COLORADO RIVER RECOVERY PROGRAM Project No.:133
FY-2006/2007 SCOPE OF WORK

Title: Evaluation of Yampa Humpback Chub Population

Lead Agency: U.S. Fish and Wildlife Service

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Category:
X Ongoing project
__ Ongoing-revised project
__ Requested new project
__ Unsolicited proposal

Expected Funding Source:
X Annual funds
___ Capital funds
___ Other (explain)

I. Title of Proposal: Evaluation of Yampa Humpback Chub Population

II. Relationship to RIPRAP:

Green River Action Plan: Yampa and Little Snake rivers: V.A. Conduct population estimate for humpback chub.

III. Background/Rational :

The recovery goals for humpback chub require no "net loss" in the size of existing humpback chub populations, and requires a monitoring program to measure the status of theses populations. The Yampa River population of humpback chub is one of the smallest populations of existing humpback chub. However, the recommendation from the recent RIP population monitoring workshop was that abundance estimates were very important relative to monitoring progress toward recovery. Another issue raised by the recovery goals, is what is the distribution of the 'Yampa' population. The recovery goals state that what is now referred to as the Yampa population also include fish that may be found in Lodore, Whirlpool, and Split Mountain canyons. The recent discovery of age-0 and age-1 humpback chub (Chris Kitcheyan, USFWS, Daryl Snyder, CSU, Personal Communication) in Island Park give support to the presence of humpback chub in at least Whirlpool Canyon, and historical records have documented captures of humpback chub in both Split Mountain and Lodore canyons. The initiation of this project will be the first attempt to sample the distribution of humpback chub in all the suspected locations occupied by humpback chub in a given year and will provide the baseline distributional information for these sites for future monitoring efforts.

IV. Goals and Objectives:

The goal of this study is define the distribution, length frequency and size of the Yampa humpback chub population, and determine the relative rate of recruitment.

1. Determine the geographical distribution of the Yampa humpback chub population.
2. Determine the number of adults and subadults in the Yampa humpback chub population
3. Determine and length frequency and relative numbers,of juveniles in the Yampa humpback chub population.

V. Study Area:

Yampa (rmi 0-47), Green River from Lodore Ranger Station to the bottom of Split Mountain Canyon (rmi 364-219).

VI. Approach:

We will determine the population estimate of humpback chub occupying the Yampa, Whirlpool, Split Mountain, and Lodore canyons. Collections of adults (> 200 mm) and subadults (120-199 mm) will be conducted during spring months on the descending limb of the hydrograph. Three, 5 day sampling trips will be made in each of Yampa (rmi 47-0), Lodore (rmi 362-345), and Whirlpool/Split Mountain (rmi 345-332/326-319) canyons to mark and recapture adult and subadult humpback chub in these reaches of river. Adult

fish will be collected with a combination of gear types that are most effective in those river reaches, i.e., nets in Whirlpool and Split Mountain, electrofishing in Yampa and Lodore, angling in areas of all reaches. Lengths and weights and locations of all humpback chub captured will be recorded. Fish will be scanned for pit tags and fish over 150 mm that are not tagged will be implanted with PIT tags. We will use closed population models (e.g., CAPTURE, White et al. 1982; Osmundson and Burnham 1998) to estimate the population size of adults and subadult (>150 mm) humpback chub. This class of models assume: 1) the population is closed geographically and demographically (i.e., no immigration, emigration, mortality, or recruitment during the capture-recapture study); 2) all individuals in the population have an equal probability of capture on a given sample pass; and 3) marked animals can be distinguished from unmarked. We believe these assumptions for the most part will be met. The first assumption, population closure, will be met because sampling will occur over the known distribution of the population and during limited time period (approximately 50 d). The second assumption, equal probability of capture, is the most difficult to meet. Probability of capture can vary among sample passes, but for single pass, probability will probably vary among individuals because of varying size, habitats or canyon reach occupied. However, analysis techniques are available that can help in dealing with this heterogeneity. Finally, we feel comfortable that the assumption that PIT tagged fish can be readily identified. Estimates of survival and recruitment can be made using open population models, called Jolly-Seber models (Jolly 1965, Seber 1965, Lebreton et al. 1992, Osmundson and Burnham 1998). These models would use the capture-recapture data obtained at yearly intervals.

Juveniles chubs will be monitored in both Yampa Canyon and Island Park. Juvenile fish will be collected with both seines and trap netting in side channels and backwaters. Juvenile sampling will be conducted in the fall months (September-October). Two trips (5 to 7 days each) to monitor juvenile chubs with seines or electrofishing gear will be made during the fall through both the Yampa River and Island Park. If flows preclude sampling the entire Yampa Canyon in the fall with backpack electrofishing equipment and seines, collecting crews will hike into areas in which juvenile chubs are known to occupy (i.e., Big Joe, Harding Hole) and sample with seines only. Analysis will consist of description of the distribution and relative abundance of adult, subadult and juvenile Yampa humpback chub population by size group.

VII. Task Description:

Task 1. Estimate the size of adults, and subadults, and monitor relative abundance and length frequency of juvenile humpback chub in Yampa, Whirlpool, Split Mountain and Lodore canyons.

Task 2. Analyze data and prepare annual and final report (final report to coordinator December 15, 2007 to Peer review/BC review January 30, 2008, and March 30, 2008 to BC for final approval.

## VIII. FY-2007/FY2008:

| Task 1 - FY2007 | USFWS | UDWR |
|---|---|---|
| Labor | Cost | Cost |
| Fall Trips | | |
| Trip Preparation | | |
| GS-11 Biologist ($38.72/hr x 8 hrs/day x 8 days) | $2,478 | |
| GS-8 Fisheries Tech ($29.94/hr x 8 hrs/day x 8 days) | $1,916 | |
| 3 GS-5 Biological Techs ($21.83/hr x 8 hrs/day x 8 days) | $4,191 | |
| Float Trips | | |
| GS-13 Biologist ($62.08/hr x 8 hrs/day x 5 days/trip x 2 trips) + ($93.12/hr x 2 hr OT/day x 5 days/trip x 2 trips) | $6,828 | |
| GS-11 Biologist ($38.72/hr x 8 hrs/day x 5 days/trip x 2 trips) + ($58.08/hr x 2 hr OT/day x 5 days/trip x 2 trips) | $4,260 | |
| GS-8 Fisheries Tech ($29.94/hr x 8 hrs/day x 5 days/trip x 2 trips) + ($44.91/hr x 2 hrs OT/day x 5 days/trip x 2 trips ) | $3,293 | |
| 3 GS-5 Biological Techs ($21.83/hr x 8 hrs/day x 5 days/trip x 2 trips) + ($32.75/hr x 2 hrs OT/day x 5 days/trip x 2 trips) | $7,204 | |
| Fisheries Technician ($13.73/hr x 8 hrs/day x 5 days/trip x 2 trip) | | $1,098 |

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|---|---|---|
| Subtotal | $30,170 | $1,098 |

| Travel, Per Diem, Equipment | Cost | Cost |
|---|---|---|
| Fall Trips | | |
| (5 trucks/trip x 100 mi/truck x $0.430/mi x 2 trips) Vernal to Deerlodge | $430 | |
| (5 trucks/trip x 100 mi/truck x $0.430/mi x 2 trips) Deerlodge to Eco Park | $430 | |
| (1 truck/trip x 75 mi/truck x $0.430/mi x 2 trips) Eco Park to Vernal | $65 | |
| (4 trucks/trip x 75 mi/truck x $0.430/mi x 2 trips) Eco Park to Vernal | $258 | |
| Shuttle Drivers (5 drivers/trip x $100/driver x 2 trips) | $1,000 | |
| Shuttle Driver Organizer (1 driver/trip x $10/driver x 2 trips) for trip organization | $20 | |
| Boat gas (6 gal gas/boat x $2.50/gal x 3 boats/trip x 2 trips) | $90 | |
| Boat oil (2 qts. Oil/boat x $2.75/qt x 3 boats/trip x 2 trips) | $33 | |
| Per diem (6 people/day x $27/person x 5 days/trip x 2 trips) | $1,620 | |
| Per diem | | $440 |
| Equipment and Maintenance (nets, repairs, fish tags, PIT Tags, etc.) | $2,000 | |

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|---|---|---|
| Supplies | | $270 |

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|---|---|---|
| Subtotal | $5,946 | $710 |
| FY 07 Total | $ 36,116 | $ 1,808 |

Task 1 - FY2008

| Labor | Cost | Cost |
|---|---|---|
| Spring and Summer Trips | | |
| Trip Preparation | | |
| GS-11 Biologist ($39.88/hr x 8 hrs/day x 12 days) | $3,828 | |
| GS-8 Fisheries Tech ($30.84/hr x 8 hrs/day x 12 days) | $2,961 | |
| 3 GS-5 Biological Techs ($22.49/hr x 8 hrs/day x 12 days) | $6,477 | |
| Float Trips | | |
| GS-13 Biologist ($63.95/hr x 8 hrs/day x 5 days/trip x 3 trips) + ($95.93/hr x 2 hr OT/day x 5 days/trip x 3 trips) | $10,552 | |
| GS-11 Biologist ($39.88/hr x 8 hrs/day x 5 days/trip x 3 trips) + ($59.82/hr x 2 hr OT/day x 5 days/trip x 3 trips) | $6,581 | |
| GS-8 Fisheries Tech ($30.84/hr x 8 hrs/day x 5 days/trip x 3 trips) + ($46.26/hr x 2 hrs OT/day x 5 days/trip x 3 trips ) | $5,089 | |
| 3 GS-5 Biological Techs ($22.49/hr x 8 hrs/day x 5 days/trip x 3 trips) + ($33.74/hr x 2 hrs OT/day x 5 days/trip x 3 trips) | $11,133 | |
| Fisheries Biologist ($36.47/hr x 8 hrs/day x 5 days/trip x 3 trips) | | $4,376 |
| Fisheries Technician ($14.14/hr x 8 hrs/day x 5 days/trip x 3 trips) | | $1,697 |

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|---|---|---|
| Subtotal | $46,621 | $6,073 |
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| Travel, Per Diem, Equipment | Cost | Cost |
| Spring and Summer Trips | | |
| (5 trucks/trip x 100 mi/truck x $0.443/mi x 3 trips) Vernal to Deerlodge | $665 | |
| (5 trucks/trip x 100 mi/truck x $0.443/mi x 3 trips) Deerlodge to Eco Park | $665 | |
| (1 truck/trip x 75 mi/truck x $0.443/mi x 3 trips) Eco Park to Vernal | $100 | |
| (4 trucks/trip x 75 mi/truck x $0.443/mi x 3 trips) Eco Park to Vernal | $399 | |
| Shuttle Drivers (5 drivers/trip x $100/driver x 3 trips) | $1,500 | |
| Shuttle Driver Organizer (1 driver/trip x $10/driver x 3 trips) for trip organization | $30 | |
| Boat gas (6 gal gas/boat x $2.57/gal x 3 boats/trip x 3 trips) | $139 | |
| Boat oil (2 qts. Oil/boat x $2.83/qt x 3 boats/trip x 3 trips) | $51 | |

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|---|---|---|
| Per diem (6 people/day x $28/person x 5 days/trip x 3 trips) | $2,520 | |
| Per Diem | | $650 |
| Equipment and Maintenance (nets, repairs, fish tags, PIT Tags, etc.) | $2,000 | |
| Supplies | | $450 |
| Subtotal | $8,069 | $1,100 |

Task 2 - FY2008

| Data summary, Analysis, report preparation, and project presentation | Cost | Cost |
|---|---|---|
| GS-14 Project Leader ($66.96/hr x 8 hrs/day x 5 days) | $2,678 | |
| GS-13 Biologist ($63.95/hr x 8 hrs/day x 5 days) | $2,558 | |
| GS-11 Fisheries Biologist ($39.88/hr x 8 hrs/day x 10 days) | $3,190 | |
| GS-9 Admin Assist. ($35.09/hr x 8 hrs/day x 5 days) | $1,404 | |
| GS-5 Technicians ($22.49/hr x 8 hrs/day x 10 days) | $1,799 | |
| Supplies (Copies, disks, paper, etc.) | $550 | |
| Per diem (1 person/day x $110/person x 2 days/trip x 2 trips) | $440 | |
| Travel to give presentations, workshops, meetings (1 truck/trip x 275 mi/truck x $0.443/mi x 2 trips) | $244 | |
| Subtotal | $12,863 | $0 |
| Total | $103,669 | $8,981 |

FY2008 Summary

| | |
|---|---|
| GS-13 Biologist ($63.95/hr x 8 hrs/day x 60 days) | $30,696 |
| GS-11 Fisheries Biologist ($39.88/hr x 8 hrs/day x 10 days) | $3,190 |
| Total | $33,886 |

IX. Reviewers:

Dr. Richard Valdez, Valdez and Associates
Mike Hudson, UDWR

X. References:

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Leberton, J. D., K. P. Burnham, J. Clobert, and D. R. Anderson. 1992. Modeling survival and testing biological hypotheses using marked animals: a unified approach with case studies. Ecological Monographs 62:67-118.

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Seber, G. A. F. 1965. A note on the multiple-recapture census. Biometrika 52:249-259.
White, G. C., D. A. Anderson, K. P. Burnham, and D. L. Otis. 1982. Capture-recapture and removal methods for sampling closed populations. Los Alamos National Laboratory, LA-8787-NERP, Los Alamos, New Mexico.