

**COLORADO RIVER RECOVERY PROGRAM
FY-2004 PROPOSED SCOPE-OF-WORK for:
Annual YOY Colorado Pikeminnow Fall Monitoring**

Project No.: 138

Lead Agency: Utah Division of Wildlife Resources
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Category:

- Ongoing project
- Ongoing-revised project
- Requested new project
- Unsolicited proposal

Expected Funding Sources:

- Annual funds
- Capital funds
- Other (explain)

I. Title of Proposal:

Annual YOY Colorado Pikeminnow Fall Monitoring

II. Relationship to RIPRAP:

Green River Action Plan: Mainstem

- V.A. Measure and document population and habitat parameters to determine status and biological response to recovery actions.
- V.B.2. Conduct appropriate studies to provide needed life history information.

Colorado River Action Plan: Mainstem

- V.A. Measure and document population and habitat parameters to determine status and biological response to recovery actions.
- V.B.2. Conduct appropriate studies to provide needed life history information.

III. Study Background/Rationale and Hypotheses:

Larval Colorado pikeminnow monitoring is ongoing in an effort to evaluate spawning success. Monitoring of juvenile Colorado pikeminnow is occurring in conjunction with adult population estimates in the Green and Colorado rivers. However, survival of YOY can vary greatly between years independent of spawning success and can have an impact on the juvenile component of Colorado pikeminnow populations. This is thought to be due to varied flows, backwater temperatures, competition and predation by non-native fish, and over-winter mortality. Spawning success means very little to recovery if conditions create high mortality of YOY fish resulting in a smaller number of juvenile Colorado pikeminnow available for recruitment into the adult population.

Documenting size and relative abundance of YOY Colorado pikeminnow may provide valuable information about the probable survival of any particular year class. Together with existing YOY data from the Interagency Standardized Monitoring Program (ISMP; 1986 - present), results from this project should provide the basis for a predictive model to help identify recruitment rates required to sustain wild populations of Colorado pikeminnow. Continued monitoring of this size class of Colorado pikeminnow will provide information toward refinement of the model and an indication of population health prior to detection by adult Colorado pikeminnow population estimates.

In addition, efforts to control non-natives may likely have the greatest affect on YOY fish. Monitoring this component of the Colorado pikeminnow will provide information toward evaluation of nonnative control projects. This project ensures continuation of existing, standardized data series (ISMP) that document trends in abundance of early-life stage Colorado pikeminnow (USFWS 1987).

IV. Study Goals, Objectives, End Product:

1. Determine size and relative numbers of YOY Colorado pikeminnow at the end of their first growing season to complement larval and juvenile sampling data.

2. Using new and existing data, determine relationship between larval and YOY Colorado pikeminnow CPE abundance estimates with respect to flow and temperature.
3. Using new and existing data, develop predictive model that relates larval and YOY Colorado pikeminnow abundance.
4. Using new and existing data, determine relationship between YOY and juvenile Colorado pikeminnow CPE abundance estimates with respect to YOY size, flow, and temperature.
5. Using new and existing data, develop predictive model that relates YOY and juvenile Colorado pikeminnow abundance.

V. Study Area

The study area for this project includes identified Colorado pikeminnow nursery habitat area in the Green and Colorado rivers in Utah (Archer et al. 1985, Tyus and Haines 1991, Valdez et al. 1982). Specifically, Split Mountain to Sand Wash (RM 320 – RM 217) on the middle Green River, Green River State Park to the confluence with the Colorado River (RM 120 – RM 0) on the lower Green River, and Cisco to the confluence with the Green River (RM 111- RM 0) on the Colorado River.

VI. Study Methods/Approach

Objective 1:

Annual YOY Colorado pikeminnow sampling will be conducted in late summer/early fall between the second week of September and the third week of October. On average, at least two backwater/low velocity habitats will be sampled every five river-miles. Field sampling will be conducted using the old ISMP protocol so that the long-term trend line can be maintained. Extra data sampled above the ISMP protocol will be used to increase the statistical power of the sample, and to compare with the ISMP trend.

Backwater/low velocity habitats will be sampled using a 1.2 m x 4 m seine with 3 mm mesh. Two non-overlapping seine hauls will be conducted in each habitat sampled. Preferably the two seine hauls will be parallel to one another and perpendicular to the axis of the backwater. However, if water depth is too great a haul can be completed along one shoreline. Seine hauls may be completed in any portion of the habitat including the mouth or shallow tail of a backwater. Length of the seine haul, maximum depth, and average depth will be determined for each sample. All endangered and native fish will be identified, total length measured (mm), and returned alive to the habitat. Ray counts will be completed for all chubs captured. Enumeration of nonnative species will not be necessary; however, a presence/absence list of species encountered will be recorded for each habitat sampled. All nonnative fish will be permanently disposed of on the riverbank.

In addition, physical habitat measurements to be collected include habitat type, habitat length, habitat width (measured at three equidistant transects along the length of the habitat), habitat temperature, main channel temperature, habitat turbidity (secchi disk), and main channel turbidity (secchi disk). This data will be collected on one backwater every five miles. Mean daily flow (cubic feet per second) as determined by USGS gages #09261000 (Green River near Jensen, UT), #09315000 (Green River at Green River, UT), and #09180500 (Colorado River near Cisco, UT) will be recorded for each day of sampling. Location of each habitat will be recorded in UTM coordinates using GPS technology.

Objectives 2-5:

Data from past and present efforts toward monitoring larval, YOY, and juvenile Colorado pikeminnow will be analyzed with respect to CPE abundance estimates, size, flow and temperature. Larval drift net data from the Yampa River, lower Green River and Colorado River will be incorporated into the analysis as well as information from McAda and Ryel (1999). Data from YOY Colorado pikeminnow monitoring through fall 2003 in the middle Green, lower Green and Colorado rivers will be included in the final analysis of the data. Juvenile Colorado pikeminnow data collected from adult ISMP sampling and adult population estimates in the Green and Colorado rivers will also be used.

Data analysis will determine the annual relationships between larval and YOY Colorado pikeminnow and multi-year relationships between YOY and juvenile Colorado pikeminnow with respect to all variables. Uncertainties such as ages at length will be addressed during the predictive model development process. Adequacy of spatial sampling scope will be addressed either through separate data analyses or during model development. Appropriate statistical analyses to determine relationships and develop a predictive model will be determined through statistical consultation with Dr. Kevin Bestgen (Colorado State University).

VII. Task Description and Schedule

Task 1: Seine backwater/low velocity habitats to collect data for endangered and native fish. Collect physical habitat data.

Middle Green River – seining (fall, 2004-2007)

Lower Green River – seining (fall, 2004-2007)

Colorado River – seining (fall, 2004-2007)

Task 2: Analyze past and current data to determine relationships between larval and YOY Colorado pikeminnow CPE abundance estimates and YOY and juvenile Colorado pikeminnow abundance estimates.

Database development and management – Fall 2004-2007
Data analysis – Fall/Winter 2004-2007_

Task 3: Develop and refine predictive models.

Model development – Winter 2004-2007
Model refinement – Winter 2004-2007

Task 4: Report Preparation

Annual Report November 2004 - 2007

Draft report to recovery program coordinator – May 31, 2008
Draft final report to peer reviewers and Biology Committee – June 30, 2008
Final report to Biology Committee – August 15, 2008

VIII. FY2004 Work

1. Deliverables/due dates: Annual Report November 2004
2. Budget:

FY 2004 Task 1: Field Data Collection

Labor	Work Days	UDWR Cost
Project Leader (\$405/day)	3	\$1,215
Biologist (\$315/day)	20	\$6,300
Technician (\$180/day)	30	\$5,400
Travel Mileage (\$35/day)	20	\$700
Food		\$600
Gas (motors)		\$500
Supplies and Equipment		\$1,500
Other		\$800
Task 1 Subtotal	\$17,015	

FY 2004 Task 2: Data Analysis

Labor	Work Days	UDWR Cost
Project Leader (\$405/day)	5	\$2,025
Biologist (\$315/day)	20	\$6,300
Technician (\$180/day)	10	\$1,800
Supplies and Equipment		\$500
Task 2 Subtotal		\$10,625

FY 2004 Task 3: Develop and refine predictive models.

	Work Days	UDWR Cost	LFL – Dr. Bestgen
Labor Project Leader (\$405/day)	23	\$9,315	
Statistician (\$375/day)	35		\$13,125
Task 3 Subtotal		\$9,315	\$13,125

FY 2004 Total

	UDWR	LFL	Total
Task 1	\$17,015		\$17,015
Task 2	\$10,625		\$10,625
Task 3	\$9,315	\$13,125	\$22,440
TOTAL	\$36,955	\$13,125	\$50,080

FY 2005 Work

1. Deliverables and due dates Deliverables/due dates: Annual Report December 2005
2. Budget:

FY 2005 Task 1: Field Data Collection

		Work Days	UDWR Cost
Labor	Project Leader (\$425/day)	3	\$1,275
	Biologist (\$330/day)	20	\$6,600
	Technician (\$189/day)	30	\$5,670
Travel	Mileage (\$35/day)	20	\$700
	Food		\$600
	Gas (outboard motors)		\$500
Supplies and Equipment			\$1,500
Other			\$800
Task 1 Subtotal			\$17,645

FY 2005 Task 2: Data Analysis

		Work Days	UDWR Cost
Labor	Project Leader (\$425/day)	5	\$2,125
	Biologist (\$330/day)	20	\$6,600
	Technician (\$189/day)	11	\$2,079
Supplies and Equipment			\$500
Task 2 Subtotal			\$11,304

FY 2005 Task 3: Develop and refine predictive models.

		Work Days	UDWR Cost	LFL - Dr. Bestgen
Labor	Project Leader (\$425/day)	28	\$11,900	
	Statistician (\$400/day)	35		\$14,000
Task 3 Subtotal			\$11,900	\$14,000

FY 2005 Total

	UDWR	LFL	Total
Task 1	\$17,645		\$17,645
Task 2	\$11,304		\$11,304
Task 3	\$11,900	\$14,000	\$25,900
Total	\$40,849	\$14,000	\$54,849

FY 2006 Work

- Deliverables and due dates: Annual Report November 2006
- Budget: \$57,591

FY 2007 Work

- Deliverables and due dates: Annual Report November 2007
- Budget: \$60,471

FY 2008 Work

- Deliverables and due dates:
 - Draft report to recovery program coordinator – May 31, 2008
 - Draft final report to peer reviewers and Biology Committee – June 30, 2008
 - Final report to Biology Committee – August 15, 2008
- Budget: \$30,000

IX. Program Budget Summary

FY 2004	\$50,080
FY 2005	\$54,849
FY 2006	\$57,591
FY 2007	\$60,471
FY 2008	\$30,000
Total	\$255,016

X. Reviewers

XI. References

Archer, D.L., L.R. Kaeding, B.D. Burdick, and C.W. McAda. 1985. A study of the endangered fishes of the upper Colorado River. Final Report. U.S. Fish and Wildlife Service, Colorado River Fishery Project. Grand Junction, Colorado.

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