

FY-2001 PROPOSED SCOPE-OF-WORK

Project No.: 22k

Population estimate of humpback chub in
Desolation/Gray Canyon, Green River, Utah

Lead Agency: Utah Division of Wildlife Resources

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Category:

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

Expected Funding Source:

- Annual funds
- Capital funds
- Other (explain)

I. Title of Proposal:

Population estimate of humpback chub in Desolation/Gray Canyon, Green River, Utah

II. Relationship to RIPRAP:

General Recovery Program Support Action Plan
V. A. 1. Conduct Standardized Monitoring Program

III. Study Background/Rationale and Hypotheses:

The RIP is currently involved in setting recovery goals for the endangered humpback chub. Recovery goals will be based in part on maintaining populations of humpback chub in several locations, among which is the Desolation/Gray canyon population on the Green River. Setting, maintaining, and monitoring a population necessitates obtaining accurate population estimates. Trend monitoring (ISMP) has been conducted annually since 1991. A five year study on humpback chub reproduction and habitat use 1992-1996 was recently completed (Chart and Lentsch, 1999) as part of the Flaming Gorge studies. However, catch rates were variable and recapture rates low, so a good population estimate could not be produced. A ballpark estimate using those data was made by Drs. Ron Ryel and Rich Valdez (draft recovery goals). This estimate was presented without confidence intervals and cannot be used for recovery with confidence. Three years have elapsed since those data were collected, therefore a new estimate is now required according to the RIP monitoring schedule.

A three year population estimate of humpback chub in Black Rocks (USFWS) and Westwater Canyon (UDWR) of the Colorado River will be completed in FY2000. Similar methods will be used in Desolation Canyon. A population estimate for Cataract Canyon will be conducted in subsequent years. Population estimates for all three populations will be repeated every 5 years, from the initial year of the estimate.

IV. Goals, Objectives, End Product:

Goal: to estimate the population size of humpback chub in Desolation/ Gray Canyon.

Objectives:

- 1) to obtain a population estimate of late juvenile/adult humpback chub in Desolation/ Gray Canyon.
- 2) to determine if a relationship exists between ISMP catch rates and population size, to relate past catch rates to changes in population.

V. Study area:

Desolation/Gray Canyons on the Green River, Utah. Specifically, four long term trend sites in Desolation/Gray Canyon (RM 184.4, 174, 160, and 145) will be sampled. Additional sites may be added in later years (previously sampled as 'wildcard sites' [RM 182, 166.5, and 148.8]).

VI. Study Methods/Approach:

Study methods will be similar to those used in the previous study (Chart and Lentsch 1999) and in the Westwater Canyon population estimate (in progress). Before sampling begins, we will discuss and refine the sampling design and population estimate with biometricians Dr. Ron Ryel, (Ryel and Associates) and Ken Burnham (CSU). A more rigorous sampling design than that used in the previous study (Chart and Lentsch 1999) will be required to produce a suitable estimate.

The '*Robust design for capture-recapture studies*' described in the Middle Green River SOW for estimating Colorado pikeminnow abundance (Bestgen et al. 2000) will be followed. This design employs sampling at two scales; weekly, to estimate population size in a given year, and annually, to estimate probabilities of capture, recruitment, and annual survival rates. The robust design approach was also employed by Osmundson and Burnham (1998) to estimate abundance and survival rate of Colorado pikeminnow in the Colorado River. This approach takes advantage of both open and closed population models. Program Capture will be used by Dr. Ryel to obtain an estimate, as he has used this program to estimate population size, confidence intervals and capture probabilities for Black Rocks and Westwater Canyon.

Although a CI of 20% was recommended by the Program Guidance document for this population estimate, we feel this would be difficult to achieve at the recommended budget level. A preliminary estimate of the Black Rocks population has been made by Dr. Ron Ryel. Four passes/year were made, resulting in CIs of 24-25%. Dr. Ryel has indicated that 5-6 passes would be necessary to drive the lower CI below 20%. About 30% of the total population of fish need to be collected to produce a suitable estimate at the current capture probabilities (Ryel, personal communication). The Black Rocks population occupies about 2.3 miles of river, and has higher catch rates than Desolation Canyon. The Desolation Canyon population occupies at least 40 miles of river, possibly as much as 80. If, after the first three trips, greater precision is needed, additional sampling trips can be added, but the budget will increase at the cost of \$10,000/trip.

It is important to emphasize the differences in the humpback chub population dynamics and logistics between the Colorado River populations and Desolation Canyon. The Desolation Canyon population is much more dispersed over a much larger area, and is of lower density than those in Black Rocks and Westwater. These differences makes it extremely difficult to apply the effort necessary to obtain a reasonable estimate over the entire occupied habitat. Therefore, we feel it is important to concentrate on a few areas and obtain a good estimate, and then relate electrofishing catch rates in the estimate sites to electrofishing estimates riverwide, and extrapolate the site estimates to the rest of the occupied habitat. It must be recognized that the best approach to this difficult problem is not yet known, and an adaptive approach should be used. Each year's results will be analyzed and discussed with a biometrician, and the sampling regime refined and changed as necessary to best meet the goal of a reasonable population estimate.

At least three sampling trips will be made in early July to late August, and repeated for two additional years. Trips will be scheduled to target flows of less than 8000 cfs to

maximize catch (Chart and Lentsch 1999). Each of the four trend sites will be sampled for two nights. Catch rates of chubs are much lower than those seen in Westwater or Blackrocks. Trammel nets and electrofishing will be used to collect chubs. The accessible shorelines at each site will be electrofished before nets are set. Six to eight nets will be set in the evening beginning at approximately 1630 hrs and checked every 1.5 to 2 hours to approximately 2230 hrs. Chubs will be held in live cages overnight. Nets will be set again before sunrise and checked every 1.5 to 2 hours, and pulled mid-morning. Fish will be processed after all nets have been pulled. All accessible shorelines in between sites and between RM 200 to 146 will also be electrofished. All chubs will be scanned for a pittag, pittagged if needed, measured (mm) and weighed (g-electronic balance), and released.

VII. Task Description and Schedule (FY-2001):

Complete 3 sampling trips (including monitoring trip) in Desolation Canyon from July-August for a humpback chub population estimate. Data will be entered on the computer and transferred to USFWS by January 15, 2002. A short annual progress report summarizing these data will be completed before the winter Colorado River researchers meeting. Annual results including a preliminary population estimate will be presented in the annual reports. A final report will be completed in June, 2004.

VIII. FY01 Work

- Deliverables/Due Dates - See above
- Budget:

Task 1

- Labor -	\$ 50,000
- Travel -	\$ 11,000
- Equipment -	\$ 5,000
- Other -	<u>\$ 1,600</u>
- Total -	\$ 67,600

FY02 Work

- Deliverables/Due Dates - See above
- Budget:

Task 1

- Labor -	\$ 51,800
- Travel -	\$ 11,270
- Equipment -	\$ 5,225
- Other -	<u>\$ 1,672</u>
- Total -	\$ 69,967

IX. Budget Summary

FY-2001	\$67,600
FY-2002	\$69,967
FY-2003	\$72,440
FY-2004	\$12,000
Total	\$222,007

X. Reviewers

Rich Valdez (SWCA, Inc.) and Tom Chart (US BR).

XI. References

Bestgen, K., J. Hawkins, G. White, K. Christopherson, T. Modde, G. Haines, and T. Nesler. 2000. Abundance Estimates for Colorado pikeminnow in the Middle Green River /Yampa River System. Scope of Work proposal submitted to the Recovery Implementation Program. U. S. Fish and Wildlife Service, Denver, Colorado.

Chart, T.E. and L. Lentsch. 1999. Reproduction and recruitment of *Gila* spp. and Colorado pikeminnow (*Ptychocheilus lucius*) in the middle Green River 1992-1996. Report C in Flaming Gorge Studies: Reproduction and Recruitment of *Gila* spp. and Colorado pikeminnow in the middle Green River. Final Report. Recovery Implementation Program Project #39.