

**COLORADO RIVER RECOVERY PROGRAM**  
**FY 2012-2013 SCOPE OF WORK for:**  
**Identification and Curation of Larval and Juvenile Fish**

Project Number:   15  

Lead agency: Larval Fish Laboratory, Colorado State University  
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Date Last Modified: 1/31/2012 7:11:00 PM, 31 Jan. 2012

<u>Category:</u>	<u>Expected Funding Source:</u>
<input checked="" type="checkbox"/> Ongoing project	<input checked="" type="checkbox"/> Annual funds
<input type="checkbox"/> Ongoing-revised project	<input type="checkbox"/> Capital funds
<input type="checkbox"/> Requested new project	<input type="checkbox"/> Other
<input type="checkbox"/> Unsolicited proposal	

I. Title of Proposal:

Identification and Curation of Larval and Juvenile Fish by Colorado State University Larval Fish Laboratory.

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.E. Provide for long-term care, cataloging, and accessibility of preserved specimens.

III. Study Background/Rationale and Hypotheses:

This project provides Larval Fish Laboratory (LFL) taxonomic and analytical services for specific Recovery Program projects (Task 1, Taxonomic Services). Incidental taxonomic services and consultation on larval and juvenile fish taxonomy, sampling techniques, and collection handling are also provided, as needed and time allows, to Upper Colorado River Basin (UCRB) researchers.

The project also provides ongoing curation (maintenance and management) of the growing Upper Colorado River Basin (UCRB) portion of the LFL Collection. LFL currently maintains approximately 3,580,000 UCRB specimens in about 109,300 taxon-specific lots as voucher for Recovery Program and earlier and related UCRB investigations. These collections are an invaluable, long-term, historical resource for future reference and research. Some collections are over quarter century old, dating back to 1976. New collections are cataloged and added to the LFL Collection as they are received or processed by LFL. As the holdings of the LFL Collection become better known, we expect use of UCRB collections will increase substantially, both within and outside the Recovery Program.

As part of the curatorial effort, we continue to pursue arrangements to help ensure collection permanency. In part through the efforts of the principal investigator, preliminary plans continue to develop for administratively and physically consolidating most of the university's Natural History Research Collections (including the LFL Collection) to provide better long-term recognition, support, and facilities for those collections as a functional unit of Colorado State University.

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

Goal—

To provide taxonomic and curatorial services for the Recovery Program.

Objectives—

Support Recovery Program researchers by identifying, processing, cataloging, and curating preserved fish, or analyzing otoliths, in specifically designated sets of collections submitted to LFL under this project (Task 1), currently collections from:

- Project 22F, LFL—samples to assess Yampa and Middle-Green Colorado pikeminnow and razorback sucker larval abundance and samples collected in the White River (**Task 1a, White River sample collection began in 2011, budget increased by about double (increase of \$16,000 w/o overhead) to accommodate anticipated samples**).
- Project 158, Utah Division of Wildlife Resources and U. S. Fish and Wildlife Service, Vernal, Utah offices—samples associated with middle Green River drift and backwater sampling aimed at understanding factors contributing to the decline of age-0 Colorado pikeminnow (Task 1b).
- Project 160, Utah Division of Wildlife Resources, Moab, Utah—samples associated with increased light-trap sampling in the lower Green River for age-0 razorback sucker (Task 1c).
- Project 161, Larval Fish Laboratory Analyze otoliths of age-0 smallmouth bass from the Colorado River (Task 1d).
- **Larval Trigger study sample analysis, added about \$16,000 (before overhead) to identify samples from that study.**

Provide, as needed and time allows, incidental taxonomic services and consultation on taxonomy, collecting techniques, and collection handling to other Recovery Program projects and researchers (Task 1).

Catalog and incorporate in the LFL Collection other preserved UCRB specimens deposited by Recovery Program projects and researchers (Task 2).

Continue curation (maintenance and management) of all cataloged UCRB specimens in the LFL Collection (Task 2).

#### End Products—

Annual project reports.

Collection or analysis data for Project 22F (including new White River sampling, began in 2011), 158, 160 and 161 researchers, and additional flood plain sample identification associated with Green River larval trigger assessment in Stewart Lake.

Other determinations of specimen identity and data.

Cataloging and incorporation of taxonomic services project collections and other deposited UCRB fish collections in the LFL Collection.

Continued maintenance and management of, and access to, the cataloged collection of preserved fish which serve as voucher for Recovery Program investigations and provide a long-term resource for future Recovery Program and other public reference and research.

#### V. Study Area:

The Recovery Program collections identified, processed, and curated by LFL were or will be collected from cool to warm-water reaches of the UCRB, generally exclusive of the San Juan River subbasin.

#### VI. Study Methods/Approach:

**Taxonomic Services—**We will identify preserved specimens (mostly larvae) or analyze otoliths collected and submitted by other Recovery Program projects specified above and process, catalog, and curate the fish collections as part of the LFL Collection. Limited incidental taxonomic services and related consultation for other Recovery Program projects and researchers also will be provided as needed and time allows.

**Ongoing Curation—**The LFL Collection will continue to serve as the depository for larval and other small fish from preserved Recovery Program collections. Methods for receiving, accessioning, cataloging, maintaining, and managing use of these preserved specimens are provided in our draft "Larval Fish Laboratory Collection Policies and Procedures Manual" (Appendix II, Snyder 1996), as adapted for our SPECIFY Collection Management System. We will respond to internal and external requests for collection information and use of specimens; Recovery Program approval will be required for any destructive use or transfer of endangered or rare species. We will continue our effort to ensure collection permanency, in part through planned consolidation of Colorado State University Natural History Research Collections.

#### VII. Task Description and Schedule:

**Task 1: Taxonomic Services—**As soon as possible after receipt collections for Recovery Program projects listed below and as time allows for other incidentally requested taxonomic services and consultation on related matters.

1a: Collection identification, processing, and curation for Project 22F.

1b: Collection identification, processing, and curation for Project 158.

1c: Collection identification, processing, and curation for Project 160.

1d: Otolith analyses of age-0 smallmouth bass for Project 161.

1e: Stewart Lake sample identification, larval trigger study evaluation.  
 Task 2: Ongoing Curation—As needed throughout each fiscal year.

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

FY 2012 (same for FY 2013):

Deliverables and Due Dates:

LFL will record and submit collection (or otolith) data to Project 22F, 158, 160, and 161 researchers as soon as the collections (or otoliths) are processed.  
 Other taxonomic determinations and related information and suggestions will be conveyed to requesting researchers as time allows.  
 Annual report—November 2012.

Budget <sup>a</sup>

<u>Task 1a (Taxonomic Services for Project 22F)</u>	<u>LFL</u>
Labor	
Principal Investigator/Taxonomist (\$6,832/mo. <sup>b</sup> ; 2 mo.)	\$13,664
Research Associates (\$3,291/mo. <sup>b</sup> ; 4 mo.)	13,164
Work-study Technicians (\$1,827/mo. <sup>c</sup> ; 0.3 x 3.5 mo.)	1,918
Supplies <sup>d</sup>	<u>830</u>
Task subtotal (Direct Costs)	29,576
<u>Task 1b (Taxonomic Services for Project 158)</u>	<u>LFL</u>
Labor	
Principal Investigator/Taxonomist (\$6,832/mo. <sup>b</sup> ; 1.1 mo.)	\$7,515
Research Associates (\$3,291/mo. <sup>b</sup> ; 3.5 mo.)	11,519
Work-study Technicians (\$1,827/mo. <sup>c</sup> ; 1.3 x 1.5 mo.)	3,563
Supplies <sup>d</sup>	<u>750</u>
Task subtotal (Direct Costs)	23,347
<u>Task 1c (Taxonomic Services for Project 160)</u>	<u>LFL</u>
Labor	
Principal Investigator/Taxonomist (\$6,832/mo. <sup>b</sup> ; 0.75 mo.)	\$5,125
Research Associates (\$3,291/mo. <sup>b</sup> ; 2 mo.)	6,582
Work-study Technicians (\$1,827/mo. <sup>c</sup> ; 0.3 x 1.5 mo.)	821
Supplies <sup>d</sup>	<u>330</u>
Task subtotal (Direct Costs)	12,858
<u>Task 1d (Otolith Analyses for Project 161)</u>	<u>LFL</u>
Labor	
Principal Investigator (\$6832/mo. <sup>b</sup> ; 0.5 mo.)	\$3,416
Research Associates (\$3,291/mo. <sup>b</sup> ; 2.34 mo.)	7,686
Work-study Technicians (\$1,827/mo. <sup>c</sup> ; 0.5 mo.)	914
Supplies <sup>d</sup>	750

Task subtotal (Direct Costs)	12,766
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Task 1e (Sample analysis for larval trigger study, Stewart Lake)	
LFL	
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Labor	
Principal Investigator (\$6832/mo. <sup>b</sup> ; 1 mo.)	\$6,832
Research Associates (\$3,291/mo. <sup>b</sup> ; 2.34 mo.)	7,686
Work-study Technicians (\$1,827/mo. <sup>c</sup> ; 0.5 mo.)	914
Supplies <sup>d</sup>	650
Task subtotal (Direct Costs)	16,082
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Task 2 (Ongoing Curation)	LFL
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Labor	
Principal Investigator/Curator (\$6,832/mo. <sup>b</sup> ; 3.62 mo.)	\$24,725
Research Associate/Collection Manager (\$3,291/mo. <sup>b</sup> ; 2.57 mo.)	8,454
Work-study Technicians (\$1,827/mo. <sup>c</sup> ; 0.3 x 1.0 mo.)	548
Travel <sup>e</sup>	900
Supplies <sup>d</sup>	737
Task 2 Subtotal (Direct Costs)	35,364
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FY 2012 Direct Cost (Task 1a+1b+1c+1d+1e+2 subtotals)	\$129,993
FY2012 Indirect Costs (17.5% of Direct Costs) <sup>f</sup>	22,749
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FY 2012 TOTAL	\$152,742
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<sup>a</sup> As requested by the Recovery Program, we have maintained salaries and other costs in our FY 2012 and FY 2013 budgets at 2011 levels (which were themselves maintained at 2009 levels). However, salaries have increased for some personnel beyond those given herein and annual estimated increases in fringe benefit rates (generally + 0.5%) and salary and other expenses (4%) are specified by the Colorado State University Office of the Vice President for Research and Information Technology in its Proposal Budget Spreadsheet. Actual increases in costs beyond those budgeted herein will require future adjustments to either the budget or tasks in this scope of work.

<sup>b</sup> Salary plus fringe benefits.

<sup>c</sup> 30% of wages, rest subsidized by work-study program.

<sup>d</sup> 80% vials, jars and 10% preservative, labels, etc. (or for Task 1d, 90% materials for preparing and mounting otoliths); 10% computer and other lab supplies.

<sup>e</sup> At least partial support for participation in annual UCRP Researchers Meeting (3 nights, 2 persons, personal or lab vehicle) with remaining funds applied toward participation in the annual Larval Fish Conference.

<sup>f</sup> Assumes current memorandum of understanding (MOU) through which Colorado State University and the Bureau of Reclamation agreed to a reduced indirect cost rate of 17.5% with the university waiving the remainder of its standard 47% indirect cost rate as its contribution to the project.

FY-2013: as per FY 2012, but one year later

IX. Budget Summary

FY 2012	\$152,742
FY 2013	<u>\$152,742</u>
Total	\$305,484

X. Reviewers: (Not applicable—ongoing project)

XI. References:

Snyder, D. E. 1996. Preserved larval and small-fish collections of the Upper Colorado River Basin: maintenance and cataloging of a valuable historical database. Final Report of the Larval Fish Laboratory, Colorado State University, to the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin, U.S. Fish and Wildlife Service, Denver, Colorado. (24 April 1996).

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