COLORADO RIVER RECOVERY PROGRAM
FY 2016 ANNUAL PROJECT REPORT

RECOVERY PROGRAM
PROJECT NUMBER: 15

I. Project Title: Identification and Curation of Larval and Juvenile Fish by Colorado State University Larval Fish Laboratory.

II. Bureau of Reclamation Agreement Number(s): R14AP00001

Project/Grant Period: Start date (Mo/Day/Yr): 10/01/14
End date: (Mo/Day/Yr): 09/30/18
Reporting period end date: 09/30/16
Is this the final report? Yes _____ No __X__

III. Principal Investigator(s): Kevin R. Bestgen (Project Manager), Darrel E. Snyder, and Sean C. Seal

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IV. Abstract: This ongoing project supports Larval Fish Laboratory (LFL) taxonomic, analytical, and curatorial services for specific Recovery Program projects, and as time allows, other incidentally requested taxonomic services and consultation (Task 1). It also provides for ongoing curation (maintenance and management) of the LFL Collection, including controlled access to and use of collection holdings and data by UCRB and other researchers (Task 2).

V. Study Schedule: Ongoing project since 1995. Collections from the following projects are identified, processed, and curated annually with the resultant data provided to the principal investigator as soon as logistically possible after the collections are received: Project 22F, LFL—preliminarily identified drift-net and light-trap samples from the lower Yampa, Middle-Green, and White Rivers to assess the larval abundance of Colorado Pikeminnow and Razorback Sucker (Task 1a); Project 138, Utah Division of Wildlife resources, Vernal and Moab offices—Interagency Standardized Monitoring Program sample identification/verification as needed; Project 158, Utah Division of Wildlife Resources (UDWR) and U. S. Fish and Wildlife Service (USFWS), Vernal offices—drift and backwater samples from the Middle-Green River to help assess factors contributing to the decline of age-0 Colorado Pikeminnow and simultaneously collected ISMP samples (Task 1b—backlog, study suspended in 2013); Project 160, UDWR, Moab—light-trap samples for age-0 razorback sucker and seine samples from the lower Green River (Task 1c); Project 163, USFWS, Grand Junction—samples

associated with Gunnison River fish community monitoring (Task 1e); Project FR-164, USFWS, Vernal—samples associated with Green River Larval Trigger Study Plan monitoring in floodplain wetlands (Task 1f); and Project FR-165, UDWR, Vernal—samples associated with Green River Larval Trigger Study Plan monitoring in Stewart Lake floodplain (Task 1g). Incidental taxonomic services and consultation on early life-stage taxonomy, sampling techniques, and collection handling are addressed as needed and time allows (also Task 1). General collection maintenance activities (e.g., fluid level and container checks) are conducted annually; other maintenance and management concerns, including National Park Service inventory checks of cross-catalogued holdings are addressed as needed and newly deposited and backlog collections are cataloged as time permits (Task 2). Responses to requests for loans, collection use, or information on collection holdings are provided as needed (also Task 2).

VI. Relationship to RIPRAP: This project is related to General Recovery Program Support Action Plan V (monitor populations and habitat and conduct research to support recovery actions—research, monitoring, and data management). Identification and processing of collections for Projects 22F, 138, 158, 160, 163, FR-164, and FR-165 and otolith analyses for Project 161 contribute to Tasks V.A (measure and document population and habitat parameters to determine status and biological response to recovery actions) and V.B (conduct research to acquire needed life history information). The remainder of this project specifically addresses Task V.E (provide for long-term care, cataloging, and accessibility of preserved specimens) and, in that preserved specimens are the ultimate natural history database, contributes to Task V.A.1 (conduct interagency data management program to compile, manage, and maintain all research and monitoring data collected by the Recovery Program).

VII. Accomplishments of FY 2016 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1, Taxonomic Services—The following preserved collections were processed.

Task 1a (Project 22F): in 2016, 233 Yampa River drift net samples (637 lots-3,162 specimens) and 18 Green River drift net samples (27 lots-44 specimens). Also in 2016, 95 razorback sucker light-trap collections (231 lots-2,319 specimens) were taken from the middle Green River.

Project 138: in 2016, provided 5 Green River samples (14 lots-43 specimens).

Task 1b (Project 158): no samples were received, suspended in 2013.

Task 1c (Project 160): in 2015, 62 light-trap (192 lots-13,013 specimens), 5 seine (6 lots-121 specimens), and 5 young of year seine (10 lots-52 specimens) collections were taken in the lower Green River. Additionally, there were 61 Colorado River light-trap (215 lots-2,429 specimens), 24 seine (40 lots-319 specimens), and 20 young of year seine (34 lots-151 specimens) collections taken and processed.

Task 1e (Project 163): in 2015, 102 Colorado River dip nets (197 lots-853 specimens), 3 seines (14 lots-154 specimens) and 210 Gunnison River dip nets (561 lots-3,053 specimens), 4 seines (13 lots-367 specimens).
Task 1g (Project FR-165): in 2016, 60 light-trap collections taken in Stewart Lake (121 lots-963 specimens).
All processed specimens have been cataloged and shelved as part of the LFL Collection and the collection data forwarded to the responsible principal investigators (PIs) for analysis and reporting.

Task 2, Ongoing Collection Maintenance and Management—We: (1) added, as of 30 September, a total of 3,460 lots of fish (77,384 specimens) from UCRB collections or investigations to the cataloged collection (Appendix A), (2) submitted an updated *Access* database version of our catalog records through FY 2016 (selected fields, flat file) to the Interagency Database Management Program (IDMP) archive, (3) made collection holdings and selected data available to UCRB researchers and other interested parties, including specimens used for developmental study of cyprinid larvae for Project 149 and inventory checks requested by the NPS, (4) responded to incidental requests from UCRB researchers for taxonomic assistance or consultation on larval-fish sampling and collection handling matters, (5) corrected incidentally found errors in our catalog database, (6) installed and tested the latest version of our collection database and management program, *Specify 6*, and (7) conducted an annual fluid level and condition check of our holdings. As of 30 September 2016, we maintain and manage 131,244 lots of cataloged fish (4,175,249 specimens) collected from the UCRB or used for UCRB Recovery Program investigations. These holdings represent almost 96% of all LFL cataloged lots (just over 97% of all cataloged specimens). We also upgraded trays used to hold vials, which improves their security.

In spite of substantial effort, no significant progress was made in FY 2016 towards plans for housing the LFL Collection and other natural history collections on campus together as a university natural history museum. We investigated the feasibility of using space in three different buildings for a University-wide museum facility, but neither space nor funding was available for such. The museum facility awaits adequate development-grant funding.

Shortcomings—None.

VIII. Additional noteworthy observations: Reports of such observations are appropriately deferred to the PI's to whom the processed collection data has been submitted.

IX. Recommendations: We recommend continued annual support of Project 15 with sufficient funds for processing newly preserved collections covered by this project, incidental taxonomic services and consultation, and on-going maintenance and management (curation) of all UCRB specimens held by LFL.

X. Project Status: On-track and ongoing.

XI. FY 2016 Budget Status

A. Funds Provided: $234,037
B. Funds Expended: $120,229
C. Difference: $113,808
Explanation: Additional work remains to accomplish 2016 tasks; see Section VII.
D. Percent of FY 2016 work completed and projected costs to complete: about 50% of work completed; funds are sufficient to complete tasks.
E. Recovery Program funds spent for publication charges: $0

XII. Status of Data Submission (Where applicable): 2015 collection data for Project 22F (Task 1a) was internally submitted to Kevin Bestgen. 2015 collection data for Project 160 (Task 1c) was submitted to respective PI's. 2015 collection data for Project 163 (Task 1e) was submitted to respective PI's. 2015 collection data for Project FR-165 (Task 1g) was submitted to respective PI's. An updated *Access* database version of our LFL Collection catalog for UCRB holdings (selected fields, flat file) through FY 2016 was submitted to the IDMP archive.

XIII. Signed: Darrel E. Snyder
Principal Investigator Date

Signed: Sean C. Seal

Principal Investigator Date

Signed: Kevin R. Bestgen

Principal Investigator, Date: 9 November 2016

Project Manager

APPENDIX A:

Study-year sets of Upper Colorado River Basin collection-species lots cataloged as part of the Colorado State University Larval Fish Laboratory Collection from October 1, 2015 through September 30, 2016 (3,460 lots; 77,384 specimens).

Catalog No.	Field Numbers	Description of Sample Sets
53528-53653	UDWR-98TD-G01 to G46, C01 to C28	98 DR, Green River, UT, Tusher Diversion*
56244	CDOW-80Y-053	80 SN, Yampa River, CO*
83438	LFL-94YA-7032	94 Larvae, DR, Yampa R, Echo Pk,DNM, CO*
83439	FWS/GJ-GU03-050	03 Larvae, DN, Gunnison R, CO*
96025	FWSV-04RZ-053	04 Larvae, RZ LT, Green R, UT*
133921-4151	FWS/V-15RZ-001 to 167, UNK	15 Larvae, RZ LT, Green R, UT
134152-4839	LFL-14GR-LW001 to 051	14 SN, Green R, Lodore-Whirlpool, CO, UT
134840-5054	UDWR-15LRZ-CL043 to CL115	15 Larvae, Lower RZ LT, Colorado R, UT
135055-5094	UDWR-15LRZ-CS01 to CS42	15 Larvae, Lower RZ SN, Colorado R, UT
135095-5098	UDWR-15LRZ-CM01 to CM04	15 Larvae, Lower RZ LT, Matheson Preserve, Colorado R, UT
135099-5290	UDWR-15LRZ-GL005 to GL077	15 Larvae, Lower RZ LT, Green R, UT
135291-5296	UDWR-15LRZ-GS29 to GS37	15 Larvae, Lower RZ SN, Green R, UT
135297-5616	LFL-10YA-RW001 to RW189	10 SN & DN, Yampa R, CO
135617-5650	UDWR-15LRZ-CY004 to CY089	15 Young of Year, Lower RZ SN, Colorado R, UT
135651-5660	UDWR-15LRZ-GY003 to GY129	15 Young of Year, Lower RZ SN, Green R, UT
135661-5674	UDWR-15GR-ISMP01 to ISMP11	15 SN, Green R, UT
135675-6311	LFL-15YA-617A1 to 8163	15 Larvae, DR, Yampa R, Echo Pk,DNM,CO

Catalog No.	Field Numbers	Description of Sample Sets
136312-6338	LFL-15GR-7203 to 8162	13 Larvae, SN, Green R, Echo Pk,DNM,CO
136339-6457	UDWR-15GR-SL001 to 060	15 LT, Green R, Stewart Lake Eval, UT
136458-6652	FWS/GJ-15CO-001 to 102	15 Larvae, DN, Colorado R, CO
136653-6666	FWS/GJ-15CO-Y23 to Y32	15 Young of Year, SN, Colorado R, CO
136667-7227	FWS/GJ-15GU-001 to 210	15 Larvae, DN, Gunnison R, CO
137228-7240	FWS/GJ-15GU-Y05 to Y27	15 Young of Year, SN, Gunnison R, CO
137241-7242	FWS/GJ-15CO-001 to 102	15 Larvae, DN, Colorado R, CO**
137243-7246	UDWR-99GR-7022, 7093, 7112, 7222	99 Larvae, DR, Green R, UT*

* Specimens found during collection condensing and cataloged.
** Specimens skipped during cataloging.