

**COLORADO RIVER RECOVERY PROGRAM**  
**FY-2012-2013 PROPOSED SCOPE OF WORK for:**  
(Colorado River smallmouth bass removal)

Project #: 126(a)

Lead Agency: Fish and Wildlife Service  
Colorado River Fishery Project

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Date: 9 March 2011  
Revised: 14 April 2011  
Revised: 18 August 2011

Category:

Source:

- Ongoing project
- Ongoing-revised project
- Requested new project
- Unsolicited proposal

Expected Funding

- Annual funds
- Capital funds
- Other (explain)

- I. Title of Proposal: **Removal of Smallmouth Bass in the Upper Colorado River between Price-Stubb Dam [Government Highline Diversion Dam] near Palisade, Colorado, and Westwater, Utah.**
- II. Relationship to RIPRAP:  
Colorado River Action Plan: Mainstem
  - III. Reduce negative impacts of nonnative fishes and sportfish management activities.
    - III.A. Develop and implement control programs in reaches of the Colorado River occupied by endangered fishes.
- III. Study Background/Rationale and Hypotheses:

General

Significant anthropogenic changes to the physical riverine habitat have undoubtedly played an important role in the decline and endangered status of Colorado pikeminnow, humpback chub, bonytail, and razorback sucker, but changes in the biological environment may also have been equally significant. Physical changes in the riverine habitat have been accompanied by the introduction, establishment, and proliferation of nonnative fishes, and concomitant declines in native fishes in the Upper Colorado River basin. The role of nonnative fishes is often identified, in association with habitat changes, as a major obstacle to conservation of native fish communities.

At least 67 nonnative fishes have been introduced actively or passively into the

Colorado River system during the last 100 years (Minckley 1982; Tyus et al. 1982; Carlson and Muth 1989; Minckley and Deacon 1991; Maddux et al. 1993). By 1980, more than 50 nonnative fishes had been actively introduced into rivers and reservoirs of the Colorado River basin (Minckley 1982; Tyus et al. 1982; Carlson and Muth 1989). Native big river fishes have disappeared from about three-fourths of their original habitat while introduced fishes have become more widespread and abundant. Former studies have also documented a decline in the abundance of native fish species as nonnative species increased in abundance (Joseph et al. 1977; Behnke 1980; Osmundson and Kaeding 1989; Quarterone 1993).

Many of the nonnative fishes introduced into the Colorado River basin are suspected of adversely affecting the native mainstem fishes in some fashion. Warmwater gamefish are thought to have the greatest adverse effect on endangered native fishes. Centrarchids (e. g., largemouth bass, green sunfish, bluegill, black crappie, and smallmouth bass), ictalurids (e. g., channel catfish and black bullhead), and esocids (northern pike) are frequently listed as contributors to the decline of native fishes. An increasing body of evidence characterizes the negative interactions of nonnative fishes with the endangered big river fishes (Hawkins and Nesler 1991; Minckley et al. 1991; Maddux et al. 1993; Lentsch et al. 1996). Some of this evidence is indirect, including inferences from field data or results from laboratory studies of predation by nonnatives on natives. Laboratory studies have documented agonistic behavior, resource sharing, and vulnerability to predation (Papoulias and Minckley 1990; Karp and Tyus 1990; Ruppert et al. 1993; Johnson et al. 1993). Direct evidence of predation includes native fishes obtained from stomach contents of nonnative fishes and by visual observation of predation. Other means by which nonnative fishes may adversely affect native fishes are by competition for food, which limits the success of razorback sucker (Papoulias and Minckley 1990). The extent of predation pressure by some nonnative fishes on populations of native fishes is not exactly known. Tyus and Saunders (1996) went on to conclude that smallmouth bass along with channel catfish and northern pike were the main threat to juvenile Colorado pikeminnow and razorback sucker. During the 1990s the Yampa River experienced a dramatic increase in northern pike and then smallmouth bass in critical habitat. Predation by these two piscivorous species wreaked havoc on the native fish community. Anderson (2004; 2005) documented significant declines of native fish densities in parts of the Yampa River between 1998 and 2004 coincident with an increase in smallmouth bass abundance. Bioenergetic modeling by Johnson et al. (2008) indicated that smallmouth bass fish consumption was similar to northern pike and about 65 times greater than channel catfish, but if more prey fish were available, piscivory by smallmouth bass could be 10 fold the piscivory by northern pike and channel catfish. They concluded that smallmouth bass presented the greatest predatory threat to native fishes of the Yampa River.

### Smallmouth Bass

Until 2003, smallmouth bass were only reported as incidental, rare captures in the Upper Colorado River from Price Stubb Dam (river mile 188.3) to the Colorado/Green River confluence. However, Fish and Wildlife sampling crews involved with the channel catfish removal evaluation recorded and documented the capture of 318 smallmouth bass in main channel riverine habitats in a 39-mile reach of the Upper Colorado River from the Gunnison/Colorado River confluence to the Utah/Colorado stateline (Burdick 2003(a)). Catch rates (fish/hour and fish/mile) steadily increased throughout the 4-month sampling period (30 June to 31 October)

and reached a high of 4.07 fish/hr. The source(s) of these smallmouth bass are unknown.

### Upper Colorado River (Colorado)

In the Upper Colorado River between Price-Stubb Dam (river mile [RM] 188.3) and the head of Westwater Canyon, (RM 125), abundance and distribution information is limited for smallmouth bass. However, the increase in the number of smallmouth bass reported during the channel catfish removal evaluation had biologists and managers concerned that smallmouth bass abundance could increase quickly, and further impact recovery of native endangered fishes. Smallmouth bass have the potential to predate or compete with different life stages of the four native endangered fishes.

Fish passage has been restored at the Grand Valley Irrigation Company Diversion Dam near Palisade, the Government Highline Diversion Dam, and recently (March 2008) at the Price-Stubb Diversion Dam. For the first time in over 100 years fish now have upstream access from the Grand Valley to upstream reaches in the Upper Colorado River. Only a fish trap at the Government Highline fish passageway can prevent unimpeded movement upstream. Smallmouth bass are located in Rifle Gap Reservoir and Highline Lake and adult smallmouth bass have been collected in the Colorado River between Rifle and Price-Stubb Dam (Anderson 1997; Burdick 2008(a)).

### Lower Gunnison River

In the fish trap of the Redlands Dam fish passageway in the Lower Gunnison River, the number of smallmouth bass have increased (19 fish in 2002 and 2003)(Burdick 2002; Burdick 2003(b)) over previous years of monitoring (1996–2001: 1 fish)(Burdick 2001). Nine smallmouth bass were collected in the fish trap at Redlands during 2004 (Burdick 2004) and 21 during 2005 (Burdick 2005a). No smallmouth bass were collected in the fish trap during 2006 (Burdick 2006) or 2007 (Burdick 2007). Four were collected in 2008, one in 2009 (Burdick 2008(b); 2009), and three in 2010 (Burdick 2010(a)). About 1,800 fingerling smallmouth bass were stocked by the Colorado Division of Wildlife (CDOW) in 1973 in the Gunnison River near Delta (Wiltzius 1978) upstream from Redlands Diversion Dam. None of these stocked smallmouth bass have been subsequently captured upstream from the diversion dam (Wiltzius 1978, Valdez et al. 1982; Burdick 1995). Redlands Dam (RM 3.0) provides an effective barrier to smallmouth bass and all other fish attempting to move further upstream in the Gunnison River.

Juanita Reservoir, which can connect to Kannah Creek and eventually to the Lower Gunnison River near the town of Whitewater, also contain smallmouth bass.

### Control of Nonnative Fish by Mechanical Removal

Control of smallmouth bass and other nonnative fish species is a primary emphasis, along with habitat restoration, propagation and stocking, and instream flow management within the Recovery Program for the four endangered fish species. In the strategic plan for the control of nonnative fishes in the Upper Colorado River Basin (Tyus and Saunders 1996), “control” was defined as “reducing the numbers of one or more nonnative species to levels below which they are no longer an

impediment to the recovery of endangered fish species.” The goal for nonnative fish control or management in the Upper Colorado River Basin is to reduce the adverse impacts of nonnative fishes on the endangered fishes which will hopefully increase the distribution and abundance of the endangered fishes and contribute to their recovery. It is not likely that nonnative fishes that have become established in the Upper Colorado River Basin can be eliminated. However, preventive measures and active control programs could be implemented to reduce the abundance of nonnative fishes in riverine and adjacent floodplain habitats. Consequently, then, reducing the abundance of some problematic, nonnative fishes would reduce the potential for predation and competition on native listed and non-listed fishes. Management to promote recovery of listed fish species may have to include long-term or periodic suppression of some problematic nonnatives, such as mechanical removal, that minimizes impacts to remaining native fishes.

#### IV. Study Goals, Objectives, End Product:

##### Study Goals/Objectives

The purpose of this proposed study is to remove as many smallmouth bass of all sizes in main channel riverine habitats in a 61-mile reach of the Upper Colorado River between Price-Stubb Dam and Westwater boat landing in eastern Utah. The goal is to reduce the abundance of smallmouth bass as quickly as possible in this reach which will ultimately benefit native listed fishes, and possibly contribute to their recovery. The study objectives are to:

1. remove all sizes of smallmouth bass in the Upper Colorado River by boat and raft-based electrofishing, and
2. obtain an abundance estimate for smallmouth bass juvenile (100-199 mm) and adults ( $\geq 200$  mm) by mark and recapture methods for the Upper Colorado River between GVIC Dam and Loma Boat Landing and the Lower Gunnison River between Redlands Dam and the Colorado/Gunnison river confluence.

FINAL PRODUCT: Computerize and analyze field data;  
Prepare annual RIP reports.

- #### V. Study Area: sixty-five miles of the Upper Colorado River:
- Price-Stubb Diversion Dam downstream to Westwater boat landing (RM 188.3 – 127.6) & the Lower Gunnison River (RM 3.0 – 0.7);
  - Rifle Bridge to Beavertail Mountain (RM 240.4 – 195.7) [added in 2004]
  - Silt to Rifle (RMs ~ 250.0 – 240.4)[added in 2007][removed for 2009/2010/2011]
  - Government Highline Diversion Dam to Cameo Bridge (RMs 193.7 – 189.7)[added for 2009]

#### VI. Study Methods/Approach:

##### General–Study Direction and Evolution

December 2003. One of the conclusions agreed upon by participants at the December 2003 Nonnative Fish Control Workshop in Grand Junction was that smallmouth bass posed a greater threat to native fishes than other nonnative game

fishes (e.g., channel catfish). Northern pike was viewed as the present number one threat to native fishes. At this workshop, the priority was established to start removing smallmouth bass from the Upper Colorado River in western Colorado as soon as possible to head off a possible increase in the abundance of this species. Recovery of listed native fishes might be more attainable if the threats (i.e., predation and competition) posed by certain nonnative fishes, such as smallmouth bass, could be minimized or eliminated.

FY2006 Study Modifications. The decision was made during the December 14, 2005, Biology Committee meeting to obtain an abundance estimate for smallmouth bass in concentration areas of the Upper Colorado River from Price Stubb Dam to Westwater, Utah. In essence this endeavor entailed marking and releasing smallmouth bass during an initial pass starting in the summer of 2006, and lethally removing and recording previously marked smallmouth bass in all subsequent passes. Smallmouth bass were marked in the river segments from Price Stubb Dam to Fruita State Park in the Upper Colorado River and a 2.3-mile segment of the Lower Gunnison River. These river segments were identified as moderate to high concentrations areas for smallmouth bass based on capture data from the summers of 2004 and 2005. An additional first pass was added to accomplish the marking. Four successive passes were performed during 2006 in the concentration areas to lethally remove smallmouth bass as was conducted in both 2004 and 2005.

Population estimates for smallmouth bass have been performed from 2007-2011, to track population abundance.

The number of removal passes for areas of low densities of smallmouth bass as determined from 2004 and 2005 capture data was reduced during 2006. These river segments included the canyon-bound reaches of Ruby and Horsethief canyons to Westwater, Utah (RM 152.6 – 127.6). The reduced effort in these reaches was re-directed to increase the number of removal passes in river segments where smallmouth bass had proliferated over the past two years. One such river reach was the 45-mile reach of the Upper Colorado River from the Rifle Bridge to Beavertail Mountain and, in particular, the 10 mile river segment from Rifle to Rulison. In 2005, the number of smallmouth bass collected in these reaches increased 11 fold and catch effort increased about 5.5 times. Re-focusing the removal effort resulted in a zero net budget change.

In 2007, study direction was modified again. Four additional removal passes were added for the Grand Valley portion of the project area. Two additional passes were performed by Fish and Wildlife personnel and two by Colorado Division of Wildlife (CDOW) personnel. The last two removal passes performed by the CDOW were in river reaches where high concentration or high abundance of smallmouth bass had been determined during the past five years of sampling. This sampling regime continued from 2008-2011.

Further modifications to the sampling protocol were implemented in 2011 from earlier sampling years (2007-2010). Removal efforts in the 45-mile reach between Rifle Bridge and Beavertail Mountain were continued but the number of removal passes was reduced from three to one. The reduced effort in the Rifle to Beavertail reach was re-allocated to increase removal passes (two total) in some of the Grand Valley reaches of the Colorado River (RMs 185.3-152.6). The principal investigator believed it was imperative to re-allocate this effort from the Rifle to Beavertail

Mountain reaches to the Grand Valley reaches for 2011 because the smallmouth bass cohort produced in 2010 in the Grand Valley reaches appeared to be stronger than that of 2007, which was recognized as one of the strongest year classes in the upper Colorado River basin rivers. It was uncertain if this 2010 cohort would overwinter, and that would not be known until the 2011 summer sampling was underway. The Service was responsible for performing this “re-allocated” effort and would not affect the removal effort (two passes) performed by the CDOW (RP project no. 126(b)), which usually occurred in September. This reallocation of effort resulted in no additional costs to the 2011 budget for this project.

A final synthesis report describing results from 2004 to 2006 was completed in January 2008 (Burdick 2008(a)).

### Methodology

To date, sampling efforts have focused on a reach and not river-wide scale. For logistical considerations, the entire 61-mile section of the Upper Colorado River from Price-Stubb Dam to the Westwater, Utah, was divided into three different sub-reaches based on hydro-geomorphic features.

Three general sub-reaches were sampled between 2004 and 2010. These included, 1) a 3-mile section between Price-Stubb and Grand Valley Irrigation dams and the 15-mile section that extends from Palisade to the Gunnison/Colorado River confluence (RMs 185.5–171), 2) the 18-mile reach that extends from the confluence of the Gunnison and Colorado rivers to the Loma Boat Landing (RMs 171.0–152.6), and 3) Ruby and Horsethief canyons (RMs 152.6–127.6) which extends from the Loma Boat Landing to the Westwater, Utah. The 15- and 18-mile sub-reaches flow through a wide alluvial section of the lower Grand Valley; the canyon-bound sub-reach is considered a quasi-alluvial sub-reach. The number of sampling occasions (i.e., passes) in the 15-mile reach has been affected by the availability of sufficient water for sampling craft to operate due to extended drought periods. Sampling the 3-mile section between Price-Stubb and Grand Valley Irrigation dams has also been reduced due to poor access and low-water conditions in mid- to late-summer.

A 45-mile reach of the Upper Colorado River from the Rifle Bridge (river mile 240.7) to Beavertail Mountain in Debeque Canyon (river mile 195.7) has been sampled with raft electrofishing all eight years (2004 – 2011) of this study. This river reach was outside the original defined removal area. However, there were unsubstantiated reports that anglers had encountered smallmouth bass in these upstream reaches, and it was determined that a “reconnaissance” sampling trip was warranted to substantiate or refute these claims. Sampling regime for this 45-mile reach (2004-2010) has been two complete passes and a third pass in high concentration areas of smallmouth bass. However, as noted above, only pass was performed in these upper reaches in 2011.

### **FY 2012; FY 2013**

#### Sampling Protocol.

Several sampling changes will occur in FY2012 FY2013 from past years. These changes are directly related to the Recovery Program’s 20% budget reduction from the FY2009, FY2010,

and FY2011 budget (\$157,200/fiscal year). These sampling modifications were necessary to remain within the new budget prescribed by the Recovery Program for FY2012 <sup>1</sup> and FY2013 (\$ 125,760/fiscal year) <sup>2</sup>. The sampling modifications include, 1) reducing the number of electrofishing craft during the marking pass from three to two, 2) reducing the number of removal passes from 10 performed in FY-2011 to five per year in the Grand Valley reaches [please note that prior to FY-2011 the most passes that were ever performed in the Grand Valley was 6. Achieving 10 removal passes in the Grand Valley in FY-2011 was due to 1) the reallocation of two removal passes from an upstream river section to the Grand Valley to help target the strong year-class of bass observed there, and 2) the two additional passes that had been performed by CDOW in recent years. However, achieving 10 passes in FY-2011 represented an anomalous sampling year. The reduction from the normal 6 removal passes that were performed in FY-2010 and prior years to 5 passes in FY-2012 and 2013 represents a 20% reduction in effort {it is actually a 16.7% reduction in effort for a 20% reduction in cost to the Recovery Program}, 3) totally eliminating sampling in some reaches that include, a) the 25-mile reach from the Loma Boat Landing to the Westwater, UT, BLM ranger station, b) the 35-mile reach from Rulison to Beavertail Mountain, and c) the 4-mile reach between Government Highline Dam and the Cameo XCEL bridge. The canyon reaches between Loma and Westwater and the upstream reaches between Rulison and Beavertail have been considered ‘monitoring’ reaches intended to detect any increases in smallmouth bass abundance which could lead to establishing a future invasive population, and have been sampled only once each year during the past four years. Also, funding was eliminated for FY2012 and FY2013 for the CDOW to perform two removal passes in high concentration areas of the Grand Valley. Therefore, all removal passes in FY2012 and FY2013 will be performed by FWS.

**Removal Passes.** Given the budget constraints for FY2012 and FY2013, we needed to determine the riverine areas that smallmouth bass control efforts should be directed to maximize and expedite removal and reduction to control their proliferation/invasiveness and potential negative impacts to native fish conservation and endangered fish recovery. A quantitative means was used to prioritize or focus on riverine reaches of high densities of smallmouth bass where removal efforts might be intensified in 2012 and 2013. The highest concentration reaches of smallmouth bass collected over the past seven years (2004-2010) of this study determined by mean catch/effort (fish/hr) were as follows (from Burdick 2010(b):

<u>Rank</u>	<u>River Reach</u>	<u>Catch/Effort (fish/hr)</u>
1	Corn Lake to the Colorado/Gunnison River confluence	8.79
2	Colorado/Gunnison River confluence to Fruita State Park	6.79
3	GVIC to Corn Lake	4.9
4	Lower Gunnison River	4.54
5	Fruita State Park to Loma	4.07
6	Price-Stubb Dam to GVIC	3.2
7	Loma to Salt Creek	2.82
8	Salt Creek to Utah/Colorado state line	2.52
9	Rifle to Beavertail Mountain	1.76
10	Utah/Colorado state line to Westwater, Utah	0.43

<sup>1</sup> For FY 2012, the number of removal passes will be reduced to five from 10 performed in 2011 to remain within RP prescribed funding levels. The number of Bio Techs will be reduced from four to three; the hours for remaining three Bio Techs had to be reduced by 120 hours each (total of 360 hrs) from FY2011

<sup>2</sup> For FY 2013, the number of removal passes will be reduced to five from 10 performed in 2011 to remain within RP prescribed funding levels. The number of Bio Techs will be reduced from four to three; the number of hours for Bio Techs had to be reduced by 180 hrs each (total of 540 hrs) from FY2011

No monitoring passes will be performed in the canyon-bound reaches between the Loma Boat Landing and the Westwater, Utah, BLM ranger station to detect for any increased smallmouth bass abundance. Likewise, no removal passes will be performed between Rulison and Beavertail Mountain in each of 2012 and 2013.

While fish passage at the Price Stubb Diversion Dam was opened in April 2009 and fish have upstream access from the Grand Valley to the Government Highline Diversion Dam, as well as moving downstream over this diversion structure to occupy this short reach, we have detected few smallmouth bass in this reach and smallmouth bass densities (0.11 fish/hr) have been low to date (see table above). Therefore, in 2012 and 2013, this reach will not be sampled.

The riverine reach between Rifle and Rulison ranks ninth of the eleven concentration reaches. However, we are planning on sampling this reach, and in particular, a backwater located at RM 236.6 in both FY2012 and FY2013 to monitor any potential influx and proliferation of smallmouth bass that may still be in this Colorado River reach or possibly re-inhabit this habitat from an accidental escapement from Rifle Gap Reservoir. This backwater at RM 236.6 in 2004 and 2005 had high densities of smallmouth bass and there still is concern that smallmouth bass adults could once again re-invade and utilize this backwater. The close proximity of this backwater to Rifle Creek which enters the Colorado River upstream at RM 238.8 is justifiable rationale that this backwater continued to be monitored. Rifle Creek drains Rifle Gap Reservoir and a population of smallmouth bass occurs in this reservoir.

In summary, for FY2012 and FY2013, removal passes and the number of removal passes will be performed in the following riverine reaches:

<u>River Reach</u>	<u>No. of Removal Passes</u>
Corn Lake to the Colorado/Gunnison River confluence	5
Colorado/Gunnison River confluence to Fruita State Park	5
GVIC to Corn Lake	5
Lower Gunnison River	5
Fruita State Park to Loma	5
Price-Stubb Dam to GVIC	5
Rifle to Beavertail Mountain	1

**Marking Pass.** In FY2012 and FY2013, smallmouth bass will continue to be marked

to obtain an abundance estimate to compare with former years. In the Grand Valley reaches of the Upper Colorado and Lower Gunnison rivers, one pass using two electrofishing craft will be devoted to mark juvenile (100 – 199 mm) and adult ( $\geq 200$  mm) smallmouth bass. Marked smallmouth bass will be noted on every removal pass, but only marked smallmouth bass recaptured from the first removal pass will be used for the population estimate. This will be followed by five passes to lethally remove all centrarchid fishes. The population estimate in FY2012 and FY2013 will be for 35.3 miles of the Upper Colorado River from Grand Valley Irrigation Company Dam at Palisade (RM 185.6 to the Loma Boat Landing (RM 152.6) and the 2.3 miles of the Lower Gunnison River from the Redlands Dam to the Colorado/Gunnison rivers, the same reaches and mileages that juvenile and adult smallmouth bass population estimates were calculated for between 2006 and 2011.

Juvenile and adult smallmouth bass collected during the first pass will be marked and released. For the population estimate in 2012 and 2013, juvenile smallmouth bass (100-199 mm) will be marked by removing the ventral lobe of the caudal fin with scissors. Adult smallmouth bass ( $\geq 200$  mm) will be marked by removing the dorsal lobe of the caudal fin with scissors. Subsequent recaptures of smallmouth bass marked during the marking pass will be recorded for determining an abundance estimate. In 2012 and 2013, field data will be recorded from all juvenile and adult endangered fish collected. They will be also checked for a PIT tag, weighed, measured, and immediately returned to the river.

***Fish Disposal.*** All smallmouth bass (except for fish marked and released during the marking pass) and all other centrarchids plus any inadvertent northern pike, walleye, gizzard shad, grass carp, and yellow perch collected will be lethally removed. Disposal of all the aforementioned fishes will be as follows: following capture, fish will be euthanized afield and preserved with ice. All dead fish will be held on station in freezers and disposed of in the Mesa County landfill southeast of Grand Junction.

***Data Analyses.*** All smallmouth bass captured within each of the sub-reaches will be enumerated in 2012 and 2013 similar to that during former years (2004 – 2011). Total numbers of smallmouth bass and largemouth bass collected and catch/effort (fish/hr) will be also determined for each sub-reach per sampling pass for each of these 3 years. Length data will be recorded for 2012-2013 similar to that during former years (2004 – 2011) to determine the size structure of smallmouth bass removed.

Data summary analyses similar to that employed between 2004 and 2011 will be used to analyze the 2012 and 2013 field data. During 2012 and 2013, mark-recapture data will be subjected to an abundance estimator to obtain a population estimate for juvenile (100-199 mm) and adult ( $\geq 200$  mm) smallmouth bass from the 15- and 18-mile reaches and the lower 2.3 miles of the Gunnison River. Chapman's (1951) modification of the Petersen-Lincoln estimator used to determine the abundance of smallmouth bass in 2006 through 2011, and will be used again in 2012 and 2013. Also, other population estimators could be used from recommendations from the smallmouth bass programmatic synthesis (Breton et al.).

Probability of capture ( $\hat{p}$ ) (after White et al. 1982), the coefficient of variation (CV:  $SE/\hat{N} \times 100$  [where  $\hat{N}$ =estimated population size]) (Pollock et al. 1990), and exploitation rates will also be computed. All centrarchid fishes captured during the 2012 and 2013 field work will also be analyzed similar to the data analyzed between

2004 and 2011 for among year comparisons.

VII. Task Description and Schedule

Description

Task 1. Remove all sizes of smallmouth bass and other centrarchid fishes.

Sub-task 1a. Mark and release smallmouth bass during pass 1.

Task 2. a) computerize field data; b) analyze data; c) prepare annual RIP reports.

Schedule

Task 1. 6/2012 – 10/2012; 6/2013 – 10/2013

Sub-task 1a. 7/2012; 7/2013

Task 2. a) 9/2012-11/2012; 9/2013-11/2013, b) & c) 11/2012, 11/2013

VIII. FY-2012 Work (ninth year of multi-year study)

Deliverables/Due Dates: Annual Report due 11/2012

Budget (salary + benefits; actual salary rates w/ benefits provided by CRFP Administrative Officer used for labor; funding levels set by RP office)

Task 1. Remove all smallmouth bass; sub-task 1a: mark & release smallmouth bass on pass 1 for population estimate

1. Labor (salary and benefits)(salaries rounded to the nearest dollar)

Project Leader (1-GS-14 @ \$ 74.16/hr)	0 hrs	\$ 0
Asst. Project Leader (1-GS-13 @ \$ 61.38/hr)	191 hrs	\$ 11,724
Fish Biologist (1-GS-12 @ 49.84/hr)	1,040 hrs	\$ 51,834
Admin. Officer (GS-9, @ \$ 39.63/hr)	258 hrs	\$ 10,225
Bio Tech (3-GS-5 @ \$ 17.45/hr)	560 hrs ea.	\$ 29,316
	Subtotal	\$103,099

2. Travel (RP meetings/workshops)		\$ 1,100
	Subtotal	\$ 1,100

3. Equipment

a) Vehicles: GSA-lease (rate=\$ 334/month; 0.30.mile)		
Number of vehicles: 3.25 (three needed for one week for marking pass)		
Lease: \$ 334/month X 3.25 months X 2 vehicles=\$ 2,171		
(5 Removal Passes); \$ 334/month X 0.25 month= \$ 84		
(Removal Pass—1 additional vehicle)		\$ 2,255
Mileage: 3,648 miles X 0.30/mile=\$ 3,026.40		\$ 1,094
b) Outboard Motor Gasoline (est. 30 gals X \$ 4.00/gal (91 Octane))		\$ 120

c) EF generator Gasoline (est. 175 gals X \$ 4.00/gal (91 Octane)		\$ 700
d) 2-cycle outboard oil for outboards, EF generator oil, props, jet-pump impellers, liners, plastic bags (fish disposal), parts		\$ 1,200
e) Maintenance (outboards, generators, EF units, aluminum boat repair)		\$ 2,000
f) Dip nets, stainless steel spheres, cable, EF hardware		\$ 600
g) Marking tools (Fiskars® scissors/punches)		\$ 130
h) Sampling bottles (polyethylene, 250 ml)		\$ 300
i) Office supplies/paper, telephones, copy machine, computer software/support, postage		\$ 1,200
	Subtotal	\$ 9,599
4. Other		\$ 0
	Subtotal	\$ 0
	Task 1 Subtotal	\$113,798

Task 2. Cross-agency coordination; apply for collection permits; data reporting requirements; computerize field data; analyze data; prepare RIP annual report.

1. Labor (salary and benefits)( salaries rounded to the nearest dollar)		
Fish Biologist (1-GS-12 @ \$ 49.84/hr)	240 hrs	\$ 11,962
	Subtotal	\$ 11,962
	Task 2 Subtotal	\$ 11,962
	<b>FY2012 All Tasks Total</b>	<b>\$125,760</b>

FY-2013 Work (tenth year of multi-year study)

Deliverables/Due Dates: Annual Report due 11/2013

Budget (salary + benefits; actual salary rates w/ benefits provided by CRFP  
Administrative Officer used for labor; funding levels set by RP office)

Task 1. Remove all smallmouth bass; sub-task 1a: mark & release smallmouth bass on pass 1 for population estimate

1. Labor (salary and benefits)(salaries rounded to the nearest dollar)		
Project Leader (1-GS-14 @ \$ 76.34/hr)	0 hrs	\$ 0
Asst. Project Leader (1-GS-13 @ \$ 65.05/hr)	191 hrs	\$ 12,425
Fish Biologist (1-GS-12 @ 51.29/hr)	1,040 hrs	\$ 53,342
Admin. Officer (GS-9, @ \$ 40.78/hr)	258 hrs	\$ 10,521
Bio Tech (3-GS-5 @ \$ 17.95/hr)	500 hrs ea.	\$ 26,925
	Subtotal	\$103,213
2. Travel (RP meetings/workshops)		\$ 1,100

Subtotal \$ 1,100

3. Equipment

- a) Vehicles: GSA-lease (rate=\$ 334/month; 0.30.mile)  
 Number of vehicles: 3.25 (three needed for one week for marking pass)  
 Lease: \$ 334/month X 3.25 months X 2 vehicles=\$ 2,171  
 (5 Removal Passes); \$ 334/month X 0.25 month= \$ 84  
 (Removal Pass—1 additional vehicle) \$ 2,255  
 Mileage: 3,648 miles X 0.30/mile=\$ 3,026.40 \$ 1,094
- b) Outboard Motor Gasoline (est. 30 gals X \$ 4.00/gal (91 Octane)) \$ 120
- c) EF generator Gasoline (est. 175 gals X \$ 4.00/gal (91 Octane)) \$ 700
- d) 2-cycle outboard oil for outboards, EF generator oil, props, jet-pump impellers, liners, plastic bags (fish disposal), parts \$ 1,147
- e) Maintenance (outboards, generators, EF units, aluminum boat repair) \$ 2,000
- f) Dip nets, stainless steel spheres, cable, EF hardware \$ 600
- g) Marking tools (Fiskars® scissors/punches) \$ 121
- h) Office supplies/paper, telephones, copy machine, office supplies, computer software/support, postage \$ 1,100

Subtotal \$ 9,137

4. Other

Subtotal \$ 0

Task 1 Subtotal \$113,450

Task 2. Cross-agency coordination; apply for collection permits; data reporting requirements; computerize field data; analyze data; prepare RIP annual report.

- 1. Labor (salary and benefits)( salaries rounded to the nearest dollar)  
 Fish Biologist (1-GS-12 @ \$ 51.29/hr) 240 hrs \$ 12,310  
 Subtotal \$ 12,310

Task 2 Subtotal \$ 12,310

**FY2013 All Tasks Total \$125,760**

IX. Budget Summary

FY-2012 \$ 125,760  
FY-2013 \$ 125,760  
 Total: \$ 251,520

X. Reviewers: None

## XI. References

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Prepared by Bob D. Burdick, 9 March 2011

Revised by: BDB, 14 April 2011

Revised by: DWR, 18 August 2011