

Endangered Fish Monitoring and Nonnative Species Monitoring and Control in the Upper/Middle San Juan River

Fiscal Year 2016 Project SOW

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Cooperative Agreement #'s:

USFWS – NMFWCO	R13PG40051
USFWS – CRFP	R13PG40052
UDWR – Moab	R13AC40007
NMDGF – Santa Fe	
NNDFW	

Period of Performance: 9/20/2013 to 9/30/2017

Background

The August 1, 2001 Colorado pikeminnow and razorback sucker Recovery Goals identified predation by and/or competition with nonnative fish species as a primary threat to the continued existence or the reestablishment of self-sustaining populations of these endangered fishes. In addition, reducing the impacts of nonnative fishes has been identified as a critical Program Element in the San Juan River Basin Recovery Implementation Program's Long Range Plan (2014). Goals, Actions, and Tasks associated with this Element encompassed within this scope of work include:

Goal 3.1—Control Problematic Nonnative Fishes

Action 3.1.1 Develop, implement, and evaluate the most effective strategies for reducing problematic nonnative fish.

Task 3.1.1.1 Mechanically remove nonnative fish to achieve objectives.

Task 3.1.1.3 Remove nonnative fish during Program research and monitoring activities.

Task 3.1.1.7 Evaluate and implement effective alternative nonnative fish reduction methods.

Secondarily, nonnative fish removal crews collect both spatial and temporal data on rare fish encountered during sampling efforts. These data have been used in assessing progress towards recovery and to evaluate the augmentation programs for both Colorado pikeminnow and razorback sucker. Additional Long Range Plan Actions and Tasks associated with this task include, but are not limited, to the following:

Goal—4.1 Monitor Fish Populations of the San Juan River Basin

Action 4.1.3 Collect data on the endangered fish and native and nonnative fish communities during other Program management activities, when possible.

Task 4.1.3.1 Collect data on the endangered fish and native fish community during nonnative fish control activities to aid in tracking the presence, status and trends of endangered fish populations.

Nonnative channel catfish and common carp can threaten native fishes of the Colorado River Basin through direct predation of early life stages (Tyus and Saunders 1996) and through potential competition for resources (Tyus and Saunders 2000; Carey and Wahl 2010). Additionally, channel catfish and common carp were found to be the second and fourth most abundant fish in the San Juan River during fish community studies completed from 1991-1997 (Ryden 2000).

As a result, the removal of nonnative fishes from the San Juan River began on a limited basis in the late 1990's in concert with other management and monitoring activities. Intensified, focused, removal efforts began in the upper reaches of the San Juan River in 2001. Between 2001 and 2003, removal trips focused on a 7.6-mile reach of river from PNM Weir (RM 166.6) to Hogback Diversion (RM 159.0). A total of ten, 3-day passes, were completed in this section in 2001 and 2002. As a result, nonnative fishes occupying this section were subjected to over 181.4 hours of electrofishing (23.8 hours of electrofishing per river mile) in 2001 and 137.9 hours (18.1 hours of electrofishing per river mile) in 2002. This intensified effort corresponded with decreases in the abundance of juvenile and adult channel catfish (Franssen et al. 2014). In this section, both channel catfish and common carp have remained at lower abundances, even as effort has declined over time.

To accommodate adaptive management and funding constraints, nonnative fish removal efforts have varied both spatially and temporally (Franssen et al. 2014). With shifting priorities and strategies, the nonnative fish community of the entire San Juan River from PNM Weir downstream to Clay Hill Landing, UT has experienced some level of exploitation; however, no other section of river has been subjected to the level of effort that was observed from PNM Weir to Hogback Diversion. For example, in 2008, nonnative fish removal was expanded to the middle section of the San Juan River from Shiprock, NM downstream to Mexican Hat, UT. It was thought that eight passes annually through this 95 RM section would result in declines in riverwide channel catfish abundance. Since 2008, channel catfish abundance has fluctuated, but no noticeable, riverwide declines have been observed (Duran 2014). A partial, and logical, explanation for this could be directly related to relative effort. Since 2010, expansion of the removal zone to 95 RM's has resulted in an average relative effort of 6.7 hours of electrofishing per river mile. This amount of effort is more than three times less than that observed from PNM Weir to Hogback Diversion in 2001, an area where declines in juvenile and adult channel catfish abundance has been documented.

The goal of nonnative fish removal is to increase mortality rates of nonnative fishes to facilitate population-level declines. To facilitate these declines, the ability to increase exploitation and, subsequently, mortality rates, will likely be needed. In order to do so, one of two management strategies could be implemented: 1) double or triple current riverwide effort, or 2) focus time and resources on smaller, more discrete reaches. Although the ability to increase current riverwide effort by 2.5 or 3 may be ideal, funding and logistical constraints would likely make this option difficult. It is estimated that a 2.5 to 3 fold increase in riverwide (e.g. RM 147.9-53) removal effort would cost over \$1.2 million per year and would be limited by the availability of equipment and personnel.

Therefore, for FY 2016, we are proposing to focus nonnative removal efforts on one, 50-mile, section of river that can be subjected to multiple electrofishing passes and a much higher level of effort (e.g., hours/river mile electrofished) than what has occurred in the recent past. It is anticipated that this shift in strategy would result in approximately 16.75 hours of electrofishing/river mile; a 2.5 fold increase from the current effort. This increased effort will help managers determine if desired population declines of channel catfish can be realized within current financial and logistical constraints.

Description of Study Area

The proposed study area includes the mainstem San Juan River and all accessible secondary channels from Shiprock, NM (RM 147.9) downstream to Mexican Hat, UT (RM 53). The specific 50-mile section to be sampled in FY 2016 will be determined at a later date. Data from FY 2015 nonnative fish removal projects, small-bodied fish monitoring, and sub-adult and adult fish community monitoring, and other data will be evaluated to determine the area of highest priority. Once determined, the SJRIP's Biology Committee will be notified in writing.

Objectives

1. Focus nonnative fish removal on a 50-mile section of the San Juan River determined to be of highest priority.
2. Evaluate distribution and abundance patterns of nonnative species within the study reach to determine the effects of increased effort.
3. Evaluate distribution and abundance patterns of nonnative species in control (non- removal) reaches.
4. Characterize seasonal and annual immigration of channel catfish into the study reach.

5. Complete a tagging trip, prior to removal, to assess immigration into the study reach.

Methods/Data Analysis

Data from a variety of sources including, but not limited to, past nonnative removal efforts, small-bodied fish monitoring, sub-adult and adult fish community monitoring and other data will be used to determine the area of highest priority for FY 2015 nonnative removal.

One tagging trip will be completed prior to the initiation of intensive nonnative fish removal. Channel catfish (≥ 200 mm) collected from Shiprock Bridge, NM to Mexican Hat, UT will be fitted with a T-bar anchor tag and returned to the river. Any channel catfish < 200 mm will be removed from the river. Coordination with Utah Department of Wildlife Resources (UDWR) will ensure that all channel catfish ≥ 200 mm collected downstream of Mexican Hat, UT are tagged prior to intensive removal efforts.

Removal of nonnatives throughout the study area will be conducted ten (10) times during the year. Efforts will be made to limit the amount of electrofishing during spawning periods for Colorado pikeminnow. It is proposed that four to five trips will be conducted from April-May. The remaining trips would be completed in July/August after Colorado pikeminnow have completed spawning.

Sampling for nonnative fishes will be conducted by four raft-mounted electrofishing units. Two rafts will begin sampling approximately one hour after the initial two rafts begin, essentially accomplishing two sampling passes per trip or 20 passes/year. Total length (TL; mm) will be recorded from all fish collected at one stop per day. Fish will be enumerated by size class (i.e., young-of-year, sub-juvenile, juvenile, adult) at all other stops. If unique or uncommon species are collected, TL and weight (g) will be collected and any other pertinent information will be recorded.

In addition to nonnative fishes, all rare fishes seen by downstream rafts will be netted. Upstream rafts will not collect rare fishes and will cease electrofishing when these species are observed. Rare fishes will be measured (nearest 1 mm) for TL, weight (nearest 5 g) and checked for the presence of a Passive Implant Transponder (PIT) tag. If no tag is present and fish are ≥ 150 mm TL, a tag will be implanted. Other pertinent information (i.e. sex, reproductive stage, abnormalities) will be recorded.

Numbers of fish removed and catch-per-unit effort (CPUE) will be reported for each trip. To determine trends in distribution and abundance, mean CPUE and standard error will be calculated utilizing data collected during sub-adult and adult fish community monitoring. If CPUE data meet the assumptions of normality and variance, a One-Way Analysis of Variance (ANOVA) will be conducted to determine if significant differences exist. Multiple pairwise comparisons using Bonferroni post hoc tests will be used to determine where specific differences exist. Data that does not meet the assumptions of an ANOVA, or for which transformations are unsuccessful in normalizing the data, will first be analyzed using a non-parametric Kruskal-Wallis rank test. If significant differences are observed, among year comparisons of ranked data will be conducted using a Nemenyi post-hoc test (Sokal and Rohlf 1995). Statistical applications not mentioned here may be utilized if deemed appropriate.

Intensive removal trips in FY 2016:

Ten (10) trips in a yet to be determined 50-mile section of river

Products/Schedule

An electronic data file will be provided for inclusion in the centralized database by 31 March 2017. A draft summary report detailing findings will be submitted to the San Juan River Implementation Program, Biology Committee, by 31 March 2017. Revisions will be completed and a final annual report will be submitted by 1 June 2017.

Literature Cited

- Carey, M.P., and D.H. Wahl. 2010. Native fish diversity alters the effects of an invasive species on food webs. *Ecology* 91:2965-2974.
- Duran, B.R. 2014. Endangered fish monitoring and nonnative species monitoring and control in the upper/middle San Juan River: 2013. Final Report submitted to the San Juan River Basin Recovery Implementation Program, U.S. Fish and Wildlife Service, Albuquerque, New Mexico.
- Franssen, N.L., J.E. Davis, D.W. Ryden and K.B. Gido. 2014. Fish community responses to mechanical removal of nonnative fishes in a large southwestern river. *Fisheries*. Volume 38(8): 352-363.
- Ryden, D.W. 2000. *Adult fish community monitoring on the San Juan River, 1991-1997*. Prepared for the San Juan River Recovery Implementation Program. U.S. Fish and Wildlife Service, Albuquerque, New Mexico.
- San Juan River Basin Recovery Implementation Program. 2014. Long-range plan. San Juan River Basin Recovery Implementation Program, U.S. Fish and Wildlife Service, Albuquerque, New Mexico.
- Sokal, R.R. and F.J. Rohlf. 1995. *Biometry: the principles and practices of statistics in biological research*. 3rd edition. W.H. Freeman and Company, New York.
- Tyus, H.M. and J.E. Saunders III. 1996. Nonnative fishes in the upper Colorado River basin and a strategic plan for their control. Center for Limnology, Final Report to the U.S. Fish and Wildlife Service (Contract 14-48-0006-95-923), University of Colorado, Boulder.
- _____. 2000. Nonnative fish control and endangered fish recovery: lessons from the Colorado River. *Fisheries* 25:17-24.

**Endangered Fish Monitoring and Non-native species
Monitoring and Control in the *Upper/Middle*
San Juan River
Fiscal Year 2016 Project Proposal
31 March 2015**

Budget for Participation by U.S. Fish Wildlife Service, Colorado
River Fishery Project (USFWS-CRFP)

Developed by:

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Contract or Agreement number(s):
R13PG40052 for USFWS – Grand Junction, CO

Reporting Dates: 10/1/2015 through 9/30/2016

Under the heading "Funding for participation of other agencies." Cost for participation of U.S. Fish and Wildlife Service, Colorado River Project – Grand Junction, CO in FY-2016 nonnative removal activities.

Fiscal Year 2016 Estimated Budget:

Costs for participation of the U.S. Fish Wildlife Service, Colorado River Fishery Project (USFWS-CRFP) office, Grand Junction, CO.

(Based on projected FY-2016 costs)

Note: The FY-16 and outyear costs have been adjusted for the GS-5 Bio Tech line items to reflect new guidance from Office of Personnel Management (OPM) to the USFWS requiring the USFWS to provide health insurance to all federal employees if they work for the federal government longer than 60 days (480 total hours)

Personnel/Labor Costs (Federal Salary + Benefits)

Principal Biologist (GS-11) – 264 hours @ \$49.36/hr (1 person X 11 days/trip X 3 camping trips)	\$ 13,031.00
Bio. Tech. Crew Leader (GS-6) – 216 hours @ \$32.76/hr (1 person X 11 days/trip X 3 camping trips (+ 40 hours overtime/per trip X 3 trips = 120 total hours of overtime at \$49.14/hr = \$5,897.00)	\$ 12,973.00
Biological Technicians (GS-5) – 720 hours @ \$24.96/hr (2 people X 11 days/trip X 3 camping trips (2 people X 11 days/trip X 7 camping trips (+ 40 hours overtime/per trip X 10 trips = 400 total hours of overtime at \$37.44/hr = \$14,976.00)	\$ 32,947.00
Sub Total	<u>\$ 58,951.00</u>

Administrative Support (Federal Salary + Benefits)

Administrative Officer (GS-9) – 80 hours @ \$44.72/hr	\$ 3,578.00
Project Leader (GS-14) – 80 hours @ \$83.42/hr	<u>\$ 6,674.00</u>
Sub Total	\$ 10,252.00

Travel and Per Diem (Based on Published FY-2014 Federal Per Diem Rates)

Hotel – 1 night in Cortez, CO @ 4 people/trip X 3 trips (12 nights @ \$111/night – single occupancy = \$1,332)	\$ 1,332.00
Hotel – 1 night in Cortez, CO @ 2 people/trip X 7 trips (14 nights @ \$111/night – single occupancy = \$1,332)	\$ 1,554.00
Per Diem (Hotel Rate) – 1 day in Cortez, CO X 4 people per trip X 3 trips (12 days @ \$51/day)	\$ 612.00
Per Diem (Hotel Rate) – 1 day in Cortez, CO X 2 people per trip X 7 trips (14 days @ \$51/day)	\$ 714.00
Per Diem (Camp Rate) – 10 days X 4 people/trip X 3 trips (120 days @ \$28/day)	\$ 3,360.00
Per Diem (Camp Rate) – 10 days X 2 people/trip X 7 trips (140 days @ \$28/day)	<u>\$ 3,920.00</u>
Sub Total	\$ 11,492.00

Equipment

Vehicle Maintenance & Gasoline (@ \$365/month lease = \$12.17 per day based on 30 days in an "average" month + \$0.33/mile) 3 trips from Grand Junction, CO to Cortez, CO to Shiprock, NM to Mexican Hat, UT and back to Grand Junction, CO X 2 trucks X 11 days per trip (610 miles/trip X 3 trips X 2 trucks = 3,660 miles X \$0.33/mile) = \$1,208 (2 trucks X 11 days/trip X 3 trips = 66 days X \$12.17/day) = \$803	\$ 2,011.00
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7 trips from Grand Junction, CO to Cortez, CO to Shiprock, NM to Mexican Hat, UT and back to Grand Junction, CO X 1 truck X 11 days per trip (610 miles/trip X 7 trips X 1 truck = 4,270 miles X \$0.33/mile) = \$1,408 (1 truck X 11 days/trip X 7 trips = 77 days X \$12.17/day) = \$937	\$ 2,345.00
Generator Gasoline (500 gallons/trip X 2 trips @ \$4.00/gallon) 10 days @ 5 gallons/day X 1 raft X 10 trips	\$ 2,000.00
Equipment Maintenance, Repair, & Replacement Exact use of the money in this line item will vary from year to year depending on what equipment needs to be maintained, repaired, or replaced, but use of these funds for a “typical” field season for one study would include the following: Annual trailer maintenance & safety inspection = \$175 Replace/repair trailer suspension, trailer lights, winch handle/straps/gears, trailer jack stand wheel bearings Replace trailer tires – 2 per year @ \$100 each = \$200 Synthetic oil for generators - 5 quarts at \$7 each = \$35 Generator repair/tune-up - 5 hrs @ \$75/hr = \$375 Hip boots – 2 pair at \$50/pair = \$100 Breathable chest waders - 2 pair @ \$125/pair = \$250 Stearns Type III life jackets – 3 @ \$70 each = \$210 Electrical Gloves - 3 pairs @ \$65/pair = \$195 Repair raft frame Aluminum welding – 3 hours @ \$150/hr = \$450 Raft repair kits Raft glue (urethane/hypalon) – Four 4-oz. cans @ \$22.50/can = \$90 NRS raft patch material – 5 feet @ \$37/ft = \$185 Acetone – 1 gallons @ \$17.50/gallon = \$17.50 Toluene – 1 gallon @ \$17.50/gallon = \$17.50 Replace any missing NRS HD-brand tie-down straps, each boat needs: Ten 2-ft straps @ \$4.20 each = \$42 Five 3-ft straps @ \$4.30 each = \$21.50 Ten 4-ft straps @ \$4.70 each = \$47 Five 6-ft straps @ \$5.05 each = \$25.25 Five 9-ft straps @ \$5.7 each = \$28.50 Five 12-ft straps @ \$6.15 each = \$30.75 Replace any missing D-style carabiners, each boat needs: 10 @ \$7.50 each = \$75 Mesh rig bag – 1 @ \$50 each = \$50 Rafting oars, oar blades, and oar rowing sleeves Carlisle 10-foot oar shafts – 2 @ \$90 each = \$180 Carlisle Oars blades – 4 @ \$65 each = \$260 Oar sleeves – 4 @ \$12 each = \$48 5-gallon plastic gasoline jerry cans – 5 @ \$20 each = \$100 River bags NRS 3.8 heavy-duty Bill’s Bag – 1 @ \$100 each = \$100 Clavey (green 7 X 17) dry bag – 3 @ \$22 each = \$66 Clavey (blue 10 X 24) dry bag – 4 @ \$26 each = \$104 20 lb. propane tanks – 3 @ \$20 each = \$60	\$ 1,245.00

Pesola brand spring scales

- # 20010 Micro-Line 10 gram – 1 @ \$50 = \$50
- # 20060 Micro-Line 60 gram – 1 \$46 = \$46
- # 20100 Micro-Line 100 gram – 1 @ \$46 = \$46
- # 40300 Medio-Line 300 gram – 1 @ \$54 = \$54
- # 40600 Medio-Line 600 gram – 1 @ \$54 = \$54
- # 42500 Medio-Line 2,500 gram – 2 @ \$56 = \$112
- # 41002 Medio-Line 1,000 gram – 3 @ \$54 = \$108
- # 80005 Macro-Line 5 kg – 1 @ \$107 = \$107
- # 80010 Macro-Line 10 kg – 1 @ \$109 = \$109

Other potential uses for these same funds could include replacing hand tools (ratchet and sockets, screw drivers, vise grips, pliers, Allen wrenches, crescent wrenches, hammer, etc.), WD-40, bailing wire, duct tape, electrical supplies (spark plugs, 12 and 14 gage wire for the boats, junction boxes, extra male & female plugs, wire nuts, fuses, Ohm meter, electrical tape), batteries (C, AA and AAA), camp stoves, lanterns, lantern mantles, small “pony” propane bottles for lanterns, Gott 5-gallon water jugs, shovels, 5-gallon buckets, cargo nets, fix chips or cracks in vehicle windshields, bulbs, lenses, and wiring to fix trailer lights and pigtailed, new electrofishing spheres, wire rope for replacing electrofishing “witches brooms,” Yeti 125-quart coolers, Dura-Frame electrofishing dip nets, 2-man dome tents, NRS Canyon Box for dry storage, Rite-In-The-Rain data sheets, data books, pencils, repair/replace river maps, etc.

Sub Total	\$ 5,590.00
USFWS-CRFP (Grand Junction) Total	\$ 86,285.00
USFWS Region 6 Regional Office Administrative Overhead (3.00%)	<u>\$ 2,589.00</u>
USFWS Region 6 Total	<u>\$ 88,874.00</u>

FY 2016 Scope of Work to Bureau of Reclamation:

Participation in Endangered Fish Monitoring and Non-native species Monitoring and Control in the Upper/Middle San Juan River

Fiscal Year 2016 Budget and Estimated Budgets for FY2017-FY2020

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 BOR Agreement #: R13AC40007

FY 2016 Costs for UDWR- Moab

Participation in Middle San Juan River Non-native Control (2 people X 5 days X 6 trips)

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

	Rate	Hours	Cost
Project Leader	\$33.87	80	\$2,710
Biologist	\$30.90	250	\$7,725
Technician	\$16.89	560	\$9,458
		subtotal	\$19,893

Food and Transport (current expense)

	Rate	Quantity	Cost
Fleet Costs (2 trucks for 3% of total fleet costs)	\$40,800.00	0.030	\$1,224
Food (2 people, 5 days, 6 passes)	\$39.00	60	\$2,340
Camping reimbursement	\$25.00	48	\$1,200
		subtotal	\$4,764

Equipment (current expense)

	Rate	Quantity	Cost
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Camping gear repair/replacement:			\$450
Sampling gear repair/replacement:			\$450
Boating gear repair/replacement:			\$450
Fuel for generators	\$4.00	90	\$360
		subtotal	\$1,710
Total Expenses			\$26,367
Administrative Overhead (17% on all personnel services)			\$3,382
Grand Total FY 2016			\$29,748

^a The State of Utah motorpool vehicles cost 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.

^b Includes, but is not limited to, tents, sleeping pads, toilet system, cookware, stoves, propane, charcoal, satellite phone and service, drybags, coolers, first aid supplies.

^c Includes, but is not limited to dip nets, tags, tagging equipment, electrofishing units, electrofishing wiring, anodes, cathodes, generators, data loggers, etc...

^d Includes, but is not limited to, raft repair/replacement, oars, oar hardware, raft frame repair, dry boxes, straps, etc...

^{b,c,d} Estimated costs are based on actual costs from previous years plus an estimated 3% cost of living increase each year following.

Under the heading "Funding for participation of other agencies." Cost for participation of American Southwest Ichthyological Researchers, LLC – Albuquerque, NM in FY-2016 nonnative removal activities

2016 BUDGET: SAN JUAN RIVER NON-NATIVE FISH REMOVAL

Based on eight sampling trips per year: Shiprock to Mexican Hat

Personnel

Field Data Collection

Shiprock to Mexican Hat - RM 148.0 - 53.3

Fisheries Biologist I (2 staff x 8 trips x 5 days x 8 hrs/day at \$ 47.10/hr):..... \$ 30,144

Personnel: Total \$ 30,144

Materials and Supplies

Rafts and associated sampling gear supplied by USFWS

Personal camping gear (we will use gear from SJR larval fish project)

Materials and Supplies: Total \$ 0

Travel and Per Diem

Travel

Travel - (1 vehicle x 8 trips x 625 miles x \$ 0.575/mile): \$ 2,875
(roundtrip Albuquerque to Montezuma Creek, shuttle to Mexican Hat and return) ¹

Travel - (1 vehicle x 8 commercial shuttles x 170/per shuttle): \$ 1,360

Per Diem

Per Diem - 1 hotel day per trip x 8 trips x 2 staff (\$ 95/day):..... \$ 1,520

Per Diem - 5 field days per trip x 8 trips x 2 staff (\$ 45/day):..... \$ 3,600

Travel and Per Diem: Total \$ 9,355

2016 Project Totals

Personnel: Total \$ 30,144

Materials and Supplies: Total \$ 0

Travel and Per Diem: Total \$ 9,355

Project Subtotal: Total \$ 39,499

IDC (20%): Total \$ 7,900

2016 Scope of Work: GRAND TOTAL \$ 47,399

nder the heading "Funding for participation of other agencies." Cost for participation of New Mexico Department of Game and Fish in FY-2016 nonnative removal activities.

Personnel/Labor Costs (State Salary + Benefits)

Biologists - 20 @ \$412/day	
(1 person x 5 days/trips x 4 trips)	<u>\$ 8,240.00</u>
	\$ 8,240.00

Travel and Per Diem (State Per Diem Rates)

Per Diem – 16 days @ \$85/day	<u>\$ 1,360.00</u>
	\$ 1,360.00

Equipment

Vehicle Maintenance & Gasoline (@ \$0.55/mile)	
(2,780 miles for 4 trips from Albuquerque to Farmington and associated shuttling of vehicles)	<u>\$ 1,529.00</u>
	\$ 1,529.00

NMDGF – Santa Fe	Total	\$ 11,129.00
Administrative Overhead (10%)		\$ 1,113.00
NMDGF – Santa Fe – Total Budget		\$ 12,242.00

Under the heading "Funding for participation of other agencies." Cost for participation of the Navajo Nation Department of Fish and Wildlife in FY-2016 nonnative removal activities.

Personnel/Labor Costs (Salary + Benefits)

Fish Biologist – 10 days @ \$163.54/day (1 person x 5 days x 2 trips)	\$ 1635.40
Biological Technician – 10 days @ \$89.54/day (1 person x 5 days x 2 trips)	\$ 895.40
	Sub-Total <u>\$1530.80</u>
Fringe Benefits X 42.48%	\$ 1075.08
Total Personnel/Labor	\$ 2,605.88

Travel (Vehicle shuttling)

Vehicle Lease/Maintenance & Gasoline \$15.13/day X 12 days = \$181.56 + 2 X 36miles X .30/mile=\$21.60 (36 miles round trip from Fruitland, NM to Shiprock x 6 trips)	\$ 203.16
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Total Travel/Per Diem \$ 203.16

Sub-total with 3% added for inflation \$ 209.25

Equipment

Equipment Maintenance, Repair, & Replacement (e.g., life jackets, hip boots, generator repair, rubber gloves, dip nets, aluminum welding, raft repair, etc.)	\$ 1,000
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Total Equipment \$ 1,000

Sub-total with 3% added for inflation \$ 1,030

Navajo Nation Fish and Wildlife Total \$3,845.13

Navajo Fish and Wildlife Administrative Overhead (18.05%) \$ 694.04

Navajo Nation Total \$4,539.18

FY 2016 Scope of Work to Bureau of Reclamation:

**Nonnative Species Control and Rare Fish Monitoring in the Lower and Middle San Juan River
Fiscal Year 2016 Project Proposal and Estimated Budget for 2016-2020**

Principal Investigator: Brian Hines
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BOR Cooperative Agreement #

UDWR Moab Field Station: R13AC40007

Navajo Nation: R11AP40089

New Mexico Department of Game and Fish: 07FG402630

USFWS Grand Junction: R13PG40052

Reporting Dates: 10/1/2015 through 9/30/2016

Nonnative Species Control and Rare Fish Monitoring in the Lower and Middle San Juan River

Fiscal Year 2016 Project Proposal

Principal Investigator: Brian Hines
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Background:

The lower San Juan River is particularly important in the recovery of the Colorado pikeminnow (*Ptychocheilus lucius*) and razorback sucker (*Xyrauchen texanus*) since it contains typical nursery habitat similar to what is present on the Green and Colorado rivers. Within the past eight years, collections of endangered fish have been increasing in this section of river. The largest collection of razorback sucker larvae in 2002 was from Reach 2 (RM 21.2; Brandenburg et al. 2003) and the largest single collection of razorback sucker larvae in 2003 came from a backwater in Reach 1 at RM 8.1 (Brandenburg et al. 2004). Additionally, adult razorback sucker were found congregating around Slickhorn Rapid (RM 17.7) in the spring of 2002, apparently using this area for spawning (Jackson 2003). In spring of 2006, another congregation of adult razorback suckers and possible spawning area was located at river mile 23.4.

Collections of adult Colorado pikeminnow in the San Juan River have been extremely rare. No wild adults have been collected since 2000 (Ryden 2003). From 2002 to 2004, Colorado pikeminnow adults and subadults, presumably from the 1996-1997 stocking efforts, have been found using the lower canyon (Reaches 1 and 2) of the San Juan River in the spring and summer (Jackson 2005). From 2003 to 2010, young-of-year Colorado pikeminnow stocked in the fall of the previous year near Farmington, NM, were also found using the lower portions of the San Juan River (Golden et al. 2005, Elverud 2009). Some of the most encouraging findings are the collections of two wild spawned Colorado pikeminnow larvae at RM 46.3 and 18.1 in 2004 (Brandenburg et al. 2005) and two wild spawn age 0 razorback sucker at RM 26.5 (Hines 2014).

Nonnative fish species remain prevalent in the lower San Juan River. Channel catfish (*Ictalurus punctatus*) and common carp (*Cyprinus carpio*) are typically the most abundant fish species collected during fall monitoring in Reaches 1 and 2 (Ryden 2003). Native and endangered fish are threatened by predation from adult channel catfish (Marsh and Brooks 1989, Brooks et al. 2000), and may compete for food and space with juvenile channel catfish. Additionally, Colorado pikeminnow have been found with channel catfish lodged in their throats in the San Juan (Ryden and Smith 2002, Elverud 2009, Hines 2015, personal observation) and Green (McAda 1983, personal observation) rivers. Common carp tend to feed on larval fish and eggs (Cooper 1987). In the spring and summer of 2004, recently stocked razorback sucker and Colorado pikeminnow were found in the stomachs of two different channel catfish (Jackson, 2005).

Since 1995, many nonnative species including striped bass (*Morone saxatilis*) and walleye (*Stizostedion vitreum*) have been able to move into the San Juan River from Lake Powell. From 1988 to 1995, a waterfall at approximately RM 0 acted as a barrier between the San Juan River and Lake Powell, preventing species from moving upstream. During 1995, rising lake levels inundated the waterfall. When lake levels receded in the winter of 1996, the waterfall did not reappear. Striped bass, walleye and threadfin shad (*Dorosoma petenense*), not previously documented in the San Juan River before waterfall inundation, were collected during large bodied fish sampling (Ryden 2001). Since then, striped bass and walleye have been collected periodically until 2000 when large numbers were collected near Farmington, NM (approximately 166 river miles upstream of Lake Powell). Many native suckers were found inside the stomachs of these striped bass

(unpublished data from San Juan River database). The San Juan River Recovery Implementation Program (SJRIP) determined in 2001 that control of striped bass and other nonnative species in the lower river was warranted. Utah Division of Wildlife Resources began nonnative fish control with the goal of removing striped bass and other nonnative species in the lower San Juan River, while documenting river and lake conditions that may correlate to striped bass movement out of Lake Powell. It was anticipated that these correlations would provide information for determining the most effective time to remove striped bass.

During 2002, Lake Powell water temperature was positively correlated with the highest catch of striped bass in June, in the lower San Juan River (Jackson, 2003). A new waterfall at RM 0.5 has prevented striped bass and other fish from moving from Lake Powell since 2003. No striped bass or walleye were observed in the lower San Juan River from 2003 to 2009. In 2006, two adult gizzard shad were captured below the waterfall indicating another possible nonnative fish of concern. In 2007, seine sampling below the waterfall collected hundreds of young-of-the-year gizzard shad below the waterfall. Additionally in 2007, 2008 and 2009, adult gizzard shad, striped bass and adult walleye were collected below the waterfall. Colorado pikeminnow and razorback suckers have also been collected during sampling efforts below the waterfall indicating loss of stocked endangered fish over the waterfall and the waterfall acting as a barrier to all fish attempting to move upstream.

Over 114,000 channel catfish and approximately 3,500 common carp were mechanically removed from the lower San Juan River from 2002 to 2013. A decrease in mean total length (TL) of channel catfish was observed between 2002 and 2013, indicating that removal efforts are causing a shift in the population size structure to smaller individuals. Additionally, shifts in sized structure of channel catfish have been reported further upstream (Davis 2005) and on a river-wide scale (Ryden 2005). Catch rate of adult channel catfish also decreased from 4.9 adult catfish per electrofishing hour in 2002 to 2.0 adult catfish per electrofishing hour in 2006 in the lower San Juan. Furthermore, similar shifts in yield and population structure have been observed in sport and commercial fisheries as the rate of exploitation increased (Bennet 1971; McHugh 1984, Pitlo 1997). Continued removal of all size classes of channel catfish in the San Juan River may eventually lead to decreased fecundity and a reduction of the overall population, therefore lessening the impact that these fish have on the native and endangered fish community.

A significant decline in catch rates of common carp was observed from 2002 to 2013. Between 2002 and 2013, catch rate of common carp decreased from over 5 fish per electrofishing hour to < 0.2 fish per electrofishing hour. However, it is unclear if this decline was directly related to removal efforts, the presence of the waterfall, or the low water conditions that have been present over the period of this project. It is probable that a combination of these factors is causative to some extent. The continuation of removal efforts for channel catfish and common carp will aid in the illumination of contributory factors and the evaluation of the success of this project and similar nonnative control efforts.

Over the course of this project, important monitoring information has been obtained on the progress of the endangered fish community as well. We have observed the apparent spawning aggregation of razorback sucker in spring 2002 at Slickhorn Rapid and collected some of the first wild spawned juvenile razorback sucker in 2003, 2004, 2013, and 2014. Since 2002, we have documented the distribution and abundance of Colorado pikeminnow and razorback sucker in the lower San Juan River stocked from 2002 to 2014. Preliminary population estimates for juvenile Colorado pikeminnow residing in the lower San Juan River were generated from 2004 to 2014 from recapture data. In 2004, we documented the first cases of channel catfish predation on stocked juvenile razorback sucker and Colorado pikeminnow in the San Juan River.

The presence of the waterfall at Piute Farms may provide a rare opportunity to concentrate on removal of other nonnative fish while influx from the lake is eliminated. Continuing monitoring and removal in the lower river above the waterfall will aid in removal efforts being conducted further upstream, and suppress predation and competition impacts on the endangered and native fish community by nonnative fish in the lower San Juan River. In addition, we propose to continue to monitor and document the progress of

Colorado pikeminnow and razorback sucker in the lower San Juan River. Recapture data for juvenile Colorado pikeminnow collected during nonnative monitoring will serve in determining population size, growth and movement of these fish in the lower San Juan River.

This work plan proposes the continuation of nonnative control and monitoring of endangered fishes in the San Juan River in accordance with the Long Range Plan (Element 3, Task 3.1.1.1; Element 4, Task 4.1.3.1). This study will serve to determine the most effective time and sections for removal actions. Beginning in 2014, some effort was shifted from the lower canyon to the section between Montezuma Creek and Sand Island. This upstream effort is included in this budget under Task 2 and will be reported on under Scope of Work #17: Upper/Middle River Nonnative Species Control and Rare Fish Monitoring.

Description of Study Area:

The study area for this project includes the San Juan River from Four Corners Bridge (RM 119.2) to Clay Hills (RM 2.9), Utah. The river from Four Corners Bridge to RM 106 is part of Geomorphic Reach 4. Geomorphic Reach 3 stretches from RM 105 to RM 68. Geomorphic Reach 2 goes from RM 68 to RM 16 and is primarily bedrock confined and dominated by riffle-type habitat. River mile 16 down to Clay Hills contains Geomorphic Reach 1 where the river is canyon bound with an active alluvial bed. Habitats within this section are heavily influenced by the shifting thalweg, changing river flow, and reservoir elevations. This section of river has been identified as important nursery habitat for native and endangered fish species.

Task Description:

- Task 1. Nonnative species control and rare fish monitoring in the lower San Juan River from Mexican Hat (RM 53) to Clay Hills (2.9) (four passes).
- Task 2. Nonnative species control and rare fish monitoring in the middle San Juan River from Four Corners Bridge (RM 119.2) to Mexican Hat (RM 53) (five passes). Exact reach (approximately 50 miles) has yet to be determined and will be guided by the previous year's findings and coordination with other crews' effort.

Objectives:

1. Mechanically remove and monitor large-bodied nonnative species in the middle and lower San Juan River (Tasks 1 and 2).
2. Generate a population estimate of channel catfish by mark-recapture data from Mexican Hat to Clay Hills (Task 1).
3. Monitor distribution and abundance of endangered fish in the middle and lower San Juan River (Tasks 1 and 2).
4. Generate a population estimate of juvenile Colorado pikeminnow (>150 mm) by mark-recapture data from Mexican Hat to Clay Hills (Task 1).

Methods/Approach:

Sampling effort will be conducted via two raft mounted electrofishing boats. The study area will be electrofished in a downstream fashion with one boat on each shoreline. Each boat will have one netter and one rower. Nine five-day passes with 6 people are anticipated. Timing and location of sampling will be dependent on catch rate from past data. Spring effort (March-April) will focus on the lower reach (Task 1)

while summer effort (July-August) will focus on the middle reach (Task 2). In an average water year, this schedule would allow for sampling a variety of habitat conditions, including variable flows, temperatures, and turbidity. In drought years, when downstream movement is hindered by low flows, electrofishing effort may be concentrated on areas with higher catch rates or trips will be increased to six days while reducing the number of trips to eight.

All nonnative fish collected will be identified, enumerated, measured to the nearest mm for total length, weighed to the nearest gram, and removed from the river. Gender and reproductive status of lacustrine species will be determined and approximate location of capture by river mile recorded. Stomach contents of lacustrine species will be examined. Contents needing microscopic identification will be preserved. Any threatened and/or endangered fish encountered will be collected, identified, enumerated, measured to the nearest mm for total and standard length, weighed to the nearest gram, and scanned for a PIT tag. If a PIT tag is not present, one will be inserted. General condition of the fish will be recorded in addition to any parasites or abnormalities. All threatened and endangered fish collected will be returned to the river at the location in which they were caught. River mile and GPS coordinates will be recorded at the location in which threatened and endangered fish are collected. Catch rates for all fish will be calculated as number of fish caught per hour. Other native fish will not be netted.

Channel catfish collected during the first trip of the year will receive a floy tag and be returned to the river. Channel catfish collected on subsequent trips will be removed from the river. A Lincoln-Peterson population estimate will be generated for channel catfish captured during the first pass and recaptured in the second pass. Captures of channel catfish during subsequent trips will allow us to monitor ratios of marked to unmarked fish and use these ratios to calculate a rough population estimate thereafter. Ratios of marked fish to unmarked fish will help determine if assumptions of a closed population are being met.

Population estimates will be generated for juvenile Colorado pikeminnow (>150 mm) in the lower San Juan River using closed population models within program CAPTURE. Program CAPTURE will be used to determine confidence intervals around the estimate, the coefficient of variation, and the probability of capture. Population estimates between two passes will be calculated using the Lincoln-Peterson model. Conducting several trips in the lower San Juan River will allow for choosing the “mark” pass and the number of “recapture” passes. Use of different mark and recapture passes will allow for testing of the reality of the results generated. Furthermore, using several combinations of trips will allow for lessening the likelihood of violating assumptions of the models used.

General water quality parameters will be recorded including temperature, conductivity, and secchi depth. Daily river discharge, temperature and turbidity will be compared to catch rates for striped bass to determine the relationship between river conditions and movement of these fish upstream.

Costs for other cooperating agencies that may provide personnel and equipment as needed are included in this budget.

Products/Schedule:

Task 1. A draft report for the Nonnative Species Control and Rare Fish Monitoring in the Lower San Juan River activities will be prepared and distributed to the San Juan River Biology Committee for review by 31 March 2016 for 2015 field work completed. Historical information on nonnative fish species use of the lower San Juan River will be included; to the extent it is available. Upon receipt of written comments, that report will be finalized and forwarded to members of the San Juan River Biology Committee 1 June 2016. Electronic copies of the field and collection data will be transferred to the San Juan River database manager following the successful protocol previously employed.

Task 2. All activities associated with Nonnative Species Control and Rare Fish Monitoring in the Middle San Juan River will be reported on under Scope of Work #17: Upper/Middle River Nonnative Species Control and Rare Fish Monitoring.

Literature Cited:

- Bennet, G.W., 1971. Management of lakes and ponds, 2nd edition. Van Nostrand Rienhold, New York.
- Brandenburg, H.W., M.A. Farrington, S.J. Gottlieb. 2003. Razorback sucker larval fish survey in the San Juan River during 2002. Draft report to the San Juan River Basin Recovery Implementation Program. U.S. Fish and Wildlife Service, Albuquerque NM.
- Brandenburg, H.W., M.A. Farrington, S.J. Gottlieb. 2004. Razorback sucker larval fish survey in the San Juan River during 2003. Draft report to the San Juan River Basin Recovery Implementation Program. U.S. Fish and Wildlife Service, Albuquerque NM.
- Brandenburg, W.H., M.A. Farrington, S.J. Gottlieb. 2005. San Juan River 2004 Colorado pikeminnow and razorback sucker larval surveys. Draft Report. San Juan River Basin Recovery Implementation Program, USFWS, Albuquerque, NM
- Brooks, J.E., M.J. Buntjer, J.R. Smith. 2000. Non-native species interactions: Management implications to aid in the recovery of the Colorado pikeminnow (*Ptychocheilus lucius*) and razorback sucker (*Xyruachen texanus*) in the San Juan River, CO-NM-UT. U. S. Fish and Wildlife Service, Albuquerque, NM.
- Cooper, E.L. ed. 1987. Carp in North America. American Fisheries Society. Maryland, Bethesda
- Davis, J.E. 2005. Non-native species monitoring and control in the Upper San Juan River, New Mexico 2004. Progress Report for the San Juan River Recovery Implementation Program, U.S. Fish and Wildlife Service, Albuquerque, NM.
- Elverud, D.S. 2009. Nonnative Species Control in the Lower San Juan River. Progress Report for the San Juan River Recovery Implementation Program, U.S. Fish and Wildlife Service, Albuquerque, NM.
- Hines, B.A. 2014. Nonnative Species Control in the Lower San Juan River (Draft Report). Progress Report for the San Juan River Recovery Implementation Program, U.S. Fish and Wildlife Service, Albuquerque, NM.
- Golden, M.E., P.B. Holden, S.K. Dahle. 2005. Retention, Growth, and Habitat Use of Stocked Colorado Pikeminnow in the San Juan River: 2002-2003 Draft Annual Report for the San Juan River Basin Recovery Implementation Program. U. S. Fish and Wildlife Service, Albuquerque NM.
- Jackson, J.A. 2003. Nonnative control in the lower San Juan River, 2002. Interim Progress Report for the San Juan River Recovery Implementation Program, U.S. Fish and Wildlife Service, Albuquerque, NM.
- Jackson, J.A. 2005. Nonnative control in the lower San Juan River, 2004. Draft Progress Report for the San Juan River Recovery Implementation Program, U.S. Fish and Wildlife Service, Albuquerque, NM.

- Marsh, P.C. and J.E. Brooks.1989. Predation by ictalurid catfishes as a deterrent to re-establishment of hatchery-reared razorback suckers. *Southwestern Naturalist* 34(2):188-195.
- McAda, C.W.1983. Colorado squawfish, *Ptychocheilus lucius* (Cyprinidae), with a channel catfish, *Ictalurus punctatus* (Ictaluridae), lodged in its throat. *Southwestern Naturalist* 28(1):119-120.
- McHugh, J.L. 1984. Industrial fisheries, pages 68-80 in R.T. Barber, C.N.K. Mooers, M.J. Bowman, and B. Zeitschel, editors. *Lecture notes on coastal and estuarine studies*. Springer-Verlag, New York.
- Pitlo, J.Jr. 1997. Response of upper Mississippi River channel catfish populations to changes in commercial harvest regulations. *North American Journal of Fisheries Management* 17: 848-859.
- Ryden, D. W. 2001. Long term monitoring of sub-adult and adult large-bodied fishes in the San Juan River, 2000. Interim Progress Report. U.S. Fish and Wildlife Service. Grand Junction, CO. 61 pp.
- Ryden, D. W. 2003. Long term monitoring of sub-adult and adult large-bodied fishes in the San Juan River: 1999-2001 Integration Report. U.S. Fish and Wildlife Service. Grand Junction, CO. 68 pp.
- Ryden, D. W. 2005. Long term monitoring of sub-adult and adult large-bodied fishes in the San Juan River, 2004. Interim Progress Report. U.S. Fish and Wildlife Service. Grand Junction, CO.
- Ryden, D. W. and J.R. Smith. 2002. Colorado pikeminnow with a channel catfish lodged in its throat in the San Juan River, Utah. *Southwestern Naturalist* 47:92-94.

Nonnative Species Control and Rare Fish Monitoring in the Lower and Middle San Juan River

Estimated Budget for 2016-2020 BOR Cooperative Agreement #R13AC40007

Principal Investigator: Brian Hines
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FY 2016 Costs for UDWR- Moab

Task 1. Lower San Juan River Nonnative Removal and Monitoring

Personnel Costs (salary + fringe costs)

	Rate	Hours	Cost
Project Leader	\$33.71	125	\$4,214
Biologist	\$30.76	700	\$21,531
Technician	\$16.77	1400	\$23,478
		subtotal	\$49,223

Food and Travel

	Rate	Quantity	Cost
Fleet Costs ^a (3 trucks for 15% of total fleet costs)	\$40,800.00	0.15	\$6,120
Food (6 people, 5 days, 4 passes)	\$30.00	120	\$3,600
Shuttle (3 trucks, 4 passes)	\$180.00	12	\$2,160
Out-of-state per diem (Biologist and Project Leader)	\$47.00	6	\$282
Hotel- Durango (Biologist and Project Leader)	\$95.00	4	\$380
		subtotal	\$12,542

Equipment

	Rate	Quantity	Cost
Camping gear repair/replacement ^b :			\$1,936
Sampling gear repair/replacement ^c :			\$2,316
Boating gear repair/replacement ^d :			\$2,200
Fuel for generators (20 gallons/pass)	\$4.00	80	\$320
		subtotal	\$6,772

Other

	Rate	Quantity	Cost
Swiftwater Rescue Training	\$350.00	2	\$700
		subtotal	\$700

Task 1. Subtotal	\$69,237
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Task 2. Middle San Juan River Nonnative Removal and Monitoring

Personnel Costs (salary + fringe costs)

	Rate	Hours	Cost
Project Leader	\$33.71	125	\$4,214
Biologist	\$30.76	700	\$21,531
Technician	\$16.77	1400	\$23,478
		subtotal	\$49,223

Food and Travel

	Rate	Quantity	Cost
Fleet Costs ^a (3 trucks for 15% of total fleet costs)	\$40,800.00	0.10	\$4,080
Food (6 people, 5 days, 5 passes)	\$30.00	150	\$4,500
Shuttle (3 trucks, 5 passes)	\$100.00	15	\$1,500
Out-of-state per diem (Biologist and Project Leader)	\$47.00	6	\$282
Hotel- Durango (Biologist and Project Leader)	\$95.00	4	\$380
		subtotal	\$10,742

Equipment

	Rate	Quantity	Cost
Camping gear repair/replacement ^b :			\$1,799
Sampling gear repair/replacement ^c :			\$2,514
Boating gear repair/replacement ^d :			\$2,200
Fuel for generators (20 gallons/pass)	\$4.00	100	\$400
		subtotal	\$6,913

Task 2. Subtotal **\$66,878**

Total Expenses \$136,115

Administrative Overhead (17% on all personnel services) \$16,736

UDWR-Moab Total **\$152,851**

Funding for Participating Agencies:

USFWS GJ Total **\$18,973**

NMFG Total **\$6,864**

Navajo Nation Total **\$9,398**

Grand Total FY 2016			\$188,085
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^a The State of Utah motorpool vehicles cost 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.

^b Includes, but is not limited to, tents, sleeping pads, toilet system, cookware, stoves, propane, charcoal, satellite phone and service, drybags, coolers, first aid supplies.

^c Includes, but is not limited to dip nets, tags, tagging equipment, electrofishing wiring, anodes, cathodes, generator repair, data loggers, etc...

^d Includes, but is not limited to, raft repair/replacement, oars, oar hardware, raft frame repair, dry boxes, straps, etc...

^{b,c,d} Estimated costs are based on actual costs from previous years plus an estimated 3% cost of living increase each year following.

Under the heading “Funding for Participating Agencies.” Estimated costs for participation of the Navajo Nation Department of Fish and Wildlife, in FY-2016-2020. BOR Cooperative Agreement Number with Navajo Nation: R11AP40089

FY 2016 Costs for Navajo Nation			
<u>Personnel/Labor Costs (Salary+Benefits)</u>	Rate	Quantity	
Fish Biologist	\$158.78	14	\$2,223
Bio Tech	\$86.93	14	\$1,217
Fringe Benefits (Labor Costs* 42.48%)	\$43.75		\$1,461
Subtotal			\$4,901
<u>Travel and Per Diem</u>			
Hotel- (4 nights)	\$72.10	4	\$288
Camping Rate-(20 nights)	\$29.87	20	\$597
Vehicle Lease/Maintenance	\$467.62	1	\$468
Gasoline-(260 miles)	\$0.62	260	\$161
Subtotal			\$1,515
<u>Equipment</u>			
Maintenance, Repair, Replacement	\$1,545.00	1	\$1,545
Subtotal			\$1,545
Total Expenses			\$7,961
Navajo Nation Administration Fees (18.05%)			\$1,437
Navajo Nation FY16 Total			\$9,398

Under the heading “Funding for Participating Agencies.” Costs for participation of the New Mexico Game and Fish in FY 2016-2020. BOR Cooperative Agreement Number with New Mexico Department of Fish and Game: 07FG402630

FY 2016 Costs for New Mexico Game and Fish			
<u>Personnel/Labor Costs (Salary+Benefits)</u>	Rate	Quantity	
Fish Biologist	\$412.00	12	\$4,944
Subtotal			\$4,944
<u>Travel and Per Diem</u>			
Per Diem	\$115.00	10	\$1,150
Gasoline-(260 miles)	\$0.55	1400	\$770
Subtotal			\$1,920
New Mexico Game and Fish FY16 Total			\$6,864

Under the heading “Funding for Participating Agencies.” Costs for participation of the U.S. Fish and Wildlife Service Colorado River Fishery Project (USFWS-CRFP) in FY 2016-2020. BOR Cooperative Agreement Number with USFWS-CRFP: R13PG40052

**Participation in Non-native Species Control in the
Lower & Middle San Juan River
Fiscal Year 2016 Project Proposal
31 March 2015**

Budget for Participation by U.S. Fish Wildlife Service, Colorado
River Fishery Project (USFWS-CRFP)

Developed by:

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Contract or Agreement number(s):
R13PG40052 for USFWS – Grand Junction, CO

Reporting Dates: 10/1/2015 through 9/30/2016

**U.S. Fish Wildlife Service, Colorado River Fishery Project (USFWS-CRFP)
 Budget for Participation in
 Non-native Species Control in the *Lower* San Juan River
 Fiscal Year 2016 Project Proposal
 Updated: 31 March 2015 (by Ben Schleicher and Dale Ryden)**

Principal Investigator(s):
 Brian Hines and Katherine Creighton
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Fiscal Year 2016 Estimated Budget:

Costs for participation of the U.S. Fish Wildlife Service, Colorado River Fishery Project (USFWS-CRFP) office, Grand Junction, CO.

(Based on projected FY-2016 costs)

Note: The FY-16 and outyear costs have been adjusted for the GS-5 Bio Tech line items to reflect new guidance from Office of Personnel Management (OPM) to the USFWS requiring the USFWS to provide health insurance to all federal employees if they work for the federal government longer than 60 days (480 total hours)

Personnel/Labor Costs (Federal Salary + Benefits)

Principal Biologist (GS-11) – 80 hours @ \$49.36/hr (1 person X 5 days/trip X 2 trips)	\$ 3,949.00
Principal Biologist (GS-7) - 80 hours @ \$33.70/hr (1 people X 5 days/trip X 2 trips) (+ 30 hours overtime at \$50.55/hr = \$1,517)	\$ 4,213.00
Biological Technician (GS-5) – 80 hours @ \$24.96/hr (1 people X 5 days/trip X 2 trips) (+ 30 hours overtime each at \$37.44/hr = \$1,123)	\$ 3,120.00
Sub Total	<u>\$ 11,282.00</u>

Administrative Support (Federal Salary + Benefits)

Administrative Officer (GS-9) – 23 hours @ \$44.72/hr	\$ 1,029.00
Project Leader (GS-14) -- 15 hours @ \$83.42/hr	<u>\$ 1,251.00</u>
Sub Total	<u>\$ 2,280.00</u>

Travel and Per Diem (Based on Published FY-2015 Federal Per Diem Rates)

Hotel Costs	
2 nights X 3 people X \$83/night (standard hotel rate)	\$ 498.00
Per Diem (Hotel Rate)	
2 days X 3 people X \$46/day (standard hotel rate)	\$ 276.00
Per Diem (Camping Rate)	
10 days X 3 people X \$28/day	<u>\$ 840.00</u>
Sub Total	<u>\$ 1,614.00</u>

Equipment

Vehicle Maintenance & Gasoline (GSA lease @ \$365 = \$12.17 per day based on 30 days in an “average” month + \$0.33/mile)	
2 trips from Grand Junction, CO to Clay Hills boat take-out in Utah X 1 truck X 5 days per trip (camping) (350 miles 1-way = 700 miles round trip X 2 trips) = \$462	\$ 584.00
(1 truck X 5 days/trip X 2 trips X	

\$12.17/day) = \$122	
Generator Gasoline for Electrofishing	
(20 gallons/trip X 2 trips @ \$4.00/gallon)	\$ 160.00
Equipment Maintenance, Repair, & Replacement	\$ 2,500.00
Exact use of the money in this line item will vary from year to year depending on what equipment needs to be maintained, repaired, or replaced, but probable uses for this incurred cost include the following:	
Annual trailer maintenance & safety inspection = \$175	
Replace/repair trailer suspension, trailer lights, winch handle/straps/gears, trailer jack stand, wheel bearings	
Replace trailer tires – 2 per year @ \$100 each = \$200	
Spark plugs for generators - 5 @ \$7.50 each = \$37.50	
Synthetic oil for generators - 5 quarts at \$7.50 each = \$37.50	
Generator repair/tune-up - 3 hrs @ \$75/hr = \$225	
Hip boots – 3 pair at \$50/pair = \$150	
Breathable chest waders - 4 pair @ \$125/pair = \$500	
Dura-Frame electrofishing dip nets – 3 @ \$300 each = \$900	
Stearns Type II life jackets – 3 @ \$70 each = \$210	
Electrical Gloves - 3 pairs @ \$65/pair = \$195	
Repair raft frame	
Aluminum welding – 3 hours @ \$150/hr = \$450	
Restock raft repair kits	
Raft glue (urethane/hypalon) – Two 4-oz. cans @ \$22.50/can = \$55	
NRS raft patch material – 5 feet @ \$37/ft = \$185	
Acetone – 1 gallon @ \$17/gallon = \$17	
Replace any missing NRS HD-brand tie-down straps, each boat needs:	
Ten 2-ft straps @ \$4.20 each = \$42	
Five 3-ft straps @ \$4.30 each = \$21.50	
Ten 4-ft straps @ \$4.70 each = \$47	
Five 6-ft straps @ \$5.05 each = \$25.25	
Five 9-ft straps @ \$5.7 each = \$28.50	
Five 12-ft straps @ \$6.15 each = \$30.75	
Replace any missing D-style carabiners, each boat needs:	
10 @ \$7.50 each = \$75	
	Sub Total \$ 3,244.00
USFWS-CRFP (Grand Junction, CO) Total	\$ 18,420.00
USFWS Region 6 Administrative Overhead (3.00%)	<u>\$ 553.00</u>
USFWS Region 6 Total	<u>\$ 18,973.00</u>