FY 2022-23 SCOPE OF WORK PROJECT: 165

Project Title
Management of Stewart Lake floodplain for use by larval and adult endangered fishes

Bureau of Reclamation Agreement Number:
R19AP00059

Reclamation Agreement Term
October 1, 2018 – September 30, 2023

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:
Utah Division of Wildlife Resources

Principal Investigator:
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Category:
_X Ongoing project
__ Ongoing-revised project
__ Requested new project
__ Unsolicited proposal

Expected Funding Source:
_X Annual funds
__ Capital funds
__ Other *[explain]*

Relationship to RIPRAP:

GREEN RIVER ACTION PLAN

II.A.	Restore and manage flooded bottomland habitat.
II.A.5.	Manage and/or modify priority floodplain sites for nursery habitat for endangered fish (as identified in Floodplain Synthesis, LTSP, etc.)
II.A.5.a.	Stewart Lake

Study Background/Rationale and Hypotheses:
Floodplain wetlands are recognized as important habitats for early life stages of razorback sucker (*Xyrauchen texanus*; Wydoski and Wick 1998; Muth et al. 1998; Lentsch et al. 1996; Modde 1996; Tyus and Karp 1990). Reproduction by razorback sucker occurs on the ascending limb of the spring hydrograph, allowing enough time between hatching and swim up for larvae to enter main channel drift when highly productive floodplain habitats are accessible (Muth et al. 1998). Seasonal timing of razorback sucker reproduction indicates a possible adaptation for entrainment and use of floodplain habitats for rearing purposes (Muth et al. 1998). However, limited research has been conducted on how long young razorback sucker stay in floodplains before moving into riverine habitats (Hedrick et al. 2012). In addition, other endangered fishes have been documented using floodplain habitat (Breen 2011; Bestgen et al. 2017).

The Green River Floodplain Management Plan (Valdez and Nelson 2004) identifies the Stewart Lake wetland as a priority habitat for endangered fishes. Stewart Lake is the third largest of 16 identified priority wetlands, thus providing greater area and depth for nursery habitat for larval razorback sucker (i.e., overwinter survival) and other native and endangered fishes. Additionally, it is approximately 11 miles downstream of a known razorback sucker spawning bar, allowing for potential entrainment (Valdez and Nelson 2004). In comparison to other floodplains, Stewart Lake is an ideal study area given that the structural design provides flexibility in water management; this feature allows for: (1) entrainment capabilities during most flow conditions, including dry hydrologic years, (2) management of inlet and outlet structures to maximize entrainment and control floodplain connectivity, (3) timing and control of outlet releases to monitor escapement, and (4) complete drawdown via a graded canal drainage system to control nonnative fish abundance and reset the system any given year. Moreover, supplemental water can be piped into Stewart Lake through the Burns Bench pipeline, managed by the Uintah Water Conservancy District (UWCD), providing the ability to maintain adequate water quality throughout summer months until the wetland is drained in autumn.

A synthesis of data by Bestgen et al. (2011) indicated that further investigations are needed regarding the timing of Flaming Gorge Dam releases and larval razorback sucker entrainment. Therefore, the Larval Trigger Study Plan (LTSP; Lagory et al. 2012) was designed to examine larval razorback sucker occurrence in the Green River as a trigger for Flaming Gorge operations. The LTSP identifies several focal wetlands with the ability to entrain larval razorback sucker during a range of flow conditions, specifically three that connect under low, median, and high flow years. The LTSP identifies these focal wetlands to be monitored over a range of flow conditions. Thus, the Stewart Lake wetland, one of three floodplains that connects at low flows and has the ability to be managed with inlet and outlet control structures, is an ideal setting to conduct a comprehensive study of fishes that immigrate into wetland habitat during floodplain connection, utilize the habitat post-connection, and emigrate from the wetland during drawdown. Using various sampling techniques, during different stages of floodplain use (i.e., entrainment, retention, escapement), we will greatly increase our chances of characterizing the use of floodplain wetlands by wild-spawned razorback sucker, other native and endangered fishes and nonnatives.

Stewart Lake was one of only two wetlands in the middle Green River to entrain flows in 2012 due to drought conditions. Wild-spawned razorback suckers were successfully entrained by adaptive management of wetland floodgate control structures. However, due to limited flows and high levels of nonnative fishes, water quality and habitat conditions deteriorated quickly preventing the survival of the

2012 cohort (Breen and Skorupski 2012). Therefore, additional techniques were utilized in following years to minimize habitat degradation by loss of water and to limit the influence of nonnatives. Furthermore, information from 2012 demonstrated the ability to entrain larvae under drought conditions and influenced management decisions to improve study design and survival of larval razorback sucker (Skorupski et al. 2013; Schelly et al. 2014; Schelly and Breen 2015; Schelly et al. 2016). The relationship between hydrology, magnitude of larval entrainment, and fall razorback recruitment are possible factors where insight can be gained through continued operation of Stewart Lake. In addition, a comprehensive monitoring plan that identifies important research needs for various life stages of razorback sucker has been completed (Bestgen et al. 2012). In relation to this monitoring plan, we have the unique opportunity to examine a variety of research questions in Stewart Lake. Furthermore, Stewart Lake results have been paramount in guiding annual Flaming Gorge Dam flow requests for the LTSP as a key management action to recover razorback sucker.

Study Goals, Objectives, End Product(s):
Significant revisions to this scope of work include the elimination of mid-summer sampling of the fish community and habitat parameters; recommended by the Upper Colorado River Endangered Fish Recovery Program (UCRRP) Program Director's Office as per FY 2022-2023 program guidance. Although no longer a task under this scope of work, post-entrainment sampling may be undertaken if circumstances require (i.e. suspicion that northern pike have entered the wetland or habitat response to cattail control measures).

Goal:
Manage Stewart Lake, a controlled floodplain wetland, to improve recruitment of wild spawned razorback sucker and characterize use by larval and adult endangered fishes.

Objectives:
1. Monitor entrainment of larval endangered fishes during high-flow connection of riverine and wetland habitats.

2. Monitor escapement (fish moving out of the wetland) of native and nonnative fishes entrained in Stewart Lake during a controlled release, through physical capture using a fixed weir trap.

3. Determine the extent of nonnative fish colonization in wetland habitats.

End Products:
We will compose an annual report describing management of the wetland for that year and how Stewart Lake functions as habitat for larval and adult endangered fishes. We will provide information on: (1) larval razorback sucker entrainment and 2) species-specific information on fishes emigrating from the floodplain during the drawdown period. In addition, an annual query of the STReaMS database for encounters of previously tagged fish from Stewart Lake will allow us to investigate in-river survival of wild razorback sucker that have previously emigrated from Stewart Lake. If reencounters of wild Stewart Lake razorbacks increase in the future, a formal analysis of survival and other population parameters of these fish may be warranted.

Study Area:
Stewart Lake, which is located along the middle Green River at river mile 300, is approximately 570 acres at full capacity (Valdez and Nelson 2004). Low-flow connection relative to other wetland habitats allows for research opportunities across a range of flow conditions. Water can be managed through an inlet gate located at the upstream end of the wetland, as well an outlet canal and gate on the downstream end. Timing and extent of floodplain inundation and drawdown can be manipulated via floodgate operations that can be regulated to meet multiple research objectives. For example, the outlet control structure is two feet lower in elevation than the inlet structure and begins flooding at approximately 3,500–4,000 cfs (Schelly, personal observation—March, 2015), thus it can be used to entrain water under low flow scenarios. Once filled to capacity from the outlet structure, the inlet gate can be operated to provide additional water to the wetland given the higher elevation.

Study Methods/Approach:
Topics of interest in the LTSP to assess Flaming Gorge Dam releases will be addressed in accordance with our Stewart Lake study, including razorback sucker larval entrainment and nonnative fish diversity and abundance in floodplain wetlands. Below we have outlined our proposed plans to systematically examine the Stewart Lake wetland and outlet from the point of floodplain connection to draw-down. However, the LTSP highlights that various floodplains could be of high value to razorback sucker under different hydrologic conditions. Thus, under a variety of hydrologic years this project may be modified to focus on other wetlands, depending on Recovery Program guidance. Given that multiple study wetlands are identified in the LTSP, this scope of work will serve a similar function as UCRRP Project #164 and we will share the workload with the U.S. Fish and Wildlife Service, GRBFWCO to adequately accomplish LTSP sampling. We have not specifically identified additional funds in this budget for expansion of this work to other wetlands, but will do so upon further UCRRP guidance in anticipation of higher flow years. In addition, we are currently working with the Bureau of Land Management – Vernal Field Office to conduct a similar project in the Stirrup floodplain (UDWR as co-PI) pending renovation to function in a similar manner as Stewart Lake.

During the high flow entrainment period, an exclusionary fish screen will be installed at the Stewart Lake outlet structure and we will sample with light traps within the wetland. The fish screen will exclude adult fish from entering the wetland for the entire duration that the floodplain is entraining water and larvae. Previously we used directional traps associated with a weir wall to allow for movement of adult natives into the wetland and exclusion of nonnatives (Skorupski et al. 2013). However, we switched to an exclusionary fish screen due to low capture rates of adult fishes in the inlet trap during filling (i.e., trap avoidance) and because it is too costly to operate a fish trap on a 24-hr basis (Schelly et al. 2014). Alternatively, to monitor adult native fishes attempting to enter the wetland, we now deploy various stationary PIT technologies in the outlet canal for passive detections (Schelly et al. 2016) and fyke nets/boat electrofishing for active sampling/physical capture. Adult endangered species captured in the outlet canal will be moved into Stewart Lake (original intent with trap nets; Breen and Skorupski 2012) as we have determined this is an extremely beneficial procedure (e.g., natural bonytail reproduction; Bestgen et al. 2017). Additionally, any age-1 razorback sucker from the previous year will be moved to the wetland if captured near the outlet gate during nonnative removal work or other sampling. In 2015, a small group of 2014 year class razorbacks were able to reenter the wetland for a second growing season (Shelly et al. 2015) and several of those fish have subsequently been detected in the Green River (Partlow et al. 2020; Smith and Beers 2020), suggesting that an additional growing season may lead to increased survival to adulthood. This coincides with previous research indicating that razorback suckers tend to emigrate from wetlands at age-2 (Hedrick et al. 2012). The exclusionary

fish screen consists of diamond shaped mesh (3/8" by 7/8"), which will exclude large-bodied fishes (limiting competition and predation on larval native fishes) while allowing larval razorback sucker and small-bodied fishes to move into the wetland freely. During wet hydrologic years when discharge exceeds 18,700 cfs, flows overtop two breaches in the Stewart Lake levee road, thus block nets will be installed to exclude adult nonnatives trying to enter the wetland at those locations.

Approximately 10 light traps will be positioned in the outlet canal and in the main body of the wetland at the point of floodplain connection. Daily sampling will initiate following larval detection in the Green River main channel (UCRRP Project #22f), and conclude when the floodplain is disconnected from the main channel or when we have verification that razorback sucker larvae have reached the interior of the wetland in sufficient densities. All larval fish present in light traps will be preserved for later identification by the Larval Fish Lab (costs included in UCRRP Project #15 budget).

Following disconnection of the wetland from the river, we will request supplemental water deliveries from the Burns Bench Pipeline. The wetland elevation on the staff gauge at the outlet gate will be recorded whenever possible and during periodic visits to the wetland. No additional fish or water quality sampling will occur until draining unless special concerns arrive that justify investigation. Fish sampling previously undertaken during summer months has become more difficult due to limited open water habitat for seining and an increased mortality risk to endangered fishes captured during periods of warm water and low dissolved oxygen. Observations of low water levels or distressed fish will trigger early draining to avoid fish kills.

A fish trap will be installed at the outlet gate to monitor escapement of native and nonnative fishes retained in the Stewart Lake wetland following high-flow connection. Wetland drawdown (timing and duration of release) will be coordinated with the Bureau of Reclamation Provo office in conjunction with selenium management strategies that require a dry period following flooding to oxidize the chemical (e.g., Naftz et al. 2005). A fish trap will allow us to effectively sample fish leaving the wetland to determine survival and growth of wild-spawned razorback suckers and other native fishes, while allowing us to PIT tag young-of-year razorback suckers to monitor post-emigration survival from the wetland through passive and active sampling associated with other UCRRP projects. Following 2016 operation of Stewart Lake, it was determined that razorback sucker growth and survival benefitted greatly from an extended inundation period by waiting until mid-September or early-October to initiate drawdown and conducting draining over the course of approximately one month in order to account for all fishes leaving the wetland (i.e., no periods of free release; Schelly et al. 2016). In addition, during the final days of draining we determined that survival increases when a 24-48 hr pulse of supplemental water is provided to improve water quality (Schelly et al. 2016). This strategy was further improved in 2018 when we requested two 24-hr flow pulses of 10 cfs each, separated by 48 hrs (Partlow et al. 2018).

Overall, we have learned many important lessons since project implementation began in 2012, each lending to project improvements and increased success. Following several improvements, Stewart Lake operation in 2016 demonstrated what can be accomplished in a priority wetland to assist razorback sucker recruitment if everything goes as planned (Schelly et al. 2016). However, in 2017 we learned that habitat conditions can quickly deteriorate to the point where larval entrainment is a moot point if the wetland is not actively managed (Staffeldt et al. 2017). More specifically, our current protocol (i.e., wetland remains dry for 8-9 months; federal mandate to drain for selenium remediation) creates ideal conditions for the proliferation of cattails (*Typha* spp.). In 2017, cattail densities became such that water

could not even flow in through the inlet channel (vital for a complete fill of the wetland) and almost no open water habitat remained in the wetland (i.e., limited fish habitat). One year after our greatest success with this project where we returned over 2,000 wild-spawned razorback sucker to the Green River upon draining (Schelly et al. 2016), only a single age-0 razorback was released back to the Green River during draining in 2017 (Staffeldt et al. 2017), despite even greater densities of drifting larvae in the spring of 2017 compared to 2016 (K. Bestgen, Colorado State University, personal communication). While it is possible that unusual hydrology in 2017, including prolonged cold water releases from Flaming Gorge Dam, may have affected the timing of larval drift and thus Stewart Lake operations, the role of habitat management in ensuring survival of entrained razorback sucker should be prioritized.

Following extensive research and numerous discussions in the fall and winter of 2017–2018, we determined that two major maintenance issues must be addressed in order to maintain adequate wetland habitat to benefit razorback sucker recruitment at Stewart Lake: (1) a complete prescribed burn performed as possible (late winter/early spring), followed by the immediate release of supplemental water into the wetland to inundate remaining root structures, and (2) dredging of the inlet channel to maintain proper flow. Recently, we have attempted to increase open water habitat by using the "burn and flood" or the "cut and flood" strategies of cattail control (Sojda and Solberg 1993). This strategy targets carbohydrate stores in underground rhizomes by forcing the plant to convert starch anaerobically. This is achieved by destroying aerenchyma tissue that provides air passage from the leaves to the rhizomes in cattails and then quickly flooding the area. We have successfully destroyed stalks and aerenchyma tissue by burning (2018) and mechanical treatment with a roller chopper and wetland-specific machinery ("Marsh Master"; Partlow et al. 2020), but we have been unable to sufficiently flood the wetland with available supplemental water and pumping from the river. For this reason, we will continue exploring available methods for cattail control in addition to prescribed fire when possible.

Task Description, Deliverables and Schedule:

Task 1: Operate and maintain a fish screen at the Stewart Lake outlet gate to entrain water and larval razorback sucker. Conduct a prescribed burn as conditions allow to maintain habitat conditions (once every three years).
Task 2: Sample fishes exiting the Stewart Lake outlet during drawdown with a fish trap.
Task 3: Data entry, analysis and reporting.
Task 4: Dredge the inlet channel to maintain proper function (every other year).

Task	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1		X	X	X	X	X					X	X
2									X	X		
3										X	X	X
4											X	X

Budget Summary:

FY Year	UDWR-Vernal
2022	$49,429
2023	$49,429
2024	$50,418
2025	$51,426
2026	$52,454
Total	$253,156

References:

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SUMMARY OF PROPOSED COSTS

Name of Servicing Agency:	Utah Division of Wildlife Resources
Project Name:	Projecct 165: Management of Stewart Lake floodplain for use by larval and adult endangered fishes (Vernal Field Office)

		YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL
Enter the BEGINNING dates for each year ------>		**10/1/2021**		**10/1/2022**		**10/2/2023**		**10/1/2024**		**10/1/2025**		
		Through		Through		Through		Through		Through		
Enter the ENDING dates for each year ------->		**9/30/2022**		**10/1/2023**		**9/30/2024**		**9/30/2025**		**9/30/2026**		
DIRECT LABOR AND FRINGE BENEFIT COSTS:		**YEAR 1**		**YEAR 2**		**YEAR 3**		**YEAR 4**		**YEAR 5**		**TOTAL**
Direct Labor - Hourly		$ 28,385.05		$ 33,189.89		$ 29,681.32		$ 33,787.61		$ 30,880.45		$ 155,924.32
Fringe Benefits - Hourly		$ 7,138.16		$ 8,745.48		$ 7,572.35		$ 8,801.54		$ 7,878.28		$ 40,135.82
Subtotal of Direct Labor & Fringe Benefits:		**$ 35,523.22**		**$ 41,935.38**		**$ 37,253.67**		**$ 42,589.16**		**$ 38,758.72**		**$ 196,060.15**
OTHER DIRECT COSTS:		**YEAR 1**		**YEAR 2**		**YEAR 3**		**YEAR 4**		**YEAR 5**		**TOTAL**
Materials and Supplies		$ 11,591.68		$ 6,179.52		$ 11,823.52		$ 6,429.18		$ 12,301.18		$ 48,325.08
Travel Costs		$ 1,314.10		$ 1,314.10		$ 1,340.38		$ 1,367.19		$ 1,394.53		$ 6,730.31
Equipment		$ -		$ -		$ -		$ -		$ -		$ -
Contractors		$ 1,000.00		$ -		$ -		$ 1,040.40		$ -		$ 2,040.40
Subtotal of Other Direct Costs:		**$ 13,905.78**		**$ 7,493.62**		**$ 13,163.90**		**$ 8,836.77**		**$ 13,695.71**		**$ 57,095.79**
INDIRECT/OVERHEAD COSTS:		**YEAR 1**		**YEAR 2**		**YEAR 3**		**YEAR 4**		**YEAR 5**		**TOTAL**
Subtotal of Labor and Other Direct Costs:		**$ 49,429.00**		**$ 49,429.00**		**$ 50,417.58**		**$ 51,425.93**		**$ 52,454.44**		
Total dollars exempt from indirect/overhead base:		$ -		$ -		$ -		$ -		$ -		
<Enter Description of Indirect/OH Cost #1>	17.00%	$ -	17.00%	$ -	17.00%	$ -	17.00%	$ -	17.00%	$ -		$ -
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:		**$ -**		**$ -**		**$ -**		**$ -**		**$ -**		**$ -**

		YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5		TOTAL
GRAND TOTAL:		**$ 49,429.00**		**$ 49,429.00**		**$ 50,417.58**		**$ 51,425.93**		**$ 52,454.44**		**$ 253,155.93**

SUMMARY OF DIRECT LABOR & FRINGE BENEFITS

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

					YEAR 1					YEAR 2				
					10/1/2021		Through	9/30/2022		10/1/2022		Through	10/1/2023	
	Task # or Description	Employee Name	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	Matt Breen	Project Leader	$ 29.14	20.0	$ 29.14	$ 582.78	40.00%	$ 233.11	30.0	$ 29.14	$ 874.17	40.00%	$ 349.67
2	1	Mike Partlow	Biologist II	$ 26.63	60.0	$ 26.63	$ 1,597.67	40.00%	$ 639.07	75.9	$ 26.63	$ 2,020.57	40.00%	$ 808.23
3	1	Garrett Tournear	Journey Maint. Specia	$ 27.08	20.0	$ 27.08	$ 541.65	40.00%	$ 216.66	20.0	$ 27.08	$ 541.65	40.00%	$ 216.66
4	1	Keena Elbin	Biologist I	$ 25.78	60.0	$ 25.78	$ 1,547.01	40.00%	$ 618.80	60.0	$ 25.78	$ 1,547.01	40.00%	$ 618.80
5	1	Seasonal	Technician II	$ 20.08	20.0	$ 20.08	$ 401.58	0.00%	$ -	20.0	$ 20.08	$ 401.58	0.00%	$ -
6	1	Seasonal	Technician I	$ 18.64	100.0	$ 18.64	$ 1,863.95	0.00%	$ -	100.0	$ 18.64	$ 1,863.95	0.00%	$ -
7	2	Matt Breen	Project Leader	$ 29.14	100.0	$ 29.14	$ 2,913.91	40.00%	$ 1,165.56	150.0	$ 29.14	$ 4,370.86	40.00%	$ 1,748.34
8	2	Mike Partlow	Biologist II	$ 26.63	100.0	$ 26.63	$ 2,662.78	40.00%	$ 1,065.11	150.0	$ 26.63	$ 3,994.17	40.00%	$ 1,597.67
9	2	Garrett Tournear	Journey Maint. Specia	$ 27.08	100.0	$ 27.08	$ 2,708.25	40.00%	$ 1,083.30	100.0	$ 27.08	$ 2,708.25	40.00%	$ 1,083.30
10	2	Keena Elbin	Biologist I	$ 25.78	100.0	$ 25.78	$ 2,578.35	40.00%	$ 1,031.34	120.0	$ 25.78	$ 3,094.02	40.00%	$ 1,237.61
11	2	Seasonal	Technician II	$ 20.08	100.0	$ 20.08	$ 2,007.91	0.00%	$ -	100.0	$ 20.08	$ 2,007.91	0.00%	$ -
12	2	Seasonal	Technician I	$ 18.64	250.0	$ 18.64	$ 4,659.87	0.00%	$ -	292.2	$ 18.64	$ 5,446.41	0.00%	$ -
13	3	Matt Breen	Project Leader	$ 29.14	20.0	$ 29.14	$ 582.78	40.00%	$ 233.11	20.0	$ 29.14	$ 582.78	40.00%	$ 233.11
14	3	Mike Partlow	Biologist II	$ 26.63	80.0	$ 26.63	$ 2,130.23	40.00%	$ 852.09	80.0	$ 26.63	$ 2,130.23	40.00%	$ 852.09
15	3	Seasonal	Technician II	$ 20.08	80.0	$ 20.08	$ 1,606.33	0.00%	$ -	80.0	$ 20.08	$ 1,606.33	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					**1,210.00**		**$ 28,385.05**		**$ 7,138.16**	**1,398.08**		**$ 33,189.89**		**$ 8,745.48**

SUMMARY OF DIRECT LABOR & FRINGE BENEFITS

Yr 3 Escalation Rate	2.00%

Yr 4 Escalation Rate	2.00%

					YEAR 3					YEAR 4				
					10/2/2023		Through	9/30/2024		10/1/2024		Through	9/30/2025	
	Task # or Description	Employee Name	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	Matt Breen	Project Leader	$ 29.14	30.0	$ 29.72	$ 891.66	40.00%	$ 356.66	20.0	$ 30.32	$ 606.33	40.00%	$ 242.53
2	1	Mike Partlow	Biologist II	$ 26.63	75.9	$ 27.16	$ 2,060.97	40.00%	$ 824.39	60.0	$ 27.70	$ 1,662.22	40.00%	$ 664.89
3	1	Garrett Tournear	Journey Maint. Specia	$ 27.08	20.0	$ 27.62	$ 552.48	40.00%	$ 220.99	20.0	$ 28.18	$ 563.53	40.00%	$ 225.41
4	1	Keena Elbin	Biologist I	$ 25.78	60.0	$ 26.30	$ 1,577.95	40.00%	$ 631.18	60.0	$ 26.83	$ 1,609.51	40.00%	$ 643.80
5	1	Seasonal	Technician II	$ 20.08	20.0	$ 20.48	$ 409.61	0.00%	$ -	20.0	$ 20.89	$ 417.81	0.00%	$ -
6	1	Seasonal	Technician I	$ 18.64	100.0	$ 19.01	$ 1,901.23	0.00%	$ -	100.0	$ 19.39	$ 1,939.25	0.00%	$ -
7	2	Matt Breen	Project Leader	$ 29.14	100.0	$ 29.72	$ 2,972.19	40.00%	$ 1,188.87	150.0	$ 30.32	$ 4,547.44	40.00%	$ 1,818.98
8	2	Mike Partlow	Biologist II	$ 26.63	100.0	$ 27.16	$ 2,716.04	40.00%	$ 1,086.42	150.0	$ 27.70	$ 4,155.54	40.00%	$ 1,662.22
9	2	Garrett Tournear	Journey Maint. Specia	$ 27.08	100.0	$ 27.62	$ 2,762.41	40.00%	$ 1,104.96	100.0	$ 28.18	$ 2,817.66	40.00%	$ 1,127.06
10	2	Keena Elbin	Biologist I	$ 25.78	100.0	$ 26.30	$ 2,629.92	40.00%	$ 1,051.97	120.0	$ 26.83	$ 3,219.02	40.00%	$ 1,287.61
11	2	Seasonal	Technician II	$ 20.08	100.0	$ 20.48	$ 2,048.07	0.00%	$ -	100.0	$ 20.89	$ 2,089.03	0.00%	$ -
12	2	Seasonal	Technician I	$ 18.64	250.0	$ 19.01	$ 4,753.07	0.00%	$ -	292.2	$ 19.39	$ 5,666.44	0.00%	$ -
13	3	Matt Breen	Project Leader	$ 29.14	20.0	$ 29.72	$ 594.44	40.00%	$ 237.77	20.0	$ 30.32	$ 606.33	40.00%	$ 242.53
14	3	Mike Partlow	Biologist II	$ 26.63	80.0	$ 27.16	$ 2,172.83	40.00%	$ 869.13	80.0	$ 27.70	$ 2,216.29	40.00%	$ 886.52
15	3	Seasonal	Technician II	$ 20.08	80.0	$ 20.48	$ 1,638.46	0.00%	$ -	80.0	$ 20.89	$ 1,671.23	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					1,235.88		$ 29,681.32		$ 7,572.35	1,372.20		$ 33,787.61		$ 8,801.54

SUMMARY OF DIRECT LABOR & FRINGE BENEFITS

Yr 5 Escalation Rate	2.00%

	Task # or Description	Employee Name	Position Title	Current Hourly Rate	YEAR 5 10/1/2025 Through 9/30/2026 # of Hours	Hourly Rate	Salary Cost	Fringe Rate	Fringe Cost	Total Salary Cost	Total Fringe Cost	Total Labor Cost
1	1	Matt Breen	Project Leader	$ 29.14	30.0	$ 30.92	$ 927.68	40.00%	$ 371.07	$ 3,882.61	$ 1,553.05	**$ 5,435.66**
2	1	Mike Partlow	Biologist II	$ 26.63	75.9	$ 28.26	$ 2,144.24	40.00%	$ 857.69	$ 9,485.66	$ 3,794.26	**$ 13,279.92**
3	1	Garrett Tournear	Journey Maint. Specia	$ 27.08	20.0	$ 28.74	$ 574.80	40.00%	$ 229.92	$ 2,774.11	$ 1,109.65	**$ 3,883.76**
4	1	Keena Elbin	Biologist I	$ 25.78	60.0	$ 27.36	$ 1,641.70	40.00%	$ 656.68	$ 7,923.19	$ 3,169.28	**$ 11,092.46**
5	1	Seasonal	Technician II	$ 20.08	20.0	$ 21.31	$ 426.16	0.00%	$ -	$ 2,056.75	$ -	
6	1	Seasonal	Technician I	$ 18.64	100.0	$ 19.78	$ 1,978.04	0.00%	$ -	$ 9,546.41	$ -	**$ 9,546.41**
7	2	Matt Breen	Project Leader	$ 29.14	100.0	$ 30.92	$ 3,092.26	40.00%	$ 1,236.90	$ 17,896.66	$ 7,158.66	**$ 25,055.32**
8	2	Mike Partlow	Biologist II	$ 26.63	100.0	$ 28.26	$ 2,825.77	40.00%	$ 1,130.31	$ 16,354.30	$ 6,541.72	**$ 22,896.02**
9	2	Garrett Tournear	Journey Maint. Specia	$ 27.08	100.0	$ 28.74	$ 2,874.01	40.00%	$ 1,149.60	$ 13,870.57	$ 5,548.23	**$ 19,418.80**
10	2	Keena Elbin	Biologist I	$ 25.78	100.0	$ 27.36	$ 2,736.17	40.00%	$ 1,094.47	$ 14,257.49	$ 5,703.00	**$ 19,960.49**
11	2	Seasonal	Technician II	$ 20.08	100.0	$ 21.31	$ 2,130.81	0.00%	$ -	$ 10,283.74	$ -	**$ 10,283.74**
12	2	Seasonal	Technician I	$ 18.64	250.0	$ 19.78	$ 4,945.09	0.00%	$ -	$ 25,470.88	$ -	**$ 25,470.88**
13	3	Matt Breen	Project Leader	$ 29.14	20.0	$ 30.92	$ 618.45	40.00%	$ 247.38	$ 2,984.78	$ 1,193.91	**$ 4,178.69**
14	3	Mike Partlow	Biologist II	$ 26.63	80.0	$ 28.26	$ 2,260.61	40.00%	$ 904.25	$ 10,910.19	$ 4,364.07	**$ 15,274.26**
15	3	Seasonal	Technician II	$ 20.08	80.0	$ 21.31	$ 1,704.65	0.00%	$ -	$ 8,226.99	$ -	**$ 8,226.99**
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					**1,235.88**		**$ 30,880.45**		**$ 7,878.28**	**$ 155,924.32**	**$ 40,135.82**	**$ 196,060.15**

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	1	Monthly fleet rental (2 trucks, 2 weeks)	SOWs funded through BOR contract R19AP00059	$ 500.00	1.00	$ 500.00	$ 500.00	1.00	$ 500.00
2	1	Mileage costs (500 miles)	SOWs funded through BOR contract R19AP00059	$ 0.40	500.00	$ 200.00	$ 0.40	500.00	$ 200.00
3	1	Weir maintenance supplies	SOWs funded through BOR contract R19AP00059	$ 1,159.28	1.00	$ 1,159.28	$ 1,159.28	1.00	$ 1,159.28
4	1	Sampling gear	SOWs funded through BOR contract R19AP00059	$ 1,545.71	1.00	$ 1,545.71	$ 1,545.71	1.00	$ 1,545.71
5	2	Monthly fleet rental (2 trucks, 1 month)	SOWs funded through BOR contract R19AP00059	$ 500.00	2.00	$ 1,000.00	$ 500.00	2.00	$ 1,000.00
6	2	Mileage costs (1,500 miles)	SOWs funded through BOR contract R19AP00059	$ 0.40	1500.00	$ 600.00	$ 0.40	1500.00	$ 600.00
7	2	Sampling gear	SOWs funded through BOR contract R19AP00059	$ 1,174.53	1.00	$ 1,174.53	$ 1,174.53	1.00	$ 1,174.53
8	4	UDWR Heavy Equipment Dredging Service	Direct billing for service from UDWR Habitat Section	$ 5,412.16	1.00	$ 5,412.16	$ 5,412.16	0.00	$ -
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	$ -
			TOTAL:			**$ 11,591.68**			**$ 6,179.52**

SUMMARY OF MATERIALS AND SUPPLIES

	Yr 3 Escalation Rate	2.00%	Yr 4 Escalation Rate	2.00%

SUMMARY OF MATERIALS, SUPPLIES, SERVICES

			Year 3			Year 4		
	Task # or Description	Item Description	Unit Price	Unit Quantity	Subtotal	Unit Price	Unit Quantity	Subtotal
1	1	Monthly fleet rental (2 trucks, 2 weeks)	$ 510.00	1.00	$ 510.00	$ 520.20	1.00	$ 520.20
2	1	Mileage costs (500 miles)	$ 0.41	500.00	$ 204.00	$ 0.42	500.00	$ 208.08
3	1	Weir maintenance supplies	$ 1,182.47	1.00	$ 1,182.47	$ 1,206.12	1.00	$ 1,206.12
4	1	Sampling gear	$ 1,576.63	1.00	$ 1,576.63	$ 1,608.16	1.00	$ 1,608.16
5	2	Monthly fleet rental (2 trucks, 1 month)	$ 510.00	2.00	$ 1,020.00	$ 520.20	2.00	$ 1,040.40
6	2	Mileage costs (1,500 miles)	$ 0.41	1500.00	$ 612.00	$ 0.42	1500.00	$ 624.24
7	2	Sampling gear	$ 1,198.02	1.00	$ 1,198.02	$ 1,221.98	1.00	$ 1,221.98
8	4	UDWR Heavy Equipment Dredging Service	$ 5,520.40	1.00	$ 5,520.40	$ 5,630.81	0.00	$ -
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	$ -
					$ 11,823.52			**$ 6,429.18**

SUMMARY OF MATERIALS AND SUPPLIES

	Yr 5 Escalation Rate	2.00%

SUMMARY OF MATERIALS, SUPPLIES, SERVICES

	Task # or Description	Item Description	Year 5 Unit Price	Year 5 Unit Quantity	Year 5 Subtotal	TOTAL
1	1	Monthly fleet rental (2 trucks, 2 weeks)	$ 530.60	1.00	$ 530.60	$ 2,560.80
2	1	Mileage costs (500 miles)	$ 0.42	500.00	$ 212.24	$ 1,024.32
3	1	Weir maintenance supplies	$ 1,230.24	1.00	$ 1,230.24	$ 5,937.39
4	1	Sampling gear	$ 1,640.32	1.00	$ 1,640.32	$ 7,916.53
5	2	Monthly fleet rental (2 trucks, 1 month)	$ 530.60	2.00	$ 1,061.21	$ 5,121.61
6	2	Mileage costs (1,500 miles)	$ 0.42	1500.00	$ 636.72	$ 3,072.96
7	2	Sampling gear	$ 1,246.42	1.00	$ 1,246.42	$ 6,015.48
8	4	UDWR Heavy Equipment Dredging Service	$ 5,743.43	1.00	$ 5,743.43	$ 16,675.99
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	$ -	$ -
					$ 12,301.18	**$ 48,325.08**

SUMMARY OF TRAVEL COSTS

Cost Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Trip #	1	1	1	1	1	
From-To	Stewart Lake	Stewart Lake	Stewart Lake	Stewart Lake	Stewart Lake	
Reason	Task 1 - Day Trips	Task 1 - Day Trips	Task 1 - Day Trips	Task 1 - Day Trips	Task 1 - Day Trips	
# of Days (include travel days)	14	14	14	14	14	
Airfare	$ -	$ -	$ -	$ -	$ -	
Lodging (Per Night)	$ -	$ -	$ -	$ -	$ -	
MI&E Per Day	$ 15.46	$ 15.46	$ 15.77	$ 16.08	$ 16.41	
Auto Rental Per Day	$ -	$ -	$ -	$ -	$ -	
Misc Costs/Adjustments/Trip	$ -	$ -	$ -	$ -	$ -	
Total Per Trip	**$ 208.71**	**$ 208.71**	**$ 212.88**	**$ 217.14**	**$ 221.48**	
No. of persons	2	2	2	2	2	
Mileage rate	$ -	$ -	$ -	$ -	$ -	
Total miles						
SUBTOTAL =	**$ 417.42**	**$ 417.42**	**$ 425.77**	**$ 434.28**	**$ 442.97**	**$ 2,137.86**

Cost Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Trip #	2	2	2	2	2	
From-To	Stewart Lake	Stewart Lake	Stewart Lake	Stewart Lake	Stewart Lake	
Reason	Task 2 - Day Trips	Task 2 - Day Trips	Task 2 - Day Trips	Task 2 - Day Trips	Task 2 - Day Trips	
# of Days (include travel days)	25	25	25	25	25	
Airfare						
Lodging (Per Night)						
MI&E Per Day	$ 15.46	$ 15.46	$ 15.77	$ 16.08	$ 16.41	
Auto Rental Per Day						
Misc Costs/Adjustments/Trip						
Total Per Trip	**$ 378.77**	**$ 378.77**	**$ 386.35**	**$ 394.07**	**$ 401.95**	
No. of persons	2	2	2	2	2	
Mileage rate						
Total miles						
SUBTOTAL =	**$ 757.54**	**$ 757.54**	**$ 772.69**	**$ 788.14**	**$ 803.91**	**$ 3,879.82**

SUMMARY OF TRAVEL COSTS

Cost Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Trip #	3	3	3	3	3	
From-To	Stewart Lake	Stewart Lake	Stewart Lake	Stewart Lake	Stewart Lake	
Reason	Task 4 - Day Trips	Task 4 - Day Trips	Task 4 - Day Trips	Task 4 - Day Trips	Task 4 - Day Trips	
# of Days (include travel days)	5	5	5	5	5	
Airfare						
Lodging (Per Night)						
MI&E Per Day	$ 15.46	$ 15.46	$ 15.77	$ 16.08	$ 16.41	
Auto Rental Per Day						
Misc Costs/Adjustments/Trip						
Total Per Trip	**$ 69.57**	**$ 69.57**	**$ 70.96**	**$ 72.38**	**$ 73.83**	
No. of persons	2	2	2	2	2	
Mileage rate						
Total miles						
SUBTOTAL =	**$ 139.14**	**$ 139.14**	**$ 141.92**	**$ 144.76**	**$ 147.66**	**$ 712.62**

	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
OTAL COST BY PERIOD =	**$ 1,314.10**	**$ 1,314.10**	**$ 1,340.38**	**$ 1,367.19**	**$ 1,394.53**	**$ 6,730.31**

SUMMARY OF CONTRACTOR COSTS

Contractor:	Purpose:	Competitive Award?	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Utah Division of Forestry Fire & State Lands	Travel costs for annual prescribed burns	No	$ 1,000.00			$ 1,040.40		**$ 2,040.40**
			$ -	$ -	$ -	$ -	$ -	**$ -**
			$ -	$ -	$ -	$ -	$ -	**$ -**
			$ -	$ -	$ -	$ -	$ -	**$ -**
			$ -	$ -	$ -	$ -	$ -	**$ -**
		TOTAL =	**$ 1,000.00**	**$ -**	**$ -**	**$ 1,040.40**	**$ -**	**$ 2,040.40**

The service is performed as an in-kind service by FFSL, we reimburse their division for travel costs