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

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III. Project Summary: This ongoing project provides for (1) the identification and processing of preserved fish from the Interagency Standardized Monitoring Program (ISMP) and (2) the long-term care, backlog cataloging, and accessibility of preserved fish from Upper Colorado River Basin (UCRB) collections. The Larval Fish Laboratory currently maintains over 75,000 lots of UCRB fish collected from 1976 through 1999 (an estimated 3.85 million specimens). Fifty-five Fall 1999 ISMP collections were processed. In addition to normal curatorial activities, 10,608 lots of backlogged, pre-1994 collections were cataloged, relabeled, and reorganized for easy access; work on remaining backlog collections should be completed in FY 2001.

IV. Study Schedule: Preserved collections processed under this project are identified, counted, measured, cataloged, and reported upon as soon as possible after they are received. Storage upgrading and cataloging of backlog pre-1994 collections under this project was begun in FY 97 and continues on a year-round basis. General collection maintenance (e.g., fluid level and container checks) is conducted annually and collection management is ongoing as needed.

V. 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 ISMP collections contribute to Task V.A.1 (measure and document population and habitat parameters to determine status and biological response to recovery actions –conduct standardized monitoring program). The remainder of the 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, Task V.A.2 (. . .–conduct interagency data management program to compile, manage, and maintain all research and monitoring data collected by the Recovery Program).

II Accomplishments of FY 2000 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings: The FY 2000 goals and objectives of this ongoing project, as revised to accommodate budget reduction, have been met. Due to budget reduction, conclusion of work on the backlog of pre-1994 collections (cataloging and upgrading storage), conversion of collection cataloging and management software from DOS-based MUSE to

Windows-based SPECIFY, and the update of printed and *dBase* versions of the collection catalog for the Interagency Database Management Program (IDMP) have been deferred to FY2001.

Fall 1999 ISMP collections were identified, counted, measured, cataloged, stored, and reported upon on schedule (see Appendix A for summary of results). Printed data reports and copies of computer database files (*dBase*) for those collections were submitted to the source agencies, Colorado Division of Wildlife (CDOW, Grand Junction, William Elmblad) and Utah Division of Wildlife Resources (UDWR, Moab, Melissa Trammell and Steve Meismer), and U.S. Fish and Wildlife Service (USFWS, Grand Junction, Frank Pfeifer and Charles McAda); copies of the database files were submitted to IDMP (Charles McAda).

Curation of larval and other small-fish collections in FY 2000 included: (1) annual fluid-level and container checks for over 75,000 lots of preserved UCRB specimens, (2) maintenance of the collection catalog, (3) management of access to specimens and associated data, and (4) the fourth of a now five-year effort (FY 97 through FY 2001) to complete cataloging and upgraded care and management of backlogged collections dating back to 1976 (about 33,000 lots at the beginning of this effort in FY 97). The latter effort includes switching specimens to new containers and preservative if necessary, relabeling each lot with standard-format cataloged-collection labels, and systematically reorganizing the lots on collection shelving for easy access. As of September 30, 2000, a total of 68,155 lots of fish have been cataloged as part of the LFL Collection (highest used collection number 69677 less 1522 unused numbers). Of these, 10,608 backlog and 2,046 recently processed UCRB lots (12,654 total) were added to the cataloged collection during FY 2000. An estimated 4,000 lots of backlog pre-1994 UCRB holdings remain to be cataloged and properly stored, labeled, and organized during FY 2001. Recent collections are cataloged as part of the cost of collection processing. Appendix B lists the study-year sets of recently processed and backlog collections that were cataloged during FY 2000.

Efforts to assure the future permanency of the collection continued in FY 2000. Prospects remain promising for a move of the LFL Collection, along with other Colorado State University natural history research collections, to campus facilities renovated specifically for these collections. The move should occur in three or four years. Meanwhile, current facilities for the Larval Fish Laboratory in the Wagar Building are scheduled for major renovation in spring and summer 2001 and the LFL Collection will need to be moved before those renovations begin and again upon their completion.

VII. Recommendations: We recommend continued annual support of Project 15 with sufficient funds for processing new preserved collections covered by this project (e.g., fall ISMP) and on-going maintenance and management (curation) of all UCRB specimens held by LFL.

VIII. Project Status: On-track and ongoing.

IX. FY 2000 Budget

A. Funds provided: $53,800
B. Funds expended: $53,800
C. Difference: $0
D. Percent of the FY 2000 work completed, and projected costs to complete: 100%, $0
E. Recovery Program funds spent for publication charges: $0

X. Status of Data Submission: Preserved fish data for Fall 1999 ISMP collections were submitted as a printed data report and *dBase* files to Colorado Division of Wildlife, Utah Division of Wildlife Resources, and USFWS, and as *dBase* files to IDMP.

XI. Signed: Darrel E. Snyder — December 8, 2000
Principal Investigator — Date

Signed: Diane L. Miller — December 8, 2000
Principal Investigator — Date

Signed: Kevin R. Bestgen — December 8, 2000
Principal Investigator — Date

APPENDIX A:

Brief summary of results for preserved fall ISMP seine collections, Colorado River and lower Green River, September 13-22, 1999 (extracted from LFL data report submitted to responsible agencies, 8 February 1999).

This report covers the preserved fishes in 55 collections taken during the 1999 fall monitoring program (ISMP)—35 from the Colorado River in Colorado (river miles 183.4-140.1, collection numbers CO01-CO35), 12 from the Colorado River in Utah (river miles 94.7-4.1 above the confluence with the Green River, collection numbers YC11-YC70), and 8 from the lower Green River in Utah (river miles 105.5-25.0, collection numbers YG11-YG67). It is a printed version of the *dBase* files "99YOY.DBF" (collection data and length frequencies) and "99YOYES.DBF" (individual total lengths for endangered species such as Colorado pikeminnow and total lengths and dorsal and anal fin-ray counts for chubs, *Gila* spp.). These files (and an associated file of collection data transcribed from field sheets, 99YOYCD.DBF) have been electronically transmitted to the recovery program database repository, USFWS, Grand Junction, as well as both source agencies. Included on the following pages are individual collection data (pages 3-11), an overall summary by species for each reach (pages 12-14) and all reaches combined (page 15), a list of Colorado pikeminnow captures with individual total lengths (pages 16-17), a list of chub captures with individual total lengths and dorsal and anal fin-ray counts (pages 18-27), comments for database records including total lengths for specimens greater than 90 mm TL (page 28), and a list of table and species abbreviations used in this or other Upper Colorado River Basin reports and databases (pages 29-30). The specimens have been cataloged (LFL 59606-59906) and are stored as part of the Larval Fish Laboratory Collection for voucher and future study (e.g., identification of humpback chub, food habits, condition, parasites).

In all, the collections received contain 13,554 preserved fish (an average of 246 specimens per collection) representing six families and 19 species. Of those fish, 6,724 are from the upper Colorado River reach (UCRR), 5,224 from the lower Colorado River reach (LCRR), and 1,606 from the lower Green River reach (LGRR). Overall, 4% of the fish are native species (3 cyprinids and 2 catostomids); 8% for the UCRR, <1% for the LCRR, and 3% for the LGRR. Overall, cyprinids (eight species) account for 98%, catostomids (three species) 1%, and other families (eight species) 1% of all fish received. For the UCRR the respective percentages are 96%, 2%, and 2%, for the LCRR 99%, 0%, and <1%, and for the LGRR 99%, <1%, and 1%. Percentage compositions for species representing 1% or more of the preserved collections are: from the UCRR–red shiner 42%, fathead minnow 29%, sand shiner 18%, *Gila* species 6%, green sunfish 1%, flannermouth sucker 1%, bluehead sucker 1%, and largemouth bass 1%; from the LCRR–sand shiner 64%, red shiner 34%, and fathead minnow 2%; and from the LGRR–red shiner 73%, fathead minnow 13%, sand shiner 9%, Colorado pikeminnow 3%, common carp 1%, and green sunfish 1%.

A total of 47 Colorado pikeminnow (11-29 mm TL) were preserved, five (18-22 mm TL) from the LCRR at river mile 19.0, and 42 (11-29 mm TL) from the LGRR at river miles 105.5 to 25.0 (36 of these in one collection at river mile 105.5); none were taken from the UCRR.

A total of 400 *Gila* species (22-56 mm TL) were taken in the UCRR at river miles 183.4 to 147.4. The vast majority are probably roundtail chub based on dorsal and anal fin ray counts of 9 and 9 or less (some 8). The remainder have counts of 9 dorsal and 10 anal rays (one 8D, 10A) and are probably either roundtail chub or humpback chub. No chub were preserved in the LCRR or LGRR collections.

APPENDIX B.

Study-year sets of Upper Colorado River Basin collection-species lots cataloged as part of the Colorado State University Larval Fish Laboratory Collection between October 1, 1999 and September 30, 2000 (total of 12,654 UCRB lots were cataloged including 10,608 lots from backlogged, pre-1994 collections).

Beginning Cat. No.	Field Numbers	Description of Sample Sets
56358	CDOW-81W-JC01 to 81Y-148	81 SN&DN; WH, CO, & YA R., CO
57757	(unused)	
57759	UDWR-99GR-7023 to 8203	99 Drift Net, Green River
58111	FWS/V-87SN-446, . . .	87 Nursery Hab, SN, Green R., UT*
58121	UDWR-99MO-7031	99 Drift Net, Colorado R., Moab, UT
58423	(unused)	
58425	UDWR-99YA-6301	99 Drift Net, Yampa R., Echo Pk., CO (LFL)
59327	(non-UCRB collections)	
59355	FWS/V-87SN-1127 to . . .	87 Nursery Hab, SN, Green R., UT, Apr.*
59400	FWS/V-88SN-015 to . . .	88 Nursery Hab, SN, Green R. UT,Mar-Apr*
59417	UDWR-99DRSN005 to 110	99 Larvae, Seine, Duchesne River, UT
59560	UDWR-99DR-DN001 to 006	99 Larvae, Dip Net, Duchesne River, UT
59571	UDWR-99DR-DR048	99 Larvae, Drift Net, Duchesne River, UT
59572	UDWR-99DR-LT026 to 092	99 Larvae, Light Trap, Duchesne River, UT
59597	UDWR-99LR-DR001 to 006	99 Levee Removal Drift Net, Green R., UT
59606	FWS/GJ-99Y-YC11 to 70	99 YOY, Fall ISMP, Seine, Colorado R., UT
59653	FWS/GJ-99Y-YG11 to 67	99 YOY, Fall ISMP, Seine, Green R., UT
59606	FWS/GJ-99Y-YC70	99 YOY, Fall ISMP, Seine,Colorado R.,UT*
59695	FWS/GJ-99Y-CO01 to 35	99 YOY, Fall ISMP, Seine, Colorado R., CO
59906	FWS/GJ-99Y-YC11	99 YOY, Fall ISMP, Seine,Colorado R.,UT*
59907	FWS/V-87SN-821 to . . .	87 Nursery Hab, SN, Green R., UT, Aug.*
60052	CDOW-82Y-001 to 82Y-324	82 SN,DN&DR, YA, GR, & CO R., CO

Beginning Cat. No.	Field Numbers	Description of Sample Sets
62225	(unused)	
62258	CDOW-82Y-325 to 591	82 SN,DN&DR, Yampa R., CO*
63182	(unused)	
63189	CDOW-82Y-562 to 82W-24	82 SN,DN&DR, YA,WH,GU,&CO R., CO*
63486	CDOW-83C-001 to 83Y-445	83 SN,DN&DR, Yampa & Colorado R., CO
65294	Z65294 to Z65299	84 SN or DR(?), YA or GR R.(?), CO
65300	CDOW-84G-001 to 110	84 DR, Green R., CO
65520	CDOW-84Y-001 to 256	84 SN & DR, Yampa R., CO
66208	CDOW-85Y-001 to 163	85 DR, Yampa R., CO
66571	CDOW-80C-023 to . . .	80 SN & DN; Colorado & Yampa R., CO*
66591	CDOW-81Y-149 to . . .	81 SN & DN; Colorado & Yampa R., CO*
66706	CDOW-82C-012 to . . .	82 SN; Colorado & Yampa R., CO*
66712	CDOW-86Y-001 to 196	86 Drift Net, Yampa River, CO
67033	Z667033 to Z667034	84 SN (?), Green R. (?), CO*
67035	CDOW-84G-028 to . . .	84 DR, Green R., CO*
67038	CDOW-84Y-056 to . . .	84 SN & DR, Yampa R., CO*
67047	(non-UCRB collections)	
67053	ERI-85-001 to 077	85 Cataract Canyon, Colorado River, CO
67167	(unused)	
67362	FWS/GJ-89Y-0001 to 0036	89 YOY, Fall ISMP, Seine, Colorado R.,CO
67565	(non-UCRB collection)	
67566	UDWR-89Y-9003 to 9091	89 YOY, Fall ISMP, Seine, L. Green R., UT
67610	UDWR-89Y-9095 to 9180	89 YOY, Fall ISMP, Seine, Colorado R., UT
67915	FWS/GJ-89Y-9401 to 9481	89 YOY, Fall ISMP, Seine, U. Green R., UT
67997	FWS/GJ-89S-0001 to 0042	89 Spring ISMP, Seine, Colorado R?., UT
68059	UDWR-82W-036 to 078	82 Drift Net, White R., UT

Beginning Cat. No.	Field Numbers	Description of Sample Sets
68136	UDWR-82W-001 to 035	82 Seine, White R., UT
68243	BIOWEST-87-001 to 121	87 Seine,Gypsum&Cataract, GR&CO R.,UT
68490	FWS/V-88SN-D058 to D102	88 Drift Net, Yampa R., Echo Park, CO
68586	(unused)	
68687	USBR-88ZP-03 to 69	88 Zooplankton Nets, Green R., UT
68714	USBR-87ZP-01 to 20	87 Zooplankton Nets, Green R., UT
68737	(non-UCRB collections)	
68748	LFL-CULT-BH7807 to (var.)	BH Study Series (cultured and wild)
68835	(non-UCRB collections)	
68987	LFL-CULT-FM7828 to (var.)	FM Study Series (cultured and wild)
69094	BLM/LFL-77W	BH Study Series (wild)*
69104	LFL-CULT-WS7813 to (var.)	WS Study Series (cultured and wild)
69277	LFL-90CO-KRB855 to 871	90 Seine, Colorado R., Debeque-Riffle, CO
69395	(unused)	
69399	(non-UCRB collections)	
69400	DNFH-82A-01 to (var.)	RZ Study Series (cultured and stocked recap)
69524	BLM/LFL-Y760601	FM Study Series (wild)*
69525	(non-UCRB collections)	
69639	LFL-93WILLIAMS1 to 8	93, Misc., Colorado R. at DeBeque, CO
69667	(non-UCRB collections)	
69676	Z69676	FM from CO & YA R.,CO (incomplete data)
69677	Z69677	WS from CO & YA R.,CO (incomplete data)

* Additional lots belonging to a previously cataloged sample set.