Small-Bodied Fishes Monitoring
Fiscal Year 2016 Statement of Work and Project Budget
Agreement Number: SJ2631

Principal Investigators: Michael Ruhl and Kirk Patten
Fisheries Management Division
New Mexico Department of Game & Fish
One Wildlife Way, P.O. Box 25112
Santa Fe, New Mexico 87504
505-476-8104
kirk.patten@state.nm.us
michael.ruhl@state.nm.us

Background

In 1991, the San Juan River Seven-Year Research Program was initiated. Subsequently, in 1992, the Research Program was placed under the auspices of the San Juan River Basin Recovery Implementation Program (SJRIP). The Research Program involved a variety of activities designed to characterize the status of the resident fish community (particularly the federally-protected Colorado pikeminnow *Ptychocheilus lucius* and razorback sucker *Xyrauchen texanus)*; to identify and quantify those factors (biotic and abiotic) that may be limiting protected fish species, as well as other native fish species; and to identify management and conservation activities that may contribute to recovery of protected species. Much of the research begun under the Seven-Year Research Program has been completed and a variety of management and conservation activities initiated.

The SJRIP drafted the Long Range Implementation Plan to guide and provide a means of evaluating progress towards achieving species recovery. It was designed to provide for "adaptive management" wherein research and particularly management or conservation activities were modified to reflect new information. To aid in the practice of adaptive management, the Long Range Plan identified monitoring of the San Juan River native and nonnative fish populations as a necessary components to "evaluate management actions and to document the [SJRIP's] progress toward achieving species recovery" (Element 4).

The SJRIP Monitoring Plan and Protocols was initially implemented in 1999 based on protocols developed for specific life stages and abiotic factors (Propst et al. 2000). The monitoring protocols contained herein are the third revision to the Monitoring Plan and Protocols (2009 Monitoring Plan and Protocols Workshop). To aid in the evaluation of achievement of these SJRIP goals, the following Monitoring Plan and Protocols' goals were developed:

1. Track the status and trends of San Juan River's fish community.
2. Track changes in abiotic parameters, including water quality, channel morphology, and habitat, important to the fish community.

3. Evaluate endangered fish species progress towards recovery.
4. Evaluate the effect of management actions, especially endangered fish stocking, non-native fish removal, and mimicry of the natural flow regime on the populations of native and non-native fishes in the San Juan River.

Meeting these goals will be accomplished by achieving the following objectives. Objectives are listed as they relate to each of the following SJRIP Monitoring Plan and Protocol goals.

1. Annually, during autumn, document occurrence and density of native and nonnative small-bodied fishes in San Juan River.
2. Document primary channel shoreline and near-shoreline, secondary channel, and backwater mesohabitat use by age-0 Colorado pikeminnow, razorback sucker, and roundtail chub, as well as other native and nonnative fishes.
3. Obtain data that will aid in the evaluation of the responses (e.g., reproduction, recruitment, and growth) of native and nonnative fishes to different flow regimes and other management actions (e.g., impediment modification).
4. Track trends in species populations (e.g., abundance, relative condition, and size structure).

The monitoring protocols detailed herein were developed from methodologies used during the Seven-Year Research effort and subsequent modifications as developed and accepted by the SJRIP. These methods were based upon published literature, the professional experience of each researcher, peer discussions and review, and project evaluations.

Study Area

The study area for annual small-bodied fishes monitoring, covering this statement of work, extends from River Mile 180.6 (Animas and San Juan rivers confluence, near Farmington, New Mexico) downstream to River Mile 2.8 (Mexican Hat, Utah).

Methods

Small-bodied fishes monitoring is designed to sample efficiently and effectively those habitats having the greatest likelihood of supporting age-0 individuals of large-bodied species and all age classes of small-bodied species. During autumn, primary shoreline and near-shoreline, secondary channel, and backwater habitats of the San Juan River will be sampled at 3-mile intervals from the Animas-San Juan rivers confluence (RM 180.6) to Sand Island (RM 76.4). At each sample location (except backwaters), all mesohabitats present (8 to 10) will be sampled with 3.0 x 1.2 m (3 mm mesh) seine. For backwaters, a minimum of two samples will be obtained; one seine haul will be made across backwater mouth and a second will be made parallel to its long axis. Additional seine hauls may be made if deemed appropriate by sampling crew. All specimens obtained from a mesohabitat will be identified to species; specimens of uncertain identity will be retained for later identification. After measurement (mm total length), all identified native fishes will be released. If a rare fish is collected, and it is of

sufficient length (>150 mm TL), it will receive a uniquely numbered PIT tag. Total (mm TL) and standard (mm SL) lengths and mass (g) will be obtained from each rare fish captured. All nonnative specimens collected from a mesohabitat will be retained or destroyed. Fish data will be recorded by mesohabitat from each sampled area. Sampling effort will be reported as number of individuals captured per unit area. After fish collection, area, depth, and cover of sampled mesohabitats will be determined. With 8 to 10 samples per site, a total of 280 to 350 primary channel, 160 to 200 secondary channel (assuming 20 side channels are present), and 20 backwater (assuming 10 backwaters are present) samples will be obtained each year.

Geographic coordinates (UTM Zone 12, NAD 83) for each site will be recorded. Basic water quality parameters (water temperature, dissolved oxygen, conductivity, specific conductance, and salinity) will be measured at each site.

The San Juan River between San Island (RM 76.4) and Clay Hills Crossing (RM 2.9) is sampled every fifth year. Sampling procedures in these lower reaches are the same as those between Animas-San Juan rivers confluence and Sand Island. This lower reach was sampled in 2010 and will be sampled in 2015, but will not be sampled in FY2016.

Annual reports will be primarily a summation of data obtained each year, a synthesis of data across years to document and assess species population responses to environmental variables (mainly discharge), a summary of mesohabitat associations of fishes, and basic characterizations of species demographics (population size and age structure, recruitment, and survival). In addition to annual narrative reports, all data collected will be recorded on electronic spreadsheets and provided to USFWS Program Office in a format determined by the database manager and principal investigator, by June 30 of the year following data collection.

Additional Sampling for Sites Modified to Increase Habitat Complexity (The Nature Conservancy sites)

Incorporated into this year's annual monitoring of small-bodied fish will be the third year sampling newly modified habitat. Six secondary channels were modified during the fall of 2012 through excavation of sediment and removal of non-native plants. The location and length of channels re-opened are:

1. River Mile 132.2 - 6,600 feet in length
2. River Mile 132.0 – 2,000 feet in length
3. River Mile 130.7A – 1,500 feet in length
4. River Mile 130.7B – 700 feet in length
5. River Mile 128.6 - 3,700 feet in length
6. River Mile 127.2 – 3,700 feet in length
7. Additional sites – Additional RERI sites and/or sampling events may be sampled under a SOW provided by TNC in FY2016.

Methods used to sample secondary channels (as described in the Methods section above) will be used to sample these sites. The SJRIP Habitat Monitoring Program will be determining reference sites. These sites will also be sampled for small-bodied fishes. Data

analysis will include comparisons between the fish community present in these newly re-opened side channels and reference sites.

Additional Sampling on the Animas River and/or on the San Juan River above its confluence with the Animas River (Upstream sites).

The SJRIP recently began augmenting populations of razorback sucker and Colorado pikeminnow in the Animas River and San Juan River upstream of its confluence with the Animas River. Prior to 2012, no monitoring of these sections of river was underway. In 2012 and 2013, the upper portion of the San Juan River was sampled from the Bloomfield Riverside Landing (RM 196.0) downstream to the McGee Park Landing (RM 188.7) and from the McGee Park Landing downstream to the Animas River confluence. Small-bodied monitoring did not occur on the Animas River upstream from the Penny Lane Landing downstream to the San Juan River due to low water (2012) and inaccessibility (2013). At least one of these sites will be monitored in 2016 given water conditions and adequate launching sites allow sampling to occur.

References

Golden, M.E. and P.B. Holden. 2005. Retention, growth and habitat use of stocked Colorado pikeminnow in the San Juan River 2003-2004: Annual report. Prepared by BIO-WEST, Inc. for the San Juan River Basin Recovery Implementation Program, U.S. Fish and Wildlife Service, Albuquerque, New Mexico. PR 874-2: 87 p.

Propst, D.L., S.P. Platania, D.W. Ryden, and R.L. Bliesner. 2000. San Juan River Monitoring plan and protocols. San Juan Recovery Implementation Program, U.S. Fish and Wildlife Service, Albuquerque, NM.

Funding History:

Fiscal Year 2000	$57,200	Fiscal Year 2010	$89,479
Fiscal Year 2001	51,700	Fiscal Year 2011	82,929
Fiscal Year 2002	51,700	Fiscal Year 2012	83,417
Fiscal Year 2003	49,775	Fiscal Year 2013	92,353
Fiscal Year 2004	63,545	Fiscal Year 2014	84,307
Fiscal Year 2005	72,645	Fiscal Year 2015	95,054
Fiscal Year 2006	72,885		
Fiscal Year 2007	81,246		
Fiscal Year 2008	91,882		
Fiscal Year 2009	89,479		

FY 2016 Budget

Field

Personnel

Tasks - Annual monitoring primary channel, secondary channel, and backwater habitats, San Juan River, Farmington, NM to Mexican Hat, UT; The Nature Conservancy and upstream sites; 12 field days projected at 12 hours of work per day = 144 hours (project leader 7 days).

Project Leader (1)	
56 hrs regular	56 hrs
$34.59/hr (base salary) + $12.11 (benefits)	$46.70/hr
28 hrs overtime	28 hrs
$46.70/hr * 1.5 (time-and-a-half)	$70.05/hr
	$4,577
Project Biologists (3)	
96 hrs regular x 3 biologists	288 hrs
$27.71/hr (base salary) + $9.70 (benefits)	$37.41/hr
48 hrs overtime x 3 biologists	144 hrs
$37.41/hr * 1.5 (time-and-a-half)	$56.12/hr
	$18,855
TOTAL PERSONNEL	**$23,432**

Per Diem

7 days/project biologist (in-state rate) for 4 biologists	
- $85.00/day (standard NM in-state rate)	$2,380.00
5 days/project biologist (out-of-state rate) for 4 biologists	
-$115.00/day (standard NM out-of-state rate)	$2300.00
TOTAL PER DIEM	**$4,680**

Vehicles (2)

Round-trip Farmington/Shiprock, NM	
1500 miles @ $0.55/mile	$825.00
Round-trip to Mexican Hat, Utah ($0.55/mile)	
960 miles @ $0.55/mile	$528.00
TOTAL VEHICLE	**$1,353**

Field Equipment & Supplies

Water quality instrument maintenance 2@$400	$ 800.00
Life Jackets 5@$40	$ 200.00
Raft maintenance	$ 500.00
Whirlpacks (500) @ $50.00/500	$ 50.00
Formalin (6 gal) @ $25/5gal	$ 150.00
TOTAL EQUIPMENT & SUPPLIES	**$1,700**

TOTAL FIELD **$31,165**

Specimen Management

Personnel

Project Biologists (2)

Tasks—processing (sorting, identification, and data-entry). Since 2000, annual monitoring collections averaged of 31,000 specimens (retained and/or released) although the last two years of collection have resulted in lower numbers of fish captured. Approximately 8 hours per day of sampling may be required to process data and specimens retained in the laboratory.

15 days of sampling at 8 hrs each x 2 biologists	240 hrs
$27.71/hr (base salary) + $9.70 (benefits)	$37.41/hr

TOTAL SPECIMEN MANAGEMENT **$8,978**

Data Synthesis and Report Preparation

Personnel

Project Leader (1)

Tasks—data analysis, data synthesis, report drafting, report review, and report revision.

120 hrs	120 hrs
$34.59/hr (base salary) + $12.11 (benefits)	$46.70/hr
TOTAL PROJECT LEADER SALARY	**$5,604**

Project Biologists (2)

Tasks—data management, data QA/QC, data analysis, data synthesis, table and graph preparation, report drafting, and report revision.

200 hrs ea.	400 hrs
$27.71/hr (base salary) + $9.70 (benefits)	$37.41/hr
TOTAL PROJECT BIOLOGISTS SALARY	**$14,964**

TOTAL DATA SYNTHESIS & REPORT PREPARATION **$20,568**

Reviews and Meetings

Personnel

Project Leader (1)	
Tasks—2 Biology Committee meetings @28 hrs. ea; report review (40)	86 hrs
$34.59/hr (base salary) + $12.11 (benefits)	$46.70/hr
TOTAL PROJECT LEADER SALARY	**$4,016.20**
Project Biologists (1)	
Tasks—5 Biology Committee @28 hrs. ea(140 hrs); report review (60 hrs)	200 hrs
$27.71/hr (base salary) + $9.70 (benefits)	$37.41/hr
TOTAL PROJECT BIOLOGISTS SALARY	**$7,482.00**
TOTAL SALARY	**$11,494.20**

Per Diem - meetings requiring travel

Project Biologists (1) (includes 3 Biology & 1 Coordination Committee meetings)	
3days @ $85.00/day (standard NM in-state rate)	$255.00
9 days @ $115.00/day (standard NM out-of-state rate)	$1035.00
Project Leader (1) (includes 1 Biology & 1 Coordination Committee meetings)	
6 days @ $115.00/day (standard NM out-of-state rate)	$690.00
TOTAL PER DIEM	**$1980.00**

Travel

Vehicle	
1 Biology & Coordination Committee meetings (Farmington)	
400 miles@ $0.55/mile (standard NM rate)	$220.00
3 Biology & Coordination Committee meetings (Durango)	
500 miles ea. = 1500 miles @ $0.55/mile (standard NM rate)	$825.00
TOTAL VEHICLE	**$1,045.00**
TOTAL REVIEWS & MEETINGS	**$14,523**

Administrative

Personnel

Secretary/Clerk Duties

Tasks—purchasing, travel arrangements.

Project Biologist (1)	80 hrs
$27.71/hr (base salary) + $9.70 (benefits)	$37.41/hr

SECRETARY/CLERK SALARY	**$2,992.80**

Grant and Budgeting

Tasks - administration of agreements, tracking budget expenditures

Project Leader (1)	120 hrs
$34.59/hr (base salary) + $12.11 (benefits)	$46.70/hr

GRANT AND BUDGETING	**$5,604.00**
TOTAL ADMINISTRATIVE	**$8,597**

FY 2016 TOTAL	**$83,831**
Field Work	**$31,165**
Specimen Management	**$8,978**
Data Synthesis and Report Preparation	**$20,568**
Reviews and Meetings	**$14,523**
Administrative	**$ 8,597**

Out-Year Budgets within Current Agreement (Through FY2018)

FY 2017 TOTAL	**$86,346**
FY 2018 TOTAL	**$88,936**

Out-Year Budgets Beyond Current Agreement (FY2019 and 2020)

FY 2019 TOTAL	**$91,604**
FY 2020 TOTAL	**$116,337**