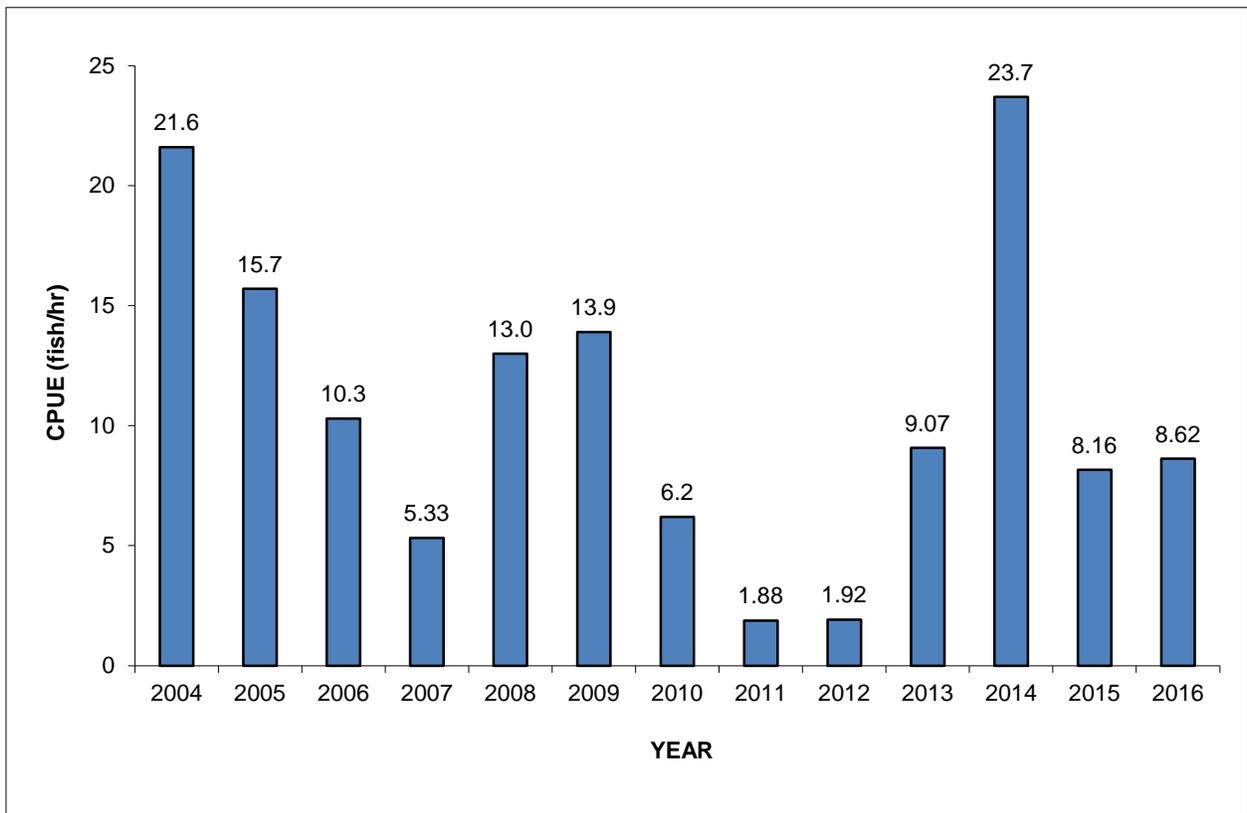


Figure 1. Overall catch rate of smallmouth bass ≥ 100 mm, Yampa Canyon 2004-2016.

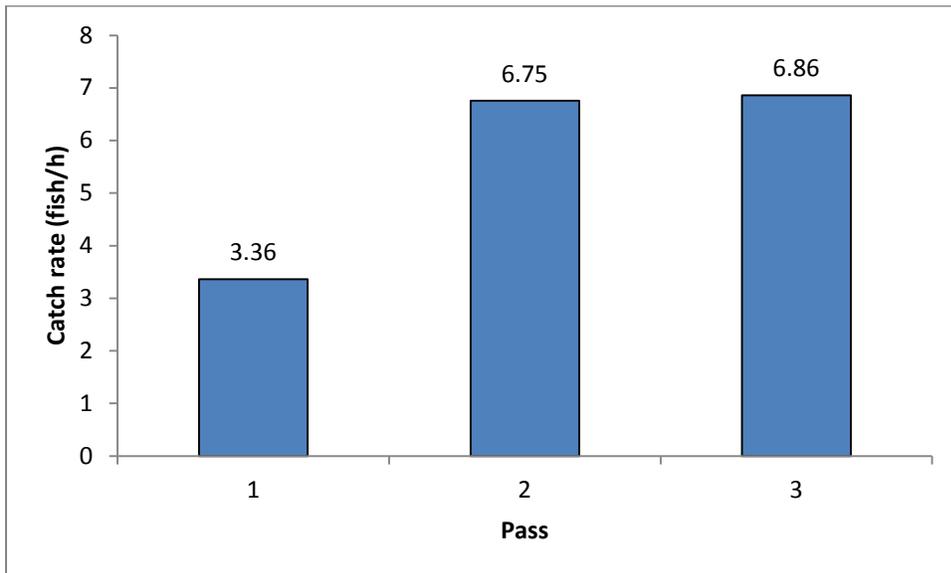


Figure 2. Adult smallmouth bass catch rates by pass, Yampa Canyon 2016.

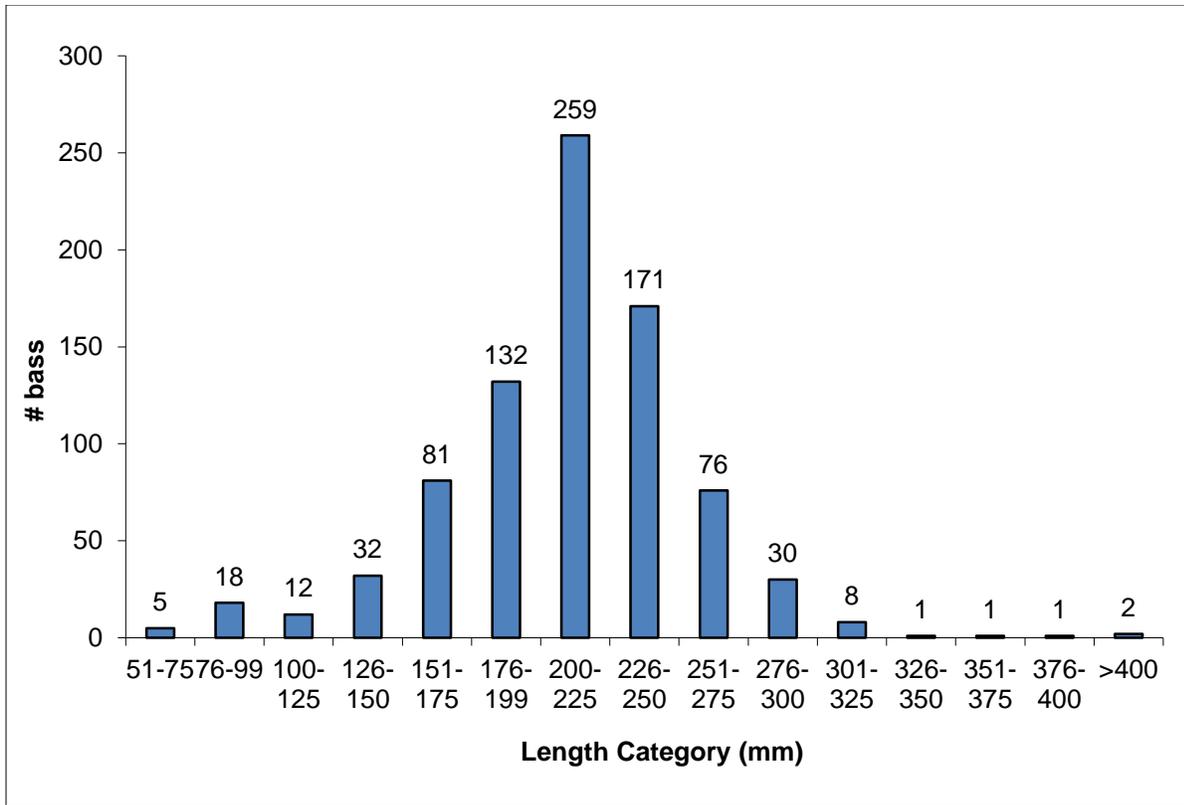


Figure 3. Length frequency histogram for smallmouth bass captured in Yampa Canyon, 2016.

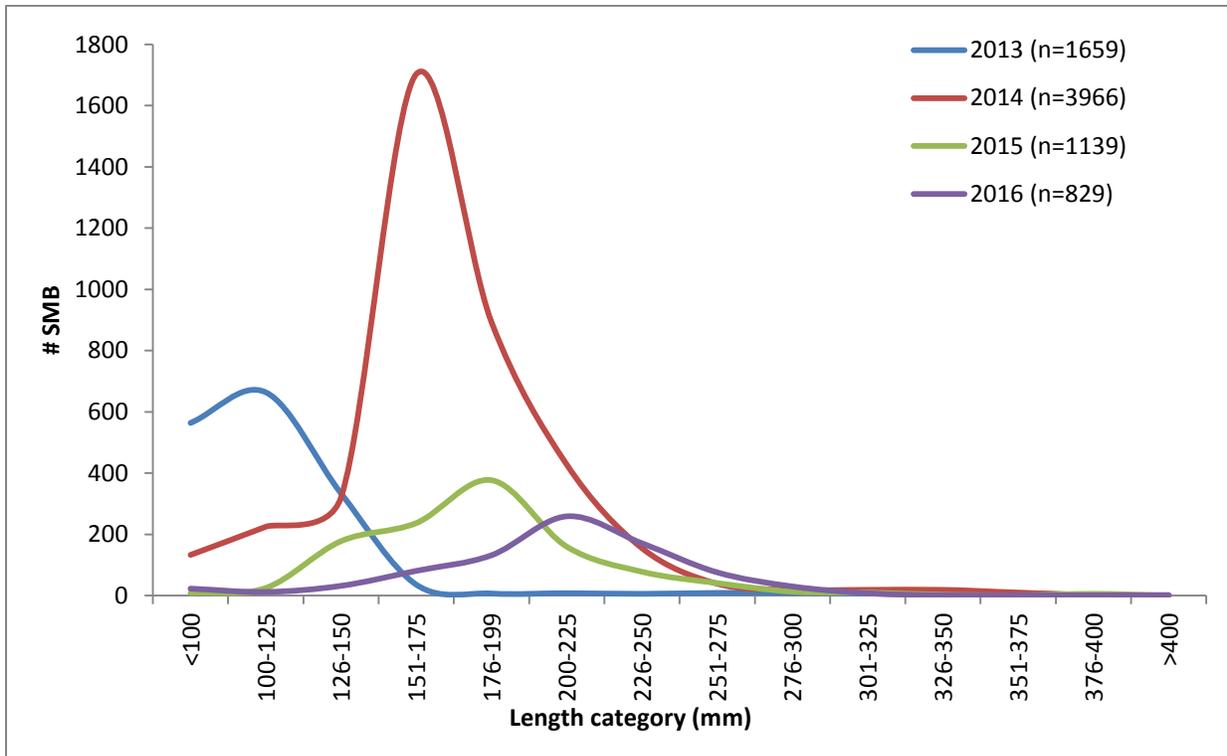


Figure 4. Length-frequencies for smallmouth bass captured in Yampa Canyon in 2013-2016.

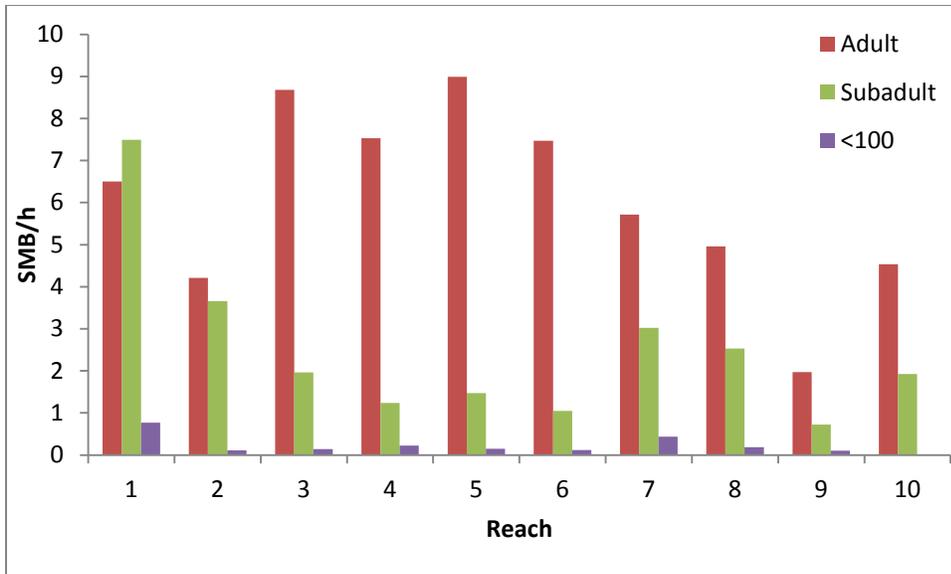


Figure 5. Catch rates of smallmouth bass in Yampa Canyon by reach, 2016.

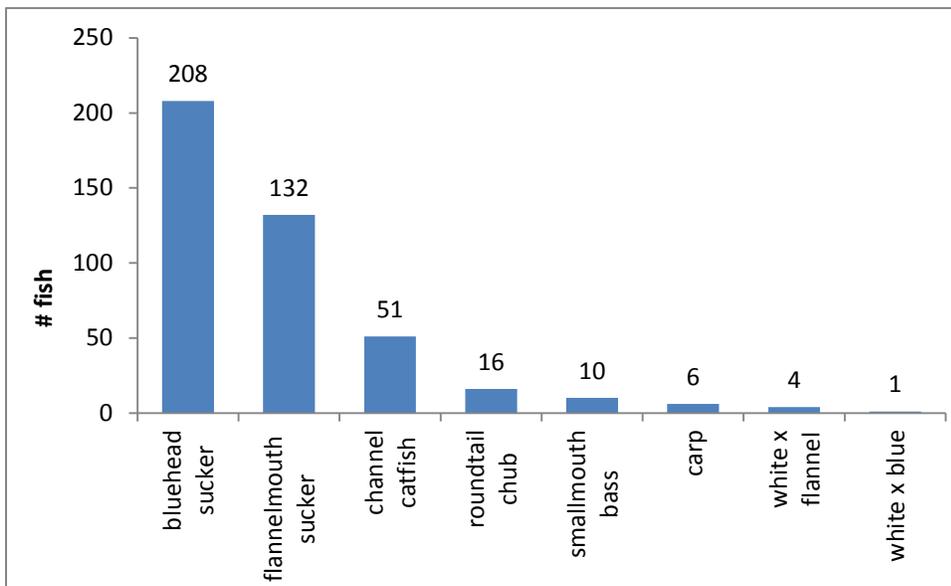


Figure 6. Total species composition for five, 1-mile monitoring reaches in Yampa Canyon, 2016

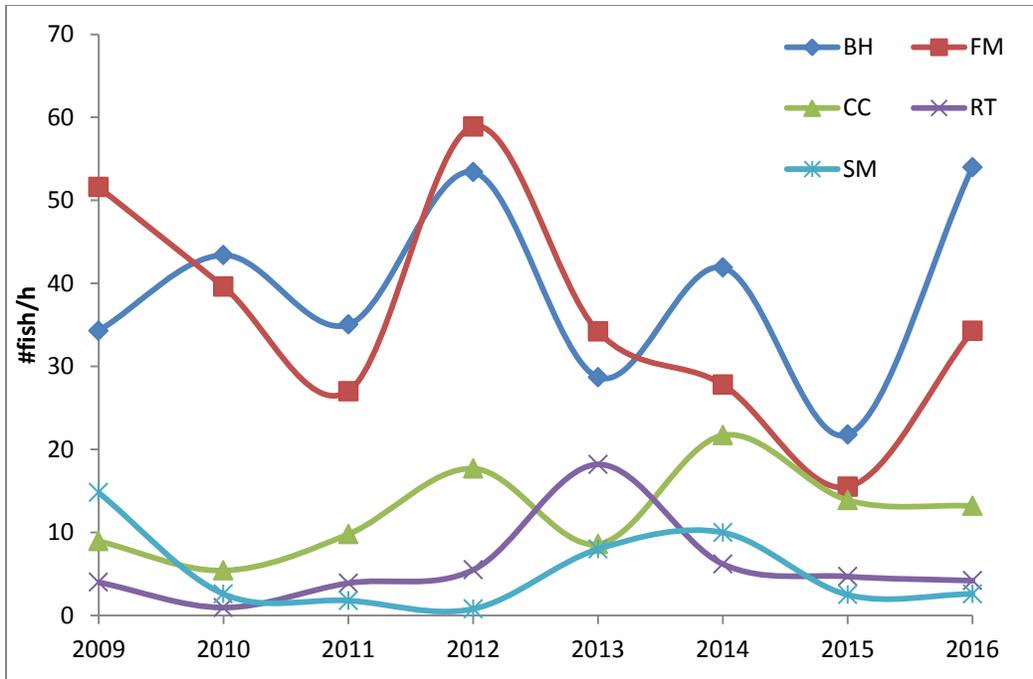


Figure 7. Annual catch rates of five most common species found in 1-mile monitoring reaches in Yampa Canyon, 2009-2016. Species codes are BH (bluehead sucker), FM (flannelmouth sucker), CC (channel catfish), RT (roundtail chub), and SM (smallmouth bass).