

**COLORADO RIVER RECOVERY PROGRAM
FY-2014 SCOPE OF WORK**

Project No.: 163

Aspinall-related fish monitoring – Gunnison and Colorado rivers

Reclamation Agreement number: R10PG40022

Reclamation Agreement term: Oct. 1, 2014 – Sep. 30, 2018

Lead Agency: Fish and Wildlife Service
Colorado River Fishery Project

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Date: May 10, 2013

Category:

Source:

- Ongoing
 Ongoing-revised project
 Requested new project
 Unsolicited proposal

Expected Funding

- 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 new 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 will be to first see (in the first two years of sampling: 2011 and 2012) if sufficient numbers of each can be captured to allow mark-recapture abundance estimation. This would 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). If the 2011-2012 sampling failed to collect sufficient numbers of endangered fish to allow for generation of population estimates (and subsequently density estimates), then monitoring in 2013 and outyears would continue to employ the less reliable 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 2011-2012 were well below the levels needed for generating population estimates, sampling in 2013 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), collected almost 20 years ago, we propose to 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 fish community monitoring in the Gunnison River, tissue samples will be collected to determine selenium concentrations in fish before and after implementation of the SMP. Muscle plug samples will be collected from all adult Colorado pikeminnow, razorback sucker and bonytail encountered. In 2011-2012 muscle plug samples were collected from 30 carp and 30 roundtail chub, and 30 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.

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 2009). During field sampling, razorback sucker capture-recapture data is also collected; we therefore propose here to develop estimates of adult razorback sucker abundance from these data. In 2012, 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. We propose to reinitiate hand-seine larval sampling in both rivers and extend the duration of sampling to encompass the razorback sucker (mid-May to early-July) spawning period (currently budgeted for), as well as the Colorado pikeminnow (mid-June to mid-August) spawning period (if funding and personnel permit -- subject to sequestration). This sampling will provide an index to reproductive success of each species using catch-per-effort (mean number/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. Because of funding constraints in 2013 and 2014 (due to sequestration), the Colorado pikeminnow portion of this sampling may not be able to be performed. 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, once funding was assured.

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). We propose to replicate 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.

IV. Study Goals, Objectives, End Product:

Goals

- 1) Begin a 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.

Objectives

- 1) Initiate a 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) Evaluate reproductive success of endangered fish in the Gunnison and upper Colorado rivers by re-initiating early-life-phase abundance monitoring through systematic collections of larvae (hand seining) and young-of-the-year (beach seining).
- 3) Determine baseline selenium concentrations in Colorado pikeminnow, razorback sucker, and bonytail inhabiting the lower Gunnison River.
- 4) Initiate 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).

End Product

Provide two final reports on study findings. Two reports will be produced: 1) results of endangered fish and fish community monitoring, including adult, YOY and larvae sampling (by CRFP - Grand Junction); 2) results of selenium concentrations found in larvae and tissue samples (by the Grand Junction, CO Ecological Services field station).

Fish Community Monitoring Report:

Draft report ready for peer review on August 30, 2015.

Draft final ready for approval consideration October 31, 2015.

Report finalized November 31, 2015.

Contaminants Report:

Draft report ready for peer review on August 30, 2013.

Draft final ready for approval consideration October 31, 2013.

Report finalized November 31, 2013.

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) to the Loma boat launch (RM 153). 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 to Westwater Wash (RM 125).

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 archival.

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. A 30-foot-long x 6-ft-deep seine with 1/8 inch mesh will be used and two non-overlapping hauls will be made in each backwater. 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 therefore propose to 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. This includes one day for sampling the section between Hartland Diversion and Confluence Park in Delta. 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, and 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 then will be re-visited here. 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 will be developed for the years 2008, 2009, and 2010, for which mark-recapture data already exist. This will provide a baseline for adult razorback sucker monitoring. Estimates will again be calculated in 2015 for the years 2013, 2014, and 2015 from 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 July for razorback larvae and then continue through the end of August for Colorado pikeminnow larvae (if funding and personnel permit -- subject to sequestration). Both the 18-mile reach and the Loma-to-Westwater reach downstream 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-to-State line following ISMP protocol with two seine hauls in each of two backwaters within each 5-mile reach (see McAda et al. 1994).

Both rivers

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, 10, 11: 2011 – Done
- Task 1, 2, 3, 4, 5, 6, 7, 8, 10, 11: 2012 – Done
- Task 1, 2, 3, 4, 5, 6, 9, 10, 11, 12: 2013 – Done

Task 1, 2, 3, 4, 5, 6, 9, 10, 11:	2014
Task 8, 9, 10, 11, 13:	2015
Task 9, 11:	2016
Task 10, 14:	2017
No Tasks Performed	2018

VIII. **FY-2014 Work (fourth year of multi-year study)**

Deliverables/Due Dates:

Annual Report due 12/2014

Budget

(Based on projected FY-2014 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 \$46.53/hr	5,584
Bio Tech Crew Leader (GS-6) – 1 person for 80 hrs (10 days) at \$30.88/hr	2,470
Biological Technicians (GS-5) – 4 people for 72 hrs (9 days) each (288 total hrs) at \$18.39/hr	5,296

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 (@ \$345/month lease = \$11.50 per day based on 30 days in an “average” month + \$0.31/mile) (3 vehicles for boats 5 days/trip X 2 trips/year)	
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3 vehicles X \$11.50/day X 10 days = \$345	345
(1 shuttle vehicle X 2 days/trip X 2 trips/year)	
1 vehicle X \$11.50/day X 4 days = \$46	46
(4 vehicles X 80 miles round-trip = 320 total miles)	
320 miles X \$0.31/mile = \$99	99

Task Total \$ 16,715

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 \$46.53/hr	744
Biological Technicians (GS-5) – 2 people for 16 hrs	
(2 days) each (64 total hrs) at \$18.39/hr	1,180

2. Travel	0
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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
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4. Vehicles	
Vehicle Maintenance & Gasoline (@ \$345/month lease = \$11.50 per day based on 30 days in an “average” month + \$0.31/mile)	
(2 vehicles for boats 2 days/trip X 1 trip/year)	
2 vehicles X \$11.50/day X 2 days = \$465	46
(1 shuttle vehicle X 2 days/trip X 1 trip/year)	
1 vehicle X \$11.50/day X 4 days = \$23	23
(3 vehicles X 23 miles round-trip = 69 total miles)	
108 miles X \$0.31/mile = \$22	<u>22</u>

Task Total \$ **2,695**

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 \$30.88/hr	6,176
Biological Technicians (GS-5) – 2 person for 200 hrs	
(25 days) each (400 total hrs) at \$18.39/hr	7,356

+412

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 (@ \$345/month lease = \$11.50 per day based on 30 days in an “average” month + \$0.31/mile)	
Delta to Escalante Canyon section	581
2 vehicles (1 for sampling & 1 for shuttle) X \$11.50/day X 1 day/week X 8 weeks = \$184	
2 vehicles X 80 miles round-trip X 8 trips (1,280 total miles) X \$0.31/mile = \$397	
Escalante Canyon to Bridgeport section	482
2 vehicles (1 for sampling & 1 for shuttle) X \$11.50/day X 1 day/week X 8 weeks = \$184	
2 vehicles X 60 miles round-trip X 8 trips (960 total miles) X \$0.31/mile = \$298	
Bridgeport to Whitewater section	382
2 vehicles (1 for sampling & 1 for shuttle) X \$11.50/day X 1 day/week X 8 weeks = \$184	
2 vehicles X 40 miles round-trip X 8 trips (640 total miles) X \$0.31/mile = \$198	
Whitewater to Redlands Diversion Dam section	283
2 vehicles (1 for sampling & 1 for shuttle) X \$11.50/day X 1 day/week X 8 weeks = \$184	
2 vehicles X 20 miles round-trip X 8 trips (320 total miles) X \$0.31/mile = \$99	
	Task Total \$ 18,710

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 \$46.53/hr	9,306
Biological Technicians (GS-5) – 2 people for 128 hrs (16 days) each (256 total hrs) at \$18.39/hr	4,708
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 (@ \$345/month lease = \$11.50 per day based on 30 days in an “average” month + \$0.31/mile)	
Grand Junction: Redlands Diversion Dam to Redlands Parkway	283
2 vehicles (1 for sampling & 1 for shuttle) X \$11.50/day	
X 1 day/week X 8 weeks = \$184	
2 vehicles X 20 miles round-trip X 8 trips (320 total miles) X \$0.31/mile = \$99	
Grand Junction: Redlands Parkway to Loma	283
2 vehicles (1 for sampling & 1 for shuttle) X \$11.50/day	
X 1 day/week X 8 weeks = \$184	
2 vehicles X 20 miles round-trip X 8 trips (320 total miles) X \$0.31/mile = \$99	

Task Total \$ 16,860

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 40 hrs	
(6 days) at \$46.53/hr	1,861
Biological Technicians (GS-5) – 3 people for 48 hrs	
(6 days) each (144 total hrs) at \$18.39/hr	2,648
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	83

2 vehicles (1 for sampling & 1 for shuttle) X \$11.50/day X 1 day = \$23	
2 vehicles X 80 miles round-trip X 1 day (160 total miles) X \$0.31/mile = \$50	
Escalante Canyon to Bridgeport section	60
2 vehicles (1 for sampling & 1 for shuttle) X \$11.50/day X 1 day = \$23	
2 vehicles X 60 miles round-trip X 1 day (120 total miles) X \$0.31/mile = \$37	
Bridgeport to Whitewater section	48
2 vehicles (1 for sampling & 1 for shuttle) X \$11.50/day X 1 day = \$23	
2 vehicles X 40 miles round-trip X 1 day (80 total miles) X \$0.31/mile = \$25	
Whitewater to Redlands Diversion Dam section	35
2 vehicles (1 for sampling & 1 for shuttle) X \$11.50/day X 1 day = \$23	
2 vehicles X 20 miles round-trip X 8 trips (40 total miles) X \$0.31/mile = \$12	
Task Total	\$ 5,295

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 \$46.53/hr	1,489
Biological Technicians (GS-5) – 3 people for 32 hrs (4 days) each (96 total hrs) at \$18.39/hr	1,765
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 (@ \$345/month lease = \$11.50 per day based on 30 days in an “average” month + \$0.31/mile)	
Grand Junction: Redlands Diversion Dam to Redlands Parkway	35
2 vehicles (1 for sampling & 1 for shuttle) X \$11.50/day X 1 day = \$23	
2 vehicles X 20 miles round-trip X 1 day (40 total miles) X \$0.31/mile = \$12	
Grand Junction: Redlands Parkway to Loma	35
2 vehicles (1 for sampling & 1 for shuttle) X \$11.50/day	

X 1 day = \$23	
2 vehicles X 20 miles round-trip X 1 day (40 total miles) X \$0.31/mile = \$12	
Loma to CO/UT State Line	45
2 vehicles (1 for sampling & 1 for shuttle) X \$11.50/day X 1 day = \$23	
2 vehicles X 36 miles round-trip X 1 day (72 total miles) X \$0.31/mile = \$22	
Task Total	\$ 3,717

Task 9. Analyze larval samples (Colorado State University – Larval Fish Lab)
 1. 363 samples anticipated @ \$300/sample **Task Total \$108,900**

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 \$46.53/hr 7,445
Task Total \$ 7,445

Task 12. Prepare final contaminates report (Barb Osmundson)
 1. Cost covered by other funding source 0
Task Total \$ 0

Project Management: Permitting; Coordination; Office & Administrative Support

1. CRFP – Grand Junction Labor (Federal Salary + Benefits)
 Administrative Officer (GS-9) – 1 person for 64 hrs
 (8 days) at \$42.15/hr 2,698
 Project Leader (GS-14) – 1 person for 64 hrs
 (8 days) at \$78.63/hr 5,032
Project Management Total: \$ 7,730

Subtotals by Task for FY-2014

Task 1 (USFWS-CRFP, Grand Jct., CO)	16,715
Task 2 (USFWS-CRFP, Grand Jct., CO)	2,695
Task 3 (USFWS-CRFP, Grand Jct., CO)	18,710
Task 4 (USFWS-CRFP, Grand Jct., CO)	16,860
Task 5 (USFWS-CRFP, Grand Jct., CO)	5,295
Task 6 (USFWS-CRFP, Grand Jct., CO)	3,717
Task 9 (Colorado State University – Larval Fish Lab)	108,900
Tasks 10 & 11 (USFWS-CRFP, Grand Jct., CO)	7,445
Project Management (USFWS-CRFP, Grand Jct., CO)	<u>7,730</u>
FY 2014 Total	\$ 188,067

Funding for FY 2014 by agency:

Fish and Wildlife Service CRFP Total \$ 79,167

163 Aspinall-related fish monitoring – Gunnison and Colorado rivers: FY 2014-2015

Colorado State University – Larval Fish Lab	<u>\$108,900</u>
FY 2014 Total	\$188,067

FY-2015 Work (fifth year of multi-year study)

Deliverables/Due Dates:

Annual Report due	12/2015
Draft final report (large-bodied fish monitoring) for peer review due	08/30/2015
Draft final report for Biology Committee approval	10/31/2015
Draft finalized	12/31/2015

Budget

(Based on projected FY-2015 costs)

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 \$47.93/hr	3,834
2. Bio-Statician – 16 hrs (2 days) @ \$125/hr	<u>2,000</u>
Task Total	\$ 5,834

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

1. 363 samples anticipated @ \$300/sample	<u>108,900</u>
Task Total	\$ 108,900

Tasks 10, 11 & 13. Input and analyze data, write annual report, prepare draft and final fish monitoring report No. 1 (large-bodied and YOY).

1. CRFP – Grand Junction Labor (Federal Salary + Benefits) Fishery Biologist (GS-11) – 1 person for 520 hrs (65 days) at \$47.93/hr	24,924
Task Total	\$ 24,924

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 \$43.41/hr	1,736
Project Leader (GS-14) – 1 person for 40 hrs (5 days) at \$80.99/hr	<u>3,240</u>
Project Management Total:	\$ 4,976

Subtotals by Task for FY-2015

Task 8 (USFWS-CRFP, Grand Jct., CO)	5,834
Task 9 (Colorado State University – Larval Fish Lab)	108,900
Task 10, 11 & 13 (USFWS-CRFP, Grand Jct., CO)	24,924

Project Management (USFWS-CRFP, Grand Jct., CO)	<u>4,976</u>
FY 2015 Total	\$ 144,634

Funding for FY 2015 by agency:

Fish and Wildlife Service CRFP Total	\$ 33,734
Bio-Statistician	\$ 2,000
Colorado State University – Larval Fish Lab	<u>\$108,900</u>
FY 2015 Total	\$144,634

**Out-year budgets for Aspinall-related fish community
monitoring: 2016-2018**

**THESE BUDGETS ARE ESTIMATES ONLY AND MAY
NOT REPRESENT ACTUAL COSTS**

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

Deliverables/Due Dates:

Annual Report due 12/2016

Budget

(Based on projected FY-2016 costs)

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

1. 363 samples anticipated @ \$300/sample 108,900

Task Total \$ 108,900

Subtotals by Task for FY-2016

Task 9 (Colorado State University – Larval Fish Lab) 108,900

FY 2016 Total \$ 108,900

Funding for FY 2016 by agency:

Colorado State University – Larval Fish Lab \$108,900

FY 2016 Total \$108,900

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

Deliverables/Due Dates:

Annual Report due 12/2017

Draft final report (Larval fish monitoring)

for peer review due 08/30/2017

Draft final report for Biology Committee approval 10/31/2017

Draft finalized 12/31/2017

Budget

(Based on projected FY-2017 costs)

Tasks 10 & 14. Input and analyze data, write annual report, and prepare draft and final fish monitoring report No. 2 (larval fish).

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

Fishery Biologist (GS-11) – 1 person for 560 hrs

(10 days) at \$50.84/hr 28,470

Task Total \$ 28,470

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 \$46.06/hr	1,842
Project Leader (GS-14) – 1 person for 40 hrs	
(9.5 days) at \$85.92/hr	<u>3,437</u>
Project Management Total:	\$ 5,279

Subtotals by Task for FY-2017

Task 10 & 14 (USFWS-CRFP, Grand Jct., CO)	28,470
Project Management (USFWS-CRFP, Grand Jct., CO)	<u>5,279</u>
FY 2017 Total	\$ 33,749

Funding for FY 2017 by agency:

Fish and Wildlife Service CRFP Total	<u>\$ 33,749</u>
FY 2017 Total	\$ 33,749

FY-2018 Work

No work, off year \$0

IX. Budget summary

2014	\$ 190,344
2015	\$ 144,634
2016	\$ 108,900
2017	\$ 33,789
2018	<u>\$ 0</u>
Total	\$ 477,667

IX. Budget Summary:

FY-2014	
USFWS-GJ	\$ 79,167
Larval Fish Lab	\$108,900
Bio-Statistician	<u>\$ 0</u>
2014 Total	\$188,067
FY-2015	
USFWS-GJ	\$ 33,734
Larval Fish Lab	\$108,900
Bio-Statistician	<u>\$ 2,000</u>
2015 Total	\$144,634

2014-2015 Total = \$332,701

Estimated Budget Summary for Fiscal Years 2016-2018:

FY-2016	
USFWS-GJ	\$ 0
Larval Fish Lab	\$108,900
Bio-Statistician	<u>\$ 0</u>
2016 Total	\$108,900
FY-2017	
USFWS-GJ	\$ 33,749
Larval Fish Lab	\$ 0
Bio-Statistician	<u>\$ 0</u>
2017 Total	\$ 33,749
FY-2018	
USFWS-GJ	\$ 0
Larval Fish Lab	\$ 0
Bio-Statistician	<u>\$ 0</u>
2018 Total	\$ 0
2016-2018 Total = \$142,649	

5-Year Total = \$475,

X. Reviewers: Program staff and Biology Committee

XI. References

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- McAda, C. M. 1994. Interagency standardized monitoring program: summary of results, 1986-1992. Final Report. U. S. Fish and Wildlife Service, Grand Junction, Colorado.
- Miller, W. H., H. M. Tyus, and R. A. Valdez. 1982. Colorado River Fishery Project, Final Report; Part Two, Field Studies. U. S. Fish and Wildlife Service and Bureau of Reclamation. Salt lake City, Utah.
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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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- U.S. Fish and Wildlife Service. 2009. Final Gunnison River basin programmatic biological opinion. Final Report. U.S. Fish and Wildlife Service, Denver, Colorado.
- Williamson, J. H. 1992. Colorado pikeminnow genetic survey-tissue sampling protocol 1992. U. S. Fish and Wildlife Service, Denver, Colorado.