



State of Washington
DEPARTMENT OF FISH AND WILDLIFE

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Subject: WDFW memorandum to Pacific Fishery Management Council Salmon Technical Team on draft Queets Coho Stock Assessment report

The Washington Department of Fish and Wildlife (WDFW) has completed an initial technical review of the draft Queets Coho Stock Assessment report, and has the following comments and observations. We would like to thank the Salmon Technical Team for the opportunity to review this document and provide our input.

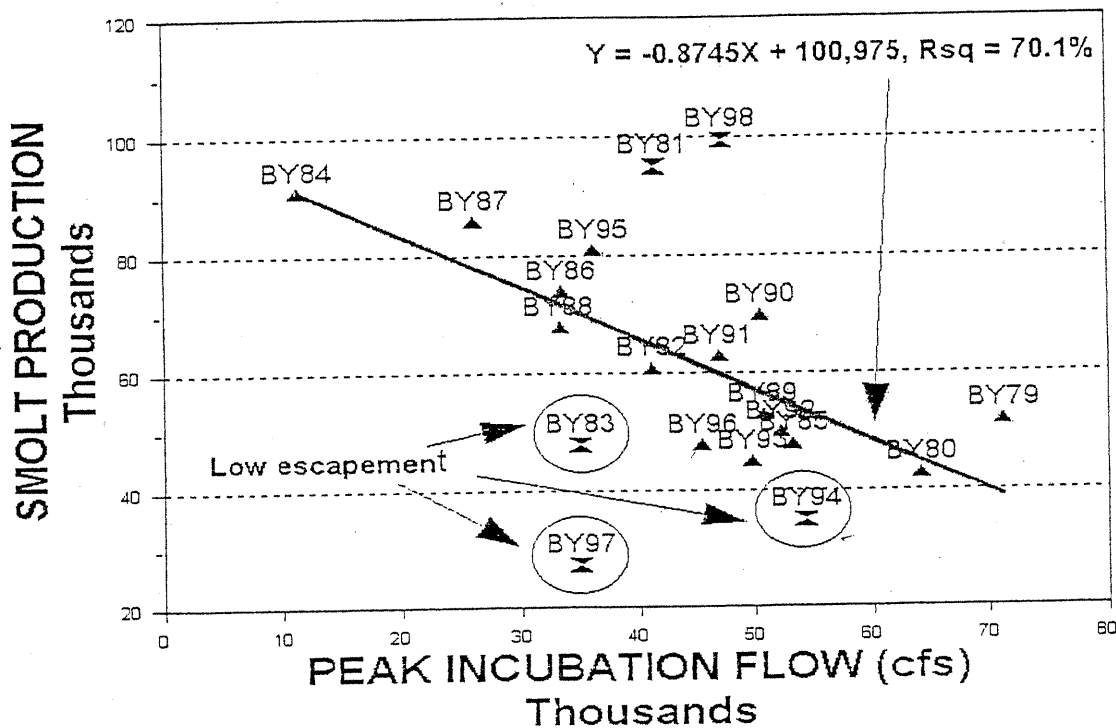
The major shortcoming of the current draft report is that it does not directly review all the key causes of the recent low Queets wild coho escapements that triggered the overfishing status review. The draft report discusses some of the issues that have had some influence on the productivity of the stock over the long term (harvest and marine survival rate changes over time), but did not examine in detail the freshwater production issues for this population, which explain a large portion of the productivity function for this population and the failure of the population to meet the stated minimum escapement goals.

Peak fall flow during the coho egg incubation period explains 70% (excluding the three years in the smolt production database with low escapement) of the inter-annual variation in smolt production for the Clearwater basin, independent of the level of parent spawners (Figure 1). The poor 1997 escapement (1994 brood year) can be attributed to a high peak incubation flow, combined with an exceptionally low parent escapement of only 1,100 fish, and poor marine survival in the 2 % range. The 1998 escapement (1995 brood year) was the outcome of very good smolt production (340,000 smolts, due to an adequate escapement and subsequent favorable fall streamflows) that was "done in" by a very poor marine survival of < 2 %. The 1999 escapement (1996 brood) was the progeny of a good parent escapement (9,000) exposed to fairly high fall incubation flows that resulted in only fair smolt production, which was again subjected to mediocre marine survival (~4 %). Harvest was obviously not a major controlling factor in the spawning escapements, given the low (<20 %) exploitation rates during this period.

The adult escapement-to-adult recruit "Ricker" model used in the report to examine stock productivity for this population was not an appropriate approach, given WDFW has observed that a more accurate production function for coho is the Beverton-Holt model, especially when coho escapement-to-smolt relationships are examined. Furthermore, escapement-to-adult production function analyses for salmon couple together the freshwater and marine survival components, which are not synchronous. Indeed, the comment in the draft report referring to the adult escapement-stock recruitment relationship as "noisy" (page 21) can be largely attributed to the very large variations in marine survival that have been observed in Washington salmon populations, such as the 14 fold variation in coho marine survival rates that has been observed at the nearby WDFW Bingham Cr. coho research station (data summarized in the WDFW memorandum 2001 Wild Coho Forecasts for Puget Sound and Washington Coastal Systems, Dave Seiler, WDFW, Olympia, WA). In regards to the one extraneous data point in the escapement-to-adult recruitment relationship that could be construed to support a Ricker type production curve (i.e. reduced adult production at higher escapement levels), the 1996 brood year, it must be noted that the emerging fry from this brood were exposed to a record high 91,000 cfs flow event and likely resulted in extreme displacement of many of the newly emerged fry, which was felt to be the primary reason smolt production fell

considerably below the production prediction regression line fit in Figure 1 (WDFW memorandum 1999 Wild Coho forecasts, Dave Seiler, WDFW), which contributed, in conjunction with subsequent poor marine survival to the poor adult production for that brood. Given these issues, a more appropriate production analysis would be to examine the smolt production vs. escapement function, which is the productivity relationship for this or any other coho population.

Figure 1: Queets River peak incubation flow and subsequent smolt production (source – Dave Seiler, WDFW)



In regards to the supplemental origin coho, WDFW would like to review at further length the issue of how “supplemental” origin coho are being considered in regards to the escapement goal in the report. For example, page 1 of the report discussed how the “2000 observed spawning escapement of 8,621 (7939 wild, 682 supplemental) coho was with the escapement range established for Queets coho”. WDFW currently does not consider that the supplemental adults are (directly) creditable towards the natural escapement goal, because of continued uncertainty about the contribution of these fish, when spawning in the wild, to subsequent wild production at this time. In regards to the observation on page 12 that the marine survival rate of supplemented fish being continually lower than the wild fish being largely related to ventral fin clips being used on the supplemental fish, WDFW has (generally) observed also that hatchery origin smolts have marine survival rates lower than naturally reared smolts (Mike Gross, WDFW, pers. comm.).

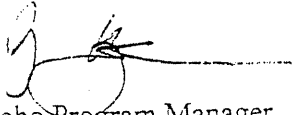
WDFW would like to also like to incorporate into the report the following comments and/or observations:

1) mass marking of the hatchery coho production (they are not currently mass marked) would be beneficial to wild coho management in the Queets, as it would allow more troll and sport harvest of the hatchery production in marine and freshwater fisheries, reducing the stray rate of these fish into the natural population. 2) the forecast description in appendix B can be more accurately described as using recent year marine survival rates * the brood year smolt production estimate. Other approaches were discussed, but not used for the official forecast, and 3) the hatchery and supplemental production review sections of the report seem to occupy an inordinate portion of the total report content.

In conclusion, WDFW has several serious concerns about the content and structure of the current draft report, and would like to see review and revision of the document to incorporate more pertinent data and conclusions regarding the productivity and status of the Queets wild coho population.

Sincerely,

Jeff Haymes

A handwritten signature in black ink, appearing to read 'Jeff Haymes', is written over a horizontal dashed line.

Coho Program Manager

CC: Dave Seiler, WDFW
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