

**COLORADO RIVER RECOVERY PROGRAM
FY-2016-2017 SCOPE OF WORK**

Project No. 163

Aspinall-related fish monitoring – Gunnison and Colorado rivers

Reclamation Agreement number: R13PG40018

Reclamation Agreement term: June 3, 2013 – Sep. 30, 2017

Lead Agency: U.S. Fish and Wildlife Service
Colorado River Fishery Project

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Category:

- Ongoing
 Ongoing-revised project
 Requested new project
 Unsolicited proposal

Expected Funding Source:

- Annual funds
 Capital funds
 Other (explain)

I. Title of Proposal: Monitoring multiple life stages of the fish community in the lower Gunnison and upper Colorado rivers, with emphasis on Colorado pikeminnow and razorback sucker populations, in response to reoperation of the Aspinall Unit and implementation of the Selenium Management Plan.

II. Relationship to RIPRAP:

Gunnison River Action Plan: Gunnison River Mainstem

V. Monitor populations and habitat and conduct research to support recovery actions.

V.A. Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions.

Colorado River Action Plan: Colorado River Mainstem

V. Monitor populations and habitat and conduct research to support recovery actions.

V.A. Conduct research to acquire life history information and enhance scientific techniques required to complete recovery

actions.

III. Study Background/Rationale and Hypotheses:

The Programmatic Biological Opinion (PBO) for water depletions in the Gunnison River Basin (USFWS 2009) stipulates that endangered fishes, as well as the entire fish community, be monitored to determine the status of the species before and after the Selenium Management Plan (SMP) is implemented and following reoperation of the Aspinall Unit reservoirs. The PBO calls for monitoring of multiple life stages and density estimates of Colorado pikeminnow and razorback sucker in the lower Gunnison and Colorado rivers.

Density estimates can be calculated by first developing population estimates through mark-recapture techniques. The standard for monitoring populations of Colorado River endangered fishes is to periodically develop population estimates using closed-model capture-recapture methods. Such estimates provide information on population status (abundance), and when repeated periodically over an extended period can also provide information on population trends. Such estimates have been made for Colorado River populations of Colorado pikeminnow and humpback chub.

Because sub-adult and adult Colorado pikeminnow and razorback sucker are few and/or difficult to locate in the Gunnison River (Burdick 1995), the approach used here was to first see (in the first two years of sampling: 2011 and 2012) if sufficient numbers of each could be captured to allow mark-recapture abundance estimation. This was to be accomplished with a limited sampling effort of only two electrofishing passes each year (see protocol below for fish community monitoring). It was anticipated that if sufficient numbers of endangered fish were caught to allow for generation of population estimates (and subsequently density estimates) annual sampling during 2013, 2014 and 2015 would be increased to five passes. Hence, the first two years were essentially a feasibility study for adult density estimation (number of individuals per unit area). Because 2011-2012 sampling failed to collect sufficient numbers of endangered fish to allow for generation of population estimates (and subsequently density estimates), monitoring in 2013 and outyears will continue to employ the less precise index of catch-per-unit-effort (number of fish caught per hour of electrofishing). This means continuing with two electrofishing passes per year, allowing comparison of catch rates through time, until such time that sufficient numbers of endangered fish are caught to allow for population and density estimates to be generated. The assumption inherent when using this index as a monitoring tool is that trends in catch rates are indicative of underlying trends in abundance, although the level of actual abundance is never known or estimated. Since numbers of endangered Colorado pikeminnow and razorback sucker collected in 2011-2014 were well below the levels needed for generating population estimates, sampling in 2016 and beyond will continue with two electrofishing passes.

The fish assemblage in the Gunnison River will also be monitored, using electrofishing catch-per-effort as an index to track trends in relative abundance of each species. Burdick (1995) conducted four passes of raft-based electrofishing to characterize the Gunnison River fish community in 1992 and 1993. He sampled once during pre-runoff, once during runoff, and twice during post-runoff. To allow comparison of our results with those of Burdick (1995), which were collected almost 20 years ago, we will use a similar sampling protocol but scale back the number of electrofishing passes to two each year and conduct these only during the post-runoff period. It is during these two electrofishing passes that capture rates of endangered fish will be assessed to determine if mark-recapture abundance estimation will be feasible in subsequent years (see above).

For young-of-the-year (YOY) and small-bodied fish monitoring, we propose to use beach seine sampling of backwaters during fall (late September-early October) using ISMP methodology (see McAda 1994). Burdick (1995) found that Gunnison River backwater habitat was very scarce and therefore he deviated from the ISMP protocol (sampling two backwaters in every five-mile segment) by sampling every backwater encountered. We propose to follow Burdick's modification of the ISMP methodology in this regard.

Concurrent with 2011-2014 fish community monitoring in the Gunnison River, tissue samples were collected to determine selenium concentrations in fish before and after implementation of the SMP. Muscle plug samples were collected from all adult Colorado pikeminnow, razorback sucker, and bonytail encountered. In addition, from 2011-2014, muscle plug samples were collected from common carp and roundtail chub, as well as whole-body samples of speckled dace (ubiquitous species) to insure that statistical comparisons could be made regarding selenium in fish tissue before and during SMP implementation. During 2015-2019 sampling for this SOW, tissue samples will continue to be collected from all adult Colorado pikeminnow, razorback sucker, and bonytail encountered in the Gunnison River. These samples will be analyzed and the data reported using funding from outside the Recovery Program.

In the Colorado River, downstream of the Gunnison River inflow, the population of adult Colorado pikeminnow is already being monitored (Project 127) with mark-recapture abundance estimation (see Osmundson and White 2014). During field sampling, razorback sucker capture-recapture data will continue to be collected; estimates of adult razorback sucker abundance will be developed from these data. In 2013, abundance estimates were developed for adult razorback sucker in the Colorado River for the years 2008, 2009, and 2010 (Osmundson in prep.). Distribution of any running ripe females collected will also be mapped to help ascertain spawning site locations. The assumption here is that improvement in flow regimes in the Gunnison River will have positive ramifications in the downstream Colorado River as well and hopefully result in benefits to endangered fish populations in both rivers.

Osmundson and Seal (2009) found increasing catch rates of razorback sucker larvae in the Colorado River from 2004 to 2007 and an apparent (non-significant) decrease in catch rates in the Gunnison River. Hand seine sampling for larval fish was performed from 2011-2014 in both rivers from mid-May to early-July, to encompass the spawning season for razorback sucker. This work will be continued in 2016-2019. Larval hand seine sampling during the Colorado pikeminnow spawning period (mid-June to mid-August) was originally planned (though not budgeted for) in the 2011-2014 SOW. However, due to funding constraints related to sequestration and the lack of collections of adult Colorado pikeminnow precluded this activity being initiated between 2011 and 2014. Larval hand seine sampling will provide an index to reproductive success of each species using catch-per-effort (mean number per sample) of endangered fish larvae. For razorback sucker larvae, results can be compared with those provided earlier (2002-2007) by Osmundson and Seal (2009). Colorado pikeminnow larval catch rates in the Colorado River can be compared with results provided by Osmundson and Burnham (1998) for the years 1986-1994. If the Program Director's Office deems that conducting larval sampling for Colorado pikeminnow is a priority, then this SOW would need to be updated to reflect this additional work (manpower and equipment), as well as the necessary funding. We recommend that this decision be based upon adult Colorado pikeminnow becoming more abundant in Gunnison River collections prior to initiating larval collection activities.

Trends in large-bodied fish community composition and species relative abundance will also be monitored in the Colorado River in the 18-mile reach immediately downstream of the Gunnison River inflow. As in the Gunnison River, shoreline electrofishing will be used to generate annual catch-per-effort statistics as a monitoring index. The Interagency Standardized Monitoring Program (ISMP) of the 1980s and 1990s included an annual, adult, spring, electrofishing survey, but was designed to detect trends only in endangered species and thus no systematic sampling of the fish community was performed. The only systematic community sampling conducted under the auspices of the Recovery Program that could now serve as a baseline for future monitoring was the electrofishing sampling conducted in 1994 and 1995 as part of the food-availability study, Project No. 48-A (see Osmundson 1999). From 2011-2014, we replicated that sampling protocol and sample the reaches randomly selected and sampled at that time so results in coming years can be compared to those earlier catch rates. This work will also continue from 2016-2019.

IV. Study Goals, Objectives, End Product:

Goals

- 1) Continue the long-term, multi-life-stage, monitoring program for Colorado pikeminnow and razorback sucker populations in the Gunnison and Colorado rivers whereby population responses can be used to evaluate the effectiveness of implementation of Aspinall re-

operation and the Selenium Management Program (SMP).

- 2) Determine selenium concentrations in endangered fish before and after implementation of the Selenium Management Program as a means to assess whether environmental selenium reductions result in concomitant reductions in endangered fish. The performance and reporting of this work will be done with funding other than Recovery Program funds.

Objectives

- 1) Continue long-term monitoring program for sub-adult and adult Colorado pikeminnow and razorback sucker in the lower Gunnison River while simultaneously bolstering existing monitoring efforts in the Colorado River by including abundance estimation of stocked razorback sucker.
- 2) Continue to evaluate reproductive success of endangered fish in the Gunnison and 18-mile reach of the Colorado rivers by performing early-life-phase abundance monitoring through systematic collections of larvae (hand seining) and young-of-the-year (beach seining).
- 3) Continue monitoring of the fish community in the Gunnison River and 18-mile reach of the upper Colorado River, including both large- (electrofishing) and small-bodied fish (beach-seining) using protocols modeled after Burdick (1995), Osmundson (1999) and ISMP young-of-year sampling (McAda et al. 1994).
- 4) Continue to determine selenium concentrations in Colorado pikeminnow, razorback sucker, and bonytail inhabiting the Gunnison River, downstream of delta, CO. The performance and reporting of this work will be done with funding other than Recovery Program funds.

End Product

A final report detailing study findings, including results of endangered and sympatric fish community monitoring -- adult, YOY, and larval sampling (to be produced by CRFP - Grand Junction). In addition, a report detailing the results of selenium concentrations found in fish samples (to be produced by Grand Junction, CO Ecological Services field station; work to be funded outside of the Recovery Program) will be provided to the Recovery Program as a courtesy, upon its completion.

Fish Community Monitoring Report:

Draft report ready for peer review on August 30, 2020.

Draft final ready for approval consideration October 31, 2020.
Report finalized November 31, 2020.

Larval Fish Monitoring Report:

Draft report ready for peer review on August 30, 2021.
Draft final ready for approval consideration October 31, 2021.
Report finalized November 31, 2021.

Contaminants Report (funded outside of the Recovery Program):

Draft report ready for peer review on August 30, 2020.
Draft final ready for approval consideration October 31, 2020.
Report finalized November 31, 2020.

V. Study Area:

Large-bodied fish, YOY, and larval fish will be sampled along shorelines and zero-velocity habitats of the lower Gunnison River from Hartland Diversion Dam (RM 59.9) downstream to a point immediately upstream from the Redlands Diversion Dam near Grand Junction (RM 3). In the Colorado River, large-bodied fish will be sampled in sub-reaches of the 18-mile reach extending downstream from the Gunnison River inflow (RM 171) downstream to the Colorado-Utah state line. Fall YOY sampling will occur throughout the same 18-mile reach and extend downstream to the Colorado-Utah line to stay consistent with the former ISMP YOY sampling area. Larval sampling in the Colorado River will be conducted from the Gunnison River inflow downstream Colorado/Utah stateline.

VI. Study Methods/Approach:

Gunnison River

Colorado pikeminnow and razorback sucker capture rates will be monitored by sampling the entirety of the Gunnison River study area. Larval sampling will be conducted four days per week from mid-May through the mid-July, or about 9 weeks each year. One complete pass can be made through the study area in four days. For larval seine sampling, the study area will be divided into 5-mile segments and 1-6 sites will be sampled per segment each week, depending on availability of low-velocity habitats, consistent with methods used by Osmundson and Seal (2009). An investigator will spend about five minutes at each site seining with a one-person, two-handled, fine-meshed seine. River-mile location of each site will be noted, as well as presence or absence of larvae. If larvae are found, they will be preserved in individually labeled bottles of 100% ethanol. Larval collections will be sent to the Larval Fish Laboratory at Colorado State University for specimen identification and archiving.

For YOY sampling, one trip will be made each fall during sometime between mid-September and mid-October, consistent with Burdick (1995). In general, the protocol used by the Interagency Standardized Monitoring Program (ISMP) for

YOY sampling will be followed (see McAda et al. 1994). However, because backwater habitat is scarce in the Gunnison River, most if not all backwaters encountered will be sampled, rather than hoping to sample two in each 5-mile reach, as stipulated in the ISMP. Two non-overlapping hauls will be made in each backwater. A 30-foot-long x 6-ft-deep 1/8 inch mesh seine or a 15-foot-long x 4-ft-deep 1/8 inch mesh seine will be used depending upon the size of the habitat to be sampled. Size of seine used at each backwater will be recorded to calculate area sampled. Fish that can be identified in the field will be counted and released; others will be preserved in 100% ethanol and sent to the Larval Fish Lab for enumeration. Area seined at each backwater will be recorded so that catch-per-effort can be calculated in terms of fish per unit area.

Large-bodied fish community sampling will follow the protocol established by Burdick (1995), who followed that of previous FWS investigators (Archer et al. 1980; Miller et al. 1982). The study area will be divided into the four primary study strata described by Burdick (1995) varying in length from 11.3 to 17.9 miles. Burdick selected one 5.5-mile sub-reach (starting mile selected from a random numbers table) within each stratum each time a pass was made; hence, sampling reaches were not consistent through time. Because we will make fewer annual passes than did Burdick, it is possible that such a method may not provide a good annual representation of the fish or habitat of each stratum, making among-year comparisons of catch rate difficult. We will therefore deviate from this protocol by sampling smaller sub-reaches within each stratum and spreading them out spatially so as to assure better geographic coverage and representation of each stratum. Three sub-reaches will be selected randomly within each stratum and each will consist of one riffle-run, meander sequence (approximately 0.5-2.0 miles long); these same three sub-reaches will be sampled each time an electrofishing pass is made. Most reaches (between available launch sites) in the Gunnison River downstream of Delta are long and electrofishing crews will need to camp as they proceed downriver. One week will be required to complete one shocking pass. Two post-runoff electrofishing passes will be completed annually, one in late July or early August and the other in either late September or early October.

Two 2-person crews will electrofish the right and left shorelines simultaneously, in a downstream direction, using either rafts or hard-bottomed boats. Electrofishing crews will attempt to collect all stunned fish within these sub-reaches. Fish will be worked up separately for each sub-reach and shocking time recorded for each. All fish collected in these sub-reaches will be identified by species, enumerated by life-stage (based on species-specific length classes), weighed (to the nearest gram), and measured (to the nearest mm total length {TL}). All T&E fish (bonytail, Colorado pikeminnow, and razorback sucker), as well as roundtail chub (in support of CPW's 3-species monitoring), collected in these sub-reaches will follow that same protocol, but they will also be checked for the presence of a PIT tag. Endangered fish species will have a muscle plug taken from them (see below). If no PIT tag is present in a T&E fish, one will be

implanted. Roundtail chub will neither be PIT-tagged nor have muscle plugs taken. All native fish will be returned alive to the river.

In the sections of river separating sub-reaches, electrofishing will continue to be conducted. However, only T&E fish will be collected in these “in-between” sections of river. This will allow complete coverage for endangered fish sampling (see above). Handling protocols for T&E fish collected in these “in-between” areas will be the same as those listed above.

Muscle plugs will be taken from adult Colorado pikeminnow and razorback sucker following procedures specified by Williamson (1992). Muscle plugs will be taken using a 5-mm biopsy punch. A different punch will be used on each fish and discarded after use. Muscle plugs will be taken 1 to 2 cm below the dorsal fin by inserting the punch with a slight twisting motion. Tilting the punch allows the tissue sample to break off at the end. The sample will be emptied into sterile cryogenic vials, placed on dry (or wet) ice in the field until they are eventually frozen. Wounds will be disinfected using betadine swabs, to decrease the chance of infection. Selenium analyses will be conducted by neutron activation, which is the method of choice for selenium analysis on small biomass samples. Up to 30 muscle plug (MP) samples may be taken in a given year (10 adult razorback; 10 adult pikeminnow; 10 bonytail).

Colorado River

The fish community sampling protocol established during Project 48-A (see Osmundson 1999) will be repeated in the 18-mile reach. At that time, the river from Rifle to Westwater was stratified by geomorphology and tributary input. On aerial photos, each of five strata was divided into multiple reaches, each consisting of one meander (riffle-run) sequence 0.5-1.2 miles long. The reaches were numbered and three study reaches were selected within each stratum using a random numbers table. The 18-mile reach was one of the strata and the three study reaches selected within the 18-mile reach then will continue to be sampled for this SOW. Both shorelines will be sampled with boat electrofishing. To keep effort consistent with the earlier methods, two netters will be stationed at the front of each boat. Fish will be identified, measured for TL, and weighed. Two boats with a crew of three people each will be needed. One deviation from the earlier design, however, will be to reduce costs by sampling only once per year in the fall (Sep-Oct), instead of both spring and fall.

In 2013, population estimates of razorback sucker (> 400 mm TL) were developed for the years 2008, 2009, and 2010 (Osmundson in prep.) from data collected during the Colorado pikeminnow monitoring project (Recovery Program Project No. 127). The preliminary estimates of were: 2008 – 2,035 (1,333-2738), 2009 – 1,680 (1,070-2,291), 2010 – 1,637 (1,179-2,095). Ninety-five percent CIs are in parenthesis. This will provide a baseline for adult razorback sucker

monitoring. Estimates will again be calculated in 2017 for the years 2013, 2014, and 2015 also using data collected during the Colorado pikeminnow monitoring project (Recovery Program Project No. 127).

Larval sampling will follow the protocol outlined above for the Gunnison River, extending from mid-May through the first week of August for razorback larvae. If at some point it is deemed feasible to begin sampling for larval Colorado pikeminnow, that sampling would occur from mid-June through the end of August (pending available funding, personnel, and equipment). The 18-mile reach and from Loma downstream to the Colorado-Utah state line will be sampled for comparison with results of Osmundson and Seal (2009).

Fall YOY sampling will be restricted to the 18-mile reach and Loma downstream to the Colorado-Utah state line, following ISMP protocol with two seine hauls in each of two backwaters within each 5-mile reach (see McAda et al. 1994).

The Principal Investigator will train crew members, act as overall crew leader and actively participate in data collection efforts. Along with annual data collection efforts, additional time will be required prior to field sampling to ready equipment and train new crew members in motor boat operation and field techniques specific to this project and later to input and check data.

The Principal Investigator will work closely with a biostatistician familiar with running program MARK to estimate razorback sucker abundance in the Colorado River and abundance of both Colorado pikeminnow and razorback sucker in the Gunnison River if mark-recapture estimation proves feasible there.

VII. Task Description and Schedule

Description

- | | |
|---------|---|
| Task 1. | Electrofish Gunnison River for endangered fish CPE, fish community monitoring, and fish tissue collection; two trips (late July or early August and again in mid-September to mid-October). |
| Task 2. | Electrofish Colorado River for fish community monitoring; one trip (late September or early October). |
| Task 3. | Sample fish larvae (mid-May to early July): Colorado River |
| Task 4. | Sample fish larvae (mid-May to early July): Gunnison River |
| Task 5. | Sample YOY in the Gunnison River (one pass – in late September or early October) |
| Task 6. | Sample YOY in the Colorado River (one pass – in late September or early October) |
| Task 7. | Analyze tissue samples for selenium |
| Task 8. | Develop population estimates of razorback sucker in |

- Colorado River
- Task 9. Analyze larval samples (Larval Fish Lab)
 - Task 10. Analyze data
 - Task 11. Write annual reports
 - Task 12. Prepare final contaminants report (Barb Osmundson)
 - Task 13. Prepare final fish monitoring report No. 1 (Large-bodied and YOY fish)
 - Task 14. Prepare final fish monitoring report No. 2 (Larval fish)

Schedule

Task 1, 2, 3, 4, 5, 6, 7, 9, 10, 11:	2016
Task 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 14:	2017
Task 1, 2, 3, 4, 5, 6, 7, 9, 10, 11:	2018
Task 1, 2, 3, 4, 5, 6, 7, 9, 11:	2019
Task 9, 10, 12, 13:	2020
Task 10, 14:	2021

VIII. FY-2016 Work (sixth year of multi-year study)

Deliverables/Due Dates:

Annual Report for 2016 field work due 11/2016

Budget

(Based on projected FY-2016 costs)

- Task 1. Electrofish Gunnison River (two 5-day trips X 6 people/trip)
 - 1. CRFP Grand Junction Labor (Federal Salary + Benefits)
 - Fishery Biologist (GS-11) – 1 person for 120 hrs (15 days) at \$49.36/hr 5,923
 - Bio Tech Crew Leader (GS-6) – 1 person for 80 hrs (10 days) at \$32.76/hr 2,621
 - Biological Technicians (GS-5) – 4 people for 72 hrs (9 days) each (288 total hrs) at \$24.96/hr 7,189
 - 2. Travel
 - Per Diem (Camp Rate = \$28/day camping)
6 people x 5 days/trip X 2 trip = 60 days @ \$28/day 1,680
 - 3. Equipment
 - Maintenance/repair 795
 - Exact use of the money in this line item will vary from year to year depending on what equipment needs to be maintained, repaired, or replaced, but use of these funds for a “typical” field season for one study could include any of the following:
 - Generator repair/tune-up – 4 hrs @ \$75/hr = \$300
 - Raft trailer maintenance
 - Signal light pigtail adapters – \$30 each

Repair raft frame	
Aluminum welding – 3 hours @ \$150/hr = \$450	
Spark plugs for generators – \$7.50 each = \$15	
Boat gas – 2 rafts X 5 gallons/day X 5 days/trip =	
50 gallons/trip X 2 trips (100 gallons) at	
4.00/gallon for 91 octane	400

4. Vehicles

Vehicle Maintenance & Gasoline (@ \$365/month lease = \$12.17 per day based on 30 days in an “average” month + \$0.33/mile)	
(3 vehicles for boats 5 days/trip X 2 trips/year)	
3 vehicles X \$12.17/day X 10 days = \$365	365
(1 shuttle vehicle X 2 days/trip X 2 trips/year)	
1 vehicle X \$12.17/day X 4 days = \$49	49
(4 vehicles X 80 miles round-trip = 320 total miles)	
320 miles X \$0.33/mile = \$106	<u>106</u>
Task Total	\$ 19,128

Task 2. Electrofish 18-Mile reach of Colorado River (one 2-day trip X 4 people/trip)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)	
Fishery Biologist (GS-11) – 1 person for 16 hrs	
(2.5 days) at \$49.36/hr	790
Biological Technicians (GS-5) – 2 people for 16 hrs	
(2 days) each (64 total hrs) at \$24.96/hr	1,597
2. Travel	0

3. Equipment

Maintenance/repair	600
Exact use of the money in this line item will vary from year to year depending on what equipment needs to be maintained, repaired, or replaced, but use of these funds for a “typical” field season for one study could include any of the following:	
Dura-Frame electrofishing dip nets – 2 @ \$300 each = \$600	
Boat gas – 2 rafts X 5 gallons/day X 2 days/trip =	
20 gallons/trip X 1 trips (20 gallons) at	
4.00/gallon for 91 octane	80

4. Vehicles

Vehicle Maintenance & Gasoline (@ \$365/month lease = \$12.17 per day based on 30 days in an “average” month + \$0.33/mile)	
(2 vehicles for boats 2 days/trip X 1 trip/year)	
2 vehicles X \$12.17/day X 2 days = \$49	49
(1 shuttle vehicle X 2 days/trip X 1 trip/year)	
1 vehicle X \$12.17/day X 4 days = \$49	49

(3 vehicles X 23 miles round-trip = 69 total miles)

69 miles X \$0.33/mile = \$23

Task Total \$ 23
\$ 3,165

Task 3. Sample larvae in the Gunnison River (4 days/week for 8 weeks)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)

Bio Tech Crew Leader (GS-6) – 1 person for 200 hrs
(25 days) at \$32.76/hr 6,552

Biological Technicians (GS-5) – 2 person for 200 hrs
(25 days) each (400 total hrs) at \$24.96/hr 9,984

2. Travel 0

3. Equipment

Boat gas – for outboard engines – 640 gallons@
\$4/gallon for 91 octane 2,560

Ethanol (95% denatured) – two 3-gallon containers
@ \$120 each 240

Nalgene Sample Bottles (250 ml) – 2 cases (250/case)
@ \$325/case 650

4. Vehicles

Vehicle Maintenance & Gasoline (@ \$365/month lease = \$12.17
per day based on 30 days in an “average” month + \$0.33/mile)

Delta to Escalante Canyon section 617

2 vehicles (1 for sampling & 1 for shuttle) X \$12.17/day
X 1 day/week X 8 weeks = \$195

2 vehicles X 80 miles round-trip X 8 trips (1,280 total
miles) X \$0.33/mile = \$422

Escalante Canyon to Bridgeport section 512

2 vehicles (1 for sampling & 1 for shuttle) X \$12.17/day
X 1 day/week X 8 weeks = \$195

2 vehicles X 60 miles round-trip X 8 trips (960 total
miles) X \$0.33/mile = \$317

Bridgeport to Whitewater section 406

2 vehicles (1 for sampling & 1 for shuttle) X \$12.17/day
X 1 day/week X 8 weeks = \$195

2 vehicles X 40 miles round-trip X 8 trips (640 total
miles) X \$0.33/mile = \$211

Whitewater to Redlands Diversion Dam section 301

2 vehicles (1 for sampling & 1 for shuttle) X \$12.17/day
X 1 day/week X 8 weeks = \$195

2 vehicles X 20 miles round-trip X 8 trips (320 total
miles) X \$0.33/mile = \$106

Task Total \$ 21,822

Task 4. Sample larvae in the Colorado River (2 10-hour days/week for 8 weeks)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)

Fishery Biologist (GS-11) – 1 person for 200 hrs (25 days) at \$49.36/hr	9,872
Biological Technicians (GS-5) – 2 people for 128 hrs (16 days) each (256 total hrs) at \$24.96/hr	6,390
2. Travel	0
3. Equipment	
Assorted field equipment	1,035
Exact use of the money in this line item will vary from year to year depending on what equipment needs to be maintained, repaired, or replaced, but use of these funds for a “typical” field season for one study would include the following:	
Stearns Type III life jackets – 3 @ \$70 each = \$210	
Larval seines – 3 at \$200 each = \$600	
Hip boots – 2 pair at \$50/pair = \$100	
Breathable chest waders - 1 pair @ \$125/pair = \$125	
Boat gas – for outboard engines – 200 gallons@ \$4/gallon for 91 octane	800
Ethanol (95% denatured) – one 3-gallon containers @ \$120 each	120
Nalgene Sample Bottles (250 ml) – 1 case (250/case) @ \$325/case	325
4. Vehicles	
Vehicle Maintenance & Gasoline (@ \$365/month lease = \$12.17 per day based on 30 days in an “average” month + \$0.33/mile)	
Grand Junction: Redlands Diversion Dam to Redlands Parkway	301
2 vehicles (1 for sampling & 1 for shuttle) X \$12.17/day X 1 day/week X 8 weeks = \$195	
2 vehicles X 20 miles round-trip X 8 trips (320 total miles) X \$0.33/mile = \$106	
Grand Junction: Redlands Parkway to Loma	301
2 vehicles (1 for sampling & 1 for shuttle) X \$12.17/day X 1 day/week X 8 weeks = \$195	
2 vehicles X 20 miles round-trip X 8 trips (320 total miles) X \$0.33/mile = \$106	
Task Total	\$ 19,144
Task 5. Sample YOY in the Gunnison River (one September pass)	
1. CRFP Grand Junction Labor (Federal Salary + Benefits)	
Fishery Biologist (GS-11) – 1 person for 48 hrs (6 days) at \$49.36/hr	2,369
Biological Technicians (GS-5) – 3 people for 48 hrs (6 days) each (144 total hrs) at \$24.96/hr	3,594
2. Travel	0

3. Equipment	
Boat gas – 100 gallons @ \$4/gallon for 91 octane	400
Ethanol (95% denatured) – one 3-gallon containers @ \$120 each	120
Bottles (30-32 250 ml bottles) @ \$325/case (case = 250 bottles)	40
4. Vehicles	
Delta to Escalante Canyon section	77
2 vehicles (1 for sampling & 1 for shuttle) X \$12.17/day X 1 day = \$24	
2 vehicles X 80 miles round-trip X 1 day (160 total miles) X \$0.33/mile = \$53	
Escalante Canyon to Bridgeport section	64
2 vehicles (1 for sampling & 1 for shuttle) X \$12.17/day X 1 day = \$24	
2 vehicles X 60 miles round-trip X 1 day (120 total miles) X \$0.33/mile = \$40	
Bridgeport to Whitewater section	50
2 vehicles (1 for sampling & 1 for shuttle) X \$12.17/day X 1 day = \$24	
2 vehicles X 40 miles round-trip X 1 day (80 total miles) X \$0.33/mile = \$26	
Whitewater to Redlands Diversion Dam section	37
2 vehicles (1 for sampling & 1 for shuttle) X \$12.17/day X 1 day = \$24	
2 vehicles X 20 miles round-trip X 8 trips (40 total miles) X \$0.33/mile = \$13	
	Task Total
	\$ 6,751

Task 6. Sample YOY in the Colorado River (one September pass)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)	
Fishery Biologist (GS-11) – 1 person for 32 hrs (4 days) at \$49.36/hr	1,580
Biological Technicians (GS-5) – 3 people for 32 hrs (4 days) each (96 total hrs) at \$24.96/hr	2,396
2. Travel	0
3. Equipment	
Boat gas – 47 gallons @ \$4/gallon for 91 octane	188
Ethanol (95% denatured) – one 3-gallon containers @ \$120 each	120
Bottles (30-32 250 ml bottles) @ \$325/case (case = 250 bottles)	40
4. Vehicles	
Vehicle Maintenance & Gasoline (@ \$365/month lease = \$12.17	

per day based on 30 days in an “average” month + \$0.33/mile)	
Grand Junction: Redlands Diversion Dam to Redlands Parkway	37
2 vehicles (1 for sampling & 1 for shuttle) X \$12.17/day	
X 1 day = \$24	
2 vehicles X 20 miles round-trip X 1 day (40 total	
miles) X \$0.33/mile = \$13	
Grand Junction: Redlands Parkway to Loma	37
2 vehicles (1 for sampling & 1 for shuttle) X \$12.17/day	
X 1 day = \$24	
2 vehicles X 20 miles round-trip X 1 day (40 total	
miles) X \$0.33/mile = \$13	
Loma to CO/UT State Line	48
2 vehicles (1 for sampling & 1 for shuttle) X \$12.17/day	
X 1 day = \$24	
2 vehicles X 36 miles round-trip X 1 day (72 total	
miles) X \$0.33/mile = \$24	
Task Total	\$ 4,446

Task 7. Analyze muscle plug samples to determine selenium concentrations (Fish and Wildlife Service – Ecological Services)

1. Unknown number of samples @ \$125/sample	
Task Total	\$ 0
*** Being funded under a separate agreement	

Task 9. Analyze larval samples (Colorado State University – Larval Fish Lab)

1. 363 samples anticipated @ \$300/sample	Task Total	\$ 0
*** Being funded under a separate agreement		

Task 10 & 11. Input and analyze data, write annual report, etc.

1. CRFP – Grand Junction Labor (Federal Salary + Benefits)	
Fishery Biologist (GS-11) – 1 person for 160 hrs	
(20 days) at \$49.36/hr	7,898
Task Total	\$ 7,898

Project Management: Permitting; Coordination; Office & Administrative Support

1. CRFP – Grand Junction Labor (Federal Salary + Benefits)	
Administrative Officer (GS-9) – 1 person for 40 hrs	
(5 days) at \$44.72/hr	1,789
Project Leader (GS-14) – 1 person for 40 hrs	
(5 days) at \$83.42/hr	3,337
Project Management Total:	\$ 5,126

Subtotals by Task for FY-2016

Task 1 (USFWS-CRFP, Grand Jct., CO)	19,128
Task 2 (USFWS-CRFP, Grand Jct., CO)	3,165

Task 3 (USFWS-CRFP, Grand Jct., CO)	21,822
Task 4 (USFWS-CRFP, Grand Jct., CO)	19,144
Task 5 (USFWS-CRFP, Grand Jct., CO)	6,751
Task 6 (USFWS-CRFP, Grand Jct., CO)	4,446
Task 7 (USFWS-Ecological Services, Grand Jct., CO)	0
Task 9 (Colorado State University – Larval Fish Lab)	0
Tasks 10 & 11 (USFWS-CRFP, Grand Jct., CO)	7,898
Project Management (USFWS-CRFP, Grand Jct., CO)	<u>5,126</u>
FY 2016 Total	\$ 87,480

Funding for FY 2016 by agency:

Fish and Wildlife Service CRFP Total	\$ 87,480
Fish and Wildlife Service Ecological Services Total	\$ 0
Colorado State University – Larval Fish Lab	<u>\$ 0</u>
FY 2016 Total	\$ 87,480

Out-year budgets for Aspinall-related fish community monitoring: 2017-2019

THESE BUDGETS ARE ESTIMATES ONLY AND MAY NOT REPRESENT ACTUAL COSTS

FY-2017 Work (seventh year of multi-year study)

Deliverables/Due Dates:

Annual Report for 2017 field work due	11/2017
Draft report (larval fish monitoring) for 2011-2014 work due for peer review	08/30/2017
Draft final report (larval fish monitoring) for 2011-2014 work due for Biology Committee approval	10/31/2017
Final Report (larval fish monitoring) for 2011-2014 work due	12/31/2017

Budget

(Based on projected FY-2017 costs)

Task 1. Electrofish Gunnison River (two 5-day trips X 6 people/trip)	
1. CRFP Grand Junction Labor (Federal Salary + Benefits)	
Fishery Biologist (GS-11) – 1 person for 120 hrs (15 days) at \$50.84/hr	6,101
Bio Tech Crew Leader (GS-6) – 1 person for 80 hrs (10 days) at \$33.74/hr	2,699
Biological Technicians (GS-5) – 4 people for 72 hrs (9 days) each (288 total hrs) at \$25.70/hr	7,402

2. Travel		
Per Diem (Camp Rate = \$28/day camping)		
6 people x 5 days/trip X 2 trip = 60 days @ \$28/day		1,680
3. Equipment		
Maintenance/repair		795
Exact use of the money in this line item will vary from year to year depending on what equipment needs to be maintained, repaired, or replaced, but use of these funds for a “typical” field season for one study could include any of the following:		
Generator repair/tune-up – 4 hrs @ \$75/hr = \$300		
Raft trailer maintenance		
Signal light pigtail adapters – \$30 each		
Repair raft frame		
Aluminum welding – 3 hours @ \$150/hr = \$450		
Spark plugs for generators – \$7.50 each = \$15		
Boat gas – 2 rafts X 5 gallons/day X 5 days/trip =		
50 gallons/trip X 2 trips (100 gallons) at		
4.00/gallon for 91 octane		400
4. Vehicles		
Vehicle Maintenance & Gasoline (@ \$376/month lease = \$12.53 per day based on 30 days in an “average” month + \$0.34/mile)		
(3 vehicles for boats 5 days/trip X 2 trips/year)		
3 vehicles X \$12.53/day X 10 days = \$376		376
(1 shuttle vehicle X 2 days/trip X 2 trips/year)		
1 vehicle X \$12.53/day X 4 days = \$50		50
(4 vehicles X 80 miles round-trip = 320 total miles)		
320 miles X \$0.34/mile = \$109		109
	Task Total	\$ 19,612

Task 2. Electrofish 18-Mile reach of Colorado River (one 2-day trip X 4 people/trip)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)		
Fishery Biologist (GS-11) – 1 person for 16 hrs		
(2.5 days) at \$50.84/hr		813
Biological Technicians (GS-5) – 2 people for 16 hrs		
(2 days) each (64 total hrs) at \$25.70/hr		1,645
2. Travel		0
3. Equipment		
Maintenance/repair		600
Exact use of the money in this line item will vary from year to year depending on what equipment needs to be maintained, repaired, or replaced, but use of these funds for a “typical”		

field season for one study could include any of the following:

Dura-Frame electrofishing dip nets – 2 @ \$300
 each = \$600
 Boat gas – 2 rafts X 5 gallons/day X 2 days/trip =
 20 gallons/trip X 1 trips (20 gallons) at
 4.00/gallon for 91 octane 80

4. Vehicles

Vehicle Maintenance & Gasoline (@ \$376/month lease = \$12.53
 per day based on 30 days in an “average” month + \$0.34/mile)
 (2 vehicles for boats 2 days/trip X 1 trip/year)
 2 vehicles X \$12.53/day X 2 days = \$50 50
 (1 shuttle vehicle X 2 days/trip X 1 trip/year)
 1 vehicle X \$12.53/day X 4 days = \$50 50
 (3 vehicles X 23 miles round-trip = 69 total miles)
 69 miles X \$0.34/mile = \$23 23

Task Total \$ **3,261**

Task 3. Sample larvae in the Gunnison River (4 days/week for 8 weeks)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)
 Bio Tech Crew Leader (GS-6) – 1 person for 200 hrs
 (25 days) at \$33.74/hr 6,748
 Biological Technicians (GS-5) – 2 person for 200 hrs
 (25 days) each (400 total hrs) at \$25.70/hr 10,280

2. Travel 0

3. Equipment

Boat gas – for outboard engines – 640 gallons@
 \$4/gallon for 91 octane 2,560
 Ethanol (95% denatured) – two 3-gallon containers
 @ \$120 each 240
 Nalgene Sample Bottles (250 ml) – 2 cases (250/case)
 @ \$325/case 650

4. Vehicles

Vehicle Maintenance & Gasoline (@ \$376/month lease = \$12.53
 per day based on 30 days in an “average” month + \$0.34/mile)
 Delta to Escalante Canyon section 635
 2 vehicles (1 for sampling & 1 for shuttle) X \$12.53/day
 X 1 day/week X 8 weeks = \$200
 2 vehicles X 80 miles round-trip X 8 trips (1,280 total
 miles) X \$0.34/mile = \$435
 Escalante Canyon to Bridgeport section 526
 2 vehicles (1 for sampling & 1 for shuttle) X \$12.53/day
 X 1 day/week X 8 weeks = \$200
 2 vehicles X 60 miles round-trip X 8 trips (960 total

miles) X \$0.34/mile = \$326	
Bridgeport to Whitewater section	418
2 vehicles (1 for sampling & 1 for shuttle) X \$12.53/day	
X 1 day/week X 8 weeks = \$200	
2 vehicles X 40 miles round-trip X 8 trips (640 total	
miles) X \$0.34/mile = \$218	
Whitewater to Redlands Diversion Dam section	309
2 vehicles (1 for sampling & 1 for shuttle) X \$12.53/day	
X 1 day/week X 8 weeks = \$200	
2 vehicles X 20 miles round-trip X 8 trips (320 total	
miles) X \$0.34/mile = \$109	
Task Total	\$ 22,366

Task 4. Sample larvae in the Colorado River (2 10-hour days/week for 8 weeks)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)	
Fishery Biologist (GS-11) – 1 person for 200 hrs	
(25 days) at \$50.84/hr	10,168
Biological Technicians (GS-5) – 2 people for 128 hrs	
(16 days) each (256 total hrs) at \$25.70/hr	6,579
2. Travel	0
3. Equipment	
Assorted field equipment	1,035
Exact use of the money in this line item will vary from year	
to year depending on what equipment needs to be maintained,	
repaired, or replaced, but use of these funds for a “typical”	
field season for one study would include the following:	
Stearns Type III life jackets – 3 @ \$70 each = \$210	
Larval seines – 3 at \$200 each = \$600	
Hip boots – 2 pair at \$50/pair = \$100	
Breathable chest waders - 1 pair @ \$125/pair = \$125	
Boat gas – for outboard engines – 200 gallons@	
\$4/gallon for 91 octane	800
Ethanol (95% denatured) – one 3-gallon containers	
@ \$120 each	120
Nalgene Sample Bottles (250 ml) – 1 case (250/case)	
@ \$325/case	325
4. Vehicles	
Vehicle Maintenance & Gasoline (@ \$376/month lease = \$12.53	
per day based on 30 days in an “average” month + \$0.34/mile)	
Grand Junction: Redlands Diversion Dam to Redlands Parkway	309
2 vehicles (1 for sampling & 1 for shuttle) X \$12.53/day	
X 1 day/week X 8 weeks = \$200	
2 vehicles X 20 miles round-trip X 8 trips (320 total	
miles) X \$0.34/mile = \$109	
Grand Junction: Redlands Parkway to Loma	309

2 vehicles (1 for sampling & 1 for shuttle) X \$12.53/day
 X 1 day/week X 8 weeks = \$200
 2 vehicles X 20 miles round-trip X 8 trips (320 total
 miles) X \$0.34/mile = \$109

Task Total \$ 19,645

Task 5. Sample YOY in the Gunnison River (one September pass)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)	
Fishery Biologist (GS-11) – 1 person for 48 hrs (6 days) at \$50.84/hr	2,440
Biological Technicians (GS-5) – 3 people for 48 hrs (6 days) each (144 total hrs) at \$25.70/hr	3,701
2. Travel	0
3. Equipment	
Boat gas – 100 gallons @ \$4/gallon for 91 octane	400
Ethanol (95% denatured) – one 3-gallon containers @ \$120 each	120
Bottles (30-32 250 ml bottles) @ \$325/case (case = 250 bottles)	40
4. Vehicles	
Delta to Escalante Canyon section	79
2 vehicles (1 for sampling & 1 for shuttle) X \$12.53/day X 1 day = \$25	
2 vehicles X 80 miles round-trip X 1 day (160 total miles) X \$0.34/mile = \$54	
Escalante Canyon to Bridgeport section	65
2 vehicles (1 for sampling & 1 for shuttle) X \$12.53/day X 1 day = \$25	
2 vehicles X 60 miles round-trip X 1 day (120 total miles) X \$0.34/mile = \$41	
Bridgeport to Whitewater section	52
2 vehicles (1 for sampling & 1 for shuttle) X \$12.53/day X 1 day = \$25	
2 vehicles X 40 miles round-trip X 1 day (80 total miles) X \$0.34/mile = \$27	
Whitewater to Redlands Diversion Dam section	39
2 vehicles (1 for sampling & 1 for shuttle) X \$12.53/day X 1 day = \$25	
2 vehicles X 20 miles round-trip X 8 trips (40 total miles) X \$0.34/mile = \$14	
Task Total	<u>\$ 6,936</u>

Task 6. Sample YOY in the Colorado River (one September pass)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)
Fishery Biologist (GS-11) – 1 person for 32 hrs

	(4 days) at \$50.84/hr	1,627
	Biological Technicians (GS-5) – 3 people for 32 hrs (4 days) each (96 total hrs) at \$25.70/hr	2,467
2.	Travel	0
3.	Equipment	
	Boat gas – 47 gallons @ \$4/gallon for 91 octane	188
	Ethanol (95% denatured) – one 3-gallon containers @ \$120 each	120
	Bottles (30-32 250 ml bottles) @ \$325/case (case = 250 bottles)	40
4.	Vehicles	
	Vehicle Maintenance & Gasoline (@ \$376/month lease = \$12.53 per day based on 30 days in an “average” month + \$0.34/mile)	
	Grand Junction: Redlands Diversion Dam to Redlands Parkway	39
	2 vehicles (1 for sampling & 1 for shuttle) X \$12.53/day X 1 day = \$25	
	2 vehicles X 20 miles round-trip X 1 day (40 total miles) X \$0.34/mile = \$14	
	Grand Junction: Redlands Parkway to Loma	39
	2 vehicles (1 for sampling & 1 for shuttle) X \$12.53/day X 1 day = \$25	
	2 vehicles X 20 miles round-trip X 1 day (40 total miles) X \$0.34/mile = \$14	
	Loma to CO/UT State Line	49
	2 vehicles (1 for sampling & 1 for shuttle) X \$12.53/day X 1 day = \$25	
	2 vehicles X 36 miles round-trip X 1 day (72 total miles) X \$0.34/mile = \$24	
	Task Total	\$ 4,569

Task 7. Analyze muscle plug samples to determine selenium concentrations (Fish and Wildlife Service – Ecological Services)

1.	Unknown number of samples @ \$125/sample	
	Task Total	\$ 0
	*** Being funded under a separate agreement	

Task 8. Develop population estimate of razorback sucker in Colorado River

1.	CRFP – Grand Junction Labor (Federal Salary + Benefits) Fishery Biologist (GS-11) – 1 person for 80 hrs (10 days) at \$50.84/hr	4,067
2.	Contract Bio-Statistician – 32 hrs (4 days) @ \$130/hr	4,160
	Task Total	\$ 8,227

Deliverables/Due Dates:
 Annual Report for 2018 field work due 11/2018

Budget

(Based on projected FY-2018 costs)

Task 1. Electrofish Gunnison River (two 5-day trips X 6 people/trip)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)	
Fishery Biologist (GS-11) – 1 person for 120 hrs (15 days) at \$52.37/hr	6,284
Bio Tech Crew Leader (GS-6) – 1 person for 80 hrs (10 days) at \$34.76/hr	2,781
Biological Technicians (GS-5) – 4 people for 72 hrs (9 days) each (288 total hrs) at \$26.48/hr	7,626
2. Travel	
Per Diem (Camp Rate = \$28/day camping) 6 people x 5 days/trip X 2 trip = 60 days @ \$28/day	1,680
3. Equipment	
Maintenance/repair	795
Exact use of the money in this line item will vary from year to year depending on what equipment needs to be maintained, repaired, or replaced, but use of these funds for a “typical” field season for one study could include any of the following:	
Generator repair/tune-up – 4 hrs @ \$75/hr = \$300	
Raft trailer maintenance	
Signal light pigtail adapters – \$30 each	
Repair raft frame	
Aluminum welding – 3 hours @ \$150/hr = \$450	
Spark plugs for generators – \$7.50 each = \$15	
Boat gas – 2 rafts X 5 gallons/day X 5 days/trip = 50 gallons/trip X 2 trips (100 gallons) at 4.00/gallon for 91 octane	400
4. Vehicles	
Vehicle Maintenance & Gasoline (@ \$387/month lease = \$12.91 per day based on 30 days in an “average” month + \$0.35/mile) (3 vehicles for boats 5 days/trip X 2 trips/year)	
3 vehicles X \$12.91/day X 10 days = \$387	387
(1 shuttle vehicle X 2 days/trip X 2 trips/year)	
1 vehicle X \$12.91/day X 4 days = \$52	52
(4 vehicles X 80 miles round-trip = 320 total miles)	
320 miles X \$0.35/mile = \$112	109
	<u>109</u>
Task Total	\$ 20,114

Task 2. Electrofish 18-Mile reach of Colorado River (one 2-day trip
 X 4 people/trip)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)	
Fishery Biologist (GS-11) – 1 person for 16 hrs (2.5 days) at \$52.37/hr	838
Biological Technicians (GS-5) – 2 people for 16 hrs (2 days) each (64 total hrs) at \$26.48/hr	1,695
2. Travel	0
3. Equipment	
Maintenance/repair	600
Exact use of the money in this line item will vary from year to year depending on what equipment needs to be maintained, repaired, or replaced, but use of these funds for a “typical” field season for one study could include any of the following:	
Dura-Frame electrofishing dip nets – 2 @ \$300 each = \$600	
Boat gas – 2 rafts X 5 gallons/day X 2 days/trip = 20 gallons/trip X 1 trips (20 gallons) at 4.00/gallon for 91 octane	80
4. Vehicles	
Vehicle Maintenance & Gasoline (@ \$387/month lease = \$12.91 per day based on 30 days in an “average” month + \$0.35/mile)	
(2 vehicles for boats 2 days/trip X 1 trip/year)	
2 vehicles X \$12.91/day X 2 days = \$52	52
(1 shuttle vehicle X 2 days/trip X 1 trip/year)	
1 vehicle X \$12.91/day X 4 days = \$52	52
(3 vehicles X 23 miles round-trip = 69 total miles)	
69 miles X \$0.35/mile = \$24	24
	<u>24</u>
Task Total	\$ 3,341

Task 3. Sample larvae in the Gunnison River (4 days/week for 8 weeks)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)	
Bio Tech Crew Leader (GS-6) – 1 person for 200 hrs (25 days) at \$34.76/hr	6,952
Biological Technicians (GS-5) – 2 person for 200 hrs (25 days) each (400 total hrs) at \$26.48/hr	10,592
2. Travel	0
3. Equipment	
Boat gas – for outboard engines – 640 gallons@ \$4/gallon for 91 octane	2,560
Ethanol (95% denatured) – two 3-gallon containers @ \$120 each	240
Nalgene Sample Bottles (250 ml) – 2 cases (250/case) @ \$325/case	650

4. Vehicles

Vehicle Maintenance & Gasoline (@ \$387/month lease = \$12.91 per day based on 30 days in an “average” month + \$0.35/mile)	
Delta to Escalante Canyon section	655
2 vehicles (1 for sampling & 1 for shuttle) X \$12.91/day X 1 day/week X 8 weeks = \$207	
2 vehicles X 80 miles round-trip X 8 trips (1,280 total miles) X \$0.35/mile = \$448	
Escalante Canyon to Bridgeport section	543
2 vehicles (1 for sampling & 1 for shuttle) X \$12.91/day X 1 day/week X 8 weeks = \$207	
2 vehicles X 60 miles round-trip X 8 trips (960 total miles) X \$0.35/mile = \$336	
Bridgeport to Whitewater section	431
2 vehicles (1 for sampling & 1 for shuttle) X \$12.91/day X 1 day/week X 8 weeks = \$207	
2 vehicles X 40 miles round-trip X 8 trips (640 total miles) X \$0.35/mile = \$224	
Whitewater to Redlands Diversion Dam section	319
2 vehicles (1 for sampling & 1 for shuttle) X \$12.91/day X 1 day/week X 8 weeks = \$207	
2 vehicles X 20 miles round-trip X 8 trips (320 total miles) X \$0.35/mile = \$112	
Task Total	\$ 22,942

Task 4. Sample larvae in the Colorado River (2 10-hour days/week for 8 weeks)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)	
Fishery Biologist (GS-11) – 1 person for 200 hrs (25 days) at \$52.37/hr	10,474
Biological Technicians (GS-5) – 2 people for 128 hrs (16 days) each (256 total hrs) at \$26.48/hr	6,779
2. Travel	0
3. Equipment	
Assorted field equipment	1,035
Exact use of the money in this line item will vary from year to year depending on what equipment needs to be maintained, repaired, or replaced, but use of these funds for a “typical” field season for one study would include the following:	
Stearns Type III life jackets – 3 @ \$70 each = \$210	
Larval seines – 3 at \$200 each = \$600	
Hip boots – 2 pair at \$50/pair = \$100	
Breathable chest waders - 1 pair @ \$125/pair = \$125	
Boat gas – for outboard engines – 200 gallons @ \$4/gallon for 91 octane	800
Ethanol (95% denatured) – one 3-gallon containers	

@ \$120 each	120
Nalgene Sample Bottles (250 ml) – 1 case (250/case)	
@ \$325/case	325

4. Vehicles

Vehicle Maintenance & Gasoline (@ \$387/month lease = \$12.91 per day based on 30 days in an “average” month + \$0.35/mile)	
Grand Junction: Redlands Diversion Dam to Redlands Parkway	319
2 vehicles (1 for sampling & 1 for shuttle) X \$12.91/day X 1 day/week X 8 weeks = \$207	
2 vehicles X 20 miles round-trip X 8 trips (320 total miles) X \$0.35/mile = \$112	
Grand Junction: Redlands Parkway to Loma	319
2 vehicles (1 for sampling & 1 for shuttle) X \$12.91/day X 1 day/week X 8 weeks = \$207	
2 vehicles X 20 miles round-trip X 8 trips (320 total miles) X \$0.354/mile = \$112	
Task Total	\$ 20,171

Task 5. Sample YOY in the Gunnison River (one September pass)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)	
Fishery Biologist (GS-11) – 1 person for 48 hrs (6 days) at \$52.37/hr	2,514
Biological Technicians (GS-5) – 3 people for 48 hrs (6 days) each (144 total hrs) at \$26.48/hr	3,813
2. Travel	0
3. Equipment	
Boat gas – 100 gallons @ \$4/gallon for 91 octane	400
Ethanol (95% denatured) – one 3-gallon containers @ \$120 each	120
Bottles (30-32 250 ml bottles) @ \$325/case (case = 250 bottles)	40
4. Vehicles	
Delta to Escalante Canyon section	82
2 vehicles (1 for sampling & 1 for shuttle) X \$12.91/day X 1 day = \$26	
2 vehicles X 80 miles round-trip X 1 day (160 total miles) X \$0.35/mile = \$56	
Escalante Canyon to Bridgeport section	68
2 vehicles (1 for sampling & 1 for shuttle) X \$12.91/day X 1 day = \$26	
2 vehicles X 60 miles round-trip X 1 day (120 total miles) X \$0.35/mile = \$42	
Bridgeport to Whitewater section	54
2 vehicles (1 for sampling & 1 for shuttle) X \$12.91/day	

X 1 day = \$26	
2 vehicles X 40 miles round-trip X 1 day (80 total miles) X \$0.35/mile = \$28	
Whitewater to Redlands Diversion Dam section	40
2 vehicles (1 for sampling & 1 for shuttle) X \$12.91/day X 1 day = \$26	
2 vehicles X 20 miles round-trip X 8 trips (40 total miles) X \$0.35/mile = \$14	
Task Total	\$ 7,131

Task 6. Sample YOY in the Colorado River (one September pass)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)	
Fishery Biologist (GS-11) – 1 person for 32 hrs (4 days) at \$52.37/hr	1,676
Biological Technicians (GS-5) – 3 people for 32 hrs (4 days) each (96 total hrs) at \$26.48/hr	2,542
2. Travel	0
3. Equipment	
Boat gas – 47 gallons @ \$4/gallon for 91 octane	188
Ethanol (95% denatured) – one 3-gallon containers @ \$120 each	120
Bottles (30-32 250 ml bottles) @ \$325/case (case = 250 bottles)	40
4. Vehicles	
Vehicle Maintenance & Gasoline (@ \$387/month lease = \$12.91 per day based on 30 days in an “average” month + \$0.35/mile)	
Grand Junction: Redlands Diversion Dam to Redlands Parkway	40
2 vehicles (1 for sampling & 1 for shuttle) X \$12.91/day X 1 day = \$26	
2 vehicles X 20 miles round-trip X 1 day (40 total miles) X \$0.35/mile = \$14	
Grand Junction: Redlands Parkway to Loma	40
2 vehicles (1 for sampling & 1 for shuttle) X \$12.91/day X 1 day = \$26	
2 vehicles X 20 miles round-trip X 1 day (40 total miles) X \$0.35/mile = \$14	
Loma to CO/UT State Line	51
2 vehicles (1 for sampling & 1 for shuttle) X \$12.91/day X 1 day = \$26	
2 vehicles X 36 miles round-trip X 1 day (72 total miles) X \$0.35/mile = \$25	
Task Total	\$ 4,697

Task 7. Analyze muscle plug samples to determine selenium concentrations (Fish and Wildlife Service – Ecological

Services)

1. Unknown number of samples @ \$125/sample
Task Total \$ 0
*** Being funded under a separate agreement

Task 9. Analyze larval samples (Colorado State University – Larval Fish Lab)

1. 363 samples anticipated @ \$300/sample **Task Total** \$ 0
*** Being funded under a separate agreement

Tasks 10 & 11 Input and analyze data, write annual report

1. CRFP – Grand Junction Labor (Federal Salary + Benefits)
Fishery Biologist (GS-11) – 1 person for 160 hrs
(20 days) at \$52.37/hr 8,379
Task Total \$ **8,379**

Project Management: Permitting; Coordination; Office & Administrative Support

1. CRFP – Grand Junction Labor (Federal Salary + Benefits)
Administrative Officer (GS-9) – 1 person for 40 hrs
(10 days) at \$47.44/hr 1,898
Project Leader (GS-14) – 1 person for 40 hrs
(9.5 days) at \$88.50/hr 3,540
Project Management Total: \$ **5,438**

Subtotals by Task for FY-2018

Task 1 (USFWS-CRFP, Grand Jct., CO)	20,114
Task 2 (USFWS-CRFP, Grand Jct., CO)	3,341
Task 3 (USFWS-CRFP, Grand Jct., CO)	22,942
Task 4 (USFWS-CRFP, Grand Jct., CO)	20,171
Task 5 (USFWS-CRFP, Grand Jct., CO)	7,131
Task 6 (USFWS-CRFP, Grand Jct., CO)	4,697
Task 7 (USFWS-Ecological Services, Grand Jct., CO)	0
Task 9 (Colorado State University – Larval Fish Lab)	0
Task 10 & 11 (USFWS-CRFP, Grand Jct., CO)	8,379
Project Management (USFWS-CRFP, Grand Jct., CO)	<u>5,438</u>
FY 2018 Total	\$ 92,213

Funding for FY 2018 by agency:

Fish and Wildlife Service CRFP Total	\$ 92,213
Fish and Wildlife Service Ecological Services Total	\$ 0
Colorado State University – Larval Fish Lab	<u>\$ 0</u>
FY 2018 Total	\$ 92,213

FY-2019 Work (ninth year of multi-year study)

Deliverables/Due Dates:

Annual Report for 2019 work due

11/2019

Budget

(Based on projected FY-2019 costs)

Task 1. Electrofish Gunnison River (two 5-day trips X 6 people/trip)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)

Fishery Biologist (GS-11) – 1 person for 120 hrs
(15 days) at \$53.94/hr 6,473

Bio Tech Crew Leader (GS-6) – 1 person for 80 hrs
(10 days) at \$35.79/hr 2,863

Biological Technicians (GS-5) – 4 people for 72 hrs
(9 days) each (288 total hrs) at \$27.27/hr 7,854

2. Travel

Per Diem (Camp Rate = \$28/day camping)
6 people x 5 days/trip X 2 trip = 60 days @ \$28/day 1,680

3. Equipment

Maintenance/repair 795

Exact use of the money in this line item will vary from year to year depending on what equipment needs to be maintained, repaired, or replaced, but use of these funds for a “typical” field season for one study could include any of the following:

Generator repair/tune-up – 4 hrs @ \$75/hr = \$300

Raft trailer maintenance

Signal light pigtail adapters – \$30 each

Repair raft frame

Aluminum welding – 3 hours @ \$150/hr = \$450

Spark plugs for generators – \$7.50 each = \$15

Boat gas – 2 rafts X 5 gallons/day X 5 days/trip =
50 gallons/trip X 2 trips (100 gallons) at
4.00/gallon for 91 octane 400

4. Vehicles

Vehicle Maintenance & Gasoline (@ \$399/month lease = \$13.30
per day based on 30 days in an “average” month + \$0.36/mile)

(3 vehicles for boats 5 days/trip X 2 trips/year)
3 vehicles X \$13.30/day X 10 days = \$399 399

(1 shuttle vehicle X 2 days/trip X 2 trips/year)
1 vehicle X \$13.30/day X 4 days = \$53 53

(4 vehicles X 80 miles round-trip = 320 total miles)
320 miles X \$0.36/mile = \$115 115

Task Total \$ 20,632

Task 2. Electrofish 18-Mile reach of Colorado River (one 2-day trip
X 4 people/trip)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)	
Fishery Biologist (GS-11) – 1 person for 16 hrs (2.5 days) at \$52.37/hr	863
Biological Technicians (GS-5) – 2 people for 16 hrs (2 days) each (64 total hrs) at \$26.48/hr	1,745
2. Travel	0
3. Equipment	
Maintenance/repair	600
Exact use of the money in this line item will vary from year to year depending on what equipment needs to be maintained, repaired, or replaced, but use of these funds for a “typical” field season for one study could include any of the following:	
Dura-Frame electrofishing dip nets – 2 @ \$300 each = \$600	
Boat gas – 2 rafts X 5 gallons/day X 2 days/trip = 20 gallons/trip X 1 trips (20 gallons) at 4.00/gallon for 91 octane	80
4. Vehicles	
Vehicle Maintenance & Gasoline (@ \$399/month lease = \$13.30 per day based on 30 days in an “average” month + \$0.36/mile)	
(2 vehicles for boats 2 days/trip X 1 trip/year)	
2 vehicles X \$13.30/day X 2 days = \$53	53
(1 shuttle vehicle X 2 days/trip X 1 trip/year)	
1 vehicle X \$13.13/day X 4 days = \$52	53
(3 vehicles X 23 miles round-trip = 69 total miles)	
69 miles X \$0.36/mile = \$25	<u>25</u>
Task Total	\$ 3,419

Task 3. Sample larvae in the Gunnison River (4 days/week for 8 weeks)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)	
Bio Tech Crew Leader (GS-6) – 1 person for 200 hrs (25 days) at \$35.79/hr	7,158
Biological Technicians (GS-5) – 2 person for 200 hrs (25 days) each (400 total hrs) at \$27.27/hr	10,908
2. Travel	0
3. Equipment	
Boat gas – for outboard engines – 640 gallons@ \$4/gallon for 91 octane	2,560
Ethanol (95% denatured) – two 3-gallon containers @ \$120 each	240
Nalgene Sample Bottles (250 ml) – 2 cases (250/case) @ \$325/case	650

4. Vehicles

Vehicle Maintenance & Gasoline (@ \$399/month lease = \$13.30 per day based on 30 days in an “average” month + \$0.36/mile)	
Delta to Escalante Canyon section	674
2 vehicles (1 for sampling & 1 for shuttle) X \$13.30/day X 1 day/week X 8 weeks = \$213	
2 vehicles X 80 miles round-trip X 8 trips (1,280 total miles) X \$0.36/mile = \$461	
Escalante Canyon to Bridgeport section	559
2 vehicles (1 for sampling & 1 for shuttle) X \$13.30/day X 1 day/week X 8 weeks = \$213	
2 vehicles X 60 miles round-trip X 8 trips (960 total miles) X \$0.36/mile = \$346	
Bridgeport to Whitewater section	443
2 vehicles (1 for sampling & 1 for shuttle) X \$13.30/day X 1 day/week X 8 weeks = \$213	
2 vehicles X 40 miles round-trip X 8 trips (640 total miles) X \$0.36/mile = \$230	
Whitewater to Redlands Diversion Dam section	328
2 vehicles (1 for sampling & 1 for shuttle) X \$13.30/day X 1 day/week X 8 weeks = \$213	
2 vehicles X 20 miles round-trip X 8 trips (320 total miles) X \$0.36/mile = \$115	
	Task Total \$ 23,520

Task 4. Sample larvae in the Colorado River (2 10-hour days/week for 8 weeks)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)	
Fishery Biologist (GS-11) – 1 person for 200 hrs (25 days) at \$53.94/hr	10,788
Biological Technicians (GS-5) – 2 people for 128 hrs (16 days) each (256 total hrs) at \$27.27/hr	6,981
2. Travel	0
3. Equipment	
Assorted field equipment	1,035
Exact use of the money in this line item will vary from year to year depending on what equipment needs to be maintained, repaired, or replaced, but use of these funds for a “typical” field season for one study would include the following:	
Stearns Type III life jackets – 3 @ \$70 each = \$210	
Larval seines – 3 at \$200 each = \$600	
Hip boots – 2 pair at \$50/pair = \$100	
Breathable chest waders - 1 pair @ \$125/pair = \$125	
Boat gas – for outboard engines – 200 gallons @ \$4/gallon for 91 octane	800
Ethanol (95% denatured) – one 3-gallon containers	

@ \$120 each	120
Nalgene Sample Bottles (250 ml) – 1 case (250/case)	
@ \$325/case	325

4. Vehicles

Vehicle Maintenance & Gasoline (@ \$399/month lease = \$13.30 per day based on 30 days in an “average” month + \$0.36/mile)	
Grand Junction: Redlands Diversion Dam to Redlands Parkway	328
2 vehicles (1 for sampling & 1 for shuttle) X \$13.30/day X 1 day/week X 8 weeks = \$213	
2 vehicles X 20 miles round-trip X 8 trips (320 total miles) X \$0.36/mile = \$115	
Grand Junction: Redlands Parkway to Loma	328
2 vehicles (1 for sampling & 1 for shuttle) X \$12.91/day X 1 day/week X 8 weeks = \$213	
2 vehicles X 20 miles round-trip X 8 trips (320 total miles) X \$0.354/mile = \$115	

Task Total \$ 20,705

Task 5. Sample YOY in the Gunnison River (one September pass)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)	
Fishery Biologist (GS-11) – 1 person for 48 hrs (6 days) at \$53.94/hr	2,589
Biological Technicians (GS-5) – 3 people for 48 hrs (6 days) each (144 total hrs) at \$27.27/hr	3,927
2. Travel	0
3. Equipment	
Boat gas – 100 gallons @ \$4/gallon for 91 octane	400
Ethanol (95% denatured) – one 3-gallon containers @ \$120 each	120
Bottles (30-32 250 ml bottles) @ \$325/case (case = 250 bottles)	40
4. Vehicles	
Delta to Escalante Canyon section	85
2 vehicles (1 for sampling & 1 for shuttle) X \$13.30/day X 1 day = \$27	
2 vehicles X 80 miles round-trip X 1 day (160 total miles) X \$0.36/mile = \$58	
Escalante Canyon to Bridgeport section	70
2 vehicles (1 for sampling & 1 for shuttle) X \$13.30/day X 1 day = \$27	
2 vehicles X 60 miles round-trip X 1 day (120 total miles) X \$0.36/mile = \$43	
Bridgeport to Whitewater section	56
2 vehicles (1 for sampling & 1 for shuttle) X \$13.30/day	

X 1 day = \$27	
2 vehicles X 40 miles round-trip X 1 day (80 total miles) X \$0.36/mile = \$29	
Whitewater to Redlands Diversion Dam section	41
2 vehicles (1 for sampling & 1 for shuttle) X \$13.30/day X 1 day = \$27	
2 vehicles X 20 miles round-trip X 8 trips (40 total miles) X \$0.36/mile = \$14	
Task Total	\$ 7,328

Task 6. Sample YOY in the Colorado River (one September pass)

1. CRFP Grand Junction Labor (Federal Salary + Benefits)	
Fishery Biologist (GS-11) – 1 person for 32 hrs (4 days) at \$53.94/hr	1,726
Biological Technicians (GS-5) – 3 people for 32 hrs (4 days) each (96 total hrs) at \$27.27/hr	2,618
2. Travel	0
3. Equipment	
Boat gas – 47 gallons @ \$4/gallon for 91 octane	188
Ethanol (95% denatured) – one 3-gallon containers @ \$120 each	120
Bottles (30-32 250 ml bottles) @ \$325/case (case = 250 bottles)	40
4. Vehicles	
Vehicle Maintenance & Gasoline (@ \$399/month lease = \$13.30 per day based on 30 days in an “average” month + \$0.36/mile)	
Grand Junction: Redlands Diversion Dam to Redlands Parkway	41
2 vehicles (1 for sampling & 1 for shuttle) X \$13.30 /day X 1 day = \$27	
2 vehicles X 20 miles round-trip X 1 day (40 total miles) X \$0.36/mile = \$14	
Grand Junction: Redlands Parkway to Loma	41
2 vehicles (1 for sampling & 1 for shuttle) X \$13.30 /day X 1 day = \$27	
2 vehicles X 20 miles round-trip X 1 day (40 total miles) X \$0.36/mile = \$14	
Loma to CO/UT State Line	53
2 vehicles (1 for sampling & 1 for shuttle) X \$13.30 /day X 1 day = \$27	
2 vehicles X 36 miles round-trip X 1 day (72 total miles) X \$0.36/mile = \$26	
Task Total	\$ 4,827

Task 7. Analyze muscle plug samples to determine selenium concentrations (Fish and Wildlife Service – Ecological

Services)

1. Unknown number of samples @ \$125/sample
Task Total \$ 0
*** Being funded under a separate agreement

Task 9. Analyze larval samples (Colorado State University – Larval Fish Lab)

1. 363 samples anticipated @ \$300/sample **Task Total** \$ 0
*** Being funded under a separate agreement

Tasks 10 & 11 Input and analyze data, write annual report

1. CRFP – Grand Junction Labor (Federal Salary + Benefits)
Fishery Biologist (GS-11) – 1 person for 160 hrs
(20 days) at \$53.94/hr 8,630
Task Total \$ **8,630**

Project Management: Permitting; Coordination; Office & Administrative Support

1. CRFP – Grand Junction Labor (Federal Salary + Benefits)
Administrative Officer (GS-9) – 1 person for 40 hrs
(10 days) at \$47.44/hr 1,954
Project Leader (GS-14) – 1 person for 40 hrs
(9.5 days) at \$88.50/hr 3,646
Project Management Total: \$ **5,600**

Subtotals by Task for FY-2018

Task 1 (USFWS-CRFP, Grand Jct., CO)	20,632
Task 2 (USFWS-CRFP, Grand Jct., CO)	3,419
Task 3 (USFWS-CRFP, Grand Jct., CO)	23,520
Task 4 (USFWS-CRFP, Grand Jct., CO)	20,705
Task 5 (USFWS-CRFP, Grand Jct., CO)	7,328
Task 6 (USFWS-CRFP, Grand Jct., CO)	4,827
Task 7 (USFWS-Ecological Services, Grand Jct., CO)	0
Task 9 (Colorado State University – Larval Fish Lab)	0
Task 10 & 11 (USFWS-CRFP, Grand Jct., CO)	8,630
Project Management (USFWS-CRFP, Grand Jct., CO)	<u>5,600</u>
FY 2018 Total	\$ 94,661

Funding for FY 2018 by agency:

Fish and Wildlife Service CRFP Total	\$ 94,661
Fish and Wildlife Service Ecological Services Total	\$ 0
Colorado State University – Larval Fish Lab	<u>\$ 0</u>
FY 2018 Total	\$ 94,661

FY-2020 (Tenth year of multi-year study)

Deliverables/Due Dates:

Annual Report for 2020 Reporting Work	11/2020
Draft report (large-bodied and YOY monitoring for 2011-2019) due for peer review	8/30/2020
Draft final report (large-bodied and YOY monitoring for 2011-2019) due for Biology Committee approval.	10/31/2020
Final Report (large-bodied and YOY monitoring for 2011-2019) due	12/31/2020

Tasks 8, 10, 11 & 13. Input and analyze data, write annual report, prepare draft and produce final large-bodied and YOY report No. 2 for 2011-2019.

1. CRFP Grand Junction Labor (Federal Salary + Benefits)

Fishery Biologist (GS-11) – 1 person for 520 hrs
(65 days) at \$55.56/hr 28,891

Task Total \$28,891

2. Project Management, Coordination, Report Reviewing, Office and Administrative Support

CRFP – Grand Junction (Federal Salary + Benefits)

Administrative Officer (GS-9) – 1 person for 16 hours
(2 days) at \$50.33/hr 805

Project leader (GS-14) – 1 person for 40 hours
5 days) at \$93.9/hr 3,756

Project Management Total \$4,561

FY-2020 Total \$33,452

IX. Budget Summary:

FY-2016

USFWS-CRFP	\$ 87,480
USFWS-ES	\$ 0
Larval Fish Lab	\$ 0
2015 Total	\$ 87,480

FY-2017

USFWS-CRFP	\$114,205
USFWS-ES	\$ 0
Larval Fish Lab	\$ 0
Bio-Statistician	\$ 4,160
2017 Total	\$118,365

FY-2018

USFWS-CRFP	\$ 92,213
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USFWS-ES	\$ 0
Larval Fish Lab	\$ 0
2018 Total	\$ 92,213
FY-2019	
USFWS-CRFP	\$ 94,661
USFWS-ES	\$ 0
Larval Fish Lab	\$ 0
2019 Total	\$ 94,661
FY-2020	
USFWS-CRFP	\$ 33,452
USFWS-ES	\$ 0
Larval Fish Lab	\$ 0
2019 Total	\$ 33,452

5-Year Total = \$426,171

X. Reviewers: Program staff and Biology Committee

XI. References

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Osmundson, D. B., and S. C. Seal. 2009. Successful spawning by stocked razorback sucker in the Gunnison and Colorado rivers, as evidenced by larval fish collections, 2002-2007. Final Report. U. S. Fish and Wildlife Service, Grand Junction, Colorado.

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