

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

FY 2022-23 SCOPE OF WORK

PROJECT: 132

**Project Title**

Population estimate of Humpback Chub in Westwater Canyon.

**Bureau of Reclamation Agreement Number:**

R19AP00059

**Reclamation Agreement Term**

Oct. 1, 2019 - Sept. 30, 2024

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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:**

Utah Division of Wildlife Resources

**Principal Investigator:**

Brian Hines and Katherine Creighton

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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:**

GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN

- V. Monitor populations and habitat and conduct research to support recovery actions (research, monitoring, and data management).

COLORADO RIVER ACTION PLAN: MAINSTEM

- V. Monitor populations and habitat and conduct research to support recovery actions (research, monitoring, and data management).

V.C.2. Westwater

## UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

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

In 2002, the U.S. Fish and Wildlife Service set recovery goals for the endangered Humpback Chub. Recovery goals are based in part on maintaining populations of Humpback Chub in several locations, among which is the Westwater Canyon population on the Colorado River. Setting, maintaining, and monitoring a population necessitates obtaining accurate population estimates based on a multiple mark-recapture model. To achieve downlisting, accurate population estimates are needed over a 5-year monitoring period. Delisting requires a 3-year monitoring period beyond once downlisting is achieved (USFWS 2002)

Three-year population estimates were conducted for the Westwater Canyon Humpback Chub population during 1998-2000 and 2003-2005. Capture  $M_0$  model (null model) population estimates were: (1998: 4,744, 1999: 2,215, 2000: 2,201) with respective profile likelihood intervals (1998: 3,760-14,665; 1999: 1,608-7,508; 2000: 1,335-4,124) (Jackson 2010). From 1998 through 2000, the probability of capture ( $p$ -hat) and coefficient of variation (CV) increased slightly (1998:  $p$ -hat=0.035, CV= 0.23; 1999:  $p$ -hat=0.041, CV= 0.28; 2000:  $p$ -hat=0.041, CV= 0.28) (Jackson 2010). The population model estimates from Capture  $M_t$  model were: (2003: 2,973, 2004: 1,729, 2005: 1,210) with respective profile likelihood intervals (2003: 1,710-6,042, 2004: 1,121-2,967, 2005: 880-1,769) (Jackson 2010).

Two-year population estimates were conducted for Westwater Canyon in 2007-2008, 2011-2012, 2016-2017, and 2020-2021. The population model estimates from Capture  $M_t$  model were: (2007: 1,757, 2008: 1,315) with respective profile likelihood intervals (2007: 1,097-3,173, 2008: 969 - 1,896,) (Elverud 2012). The probability of capture ( $p$ -hat) and coefficient of variation (CV) from 2007 and 2008 were: (2007:  $p$ -hat = 0.05, CV = 0.27; 2008:  $p$ -hat = 0.08, CV = 0.17) (Elverud 2012). The population model estimates for 2011-2021 were calculated using robust design closed capture models. The estimates for 2011 were 1,467 (1,175-1,861 95% CI) and 1,315 (1,022-1,1713 95% CI) for 2012 (Hines et al 2016). The probability of capture ( $p$ -hat) and coefficient of variation (CV) from 2011 and 2012 were: (2011:  $p$ -hat = 0.23, CV = 0.12; 2012:  $p$ -hat = 0.16, CV = 0.13) (Hines et al 2016). The abundance estimates for 2016 and 2017 are 23,301 (2,360-4,718 95% CI) and 3,290 (2,217-5,000 95% CI), respectively. The probability of capture ( $p$ -hat) and coefficient of variation (CV) from 2016 and 2017 were: ( $p$ -hat = 0.29, CV = 0.19;  $p$ -hat = 0.04, CV = 0.21, respectively) (Hines et al 2020).

The recovery goals require that population estimates for Westwater Canyon Humpback Chub be conducted 2–3 consecutive years with 1–2 years between blocks of estimates. Information collected previously by the Utah Division of Wildlife Resources-Moab Field Station and recommendations from the USFWS population estimate workshops held in Winter 2002 are incorporated into the approach to provide the best opportunity of determining the most accurate and precise estimate for the Westwater Canyon Humpback Chub population.

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

#### *Goal:*

To estimate the population size of Humpback Chub in Westwater Canyon with coefficient of variation of less than 20%.

#### *Objectives:*

1. Obtain population and survival estimates of adult Humpback Chub (> 200 mm) in Westwater Canyon

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2. Determine mean estimated recruitment of naturally produced subadult Humpback Chub (150-199 mm) in Westwater Canyon

### *End Product:*

Annual progress report detailing these data (including population estimates, 95% confidence intervals, coefficients of variation, and probabilities of capture). In the year following field work a final report will be prepared, which will incorporate in-depth analyses (including population estimates, 95% confidence intervals, coefficients of variation, and probabilities of capture) for both years of the study.

### **Study Area:**

Westwater Canyon, Colorado River (RM 124.5-112.5), Utah. Sampling will occur at four locations:

1. RM 124.5-123.7 - Above and Below Miners Cabin
2. RM 123.2-121.7 – Above Cougar Bar
3. RM 121.7-120.8 - Cougar Bar to Little Hole
4. RM 120.0-119.5 - Hades Bar

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

Three sampling trips will be made in September and October approximately one to two weeks apart. The first trip is preferably scheduled when river temperatures are below 20°C to reduce handling stress and delayed mortality (Hunt et al 2012). Each of the four sampling locations will be sampled for one night around the crepuscular hours (i.e., late afternoon to midnight, and pre-dawn to mid-morning). Three of these sites will be sampled for an additional night to maximize captures of Humpback Chub in Westwater Canyon (Above and Below Miners Cabin, RM 124.5-123.7; Above Cougar Bar, RM 123.2-121.7; Cougar Bar to Little Hole, RM 121.7-120.8).

Humpback Chub will be captured using trammel and hoop nets and electrofishing at each sampling location. The number of trammel nets set at each sampling location will be maximized according to available sampling habitat (5-8 nets per sampling location). Trammel nets will be fished in 1.5 to 2 hour sets from late afternoon through approximately 2300 hrs. At that time, the nets will be pulled for the remainder of the night. Trammel nets will again be fished in 1.5 to 2 hour nets sets from pre-dawn through mid-morning. The number of hoop nets set at each sampling location will be maximized according to available sampling habitat (~5-10 set in areas where we cannot set trammel nets). Hoop nets will be scented and fished for ~18-24 hrs (set early afternoon and checked midmorning the following day). Electrofishing will be conducted at each sampling location prior to nets being set in the afternoon. All chubs will be scanned for a PIT tag, tagged (if necessary), measured for total length (mm), weighed (g), principal dorsal and anal fin rays counted, and released. Other endangered fish captured will be scanned for a PIT tag, tagged (if necessary), measured for total length (mm), weighed (g), and released. All other native fish captured will be counted and released. All nonnative fish will be counted and euthanized fish will also be measured for total length (mm), weighed (g), and disposed of accordingly. This information will be collected immediately after capture to reduce handling stress.

### **Task Description, Deliverables and Schedule:**

Task 1: Sampling: Complete 3 sampling trips in Westwater Canyon (September-October 2024 and 2025).

Task 2: Data entry, analysis, and reporting: Data will be entered into a database on the computer and submitted to STReAMS by January 15 each year following sampling. An annual progress report

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including: 1) number of passes made; 2) estimator model used (and why) and point estimate (N-hat); 3) confidence interval; 4) probability of capture (p-hat) and coefficient of variation (C.V.); 5) length frequency charts with demarcation of subadults and adults; and 6) percentage of subadult to adult fish, which will be submitted in November each year following sampling (October-November 2024 and 2025). 7) summary table of all species collected/trip

Task 3: A final report will be prepared following the final year of sampling (March 2027)

Deliverables:

	Deliverable	Due Date
FY 2022		
FY 2023		
FY 2024	Annual Report	November 2024
FY 2025	Annual Report, Final Report	November 2025, March 2027
FY 2026		

Schedule:

Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1									X	X		
2										X	X	X
3	X	X	X	X	X	X	X	X	X	X	X	X

Budget Summary:

FY Year	UDWR
2022	\$0
2023	\$0
2024	\$101,316
2025	\$127,585
2026	\$0
Total	\$228,901

Reviewers:

NA

References:

Elverud, D.S. 2012. Population Estimates for Humpback Chub (*Gila cypha*) and Roundtail Chub (*Gila robusta*) in Westwater Canyon, Colorado River, Utah. Final Report Of the Utah Division of Wildlife Resources to the Upper Colorado River Endangered Fish Recovery Program, Denver, CO.

Hines, B. A., K. R. Bestgen, and G. C. White. 2016. Abundance Estimates for Humpback Chub (*Gila cypha*) and Roundtail Chub (*Gila robusta*) in Westwater Canyon, Utah 2011-2012. Final Report of the Utah Division of Wildlife Resources to the Upper Colorado River Endangered Fish Recovery Program, Denver Colorado.

Hines, B. A., K. R. Bestgen, and G. C. White. 2020. Abundance Estimates for Humpback Chub (*Gila cypha*) and Roundtail Chub (*Gila robusta*) in Westwater Canyon, Utah 2016-2017. Final Report of

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the Utah Division of Wildlife Resources to the Upper Colorado River Endangered Fish Recovery Program, Denver Colorado.

Hunt, T. A., C. R. Propper, A.C. Gibb, and D.L. Ward. 2012. Effects of capture by trammel net on the Colorado River native fishes. *Journal of Fish and Wildlife Management* 3(1): 133-141.

Jackson, J.A. 2010. Population Estimate for Humpback Chub (*Gila cypha*) and Roundtail Chub (*Gila robusta*) in Westwater Canyon, Colorado River, Utah 2003-2005. Final Report of the Utah Division of Wildlife Resources to the Upper Colorado River Endangered Fish Recovery Program, Denver Colorado.

U.S. Fish and Wildlife Service. 2002. Humpback Chub (*Gila cypha*) Recovery Goals: amendment and supplement to the Humpback Chub Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

**SUMMARY OF PROPOSED COSTS**

<b>Name of Servicing Agency:</b>	Utah Division of Wildlife Resources
<b>Project Name:</b>	Project 132 Humpback chub monitoring in Westwater Canyon

	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	9/30/2022	Through	10/1/2023	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 ----->											
<b>DIRECT LABOR AND FRINGE BENEFIT COSTS:</b>	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL
Direct Labor - Hourly	\$	-	\$	-	\$	59,697.96	\$	75,518.44	\$	-	\$ 135,216.40
Fringe Benefits - Hourly	\$	-	\$	-	\$	18,851.92	\$	27,908.11	\$	-	\$ 46,760.03
Subtotal of Direct Labor & Fringe Benefits:	\$	-	\$	-	\$	78,549.88	\$	103,426.54	\$	-	\$ 181,976.42
<b>OTHER DIRECT COSTS:</b>	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL
Materials and Supplies	\$	-	\$	-	\$	15,912.00	\$	17,166.60	\$	-	\$ 33,078.60
Travel Costs	\$	-	\$	-	\$	6,854.40	\$	6,991.49	\$	-	\$ 13,845.89
Equipment	\$	-	\$	-	\$	-	\$	-	\$	-	\$ -
Contractors	\$	-	\$	-	\$	-	\$	-	\$	-	\$ -
Subtotal of Other Direct Costs:	\$	-	\$	-	\$	22,766.40	\$	24,158.09	\$	-	\$ 46,924.49
<b>INDIRECT/OVERHEAD COSTS:</b>	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL
Subtotal of Labor and Other Direct Costs:	\$	-	\$	-	\$	101,316.28	\$	127,584.63	\$	-	
Total dollars exempt from indirect/overhead base:	\$	-	\$	-	\$	101,316.28	\$	127,584.63	\$	-	
<Enter Description of Indirect/OH Cost #1>	0.00%	\$ -	0.00%	\$ -	0.00%	\$ -	0.00%	\$ -	0.00%	\$ -	\$ -
Total dollars exempt from indirect/overhead base:	\$	-	\$	-	\$	-	\$	-	\$	-	
<Enter Description of Indirect/OH Cost #2>	0.00%	\$ -	0.00%	\$ -	0.00%	\$ -	0.00%	\$ -	0.00%	\$ -	\$ -
Subtotal of Indirect/Overhead Costs:	\$	-	\$	-	\$	-	\$	-	\$	-	\$ -

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
<b>GRAND TOTAL:</b>	\$ -	\$ -	\$ 101,316.28	\$ 127,584.63	\$ -	\$ 228,900.91

**SUMMARY OF DIRECT LABOR & FRINGE BENEFITS**

Enter Escalation Rates ----->	Yr 2 Escalation Rate	0.00%
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	Task # or Description	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	Project Leader(1)	\$ 27.66		\$ 27.66	\$ -	48.00%	\$ -		\$ 27.66	\$ -	48.00%	\$ -
2	1	Biologist(4)	\$ 22.91		\$ 22.91	\$ -	68.00%	\$ -		\$ 22.91	\$ -	68.00%	\$ -
3	1	Technician(s)(12)	\$ 16.36		\$ 16.36	\$ -	8.77%	\$ -		\$ 16.36	\$ -	8.77%	\$ -
4	2	Project Leader(1)	\$ 27.66		\$ 27.66	\$ -	48.00%	\$ -		\$ 27.66	\$ -	48.00%	\$ -
5	2	Biologist(4)	\$ 22.91		\$ 22.91	\$ -	68.00%	\$ -		\$ 22.91	\$ -	68.00%	\$ -
6	2	Technician(s)(12)	\$ 16.36		\$ 16.36	\$ -	8.77%	\$ -		\$ 16.36	\$ -	8.77%	\$ -
7	3	Project Leader(1)	\$ 27.66		\$ 27.66	\$ -	48.00%	\$ -		\$ 27.66	\$ -	48.00%	\$ -
8	3	Biologist(4)	\$ 22.91		\$ 22.91	\$ -	68.00%	\$ -		\$ 22.91	\$ -	68.00%	\$ -
9	3	Technician(s)(12)	\$ 16.36		\$ 16.36	\$ -	8.77%	\$ -		\$ 16.36	\$ -	8.77%	\$ -
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**SUMMARY OF DIRECT LABOR & FRINGE BENEFIT:**

Yr 3 Escalation Rate	2.00%
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Yr 4 Escalation Rate	2.00%
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				YEAR 3					YEAR 4				
				10/2/2023		Through	9/30/2024		10/1/2024		Through	9/30/2025	
Task # or Description	Position Title	Current Hourly Rate		# of Hours	Hourly Rate	Salary Cost	Fringe Rate	Fringe Cost	# of Hours	Hourly Rate	Salary Cost	Fringe Rate	Fringe Cost
1	1	Project Leader(1)	\$ 27.66	240.0	\$ 28.21	\$ 6,770.07	48.00%	\$ 3,249.63	240.0	\$ 28.77	\$ 6,905.47	48.00%	\$ 3,314.62
2	1	Biologist(4)	\$ 22.91	600.0	\$ 23.37	\$ 14,019.21	68.00%	\$ 9,533.06	600.0	\$ 23.83	\$ 14,299.59	68.00%	\$ 9,723.72
3	1	Technician(s)(12)	\$ 16.36	2,000.0	\$ 16.69	\$ 33,374.40	8.77%	\$ 2,926.93	2,000.0	\$ 17.02	\$ 34,041.89	8.77%	\$ 2,985.47
4	2	Project Leader(1)	\$ 27.66	40.0	\$ 28.21	\$ 1,128.34	48.00%	\$ 541.61	40.0	\$ 28.77	\$ 1,150.91	48.00%	\$ 552.44
5	2	Biologist(4)	\$ 22.91	160.0	\$ 23.37	\$ 3,738.46	68.00%	\$ 2,542.15	160.0	\$ 23.83	\$ 3,813.22	68.00%	\$ 2,592.99
6	2	Technician(s)(12)	\$ 16.36	40.0	\$ 16.69	\$ 667.49	8.77%	\$ 58.54	40.0	\$ 17.02	\$ 680.84	8.77%	\$ 59.71
7	3	Project Leader(1)	\$ 27.66	-	\$ 28.21	\$ -	48.00%	\$ -	80.0	\$ 28.77	\$ 2,301.82	48.00%	\$ 1,104.87
8	3	Biologist(4)	\$ 22.91	-	\$ 23.37	\$ -	68.00%	\$ -	460.0	\$ 23.83	\$ 10,963.02	68.00%	\$ 7,454.85
9	3	Technician(s)(12)	\$ 16.36	-	\$ 16.69	\$ -	8.77%	\$ -	80.0	\$ 17.02	\$ 1,361.68	8.77%	\$ 119.42
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				<b>3,080.00</b>		<b>\$ 59,697.96</b>		<b>\$ 18,851.92</b>	<b>3,700.00</b>		<b>\$ 75,518.44</b>		<b>\$ 27,908.11</b>



**SUMMARY OF DIRECT LABOR & FRINGE BENEFIT:**

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
Task # or Description	Position Title	Current Hourly Rate	# of Hours	Hourly Rate	Salary Cost	Fringe Rate	Fringe Cost				
1	1	Project Leader(1)	\$ 27.66		\$ 29.35	\$ -	48.00%	\$ -	\$ 13,675.53	\$ 6,564.26	\$ 20,239.79
2	1	Biologist(4)	\$ 22.91		\$ 24.31	\$ -	68.00%	\$ -	\$ 28,318.80	\$ 19,256.78	\$ 47,575.58
3	1	Technician(s)(12)	\$ 16.36		\$ 17.36	\$ -	8.77%	\$ -	\$ 67,416.29	\$ 5,912.41	\$ 73,328.70
4	2	Project Leader(1)	\$ 27.66		\$ 29.35	\$ -	48.00%	\$ -	\$ 2,279.26	\$ 1,094.04	\$ 3,373.30
5	2	Biologist(4)	\$ 22.91		\$ 24.31	\$ -	68.00%	\$ -	\$ 7,551.68	\$ 5,135.14	\$ 12,686.82
6	2	Technician(s)(12)	\$ 16.36		\$ 17.36	\$ -	8.77%	\$ -	\$ 1,348.33	\$ 118.25	\$ 1,466.57
7	3	Project Leader(1)	\$ 27.66		\$ 29.35	\$ -	48.00%	\$ -	\$ 2,301.82	\$ 1,104.87	\$ 3,406.70
8	3	Biologist(4)	\$ 22.91		\$ 24.31	\$ -	68.00%	\$ -	\$ 10,963.02	\$ 7,454.85	\$ 18,417.87
9	3	Technician(s)(12)	\$ 16.36		\$ 17.36	\$ -	8.77%	\$ -	\$ 1,361.68	\$ 119.42	\$ 1,481.09
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12			\$ -	-	\$ -	\$ -	0.00%	\$ -	\$ -	\$ -	\$ -
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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%	\$ -	\$ -	\$ -	\$ -
					\$ -	\$ -		\$ -	\$ 135,216.40	\$ 46,760.03	\$ 181,976.42

# SUMMARY OF MATERIALS AND SUPPLIES

## SUMMARY OF MATERIALS, SUPPLIES, AND SERVICES

Yr 2 Escalation Rate	0.00%
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	Task # or Description	Item Description	Rationale for Proposed Cost	Year 1			Year 2		
				Unit Price	Unit Quantity	Subtotal	Unit Price	Unit Quantity	Subtotal
1	1	Monthly fleet rental (4 trucks, 2 months)	Based on previous experience & SOWs	\$ 500.00		\$ -	\$ 500.00		\$ -
2	1	Mileage costs (2500 miles)	Based on previous experience & SOWs	\$ 0.40		\$ -	\$ 0.40		\$ -
3	1	Camping materials and gear	Based on previous experience & SOWs	\$ 1,000.00		\$ -	\$ 1,000.00		\$ -
4	1	Sampling materials and gear	Based on previous experience & SOWs	\$ 1,000.00		\$ -	\$ 1,000.00		\$ -
5	1	Boating materials, gear, shuttle and fuel	Based on previous experience & SOWs	\$ 1,000.00		\$ -	\$ 1,000.00		\$ -
6	2	Monthly fleet rental (1 truck, 1 month)	Based on previous experience & SOWs	\$ 500.00		\$ -	\$ 500.00		\$ -
7	2	Mileage costs (500 miles)	Based on previous experience & SOWs	\$ 0.40		\$ -	\$ 0.40		\$ -
11	3	Monthly fleet rental (1 trucks, 1 month)	Based on previous experience & SOWs	\$ 500.00		\$ -	\$ 500.00		\$ -
12	3	Mileage costs (1000 miles)	Based on previous experience & SOWs	\$ 0.40		\$ -	\$ 0.40		\$ -
13						\$ -	\$ -		\$ -
14						\$ -	\$ -		\$ -
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	\$ -
24				\$ -	0	\$ -	\$ -	0	\$ -
25				\$ -	0	\$ -	\$ -	0	\$ -
26				\$ -	0	\$ -	\$ -	0	\$ -
27				\$ -	0	\$ -	\$ -	0	\$ -
28				\$ -	0	\$ -	\$ -	0	\$ -
29				\$ -	0	\$ -	\$ -	0	\$ -
30				\$ -	0	\$ -	\$ -	0	\$ -
<b>TOTAL:</b>						<b>\$ -</b>			<b>\$ -</b>

# SUMMARY OF MATERIALS AND SUPPLIES

<b>SUMMARY OF MATERIALS, SUPPLIES</b>	Yr 3 Escalation Rate	2.00%	Yr 4 Escalation Rate	2.00%
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	Task # or Description	Item Description	Year 3			Year 4		
			Unit Price	Unit Quantity	Subtotal	Unit Price	Unit Quantity	Subtotal
1	1	Monthly fleet rental (4 trucks, 2 months)	\$ 510.00	8.00	\$ 4,080.00	\$ 520.20	8.00	\$ 4,161.60
2	1	Mileage costs (2500 miles)	\$ 0.41	2500.00	\$ 1,020.00	\$ 0.42	2500.00	\$ 1,040.40
3	1	Camping materials and gear	\$ 1,020.00	3.00	\$ 3,060.00	\$ 1,040.40	3.00	\$ 3,121.20
4	1	Sampling materials and gear	\$ 1,020.00	3.00	\$ 3,060.00	\$ 1,040.40	3.00	\$ 3,121.20
5	1	Boating materials, gear, shuttle and fuel	\$ 1,020.00	4.00	\$ 4,080.00	\$ 1,040.40	4.00	\$ 4,161.60
6	2	Monthly fleet rental (1 truck, 1 month)	\$ 510.00	1.00	\$ 510.00	\$ 520.20	1.00	\$ 520.20
7	2	Mileage costs (500 miles)	\$ 0.41	250.00	\$ 102.00	\$ 0.42	250.00	\$ 104.04
11	3	Monthly fleet rental (1 trucks, 1 month)	\$ 510.00	0.00	\$ -	\$ 520.20	1.00	\$ 520.20
12	3	Mileage costs (1000 miles)	\$ 0.41	0.00	\$ -	\$ 0.42	1000.00	\$ 416.16
13			\$ -		\$ -	\$ -		\$ -
14			\$ -		\$ -	\$ -		\$ -
15			\$ -		\$ -	\$ -		\$ -
16			\$ -	0	\$ -	\$ -	0	\$ -
17			\$ -	0	\$ -	\$ -	0	\$ -
18			\$ -	0	\$ -	\$ -	0	\$ -
19			\$ -	0	\$ -	\$ -	0	\$ -
20			\$ -	0	\$ -	\$ -	0	\$ -
21			\$ -	0	\$ -	\$ -	0	\$ -
22			\$ -	0	\$ -	\$ -	0	\$ -
23			\$ -	0	\$ -	\$ -	0	\$ -
24			\$ -	0	\$ -	\$ -	0	\$ -
25			\$ -	0	\$ -	\$ -	0	\$ -
26			\$ -	0	\$ -	\$ -	0	\$ -
27			\$ -	0	\$ -	\$ -	0	\$ -
28			\$ -	0	\$ -	\$ -	0	\$ -
29			\$ -	0	\$ -	\$ -	0	\$ -
30			\$ -	0	\$ -	\$ -	0	\$ -
					<b>\$ 15,912.00</b>	<b>\$ 17,166.60</b>		

# SUMMARY OF MATERIALS AND SUPPLIES

<b>SUMMARY OF MATERIALS, SUPPLIES</b>	Yr 5 Escalation Rate	2.00%
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			<b>Year 5</b>			
	Task # or Description	Item Description	Unit Price	Unit Quantity	Subtotal	TOTAL
1	1	Monthly fleet rental (4 trucks, 2 months)	\$ 530.60		\$ -	\$ 8,241.60
2	1	Mileage costs (2500 miles)	\$ 0.42		\$ -	\$ 2,060.40
3	1	Camping materials and gear	\$ 1,061.21		\$ -	\$ 6,181.20
4	1	Sampling materials and gear	\$ 1,061.21		\$ -	\$ 6,181.20
5	1	Boating materials, gear, shuttle and fuel	\$ 1,061.21		\$ -	\$ 8,241.60
6	2	Monthly fleet rental (1 truck, 1 month)	\$ 530.60		\$ -	\$ 1,030.20
7	2	Mileage costs (500 miles)	\$ 0.42		\$ -	\$ 206.04
11	3	Monthly fleet rental (1 trucks, 1 month)	\$ 530.60		\$ -	\$ 520.20
12	3	Mileage costs (1000 miles)	\$ 0.42		\$ -	\$ 416.16
13			\$ -		\$ -	\$ -
14			\$ -		\$ -	\$ -
15			\$ -	0	\$ -	\$ -
16			\$ -	0	\$ -	\$ -
17			\$ -	0	\$ -	\$ -
18			\$ -	0	\$ -	\$ -
19			\$ -	0	\$ -	\$ -
20			\$ -	0	\$ -	\$ -
21			\$ -	0	\$ -	\$ -
22			\$ -	0	\$ -	\$ -
23			\$ -	0	\$ -	\$ -
24			\$ -	0	\$ -	\$ -
25			\$ -	0	\$ -	\$ -
26			\$ -	0	\$ -	\$ -
27			\$ -	0	\$ -	\$ -
28			\$ -	0	\$ -	\$ -
29			\$ -	0	\$ -	\$ -
30			\$ -	0	\$ -	\$ -
					<b>\$ -</b>	<b>\$ 33,078.60</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>	Task 1. Sampling	Task 1. Sampling	Task 1. Sampling	Task 1. Sampling	Task 1. Sampling	
<b>Reason</b>	Field Work	Field Work	Field Work	Field Work	Field Work	
<b># of Days (include travel days)</b>	0	0	8	8	0	
<b>Airfare</b>	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>Lodging (Per Night)</b>	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>MI&amp;E Per Day</b>	\$ 35.00	\$ 35.00	\$ 35.70	\$ 36.41	\$ 37.14	
<b>Auto Rental Per Day</b>	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>Misc Costs/Adjustments/Trip</b>	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>Total Per Trip</b>	\$ -	\$ -	\$ 285.60	\$ 291.31	\$ -	
<b>No. of persons</b>	0	0	8	8	0	
<b>No. of trips</b>	0	0	3	3	0	
<b>SUBTOTAL =</b>	\$ -	\$ -	\$ 6,854.40	\$ 6,991.49	\$ -	\$ 13,845.89

	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
<b>TOTAL COST BY PERIOD =</b>	\$ -	\$ -	\$ 6,854.40	\$ 6,991.49	\$ -	\$ 13,845.89