

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

FY 2022-23 SCOPE OF WORK

PROJECT: 163

Project Title

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 Aspinnall Unit and implementation of the Selenium Management Plan.

Bureau of Reclamation Agreement Number:

R20PG00024

Reclamation Agreement Term

Oct. 1, 2019 – Sep. 30, 2024

Note: Recovery Program FY22-23 scopes of work are drafted in May 2021. They often are revised before final Program approval and may subsequently be revised again in response to changing Program needs. Program participants also recognize the need and allow for some flexibility in scopes of work to accommodate new information (especially in nonnative fish management projects) and changing hydrological conditions.

Lead Agency:

U.S. Fish and Wildlife Service
Grand Junction Fish and Wildlife Conservation Office (GJ FWCO)

Principal Investigator:

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Category:

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

Expected Funding Source:

- Annual funds
- Capital funds
- Other [explain]

Relationship to RIPRAP:

Gunnison River Action Plan: Gunnison River Mainstem
V. Monitor populations and habitat and conduct research to support recovery actions.

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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.

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 Aspinnall 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.

The fish assemblage in the Gunnison River will be monitored using electrofishing catch-per-effort as an index to track trends in relative abundance of each species. The assumption inherent when using catch per unit effort 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. 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), 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. Because sub-adult and adult Colorado pikeminnow and razorback sucker are few and/or difficult to locate in the Gunnison River (Burdick 1995), the two species will be monitored using the fish community monitoring. Should numbers of endangered fish sufficient for mark-recapture estimates to be generated, a change in methodology will be considered. 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. 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

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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 2011-2018 were well below the levels needed for generating population estimates, sampling in 2019 and beyond will continue with two electrofishing passes.

For young-of-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.

In the Colorado River, downstream of the Gunnison River inflow, the populations of adult Colorado pikeminnow and razorback sucker are already being monitored (Project 127) with mark-recapture abundance estimation (see Elverud et al 2020). 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 2011-2018 in both rivers from mid-May to early-August, to encompass the spawning season for razorback sucker. This work will be continued in 2022-2026. 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 in both the Colorado and Gunnison Rivers. 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 could be compared with results provided by Osmundson and Burnham (1998) for the years 1986-1994.

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 2011-2021, we replicated that sampling protocol so results in coming years can be compared to those earlier catch rates. This work will also continue from 2022-2026.

Study Goals, Objectives, End Product(s):

Goals

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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 Aspinnall re-operation and the Selenium Management Program (SMP).

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.

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). Young-of-the-year monitoring includes one full pass in both rivers. Due to Recovery Program budget limitation in FY 2022 and FY 2023 larvae sampling will be reduced from nine full passes in 2020-2021 to five full passes in both rivers. We hope to return to a full effort beginning in 2024.

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). Large-bodied monitoring (electrofishing) includes two full passes in the Gunnison River and one pass in the Colorado River.

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 GJ FWCO - Grand Junction). The first report for work performed 2011-2016 is in revision (Elverud *in revision*). In addition, a final draft of the 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) has been provided to the Recovery Program as a courtesy.

Fish Community Monitoring Report:

Draft report ready for peer review on August 30, 2022.

Draft final ready for approval consideration October 31, 2022.

Report finalized November 31, 2022.

Larval Fish Monitoring Report:

Included as appendix in the Fish Community Monitoring Report

Study Area:

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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.

Study Methods/Approach:

Due to Program budget limitations in 2022 and 2023, the number of larval sampling passes in the Colorado and Gunnison Rivers will be reduced from nine to five full passes in both rivers.

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 from mid-May through the beginning of August, or about 12 weeks each year. One complete pass can be made through the study area in four days. For FY2022 and FY 2023, five complete larval passes will be completed. 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

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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. 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.

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.

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

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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.

Task Description, Deliverables 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 late-September or early-October).

Task 2. Electrofish Colorado River for fish community monitoring; one trip (late September or early October).

Task 3. Sample fish larvae: Gunnison and Colorado rivers (mid-May to early August– 5 passes each)

Task 4. Sample YOY in the Gunnison and Colorado rivers (one pass each– in late September or early October)

Task 5. Analyze larval samples (Larval Fish Lab)

Task 6. Analyze data and write annual report

Task 7. Prepare final fish monitoring report

Schedule

Tasks	Fiscal Year
1-7	2022
1-7	2023
1-6	2024
1-6	2025
1-6	2026

Budget Summary:

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FY Year	GJFWCO	3% Overhead *	Total
2022	\$71,693.97	\$2,150.82	\$73,845
2023	\$92,533.70	\$2,776.01	\$95,310
2024	\$98,360.48	\$2,950.81	\$101,311
2025	\$100,326.79	\$3,009.80	\$103,337
2026	\$124,882.24	\$3,746.47	\$128,629
Total	\$487,797.18	\$14,633.92	\$502,431

*Paid to USFWS Interior Regions 5 and 7 not GJFWCO

Reviewers:

Program staff and Biology Committee

References:

Archer, D. L., H. M. Tyus, and R. A. Valdez. 1980. Field methodologies of the Fish and Wildlife Service's Colorado River Fishery Project. Transactions of the Bonneville Chapter of the American Fisheries Society. Salt Lake City, Utah.

Burdick, B. D. 1995. Ichthyofaunal studies of the Gunnison River, Colorado, 1992-1994. Final Report. U. S. Fish and Wildlife Service, Grand Junction, Colorado.

Elverud, D.S. *in revision*. Monitoring Large-Bodied, Young-of-Year, and Larval Fishes of the Upper Colorado River and the Lower Gunnison River, Colorado in Response to Reoperation of the Aspinall Unit Reservoirs 2011-2016. Final Report. U.S. Fish and Wildlife Service, Grand Junction, Colorado.

Elverud, D.S., D. B. Osmundson, and G. C. White. 2020. Population structure, abundance and recruitment of Colorado pikeminnow of the upper Colorado River, 1991–2015. Final Report. U. S. Fish and Wildlife Service, Grand Junction, Colorado.

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.

Osmundson, D. B. 1999. Longitudinal variation in fish community structure and water temperature in the upper Colorado River. Final Report. U. S. Fish and Wildlife Service, Grand Junction, Colorado.

Osmundson, D. B., and K. P. Burnham. 1998. Status and trends of the endangered Colorado squawfish in the upper Colorado River. Transactions of the American Fisheries Society 127:957-970.

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.

SUMMARY OF PROPOSED COSTS

Name of Servicing Agency:	U.S.F.W.S. Grand Junction Fish and Wildlife Conservation Office
Project Name:	er Gunnison and upper Colorado rivers, with emphasis on Colorado pikeminnow and razorback sucker populations, in response to reoperation of the As

	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL
	10/1/2021		10/1/2022		10/1/2023		10/1/2024		10/1/2025		
	Through	9/30/2022	Through	9/30/2023	Through	9/30/2024	Through	9/30/2025	Through	9/30/2026	
Enter the BEGINNING dates for each year ----->											
Enter the ENDING dates for each year ----->											
DIRECT LABOR AND FRINGE BENEFIT COSTS:	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL
Direct Labor - Hourly	\$	40,756.24	\$	54,511.84	\$	55,722.12	\$	56,836.56	\$	72,857.07	\$ 280,683.83
Fringe Benefits - Hourly	\$	20,628.96	\$	27,713.09	\$	27,994.59	\$	28,554.49	\$	36,790.72	\$ 141,681.85
Subtotal of Direct Labor & Fringe Benefits:	\$	61,385.20	\$	82,224.93	\$	83,716.71	\$	85,391.05	\$	109,647.79	\$ 422,365.68
OTHER DIRECT COSTS:	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL
Materials and Supplies	\$	8,102.08	\$	8,102.08	\$	12,348.77	\$	12,595.74	\$	12,847.65	\$ 53,996.32
Travel Costs	\$	2,206.69	\$	2,206.69	\$	2,295.00	\$	2,340.00	\$	2,386.80	\$ 11,435.18
Equipment	\$	-	\$	-	\$	-	\$	-	\$	-	\$ -
Contractors	\$	-	\$	-	\$	-	\$	-	\$	-	\$ -
Subtotal of Other Direct Costs:	\$	10,308.77	\$	10,308.77	\$	14,643.77	\$	14,935.74	\$	15,234.45	\$ 65,431.50
INDIRECT/OVERHEAD COSTS:	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL
Subtotal of Labor and Other Direct Costs:	\$	71,693.97	\$	92,533.70	\$	98,360.48	\$	100,326.79	\$	124,882.24	\$ 487,797.18
Total dollars exempt from indirect/overhead base:	\$	-	\$	-	\$	-	\$	-	\$	-	\$ -
<Enter Description of Indirect/OH Cost #1>	3.00%	\$ 2,150.82	3.00%	\$ 2,776.01	3.00%	\$ 2,950.81	3.00%	\$ 3,009.80	3.00%	\$ 3,746.47	\$ 14,633.92
Total dollars exempt from indirect/overhead base:	\$	-	\$	-	\$	-	\$	-	\$	-	\$ -
<Enter Description of Indirect/OH Cost #2>		\$ -	0.00%	\$ -	0.00%	\$ -	0.00%	\$ -	0.00%	\$ -	\$ -
Subtotal of Indirect/Overhead Costs:	\$	2,150.82	\$	2,776.01	\$	2,950.81	\$	3,009.80	\$	3,746.47	\$ 14,633.92

YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
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SUMMARY OF DIRECT LABOR & FRINGE BENEFITS

Enter Escalation Rates -----> Yr 2 Escalation Rate 0.00%

Project #	Task # or Description	Position Title	GS/WG Grade	GS/WG Step	OPM Pay Location	Current Hourly Rate	YEAR 1					YEAR 2					
							10/1/2021		Through	9/30/2022		10/1/2022		Through	9/30/2023		
							# of Hours	Hourly Rate	Salary Cost	Fringe Rate	Fringe Cost	# of Hours	Hourly Rate	Salary Cost	Fringe Rate	Fringe Cost	
1	163	1 through 7	Fisheries Biologist	11	8	Rest of US	\$ 38.21	576.0	\$ 38.21	\$ 22,008.96	51.50%	\$ 11,334.61	936.0	\$ 38.21	\$ 35,764.56	51.50%	\$ 18,418.75
2	163	1 through 7	Project Leader	14	8	Rest of US	\$ 64.35	40.0	\$ 64.35	\$ 2,574.00	42.80%	\$ 1,101.67	40.0	\$ 64.35	\$ 2,574.00	42.80%	\$ 1,101.67
3	163	1 through 6	Biological Technician (Crew Leader)	7	5	Rest of US	\$ 23.72	184.0	\$ 23.72	\$ 4,364.48	65.00%	\$ 2,836.91	184.0	\$ 23.72	\$ 4,364.48	65.00%	\$ 2,836.91
4	163	1 through 6	Biological Technician (Crew Leader)	6	4	Rest of US	\$ 20.72	-	\$ 20.72	\$ -	49.80%	\$ -	-	\$ 20.72	\$ -	49.80%	\$ -
5	163	1 through 6	Biological Technician	5	1	Rest of US	\$ 16.90	624.0	\$ 16.90	\$ 10,545.60	45.60%	\$ 4,808.79	624.0	\$ 16.90	\$ 10,545.60	45.60%	\$ 4,808.79
6	163	1 through 7	Administrative Officer	9	8	Rest of US	\$ 31.58	40.0	\$ 31.58	\$ 1,263.20	43.30%	\$ 546.97	40.0	\$ 31.58	\$ 1,263.20	43.30%	\$ 546.97
7	163	1 through 6	Biological Technician (Crew Leader) OT	7	5	Rest of US	\$ 35.58	-	\$ 35.58	\$ -	65.00%	\$ -	-	\$ 35.58	\$ -	65.00%	\$ -
8	163	1 through 6	Biological Technician (Crew Leader) OT	6	4	Rest of US	\$ 31.08	-	\$ 31.08	\$ -	49.80%	\$ -	-	\$ 31.08	\$ -	49.80%	\$ -
9	163	1 through 6	Biological Technician OT	5	1	Rest of US	\$ 25.35	-	\$ 25.35	\$ -	45.60%	\$ -	-	\$ 25.35	\$ -	45.60%	\$ -
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24							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
25							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
26							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
27							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
28							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
29							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
30							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
31							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
							1,464.00		\$ 40,756.24		\$ 20,628.96	1,824.00		\$ 54,511.84		\$ 27,713.09	

SUMMARY OF DIRECT LABOR & FRINGE BENEFITS

Yr 3 Escalation Rate 4.00%

Yr 4 Escalation Rate 2.00%

	Project #	Task # or Description	Position Title	GS/WG Grade	GS/WG Step	OPM Pay Location	Current Hourly Rate	YEAR 3					YEAR 4				
								10/1/2023		Through	9/30/2024		10/1/2024		Through	9/30/2025	
								# of Hours	Hourly Rate	Salary Cost	Fringe Rate	Fringe Cost	# of Hours	Hourly Rate	Salary Cost	Fringe Rate	Fringe Cost
1	163	1 through 7	Fisheries Biologist	11	8	Rest of US	\$ 38.21	576.0	\$ 39.74	\$ 22,889.32	51.50%	\$ 11,788.00	576.0	\$ 40.53	\$ 23,347.10	51.50%	\$ 12,023.76
2	163	1 through 7	Project Leader	14	8	Rest of US	\$ 64.35	40.0	\$ 66.92	\$ 2,676.96	42.80%	\$1,145.74	40.0	\$ 68.26	\$ 2,730.50	42.80%	\$1,168.65
3	163	1 through 6	Biological Technician (Crew Leader)	7	5	Rest of US	\$ 23.72	280.0	\$ 24.67	\$ 6,907.26	65.00%	\$4,489.72	280.0	\$ 25.16	\$ 7,045.41	65.00%	\$4,579.52
4	163	1 through 6	Biological Technician (Crew Leader)	6	4	Rest of US	\$ 20.72	-	\$ 21.55	\$ -	49.80%	\$ -	-	\$ 21.98	\$ -	49.80%	\$ -
5	163	1 through 6	Biological Technician	5	1	Rest of US	\$ 16.90	1,248.0	\$ 17.58	\$ 21,934.85	45.60%	\$ 10,002.29	1,248.0	\$ 17.93	\$ 22,373.54	45.60%	\$ 10,202.34
6	163	1 through 7	Administrative Officer	9	8	Rest of US	\$ 31.58	40.0	\$ 32.84	\$ 1,313.73	43.30%	\$ 568.84	40.0	\$ 33.50	\$ 1,340.00	43.30%	\$ 580.22
7	163	1 through 6	Biological Technician (Crew Leader) OT	7	5	Rest of US	\$ 35.58	-	\$ 37.00	\$ -	65.00%	\$ -	-	\$ 37.74	\$ -	65.00%	\$ -
8	163	1 through 6	Biological Technician (Crew Leader) OT	6	4	Rest of US	\$ 31.08	-	\$ 32.32	\$ -	49.80%	\$ -	-	\$ 32.97	\$ -	49.80%	\$ -
9	163	1 through 6	Biological Technician OT	5	1	Rest of US	\$ 25.35	-	\$ 26.36	\$ -	45.60%	\$ -	-	\$ 26.89	\$ -	45.60%	\$ -
10							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
11							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
12							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
13							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
14							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
15							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
16							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
17							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
18							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
19							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
20							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
21							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
22							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
23							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
24							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
25							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
26							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
27							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
28							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
29							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
30							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
31							\$ -	-	\$ -	\$ -	0.00%	\$ -	-	\$ -	\$ -	0.00%	\$ -
								2,184.00		\$ 55,722.12		\$ 27,994.59	2,184.00		\$ 56,836.56		\$ 28,554.49

SUMMARY OF DIRECT LABOR & FRINGE BENEFITS

Yr 5 Escalation Rate	2.00%
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								YEAR 5							
								10/1/2025		Through	9/30/2026		Total Salary Cost	Total Fringe Cost	Total Labor Cost
Project #	Task # or Description	Position Title	GS/WG Grade	GS/WG Step	OPM Pay Location	Current Hourly Rate	# of Hours	Hourly Rate	Salary Cost	Fringe Rate	Fringe Cost				
1	163	1 through 7	Fisheries Biologist	11	8	Rest of US	\$ 38.21	936.0	\$ 41.34	\$ 38,697.83	51.50%	\$ 19,929.38	\$ 142,707.77	\$ 73,494.50	\$ 216,202.27
2	163	1 through 7	Project Leader	14	8	Rest of US	\$ 64.35	40.0	\$ 69.63	\$ 2,785.11	42.80%	\$ 1,192.03	\$ 13,340.57	\$ 5,709.76	\$ 19,050.33
3	163	1 through 6	Biological Technician (Crew Leader)	7	5	Rest of US	\$ 23.72	280.0	\$ 25.67	\$ 7,186.32	65.00%	\$ 4,671.11	\$ 29,867.95	\$ 19,414.17	\$ 49,282.12
4	163	1 through 6	Biological Technician (Crew Leader)	6	4	Rest of US	\$ 20.72	-	\$ 22.42	\$ -	49.80%	\$ -	\$ -	\$ -	\$ -
5	163	1 through 6	Biological Technician	5	1	Rest of US	\$ 16.90	1,248.0	\$ 18.29	\$ 22,821.02	45.60%	\$ 10,406.38	\$ 88,220.61	\$ 40,228.60	\$ 128,449.21
6	163	1 through 7	Administrative Officer	9	8	Rest of US	\$ 31.58	40.0	\$ 34.17	\$ 1,366.80	43.30%	\$ 591.83	\$ 6,546.93	\$ 2,834.82	\$ 9,381.76
7	163	1 through 6	Biological Technician (Crew Leader) OT	7	5	Rest of US	\$ 35.58	-	\$ 38.50	\$ -	65.00%	\$ -	\$ -	\$ -	\$ -
8	163	1 through 6	Biological Technician (Crew Leader) OT	6	4	Rest of US	\$ 31.08	-	\$ 33.63	\$ -	49.80%	\$ -	\$ -	\$ -	\$ -
9	163	1 through 6	Biological Technician OT	5	1	Rest of US	\$ 25.35	-	\$ 27.43	\$ -	45.60%	\$ -	\$ -	\$ -	\$ -
10							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
11							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
12							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
13							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
14							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
15							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
16							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
17							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
18							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
19							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
20							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
21							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
22							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
23							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
24							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
25							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
26							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
27							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
28							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
29							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
30							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
31							\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
								2,544.00		\$ 72,857.07		\$ 36,790.72	\$ 280,683.83	\$ 141,681.85	\$ 422,365.68

SUMMARY OF MATERIALS AND SUPPLIES

SUMMARY OF MATERIALS, SUPPLIES, AND SERVICES

Yr 2 Escalation Rate	0.00%
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	Project #	Task # or Description	Item Description	Rationale for Proposed Cost	Year 1			Year 2		
					Unit Price	Unit Quantity	Subtotal	Unit Price	Unit Quantity	Subtotal
1	163	1 through 7	Miscellaneous Office Supplies	<u>\$520.20 was funded in FY20 Agreement (R20PG00024): Please see year 3 in linked document</u>	\$ 520.20	0	\$ -	\$ 520.20	0	\$ -
2	163	1 through 7	Miscellaneous Field Supplies	<u>\$1560.60 was funded in FY20 Agreement (R20PG00024): Please see year 3 in linked document</u>	\$ 1,560.60	0	\$ -	\$ 1,560.60	0	\$ -
3	163	1 through 7	Miscellaneous Boating Supplies, Repairs, Maintenance	<u>\$2601 was funded in FY20 Agreement (R20PG00024): Please see year 3 in linked document</u>	\$ 2,601.00	1	\$ 2,601.00	\$ 2,601.00	1	\$ 2,601.00
4	163	1 through 7	Boat Gas 91 Octane		\$ 3.12	791	\$ 2,468.87	\$ 3.12	791	\$ 2,468.87
5	163	1	GSA Lease of Equip Code 6359 (monthly lease)	http://www.gsa.gov/portal/category/21852	\$ 448.00	3	\$ 1,344.00	\$ 448.00	3	\$ 1,344.00
6	163	1	GSA Lease of Equip Code 6359 (mileage rate)	http://www.gsa.gov/portal/category/21852	\$ 0.40	4210	\$ 1,688.21	\$ 0.40	4210	\$ 1,688.21
7					\$ -	0	\$ -	\$ -	0	\$ -
8					\$ -	0	\$ -	\$ -	0	\$ -
9					\$ -	0	\$ -	\$ -	0	\$ -
10					\$ -	0	\$ -	\$ -	0	\$ -
11					\$ -	0	\$ -	\$ -	0	\$ -
12					\$ -	0	\$ -	\$ -	0	\$ -
13					\$ -	0	\$ -	\$ -	0	\$ -
14					\$ -	0	\$ -	\$ -	0	\$ -
15					\$ -	0	\$ -	\$ -	0	\$ -
16					\$ -	0	\$ -	\$ -	0	\$ -
17					\$ -	0	\$ -	\$ -	0	\$ -
18					\$ -	0	\$ -	\$ -	0	\$ -
19					\$ -	0	\$ -	\$ -	0	\$ -
20					\$ -	0	\$ -	\$ -	0	\$ -
21					\$ -	0	\$ -	\$ -	0	\$ -
22					\$ -	0	\$ -	\$ -	0	\$ -
23					\$ -	0	\$ -	\$ -	0	\$ -
TOTAL:							\$ 8,102.08			\$ 8,102.08

SUMMARY OF MATERIALS AND SUPPLIES

	Yr 3 Escalation Rate	4.00%	Yr 4 Escalation Rate	2.00%
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SUMMARY OF MATERIALS, SUPPLIES, AND SERVICES

	Project #	Task # or Description	Item Description	Year 3			Year 4			
				Unit Price	Unit Quantity	Subtotal	Unit Price	Unit Quantity	Subtotal	
1	163	1 through 7	Miscellaneous Office Supplies	\$ 541.01	1	\$ 541.01	\$ 551.83	1	\$ 551.83	
2	163	1 through 7	Miscellaneous Field Supplies	\$ 1,623.02	1	\$ 1,623.02	\$ 1,655.48	1	\$ 1,655.48	
3	163	1 through 7	Miscellaneous Boating Supplies, Repairs, Maintenance	\$ 2,705.04	1	\$ 2,705.04	\$ 2,759.14	1	\$ 2,759.14	
4	163	1 through 7	Boat Gas 91 Octane	\$ 3.25	1107	\$ 3,593.38	\$ 3.31	1107	\$ 3,665.24	
5	163	1	GSA Lease of Equip Code 6359 (monthly lease)	\$ 465.92	4	\$ 1,863.68	\$ 475.24	4	\$ 1,900.95	
6	163	1	GSA Lease of Equip Code 6359 (mileage rate)	\$ 0.42	4850	\$ 2,022.64	\$ 0.43	4850	\$ 2,063.10	
7				\$ -	0	\$ -	\$ -	0	\$ -	
8				\$ -	0	\$ -	\$ -	0	\$ -	
9				\$ -	0	\$ -	\$ -	0	\$ -	
10				\$ -	0	\$ -	\$ -	0	\$ -	
11				\$ -	0	\$ -	\$ -	0	\$ -	
12				\$ -	0	\$ -	\$ -	0	\$ -	
13				\$ -	0	\$ -	\$ -	0	\$ -	
14				\$ -	0	\$ -	\$ -	0	\$ -	
15				\$ -	0	\$ -	\$ -	0	\$ -	
16				\$ -	0	\$ -	\$ -	0	\$ -	
17				\$ -	0	\$ -	\$ -	0	\$ -	
18				\$ -	0	\$ -	\$ -	0	\$ -	
19				\$ -	0	\$ -	\$ -	0	\$ -	
20				\$ -	0	\$ -	\$ -	0	\$ -	
21				\$ -	0	\$ -	\$ -	0	\$ -	
22				\$ -	0	\$ -	\$ -	0	\$ -	
23				\$ -	0	\$ -	\$ -	0	\$ -	
						\$ 12,348.77				\$ 12,595.74

SUMMARY OF MATERIALS AND SUPPLIES

Yr 5 Escalation Rate	2.00%
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SUMMARY OF MATERIALS, SUPPLIES, AND SERVICES

				Year 5			
Project #	Task # or Description	Item Description	Unit Price	Unit Quantity	Subtotal	TOTAL	
1	163	1 through 7	Miscellaneous Office Supplies	\$ 562.86	1	\$ 562.86	\$ 1,655.70
2	163	1 through 7	Miscellaneous Field Supplies	\$ 1,688.59	1	\$ 1,688.59	\$ 4,967.09
3	163	1 through 7	Miscellaneous Boating Supplies, Repairs, Maintenance	\$ 2,814.32	1	\$ 2,814.32	\$ 13,480.50
4	163	1 through 7	Boat Gas 91 Octane	\$ 3.38	1107	\$ 3,738.55	\$ 15,934.91
5	163	1	GSA Lease of Equip Code 6359 (monthly lease)	\$ 484.74	4	\$ 1,938.97	\$ 8,391.60
6	163	1	GSA Lease of Equip Code 6359 (mileage rate)	\$ 0.43	4850	\$ 2,104.36	\$ 9,566.52
7				\$ -	0	\$ -	\$ -
8				\$ -	0	\$ -	\$ -
9				\$ -	0	\$ -	\$ -
10				\$ -	0	\$ -	\$ -
11				\$ -	0	\$ -	\$ -
12				\$ -	0	\$ -	\$ -
13				\$ -	0	\$ -	\$ -
14				\$ -	0	\$ -	\$ -
15				\$ -	0	\$ -	\$ -
16				\$ -	0	\$ -	\$ -
17				\$ -	0	\$ -	\$ -
18				\$ -	0	\$ -	\$ -
19				\$ -	0	\$ -	\$ -
20				\$ -	0	\$ -	\$ -
21				\$ -	0	\$ -	\$ -
22				\$ -	0	\$ -	\$ -
23				\$ -	0	\$ -	\$ -
					\$ 12,847.65	\$ 53,996.32	

SUMMARY OF TRAVEL COSTS

Cost Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Trip # 163	1	1	1	1	1	
From-To	Gun. Adult Monitoring	Gun. Adult Monitoring	Gun. Adult Monitoring	Gun. Adult Monitoring	Gun. Adult Monitoring	
Reason	Camping/Field Work	Camping/Field Work	Camping/Field Work	Camping/Field Work	Camping/Field Work	
# of Days (include travel days)	5	5	5	5	5	
Airfare						
Lodging (Per Night)						
MI&E Per Day	\$ 36.78	\$ 36.78	\$ 38.25	\$ 39.00	\$ 39.78	
Auto Rental Per Day						
Total Per Trip	\$ 183.89	\$ 183.89	\$ 191.25	\$ 195.00	\$ 198.90	
No. of persons	6	6	6	6	6	
SUBTOTAL =	\$ 1,103.34	\$ 1,103.34	\$ 1,147.50	\$ 1,170.00	\$ 1,193.40	\$ 5,717.59

Cost Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Trip # 163	2	2	2	2	2	
From-To	Gun. Adult Monitoring	Gun. Adult Monitoring	Gun. Adult Monitoring	Gun. Adult Monitoring	Gun. Adult Monitoring	
Reason	Camping/Field Work	Camping/Field Work	Camping/Field Work	Camping/Field Work	Camping/Field Work	
# of Days (include travel days)	5	5	5	5	5	
Airfare						
Lodging (Per Night)						
MI&E Per Day	\$ 36.78	\$ 36.78	\$ 38.25	\$ 39.00	\$ 39.78	
Auto Rental Per Day						
Total Per Trip	\$ 183.89	\$ 183.89	\$ 191.25	\$ 195.00	\$ 198.90	
No. of persons	6	6	6	6	6	
SUBTOTAL =	\$ 1,103.34	\$ 1,103.34	\$ 1,147.50	\$ 1,170.00	\$ 1,193.40	\$ 5,717.59

	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
TOTAL COST BY PERIOD =	\$ 2,206.69	\$ 2,206.69	\$ 2,295.00	\$ 2,340.00	\$ 2,386.80	\$ 11,435.18