

Non-Discretionary Project Results For FY 1998

Project 89-108-00: Monitoring and Evaluation Modeling Support -University of Washington

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FY99 Forecast: \$344,846 (Note: Costs related to maintenance, operations and services of Second-Tier Database are now incorporated under Project 96-019-00).

FY98 Funding: \$364,239

Project Requirements: This contract provides independent scientific support to BPA and the region from an inter-disciplinary team of scientists for modeling and evaluation of the effects of Columbia and Snake River hydrosystem operations and salmon recovery plans on fish migration and survival. The project provides tools to conduct scientific ecosystem-based evaluations of the impacts of specific fish mitigation actions. Specific work includes the development of adult and juvenile passage models, development of a multi-species selective stock harvest model, development of a water quality model, and within-season analysis of juvenile and adult river passage.

Juvenile Passage Analysis (1)

Dam Passage Coding (1.1.3)

CRiSP 1.6 development included new spill and spill mortality algorithms.

Smolt Growth (1.3)

An analysis of the rates of smolt growth and the factors controlling growth were conducted and a draft document prepared. The analysis identified areas of high growth for fall chinook and estimated the temperature corrected growth rates which indicate whether or not smolts feed at their maximum rate or less.

Initiation of Wild Fish Migration (1.4)

River data (flow and temperature) has been compiled through 1997 from the Peck (Clearwater River) and Anatone (Snake River) gauge stations. Analyzed PIT tag data from 1995-1997 for Snake River fall chinook. Arrival timing at Lower Granite was compared to the covariates fish length, river flow, river temperature and date in the season.

Passage Model Calibration (1.5)

Completed travel time calibration for Snake River fall chinook, 1995-1997. Both hatchery and wild releases were analyzed from Lower Granite Dam to Bonneville Dam. Calibration of spring

and fall chinook passage survival was completed with the most recent PIT tag data. Steelhead calibration was completed for travel time and survival.

Model Documentation (4)

Work is underway on updating the User's Manual for the cross-platform version of the model

In-Season Analysis (5)

Migration parameters were generated for several yearling chinook stocks, i.e. Catherine Creek, Imnaha River, Minam River, and SF Salmon River to be used in 1998. In addition, these researchers have developed parameters to describe wild steelhead out-migration. The entire package for steelhead was brought on-line during the 1998 migration season.

Work was completed to update the in-season forecasts for gas and temperature for the 1998 season. This included making the code compliant with the year 2000. On-line documentation was also updated.

A process for making in-season predictions, gas only, from early flow forecasts provided from the COE Water Management Division office was developed.

The web page for gas & temperature analysis is listed below:

http://www.cqs.washington.edu/crt/get?Config=gas&Segment=Lower_Granite_Dam

http://www.cqs.washington.edu/crtget?Config=temperature&Segment =Lower_Granite_Pool

Post-Season Analysis 1996-1997 (5.3)

Analysis has been completed for temperature, gas, flow and travel time predictions.

CRiSP Solver (6)

A generic calibration tool was developed to calibrate the model for travel time and survival.

DART (7)

Database Administration (7.1)

Monitor, Maintain and Backup System

To conduct their analysis the researchers utilize an in-house database that contains fish, oceanographic, climatic and some biological data.

The University of Washington Data Access in Real Time (DART) provided university and regional information requesters access to a variety of fisheries and river database resources. These databases supported research and river management decision-support systems. Both real time and historic data were provided.

System maintenance was carried out and an upgrade to the internal configuration was required to expand resources for added work loads.

Between January and June of 1998 over 50,000 web pages of information were served to the public and Over 10,000 page hits occur each week. DART is the only on-line source of current and historical Columbia River fisheries and environmental data on the web.

Publications

Zabel, R.W., J.J. Anderson, and P.A. Shaw. 1998. A multiple reach model describing the migratory behavior of Snake River yearling chinook salmon (*Oncorhynchus tshawytscha*). *Canadian Journal of Fisheries and Aquatic Sciences*: 55:658-667.

Beer, W. N. and Anderson, J. J. (1998) Modeling the growth of salmonid embryos. *J. theor. Biol.*