



MEMORANDUM

TO: Michael Purser (Snohomish County)
Kit Rawson (Tulalip Tribes)

FROM: Greg Blair

DATE: March 31, 2005

RE: EDT Population Model Results for Stillaguamish and Snohomish

This memo summarizes model assumptions used in the EDT Population model for Chinook recovery plan analyses in the Stillaguamish and Snohomish rivers. The model analyses examine the integrated effects of habitat, hatchery, and harvest plans for these rivers.

An overview of the model and model results are presented in the attached power point presentation. A version of the EDT Population model is available for your use.

Thank you for the opportunity to assist you in the development of recovery plans for Chinook in the Snohomish and Stillaguamish basins by performing analyses with the EDT Population model. We look forward to the possibility of working together on additional analyses.

Snohomish Basin

Two recovery plans were analyzed for the Snohomish Basin. The plans differ in hatchery brood stock strategies for Chinook reared and released from the Wallace River and Tulalip Bay.

Plan 1 includes natural origin brood stock collected at the Wallace River. Approximately ten percent of the total brood stock was of natural origin.

Plan 2 was developed by the comanagers to include a higher percentage of natural origin adults in the Wallace River brood stock – approximately eighty percent of the total brood stock was of natural origin collected at Sunset Falls and the Wallace River. The plan assumed that fish released at the Tulalip Bay facility were entirely from hatchery origin returns to the Wallace River facility (i.e., 100% were hatchery origin brood stock).

The habitat strategy modeled under both Plans 1 and 2 was based on restoration actions used in the EDT habitat model that were developed by the Snohomish Basin Salmon Recovery Forum. Snohomish County provided assumptions for the action time series required by the population model (100 yr simulation period).

The harvest strategy modeled under both Plans 1 and 2 was developed by the comanagers. The strategy assumed a recovery exploitation rate of 24 percent, and a bias of 1.03 with a variance of 0.0186 was added to this exploitation rate. The bias and variance represent the difference between planned exploitation rate and actual exploitation rate.

Stillaguamish Basin

A single recovery plan was modeled for the Stillaguamish Basin. This plan includes hatchery supplementation of the North Fork Stillaguamish population and habitat restoration in the North Fork, South Fork, Stillaguamish mainstem, and tributaries. A recovery exploitation rate of 25 percent was used.

The hatchery strategy modeled under this plan was based on information provided by the Stillaguamish Tribe. All returning hatchery adults spawn in nature. Hatchery brood stock includes about 60 percent natural origin adults (recent year average).

The habitat strategy modeled under this plan was based on restoration actions used in the EDT habitat model that were developed by the Stillaguamish Implementation Review Committee. Snohomish County provided assumptions for the action time series required by the population model (100 yr simulation period).

The harvest strategy modeled under this plan was developed by the comanagers. The strategy assumed a recovery exploitation rate of 25 percent, and a bias of 1.03 with a variance of 0.0186 was added to this exploitation rate. The bias and variance represent the difference between planned exploitation rate and actual exploitation rate.

An additional analysis was completed to evaluate the benefits of the hatchery strategy with habitat and harvest conditions, as they existed from 1983 to 1998. Kip Killebrew with the Stillaguamish Tribe provided assumptions for this analysis. An exploitation rate of 0.43, with a variance of 0.0151 was modeled, representing the average and variance for 1983 to 1998. Flow conditions were limited to the period 1983 to 1998, and habitat condition was kept at the current condition for the 100 yr simulation run. Low marine survival was modeled for the entire 100 yr simulation.

GB
Enc.