

Museum of Southwestern Biology
Curation of Lower Colorado River Basin Larval Fish Collections and Digital Files

Fiscal Year 2018 Scope of Work

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Background

Collections Curation and Data Archives -- Personnel with the Division of Fishes, Museum of Southwestern Biology (MSB), at the University of New Mexico (UNM) are responsible for the curation of collections of fishes taken by principle investigators with the San Juan River Basin Recovery Implementation Program (SJRIP). Since 1991, the MSB Division of Fishes has been the permanent repository for large numbers of voucher specimens and associated data collected by SJRIP researchers. The numbers of specimens and field notes processed each year have varied depending on the availability of specimen/field data after the field season, collecting techniques, and annual variability of sampling conditions. Specimens of San Juan River fishes, taken by the New Mexico Department of Game and Fish during the 1987-2005 secondary channel surveys, were not received by the MSB until 2007; about 85% of these collections have been incorporated into the MSB collections of specimens, field notes, and data. The SJRRIP collections (15,482 cataloged lots and 2,900 data sheets) taken by the Utah Division of Wildlife Resources from 1991 to 2000 were received starting in 1993 have since been fully incorporated.

Given the variability in number of fishes to process, the San Juan River Biology Committee has recommended that the annual budget for the San Juan River specimen curation and larval fish identification reflect an “average” year of sample processing. The SJRIP Biology Committee recognizes that some years would require more effort from MSB staff than budgeted, while other years might not require the same high level of activity. A relatively stable budget would allow for uninterrupted processing of new collections and yet be sufficient to cover the ongoing work of processing backlogged SJRIP collections due to circumstances previously discussed.

To date, 44,255 lots or 1,530,729 fish specimens have been collected (1987-2015) by the San Juan River research group and these specimens have been processed, cataloged, and archived at the Museum of Southwestern Biology, Division of Fishes. A total of 19,540 San Juan River collection sites have been entered into the MSB database and georeferenced; all locality and habitat information has been captured using original field notes and data sheets. Over 25,000 pages of original San Juan River field notes and data sheets have been digitally captured, cleaned, and saved in both tiff and pdf formats for the electronic archives; the original field notes and data sheets are permanently stored in acid-free document boxes for long-term conservation.

Incoming specimen collections are removed from WhirlPaks®, cleaned of debris, placed in known concentrations of fixative (either 5% buffered formalin, 10 % buffered formalin, or 95% ethanol), and organized on the accession shelves by MSB staff. Collections are later sorted and

identified by the principal SJRIP investigators. Specimen collections are assigned an accession number (tracking number) and all associated documentation, like permits and field notes, are filed under that same number. Processing collections of fish specimens (adults and larvae) requires fluid transfers from formalin fixative to ethanol preservative (typically), sending out specimens for species verification as required, counting the number of individuals in each collection, recording the standard lengths for the largest and smallest specimen in each collection, entering all locality and specimen data into an electronic catalog, digital capture of field notes and data sheets, and labeling and filing vials and jars of cataloged San Juan River specimens into the permanent MSB collections. The basic principles for accessioning specimens of fishes in the MSB are standard for most museums of natural history (e.g., Smithsonian Institution, Carnegie Museum, and University of Michigan Museum of Zoology). Species identifications and locality/collection data are verified as necessary prior to incorporation into the MSB catalog. This step is very important for the SJRIP researchers so that any misleading information is not incorporated into subsequent reports on San Juan River fish species, particularly for the larval Colorado pikeminnow (*Ptychocheilus lucius*) and razorback sucker (*Xyrauchen texanus*) studies. For purposes of permitting, the MSB provides with field and species data in museum report format. This information includes species identification, catalog number (MSB number), number of specimens and size range per lot.

Study Area

The objective of this project is to process and organize specimens of fishes, collection data, and field notes taken under the San Juan River Recovery Implementation Program (San Juan River and Upper Colorado River Basin). Capture all field information into an electronic catalog, and incorporate the SJRIP collections into a phylogenetic system within the museum archives for easy access. All of these activities take place in the Division of Fishes, Museum of Southwestern Biology, on the University of New Mexico campus in Albuquerque NM. The work and collaboration to synthesize, analyze, and integrate relevant elements of this large database has moved to the USFWS SJRRIP Program Office in Albuquerque and continues to be presented at researchers' meetings held in the Four Corners area, Colorado or New Mexico.

The MSB Division of Fishes has three offices with a total of six computer workstations for data entry, data management, and data analysis; a fully equipped laboratory for preparation of fish specimens, and approximately 1,858 linear meters of compacted shelving for storage of cataloged collections. On average, five UNM students and staff (three undergraduate, one graduate student, and part-time staff curatorial assistant) process and curate SJRRIP collections. One postdoctoral research associate position is responsible for SJRRIP data synthesis and integration, meeting the research goals of the SJRRIP Program.

Curation and Collections Care Objectives

1. Provide a secure and organized repository for San Juan River fish collections, field notes, and associated data thereby facilitating access to these resources by SJRIP researchers.
2. Insure that all SJRIP species identifications and associated data are verified and correctly represented in the MSB electronic catalog; report discrepancies to SJRIP principal investigators.
3. Georeference collection sites for SJRIP collections; maintain license for ArcView and make collection data available to SJRIP researchers in that format, as required.

Curation and Collections Care Methods

Tasks to be completed under this project are processing and curation of fish specimens and all data from the San Juan River Basin Recovery Implementation Program synthesized and integrated in the form of reports to the Committee and peer review publications. Specimen collections are deposited with the MSB Division of Fishes by SJRIP principal investigators.

Upon receipt of newly collected San Juan River specimens, MSB staff transfer these collections from formalin fixative into stages of 35%, 50%, and 70% concentrations of ethanol. Exceptions to this protocol are made per request of PI, as in the case of using 95% ethanol for genetic or otolith studies. Fish specimens are removed from field containers and cleaned (debris removed) and placed into museum quality jars during the fluid transfers. Principle investigators sort, identify, count and measure each lot (discrete collection) once the collections are transferred to ethanol. MSB staff catalog, label, and file the specimens once the principle investigators have completed their work. SJRIP collections are organized in the permanent archives by drainage (San Juan River) and taxa. These archives are in a room that is controlled for temperature (18° Celsius) and light (complete darkness to low light levels). All data associated with the specimens are entered and organized in the electronic MSB Division of Fishes database (MS Access 2010) and georeferenced (GeoLocate Ver. 3). All original field notes and data sheets are digitally captured and archived in acid-free document boxes for permanent storage.

Products

SJRIP and Upper Colorado River Basin fishes and associated data will be curated in the Division of Fishes, Museum of Southwestern Biology (MSB), at the University of New Mexico. Collection sites will be georeferenced and available in ArcView format. Original field notes and data sheets will be digitized and archived (physical and electronic copies) by the MSB Division of Fishes. Collection data will be electronically stored in a permanent MSB database program. Species verifications and corrections and digital copies (PDF) of their field notes will be made available to SJRIP principle investigators. A draft report of the 2017 San Juan River and upper Colorado River Basin specimen curation, larval fish sampling and identification, and data integration activities will be prepared and distributed by 31 March 2018 to the San Juan River Biology Committee for review. Upon receipt of written comments, that report will be finalized and disseminated to members of the San Juan River Biology Committee by 1 June 2018.

Budget Fiscal Year 2018 1 October 2017 to 30 September 2018

BUDGET ITEM DESCRIPTION	COMPUTATION		RECIPIENT FUNDING	OTHER FUNDING	RECLAMATION FUNDING	TOTAL COST
	\$/Unit	Quantity				
SALARIES AND WAGES --Position title x hourly wage/salary x est. hours for assisted activity. Describe this information for each position.						
Undergraduate student	\$11.30/HR	2160 HRS			\$24,408.00	\$24,408.00
Undergraduate student	\$12.36/HR	442 HRS			\$5,463.00	\$ 5,463.00
Undergraduate student	\$13.39/HR	912 HRS			\$12,212.00	\$12,212.00
FRINGE BENEFITS – Explain the type of fringe benefits and how applied to various categories of personnel.						
UNM Undergraduate UNM Rate	1% per salary	5 STUDENTS			\$421.00	\$421.00
TRAVEL —dates; location of travel; method of travel x estimated cost; who will travel						
EQUIPMENT —Leased Equipment use rate + hourly wage/salary x est. hours for assisted activity—Describe equipment to be purchased, unit price, # of units for all equipment to be purchased or leased for assisted activity: Do not list contractor supplied equipment here.						
SUPPLIES/MATERIALS --Describe all major types of supplies/materials, unit price, # of units, etc., to be used on this assisted activity.						
Chemical Preservatives-EtOH 95%	\$9.64	25 gallons			\$241.00	\$241.00
Labeling-paper and print film	.91/ft	100 feet			\$91.00	\$91.00
Specimen containers-3 liter jars	7.35/ea	30 jars			\$221.00	\$221.00
Specimen containers-8oz jars	.93/ea	40 jars			\$42.78	\$42.78
Specimen containers-8 dr vials	0.72/ea	1200 vials			\$864.00	\$864.00
Specimen containers-1 dr vials	0.18/ea	300 vials			\$54.00	\$54.00
Closures-cotton plugs	0.008/ea	4000 plugs			\$32.00	\$32.00
Closures-gaskets	3.02/ea	30 gaskets			\$90.60	\$90.60
Closures-caps	0.31/ea	40 caps			\$13.95	\$13.95
CONTRACTUAL/ CONSTRUCTION —Explain any contracts or sub-Agreements that will be awarded, why needed. Explain contractor qualifications and how the contractor will be selected.						
OTHER –List any other cost elements necessary for your project; such as extra reporting, or contingencies in a construction contract.						
TOTAL DIRECT COSTS--					\$44,154.00	\$44,154.00
INDIRECT COSTS – 17.5%						
					\$7,727.00	\$7,727.00
TOTAL PROJECT/ACTIVITY COSTS FY18						\$51,881.00

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