

**RECOVERY PROGRAM  
FY 2016-2017 SCOPE OF WORK for:**

Recovery Program Project Number: 138

Annual fall monitoring of YOY Colorado pikeminnow and small-bodied native fishes and Green River Canal endangered fish salvage

Reclamation Agreement number: R14AP00007  
Reclamation Agreement term: 05/01/2014-09/30/2018

Note: Recovery Program FY16-17 scopes of work are drafted in May 2015. 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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Category:

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

Expected Funding Sources:

- Annual funds  
 Capital funds  
 Other (explain)

I. Title of Proposal: Annual fall monitoring of YOY Colorado pikeminnow and small-bodied native fishes and Green River Canal endangered fish salvage

II. 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).
- V.A. Measure and document population and habitat parameters to determine status and biological response to recovery actions.
- V.B.2. Conduct appropriate studies to provide needed life history information.

## GREEN RIVER ACTION PLAN: MAINSTEM

- V. Monitor populations and habitat and conduct research to support recovery actions (research, monitoring, and data management).
- V.A. Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions.
- II.B. Restore native fish passage at instream barriers.

## COLORADO RIVER ACTION PLAN: MAINSTEM

- V. Monitor populations and habitat and conduct research to support recovery actions (research, monitoring, and data management).
- V.A. Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions

### III. Study Background/Rationale and Hypotheses:

Larval Colorado pikeminnow monitoring is an ongoing effort to evaluate spawning success. Monitoring of juvenile Colorado pikeminnow (*Ptychocheilus lucius*) occurs in conjunction with adult population estimates in the Green and Colorado rivers. However, survival of young-of-year (YOY) can vary greatly between years independent of spawning success and can have an impact on the juvenile component of Colorado pikeminnow populations. For example, biotic and abiotic factors such as flow variation, backwater temperatures, competition and predation by nonnative fish (e.g., gamefish and small-bodied cyprinids), and over-winter mortality can hinder spawning success (i.e., high mortality of YOY fish) resulting in a smaller number of juvenile Colorado pikeminnow available for recruitment into the adult population (Bestgen et al. 2006). Recruitment of other native species such as bluehead sucker (*Catostomus discobolus*), flannelmouth sucker (*C. latipinnis*), roundtail chub (*Gila robusta*), and speckled dace (*Rhinichthys osculus*) is affected similarly.

As a result of decreased recruitment, control actions targeting nonnative gamefish species, primarily smallmouth bass (*Micropterus dolomieu*), northern pike (*Esox lucius*), and walleye (*Sander vitreus*), are being evaluated across the upper Colorado River basin to determine the level of reduction necessary to minimize the threat to the recovery of Colorado pikeminnow and other endangered Colorado River fishes. Successful implementation of nonnative fish removal will likely be measured by the response of endangered fish and other native species (i.e., increased abundance). However, nonnative fish removal efforts are preliminary, thus the first observed response will likely be evident in early life-stages of the native fish community (Bestgen et al. 2007a). An adult response to nonnative removal may not be detectable initially for a number of

reasons, one of which is the large home range of adults (UDWR 2006). Furthermore, a positive response by adult endangered species may be difficult to measure statistically without extensive observations due to generation times of endangered fish populations (e.g. Bestgen et al. 2007b).

Data necessary to evaluate the recovery status of native fishes will be generated by current and future YOY sampling in conjunction with nonnative fish removal efforts. For instance, documenting size and relative abundance of YOY Colorado pikeminnow and other native species may provide valuable information about the probable survival of any particular year class. Together with existing YOY data compiled from the Interagency Standardized Monitoring Program (ISMP; 1987 - present), results from this project should provide the basis for monitoring distribution and recruitment rates of YOY Colorado pikeminnow. Efforts to control nonnatives will likely have the greatest affect on YOY fish (i.e., decreased predation and increased survival). Therefore, monitoring this component of the Colorado pikeminnow population will provide information toward evaluating nonnative control projects. Additionally, this project ensures continuation of existing, standardized data series (ISMP) that document trends in abundance of early-life stage Colorado pikeminnow (USFWS 1987). Finally, response of early life-stages of native and small-bodied fish to removal of nonnative predators will serve as indicators of the response that would be experienced by endangered fish species occupying the same habitats.

NOTE: Utah Division of Wildlife Resources (UDWR) has been responsible for monitoring YOY Colorado pikeminnow abundance since 1986. In 2004, this project was expanded to explore linkages between trends in YOY abundance (collected in this study), with abundances of larval (current Project No. 22f) and juvenile pikeminnow (old ISMP data set; and current Project No. 128). Also, beginning in 2004, there was reference to the use of predictive modeling to correlate trends in these multiple life stages with environmental variables. Those analyses were not completed. In late 2008, in conjunction with uncertainties identified in the *Green River Study Plan*, the Recovery Program decided to conduct a separate comprehensive synthesis of the effect of changes in physical habitat (as a function of flow and flow variability) and other environmental conditions on the small-bodied fish community (emphasis on Colorado pikeminnow). That comprehensive synthesis was initiated in 2009, entitled *Historical assessment of factors affecting young Colorado pikeminnow abundance and physical habitat availability in the Green River, Utah*, and a draft report has been completed as of 2014. Lastly, response of early life-stages of native and small-bodied fish to removal of nonnative predators in the middle Green River was originally assessed under Project 144. Due to overlapping similarities in field sampling and biotic/abiotic variables affecting YOY community response, the Project 144 scope of work was incorporated into Project 138 in 2009. However, recent findings potentially suggest an inability to detect a response from current sampling protocols (Skorupski et al. 2012), thus initiating a reconsideration of the previous study objective “Estimate the response of small-bodied and YOY native fish to removal of northern pike and smallmouth bass”. Specifically, habitat overlap between YOY native fishes and early life-stages of nonnative predators in the middle Green River (alluvial reach) is likely a limited factor in comparison to other

reaches in the upper Colorado River basin where native fish response is being assessed (e.g., Yampa River; Bestgen et al. 2007a). Thus, implementation of a new study objective for this portion of Project 138 is warranted and will be reassessed upon completion of the Project 158 Interim report (pending recommendations; due in 2016).

The Tusher Diversion, which supplies irrigation water to the Green River Canal near the town of Green River, UT, presents both a barrier to fish passage and a risk of entrainment and mortality for endangered fishes of the Lower Green River. Design of structures to exclude fish and reduce resultant negative impacts on endangered fish populations is in progress. Sampling of the canal and translocation of endangered fishes may help to mitigate these negative effects in the interim.

#### IV. Study Goals, Objectives, End Product:

Goals: Monitor YOY Colorado pikeminnow to assess long-term trends in annual fall recruitment and salvage endangered fish entrained in the Green River Canal.

Objectives:

1. Determine size and relative abundance of YOY Colorado pikeminnow at the end of their first growing season to complement larval and juvenile sampling data.
2. Determine whether use of this data set is feasible for evaluation of small-bodied and YOY native fish response to nonnative predator control measures (pending Project 158 recommendations).
3. Remove entrained endangered fish from the Green River Canal and return them to the mainstem at the end of the irrigation season.

End Products: continuation of long-term data set for YOY pikeminnow and associated habitat information and annual Recovery Program reports. Findings will be reported annually. Green River Canal salvage effort will be reported on under Project #29a.

#### V. Study Area

The study area for this project includes identified Colorado pikeminnow nursery habitat areas in the Green and Colorado rivers in Utah (Valdez et al. 1982; Archer et al. 1985; Tyus and Haines 1991). Specifically, Split Mountain to Sand Wash (RM 319 – RM 215) on the middle Green River, Green River State Park to the confluence with the Colorado River (RM 120 – RM 0) on the lower Green River, and Cisco to the confluence with the Green River (RM 111 – RM 0) on the Colorado River.

The Green River Canal is a 7.5 mile system spanning from the Tusher Diversion Dam (RM 128) through the Green River Valley to Saleratus Wash (RM 119.6).

#### VI. Study Methods/Approach

Annual YOY Colorado pikeminnow and native fish sampling will be conducted in late summer/early fall between the second week of September and the third week of October. The first two backwater/low velocity habitats encountered every five river-miles will be sampled dependent upon availability of suitable habitats within each subreach. One additional backwater/low velocity habitat will be sampled every five miles in the middle Green River only to collect additional information on small-bodied and YOY native fish that may not necessarily be well represented while sampling under the constraints of the ISMP protocol. Field sampling will be conducted using the ISMP protocol (USFWS 1987) so that long-term trends can be maintained. However, habitat selection criteria will be relaxed for additional habitats (i.e., third backwater).

Backwater/low velocity habitats will be sampled using a 1.2 m x 4 m seine with 3 mm mesh. At least two non-overlapping seine hauls will be conducted in each habitat sampled (or one seine haul if 25% of the habitat is sampled). Seine hauls will be parallel to one another and perpendicular to the axis of the backwater. However, if water depth is too great seine hauls will be completed along one shoreline. The first two seine hauls in each five mile reach will be taken at  $\frac{1}{3}$  and  $\frac{2}{3}$  the distance from the mouth of the backwater. Additional seine hauls may be completed in any portion of the backwater including the mouth or shallow tail end. Length of each seine haul, maximum depth, and average depth will be recorded for each sample. All endangered and native fish will be enumerated, identified, measured (total length in mm), and returned alive to the habitat. Fin ray counts will be completed for all chubs (*Gila* spp.) captured. All nonnative fishes will be enumerated (first seine haul only) and removed. In subsequent seine hauls, common (i.e., highly abundant) nonnative species will be ignored and other less common nonnative species will be enumerated.

In addition, physical habitat measurements to be collected at each site include habitat type, habitat length, habitat width, backwater temperature, main channel temperature, backwater turbidity, and main channel turbidity. Location of each habitat will be recorded as the approximate river mile and in UTM coordinates using GPS technology.

Crews will sample the Green River Canal with backpack and, if necessary, barge electrofishing gear in November of 2015. All native species will be measured, weighed and translocated to the mainstem Green River immediately adjacent to the canal. Endangered species will be scanned for a PIT tag, and marked before release if previously untagged. Nonnative species will be enumerated and returned to the canal.

## VII. Task Description and Schedule:

Task 1. Seine backwater/low velocity habitats to collect data for endangered, native and nonnative fish; collect physical habitat data: middle Green River. (UDWR Vernal; September-October).

Task 2. Seine backwater/low velocity habitats to collect data for endangered, native and nonnative fish; collect physical habitat data: lower Green River and lower Colorado

River (UDWR Moab; September).

Task 3. Data entry, analysis, and report preparation (UDWR Vernal and UDWR Moab; October-November).

Task 4. Green River Canal salvage (UDWR Moab; November).

Schedule: FY16-FY20

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

VIII. Deliverables, Due Dates, and Budget by Fiscal Year:

**FY2016:** Annual Report by November 2016.

Task 1. Seining the middle Green River (UDWR–Vernal).

	Rate	Hours/Units	Cost
<b>Labor</b>			
Project Leader	35.48		80 2838.40
Biologist II	33.12		80 2649.60
Journey Maintenance/Construction Specialist	26.66		160 4265.60
Technician I	16.60		160 2655.23
Shuttle Drivers	16.95		80 1356.24
		<b>Subtotal</b>	<b>\$13,765</b>
<b>Travel</b>			
2 trucks @ 12.5% of annual use <sup>a</sup>	13600.00		0.125 1700.00
Per diem (2 overnights & 6 day trips x 4 people)	19.50		32 624.00
		<b>Subtotal</b>	<b>\$2,324</b>
<b>Equipment</b>			
Boat fuel (gallons)	4.00		80 320.00
Boat/motor repair and maintenance <sup>b</sup>			1000.00
Camping supplies <sup>c</sup>			700.00
Sampling equipment <sup>d</sup>			1650.00
		<b>Subtotal</b>	<b>\$3,670</b>
		<b>Task 1 Total</b>	<b>\$19,759</b>

<sup>a</sup> The State of Utah uses Automotive Resources Inc. for motor pool operations. Rental is approximately \$6,800/year/vehicle (includes fleet rental, mileage, and gas), which is based on the average annual cost for all trucks used in our program.

<sup>b</sup> Includes, but is not limited to, motor oil (\$66), props (2 @ \$150), water pump/filters/lower unit oil/grease/gas can/misc. maintenance items (\$300), shop supplies/tools/safety gear/misc. small parts (\$300).

<sup>c</sup> Includes, but is not limited to, 1 tent (REI-\$100), 1 sleeping pad (Aire-\$150), cooking utensils & supplies/propane/toilet supplies/toilet system (\$450).

<sup>d</sup> Includes, but is not limited to, handheld GPS (Garmin-\$400), batteries (\$100), SPOT locator & service plan (\$250/year), waders (Simms-\$400), livewell/buckets/fish nets/measuring boards (\$100), rangefinder (Nikon-\$200), seine repair/replacement (Memphis Net & Twine-\$200).

NOTE: estimated costs based on current prices procured from various sources and previous expenditures for items under each category; outyears (FY2017 and beyond) include an annual 2% cost of living increase for all categories.

Task 2. Seining the lower Green River and the Colorado River (UDWR–Moab).

**Task 2. Seining Lower Green and Lower Colorado- Moab UDWR**

Personnel Costs (salary + fringe costs)

	<b>Rate</b>	<b>Hours</b>	<b>Cost</b>
Project Leader	\$33.71	80	\$2,697
Biologist	\$30.76	240	\$7,382
Technician	\$16.77	400	\$6,708
		<b>subtotal</b>	<b>\$16,787</b>

Food and Travel

	<b>Rate</b>	<b>Quantity</b>	<b>Cost</b>
	\$40,800.0		
Fleet Costs <sup>a</sup> (5 trucks for 6% of total fleet costs)	0	0.06	\$2,448
Food (8 people, 4 days)	\$30.00	32	\$960
		<b>subtotal</b>	<b>\$3,408</b>

Equipment

	<b>Rate</b>	<b>Quantity</b>	<b>Cost</b>
Camping gear repair/replacement <sup>b</sup> :			\$890
Sampling gear repair/replacement <sup>c</sup> :			\$840
Boating gear repair/replacement <sup>d</sup> :			\$900
Fuel for motors (75 gallons)	\$4.00	75	\$300
		<b>subtotal</b>	<b>\$2,930</b>

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**Task 2 subtotal** **\$23,124**

Task 3. Data entry, analysis, and report preparation (UDWR–Vernal).

	Rate	Hours/units	Cost
Labor			
Project Leader	35.48	50	1774.00
Biologist II	33.12	120	3974.40
Technician II (Assistant Crew Leader)	17.87	60	1072.40
<b>Task 3 Total</b>			<b>\$6,821</b>

Task 3. Data entry, analysis, and report preparation (UDWR–Moab).

Personnel Costs (salary + fringe costs)

	Rate	Hours	Cost
Project Leader	\$33.71	40	\$1,348
Biologist	\$30.76	130	\$3,999
Technician	\$16.77	80	\$1,342
<b>subtotal</b>			<b>\$6,689</b>
<b>Task 3 subtotal</b>			<b>\$6,689</b>

Task 4. Green River Canal salvage (UDWR- Moab)

**Task 4. Green River Canal Salvage**

Personnel Costs (salary + fringe costs)

	Rate	Hours	Cost
Project Leader	\$33.71	70	\$2,360
Biologist	\$30.76	160	\$4,921
Technician	\$16.77	115	\$1,929
<b>subtotal</b>			<b>\$9,210</b>

Food and Travel

	Rate	Quantity	Cost
	\$40,800.0		
Fleet Costs <sup>a</sup> (2 trucks for 1% of total fleet costs)	0	0.01	\$408
<b>subtotal</b>			<b>\$408</b>

Equipment

	Rate	Quantity	Cost
Camping gear repair/replacement <sup>b</sup> :			\$0
Sampling gear repair/replacement <sup>c</sup> :			\$500
Boating gear repair/replacement <sup>d</sup> :			\$0
Fuel for motors/generators	\$4.00	9	\$36
<b>subtotal</b>			<b>\$536</b>

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**Task 4 subtotal** **\$10,154**

	<b>UDWR - Vernal</b>	<b>UDWR - Moab</b>
<b>FY 2016 Total</b>	\$26,580	\$39,967

**FY2017:** Annual Report by November 2017.

Task 1. Seining the middle Green River (UDWR–Vernal).

	Rate	Hours/Units	Cost
<b>Labor</b>			
Project Leader	36.19	80	2895.17
Biologist II	33.78	80	2702.59
Journey Maintenance/Construction Specialist	27.19	160	4350.91
Technician I	16.93	160	2708.33
Shuttle Drivers	17.29	80	1383.37
		<b>Subtotal</b>	<b>\$14,040</b>
<b>Travel</b>			
2 trucks @ 12.5% of annual use <sup>a</sup>	13872.00	0.125	1734.00
Per diem (2 overnights & 6 day trips x 4 people)	19.89	32	636.48
		<b>Subtotal</b>	<b>\$2,370</b>
<b>Equipment</b>			
Boat fuel (gallons)	4.08	96	391.68
Boat/motor repair and maintenance <sup>b</sup>			1020.00
Camping supplies <sup>c</sup>			714.00
Sampling equipment <sup>d</sup>			1683.00
		<b>Subtotal</b>	<b>\$3,809</b>
		<b>Task 1 Total</b>	<b>\$20,220</b>

Task 2. Seining the lower Green River and the Colorado River (UDWR–Moab).

Labor: salary + benefits + applicable overtime (personnel services)

	Rate	Hours	Cost
Project Leader	\$34.38	80	\$2,751
Biologist	\$31.37	240	\$7,530
Technician	\$17.11	400	\$6,842
		<b>subtotal</b>	<b>\$17,123</b>

Food and Transport (current expense)

	Rate	Quantity	Cost
	\$41,616.0		
Fleet Costs (5 trucks for 6% of total fleet costs)	0	0.06	\$2,497

Food (8 people, 4 days)	\$30.60	32	\$979
		<b>subtotal</b>	<b>\$3,476</b>

Equipment (current expense)

	Rate	Quantity	Cost
Camping gear repair/replacement:			\$907
Sampling gear repair/replacement:			\$857
Boating gear repair/replacement:			\$918
Fuel for motors (75 gallon)	\$4.08	75	\$306
		<b>subtotal</b>	<b>\$2,988</b>

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**Task 2 subtotal** **\$23,587**

Task 3. Data entry, analysis, and report preparation (UDWR–Vernal).

	Rate	Hours/units	Cost
Labor			
Project Leader	36.19	50	1809.48
Biologist II	33.78	120	4053.89
Technician II (Assistant Crew Leader)	18.23	60	1093.85
		<b>Task 3 Total</b>	<b>\$6,957</b>

Task 3. Data entry, analysis, and report preparation (UDWR–Moab).

Labor: salary + benefits + applicable overtime (personnel services)

	Rate	Hours	Cost
Project Leader	\$34.38	40	\$1,375
Biologist	\$31.37	130	\$4,079
Technician	\$17.11	80	\$1,368
		<b>subtotal</b>	<b>\$6,822</b>
<b>Task 3 subtotal</b>			<b>\$6,822</b>

Task 4. Green River Canal salvage (UDWR- Moab).

**Task 4. Green River Canal Salvage**

Personnel Costs (salary + fringe costs)

	Rate	Hours	Cost
Project Leader	\$34.38	70	\$2,407
Biologist	\$31.37	160	\$5,020
Technician	\$17.11	115	\$1,967
		<b>subtotal</b>	<b>\$9,394</b>

Food and Travel

	Rate	Quantity	Cost
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Fleet Costs <sup>a</sup> (2 trucks for 1% of total fleet costs)	\$41,616.0	0	0.01	\$416
			<b>subtotal</b>	<b>\$416</b>

Equipment

	Rate	Quantity	Cost
Camping gear repair/replacement <sup>b</sup> :			\$0
Sampling gear repair/replacement <sup>c</sup> :			\$500
Boating gear repair/replacement <sup>d</sup> :			\$0
Fuel for motors/generators	\$4.08	9	\$37
		<b>subtotal</b>	<b>\$537</b>

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**Task 4 subtotal** **\$10,347**

	UDWR - Vernal	UDWR - Moab
<b>FY 2017 Total</b>	\$27,177	\$42,009

**FY2018:** Annual Report by November 2018.

Task 1. Seining the middle Green River (UDWR–Vernal).

	Rate	Hours/Units	Cost
<b>Labor</b>			
Project Leader	36.91	80	2953.07
Biologist II	34.46	80	2756.64
Journey Maintenance/Construction Specialist	27.74	160	4437.93
Technician I	17.27	160	2762.50
Shuttle Drivers	17.64	80	1411.04
		<b>Subtotal</b>	<b>\$14,321</b>
<b>Travel</b>			
2 trucks @ 12.5% of annual use <sup>a</sup>	14149.44	0.125	1768.68
Per diem (2 overnights & 6 day trips x 4 people)	20.29	32	649.21
		<b>Subtotal</b>	<b>\$2,418</b>
<b>Equipment</b>			
Boat fuel (gallons)	4.1616	96	399.51
Boat/motor repair and maintenance <sup>b</sup>			1040.40
Camping supplies <sup>c</sup>			728.28
Sampling equipment <sup>d</sup>			1716.66
		<b>Subtotal</b>	<b>\$3,885</b>
		<b>Task 1 Total</b>	<b>\$20,624</b>

Task 2. Seining the lower Green River and the Colorado River (UDWR–Moab).

Labor: salary + benefits + applicable overtime (personnel services)

	<b>Rate</b>	<b>Hours</b>	<b>Cost</b>
Project Leader	\$35.07	80	\$2,806
Biologist	\$32.00	240	\$7,680
Technician	\$17.45	400	\$6,979
		<b>subtotal</b>	<b>\$17,465</b>

Food and Transport (current expense)

	<b>Rate</b>	<b>Quantity</b>	<b>Cost</b>
	\$42,448.3		
Fleet Costs (5 trucks for 6% of total fleet costs)	2	0.06	\$2,547
Food (8 people, 4 days)	\$31.21	32	\$999
		<b>subtotal</b>	<b>\$3,546</b>

Equipment (current expense)

	<b>Rate</b>	<b>Quantity</b>	<b>Cost</b>
Camping gear repair/replacement:			\$925
Sampling gear repair/replacement:			\$874
Boating gear repair/replacement:			\$936
Fuel for motors (75 gallon)	\$4.16	75	\$312
		<b>subtotal</b>	<b>\$3,048</b>

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**Task 2 subtotal** **\$24,059**

Task 3. Data entry, analysis, and report preparation (UDWR–Vernal).

	<b>Rate</b>	<b>Hours/units</b>	<b>Cost</b>
Labor			
Project Leader	36.91	50	1845.67
Biologist II	34.46	120	4134.97
Technician II (Assistant Crew Leader)	18.60	60	1115.72
		<b>Task 3 Total</b>	<b>\$7,096</b>

Task 3. Data entry, analysis, and report preparation (UDWR–Moab).

Labor: salary + benefits + applicable overtime (personnel services)

	<b>Rate</b>	<b>Hours</b>	<b>Cost</b>
Project Leader	\$35.07	40	\$1,403
Biologist	\$32.00	130	\$4,160

Technician	\$17.45	80	\$1,396
		<b>subtotal</b>	<b>\$6,959</b>
<b>Task 3 subtotal</b>			<b>\$6,959</b>

Task 4. Green River Canal salvage (UDWR- Moab).

**Task 4. Green River Canal Salvage**

Personnel Costs (salary + fringe costs)

	Rate	Hours	Cost
Project Leader	\$35.77	70	\$2,504
Biologist	\$32.64	160	\$5,223
Technician	\$17.80	115	\$2,047
		<b>subtotal</b>	<b>\$9,773</b>

Food and Travel

	Rate	Quantity	Cost
	\$42,448.3		
Fleet Costs <sup>a</sup> (2 trucks for 1% of total fleet costs)	2	0.01	\$424
		<b>subtotal</b>	<b>\$424</b>

Equipment

	Rate	Quantity	Cost
Camping gear repair/replacement <sup>b</sup> :			\$0
Sampling gear repair/replacement <sup>c</sup> :			\$500
Boating gear repair/replacement <sup>d</sup> :			\$0
Fuel for motors/generators	\$4.16	9	\$37
		<b>subtotal</b>	<b>\$537</b>

**Task 4 subtotal** **\$10,735**

	UDWR - Vernal	UDWR - Moab
<b>FY 2018 Total</b>	\$27,720	\$43,072

**FY2019:** Annual Report by November 2019.

Task 1. Seining the middle Green River (UDWR–Vernal).

	Rate	Hours/Units	Cost
Labor			
Project Leader	37.65	80	3012.13
Biologist II	35.15	80	2811.78
Journey Maintenance/Construction Specialist	28.29	160	4526.69
Technician I	17.61	160	2817.75

Shuttle Drivers	17.99	80	1439.26
		<b>Subtotal</b>	<b>\$14,608</b>
Travel			
2 trucks @ 12.5% of annual use <sup>a</sup>	14432.43	0.125	1804.05
Per diem (2 overnights & 6 day trips x 4 people)	20.69	32	662.19
		<b>Subtotal</b>	<b>\$2,466</b>
Equipment			
Boat fuel (gallons)	4.24	96	407.50
Boat/motor repair and maintenance <sup>b</sup>			1061.21
Camping supplies <sup>c</sup>			742.85
Sampling equipment <sup>d</sup>			1750.99
		<b>Subtotal</b>	<b>\$3,963</b>
		<b>Task 1 Total</b>	<b>\$21,036</b>

Task 2. Seining the lower Green River and the Colorado River (UDWR–Moab).

Labor: salary + benefits + applicable overtime (personnel services)

	Rate	Hours	Cost
Project Leader	\$35.77	80	\$2,862
Biologist	\$32.64	240	\$7,834
Technician	\$17.80	400	\$7,119
		<b>subtotal</b>	<b>\$17,814</b>

Food and Transport (current expense)

	Rate	Quantity	Cost
	\$43,297.2		
Fleet Costs (5 trucks for 6% of total fleet costs)	9	0.06	\$2,598
Food (8 people, 4 days)	\$31.84	32	\$1,019
		<b>subtotal</b>	<b>\$3,617</b>

Equipment (current expense)

	Rate	Quantity	Cost
Camping gear repair/replacement:			\$944
Sampling gear repair/replacement:			\$891
Boating gear repair/replacement:			\$955
Fuel for motors (75 gallon)	\$4.24	75	\$318
		<b>subtotal</b>	<b>\$3,109</b>

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**Task 2 subtotal** **\$24,540**

Task 3. Data entry, analysis, and report preparation (UDWR–Vernal).

	Rate	Hours/units	Cost
Labor			
Project Leader	37.65	50	1882.58
Biologist II	35.15	120	4217.67
Technician II (Assistant Crew Leader)	18.97	60	1138.04
<b>Task 3 Total</b>			<b>\$7,238</b>

Task 3. Data entry, analysis, and report preparation (UDWR–Moab).

Labor: salary + benefits + applicable overtime (personnel services)

	Rate	Hours	Cost
Project Leader	\$35.77	40	\$1,431
Biologist	\$32.64	130	\$4,243
Technician	\$17.80	80	\$1,424
<b>subtotal</b>			<b>\$7,098</b>
<b>Task 3 subtotal</b>			<b>\$7,098</b>

Task 4. Green River Canal salvage (UDWR- Moab).

**Task 4. Green River Canal Salvage**

Personnel Costs (salary + fringe costs)

	Rate	Hours	Cost
Project Leader	\$35.77	70	\$2,504
Biologist	\$32.64	160	\$5,223
Technician	\$17.80	115	\$2,047
<b>subtotal</b>			<b>\$9,773</b>

Food and Travel

	Rate	Quantity	Cost
	\$43,297.2		
Fleet Costs <sup>a</sup> (2 trucks for 1% of total fleet costs)	9	0.01	\$433
<b>subtotal</b>			<b>\$433</b>

Equipment

	Rate	Quantity	Cost
Camping gear repair/replacement <sup>b</sup> :			\$0
Sampling gear repair/replacement <sup>c</sup> :			\$500
Boating gear repair/replacement <sup>d</sup> :			\$0
Fuel for motors/generators	\$4.24	9	\$38

	<b>subtotal</b>	<b>\$538</b>
<b>Task 4 subtotal</b>		<b>\$10,744</b>
	<b>UDWR - Vernal</b>	<b>UDWR - Moab</b>
<b>FY 2019 Total</b>	<b>\$28,275</b>	<b>\$43,728</b>

**FY2020:** Annual Report by November 2020.

Task 1. Seining the middle Green River (UDWR–Vernal).

	Rate	Hours/Units	Cost
<b>Labor</b>			
Project Leader	38.40	80	3072.38
Biologist II	35.85	80	2868.01
Journey Maintenance/Construction Specialist	28.86	160	4617.22
Technician I	17.96	160	2874.10
Shuttle Drivers	18.35	80	1468.04
		<b>Subtotal</b>	<b>14899.76</b>
<b>Travel</b>			
2 trucks @ 12.5% of annual use <sup>a</sup>	14721.08	0.125	1840.13
Per diem (2 overnights & 6 day trips x 4 people)	21.11	32	675.44
		<b>Subtotal</b>	<b>\$2,516</b>
<b>Equipment</b>			
Boat fuel (gallons)	4.33	96	415.65
Boat/motor repair and maintenance <sup>b</sup>			1082.43
Camping supplies <sup>c</sup>			757.70
Sampling equipment <sup>d</sup>			1786.01
		<b>Subtotal</b>	<b>\$4,042</b>
		<b>Task 1 Total</b>	<b>\$21,457</b>

Task 2. Seining the lower Green River and the Colorado River (UDWR–Moab).

Labor: salary + benefits + applicable overtime (personnel services)

	Rate	Hours	Cost
Project Leader	\$36.49	80	\$2,919
Biologist	\$33.29	240	\$7,991
Technician	\$18.15	400	\$7,261
		<b>subtotal</b>	<b>\$18,171</b>

Food and Transport (current expense)

	<b>Rate</b>	<b>Quantity</b>	<b>Cost</b>
	\$44,163.2		
Fleet Costs (5 trucks for 6% of total fleet costs)	3	0.06	\$2,650
Food (8 people, 4 days)	\$32.47	32	\$1,039
		<b>subtotal</b>	<b>\$3,689</b>

Equipment (current expense)

	<b>Rate</b>	<b>Quantity</b>	<b>Cost</b>
Camping gear repair/replacement:			\$963
Sampling gear repair/replacement:			\$909
Boating gear repair/replacement:			\$974
Fuel for motors (75 gallon)	\$4.33	75	\$325
		<b>subtotal</b>	<b>\$3,171</b>

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**Task 2 subtotal** **\$25,031**

Task 3. Data entry, analysis, and report preparation (UDWR–Vernal).

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	<b>Rate</b>	<b>Hours/units</b>	<b>Cost</b>
Labor			
Project Leader	38.40	50	1920.23
Biologist II	35.85	120	4302.02
Technician II (Assistant Crew Leader)	19.35	60	1160.80
		<b>Task 3 Total</b>	<b>\$7,383</b>

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Task 3. Data entry, analysis, and report preparation (UDWR–Moab).

Labor: salary + benefits + applicable overtime (personnel services)

	<b>Rate</b>	<b>Hours</b>	<b>Cost</b>
Project Leader	\$36.49	40	\$1,459
Biologist	\$33.29	130	\$4,328
Technician	\$18.15	80	\$1,452
		<b>subtotal</b>	<b>\$7,240</b>
<b>Task 3 subtotal</b>			<b>\$7,240</b>

Task 4. Green River Canal salvage (UDWR- Moab).

**Task 4. Green River Canal Salvage**

Personnel Costs (salary + fringe costs)

<b>Rate</b>	<b>Hours</b>	<b>Cost</b>
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Project Leader	\$36.49	70	\$2,554
Biologist	\$33.29	160	\$5,327
Technician	\$18.15	115	\$2,088
		<b>subtotal</b>	<b>\$9,969</b>

Food and Travel

	Rate	Quantity	Cost
	\$44,163.2		
Fleet Costs <sup>a</sup> (2 trucks for 1% of total fleet costs)	3	0.01	\$442
		<b>subtotal</b>	<b>\$442</b>

Equipment

	Rate	Quantity	Cost
Camping gear repair/replacement <sup>b</sup> :			\$0
Sampling gear repair/replacement <sup>c</sup> :			\$500
Boating gear repair/replacement <sup>d</sup> :			\$0
Fuel for motors/generators	\$4.33	9	\$39
		<b>subtotal</b>	<b>\$539</b>

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**Task 4 subtotal** **\$10,949**

	UDWR - Vernal	UDWR - Moab
<b>FY 2020 Total</b>	\$28,840	\$44,593

IX. Program Budget Summary

	UDWR Vernal	UDWR Moab	Total
<b>FY2016</b>	\$26,580	\$39,967	<b>\$66,547</b>
<b>FY2017</b>	\$27,177	\$40,756	<b>\$67,933</b>
<b>FY2018</b>	\$27,720	\$41,753	<b>\$69,473</b>
<b>FY2019</b>	\$28,275	\$42,382	<b>\$70,657</b>
<b>FY2020</b>	\$28,840	\$43,220	<b>\$72,060</b>
Subtotal	\$138,592	\$208,078	<b>\$346,670</b>

X. Reviewers

XI. References

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