

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

FY 2022-23 SCOPE OF WORK

PROJECT: 140

**Project Title**

Evaluating effects of non-native predator fish removal on native fishes in the Yampa River

**Bureau of Reclamation Agreement Number:**

R19AP00058

**Reclamation Agreement Term:**

1 October 2019-30 September 2023

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*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.*

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**Lead Agency:**

Larval Fish Laboratory

**Principal Investigator:**

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Larval Fish Laboratory  
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Category:

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

Expected Funding Source:

- Annual funds
- Capital funds
- Other [explain]

## UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

### **Relationship to RIPRAP:**

Green River Action Plan: Yampa and Little Snake rivers

See RIPRAP at <http://www.coloradoriverrecovery.org/documents-publications/foundational-documents/recovery-action-plan.html>

III.A.1. Implement Yampa Basin aquatic wildlife management plan to develop nonnative fish control programs in reaches of the Yampa River occupied by endangered fishes. Each control activity will be evaluated for effectiveness and then continued as needed.

III.B.2.h. Monitor native and endangered fish response

### **Study Background/Rationale and Hypotheses:**

Control actions for several non-native fish predators have been implemented in several rivers of the upper Colorado River Basin but effects of those removals on restoration of native fishes requires ongoing monitoring. Understanding the response of the native fish community to predator removal is needed to understand if removal programs are having the desired effect. Strong scientific inferences can be obtained only from studies conducted with a valid methodology. Some of the critical components of an experimental design to assess effects of non-native predator fish removal include estimating the level and precision of the nonnative removal effort, achieving a large treatment (removal) effect, quantifying the response by native fishes to fish removal, comparing results in treatment and reference (control) reaches, replicating those treatments and controls in space and time, and controlling for extraneous confounding variables. This study will provide data to disentangle important the effects of predator removal and river flows on fish community response. Results will support the important role that nonnative fish removal plays in recovery of endangered fishes.

### **Study Goals, Objectives, End Product(s):**

The goal of this work is to reliably estimate the response of resident native fishes to a known, relatively large, and well-estimated level of predator removal.

Specific objectives necessary to achieve that goal for Yampa River fish removal evaluation studies follow.

1. Consider treatment and reference areas for study.
2. Implement removal of smallmouth bass and northern pike in treatment reaches in spring (mostly conducted in Project 125).
3. Assess relative abundance of predators in treatment and reference reaches to determine removal effects.
4. Conduct additional removals of small smallmouth bass prior to summer and early autumn (mostly under project 125, but also some associated with evaluation sampling in this study).
5. Estimate response of native fishes in autumn in control and treatment reaches after spring-summer predator removal, including some emphasis on the Lily Park section of the Yampa River.

End Product: Recovery Program annual reports submitted following the field seasons after sampling was conducted. We have also participated in the annual non-native fish workshops and presented data that were collected as recently as one month prior to the meeting. We completed a four-year data summary

## UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

and evaluation (Bestgen et al. 2007) in March 2007. Another such effort is underway and planned for completion in 2021.

### **Study Area:**

Treatment and reference reaches have been established in the Yampa River as a part of non-native predator removal studies. The upper study area consists of a 24-mile reach (RM 125-101) beginning upstream of Morgan Gulch and ending downstream of Little Yampa Canyon. The downstream 12-mile reach has been designated the removal reach, and the upstream 12-mile reach has been designated the reference reach. This reach was chosen because it is relatively accessible and the reference reach has a sampling history that will be valuable to assessing trends in fish abundance over time. Sampling is in late summer and autumn.

The other treatment area (no reference) is a 5-mile river reach in Lily Park. We plan to continue sampling in the Lily Park reach of the Yampa River if we can maintain access, because it offers a substantially more intact native fish assemblage than the upstream reach and will give us insights into effects of removal in that setting. Sampling in that reach will also offer insights into longitudinal patterns of the fish community, both for native and non-native species, which will allow us to put findings in the upstream reach into better perspective. This sampling is also consistent with nonnative fish predator removal efforts planned under associated project 125. For the past several years we have not been able to sample Lily Park so shifted work to Little Yampa Canyon.

### **Study Methods/Approach:**

Since 2015, the Recovery Program has implemented a two-tiered strategy for reducing populations of problematic nonnative predators in endangered species habitats by 1) performing large-scale removal of nonnative predators, especially focusing on spawning disruption; and 2) preventing escapement of nonnative predators from off-channel sources by containing or eradicating populations. The combination of these two strategies is important because reducing in-river reproduction and limiting emigration from off-channel sources limits population growth after in-river removal is performed. Currently, the Recovery Program removes nonnative smallmouth bass, northern pike and walleye from over 600 miles of river. Screens have been installed on 5 of 7 major reservoir outlets to prevent escapement with 2 more pending.

Over the past decade, this strategy has been applied with general success for smallmouth bass, northern pike, and walleye. For example, in the Yampa River smallmouth bass populations have been contained at Elkhead Reservoir via a spillway net and outlet screen, while spawning has been disrupted via intense nest disruption. As a result, even with occasional strong year classes, the adult population of smallmouth Bass in Little Yampa Canyon remains low compared to almost all prior years ([Hawkins 2020](#)). Northern pike are also contained at Elkhead Reservoir, while spawning in the Yampa River is disrupted via early spring backwater gill-netting. Abundance estimates show that this effort has resulted in a large reduction in Yampa River northern pike between Hayden and Craig compared to estimates a decade ago ([Bestgen et al. 2020](#)). Similarly, in the upper Colorado River, containment at Rifle Gap Reservoir, along with containment and removal at the Mamm Creek gravel ponds, appears to have successfully suppressed catch of northern pike in endangered fish habitats ([Francis 2020](#)). Reservoir containment of walleye is the priority; in-river walleye recruitment has not been documented, so

## UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

spawning disruption is not needed. Catches of walleye in the middle Green River over the past few years have declined from previous norms ([Partlow and Elbin 2020](#)), likely the result of eradication and containment of populations at Red Fleet and Starvation Reservoirs. These examples demonstrate that a two-tiered approach is generally successful at limiting populations of problematic predators.

This project focuses on evaluation of in-river removal of smallmouth bass and response of native fish to that removal. As part of the project, we will include an estimate of native fish response to nonnative removal and provide additional information on smallmouth bass life history related to response to flows. In addition, we will remove individuals of smallmouth bass to reduce the population abundance. We will measure response to these efforts via catch-effort and fish community composition information.

In each of the reference and treatment reaches, we will identify suitable low-velocity channel margin areas for sampling. Low-velocity shoreline areas and backwaters are typically the most sampled habitat types. We also choose areas that are typically available from year to year for sampling if similar areas can be found in each of the reference and treatment reaches, which allows for some documentation of annual changes in young bass abundance. An effort will also be made to choose sampling areas in treatment and reference reaches that are similar in size and habitat characteristics. We have sampled mostly with an electric seine in the past several years although a backpack shocker and conventional seine have been used when turbidity limits sampling efficiency. Samples of each species captured are measured and weighed so that comparisons of size structure could be made. Non-native predators captured in the treatment reach are removed, fish captured in reference areas are returned. We attempt to generate catch/effort estimates for all species captured, including non-native cyprinids, because these species may also show a response to removal of non-native fish predators in the reach. Sampling area and other aspects of the habitat would be quantified so that comparisons could be made between control and reference areas. Data available for comparison among treatment and reference areas would be fish community composition, density estimates based on effort or area sampled, and community size-structure. Large-bodied fish response data in the study area are collected during spring sampling in Project 125 in selected 1-mile reaches.

## UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

### Task Description, Deliverables and Schedule :

Task 1. Preseason logistics and prep sampling equipment.

Task 2. Small-bodied fish sampling.

Task 3. Data entry and analysis.

Task 4. Annual reporting.

Deliverables include an annual report, early November each year. A summary report is being prepared at this time as well.

### Budget Summary:

FY	Amount
2022	\$ 68,278
2023	\$ 68,278
2024	\$ 69,566
2025	\$ 70,745
2026	\$ 71,947
total	\$ 348,814

### Reviewers:

NA

### References:

Bundy, J. M., and K. R. Bestgen. 2001. Evaluation of the Interagency Standardized Monitoring Program Sampling Technique in Backwaters of the Colorado River in the Grand Valley, Colorado. Unpublished report to the Recovery Implementation Program for Endangered Fishes in the Upper Colorado River Basin. Larval Fish Laboratory Contribution 119.

Bestgen, K. R., C. D. Walford, and A. A. Hill. 2007. Native fish response to removal of non-native predator fish in the Yampa River, Colorado. Final report to the Recovery Implementation Program for Endangered Fishes in the Upper Colorado River Basin. U. S. Fish and Wildlife Service, Denver, CO. Larval Fish Laboratory Contribution 150.

**SUMMARY OF PROPOSED COSTS**

<b>Name of Servicing Agency:</b>	<b>Colorado State University</b>
<b>Project Name:</b>	<b>Project 140, Evaluating effects of non-native predator removal on native fishes in the Yampa River, Colorado</b>

	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL
	10/1/2021		10/1/2022		10/2/2023		10/1/2024		10/1/2025		
	Through		Through		Through		Through		Through		
Enter the BEGINNING dates for each year ----->	9/30/2022		10/1/2023		9/30/2024		9/30/2025		9/30/2026		
Enter the ENDING dates for each year ----->											
<b>DIRECT LABOR AND FRINGE BENEFIT COSTS:</b>		<b>YEAR 1</b>		<b>YEAR 2</b>		<b>YEAR 3</b>		<b>YEAR 4</b>		<b>YEAR 5</b>	<b>TOTAL</b>
Direct Labor - Hourly		\$ 37,444.28		\$ 37,444.28		\$ 38,193.17		\$ 38,957.03		\$ 39,736.17	\$ 191,774.93
Fringe Benefits - Hourly		\$ 10,259.73		\$ 10,259.73		\$ 10,579.51		\$ 10,791.10		\$ 11,006.92	\$ 52,896.99
Subtotal of Direct Labor & Fringe Benefits:		\$ 47,704.02		\$ 47,704.02		\$ 48,772.67		\$ 49,748.13		\$ 50,743.09	\$ 244,671.92
<b>OTHER DIRECT COSTS:</b>		<b>YEAR 1</b>		<b>YEAR 2</b>		<b>YEAR 3</b>		<b>YEAR 4</b>		<b>YEAR 5</b>	<b>TOTAL</b>
Materials and Supplies		\$ 1,368.09		\$ 1,368.09		\$ 1,395.45		\$ 1,423.37		\$ 1,451.81	\$ 7,006.81
Travel Costs		\$ 9,037.00		\$ 9,037.00		\$ 9,037.00		\$ 9,037.00		\$ 9,037.00	\$ 45,185.00
Equipment		\$ -		\$ -		\$ -		\$ -		\$ -	\$ -
Contractors		\$ -		\$ -		\$ -		\$ -		\$ -	\$ -
Subtotal of Other Direct Costs:		\$ 10,405.09		\$ 10,405.09		\$ 10,432.45		\$ 10,460.37		\$ 10,488.81	\$ 52,191.81
<b>INDIRECT/OVERHEAD COSTS:</b>		<b>YEAR 1</b>		<b>YEAR 2</b>		<b>YEAR 3</b>		<b>YEAR 4</b>		<b>YEAR 5</b>	<b>TOTAL</b>
Subtotal of Labor and Other Direct Costs:		\$ 58,109.11		\$ 58,109.11		\$ 59,205.12		\$ 60,208.50		\$ 61,231.90	
Total dollars exempt from indirect/overhead base:											
<Enter Description of Indirect/OH Cost #1>	17.50%	\$ 10,169.09	17.50%	\$ 10,169.09	17.50%	\$ 10,360.90	17.50%	\$ 10,536.49	17.50%	\$ 10,715.58	\$ 51,951.15
Total dollars exempt from indirect/overhead base:		\$ -		\$ -		\$ -		\$ -		\$ -	
<Enter Description of Indirect/OH Cost #2>	11.00%		11.00%		11.00%		11.00%		11.00%		\$ -
Subtotal of Indirect/Overhead Costs:		\$ 10,169.09		\$ 10,169.09		\$ 10,360.90		\$ 10,536.49		\$ 10,715.58	\$ 51,951.15
<b>GRAND TOTAL:</b>		<b>YEAR 1</b>		<b>YEAR 2</b>		<b>YEAR 3</b>		<b>YEAR 4</b>		<b>YEAR 5</b>	<b>TOTAL</b>
		\$ 68,278.20		\$ 68,278.20		\$ 69,566.02		\$ 70,744.99		\$ 71,947.48	\$ 348,814.89

# SUMMARY OF DIRECT LABOR & FRINGE BENEFITS

Enter Escalation Rates ----->	Yr 2 Escalation Rate	0.00%
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	Task # or Description	Employee Name	Position Title	Current Hourly Rate	YEAR 1					YEAR 2				
					10/1/2021		Through	9/30/2022		10/1/2022		Through	10/1/2023	
					# of Hours	Hourly Rate	Salary Cost	Fringe Rate	Fringe Cost	# of Hours	Hourly Rate	Salary Cost	Fringe Rate	Fringe Cost
1	1	Bestgen	Principal investigator	\$ 52.79	2.0	\$ 52.79	\$ 105.58	27.40%	\$ 28.93	2.0	\$ 52.79	\$ 105.58	27.40%	\$ 28.93
2	1		Senior technician	\$ 22.54	56.0	\$ 22.54	\$ 1,262.24	27.40%	\$ 345.85	56.0	\$ 22.54	\$ 1,262.24	27.40%	\$ 345.85
3	1		Technician	\$ 14.47	40.0	\$ 14.47	\$ 578.80	27.40%	\$ 158.59	40.0	\$ 14.47	\$ 578.80	27.40%	\$ 158.59
4	2, 3		Principal investigator	\$ 52.79	80.0	\$ 52.79	\$ 4,223.20	27.40%	\$ 1,157.16	80.0	\$ 52.79	\$ 4,223.20	27.40%	\$ 1,157.16
5	2, 3		Senior technician	\$ 22.54	490.0	\$ 22.54	\$ 11,044.60	27.40%	\$ 3,026.22	490.0	\$ 22.54	\$ 11,044.60	27.40%	\$ 3,026.22
6	2, 3		Technician	\$ 14.47	927.8	\$ 14.47	\$ 13,424.83	27.40%	\$ 3,678.40	927.8	\$ 14.47	\$ 13,424.83	27.40%	\$ 3,678.40
7	4		Principal investigator	\$ 52.79	25.0	\$ 52.79	\$ 1,319.75	27.40%	\$ 361.61	25.0	\$ 52.79	\$ 1,319.75	27.40%	\$ 361.61
8	4		Senior technician	\$ 22.54	192.0	\$ 22.54	\$ 4,327.68	27.40%	\$ 1,185.78	192.0	\$ 22.54	\$ 4,327.68	27.40%	\$ 1,185.78
9	4		Technician	\$ 14.47	80.0	\$ 14.47	\$ 1,157.60	27.40%	\$ 317.18	80.0	\$ 14.47	\$ 1,157.60	27.40%	\$ 317.18
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					1,892.77		\$ 37,444.28		\$ 10,259.73	1,892.77		\$ 37,444.28		\$ 10,259.73

# SUMMARY OF DIRECT LABOR & FRINGE BENEFITS

Yr 3 Escalation Rate	2.00%
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Yr 4 Escalation Rate	2.00%
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	Task # or Description	Employee Name	Position Title	Current Hourly Rate	YEAR 3					YEAR 4				
					10/2/2023		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	1	Bestgen	Principal investigator	\$ 52.79	2.0	\$ 53.85	\$ 107.69	27.70%	\$ 29.83	2.0	\$ 54.92	\$ 109.85	27.70%	\$ 30.43
2	1		Senior technician	\$ 22.54	56.0	\$ 22.99	\$ 1,287.48	27.70%	\$ 356.63	56.0	\$ 23.45	\$ 1,313.23	27.70%	\$ 363.77
3	1		Technician	\$ 14.47	40.0	\$ 14.76	\$ 590.38	27.70%	\$ 163.53	40.0	\$ 15.05	\$ 602.18	27.70%	\$ 166.80
4	2, 3		Principal investigator	\$ 52.79	80.0	\$ 53.85	\$ 4,307.66	27.70%	\$ 1,193.22	80.0	\$ 54.92	\$ 4,393.82	27.70%	\$ 1,217.09
5	2, 3		Senior technician	\$ 22.54	490.0	\$ 22.99	\$ 11,265.49	27.70%	\$ 3,120.54	490.0	\$ 23.45	\$ 11,490.80	27.70%	\$ 3,182.95
6	2, 3		Technician	\$ 14.47	927.8	\$ 14.76	\$ 13,693.33	27.70%	\$ 3,793.05	927.8	\$ 15.05	\$ 13,967.20	27.70%	\$ 3,868.91
7	4		Principal investigator	\$ 52.79	25.0	\$ 53.85	\$ 1,346.15	27.70%	\$ 372.88	25.0	\$ 54.92	\$ 1,373.07	27.70%	\$ 380.34
8	4		Senior technician	\$ 22.54	192.0	\$ 22.99	\$ 4,414.23	27.70%	\$ 1,222.74	192.0	\$ 23.45	\$ 4,502.52	27.70%	\$ 1,247.20
9	4		Technician	\$ 14.47	80.0	\$ 14.76	\$ 1,180.75	27.70%	\$ 327.07	80.0	\$ 15.05	\$ 1,204.37	27.70%	\$ 333.61
10					-	\$ -	\$ -	27.70%	\$ -	-	\$ -	\$ -	27.70%	\$ -
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					1,892.77	\$ 38,193.17			\$ 10,579.51	1,892.77	\$ 38,957.03			\$ 10,791.10



# SUMMARY OF DIRECT LABOR & FRINGE BENEFITS

Yr 5 Escalation Rate	2.00%
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					YEAR 5					Total Salary Cost	Total Fringe Cost	Total Labor Cost
					10/1/2025		Through	9/30/2026				
Task # or Description	Employee Name	Position Title	Current Hourly Rate		# of Hours	Hourly Rate	Salary Cost	Fringe Rate	Fringe Cost			
1	1	Bestgen	Principal investigator	\$ 52.79	2.0	\$ 56.02	\$ 112.04	27.70%	\$ 31.04	\$ 540.74	\$ 149.15	\$ 689.89
2	1		Senior technician	\$ 22.54	56.0	\$ 23.92	\$ 1,339.50	27.70%	\$ 371.04	\$ 6,464.70	\$ 1,783.15	\$ 8,247.85
3	1		Technician	\$ 14.47	40.0	\$ 15.36	\$ 614.23	27.70%	\$ 170.14	\$ 2,964.39	\$ 817.66	\$ 3,782.05
4	2, 3		Principal investigator	\$ 52.79	80.0	\$ 56.02	\$ 4,481.69	27.70%	\$ 1,241.43	\$ 21,629.57	\$ 5,966.05	\$ 27,595.63
5	2, 3		Senior technician	\$ 22.54	490.0	\$ 23.92	\$ 11,720.62	27.70%	\$ 3,246.61	\$ 56,566.11	\$ 15,602.55	\$ 72,168.66
6	2, 3		Technician	\$ 14.47	927.8	\$ 15.36	\$ 14,246.54	27.70%	\$ 3,946.29	\$ 68,756.73	\$ 18,965.06	\$ 87,721.79
7	4		Principal investigator	\$ 52.79	25.0	\$ 56.02	\$ 1,400.53	27.70%	\$ 387.95	\$ 6,759.24	\$ 1,864.39	\$ 8,623.63
8	4		Senior technician	\$ 22.54	192.0	\$ 23.92	\$ 4,592.57	27.70%	\$ 1,272.14	\$ 22,164.68	\$ 6,113.65	\$ 28,278.33
9	4		Technician	\$ 14.47	80.0	\$ 15.36	\$ 1,228.45	27.70%	\$ 340.28	\$ 5,928.77	\$ 1,635.32	\$ 7,564.10
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18				\$ -	-	\$ -	\$ -	27.70%	\$ -	\$ -	\$ -	\$ -
19				\$ -	-	\$ -	\$ -	27.70%	\$ -	\$ -	\$ -	\$ -
20				\$ -	-	\$ -	\$ -	27.70%	\$ -	\$ -	\$ -	\$ -
21				\$ -	-	\$ -	\$ -	27.70%	\$ -	\$ -	\$ -	\$ -
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%	\$ -	\$ -	\$ -	\$ -
					1,892.77		\$ 39,736.17		\$ 11,006.92	\$ 191,774.93	\$ 52,896.99	\$ 244,671.92

# SUMMARY OF MATERIALS AND SUPPLIES

SUMMARY OF MATERIALS, SUPPLIES, AND SERVICES

Yr 2 Escalation Rate 0.00%

	Task # or Description	Item Description	Rationale for Proposed Cost	Year 1			Year 2		
				Unit Price	Unit Quantity	Subtotal	Unit Price	Unit Quantity	Subtotal
1	2, 3	gas	Based on previous experience & SOWs funded through BOR agreement R14AP00002 and RP1900058	\$ 2.55	50	\$ 127.66	\$ 2.55	50	\$ 127.66
2	2, 3	oil	Based on previous experience & SOWs funded through BOR agreement R14AP00002 and RP1900058	\$ 2.13	5	\$ 10.64	\$ 2.13	5	\$ 10.64
3	2, 3	props	Based on previous experience & SOWs funded through BOR agreement R14AP00002 and RP1900058	\$ 170.21	1	\$ 170.21	\$ 170.21	1	\$ 170.21
4	2, 3	nets, seines, pens	Based on previous experience & SOWs funded through BOR agreement R14AP00002 and RP1900058	\$ 83.40	4	\$ 333.62	\$ 83.40	4	\$ 333.62
5	2, 3	preservative	Based on previous experience & SOWs funded through BOR agreement R14AP00002 and RP1900058	\$ 28.09	1	\$ 28.09	\$ 28.09	1	\$ 28.09
6	2, 3	misc tools for repairs	Based on previous experience & SOWs funded through BOR agreement R14AP00002 and RP1900058	\$ 18.72	10	\$ 187.23	\$ 18.72	10	\$ 187.23
7	2, 3	raft gear (oars, flotation)	Based on previous experience & SOWs funded through BOR agreement R14AP00002 and RP1900058	\$ 85.11	6	\$ 510.64	\$ 85.11	6	\$ 510.64
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	\$ -
<b>TOTAL:</b>						<b>\$ 1,368.09</b>			<b>\$ 1,368.09</b>

# SUMMARY OF MATERIALS AND SUPPLIES

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

	Task # or Description	Item Description	Year 3			Year 4			
			Unit Price	Unit Quantity	Subtotal	Unit Price	Unit Quantity	Subtotal	
1	2, 3	gas	\$ 2.60	50	\$ 130.21	\$ 2.66	50	\$ 132.82	
2	2, 3	oil	\$ 2.17	5	\$ 10.85	\$ 2.21	5	\$ 11.07	
3	2, 3	props	\$ 173.62	1	\$ 173.62	\$ 177.09	1	\$ 177.09	
4	2, 3	nets, seines, pens	\$ 85.07	4	\$ 340.29	\$ 86.77	4	\$ 347.10	
5	2, 3	preservative	\$ 28.65	1	\$ 28.65	\$ 29.22	1	\$ 29.22	
6	2, 3	misc tools for repairs	\$ 19.10	10	\$ 190.98	\$ 19.48	10	\$ 194.80	
7	2, 3	raft gear (oars, flotation)	\$ 86.81	6	\$ 520.85	\$ 88.54	6	\$ 531.27	
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	\$ -	
					<b>\$ 1,395.45</b>				<b>\$ 1,423.37</b>

# SUMMARY OF MATERIALS AND SUPPLIES

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

			Year 5			
	Task # or Description	Item Description	Unit Price	Unit Quantity	Subtotal	TOTAL
1	2, 3	gas	\$ 2.71	50	\$ 135.47	\$ 653.82
2	2, 3	oil	\$ 2.26	5	\$ 11.29	\$ 54.49
3	2, 3	props	\$ 180.63	1	\$ 180.63	\$ 871.76
4	2, 3	nets, seines, pens	\$ 88.51	4	\$ 354.04	\$ 1,708.67
5	2, 3	preservative	\$ 29.80	1	\$ 29.80	\$ 143.85
6	2, 3	misc tools for repairs	\$ 19.87	10	\$ 198.69	\$ 958.93
7	2, 3	raft gear (oars, flotation)	\$ 90.32	6	\$ 541.89	\$ 2,615.29
8			\$ -	0	\$ -	\$ -
9			\$ -	0	\$ -	\$ -
10			\$ -	0	\$ -	\$ -
11			\$ -	0	\$ -	\$ -
12			\$ -	0	\$ -	\$ -
13			\$ -	0	\$ -	\$ -
14			\$ -	0	\$ -	\$ -
15			\$ -	0	\$ -	\$ -
16			\$ -	0	\$ -	\$ -
17			\$ -	0	\$ -	\$ -
18			\$ -	0	\$ -	\$ -
19			\$ -	0	\$ -	\$ -
					<b>\$ 1,451.81</b>	<b>\$ 7,006.81</b>

## SUMMARY OF TRAVEL COSTS

Cost Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
<b>Trip #</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	
<b>From-To</b>	Fort Collins to Grand Junction	Fort Collins to Grand Junction	Fort Collins to Grand Junction	Fort Collins to Grand Junction	Fort Collins to Grand Junction	
<b>Reason</b>	BC meeting	BC meeting	BC meeting	BC meeting	BC meeting	
<b># of Days (include travel days)</b>	2	2	2	2	2	
<b>Airfare</b>						
<b>Lodging (Per Night)</b>	\$ 88.00	\$ 88.00	\$ 88.00	\$ 88.00	\$ 88.00	
<b>MI&amp;E Per Day</b>	\$ 55.00	\$ 55.00	\$ 55.00	\$ 55.00	\$ 55.00	
<b>Auto Rental Per Day</b>						
<b>Misc Costs/Adjustments/Trip</b>						
<b>Total Per Trip</b>	<b>\$ 258.50</b>	<b>\$ 258.50</b>	<b>\$ 258.50</b>	<b>\$ 258.50</b>	<b>\$ 258.50</b>	
<b>No. of persons</b>	2	2	2	2	2	
<b>Mileage rate</b>	\$ 0.50	\$ 0.50	\$ 0.50	\$ 0.50	\$ 0.50	
<b>Total miles</b>	640	640	640	640	640	
<b>SUBTOTAL =</b>	<b>\$ 837.00</b>	<b>\$ 837.00</b>	<b>\$ 837.00</b>	<b>\$ 837.00</b>	<b>\$ 837.00</b>	<b>\$ 4,185.00</b>
<b>Cost Element</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>TOTAL</b>
<b>Trip #</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	
<b>From-To</b>	Fort Collins-Maybell	Fort Collins-Maybell	Fort Collins-Maybell	Fort Collins-Maybell	Fort Collins-Maybell	
<b>Reason</b>	Field Work	Field Work	Field Work	Field Work	Field Work	
<b># of Days (include travel days)</b>	6	6	6	6	6	
<b>Airfare</b>						
<b>Lodging (Per Night)</b>	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	
<b>MI&amp;E Per Day</b>	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	
<b>Auto Rental Per Day</b>						
<b>Misc Costs/Adjustments/Trip</b>						
<b>Total Per Trip</b>	<b>\$ 287.50</b>	<b>\$ 287.50</b>	<b>\$ 287.50</b>	<b>\$ 287.50</b>	<b>\$ 287.50</b>	
<b>No. of persons</b>	4	4	4	4	4	
<b>Mileage rate</b>	\$ 0.50	\$ 0.50	\$ 0.50	\$ 0.50	\$ 0.50	
<b>Total miles</b>	1,800	1,800	1,800	1,800	1,800	
<b>SUBTOTAL =</b>	<b>\$ 2,050.00</b>	<b>\$ 2,050.00</b>	<b>\$ 2,050.00</b>	<b>\$ 2,050.00</b>	<b>\$ 2,050.00</b>	<b>\$ 10,250.00</b>

## SUMMARY OF TRAVEL COSTS

Cost Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
<b>Trip #</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	
<b>From-To</b>	Fort Collins-Maybell	Fort Collins-Maybell	Fort Collins-Maybell	Fort Collins-Maybell	Fort Collins-Maybell	
<b>Reason</b>	Field Work	Field Work	Field Work	Field Work	Field Work	
<b># of Days (include travel days)</b>	6	6	6	6	6	
<b>Airfare</b>						
<b>Lodging (Per Night)</b>	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	
<b>MI&amp;E Per Day</b>	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	
<b>Auto Rental Per Day</b>						
<b>Misc Costs/Adjustments/Trip</b>						
<b>Total Per Trip</b>	<b>\$ 287.50</b>	<b>\$ 287.50</b>	<b>\$ 287.50</b>	<b>\$ 287.50</b>	<b>\$ 287.50</b>	
<b>No. of persons</b>	4	4	4	4	4	
<b>Mileage rate</b>	\$ 0.50	\$ 0.50	\$ 0.50	\$ 0.50	\$ 0.50	
<b>Total miles</b>	1,800	1,800	1,800	1,800	1,800	
<b>SUBTOTAL =</b>	<b>\$ 2,050.00</b>	<b>\$ 2,050.00</b>	<b>\$ 2,050.00</b>	<b>\$ 2,050.00</b>	<b>\$ 2,050.00</b>	<b>\$ 10,250.00</b>

Cost Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
<b>Trip #</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>4</b>	
<b>From-To</b>	Fort Collins-Maybell	Fort Collins-Maybell	Fort Collins-Maybell	Fort Collins-Maybell	Fort Collins-Maybell	
<b>Reason</b>	Field Work	Field Work	Field Work	Field Work	Field Work	
<b># of Days (include travel days)</b>	6	6	6	6	6	
<b>Airfare</b>						
<b>Lodging (Per Night)</b>	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	
<b>MI&amp;E Per Day</b>	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	
<b>Auto Rental Per Day</b>						
<b>Misc Costs/Adjustments/Trip</b>						
<b>Total Per Trip</b>	<b>\$ 287.50</b>	<b>\$ 287.50</b>	<b>\$ 287.50</b>	<b>\$ 287.50</b>	<b>\$ 287.50</b>	
<b>No. of persons</b>	4	4	4	4	4	
<b>Mileage rate</b>	\$ 0.50	\$ 0.50	\$ 0.50	\$ 0.50	\$ 0.50	
<b>Total miles</b>	1,800	1,800	1,800	1,800	1,800	
<b>SUBTOTAL =</b>	<b>\$ 2,050.00</b>	<b>\$ 2,050.00</b>	<b>\$ 2,050.00</b>	<b>\$ 2,050.00</b>	<b>\$ 2,050.00</b>	<b>\$ 10,250.00</b>

## SUMMARY OF TRAVEL COSTS

Cost Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
<b>Trip #</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	
<b>From-To</b>	Fort Collins- Maybell	Fort Collins- Maybell	Fort Collins- Maybell	Fort Collins- Maybell	Fort Collins- Maybell	
<b>Reason</b>	Field Work	Field Work	Field Work	Field Work	Field Work	
<b># of Days (include travel days)</b>	6	6	6	6	6	
<b>Airfare</b>						
<b>Lodging (Per Night)</b>	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	
<b>MI&amp;E Per Day</b>	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	
<b>Auto Rental Per Day</b>						
<b>Misc Costs/Adjustments/Trip</b>						
<b>Total Per Trip</b>	\$ 287.50	\$ 287.50	\$ 287.50	\$ 287.50	\$ 287.50	
<b>No. of persons</b>	4	4	4	4	4	
<b>Mileage rate</b>	\$ 0.50	\$ 0.50	\$ 0.50	\$ 0.50	\$ 0.50	
<b>Total miles</b>	1,800	1,800	1,800	1,800	1,800	
<b>SUBTOTAL =</b>	\$ 2,050.00	\$ 2,050.00	\$ 2,050.00	\$ 2,050.00	\$ 2,050.00	\$ 10,250.00

Cost Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
<b>Trip #</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>6</b>	
<b>From-To</b>	Fort Collins- Maybell	Fort Collins- Maybell	Fort Collins- Maybell	Fort Collins- Maybell	Fort Collins- Maybell	
<b>Reason</b>	Field Work	Field Work	Field Work	Field Work	Field Work	
<b># of Days (include travel days)</b>						
<b>Airfare</b>						
<b>Lodging (Per Night)</b>	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	
<b>MI&amp;E Per Day</b>	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	\$ 25.00	
<b>Auto Rental Per Day</b>						
<b>Misc Costs/Adjustments/Trip</b>						
<b>Total Per Trip</b>	\$ (12.50)	\$ (12.50)	\$ (12.50)	\$ (12.50)	\$ (12.50)	
<b>No. of persons</b>						
<b>Mileage rate</b>	\$ 0.50	\$ 0.50	\$ 0.50	\$ 0.50	\$ 0.50	
<b>Total miles</b>						
<b>SUBTOTAL =</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

## SUMMARY OF TRAVEL COSTS

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	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
TOTAL COST BY PERIOD =	\$ 9,037.00	\$ 9,037.00	\$ 9,037.00	\$ 9,037.00	\$ 9,037.00	\$ 45,185.00