

**RECOVERY PROGRAM  
FY 2014-2015 SCOPE OF WORK for:**

Recovery Program Project Number: New

Identifying Razorback Sucker Spawning Areas in the Middle Green River

Reclamation Agreement number: \_\_\_\_\_

Reclamation Agreement term: \_\_\_\_\_

Lead agency: Utah Division of Wildlife Resources

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Date Last Modified: 5/3/2013 4:08:00 PM

Category:

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

Expected Funding Source:

- Annual funds
- Capital funds
- Other [*explain*]

I. Title of Proposal: Identifying Razorback Sucker Spawning Areas in the Middle Green River

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. Conduct research to acquire needed life history information.

V.B.2. Conduct appropriate studies to provide needed life history information.

## GREEN RIVER ACTION PLAN

V.A. Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions.

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

Wild razorback sucker (*Xyrauchen texanus*) populations were in sharp decline in the 1980s and extirpated shortly after in the Upper Colorado River. Therefore, populations have been augmented by a stocking program beginning in 1995, which steadily increased in production and efficiency (size and numbers) since 2000 (Bestgen et al. 2012). Due to extensive stocking efforts, populations have increased to a point where a portion of individuals are now successfully reproducing. Known spawning areas in the middle Green River include Razorback Bar and Escalante Bar (Modde and Irving 1998), and it has been shown that hatchery-reared razorback sucker use these same spawning grounds (Modde et al. 2005). Although it is likely razorback sucker (hatchery-reared and/or wild fish) are using additional spawning areas, there is limited information on the abundance and extent of these spawning areas. As identified in Bestgen et al. (2012), there is a need to improve recaptures of razorback sucker and targeting them when in spawning aggregates greatly increases capture rates, but this should be accomplished in a passive manner. We identify procedures to investigate different spawning areas within the proximity of known spawning locations to better understand the extent and magnitude of the viable razorback sucker population during the spawning period.

### IV. Study Goals, Objectives, End Product(s):

#### Goal:

Identify new spawning locations (in addition to Razorback and Escalante spawning bars), the extent of these spawning areas, and temporal patterns of razorback sucker spawning activity in the middle Green River.

#### Objectives:

1. Locate razorback sucker spawning congregations with use of a floating PIT reader.
2. Verify spawning activity by physical capture (ground truth with boat electrofishing).
3. Determine the extent (abundance and habitat area) of razorback sucker spawning areas.

End product: knowledge gained through this project will allow us to determine locations to place stationary PIT tag antenna locations to thoroughly investigate spawning areas in a more cost-effective manner as a means to improve monitoring of the adult life stage of razorback sucker (see Zelasko et al. 2010).

V. Study Area:

The study area is limited to a 20.3 mile section in the middle Green River from Split Mountain boat ramp (RM 319.3) to Ashley Creek (RM 299.0). This section contains known razorback spawning locations and will be thoroughly investigated for additional areas.

VI. Study Methods/Approach:

During years the Colorado pikeminnow population estimate is not occurring (FY 2014-2015) we will sample to identify razorback spawning areas using a floating PIT tag reader. Each sampling event will target the right shoreline, left shoreline and two transects in the middle of the channel moving in the downstream direction. Detection of three unique fish within a 50 m<sup>2</sup> area will trigger a thorough investigation of the potential spawning area. Each potential spawning area will be scanned in a series of transects (parallel and perpendicular to the shoreline) to determine the abundance of razorback sucker and total area fish are using. Investigations will occur during two events focused around the estimated spawning period, which will be based on temperature-derived model predictions (i.e., peak spawning dates) provided by the Larval Fish Lab. Periods that fish are staging at Razorback Bar, as determined through Project #C-6 Baeser, will also serve as a trigger for this sampling and will be used in combination with model predictions for a more accurate measurement of when sampling trips should occur. More specifically, sampling events will be timed in an attempt to maximize captures/detections and enumerate all potential spawning areas within the study reach. The presence of larval razorback sucker in Green River drift as determined through project 22F, will serve as verification that the spawning period is complete and that these surveys should no longer occur. In conjunction with floating PIT tag reader trips, boat electrofishing will be utilized to verify the condition of fish upon PIT tag detection and to ground truth floating tag reader detection with physical capture. A minimum of two fish will be handled to determine spawning condition of male and females and to limit the handling of individuals during the spawn.

Task Description and Schedule:

Task 1. Identify razorback sucker spawning areas using a floating PIT tag reader during two sampling events (UDWR & USU)

Task 2. Verify razorback sucker spawning condition via physical capture with boat electrofishing during two sampling events (UDWR)

Task 3. Data entry, analysis, and reporting (UDWR)

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

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

FY 2014

Task 1. Identify razorback sucker spawning areas using a floating PIT tag reader during two sampling events (UDWR)

	Rate	Hours/Units	Cost
<b>Labor</b>			
Project Leader	31.95	40	1278
Biologist II	32.70	60	1962
Technician II (Assistant Crew Leader)	17.14	40	686
		<b>Subtotal</b>	<b>\$3,925</b>
<b>Travel<sup>a</sup></b>			
3 trucks @ 3% of annual use	20400.00	0.03	612
Per diem (8 day trips x 3 people)	13.00	24	312
		<b>Subtotal</b>	<b>\$924</b>
<b>Equipment</b>			
Boat fuel (gallons)	4.00	48	400
Boat/motor repair and maintenance			200
Sampling equipment			200
		<b>Subtotal</b>	<b>\$800</b>
		<b>Task 1 Total</b>	<b>\$5,649</b>

Task 1. Identify razorback sucker spawning areas using a floating PIT tag reader during two sampling events (USU)

	Rate	Hours/Units	Cost
<b>Labor</b>			
Fish Technology Engineer	54.53	100	5453
		<b>Subtotal</b>	<b>\$5,453</b>
<b>Travel</b>			
Vehicle mileage	0.55	520	286
Lodging	77.00	3	231
Per diem (4 overnights)	46.00	4	184
		<b>Subtotal</b>	<b>\$701</b>
<b>Equipment</b>			
Use of floating PIT tag system	250.00	2	500
		<b>Subtotal</b>	<b>\$500</b>
USU-UDWR Overhead (10%)			<b>\$665</b>
		<b>Task 1 Total</b>	<b>\$7,319</b>

Task 2. Verify razorback sucker spawning condition via physical capture with boat electrofishing during two sampling events (UDWR)

	Rate	Hours/Units	Cost
<b>Labor</b>			
Biologist II	32.70	60	1962
Technician II (Field Supervisor)	22.24	80	1779
Technician II (Assistant Crew Leader)	17.14	40	686
		<b>Task 3 Total</b>	<b>\$4,427</b>

Task 3. Data entry, analysis, and reporting (UDWR)

	Rate	Hours/Units	Cost
<b>Labor</b>			
Project Leader	31.95	20	639
Biologist II	32.70	80	2616
Technician II	22.24	80	1779
		<b>Task 4 Total</b>	<b>\$5,034</b>
		<b>FY 2014 Total</b>	<b>\$22,429</b>

FY 2015

Task 1. Identify razorback sucker spawning areas using a floating PIT tag reader during two sampling events (UDWR)

	Rate	Hours/Units	Cost
<b>Labor</b>			
Project Leader	32.58	40	1303
Biologist II	33.35	60	2001
Technician II (Assistant Crew Leader)	17.48	40	699
		<b>Subtotal</b>	<b>\$4,004</b>
<b>Travel<sup>a</sup></b>			
3 trucks @ 3% of annual use	20808.00	0.03	624
Per diem (8 day trips x 3 people)	13.26	24	318
		<b>Subtotal</b>	<b>\$942</b>
<b>Equipment</b>			
Boat fuel (gallons)	4.08	48	408
Boat/motor repair and maintenance			204
Sampling equipment			204
		<b>Subtotal</b>	<b>\$816</b>
		<b>Task 1 Total</b>	<b>\$5,762</b>

Task 1. Identify razorback sucker spawning areas using a floating PIT tag reader during two sampling events (USU)

	Rate	Hours/Units	Cost
<b>Labor</b>			
Fish Technology Engineer	55.62	100	5562
		<b>Subtotal</b>	<b>\$5,562</b>
<b>Travel</b>			
Vehicle mileage	0.56	520	292
Lodging	78.54	3	236
Per diem (4 overnights)	46.92	4	188
		<b>Subtotal</b>	<b>\$715</b>
<b>Equipment</b>			
Use of floating PIT tag system	255.00	2	510
		<b>Subtotal</b>	<b>\$510</b>
USU-UDWR Overhead (10%)			<b>\$679</b>
		<b>Task 1 Total</b>	<b>\$7,466</b>

Task 2. Verify razorback sucker spawning condition via physical capture with boat electrofishing during two sampling events (UDWR)

	Rate	Hours/Units	Cost
<b>Labor</b>			
Biologist II	33.35	60	2001
Technician II (Field Supervisor)	22.68	80	1815
Technician II (Assistant Crew Leader)	17.48	40	699
		<b>Task 3 Total</b>	<b>\$4,515</b>

Task 3. Data entry, analysis, and reporting (UDWR)

	Rate	Hours/Units	Cost
<b>Labor</b>			
Project Leader	32.58	20	652
Biologist II	33.35	80	2668
Technician II	22.68	80	1815
		<b>Task 4 Total</b>	<b>\$5,135</b>
		<b>FY 2015 Total</b>	<b>\$22,878</b>

FY 2016

Task 1. Identify razorback sucker spawning areas using a floating PIT tag reader during two sampling events (UDWR)

	Rate	Hours/Units	Cost
<b>Labor</b>			
Project Leader	33.24	40	1329
Biologist II	34.02	60	2041
Technician II (Assistant Crew Leader)	17.83	40	713
		<b>Subtotal</b>	<b>\$4,084</b>
<b>Travel<sup>a</sup></b>			
3 trucks @ 3% of annual use	21224.16	0.03	637
Per diem (8 day trips x 3 people)	13.53	24	325
		<b>Subtotal</b>	<b>\$961</b>
<b>Equipment</b>			
Boat fuel (gallons)	4.16	48	416
Boat/motor repair and maintenance			208
Sampling equipment			208
		<b>Subtotal</b>	<b>\$832</b>
<b>Task 1 Total</b>			<b>\$5,878</b>

Task 1. Identify razorback sucker spawning areas using a floating PIT tag reader during two sampling events (USU)

	Rate	Hours/Units	Cost
<b>Labor</b>			
Fish Technology Engineer	56.73	100	5673
		<b>Subtotal</b>	<b>\$5,673</b>
<b>Travel</b>			
Vehicle mileage	0.57	520	298
Lodging	80.11	3	240
Per diem (4 overnights)	47.86	4	191
		<b>Subtotal</b>	<b>\$729</b>
<b>Equipment</b>			
Use of floating PIT tag system	260.10	2	520
		<b>Subtotal</b>	<b>\$520</b>
USU-UDWR Overhead (10%)			<b>\$692</b>
<b>Task 1 Total</b>			<b>\$7,615</b>

Task 2. Verify razorback sucker spawning condition via physical capture with boat electrofishing during two sampling events (UDWR)

	Rate	Hours/Units	Cost
<b>Labor</b>			
Biologist II	34.02	60	2041
Technician II (Field Supervisor)	23.14	80	1851
Technician II (Assistant Crew Leader)	17.83	40	713
<b>Task 3 Total</b>			<b>\$4,606</b>

Task 3. Data entry, analysis, and reporting (UDWR)

	Rate	Hours/Units	Cost
<b>Labor</b>			
Project Leader	33.24	20	665
Biologist II	34.02	80	2722
Technician II	23.14	80	1851
<b>Task 4 Total</b>			<b>\$5,237</b>
<b>FY 2016 Total</b>			<b>\$23,335</b>

FY 2017

Task 1. Identify razorback sucker spawning areas using a floating PIT tag reader during two sampling events (UDWR)

	Rate	Hours/Units	Cost
Labor			
Project Leader	33.90	40	1356
Biologist II	34.70	60	2082
Technician II (Assistant Crew Leader)	18.19	40	728
		<b>Subtotal</b>	<b>\$4,166</b>
Travel <sup>a</sup>			
3 trucks @ 3% of annual use	21648.64	0.03	649
Per diem (8 day trips x 3 people)	13.80	24	331
		<b>Subtotal</b>	<b>\$981</b>
Equipment			
Boat fuel (gallons)	4.24	48	424
Boat/motor repair and maintenance			212
Sampling equipment			212
		<b>Subtotal</b>	<b>\$849</b>
		<b>Task 1 Total</b>	<b>\$5,995</b>

Task 1. Identify razorback sucker spawning areas using a floating PIT tag reader during two sampling events (USU)

	Rate	Hours/Units	Cost
Labor			
Fish Technology Engineer	57.87	100	5787
		<b>Subtotal</b>	<b>\$5,787</b>
Travel			
Vehicle mileage	0.58	520	304
Lodging	81.71	3	245
Per diem (4 overnights)	48.82	4	195
		<b>Subtotal</b>	<b>\$744</b>
Equipment			
Use of floating PIT tag system	265.30	2	531
		<b>Subtotal</b>	<b>\$531</b>
USU-UDWR Overhead (10%)			<b>\$706</b>
		<b>Task 1 Total</b>	<b>\$7,767</b>

Task 2. Verify razorback sucker spawning condition via physical capture with boat electrofishing during two sampling events (UDWR)

	Rate	Hours/Units	Cost
Labor			
Biologist II	34.70	60	2082
Technician II (Field Supervisor)	23.60	80	1888
Technician II (Assistant Crew Leader)	18.19	40	728
		<b>Task 3 Total</b>	<b>\$4,698</b>

Task 3. Data entry, analysis, and reporting (UDWR)

	Rate	Hours/Units	Cost
Labor			
Project Leader	33.90	20	678
Biologist II	34.70	80	2776
Technician II	23.60	80	1888
		<b>Task 4 Total</b>	<b>\$5,342</b>
		<b>FY 2017 Total</b>	<b>\$23,802</b>

FY 2018

Task 1. Identify razorback sucker spawning areas using a floating PIT tag reader during two sampling events (UDWR)

	Rate	Hours/Units	Cost
<b>Labor</b>			
Project Leader	34.58	40	1383
Biologist II	35.39	60	2124
Technician II (Assistant Crew Leader)	18.55	40	742
		<b>Subtotal</b>	<b>\$4,249</b>
<b>Travel<sup>a</sup></b>			
3 trucks @ 3% of annual use	22081.62	0.03	662
Per diem (8 day trips x 3 people)	14.07	24	338
		<b>Subtotal</b>	<b>\$1,000</b>
<b>Equipment</b>			
Boat fuel (gallons)	4.33	48	433
Boat/motor repair and maintenance			216
Sampling equipment			216
		<b>Subtotal</b>	<b>\$866</b>
		<b>Task 1 Total</b>	<b>\$6,115</b>

Task 1. Identify razorback sucker spawning areas using a floating PIT tag reader during two sampling events (USU)

	Rate	Hours/Units	Cost
<b>Labor</b>			
Fish Technology Engineer	59.03	100	5903
		<b>Subtotal</b>	<b>\$5,903</b>
<b>Travel</b>			
Vehicle mileage	0.60	520	310
Lodging	83.35	3	250
Per diem (4 overnights)	49.79	4	199
		<b>Subtotal</b>	<b>\$759</b>
<b>Equipment</b>			
Use of floating PIT tag system	270.61	2	541
		<b>Subtotal</b>	<b>\$541</b>
USU-UDWR Overhead (10%)			<b>\$720</b>
		<b>Task 1 Total</b>	<b>\$7,923</b>

Task 2. Verify razorback sucker spawning condition via physical capture with boat electrofishing during two sampling events (UDWR)

	Rate	Hours/Units	Cost
<b>Labor</b>			
Biologist II	35.39	60	2124
Technician II (Field Supervisor)	24.07	80	1926
Technician II (Assistant Crew Leader)	18.55	40	742
		<b>Task 3 Total</b>	<b>\$4,792</b>

Task 3. Data entry, analysis, and reporting (UDWR)

	Rate	Hours/Units	Cost
<b>Labor</b>			
Project Leader	34.58	20	692
Biologist II	35.39	80	2831
Technician II	24.07	80	1926
		<b>Task 4 Total</b>	<b>\$5,449</b>
		<b>FY 2018 Total</b>	<b>\$24,278</b>

VIII. Budget Summary:

FY 2014	\$22,429
FY 2015	\$22,878
FY 2016	\$23,335
FY 2017	\$23,802
FY 2018	\$24,278
<b>TOTAL</b>	<b>\$116,722</b>

IX. Reviewers:

X. References:

- Bestgen, K. R., K. A. Zelasko, and G. C. White. 2012. Monitoring reproduction, recruitment, and population status of razorback suckers in the Upper Colorado River Basin. Final Report to the Upper Colorado River Endangered Fish Recovery Program, U. S. Fish and Wildlife Service, Denver. Larval Fish Laboratory Contribution 170.
- Modde, T., Z. H. Bowen, and D. C. Kitcheyan. 2005. Spatial and temporal use of a spawning site in the Middle Green River by wild and hatchery-reared razorback suckers. *Transactions of the American Fisheries Society* 134:937– 944.
- Modde, T., Z. H. and D. B. Irving. 1998. Use of multiple spawning sites and seasonal movement by razorback suckers in the middle Green River, Utah. *North American Journal of Fisheries Management* 18:318-326.
- Zelasko, K. A, K. R. Bestgen, and G. C. White. 2010. Survival rate estimation and movement of hatchery-reared razorback suckers *Xyrauchen texanus* in the Upper Colorado River Basin, Utah and Colorado. *Transactions of the American Fisheries Society* 139:1478–1499.