United States Department of the Interior

**U. S. GEOLOGICAL SURVEY
Western Fisheries Research Center
Columbia River Research Laboratory
5501A Cook-Underwood Road
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Mr. Roy Beaty
Bonneville Power Administration
P.O. Box 3621
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Portland, OR 97208-3621

Mr. Beaty,

This letter is a non-technical annual report of activities on Project 2007-275-00, Impact of American Shad for the period February 1, 2008 through January 31, 2009. A non-technical report is appropriate at this time since data collection is ongoing and results are preliminary. This report is intended to highlight accomplishments during this performance period. Progress on administrative work elements in the statement of work has been captured in the periodic status reports provided through Pisces.

During this performance period the USGS accomplished the following tasks:

- Co-chaired a symposium on American shad in the Columbia Basin at the annual meeting of the Western Division, American Fisheries Society. The USGS gave four presentations from work done during this project. Abstracts of the presentations were attached to the 2007 progress report.
- Continued parameterization of a bioenergetics model for juvenile American shad. We performed a literature review to determine the applicability of the existing adult salmon bioenergetics parameters to juvenile fall Chinook salmon in support of our modeling investigation of diet overlap between juvenile American shad and fall Chinook salmon. We formulated testable hypotheses to investigate using bioenergetics models and conceptually developed model simulations. Held an in-house workshop to obtain feedback on the physiological parameters we selected for the American shad bioenergetics model and to solicit feedback on our modeling approach to address research questions.
- Received a Section 10 ESA sampling permit based on the application submitted in the 2007 contract period. With the ESA permit in hand, we obtained scientific collection permits from the states of Washington and Oregon that allowed us to use a variety of fisheries sampling techniques to capture juvenile and adult American shad.
- Conducted field sampling to meet project objectives. Gillnetting efforts to capture adult American shad near Astoria were discontinued in accordance with our ESA

permit after encountering a higher-than-expected number of salmonids. Only 30 PIT-tagged adult pre-spawn American shad were released. Another 53 adults were processed for diet and population characterization. Collection objectives for adult pre-spawn fish were met for areas downstream from Bonneville, John Day, and McNary dams. In October we captured 30 post-spawn adult shad from the McNary Dam forebay for diet analysis. Collection objectives for juvenile American shad were met for all four areas.

- Began laboratory work to enumerate and accomplish dry-weight analysis of prey items from juvenile and adult shad stomachs.
- Continued to exchange information and develop relations with others interested in American shad research. As an example, at the request of the U.S. Fish and Wildlife Service, Northeast Fishery Center, Lamar, PA, we provided tissue samples from adult Columbia River American shad for use in genetic comparisons with Hudson River fish.

Key findings during this contract period:

- Determined that prevalence of *Ichthyophonus* infection among adult American shad was the highest level detected in any population of fish throughout the Pacific region. A manuscript describing results is in preparation.
- Thiaminase specific activity assessed from Columbia River juvenile and adult American shad is higher than that of forage fish of salmonines in the Great Lakes. The consumption of forage fish high in thiaminase can lead to thiamine deficiency in the predator if the diet of the predators contains little other prey.
- Adult American shad are feeding during their freshwater migration.

Plans for next year:

- Completing laboratory analysis of the gut contents of juvenile and adult American shad collected.
- Completing bioenergetics model parameterization and testing hypotheses.
- Describing the age composition of the adult American shad run during the 2008 spawning migration via aging of scales and otoliths.
- Providing a draft final report describing project tasks and findings.

Please don't hesitate to contact me if you have questions about our work.

Sincerely,

Michael J. Parsley
Research Fishery Biologist/Project Lead