

October 18, 2004

Shelley Spalding, Chair
Chair, Bull Trout Committee
Western Division of the American Fisheries Society

Dear Shelley,

The WDAFS Bull Trout committee has become a catalyst in the effort to synthesize research relevant to this endangered species. We are requesting the committee's support of a joint U.S.-Japan workshop to provide a published synthesis regarding the biology of white-spotted charr (*Salvelinus leucomaenis*) and bull trout (*S. confluentus*), with implications for their conservation and research needs. These are sister taxa that represent major conservation concerns in both nations. Research on these species in both regions has proceeded along separate lines, whose similarities and differences set the stage for fruitful comparison and synthesis. Because information on either species is relatively limited, a synthesis of these two lines of research could be a way to substantially advance our understanding of both species, providing valuable insights for application to conservation problems and prioritization for future research directions.

We would like to request financial support for this project from the Western Division of the American Fisheries Society. The AFS has a long history of supporting efforts such as the one we propose, and the goals of our project are closely aligned with the mission of the society. The project we propose would complement recent syntheses supported by the WDAFS Bull Trout committee on 1) sampling protocols for bull trout and 2) the findings of bull trout telemetry studies. In addition, given the theme of this year's meeting in Anchorage, "Creating a fisheries mosaic: connections across jurisdictions, disciplines, and cultures," a special session as part of this workshop would be very appropriate. Our project would help foster important pan-Pacific Rim collaborations that are essential to developing understanding and better stewardship of the many fishes shared by this portion of the world.

Thank you for considering our request. We look forward to hearing from you.

Sincerely,

Colden Baxter, Assistant Professor
Department of Biological Sciences
Idaho State University
Pocatello, Idaho

Jason Dunham, Research Fishery Biologist
U.S.F.S., Rocky Mountain Research Station
Boise Aquatic Sciences Laboratory
Boise, Idaho

Research Prospectus

A synthesis of the biology of white-spotted charr (*Salvelinus leucomaenis*) and North American bull trout (*S. confluentus*) with implications for conservation and research needs

Hosts:

Jason B. Dunham, Research Fishery Biologist, U.S.F.S., Rocky Mountain Research Station, Boise Aquatic Sciences Laboratory, Boise, ID 83702; 208-373-4380; jbdunham@fs.fed.us

Colden V. Baxter, Assistant Professor, Idaho State University, Department of Biological Sciences, Pocatello, ID 83209; 970-491-1096; baxterco@cnr.colostate.edu

Japanese Partners:

Kentaro Morita, Hokkaido National Fisheries Research Institute, Kushiro, Hokkaido, Japan

Itsuro Koizumi, Laboratory of Conservation Biology, Field Science Center for Northern Biosphere, Hokkaido University, Sapporo, Hokkaido, Japan

Shoichiro Yamamoto, National Research Institute of Fisheries Science, Fisheries Research Agency, Nikko, Tochigi, Japan

Project description

Bull trout are a threatened species encompassing a vast geographic range within the conterminous United States, and represent one of the major species affecting conservation activities within the region. Similarly, white-spotted charr are a species conservation concern in Japan. In evolutionary terms, these two species are sister taxa. They also share much in common ecologically. Both species inhabit cooler temperate stream environments in North America and Japan and naturally co-occur with another native charr, Dolly Varden (*Salvelinus malma*), along with several species of Pacific salmon in coastal areas. Research on these species in both regions has proceeded along separate, but parallel lines in many respects. There are also important differences in research approaches and questions addressed for each species. Thus far in the history of research on these closely related species, there has been no synthesis of information to summarize similarities and differences in their biology and conservation issues. Because information on either species is relatively limited, a synthesis of these two lines of research could be a way to substantially advance our understanding of both species, thus providing valuable insights for application to conservation problems and prioritization of future research directions.

The primary objective of this proposed scientific exchange would be development of a review of existing literature on bull trout and white-spotted charr that addresses key biological and conservation issues. This review would be submitted for publication in a peer-reviewed journal when completed. The literature summary would cover both English and Japanese-language publications. In the context of this review, participating scientists would also explore possibilities for future collaborations in research or management applications using existing data or developing studies to collect new information on both species. The scientists involved have extensive experience working with either species and have published numerous articles in the peer-reviewed literature (see below for examples) on them as well. Additional objectives (detailed below) of the project would include interaction with biologists at the *Salvelinus confluentus* Society meeting, and a special session at this year's annual meeting of the American Fisheries Society.

Location and Timing

The project will last 3 weeks. It will begin during the last week of August, 2005, at the University of Montana's Flathead Lake Biological Station, an ideal facility located in the heart of bull trout habitat. During this time, the focal group of the workshop will work on the synthesis review paper described above. The workshop will then overlap with the annual *Salvelinus confluentus* Society meeting, which will be held nearby in Glacier National Park. This will provide the opportunity for the visiting scientists to interact with a larger group of bull trout scientists and resource managers. It will also provide opportunity to experience bull trout and their habitat first-hand, thus facilitating in-the-field comparisons between the two species. Next, a special session will be proposed for the American Fisheries Society meeting to be held from 11-15th of September in Anchorage, Alaska. This session will feature presentations from scientists studying bull trout and white-spotted charr from Japan and the U.S., and perhaps from Russia and Canada as well. The session will stimulate additional dialogue and ideas for the synthesis paper, facilitate future pan-Pacific Rim research collaboration, and provide another chance for a larger audience to interact with visiting scientists and learn about their work. Such a session would be especially appropriate given the theme of this year's meeting, "Creating a fisheries mosaic: connections across jurisdictions, disciplines, and cultures." The principal collaborators will continue to communicate, and will complete the publication of their synthesis paper during the following year.

Funding

Funding will be required to provide transportation, lodging, per diem, and limited supplies for the Japanese scientists to travel to the U.S. A length of stay of 3 weeks would be needed to accomplish this exchange and is estimated to cost about \$20,000.

Relevant publications by U.S. hosts

- Baxter, C. V. 2002. Fish movement and assemblage dynamics in a Pacific Northwest riverscape. Doctoral Dissertation, Oregon State University, Corvallis, OR.
- Baxter, C. V., C. A. Frissell, and F. R. Hauer. 1999. Geomorphology, logging roads, and the distribution of bull trout spawning in a forested river basin: implications for management and conservation. *Transactions of the American Fisheries Society* 128:854-867.
- Baxter, C. V., and F. R. Hauer. 2000. Geomorphology, hyporheic exchange and selection of spawning habitat by bull trout (*Salvelinus confluentus*). *Canadian Journal of Fisheries and Aquatic Sciences* 57:1470-1481.
- Dunham, J., B. Rieman, and G. Chandler. 2003. Influences of temperature and environmental variables on the distribution of bull trout at the southern margin of its range. *North American Journal of Fisheries Management* 23:894-904.
- Dunham, J. B., and B. E. Rieman. 1999. Metapopulation structure of bull trout: influences of physical, biotic, and geometrical landscape characteristics. *Ecological Applications* 9:642-655.
- Dunham, J. B., B. E. Rieman, and K. Davis. 2001. Sources and magnitude of sampling error in redd counts for bull trout *Salvelinus confluentus*. *North American Journal of Fisheries Management*.

Relevant Publications by Japanese Participants

- Koizumi, I., and K. Maekawa. 2003. Spawning migration of stream-dwelling Dolly Varden in spring-fed tributaries of the Shiisorapuchi River, Japan. *Journal of Freshwater Ecology* 18:321-331.
- Koizumi, I., and K. Maekawa. 2004. Metapopulation structure of stream-dwelling Dolly Varden inferred from patterns of occurrence in the Sorachi River basin, Hokkaido, Japan. *Freshwater Biology* 49:973-981.
- Morita, K., and S. Yamamoto. 2002. Effects of habitat fragmentation by damming on the persistence of stream-dwelling charr populations. *Conservation Biology* 16:1318-1323.
- Morita, K., S. Yamamoto, and N. Hoshino. 2000. Extreme life history change of white-spotted char (*Salvelinus leucomaenis*) after damming. *Canadian Journal of Fisheries and Aquatic Sciences* 57:1300-1306.
- Morita, K., and A. Yokota. 2002. Population viability of stream-resident salmonids after habitat fragmentation: a case study with white-spotted charr (*Salvelinus leucomaenis*) by an individual based model. *Ecological Modelling* 155:85-94.
- Yamamoto, S., K. Morita, and A. Goto. 1999. Geographic variations in life-history characteristics of white-spotted charr (*Salvelinus leucomaenis*). *Canadian Journal of Zoology* 77:871-878.
- Yamamoto, S., K. Morita, S. Kitana, K. Watanabe, I. Koizumi, K. Maekawa, and K. Takamura. 2004a. Phylogeography of white-spotted charr (*Salvelinus leucomaenis*) inferred from mitochondrial DNA sequences. *Zoological Science* 21:229-240.
- Yamamoto, S., K. Morita, I. Koizumi, and K. Maekawa. 2004b. Genetic differentiation of white-spotted charr (*Salvelinus leucomaenis*) populations after habitat fragmentation: spatial-temporal changes in gene frequencies. *Conservation Genetics* 5:529-538.