Preliminary
Estimates of Updated "Indicator Metrics" Applied in the 2000 FCRPS Biological Opinion[1]

September 29, 2003

The information in this report is preliminary and subject to change. It is being shared in this preliminary form to ensure that all interested parties have access to the data and analyses that NOAA Fisheries is currently reviewing.

INTRODUCTION

The 2000 Federal Columbia River Power System (FCRPS) Biological Opinion (FCRPS Biop) evaluated whether the operation of the FCRPS, when combined with survival rates expected to occur in all other life stages, would result in a "high likelihood of survival and a moderate-to-high likelihood of recovery." This qualitative determination was informed by quantitative estimates for several evolutionarily significant units (ESU). Specifically, NOAA Fisheries evaluated:

> whether or not there would be a 5% or lower probability of absolute extinction of natural spawners within 24- and 100-year periods as a "metric indicative of survival;"
>
> whether or not there would be at least a 50% probability of the 8-year geometric mean natural spawners being equal to, or greater than, interim recovery abundance levels in 48 and 100 years as a primary "metric indicative of recovery;"
>
> and whether or not there would be at least a 50% likelihood of the annual population growth rate ("lambda") being equal to, or greater than, 1.0 as an alternate "metric indicative of recovery" for populations lacking interim recovery abundance goals.

As NOAA Fisheries begins the remand of the 2000 FCRPS Biop, it is necessary to update the biological information, including the indicator metrics. Recently, NOAA Fisheries' West Coast Salmon Biological Review Team (BRT) released a draft review of the status of listed ESUs in the Columbia River basin (BRT 2003). This report uses the information assembled by the BRT, along with supplemental analyses, and converts it to "indicator metrics" to provide a preliminary look at how these have changed in response to recent returns since the 2000 FCRPS Biop was issued. Additionally, a supplemental analysis that looks at the sensitivity of choice of time period for "lambda" estimation was included at the request of Federal fisheries managers.

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The information in this report was presented in preliminary form to Federal Caucus members on July 23, 2003, and was presented to the Columbia Basin Fish and Wildlife Authority (CBFWA) Anadromous Fish Managers on July 30, 2003.

This exercise of updating the 2000 FCRPS Biop's "indicator metrics" should not be taken as a commitment on NOAA Fisheries' part to employ identical methodology in the new biological opinion. We will be reviewing some of these methods through a process that was specified in the 2000 FCRPS Biop. We will also be reviewing the methods in light of the recent ruling on biological opinion remand.

METHODS

Data Sets NOAA Fisheries' BRT reviewed available data for salmon and steelhead spawning aggregations for the draft status review (BRT 2003). The draft report, including all data sets used to generate it, was released to state and tribal co-managers for review in February 2003. Based on comments received during the review, the data sets were updated and posted on the internet at www.nwfsc.noaa.gov/trt/brtrpt.htm . This report relies upon the updated BRT data sets.

Original data sources for the BRT data sets were generally state fisheries agencies, although other data sources include tribes, the US Fish and Wildlife Service, and dam operators. Data are reported in units of **Fish** (either direct counts at dams or weirs, or redd count expansions that were considered reliable by the BRT), **Redd Counts** (RC), or **Redds Per Mile** (RPM). Redd counts were reported for data sets in which redds were counted in the same stream reaches each year, or for which adjustments considered reliable by the BRT were made when index areas or methods changed. Redds per mile were reported when the stream reach varied such that total redds were not comparable on a year-to-year basis. Redds per mile serves as a relative index of spawners, based on the assumption that density of spawners in the index areas sampled each year correlates with total abundance of spawners. Descriptions of the sources for each data set and details of are found in the last worksheet of the data spreadsheet for Interior ESUs and in a documentation file in the Willamette/Lower Columbia ESU zipped file packet, each of which is at www.nwfsc.noaa.gov/trt/brtrpt.htm .

Population Structure In response to requests from Federal managers to place the data sets into context with respect to ESU population structure, we relied upon two recent reports. The Interior Columbia Basin Technical Recovery Team (Interior TRT) released a report in July 2003 proposing demographically independent populations for Snake River (SR) spring/summer chinook salmon, SR fall chinook salmon, SR steelhead, SR sockeye salmon, Upper Columbia River (UCR) spring chinook, UCR steelhead, and Mid-Columbia River (MCR) steelhead (Interior TRT 2003). Members of the Lower Columbia/Willamette TRT issued a similar report proposing population structure for Lower Columbia River (LCR) chinook, LCR steelhead, Upper Willamette River (UWR) chinook, UWR steelhead, and Columbia River chum salmon (Myers et al. 2003). Information from these reports was used to organize data sets by population and ESU.

Additionally, we attempted to identify each data set in relation to Northwest Power and Conservation Council (Council) subbasins, since there was considerable interest in this information from people involved in the Council's subbasin planning process.

Analyses To Estimate 2000 FCRPS Biop Indicator Metrics We estimated the median population growth rate (lambda) and three indicator metrics that are derived from population growth rate, according to methods used in the 2000 FCRPS Biop and some more recent improvements.

1. Median Population Growth Rate (Lambda). We estimated lambda following "Dennis/Holmes" methodology (Holmes 2001). Briefly, an exponential trend is fit to a time series of four-year running sums of natural spawners, redd counts, or redds per mile. Lambda less than 1.0 means a population is declining, while lambda greater than 1.0 means that it is increasing. Variance is estimated using diffusion approximation methods. The "Dennis/Holmes" method has been developed for data sets with high sampling error and age-structured cycles, both of which are common to Pacific Northwest salmonid data sets. The methods have been extensively tested using simulations for both threatened and endangered populations as well as for stocks believed to be at low risk (Holmes *in press*). The method has also been cross-validated with time series data (Holmes and Fagan 2002).

The population growth rate analysis in this report is similar to those recently completed by McClure et al. (2003) and BRT (2003). The actual calculations were performed using a model developed by Eli Holmes (McClure 2003) and with the SimSalmon model (McElhany and Payne 2001), which implements the "Dennis/Holmes" methodology, among other features. We cross-tested to ensure that both methods produced identical results. This was the case for most data sets, but for a few there were relatively minor differences in estimated lambda, which at this point cannot be explained.

The primary differences between the lambda estimates in this report and those in McClure et al. (2003) and BRT (2003) are related to the time period of the data sets and our assumptions regarding historical effectiveness of hatchery-origin natural spawners (hereafter, "hatchery effectiveness"). Regarding time period, we used data sets that include 1-2 more recent years than the time series in each of the previous analyses. The updated BRT data that we used generally ended in 2001. Also, unlike BRT (2003), we were primarily interested in estimating lambda from the 1980-present time series, since this was the period deemed relevant in the 2000 FCRPS Biop. Unlike both of the previous reports, which considered "hatchery effectiveness" assumptions of 0 and 1.0, we considered 0.2 and 0.8, based on an assessment of best available information in the 2000 FCRPS Biop (Waples 1999).

An important practice applied in our lambda calculations was estimation of missing data using an average of the previous and subsequent values. In a large percentage of the data sets there are one or more missing years of counts or of estimated hatchery fraction. In the 2000 Biop, McClure et al. (2003), and BRT (2003), data averaging was used to allow estimates from as many locations as possible. We excluded any data sets with more than

two adjacent missing values. Many data sets had no information on hatchery fraction and, because we were interested in natural population growth rate, these data sets were eliminated from consideration.

Because there has been much interest by salmon managers in sensitivity of population growth rate to alternative time periods, we investigated alternatives in two ways. First, for two data sets, Marsh Creek spring/summer chinook salmon and Wenatchee River spring chinook, we estimated lambda for every possible time period ending with 2001 and plotted the results. Second, because the BRT (2003) report also pointed out the relevance of 1990-present and the longest time period possible, we included a summary of lambda estimates based on those time periods. Again, these estimates differ from the lambda estimates in BRT (2003) because of the "hatchery effectiveness" assumptions and because of the additional year in our data sets.

2. Survival Change Necessary To Reduce Extinction Risk To 5% Or Less Estimation of extinction risk with the "Dennis/Holmes" method is described in Holmes (2001). Briefly, extinction risk is related to three variables: the current population size, the estimated population trend, and the variance of the trend. Using this information, it is possible to estimate the likelihood that a population will cross a certain abundance threshold within a certain period of time. The extinction threshold defined in the 2000 FCRPS Biop is a running sum of 1 fish or less, the time periods of interest were 24 and 100 years, and the acceptable risk of extinction for jeopardy analyses was defined as 5% or less. Because the risk of extinction in 100 years is always greater than the risk in 24 years, we have focused on the 100-year extinction risk (as was the case in the 2000 FCRPS Biop). However, estimates for both time periods will be presented in subsequent reports and in the new biological opinion.

Extinction risk could only be estimated for a small percentage of the available data sets. One reason is because the data must be in units of fish, rather than redd counts or redds per mile, which eliminates a large number of data sets. Second, it can only be calculated for data sets with valid lambda estimates. As described above, this also eliminates many data sets with no information on hatchery fraction.

Analyses provided by McClure (2003) and those implemented with the SimSalmon model estimate the percentage change in lambda that would be necessary to reduce extinction risk in 100 years to 5% or less. As described in Appendix A of the 2000 FCRPS Biop, we then converted these needed changes in lambda to needed changes in survival by raising the lambda multiplier to the power of the mean generation time for the spawning aggregation in question. Mean generation time was estimated from weighted age structure in the data sets.

3. Survival Change Necessary For 50% Likelihood of Reaching Recovery Abundance Goal In 48 or 100 Years. The method of estimating the recovery metric is described in Appendix A of the 2000 FCRPS Biop. Briefly, the population growth rate needed to meet the interim recovery goal in a certain time period is the current recovery abundance level divided by the current abundance level, with the result raised to the power of 1

divided by the number of years remaining in the time period. Because lambda is a median value, this is the population growth rate which, if implemented instantaneously, would result in 50% likelihood that the population would reach the recovery goal in the defined time period. A key assumption of this calculation is that density-dependence does not occur as the population is growing towards the recovery level (see discussion in 2000 FCRPS Biop). Both the current and recovery abundance levels are defined as 8-year geometric means. To determine the survival change necessary to meet the goal, the needed lambda is divided by the current lambda, and the result is raised to the power of the mean generation time for the spawning aggregation in question.

Interim recovery abundance goals have not been defined for Lower Columbia and Willamette River ESUs. Interim recovery abundance goals for Interior ESUs are described in Lohn (2002). Because relatively few interim recovery goals have been identified, the goals often are at a higher hierarchical level than the available data sets, and because the goals only apply to data sets that represent fish counts, the ability to estimate this indicator metric was limited.

4. Survival Change Necessary For 50% Or Greater Likelihood That Lambda Is Equal Or Greater Than 1.0 This metric was used as a "fall-back" recovery indicator metric, when it was not possible to estimate the "primary" recovery indicator metric described above. Because lambda represents an estimate of the median population growth rate, there is a 50% chance that the true population growth rate is equal or greater than the calculated value. As described in Appendix A of the 2000 FCRPS Biop, the needed change in lambda is estimated by dividing 1.0 by the current estimate of lambda. The result is then raised to the power of the mean generation time in order to calculate the needed change in survival.

It was possible to estimate this indicator metric for each data set for which an estimate of lambda was possible.

Adjustments to Population Growth Rate Estimates

In the 2000 FCRPS Biop we made adjustments to the current estimate of lambda to reflect changes in some life stage survival rates that had occurred from 1980 to the present. For example, harvest rates on SR fall chinook, SR steelhead, and UCR steelhead were considerably lower in 2000 than they had been on average during the 1980-1999 period and these lower harvest rates were expected to continue into the future according to the Basin-wide Salmon Recovery Strategy. Similarly, survival of juveniles through the FCRPS was higher in 2000 than it had been on average between 1980-1999 due to improvements in configuaration and operation of projects. An adjustment in lambda was made for both the current survival rate in 2000 and the survival rate expected from the reasonable and prudent alternative (RPA).

For the purpose of updating the jeopardy indicator metrics in light of recent court decisions, it was not clear if these adjustments were still appropriate. We therefore evaluated the indicator metrics under two conditions: with no adjustments and with

adjustments identical to those applied in the 2000 FCRPS Biop. It is possible that alternative adjustments (e.g., to reflect an environmental baseline in which no future federal activities would occur unless they had undergone Section 7 consultation) will be more appropriate, but these have not yet been developed.

RESULTS

Updated 2000 FCRPS Biop Indicator Metrics

Table 1 displays 166 populations proposed by the Interior TRT and the Lower Columbia/Willamette TRT that are relevant to the 11 ESUs considered in this analysis. At least one BRT data set representing a relevant spawning aggregation was associated with 92 of the populations (55%). No applicable data set could be identified for the remaining 74 populations. Because some data sets represent aggregates of two or more populations and because multiple data sets are available for some populations, there is not a direct correspondence between the number of data sets and the number of populations. All told, 139 data sets were available for the analysis. In most cases, data set documentation does not indicate if a data set represents the entire population or a subset of the population.

Table 1 displays the applicability of each data set to the 2000 FCRPS Biop indicator metrics, based on 1980-present population growth rate, and also indicates if data sets correspond to similarly-named data sets that were used in the 2000 FCRPS Biop. Table 2 provides more details regarding applicability of the data sets to each indicator metric. Note that Table 2 comments are not restricted to the 1980-present time period, so Table 1 is based on a combination of the comments in Table 2 and consideration of the time period represented by the data set.

The 1980-present (generally 2001) population growth rate could be calculated for 83 of the data sets. This calculation is important because it is necessary for each of the other indicator metrics and is directly used for the "lambda $\geq$1" alternate recovery indicator metric. A 1980-present lambda could not be calculated for the remaining 56 data sets because they did not encompass the entire time period, too many years were missing within the time period, or hatchery fraction was not available for the data set (Table 2).

The change in survival necessary to reduce extinction risk to 5% in 100 years, based on the 1980-present population growth rate, could be calculated for 53 data sets. Thirty data sets, for which lambda could be calculated, were not valid for extinction risk estimates because the data were not in units of fish (which is necessary to evaluate the extinction threshold) or because the variance about lambda could not be calculated (Table 2). The "Dennis/Holmes" method estimates variance by the "slope method" and certain assumptions must be met for this approach to work. Holmes (2001) showed that alternative methods of estimating variance are biased.

The change in survival necessary for a 50% likelihood of meeting interim recovery abundance goals in 48 years, based on the 1980-present population growth rate, could be calculated for 19 data sets. The main reason that so few data sets could be used for this purpose is the lack of interim recovery abundance goals for lower Columbia and Willamette ESUs and a lack of correspondence between the scale of many of the interior Columbia interim recovery goals and the scale of the available data sets (Table 2). Another reason was the lack of correspondence between units of interim recovery goals (fish) and units of data sets (often redd counts or redds per mile).

Table 1 indicates that relatively few updated results are directly comparable to results in the 2000 FCRPS Biop. The main reason for this lack of correspondence is the more stringent review of data sets by the BRT and by state and tribal co-managers during the review of the draft BRT (2003) report. In many cases, previous data sets were either merged or split, as appropriate to ensure consistency in methods and coverage. As a result, many data sets used in the 2000 FCRPS Biop were dropped and many new ones now exist. A large number of the data sets that are in units of "fish" are actually expansions of data sets that are in units of redd counts or redds per mile. In many instances, the expansion methods were reviewed and updated so the resulting data set, while representing the same geographical area as a data set used in the 2000 FCRPS Biop, now is not directly comparable. If the updated data set appeared to have relatively minor changes for years represented in the 2000 FCRPS Biop analysis, or if the changes were significant but differed by a constant factor such that the trend was unchanged, we considered the data sets comparable. In the case of UCR steelhead, we determined that the results were not comparable because of different methods of estimating lambda used for that ESU in the 2000 FCRPS Biop and used in the new analysis, not because the data sets differed.

Table 3 and Figures 1-9 display the updated lambda estimates, along with 95% confidence limits, and Table 3 makes appropriate comparisons to lambda estimates included in Appendix A of the 2000 FCRPS Biop. Nearly all of the spawning aggregations for LCR chinook, LCR steelhead, UWR chinook, UWR steelhead, UCR chinook, and UCR steelhead had population growth rates less than 1.0 (i.e., they are declining). CR chum salmon, MCR steelhead, SR steelhead, and SR spring/summer chinook generally had population growth rates greater than 1.0 , although this was not true for all spawning aggregations. SR fall chinook were either increasing or decreasing, depending upon "hatchery effectiveness" assumptions.

Because adult returns in 2001 were well above average for most stocks, the updated lambda estimates are generally higher than those estimated in the 2000 FCRPS Biop. In general, lambda increased by about 2-10% (absolute). Exceptions included the aggregate SR spring/summer chinook data set, and LCR chinook and steelhead data sets, which declined from the 2000 FCRPS Biop estimates.

The range of survival changes necessary to achieve each of the indicator metrics are displayed in Table 4 for each of the ESUs determined to be jeopardized in the 2000 FCRPS Biop. Details for each ESU are included in Tables 5-17. These tables follow the

format of tables in section 9 of the 2000 FCRPS Biop to indicate how they might be updated based upon currently available biological information. There are two tables for each ESU - one that does not adjust the 1980-present lambda estimate to account for current survival rates that differ from the average 1980-present survival rates or to account for survival changes expected from the RPA. The second table applies the same adjustments that were included in the 2000 FCRPS Biop under the columns labeled "Expected Survival Change".

Table 4 indicates that, at least under some assumptions (all of which were considered equally valid in the 2000 FCRPS Biop), at least one spawning aggregation within each ESU is currently achieving the 2000 FCRPS Biop indicator criteria. It also indicates that under some assumptions at least one spawning aggregation for every ESU except CR chum salmon requires additional survival improvements. These additional improvements are high for SR steelhead and UCR steelhead. For UCR steelhead, the natural survival rate would have to increase nearly seven-fold to meet the indicator criteria under all assumptions and for all spawning aggregations.

Sensitivity To Alternative Time Periods

Figures 10 and 12 show the sensitivity of lambda estimates to alternative choices of time period for the Marsh Creek spring chinook and Wenatchee River spring chinook data sets. In each case, the estimate of median population growth rate is highly dependent upon choice of the first year in the time series. For example, Figure 10 indicates that the choice of time series that begin in 1979, 1980, 1981, 1982, or 1983 and end in 2001 results in lambda greater than 1.0, which would indicate that the population is growing. On the other hand, choice of time series that begin in 1984, 1985, 1986, 1987, or 1988 and end in 2001 results in lambda less than 1.0, which indicates that the population is declining. Figures 11 and 13 show the 99% confidence limits around the lambda estimates for each of the time series. These generally indicate that the shorter the time period, the greater the uncertainty regarding the estimate of lambda.

Table 18 displays estimates of median population growth rate and 95% confidence limits for the 1990-present time period and for the longest possible time period, each of which was identified as important in BRT (2003). These estimates are evaluated at "hatchery effectiveness" assumptions of 20% and 80%. There is considerable variability both within and among ESUs as to whether these alternative time periods yield higher or lower estimates of lambda than the 1980-present time period.

NEXT STEPS

Next steps include further review of the data sets and preliminary analyses included in this report; updating adult return data through 2002 (expected from TRTs in October 2003); completion of a review of population growth rate methods by the Northwest Fisheries Science Center, including a workshop that includes a larger scientific group,

during the fall of 2003; completion of the final BRT status review (date uncertain); and evaluation of other quantitative indicators of population status for possible inclusion in the new biological opinion.

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Figure 1. Updated 1980-present Lambda estimates with 95% confidence intervals for the Snake River Spring and Summer Chinook ESU calculated with hatchery effectiveness of 0.2 and 0.8

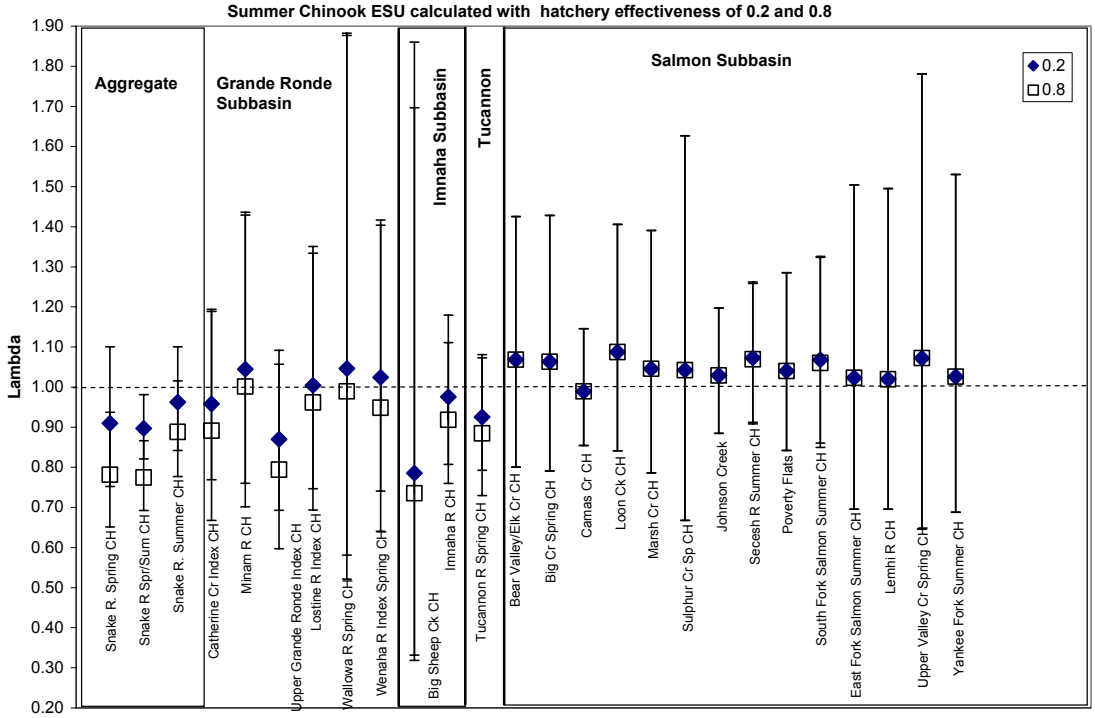

Figure 2. Updated 1980-present Lambda estimates with 95% confidence intervals for the Snake River Steelhead ESU calculated with hatchery effectiveness of 0.2 and 0.8

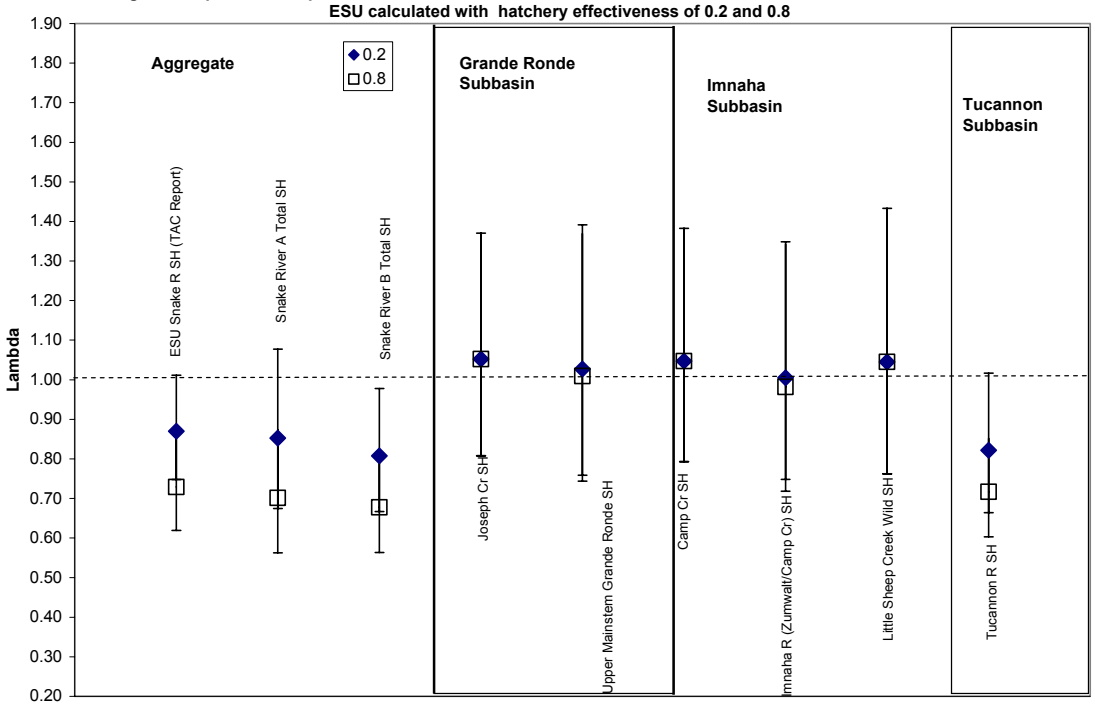

Figure 3. Updated 1980-present Lambda estimates with 95% confidence intervals for the Upper Columbia River Chinook ESU calculated with hatchery effectiveness of 0.2 and 0.8

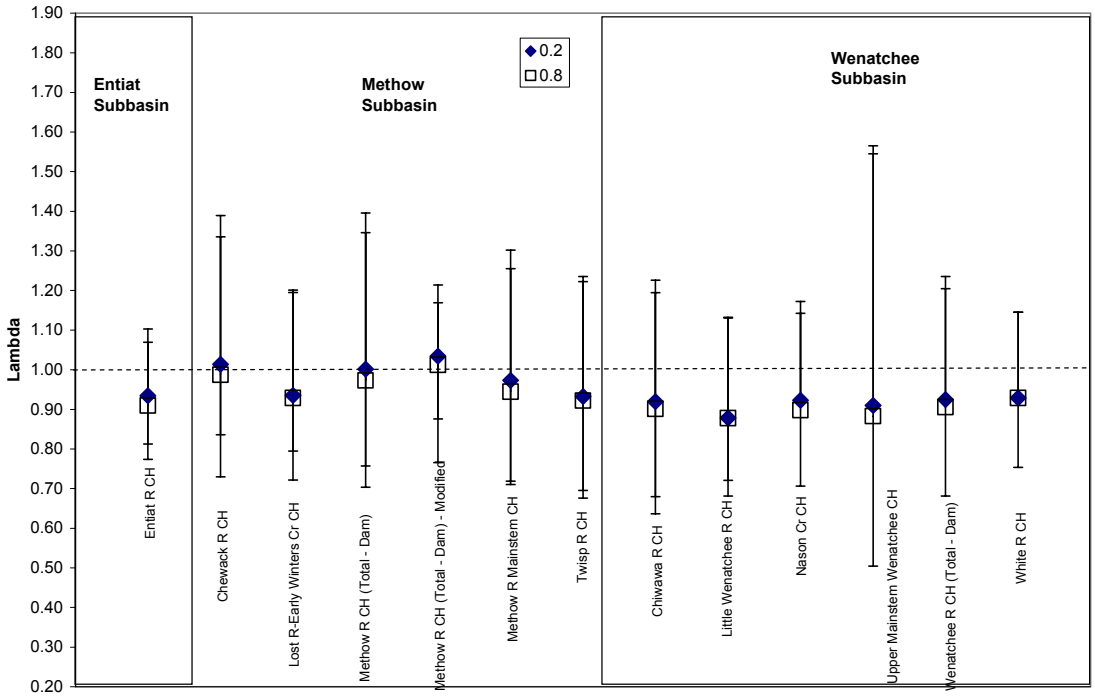

Figure 4. Updated 1980-present Lambda estimates with 95% confidence intervals for the UpperColumbia Steelhead ESU calculated with hatchery effectiveness of 0.2 and 0.8

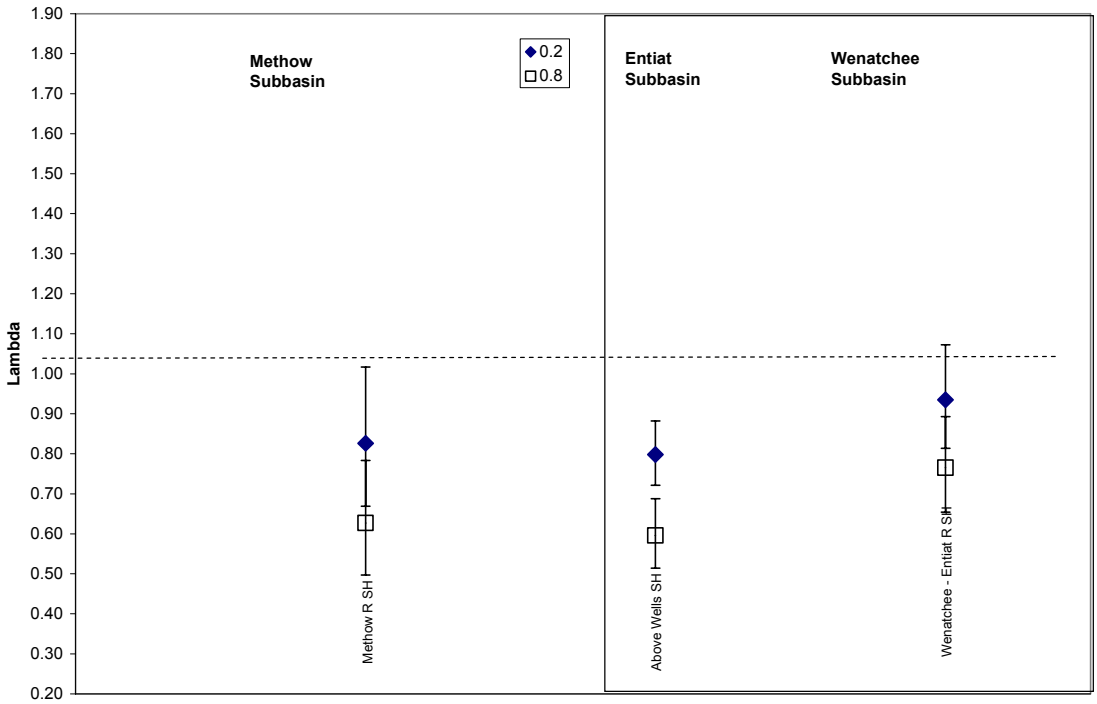

Figure 5. Updated 1980-present Lambda estimates with 95% confidence intervals for the Mid Columbia Steelhead ESU calculated with hatchery effectiveness of 0.2 and 0.8

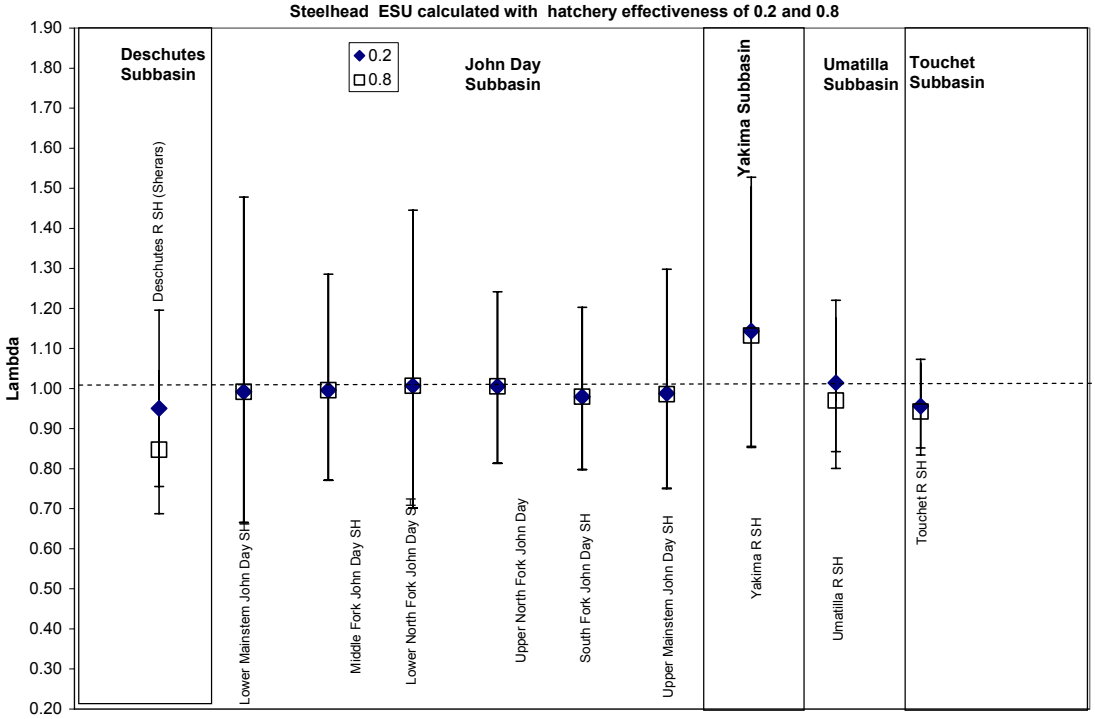

Figure 6. Updated 1980-present Lambda estimates with 95% confidence intervals for the Columbia Chum ESU calculated with hatchery effectiveness of 0.2 and 0.8

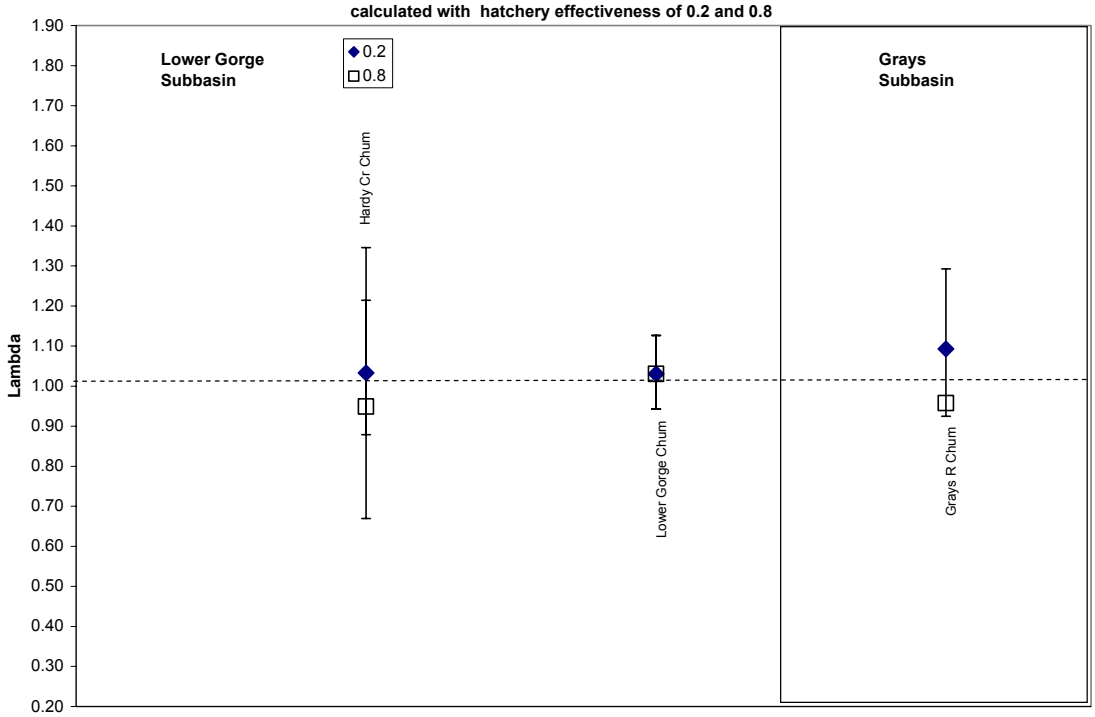

Figure 7. Updated 1980-present Lambda estimates with 95% confidence intervals for the Lower Columbia Chinook ESU calculated with hatchery effectiveness of 0.2 and 0.8

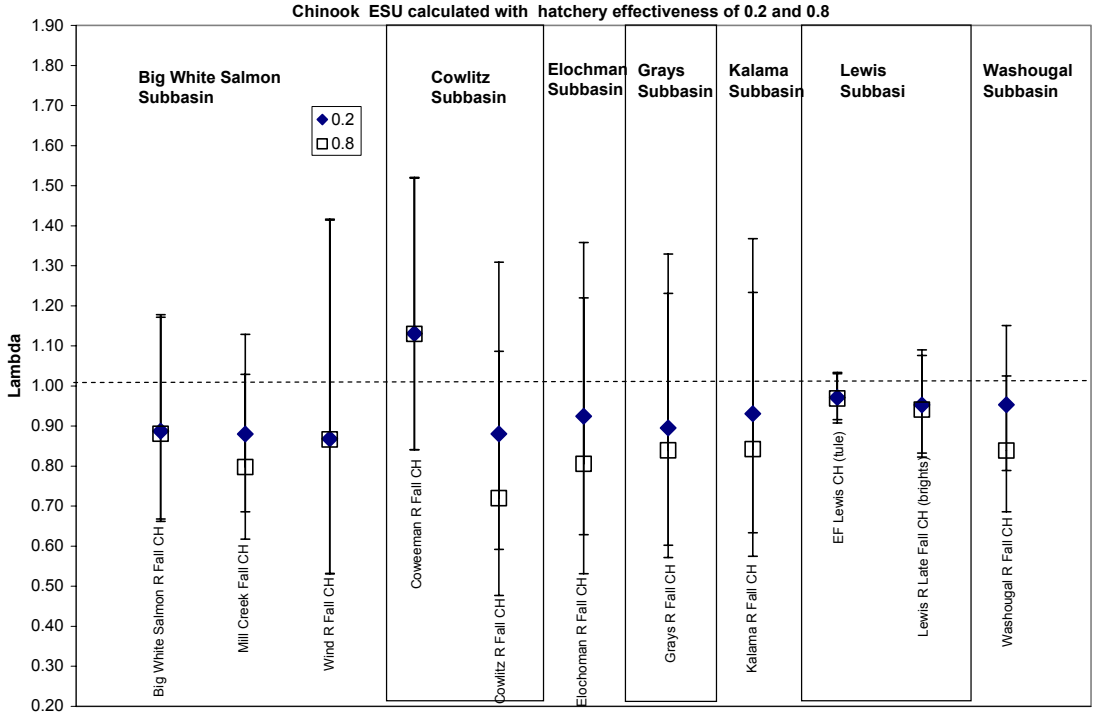

Figure 8. Updated 1980-present Lambda estimates with 95% confidence intervals for the Lower Columbia Steelhead ESU calculated with hatchery effectiveness of 0.2 and 0.8

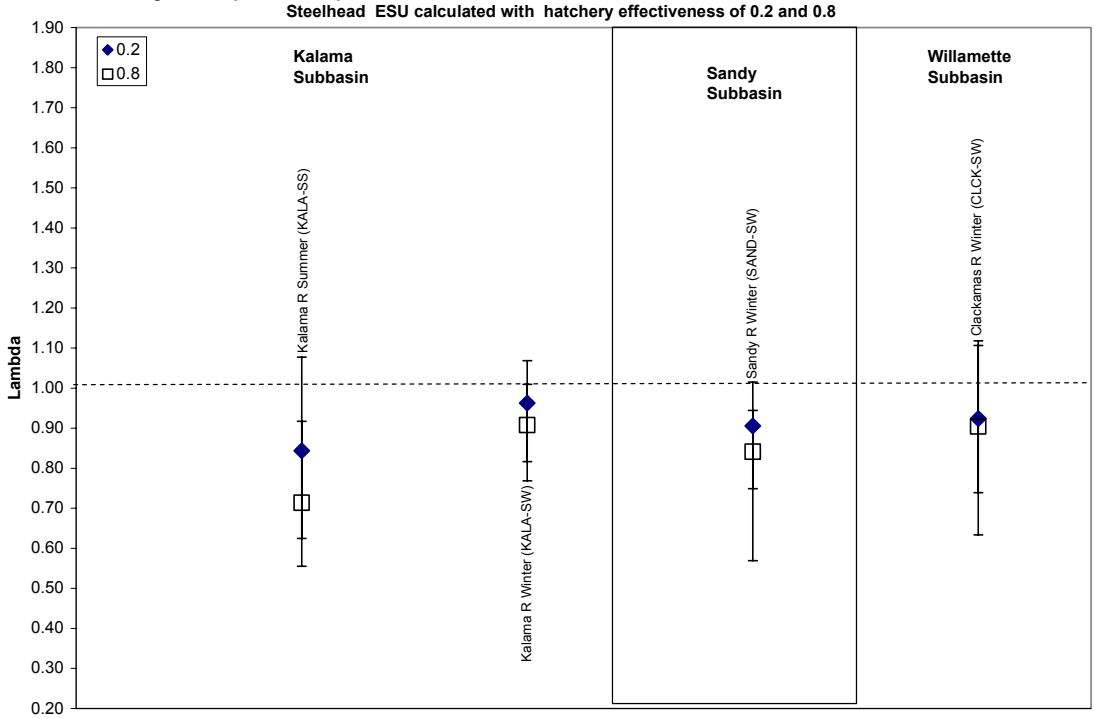

Figure 9. Updated 1980-present Lambda estimates with 95% confidence intervals for the Upper Willamete Steelhead ESU calculated with hatchery effectiveness of 0.2 and 0.8

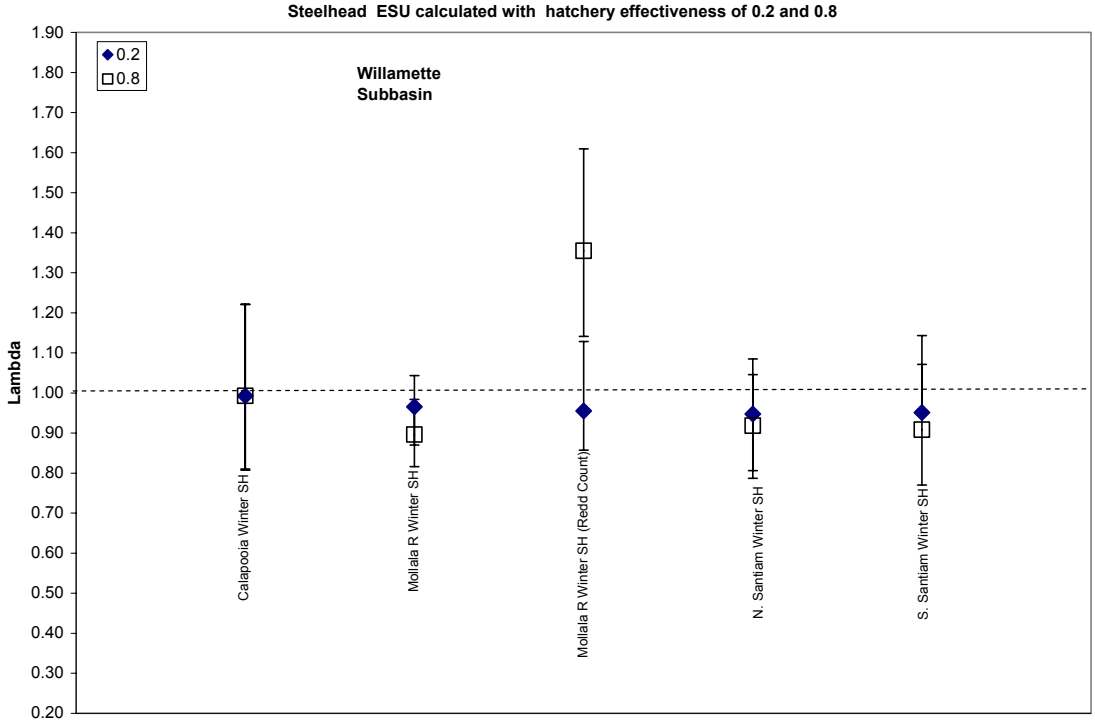

Figure 10. Sensitivity of Median Lambda estimates to alternative dhoices of time period for the Marsh Creek spring chinook data set. Each point represents and estimate for the starting year through 2001. This population has no hatchery influence.

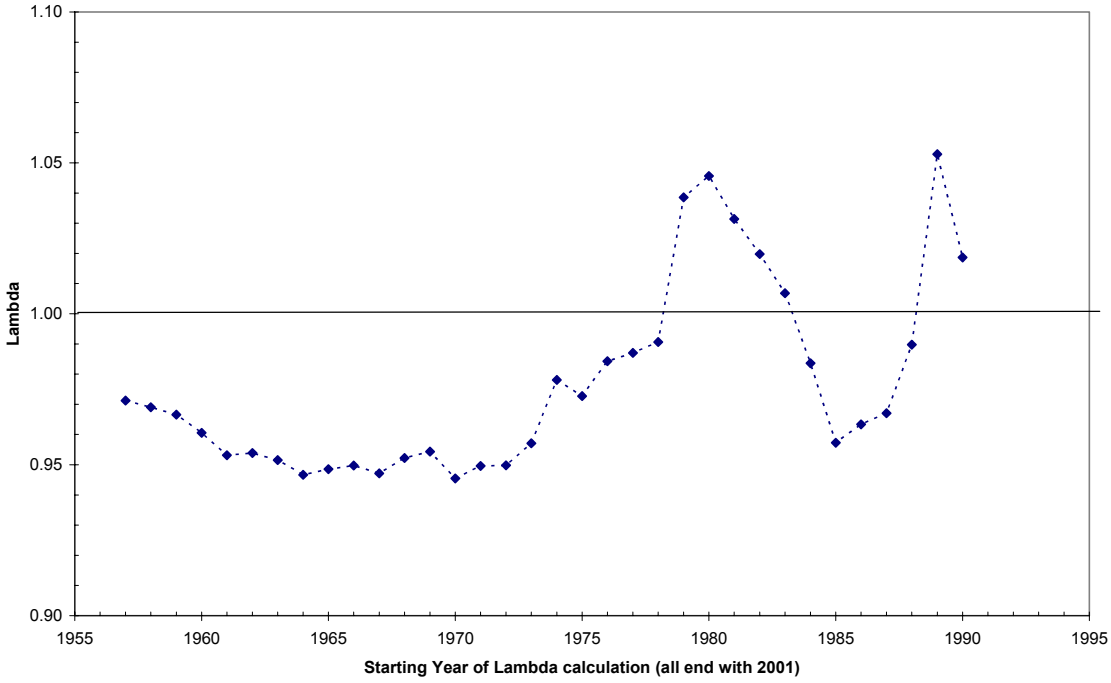

Figure 11. Sensitivity of 95% confidence intervals to alternative time periods for the Marsh Creek spring chinook lambda estimates displayed in Figure 10.

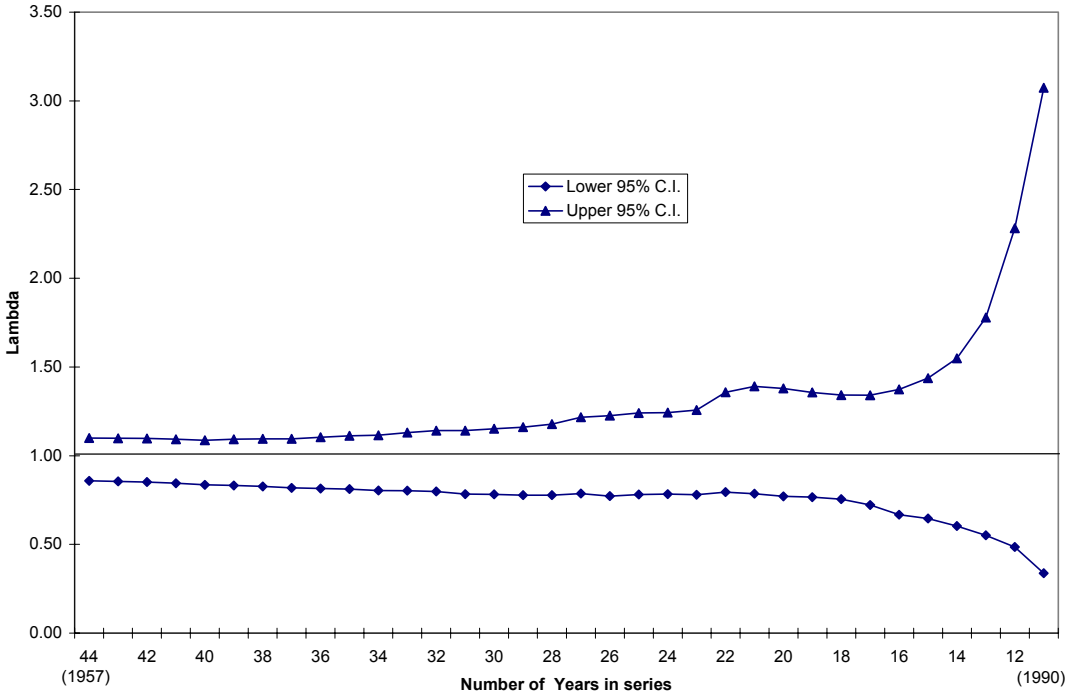

Figure 12. Sensitivity of Median Lambda estimates to alternative dhoices of time period for the Wenatchee River spring chinook data set. Each point represents and estimate for the starting year through 2001.

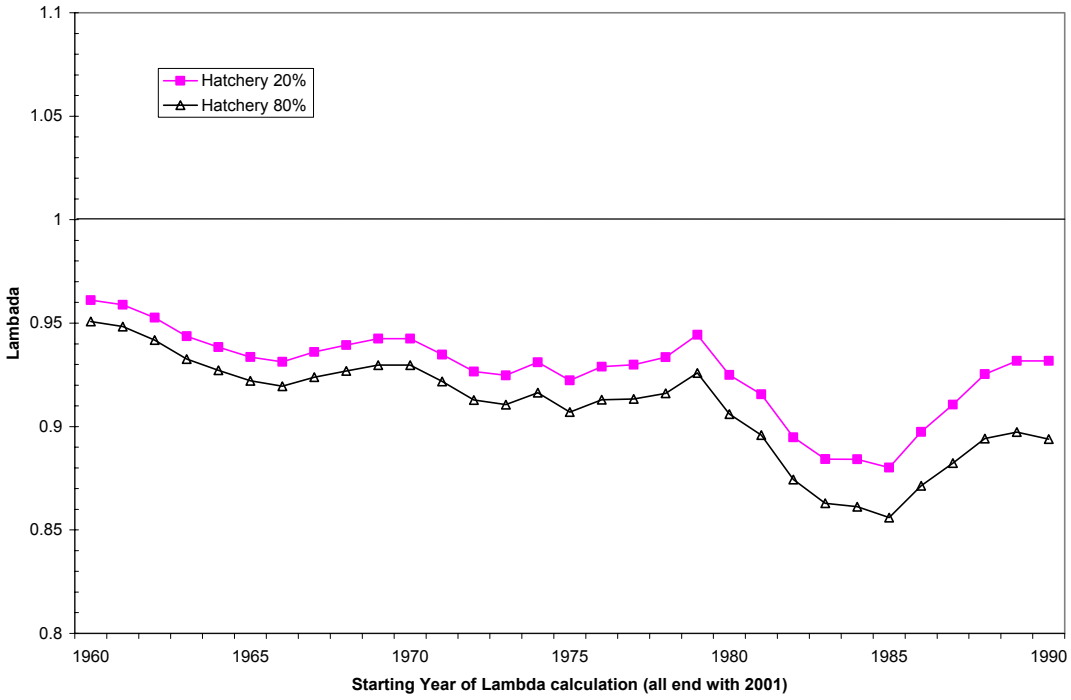

Figure 13. Sensitivity of 95% confidence intervals to alternative time periods for the Wenatchee River spring chinook lambda estimates displayed in Figure 10.

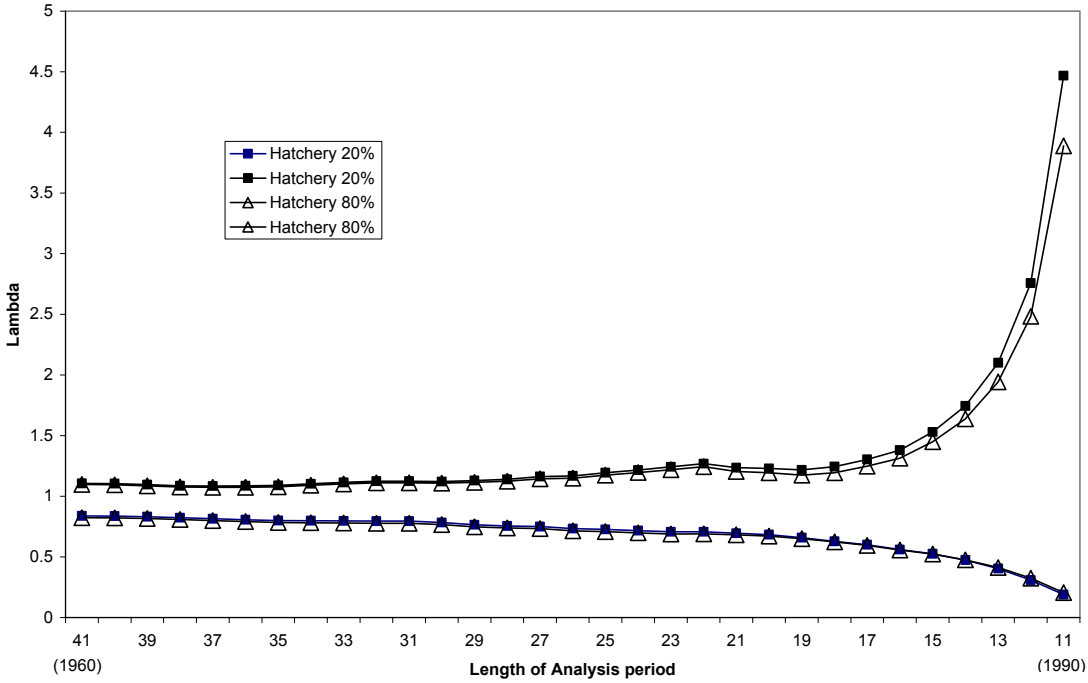

Table 1. Description of population structure, availability of relevant data sets, and use of data sets for evaluating 2000 FCRPS Biop jeopardy indicator metrics using updated 1980-present data.

ESU	NPCC Subbasin	Population	Spawning Agregation	Data	Start Year	End Year	Can Updated 1980-Present Lambda Be Calculated?	Can Updated Survival Change For <5% Extinction Risk, Based on 1980-Present Lambda, Be Calculated?	Can Updated Survival Change For 50% Likelihood of Recovery in 48 Years, Based on 1980-Present Lambda, Be Calculated?	Can Updated Estimates Be Compared to 2000 Biop Estimates (i.e., are the data sets and methods comparable)?
Snake River Fall Chinook Salmon	Snake-Hells Canyon, Snake-Lower	Snake River (SNMAI)	Snake River Fall Total	Fish	1975	2001	**Yes**	**Yes**	**Yes**	**Yes**
Snake River Spring/Summer Chinook Salmon	Multiple	Aggregate	Snake R. Spring CH	Fish	1979	2001	**Yes**	**Yes**	**No**	**No**
" "	" "	" "	Snake R Spr/Sum CH	Fish	1980	1999	**Yes**	**Yes**	**No**	**Yes**
" "	" "	" "	Snake R. Summer CH	Fish	1979	2001	**Yes**	**Yes**	**No**	**No**
" "	Grande Ronde	Catherine Ck (GRCAT)	Catherine Ck CH	Fish	1953	1996	**No**	**No**	**No**	**No**
" "	" "	" "	Catherine Cr Index CH	RC	1957	2001	**Yes**	**No**	**No**	**No**
" "	" "	*Lookingglass Cr. - (GRLOO) (Historic Population - now only hatchery)*	*Lookingglass Cr CH*	*RC*	*1957*	*2001*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Minam R (GRMIN)	Minam R CH	Fish	1964	2001	**Yes**	**Yes**	**Yes**	**Yes**
" "	" "	Upper Mainstem (GRUMA)	Upper Grande Ronde CH	Fish	1959	1996	**No**	**No**	**No**	**No**
" "	" "	" "	Upper Grande Ronde Index CH	RC	1960	2001	**Yes**	**No**	**No**	**No**
" "	" "	Wallowa/Lostine (GRLOS)	Lostine R Index CH	RC	1964	2001	**Yes**	**No**	**No**	**Yes**
" "	" "	" "	Wallowa R Spring CH	RC	1963	2001	**Yes**	**No**	**No**	**Yes**
" "	" "	Wenaha R (GRWEN)	Wenaha R Index Spring CH	RC	1963	2001	**Yes**	**No**	**No**	**No**
" "	" "	" "	Wenaha R Spring CH	Fish	1964	1996	**No**	**No**	**No**	**No**
" "	Imnaha	Big Sheep Ck (IRBSH)	Big Sheep Ck CH	RC	1957	2000	**Yes**	**No**	**No**	**Yes**
" "	" "	Imnaha R Mainstem (IRMAI)	Imnaha R CH	Fish	1953	2001	**Yes**	**Yes**	**Yes**	**Yes**
" "	" "	Imnaha R Mainstem (IRMAI)	Lick Cr (Imnaha) CH	RC	1964	2001	**No**	**No**	**No**	**No**
" "	Tucannon	Tucannon R (SNTUC)	Tucannon R Spring CH	Fish	1979	2001	**Yes**	**Yes**	**Yes**	**No**
" "	Salmon (*Middle Fork*)	Bear Valley/Elk Creeks (MFBEA)	Bear Valley/Elk Cr CH	Fish	1960	2001	**Yes**	**Yes**	**Yes**	**Yes**
" "	" "	Big Cr (MFBIG)	Big Cr Spring CH	Fish	1957	2001	**Yes**	**No**	**No**	**Yes**
" "	" "	" "	Big Cr Summer CH	RC	1957	2001	**No**	**No**	**No**	**No**
" "	" "	Camas Cr (MFCAM)	Camas Cr CH	RC	1972	2001	**Yes**	**No**	**No**	**No**
" "	" "	Loon Cr (MFLOO)	Loon Ck CH	RC	1957	2001	**Yes**	**No**	**No**	**Yes**
" "	" "	Marsh Cr (MFMAR)	Marsh Cr CH	Fish	1957	2001	**Yes**	**Yes**	**Yes**	**Yes**
" "	" "	Middle Fork Salmon Above Indian Cr. (MFUMA)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Middle Fork Salmon Below Indian Cr. (MFLMA)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Pistol Cr (MFPIS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*

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Snake River Spring/Summer Chinook Salmon	Salmon (*Middle Fork*)	Sulphur Creek (MFSUL)	Sulphur Cr Sp CH	Fish	1957	2001	**Yes**	**Yes**	**No**	**Yes**
" "	Salmon (*S. Fork*)	EF SF Salmon/ Johnson Creek (SFEFS)	Johnson Creek	Fish	1957	2001	**Yes**	**Yes**	**Yes**	**Yes**
" "	" "	Secesh R. (SFSEC)	Lake Cr Summer CH	RPM	1952	1997	**No**	**No**	**No**	**No**
" "	" "	" "	Secesh R Summer CH	RC	1957	2001	**Yes**	**No**	**No**	**No**
" "	" "	South Fork Salmon (SFMAI)	Poverty Flats	Fish	1957	2001	**Yes**	**Yes**	**No**	**Yes**
" "	" "	" "	South Fork Salmon Summer CH	RC	1957	2001	**Yes**	**No**	**No**	**Yes**
" "	Salmon (*Tribs*)	Chamberlain Cr (SRCHA)	Chamberlain Cr CH	RPM	1952	1997	**No**	**No**	**No**	**No**
" "	" "	Little Salmon R. (SRLSR)	*Rapid River (hatchery stock)*	*RPM*	*1972*	*2001*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Salmon (*Upper*)	E. Fork Salmon R. (SREFS)	East Fork Salmon Spring CH	RPM	1952	1997	**No**	**No**	**No**	**No**
" "	" "	" "	East Fork Salmon Summer CH	RPM	1957	2001	**Yes**	**No**	**No**	**No**
" "	" "	" "	Herd Cr CH	RPM	1958	1986	**No**	**No**	**No**	**No**
" "	" "	Lemhi R (SRLEM)	Lemhi R CH	RC	1957	2001	**Yes**	**No**	**No**	**No**
" "	" "	NF Salmon River (SRNFS)	North Fork Spring CH	RC	1960	2000	**No**	**No**	**No**	**No**
" "	" "	Pahsimeroi R (SRPAH)	Pahsimeroi R CH	TLC	1980	2001	**No**	**No**	**No**	**No**
" "	" "	*Panther Creek (SRPAN) (Historic population)*	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Upper Mainstem Salmon Above Redfish Lake (SRUMA)	Alturas Lake Cr CH	RC	1957	2001	**No**	**No**	**No**	**No**
" "	" "	Upper Mainstem Salmon Below Redfish Lake (SRLMA)	Upper Salmon Spring CH	RC	1954	2001	**No**	**No**	**No**	**No**
" "	" "	Upper Mainstem Salmon Below Redfish Lake (SRLMA)	Upper Salmon Summer CH	RPM	1957	1997	**No**	**No**	**No**	**No**
" "	" "	Valley Cr (SRVAL)	Upper Valley Cr Spring CH	RC	1957	2001	**Yes**	**No**	**No**	**No**
" "	" "	" "	Upper Valley Cr Summer CH	RPM	1952	2000	**No**	**No**	**No**	**No**
		Yankee Fork (SRYFS)	Yankee Fork Spring CH	RPM	1952	1997	**No**	**No**	**No**	**No**
" "	" "	" "	Yankee Fork Summer CH	RC	1960	2001	**Yes**	**No**	**No**	**No**
" "	" "	" "	Yankee Fork West Fk Spring CH	RC	1960	2001	**No**	**No**	**No**	**No**

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Snake River Steelhead	Multiple	Aggregate	ESU Snake R SH (TAC Report)	Fish	1980	2001	**Yes**	**Yes**	**Yes**	**Yes**
" "	" "	" "	Snake River A Total SH	Fish	1985	2001	**No**	**No**	**No**	**No**
" "	" "	" "	Snake River B Total SH	Fish	1985	2001	**No**	**No**	**No**	**No**
" "	Asotin	Asotin Creek (SNASO-s)	Asotin Cr SH	Fish	1986	2001	**No**	**No**	**No**	**No**
" "	Clearwater	Lochsa River (CRLOC-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Lolo Creek (CRLOL-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Lower Clearwater R (CRLMA-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	" "	*North Fork Clearwater (CRNFC-s) (Historic population)*	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Selway River (CRSEL-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	South Fork Clearwater (CRSFC-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Grande Ronde	Joseph Creek (GRJOS-s)	Joseph Cr SH	Fish	1974	2002	**Yes**	**Yes**	**Yes**	**No**
" "	" "	Lower Grande Ronde (GRLMT-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Upper Grande Ronde (GRUMA-s)	Upper Mainstem Grande Ronde SH	RPM	1967	2000	**Yes**	**No**	**No**	**No**
" "	" "	Wallowa River (GRWAL-s)	Wallowa SH	RPM	1965	1996	**No**	**No**	**No**	**No**
" "	Imnaha	Imnaha (IRMMT-s)	Camp Cr SH	Fish	1974	2002	**Yes**	**Yes**	**No**	**No**
" "	" "	" "	Imnaha R (Zumwalt/Camp Cr) SH	RPM	1974	2000	**Yes**	**No**	**No**	**No**
" "	" "	" "	*Little Sheep Creek Hatchery SH*	*Fish*	*1985*	*2002*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	" "	Little Sheep Creek Wild SH	Fish	1985	2002	**Yes**	**Yes**	**No**	**No**
" "	Salmon River	Chamberlain Creek (SRCHA-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Little Salmon and Lower almon Tribs (SRLSR-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	East Fork Salmon R (SREFS-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Lemhi River (SRLEM-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Lower Middle Fork (MFBIG-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	North Fork Salmon R (SRNFS-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Pahsimeroi River (SRPAH-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Panther Creek (SRPAN-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*

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Snake River Steelhead	Salmon River	Secesh River (SFSEC-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	South Fork Salmon R (SFMAI-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Upper Mainstem Salmon R (SRUMA-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Upper Middle Fork Salmon R (MFUMA-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Snake Hell's Canyon	Hell's Canyon tribs (SNHCT-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Tucannon	Tucannon R (SNTUC-s)	Tucannon R SH	Fish	1987	2001	**Yes**	**Yes**	**Yes**	**No**
Upper Columbia River Spring Chinook Salmon	Entiat	Entiat R (UCENT)	Entiat R CH	Fish	1960	2001	**Yes**	**Yes**	**Yes**	**Yes**
" "	Methow	Methow R (UCMET)	Chewack R CH	RC	1960	2001	**Yes**	**No**	**No**	**No**
" "	" "	" "	Lost R-Early Winters Cr CH	Fish	1958	2001	**Yes**	**Yes**	**No**	**No**
" "	" "	" "	Methow R CH (Total - Dam)	Fish	1960	2001	**Yes**	**Yes**	**Yes**	**Yes**
" "	" "	" "	Methow R CH (Total - Dam) - Modified	Fish	1960	2001	**Yes**	**Yes**	**Yes**	**Yes**
" "	" "	" "	Methow R Mainstem CH	RC	1958	2001	**Yes**	**No**	**No**	**No**
" "	" "	" "	Twisp R CH	RC	1958	2001	**Yes**	**No**	**No**	**No**
" "	Wenatchee	Wenatchee R (UCWEN)	Chiwawa R CH	RC	1958	2001	**Yes**	**No**	**No**	**No**
" "	" "	" "	Icicle Cr CH	RC	1958	2001	**No**	**No**	**No**	**No**
" "	" "	" "	Little Wenatchee R CH	RC	1958	2001	**Yes**	**No**	**No**	**No**
" "	" "	" "	Nason Cr CH	RC	1958	2001	**Yes**	**No**	**No**	**No**
" "	" "	" "	Upper Mainstem Wenatchee CH	RC	1959	2001	**Yes**	**No**	**No**	**No**
" "	" "	Wenatchee R (UCWEN)	Wenatchee R CH (Total - Dam)	Fish	1960	2001	**Yes**	**Yes**	**Yes**	**Yes**
" "	" "	" "	White R CH	RC	1958	2001	**Yes**	**No**	**No**	**No**
Upper Columbia River Steelhead	Methow	Methow R (UCMET-s)	Methow R SH	Fish	1976	2001	**Yes**	**Yes**	**Yes**	**No**
" "	Methow& Okanagan	Methow R (UCMET-s) & Okanagan R (UCOKA-s)	Above Wells SH	Fish	1976	2001	**Yes**	**Yes**	**No**	**No**
" "	Okanogan	Okanogan R (UCOKA-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Wenatchee	Wenatchee R (UCWEN-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Wenatchee&Entiat	Wenatchee R (UCWEN-s) & Entiat R (UCENT-s)	Wenatchee - Entiat R SH	Fish	1976	2001	**Yes**	**Yes**	**Yes**	**No**

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Middle Columbia River Steelhead	Deschutes	Deschutes Eastside (DREST-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Deschutes Eastside (DREST-s) & Westside (DRWST-s)	Deschutes R SH (Sherars)	Fish	1978	2002	**Yes**	**Yes**	**Yes**	**No**
" "	" "	Deschutes Westside (DRWST-s)	Shitike Cr SH	RPM	1976	2002	**No**	**No**	**No**	**No**
" "	" "	Deschutes Westside (DRWST-s)	*Warm Springs Hatchery SH*	*Fish*	*1980*	*1999*	*N/A*	*N/A*	*N/A*	*N/A - Also, this data set does not match the "Warm Springs NFH Sum" data set used for the 2000 Biop - counts are off-set by two years.*
" "	Fifteenmile	Fifteenmile Cr (MCFIF-s)	Fifteenmile Cr SH	RPM	1964	2001	**No**	**No**	**No**	**No**
" "	John Day	Lower Mainstem John Day (JDLMT-s)	Lower Mainstem John Day SH	RPM	1965	2002	**Yes**	**No**	**No**	**No**
" "	" "	Middle Fork John Day (JDMF-s)	Middle Fork John Day SH	RPM	1974	2001	**Yes**	**No**	**No**	**No**
" "	" "	North Fork John Day (JDNFJ-s)	Lower North Fork John Day SH	RPM	1976	2002	**Yes**	**No**	**No**	**No**
" "	" "	" "	Upper North Fork John Day	RPM	1977	2002	**Yes**	**No**	**No**	**No**
" "	" "	South Fork John Day (JDSF-s)	South Fork John Day SH	RPM	1974	2002	**Yes**	**No**	**No**	**No**
" "	" "	Upper Mainstem John Day (JDUMA-s)	Upper Mainstem John Day SH	Fish	1974	2002	**Yes**	**Yes**	**Yes**	**No**
" "	Klickitat	Klickitat R (MCKLI-s)	Klickitat R SH	RC	1990	2002	**No**	**No**	**No**	**No**
" "	Palouse	Rock Creek (MCROC-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Yakima	Aggregate - Dam	Yakima R SH	Fish	1980	2001	**Yes**	**Yes**	**??**	**Yes**
" "	" "	Upper Mainstem (YRUMA-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Naches River (YRNAC-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Satus and Toppenish Creeks (YRTOS-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Umatilla	Umatilla R (MCUMA-s)	Umatilla R SH	Fish	1966	2002	**Yes**	**Yes**	**Yes**	**No**
" "	Walla Walla	Walla Walla R (WWMAI-s)	Walla Walla R SH	Fish	1993	2000	**No**	**No**	**No**	**No**
" "	" "	Touchet R (WWTOU-s)	Touchet R SH	Fish	1987	2001	**Yes**	**Yes**	**No**	**No**

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Columbia River Chum Salmon	Columbia Estuary	Big Creek (BIGC-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Chinook River (CHIN-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Clatskanie River (CLAT-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Mill Creek (MILL-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Young's Bay (YOUN-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Columbia Gorge	Upper Gorge tribs (UGRG-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Columbia Lower	Lower Gorge tribs (LGRG-CM)	Hardy Cr Chum	Fish	1957	2000	**Yes**	**Yes**	**No**	**No**
" "	" "	" "	Lower Gorge Chum	Fish	1944	2000	**Yes**	**Yes**	**No**	**No**
" "	Cowlitz	Cowlitz R. fall/summer (COWL-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Salmon Creek (SALM-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Elochman	Elochman River (ELOC-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Grays R	Grays R. (GRAY-CM)	Grays R Chum	Fish	1951	2000	**Yes**	**Yes**	**No**	**No**
" "	" "	" "	Grays River II Chum	Fish	1967	1998	**No**	**No**	**No**	**No**
" "	Kalama River	Kalama River (KALA-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Lewis River	Lewis River (LEWS-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Lower Columbia	Scappose Creek (SCAP-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Sandy	Sandy R. (SAND-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Washougal	Washougal R. (WASH-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Willamette	Clackamas R. (CLCK-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
Lower Columbia River Chinook Salmon	Big White Salmon	Big White Salmon R Fall (BWSR-KF)	Big White Salmon R Fall CH	Fish	1967	2001	**Yes**	**Yes**	**No**	**No**
" "	" "	Big White Salmon Spring (BWSR-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Columbia Estuary	Big Creek Fall (BIGC-KF)	Big Creek Fall CH	FPM	1970	2001	**No**	**No**	**No**	**No**
" "	" "	Clatskanie R Fall (CLAT-KF)	Clatskanie Fall CH	FPM	1970	2001	**No**	**No**	**No**	**No**
" "	" "	Mill Creek Fall (MILL-KF)	Mill Creek Fall CH	Fish	1980	2001	**Yes**	**Yes**	**No**	**No**
" "	" "	Young's Bay Fall (YOUN-KF)	Young's Bay Fall CH	FPM	1950	2001	**No**	**No**	**No**	**No**

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Lower Columbia River Chinook Salmon	Columbia Gorge	Lower Gorge Tribs LGRG-KF)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Upper Gorge Tribs (UGRG-KF)	Wind R Fall CH	Fish	1964	2001	**Yes**	**Yes**	**No**	**No**
" "	Cowlitz	Cispus R Spring (CISP-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Coweeman R Fall (COWE-KF)	Coweeman R Fall CH	Fish	1964	2001	**Yes**	**Yes**	**No**	**No**
" "	" "	Tilton R Spring (TILT-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Toutle R Fall (TOUT-KF)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Toutle R Spring (TOUT-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Upper Cowlitz R Fall (UCWL-KF) + Lower Cowlitz R Fall (LCWL-KF)	Cowlitz R Fall CH	Fish	1964	2000	**Yes**	**Yes**	**No**	**No**
" "	" "	Upper Cowlitz R Spring (UCWL-KS)	Cowlitz R Spring CH	Fish	1980	2001	**No**	**No**	**No**	**No**
" "	Elochoman	Elochoman R Fall (ELOC-KF)	Elochoman R Fall CH	Fish	1964	2001	**Yes**	**Yes**	**No**	**No**
" "	Grays	Grays R Fall (GRAY-KF)	Grays R Fall CH	Fish	1964	2001	**Yes**	**Yes**	**No**	**No**
" "	Hood	Hood R Fall (HOOD-KF)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Hood R Spring (HOOD-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Kalama	Kalama R Fall (KALA-KF)	Kalama R Fall CH	Fish	1964	2001	**Yes**	**Yes**	**No**	**Yes**
" "	" "	Kalama R Spring (KALA-KS)	Kalama R Spring CH	Fish	1980	2001	**No**	**No**	**No**	**Yes**
" "	Lewis	Lewis R. Late Fall (LEWL-KF)	EF Lewis CH (tule)	Fish	1980	2000	**Yes**	**Yes**	**No**	**Yes?**
" "	" "	" "	Lewis R Late Fall CH (brights)	Fish	1964	2001	**Yes**	**Yes**	**No**	**Yes?**
" "	" "	Lewis R. Spring (LEWS-KS)	Lewis R. Spring CH	Fish	1980	2001	**No**	**No**	**No**	**Yes**
" "	" "	Salmon Creek Fall (SALM-KF)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Sandy	Sandy River Early Fall (SNDE-KF)	Sandy R Early Fall	Fish	1988	2001	**No**	**No**	**No**	**No**
" "	" "	Sandy River Late Fall (SNDL-KF)	Sandy R Late Fall CH	Fish	1984	2001	**No**	**No**	**No**	**Yes**
" "	Washougal	Washougal R Fall (WASH-KF)	Washougal R Fall CH	Fish	1964	2001	**Yes**	**Yes**	**No**	**No**
" "	Willamette	Clackamas R Fall Chinook (CLCK-KF)	Clackamas R Fall CH	Fish	1967	2001	**No**	**No**	**No**	**No**

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ESU	NPCC Subbasin	Population	Spawning Agregation	Data	Start Year	End Year	Can Updated 1980-Present Lambda Be Calculated?	Can Updated Survival Change For <5% Extinction Risk, Based on 1980-Present Lambda, Be Calculated?	Can Updated Survival Change For 50% Likelihood of Recovery in 48 Years, Based on 1980-Present Lambda, Be Calculated?	Can Updated Estimates Be Compared to 2000 Biop Estimates (i.e., are the data sets and methods comparable)?
Lower Columbia River Steelhead	Columbia Gorge	Lower Gorge Tributaries (LRG-SW)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Upper Gorge Tributaries (UGRG-SW)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Cowlitz	Cispus R Winter (CISP-SW)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Coweeman R Winter (COWE-SW)	Coweeman R Winter SH	RC	1987	2002	**No**	**No**	**No**	**No**
" "	" "	Lower Cowlitz R Winter (LCWL-SW)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	N Fork Toutle R Winter (Green River) (NTOU-SW)	N Fork Toutle Winter SH	Fish	1989	2002	**No**	**No**	**No**	**No**
" "	" "	S Fork Toutle R Winter (STOU-SW)	S Fork Toutle Winter SH	Fish	1984	2002	**No**	**No**	**No**	**Yes?**
" "	" "	Tilton R Winter (TILT-SW)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Upper Cowlitz R Winter (UCWL-SW)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Hood	Hood R Summer (HOOD-SS)	Hood R Summer SH	Fish	1992	2000	**No**	**No**	**No**	**No**
" "	" "	Hood R Winter (HOOD-SW)	Hood R Winter SH	Fish	1992	2000	**No**	**No**	**No**	**No**
" "	Kalama	Kalama R Summer (KALA-SS)	Kalama R Summer SH	Fish (Trap Count)	1977	2003	**Yes**	**Yes**	**No**	**Yes**
" "	" "	Kalama R Winter (KALA-SW)	Kalama R Winter SH	Fish	1977	2002	**Yes**	**Yes**	**No**	**Yes**
" "	Lewis	E Fork Lewis R Summer (ELEW-SS)	EF Lewis R Summer SH	Fish	1996	2003	**No**	**No**	**No**	**No**
" "	" "	E Fk Lewis R Winter (ELEW-SW)	E Fk Lewis R Winter SH	Fish	1985	1994	**No**	**No**	**No**	**No**
" "	" "	N Fork Lewis R Summer (NLEW-SS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	N Fk Lewis R Winter (NLEW-SW)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Sandy	Salmon Creek Winter (SALM-SW)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Sandy R Winter (SAND-SW)	Sandy R Winter SH	Fish	1978	2001	**Yes**	**Yes**	**No**	**Yes**
" "	Washougal	Washougal R Summer (WASH-SS)	Washougal R Summer SH	Fish	1986	2003	**No**	**No**	**No**	**No**
" "	" "	Washougal R Winter (WASH-SW)	Washougal R Winter SH	RC	1991	2002	**No**	**No**	**No**	**No**
" "	Willamette	Clackamas R Winter (CLCK-SW)	Clackamas R Winter SH	Fish	1958	2001	**Yes**	**Yes**	**No**	**No**
" "	Wind	Wind R Summer - (WIND-SS)	Wind R Summer SH	Fish	1989	2003	**No**	**No**	**No**	**No**

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Upper Willamette River Chinook Salmon	Sandy	Sandy R Spring (SAND-KS)	Sandy R Spring CH	Fish	1977	2001	No	No	No	No
" "	Willamette	Aggregate	Willamette Falls Spring CH	Fish	1946	2001	No	No	No	No
" "	" "	Calapooia R Spring (CALA-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Clackamas R Spring (CLCK-KS)	Clackamas R Spring CH (NF Dam)	Fish	1958	2002	No	No	No	No
" "	" "	McKenzie R Spring (MCKZ-KS)	McKenzie R Spring CH (Leaburg Dam)	Fish	1970	2001	No	No	No	Yes
Upper Willamette River Chinook Salmon	Willamette	Middle Fork Willamette Spring (MFWL-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Mollala R Spring (MOLA-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	N. Santiam R Spring (NSNT-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	S. Santiam R Spring (SSNT-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
Upper Willamette River Steelhead	Willamette	Aggregate	Willamette Falls Winter SH Dam Counts	Fish	1971	2002	No	No	No	No
" "	" "	Calapooia R Winter (CALA-SW)	Calapooia Winter SH	Fish	1980	1997	Yes	Yes	No	No
" "	" "	" "	Calapooia Winter SH (Redd Count)	RC	1980	2000	No	No	No	No
" "	" "	Mollala R Winter (MOLA-SW)	Mollala R Winter SH	Fish	1980	1997	Yes	Yes	No	No
" "	" "	" "	Mollala R Winter SH (Redd Count)	RC	1980	2000	Yes	Yes	No	No
" "	" "	N. Santiam R Winter (NSNT-SW)	N. Santiam Winter SH (Redd Count)	RC	1983	2000	No	No	No	No
" "	" "	" "	N. Santiam Winter SH	Fish	1980	1997	Yes	Yes	No	No
" "	" "	S. Santiam R Winter (SSNT-SW)	Foster Dam Winter SH	Fish	1973	2000	No	No	No	No
" "	" "	" "	S. Santiam Winter SH	Fish	1980	1997	Yes	Yes	No	No
" "	" "	" "	S. Santiam Winter SH (Foster Dam)	Fish	1967	2002	No	No	No	No
" "	" "	" "	S. Santiam Winter SH (Redd Count)	RC	1980	2001	No	No	No	No
" "	" "	Westside Tributaries Winter (WEST-SW)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*

Table 2. Details regarding use of data sets for evaluating jeopardy indicator metrics in the 2000 FCRPS Biop. Note that, in contrast to Table 1, considerations are not restricted to the 1980-present time period.

ESU	NPCC Subbasin	Population	Spawning Agregation	Data	Start Year	End Year	Can Lambda Be Calculated (Basis For All 2000 Biop Indicator Metrics, Including 50% Likelihood of Lambda>1 Recovery Indicator Metric)?	Can Survival Change For <5% Extinction Risk Be Calculated (For 2000 Biop Survival Indicator Metric)?	Can the Survival Change For 50% Likelihood of Recovery in 48 Years Be Calculated (For 2000 Biop Primary Recovery Indicator Metric)?	Can Updated Estimates Be Compared to 2000 Biop?
Snake River Fall Chinook Salmon	Snake-Hells Canyon, Snake-Lower	Snake River (SNMAI)	Snake River Fall Total	Fish	1975	2001	Yes	Yes	Yes - the interim recovery goal is 2500 aggregate spawners	Yes - Matches the "Snake River Fall Chinook Aggregate" data set used in the 2000 Biop.
Snake River Spring/Summer Chinook Salmon	Multiple	Aggregate	Snake R. Spring CH	Fish	1979	2001	Yes	Yes	No - no interim recovery goal for aggregate spring chinook	No - there was not a similar data set used in the 2000 Biop.
" "	" "	" "	Snake R Spr/Sum CH	Fish	1980	1999	Yes	Yes	No - no interim recovery goal for aggregate ESU	Yes - Matches the "Aggregate ESU" data set used in the 2000 Biop.
" "	" "	" "	Snake R. Summer CH	Fish	1979	2001	Yes	Yes	No - no interim recovery goal for aggregate summer chinook	No - there was not a similar data set used in the 2000 Biop.
" "	Grande Ronde	Catherine Ck (GRCAT)	Catherine Ck CH	Fish	1953	1996	Yes	Yes	No - no interim recovery goal	No - This is the "Catherine Creek" data set used in the 2000 Biop and it has not been updated since then. It is derived from the Catherine Creek Index CH data set, based on run reconstruction information.
" "	" "	" "	Catherine Cr Index CH	RC	1957	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - this data set does not match the "Catherine Creek" data set used in the 2000 Biop.
" "	" "	*Lookingglass Cr. - (GRLOO) (Historic Population - now only hatchery)*	*Lookingglass Cr CH*	*RC*	*1957*	*2001*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Minam R (GRMIN)	Minam R CH	Fish	1964	2001	Yes	Yes	Yes - the interim recovery goal is 439 spawners	Yes - Matches the "Minam River" data set used in the 2000 Biop.
" "	" "	Upper Mainstem (GRUMA)	Upper Grande Ronde CH	Fish	1959	1996	Yes	Yes	No - no interim recovery goal	No - This is the "Grande Ronde River" data set used in the 2000 Biop and it has not been updated since then. It is derived from the Upper Grande Ronde Index CH data set, based on run reconstruction information.
" "	" "	" "	Upper Grande Ronde Index CH	RC	1960	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - this data set does not match the "Grande Ronde River" data set used in the 2000 Biop.
" "	" "	Wallowa/Lostine (GRLOS)	Lostine R Index CH	RC	1964	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	Yes - Matches the "Lostine Creek" data set used in the 2000 Biop.
" "	" "	" "	Wallowa R Spring CH	RC	1963	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	Yes - Matches the "Wallowa Creek" data set used in the 2000 Biop.
" "	" "	Wenaha R (GRWEN)	Wenaha R Index Spring CH	RC	1963	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - this data set does not match the "Wenaha River" data set used in the 2000 Biop.
" "	" "	" "	Wenaha R Spring CH	Fish	1964	1996	Yes	Yes	No - no interim recovery goal	No - This is the "Wenaha River" data set used in the 2000 Biop and it has not been updated since then. It is derived from the Wenaha River Index CH data set, based on run reconstruction information.
" "	Imnaha	Big Sheep Ck (IRBSH)	Big Sheep Ck CH	RC	1957	2000	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	Yes - Matches the "Big Sheep Creek" data set used in the 2000 Biop.

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Snake River Spring/Summer Chinook Salmon	Imnaha	Imnaha R Mainstem (IRMAI)	Imnaha R CH	Fish	1953	2001	Yes	Yes	Yes - the interim recovery goal is 2500 spawners	Yes - Matches the "Imnaha River" data set used in the 2000 Biop.
" "	" "	**Imnaha R Mainstem (IRMAI)**	Lick Cr (Imnaha) CH	RC	1964	2001	No - there are too many zero returns, making some running sums go to zero, and lambda undefined because it requires natural logs of the running sums	No - lambda, which is basis for calculation, could not be estimated and data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	Tucannon	Tucannon R (SNTUC)	Tucannon R Spring CH	Fish	1979	2001	Yes	Yes	Yes - the interim recovery goal is 1000 spawners and data set represents spawners.	No - there was not a similar data set used in the 2000 Biop.
" "	Salmon (*Middle Fork*)	Bear Valley/Elk Creeks (MFBEA)	Bear Valley/Elk Cr CH	Fish	1960	2001	Yes	Yes	Yes - the interim recovery goal is 911 spawners	Yes - Matches the "Bear Valley/Elk Creeks" data set used in the 2000 Biop.
" "	" "	Big Cr (MFBIG)	Big Cr Spring CH	Fish	1957	2001	Yes	Yes	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	" "	" "	Big Cr Summer CH	RC	1957	2001	No - hatchery fraction is not available	No - lambda, which is basis for calculation, could not be estimated and data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	" "	Camas Cr (MFCAM)	Camas Cr CH	RC	1972	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - This data set does not match the "Camas Creek" data set used in the 2000 Biop - counts are greater than the Biop data set estimates and differences are not consistent.
" "	" "	Loon Cr (MFLOO)	Loon Ck CH	RC	1957	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	Yes - This data set does not match the "Loon Creek" data set used in the 2000 Biop - counts are approximately 16-18x greater than the Biop data set estimates, but the difference is fairly consistent so trends should be comparable.
" "	" "	Marsh Cr (MFMAR)	Marsh Cr CH	Fish	1957	2001	Yes	Yes	Yes - the interim recovery goal is 426 spawners	Yes - Matches the "Marsh Creek" data set used in the 2000 Biop.
" "	" "	Middle Fork Salmon Above Indian Cr. (MFUMA)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Middle Fork Salmon Below Indian Cr. (MFLMA)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Pistol Cr (MFPIS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Sulphur Creek (MFSUL)	Sulphur Cr Sp CH	Fish	1957	2001	Yes	Yes	No - no interim recovery goal	Yes - Matches the "Sulphur Creek" data set used in the 2000 Biop.
" "	Salmon (*S. Fork*)	EF SF Salmon/ Johnson Creek (SFEFS)	Johnson Creek	Fish	1957	2001	Yes	Yes	Yes - the interim recovery goal is 288 spawners	Yes - Matches the "Johnson Creek" data set used in the 2000 Biop.
" "	" "	Secesh R. (SFSEC)	Lake Cr Summer CH	RPM	1952	1997	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - this is the "Lake Creek" data set used in the 2000 Biop, but it has not been updated since then.
" "	" "	" "	Secesh R Summer CH	RC	1957	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - This data set does not match the "Secesh River" data set used in the 2000 Biop - counts are greater than the Biop data set estimates and differences are not consistent.

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Snake River Spring/Summer Chinook Salmon	Salmon (*S. Fork*)	South Fork Salmon (SFMAI)	Poverty Flats	Fish	1957	2001	Yes	Yes	No - no interim recovery goal	Yes - Matches the "Poverty Flats" data set used in the 2000 Biop.
" "	" "	" "	South Fork Salmon Summer CH	RC	1957	2001	Yes	No - data set does not represent spawners	No - there is an interim recovery goal of 9200 spawners, but the data set does not represent spawners.	Yes - This data set does not match the "Salmon R. S. Fork" data set used in the 2000 Biop - counts are approximately 40x greater than the Biop data set estimates, but the difference is consistent so trends should be comparable.
" "	Salmon (*Tribs*)	Chamberlain Cr (SRCHA)	Chamberlain Cr CH	RPM	1952	1997	No - hatchery fraction is not available and many years of returns are missing	No - lambda, which is basis for calculation, could not be estimated and data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	" "	Little Salmon R. (SRLSR)	*Rapid River (hatchery stock)*	*RPM*	*1972*	*2001*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Salmon (*Upper*)	E. Fork Salmon R. (SREFS)	East Fork Salmon Spring CH	RPM	1952	1997	No - hatchery fraction is not available	No - lambda, which is basis for calculation, could not be estimated and data set does not represent spawners	No - there is an interim recovery goal of 700 spawners, but the data set does not represent spawners.	No - This data set does not match the "Salmon River E. Fork" data set used in the 2000 Biop
" "	" "	" "	East Fork Salmon Summer CH	RPM	1957	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - This data set does not match the "Salmon River E. Fork" data set used in the 2000 Biop
" "	" "	" "	Herd Cr CH	RPM	1958	1986	No - hatchery fraction is not available	No - lambda, which is basis for calculation, could not be estimated and data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	" "	Lemhi R (SRLEM)	Lemhi R CH	RC	1957	2001	Yes	No - data set does not represent spawners	No - there is an interim recovery goal of 2200 spawners, but the data set does not represent spawners.	No - This data set does not match the "Lemhi River" data set used in the 2000 Biop - counts are much greater than the Biop data set estimates and differences are not consistent.
" "	" "	NF Salmon River (SRNFS)	North Fork Spring CH	RC	1960	2000	No - hatchery fraction is not available and several years of returns are missing	No - lambda, which is basis for calculation, could not be estimated and data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	" "	Pahsimeroi R (SRPAH)	Pahsimeroi R CH	TLC	1980	2001	No - hatchery fraction is not available and several years of returns are missing	No - lambda, which is basis for calculation, could not be estimated	No - there is an interim recovery goal of 1300 (wild) spawners, but the data set does not distinguish between wild and hatchery spawners.	No - there was not a similar data set used in the 2000 Biop.
" "	" "	*Panther Creek (SRPAN) (Historic population)*	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Upper Mainstem Salmon Above Redfish Lake (SRUMA)	Alturas Lake Cr CH	RC	1957	2001	No - hatchery fraction is not available	No - lambda, which is basis for calculation, could not be estimated and data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - This data set does not match the "Alturas Lake Creek" data set used in the 2000 Biop - counts are several times greater than the Biop data set estimates and differences are not consistent.
" "	" "	Upper Mainstem Salmon Below Redfish Lake (SRLMA)	Upper Salmon Spring CH	RC	1954	2001	No - hatchery fraction is not available	No - lambda, which is basis for calculation, could not be estimated and data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - This data set does not match the "Upper Salmon River" data set used in the 2000 Biop

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ESU	NPCC Subbasin	Population	Spawning Agregation	Data	Start Year	End Year	Can Lambda Be Calculated (Basis For All 2000 Biop Indicator Metrics, Including 50% Likelihood of Lambda>1 Recovery Indicator Metric)?	Can Survival Change For <5% Extinction Risk Be Calculated (For 2000 Biop Survival Indicator Metric)?	Can the Survival Change For 50% Likelihood of Recovery in 48 Years Be Calculated (For 2000 Biop Primary Recovery Indicator Metric)?	Can Updated Estimates Be Compared to 2000 Biop?
Snake River Spring/Summer Chinook Salmon	Salmon (*Upper*)	Upper Mainstem Salmon Below Redfish Lake (SRLMA)	Upper Salmon Summer CH	RPM	1957	1997	No - hatchery fraction is not available	No - lambda, which is basis for calculation, could not be estimated and data set does not represent spawners	No - there is an interim recovery goal of 2000 spawners, but the data set does not represent spawners.	No - This data set does not match the "Upper Salmon River" data set used in the 2000 Biop
" "	" "	Valley Cr (SRVAL)	Upper Valley Cr Spring CH	RC	1957	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - This data set does not match the "Upper Valley Creek" data set used in the 2000 Biop
" "	" "	" "	Upper Valley Cr Summer CH	RPM	1952	2000	No - hatchery fraction is not available and several years of returns are missing	No - lambda, which is basis for calculation, could not be estimated and data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - This data set does not match the "Upper Valley Creek" data set used in the 2000 Biop
		Yankee Fork (SRYFS)	Yankee Fork Spring CH	RPM	1952	1997	No - hatchery fraction is not available	No - lambda, which is basis for calculation, could not be estimated and data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - This data set does not match the "Yankee Fork" data set used in the 2000 Biop
" "	" "	" "	Yankee Fork Summer CH	RC	1960	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - This data set does not match the "Yankee Fork" data set used in the 2000 Biop
" "	" "	" "	Yankee Fork West Fk Spring CH	RC	1960	2001	No - hatchery fraction is not available	No - lambda, which is basis for calculation, could not be estimated and data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - This data set does not match the "Yankee West Fork" data set used in the 2000 Biop - some differences are minor and others are quite large.
Snake River Steelhead	Multiple	Aggregate	ESU Snake R SH (TAC Report)	Fish	1980	2001	Yes	Yes	No - no interim recovery goal	Yes - This data set is a revised version of the "ESU Aggregate" data set used for the 2000 Biop - changes are not significant.
" "	" "	" "	Snake River A Total SH	Fish	1985	2001	Yes (but only after 1985 because of missing data in earlier years)	Yes	No - no interim recovery goal	No - This data set does not match the "A-Run Aggregate" data set used for the 2000 Biop - start year is 1985 (no comparable 1980-84 data), 1985 estimate differs by over 30,000 fish, counts after 1985 are close.
" "	" "	" "	Snake River B Total SH	Fish	1985	2001	Yes (but only after 1985 because of missing data in earlier years)	Yes	No - no interim recovery goal	No - This data set does not match the "B-Run Aggregate" data set used for the 2000 Biop - start year is 1985 (no comparable 1980-84 data), although subsequent years are similar in the two data sets.
" "	Asotin	Asotin Creek (SNASO-s)	Asotin Cr SH	Fish	1986	2001	No - hatchery fraction is not available and several years of returns are missing	No - lambda, which is basis for calculation, could not be estimated	No - there is an interim recovery goal of 500 (wild) spawners, but the data set does not distinguish between wild and hatchery spawners.	No - there was not a similar data set used in the 2000 Biop.
" "	Clearwater	Lochsa River (CRLOC-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Lolo Creek (CRLOL-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Lower Clearwater R (CRLMA-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	*North Fork Clearwater (CRNFC-s) (Historic population)*	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*

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Snake River Steelhead	Clearwater	Selway River (CRSEL-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	South Fork Clearwater (CRSFC-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Grande Ronde	Joseph Creek (GRJOS-s)	Joseph Cr SH	Fish	1974	2002	Yes	Yes	Yes - the interim recovery goal is 1,400 spawners	No - there was not a similar data set used in the 2000 Biop.
" "	" "	Lower Grande Ronde (GRLMT-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Upper Grande Ronde (GRUMA-s)	Upper Mainstem Grande Ronde SH	RPM	1967	2000	Yes	No - data set does not represent spawners	No - There is an interim recovery goal of 4000 spawners, but the data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	" "	Wallowa River (GRWAL-s)	Wallowa SH	RPM	1965	1996	No - hatchery fraction is not available and several years of returns are missing	No - lambda, which is basis for calculation, could not be estimated	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	Imnaha	Imnaha (IRMMT-s)	Camp Cr SH	Fish	1974	2002	Yes	Yes	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	" "	" "	Imnaha R (Zumwalt/Camp Cr) SH	RPM	1974	2000	Yes	No - data set does not represent spawners	No - There is an interim recovery goal of 2700 spawners, but the data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	" "	" "	*Little Sheep Creek Hatchery SH*	*Fish*	*1985*	*2002*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	" "	Little Sheep Creek Wild SH	Fish	1985	2002	Yes (but only after 1985 because of missing data in earlier years)	Yes	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	Salmon River	Chamberlain Creek (SRCHA-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Little Salmon and Lower almon Tribs (SRLSR-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	East Fork Salmon R (SREFS-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Lemhi River (SRLEM-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Lower Middle Fork (MFBIG-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	North Fork Salmon R (SRNFS-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Pahsimeroi River (SRPAH-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Panther Creek (SRPAN-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Secesh River (SFSEC-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	South Fork Salmon R (SFMAI-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Upper Mainstem Salmon R (SRUMA-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Upper Middle Fork Salmon R (MFUMA-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*

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Snake River Steelhead	Snake Hell's Canyon	Hell's Canyon tribs (SNHCT-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Tucannon	Tucannon R (SNTUC-s)	Tucannon R SH	Fish	1987	2001	Yes	Yes	Yes - there is an interim recovery goal of 500 spawners	No - there was not a similar data set used in the 2000 Biop.
Upper Columbia River Spring Chinook Salmon	Entiat	Entiat R (UCENT)	Entiat R CH	Fish	1960	2001	Yes	Yes	Yes - the interim recovery goal is 500 spawners	Yes - Matches the "Entiat River" data set used in the 2000 Biop.
" "	Methow	Methow R (UCMET)	Chewack R CH	RC	1960	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	" "	" "	Lost R-Early Winters Cr CH	Fish	1958	2001	Yes	Yes	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	" "	" "	Methow R CH (Total - Dam)	Fish	1960	2001	Yes	Yes	Yes - the interim recovery goal is 2000 spawners	Yes - Matches the "Methow River" data set used in the 2000 Biop. This data set includes all of the fish in the other Methow R data sets. All returning fish were intercepted in 1996 and 1998 for supplementation program so these years are missing from this data set.
" "	" "	" "	Methow R CH (Total - Dam) - Modified	Fish	1960	2001	Yes	Yes	Yes - the interim recovery goal is 2000 spawners	Yes - Matches the "Methow River" data set used in the 2000 Biop. This data set includes all of the fish in the other Methow R data sets. All returning fish were intercepted in 1996 and 1998 for supplementation program - the intercepted fish are counted as returns in those years for this data set.
" "	" "	" "	Methow R Mainstem CH	RC	1958	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	" "	" "	Twisp R CH	RC	1958	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	Wenatchee	Wenatchee R (UCWEN)	Chiwawa R CH	RC	1958	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	" "	" "	Icicle Cr CH	RC	1958	2001	No - hatchery fraction is not available	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	" "	" "	Little Wenatchee R CH	RC	1958	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	" "	" "	Nason Cr CH	RC	1958	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	" "	" "	Upper Mainstem Wenatchee CH	RC	1959	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	" "	Wenatchee R (UCWEN)	Wenatchee R CH (Total - Dam)	Fish	1960	2001	Yes	Yes	Yes - the interim recovery goal is 3750 spawners	Yes - Matches the "Wenatchee River" data set used in the 2000 Biop. This count includes all of the fish in the other Wenatchee R data sets

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Upper Columbia River Spring Chinook Salmon	Wenatchee	Wenatchee R (UCWEN)	White R CH	RC	1958	2001	Yes	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
Upper Columbia River Steelhead	Methow	Methow R (UCMET-s)	Methow R SH	Fish	1976	2001	Yes	Yes	Yes - the interim recovery goal is 2500 spawners	No - This data set matches the "Methow River" data set used in the 2000 Biop. However, for the 2000 Biop, lambda for this data set was estimated by a different method (QAR - Cooney 2000) than current estimates of lambda. For an unknown reason the results do not appear to be comparable.
" "	Methow& Okanagan	Methow R (UCMET-s) & Okanagan R (UCOKA-s)	Above Wells SH	Fish	1976	2001	Yes	Yes	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	Okanogan	Okanogan R (UCOKA-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Wenatchee	Wenatchee R (UCWEN-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Wenatchee&Entiat	Wenatchee R (UCWEN-s) & Entiat R (UCENT-s)	Wenatchee - Entiat R SH	Fish	1976	2001	Yes	Yes	Yes? - the Wenatchee interim recovery goal is 2500 spawners, the Entiat goal is 500 spawners, so the combined goal could be considered 3000, but there would have to be some assurance that at least 500 fish spawn in the Entiat.	No - This data set matches the "Wenatchee/Entiat River" data set used in the 2000 Biop. However, for the 2000 Biop, lambda for this data set was estimated by a different method (QAR - Cooney 2000) than current estimates of lambda. For an unknown reason the results do not appear to be comparable.
Middle Columbia River Steelhead	Deschutes	Deschutes Eastside (DREST-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Deschutes Eastside (DREST-s) & Westside (DRWST-s)	Deschutes R SH (Sherars)	Fish	1978	2002	Yes	Yes	Yes - the interim recovery goal is 5400 spawners	No - This data set does not match the "Deschutes R Sum" data set used for the 2000 Biop - counts in this data set are considerably lower and do not vary consistently from the Biop data set.
" "	" "	Deschutes Westside (DRWST-s)	Shitike Cr SH	RPM	1976	2002	No - hatchery fraction is not available	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	" "	Deschutes Westside (DRWST-s)	*Warm Springs Hatchery SH*	*Fish*	*1980*	*1999*	*N/A*	*N/A*	*N/A*	*N/A - Also, this data set does not match the "Warm Springs NFH Sum" data set used for the 2000 Biop - counts are off-set by two years.*
" "	Fifteenmile	Fifteenmile Cr (MCFIF s)	Fifteenmile Cr SH	RPM	1964	2001	Yes - but much missing data - can't do 1980-present because 80-83 missing	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	John Day	Lower Mainstem John Day (JDLMT-s)	Lower Mainstem John Day SH	RPM	1965	2002	Yes	No - data set does not represent spawners	No - there is an interim recovery goal of 3200 spawners, but the data set does not represent spawners.	No - there was not a similar data set used in the 2000 Biop.

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Middle Columbia River Steelhead	John Day	Middle Fork John Day (JDMF-s)	Middle Fork John Day SH	RPM	1974	2001	Yes	No - data set does not represent spawners	No - there is an interim recovery goal of 1300 spawners, but the data set does not represent spawners.	No - there was not a similar data set used in the 2000 Biop.
" "	" "	North Fork John Day (JDNFJ-s)	Lower North Fork John Day SH	RPM	1976	2002	Yes	No - data set does not represent spawners	No - there is an interim recovery goal of 1300 spawners, but the data set does not represent spawners.	No - there was not a similar data set used in the 2000 Biop.
" "	" "	" "	Upper North Fork John Day	RPM	1977	2002	Yes	No - data set does not represent spawners	No - no interim recovery goal for Upper N. Fork (just for Upper and Lower, combined) and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	" "	South Fork John Day (JDSF-s)	South Fork John Day SH	RPM	1974	2002	Yes	No - data set does not represent spawners	No - no interim recovery goal for Lower N. Fork (just for Upper and Lower, combined) and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	" "	Upper Mainstem John Day (JDUMA-s)	Upper Mainstem John Day SH	Fish	1974	2002	Yes	Yes	Yes - there is an interim recovery goal of 2000 spawners	No - there was not a similar data set used in the 2000 Biop.
" "	Klickitat	Klickitat R (MCKLI-s)	Klickitat R SH	RC	1990	2002	No - missing years in middle of short data set	No - data set does not represent spawners	No - there is an interim recovery goal of 3600 spawners, but the data set does not represent spawners.	No - there was not a similar data set used in the 2000 Biop.
" "	Palouse	Rock Creek (MCROC-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Yakima	Aggregate - Dam	Yakima R SH	Fish	1980	2001	Yes	Yes	Yes? - the Yakima interim recovery goal is distributed among four reaches. If added together, the aggregate interim recovery goal would be 10,500 spawners, but there would have to be some assurance that the fish were distributed as anticipated in the more specific goals.	Yes - This data set is a revised version of the "Yakima R Sum" data set used for the 2000 Biop - changes are not significant.
" "	" "	Upper Mainstem (YRUMA-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Naches River (YRNAC-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Satus and Toppenish Creeks (YRTOS-s)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Umatilla	Umatilla R (MCUMA-s)	Umatilla R SH	Fish	1966	2002	Yes	Yes	Yes - there is an interim recovery goal of 2300 spawners, and the data set represents spawners.	No - This data set does not match the "Umatilla R Sum" data set used for the 2000 Biop - changes are significant.

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Middle Columbia River Steelhead	Walla Walla	Walla Walla R (WWMAI-s)	Walla Walla R SH	Fish	1993	2000	No - not enough data	No - not enough data	No - although there is a recovery goal of 2600 spawners, there is not enough data to determine the needed survival change	No - there was not a similar data set used in the 2000 Biop.
" "	" "	Touchet R (WWTOU-s)	Touchet R SH	Fish	1987	2001	Yes	Yes	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
Columbia River Chum Salmon	Columbia Estuary	Big Creek (BIGC-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Chinook River (CHIN-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Clatskanie River (CLAT-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Mill Creek (MILL-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Young's Bay (YOUN-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Columbia Gorge	Upper Gorge tribs (UGRG-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Columbia Lower	Lower Gorge tribs (LGRG-CM)	Hardy Cr Chum	Fish	1957	2000	Yes	Yes	No - no interim recovery goal	No - data set does not match any of the chum salmon data sets used in the 2000 Biop
" "	" "	" "	Lower Gorge Chum	Fish	1944	2000	Yes	Yes	No - no interim recovery goal	No - data set does not match any of the chum salmon data sets used in the 2000 Biop
" "	Cowlitz	Cowlitz R. fall/summer (COWL-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Salmon Creek (SALM-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Elochman	Elochman River (ELOC-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Grays R	Grays R. (GRAY-CM)	Grays R Chum	Fish	1951	2000	Yes	Yes	No - no interim recovery goal	No - data set does not match any of the chum salmon data sets used in the 2000 Biop
" "	" "	" "	Grays River II Chum	Fish	1967	1998	No - unresolved questions about data	No - unresolved questions about data	No - no interim recovery goal	No - data set does not match any of the chum salmon data sets used in the 2000 Biop
" "	Kalama River	Kalama River (KALA-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Lewis River	Lewis River (LEWS-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Lower Columbia	Scappose Creek (SCAP-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Sandy	Sandy R. (SAND-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Washougal	Washougal R. (WASH-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Willamette	Clackamas R. (CLCK-CM)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*

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Lower Columbia River Chinook Salmon	Big White Salmon	Big White Salmon R Fall (BWSR-KF)	Big White Salmon R Fall CH	Fish	1967	2001	Yes (but only after 1980 because of missing hatchery fraction in earlier years)	Yes	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	" "	Big White Salmon Spring (BWSR-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Columbia Estuary	Big Creek Fall (BIGC-KF)	Big Creek Fall CH	FPM	1970	2001	No - hatchery fraction is not available	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - data set does not match the "Big Creek" data set used in the 2000 Biop
" "	" "	Clatskanie R Fall (CLAT-KF)	Clatskanie Fall CH	FPM	1970	2001	No - hatchery fraction is not available	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - data set does not match the "Clatskanie" data set used in the 2000 Biop
" "	" "	Mill Creek Fall (MILL-KF)	Mill Creek Fall CH	Fish	1980	2001	Yes	Yes	No - no interim recovery goal	No - data set does not match the "Mill Fall" data set used in the 2000 Biop
" "	" "	Young's Bay Fall (YOUN-KF)	Young's Bay Fall CH	FPM	1950	2001	No - hatchery fraction is not available	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - data set does not match the "Youngs" data set used in the 2000 Biop
" "	Columbia Gorge	Lower Gorge Tribs LGRG-KF)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Upper Gorge Tribs (UGRG-KF)	Wind R Fall CH	Fish	1964	2001	Yes (but only after 1980 because of missing hatchery fraction in earlier years)	Yes	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	Cowlitz	Cispus R Spring (CISP-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Coweeman R Fall (COWE-KF)	Coweeman R Fall CH	Fish	1964	2001	Yes (but only after 1980 because of missing hatchery fraction in earlier years)	Yes	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	" "	Tilton R Spring (TILT-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Toutle R Fall (TOUT-KF)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Toutle R Spring (TOUT-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Upper Cowlitz R Fall (UCWL-KF) + Lower Cowlitz R Fall (LCWL-KF)	Cowlitz R Fall CH	Fish	1964	2000	Yes (but only after 1980 because of missing hatchery fraction in earlier years)	Yes	No - no interim recovery goal	No - data set does not match the "Cowlitz Tule" data set used in the 2000 Biop
" "	" "	Upper Cowlitz R Spring (UCWL-KS)	Cowlitz R Spring CH	Fish	1980	2001	No - hatchery fraction is not available	No - lambda, which is basis for calculation, could not be estimated	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	Elochoman	Elochoman R Fall (ELOC-KF)	Elochoman R Fall CH	Fish	1964	2001	Yes (but only after 1980 because of missing hatchery fraction in earlier years)	Yes	No - no interim recovery goal	Yes - This data set is a revised version of the "Elochoman" data set used for the 2000 Biop - changes are not significant.
" "	Grays	Grays R Fall (GRAY-KF)	Grays R Fall CH	Fish	1964	2001	Yes (but only after 1980 because of missing hatchery fraction in earlier years)	Yes	No - no interim recovery goal	Yes - This data set is a revised version of the "Grays Tule" data set used for the 2000 Biop - changes are not significant.
" "	Hood	Hood R Fall (HOOD-KF)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Hood R Spring (HOOD-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Kalama	Kalama R Fall (KALA-KF)	Kalama R Fall CH	Fish	1964	2001	Yes (but only after 1980 because of missing hatchery fraction in earlier years)	Yes	No - no interim recovery goal	Yes - This data set is a revised version of the "Kalama" data set used for the 2000 Biop - changes are not significant.

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Lower Columbia River Chinook Salmon	Kalama	Kalama R Spring (KALA-KS)	Kalama R Spring CH	Fish	1980	2001	No - hatchery fraction is not available	No - lambda, which is basis for calculation, could not be estimated	No - no interim recovery goal	Yes - This data set is a revised version of the "Kalama Spring" data set used for the 2000 Biop - changes are not significant.
" "	Lewis	Lewis R. Late Fall (LEWL-KF)	EF Lewis CH (tule)	Fish	1980	2000	Yes	Yes	No - no interim recovery goal	Yes? - This data set is a revised version of the "Lewis, E Fk Tule" data set used for the 2000 Biop - most changes are not significant.
" "	" "	" "	Lewis R Late Fall CH (brights)	Fish	1964	2001	Yes	Yes	No - no interim recovery goal	Yes? - This data set is a revised version of the "Lewis R Bright" data set used for the 2000 Biop - most changes are not significant.
" "	" "	Lewis R. Spring (LEWS-KS)	Lewis R. Spring CH	Fish	1980	2001	No - hatchery fraction is not available	No - lambda, which is basis for calculation, could not be estimated	No - no interim recovery goal	Yes - This data set is a revised version of the "Lewis Spring" data set used for the 2000 Biop - changes are not significant.
" "	" "	Salmon Creek Fall (SALM-KF)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Sandy	Sandy River Early Fall (SNDE-KF)	Sandy R Early Fall	Fish	1988	2001	No - not enough data (4 missing years in short time series)	No - lambda, which is basis for calculation, could not be estimated	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	" "	Sandy River Late Fall (SNDL-KF)	Sandy R Late Fall CH	Fish	1984	2001	Yes (but only after 1984 because no data for earlier years)	Yes	No - no interim recovery goal	Yes - matches the "Sandy Late" data set used in the 2000 Biop.
" "	Washougal	Washougal R Fall (WASH-KF)	Washougal R Fall CH	Fish	1964	2001	Yes (but only after 1980 because of missing hatchery fraction in earlier years)	Yes	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	Willamette	Clackamas R Fall Chinook (CLCK-KF)	Clackamas R Fall CH	Fish	1967	2001	No - hatchery fraction is not available	No - lambda, which is basis for calculation, could not be estimated	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
Lower Columbia River Steelhead	Columbia Gorge	Lower Gorge Tributaries (LRG-SW)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Upper Gorge Tributaries (UGRG-SW)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Cowlitz	Cispus R Winter (CISP-SW)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Coweeman R Winter (COWE-SW)	Coweeman R Winter SH	RC	1987	2002	No - not enough data (four missing years in short time series)	No - lambda, which is basis for calculation, could not be estimated and data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	" "	Lower Cowlitz R Winter (LCWL-SW)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	N Fork Toutle R Winter (Green River) (NTOU-SW)	N Fork Toutle Winter SH	Fish	1989	2002	Yes (but only after 1989 because no data for earlier years)	Yes	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	" "	S Fork Toutle R Winter (STOU-SW)	S Fork Toutle Winter SH	Fish	1984	2002	Yes (but only after 1984 because no data for earlier years)	Yes	No - no interim recovery goal	Yes? - This data set is very similar to the "Toutle winter" data set used for the 2000 Biop - most changes are not significant.
" "	" "	Tilton R Winter (TILT-SW)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Upper Cowlitz R Winter (UCWL-SW)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*

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Lower Columbia River Steelhead	Hood	Hood R Summer (HOOD-SS)	Hood R Summer SH	Fish	1992	2000	No - not enough data (does not begin until 1992)	No - lambda, which is basis for calculation, could not be estimated	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	" "	Hood R Winter (HOOD-SW)	Hood R Winter SH	Fish	1992	2000	No - not enough data (does not begin until 1992)	No - lambda, which is basis for calculation, could not be estimated	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	Kalama	Kalama R Summer (KALA-SS)	Kalama R Summer SH	Fish (Trap Count)	1977	2003	Yes	Yes	No - no interim recovery goal	Yes - matches the "Kalama summer" data set used in the 2000 Biop.
" "	" "	Kalama R Winter (KALA-SW)	Kalama R Winter SH	Fish	1977	2002	Yes	Yes	No - no interim recovery goal	Yes - matches the "Kalama River winter" data set used in the 2000 Biop.
" "	Lewis	E Fork Lewis R Summer (ELEW-SS)	EF Lewis R Summer SH	Fish	1996	2003	No - not enough data (does not begin until 1996)	No - lambda, which is basis for calculation, could not be estimated	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	" "	E Fk Lewis R Winter (ELEW-SW)	E Fk Lewis R Winter SH	Fish	1985	1994	Yes (but only after 1985 because no data for earlier years)	Yes	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	" "	N Fork Lewis R Summer (NLEW-SS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	N Fk Lewis R Winter (NLEW-SW)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	Sandy	Salmon Creek Winter (SALM-SW)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Sandy R Winter (SAND-SW)	Sandy R Winter SH	Fish	1978	2001	Yes	Yes	No - no interim recovery goal	Yes - matches the "Sandy winter" data set used in the 2000 Biop.
" "	Washougal	Washougal R Summer (WASH-SS)	Washougal R Summer SH	Fish	1986	2003	Yes (but only after 1989 because no data for earlier years)	Yes	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	" "	Washougal R Winter (WASH-SW)	Washougal R Winter SH	RC	1991	2002	No - not enough data (does not begin until 1991, and 1 year after that is missing)	No - lambda, which is basis for calculation, could not be estimated and data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.
" "	Willamette	Clackamas R Winter (CLCK-SW)	Clackamas R Winter SH	Fish	1958	2001	Yes	Yes	No - no interim recovery goal	No - This data set is a revised version of the "Clackamas winter" data set used for the 2000 Biop - some of the changes are significant.
" "	Wind	Wind R Summer - (WIND-SS)	Wind R Summer SH	Fish	1989	2003	Yes (but only after 1989 because no data for earlier years)	Yes	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
Upper Willamette River Chinook Salmon	Sandy	Sandy R Spring (SAND-KS)	Sandy R Spring CH	Fish	1977	2001	No - hatchery fraction is not available	No - lambda, which is basis for calculation, could not be estimated	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	Willamette	Aggregate	Willamette Falls Spring CH	Fish	1946	2001	No - hatchery fraction is not available	No - lambda, which is basis for calculation, could not be estimated	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	" "	Calapooia R Spring (CALA-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Clackamas R Spring (CLCK-KS)	Clackamas R Spring CH (NF Dam)	Fish	1958	2002	No - hatchery fraction is not available	No - lambda, which is basis for calculation, could not be estimated	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	" "	McKenzie R Spring (MCKZ-KS)	McKenzie R Spring CH (Leaburg Dam)	Fish	1970	2001	No - hatchery fraction is not available prior to 1994	No - lambda, which is basis for calculation, could not be estimated	No - no interim recovery goal	Yes - matches the "McKenzie River above Leaburg" data set used in the 2000 Biop.

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Upper Willamette River Chinook Salmon	Willamette	Middle Fork Willamette Spring (MFWL-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	Mollala R Spring (MOLA-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	N. Santiam R Spring (NSNT-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
" "	" "	S. Santiam R Spring (SSNT-KS)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
Upper Willamette River Steelhead	Willamette	Aggregate	Willamette Falls Winter SH Dam Counts	Fish	1971	2002	No - hatchery fraction is not available	No - lambda, which is basis for calculation, could not be estimated	No - no interim recovery goal	No - does not appear to correspond to the "ESU Aggregate" data set used in the 2000 Biop
" "	" "	Calapooia R Winter (CALA-SW)	Calapooia Winter SH	Fish	1980	1997	Yes	Yes	No - no interim recovery goal	No - This is the "Calapooia" data set used in the 2000 Biop and it has not been updated since then. It is derived from the Calapooia Winter SH (Redd Count) data set, based on run reconstruction information.
" "	" "	" "	Calapooia Winter SH (Redd Count)	RC	1980	2000	No - hatchery fraction not available after 1997	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - does not match the "Calapooia" data set used in the 2000 Biop
" "	" "	Mollala R Winter (MOLA-SW)	Mollala R Winter SH	Fish	1980	1997	Yes	Yes	No - no interim recovery goal	No - This is the "Mollala" data set used in the 2000 Biop and it has not been updated since then. It is derived from the Mollala R Winter SH (Redd Count) data set, based on run reconstruction information.
" "	" "	" "	Mollala R Winter SH (Redd Count)	RC	1980	2000	Yes	Yes	No - no interim recovery goal and data set does not represent spawners	No - does not match the "Mollala" data set used in the 2000 Biop
" "	" "	N. Santiam R Winter (NSNT-SW)	N. Santiam Winter SH (Redd Count)	RC	1983	2000	Yes (but only after 1983 because no data for earlier years)	Yes	No - no interim recovery goal and data set does not represent spawners	No - does not match the "N Santiam" data set used in the 2000 Biop
" "	" "	" "	N. Santiam Winter SH	Fish	1980	1997	Yes	Yes	No - no interim recovery goal	No - This is the "N Santiam" data set used in the 2000 Biop and it has not been updated since then. It is derived from the N Santiam Winter SH (Redd Count) data set, based on run reconstruction information.
" "	" "	S. Santiam R Winter (SSNT-SW)	Foster Dam Winter SH	Fish	1973	2000	Yes - (but only after 1983 because hatchery fraction not available for earlier years)	Yes	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	" "	" "	S. Santiam Winter SH	Fish	1980	1997	Yes	Yes	No - no interim recovery goal	No - This is the "S Santiam" data set used in the 2000 Biop and it has not been updated since then. It is derived from some combination of the other S Santiam data sets.
" "	" "	" "	S. Santiam Winter SH (Foster Dam)	Fish	1967	2002	Yes (but only after 1982 because hatchery fraction not available for earlier years)	Yes	No - no interim recovery goal	No - there was not a similar data set used in the 2000 Biop.
" "	" "	" "	S. Santiam Winter SH (Redd Count)	RC	1980	2001	Yes - (but only after 1983 because hatchery fraction not available for earlier years)	No - data set does not represent spawners	No - no interim recovery goal and data set does not represent spawners	No - there was not a similar data set used in the 2000 Biop.

Table 2. Details regarding use of data sets for evaluating jeopardy indicator metrics in the 2000 FCRPS Biop. Note that, in contrast to Table 1, considerations are not restricted to the 1980-present time period.

ESU	NPCC Subbasin	Population	Spawning Agregation	Data	Start Year	End Year	Can Lambda Be Calculated (Basis For All 2000 Biop Indicator Metrics, Including 50% Likelihood of Lambda>1 Recovery Indicator Metric)?	Can Survival Change For <5% Extinction Risk Be Calculated (For 2000 Biop Survival Indicator Metric)?	Can the Survival Change For 50% Likelihood of Recovery in 48 Years Be Calculated (For 2000 Biop Primary Recovery Indicator Metric)?	Can Updated Estimates Be Compared to 2000 Biop?
Upper Willamette River Steelhead	Willamette	Westside Tributaries Winter (WEST-SW)	*No Applicable Data Set*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*

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				Updated Analysis							Comparable Biop Estimate			Absolute Change	
					20% Hatchery Effectiveness			80% Hatchery Effectiveness							
ESU	NPCC Subbasin	Population	Spawning Agregation	End Year	Lower 95% CI	Lambda	Upper 95% CI	Lower 95% CI	Lambda	Upper 95% CI	End Year	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.
Snake River Fall Chinook Salmon	Snake-Hells Canyon, Snake-Lower	Snake River (SNMAI)	Snake River Fall Total	2001	0.77	0.91	1.09	0.86	1.01	1.17	1996	**0.92**	**0.87**	-0.01	0.30
Snake River Spring/Summer Chinook Salmon	Multiple	Aggregate	Snake R. Spring CH	2001	0.75	**0.91**	1.10	0.65	**0.78**	0.94					
" "	" "	" "	Snake R Spr/Sum CH	1999	0.82	**0.90**	0.98	0.69	**0.77**	0.87	1999	**0.91**	**0.82**	-0.01	-0.05
" "	" "	" "	Snake R. Summer CH	2001	0.84	**0.96**	1.10	0.78	**0.89**	1.02					
" "	Grande Ronde	Catherine Ck (GRCAT)	Catherine Ck CH	1996											
" "	" "	" "	Catherine Cr Index CH	2001	0.77	**0.96**	1.19	0.67	**0.89**	1.19					
" "	" "	*Lookingglass Cr. - (GRLOO) (Historic Population - now only hatchery)*	*Lookingglass Cr CH*	*2001*											
" "	" "	Minam R (GRMIN)	Minam R CH	2001	0.76	**1.04**	1.44	0.70	**1.00**	1.43	1999	**0.98**	**0.93**	0.07	0.07
" "	" "	Upper Mainstem (GRUMA)	Upper Grande Ronde CH	1996											
" "	" "	" "	Upper Grande Ronde Index CH	2001	0.69	**0.87**	1.09	0.60	0.79	1.06					
" "	" "	Wallowa/Lostine (GRLOS)	Lostine R Index CH	2001	0.75	**1.00**	1.35	0.69	**0.96**	1.33	1997	**0.90**	**0.87**	0.10	0.09
" "	" "	" "	Wallowa R Spring CH	2001	0.58	**1.05**	1.88	0.52	**0.99**	1.88					
" "	" "	Wenaha R (GRWEN)	Wenaha R Index Spring CH	2001	0.74	**1.02**	1.42	0.64	**0.95**	1.40					
" "	" "	" "	Wenaha R Spring CH	1996											
" "	Imnaha	Big Sheep Ck (IRBSH)	Big Sheep Ck CH	2000	0.33	**0.79**	1.86	0.32	**0.74**	1.70	1997	**0.88**	**0.85**	-0.09	-0.12
" "	" "	Imnaha R Mainstem (IRMAI)	Imnaha R CH	2001	0.81	**0.98**	1.18	0.76	**0.92**	1.11	1999	**0.89**	**0.88**	0.08	0.04
" "	" "	Imnaha R Mainstem (IRMAI)	Lick Cr (Imnaha) CH	2001											
" "	Tucannon	Tucannon R (SNTUC)	Tucannon R Spring CH	2001	0.79	**0.93**	1.08	0.73	**0.88**	1.07					
" "	Salmon (*Middle Fork*)	Bear Valley/Elk Creeks (MFBEA)	Bear Valley/Elk Cr CH	2001	0.80	**1.07**	1.43	0.80	**1.07**	1.43	1999	**1.02**	**1.02**	0.05	0.05
" "	" "	Big Cr (MFBIG)	Big Cr Spring CH	2001	0.79	**1.06**	1.43	0.79	**1.06**	1.43					
" "	" "	" "	Big Cr Summer CH	2001											
" "	" "	Camas Cr (MFCAM)	Camas Cr CH	2001	0.85	**0.99**	1.15	0.85	**0.99**	1.15					
" "	" "	Loon Cr (MFLOO)	Loon Ck CH	2001	0.84	**1.09**	1.41	0.84	**1.09**	1.41	1999	**1.00**	**1.00**	0.08	0.08
" "	" "	Marsh Cr (MFMAR)	Marsh Cr CH	2001	0.79	**1.05**	1.39	0.79	**1.05**	1.39	1999	**0.99**	**0.99**	0.06	0.06
" "	" "	Middle Fork Salmon Above Indian Cr. (MFUMA)	*No Applicable Data Set*	*N/A*											
" "	" "	Middle Fork Salmon Below Indian Cr. (MFLMA)	*No Applicable Data Set*	*N/A*											
" "	" "	Pistol Cr (MFPIS)	*No Applicable Data Set*	*N/A*											

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				Updated Analysis							Comparable Biop Estimate			Absolute Change	
					20% Hatchery Effectiveness			80% Hatchery Effectiveness							
ESU	NPCC Subbasin	Population	Spawning Agregation	End Year	Lower 95% CI	Lambda	Upper 95% CI	Lower 95% CI	Lambda	Upper 95% CI	End Year	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.
Snake River Spring/Summer Chinook Salmon	Salmon (*Middle Fork*)	Sulphur Creek (MFSUL)	Sulphur Cr Sp CH	2001	0.67	**1.04**	1.63	0.67	**1.04**	1.63	1999	**1.04**	**1.04**	0.00	0.00
" "	Salmon (*S. Fork*)	EF SF Salmon/ Johnson Creek (SFEFS)	Johnson Creek	2001	0.88	**1.03**	1.20	0.88	**1.03**	1.20	1999	**1.01**	**1.01**	0.02	0.02
" "	" "	Secesh R. (SFSEC)	Lake Cr Summer CH	1997											
" "	" "	" "	Secesh R Summer CH	2001	0.91	**1.07**	1.26	0.91	**1.07**	1.26					
" "	" "	South Fork Salmon (SFMAI)	Poverty Flats	2001	0.84	**1.04**	1.29	0.84	**1.04**	1.29	1999	**1.00**	**0.99**	0.04	0.05
" "	" "	" "	South Fork Salmon Summer CH	2001	0.86	**1.07**	1.33	0.85	**1.06**	1.32	1999	**1.06**	**1.06**	0.01	0.00
" "	Salmon (*Tribs*)	Chamberlain Cr (SRCHA)	Chamberlain Cr CH	1997											
" "	" "	Little Salmon R. (SRLSR)	*Rapid River (hatchery stock)*	*2001*											
" "	Salmon (*Upper*)	E. Fork Salmon R. (SREFS)	East Fork Salmon Spring CH	1997											
" "	" "	" "	East Fork Salmon Summer CH	2001	0.70	**1.02**	1.50	0.70	**1.02**	1.50					
" "	" "	" "	Herd Cr CH	1986											
" "	" "	Lemhi R (SRLEM)	Lemhi R CH	2001	0.70	**1.02**	1.49	0.70	**1.02**	1.49					
" "	" "	NF Salmon River (SRNFS)	North Fork Spring CH	2000											
" "	" "	Pahsimeroi R (SRPAH)	Pahsimeroi R CH	2001											
" "	" "	*Panther Creek (SRPAN) (Historic population)*	*No Applicable Data Set*	*N/A*											
" "	" "	Upper Mainstem Salmon Above Redfish Lake (SRUMA)	Alturas Lake Cr CH	2001											
" "	" "	Upper Mainstem Salmon Below Redfish Lake (SRLMA)	Upper Salmon Spring CH	2001											
" "	" "	Upper Mainstem Salmon Below Redfish Lake (SRLMA)	Upper Salmon Summer CH	1997											
" "	" "	Valley Cr (SRVAL)	Upper Valley Cr Spring CH	2001	0.65	**1.07**	1.78	0.65	**1.07**	1.78					
" "	" "	" "	Upper Valley Cr Summer CH	2000											
		Yankee Fork (SRYFS)	Yankee Fork Spring CH	1997											
" "	" "	" "	Yankee Fork Summer CH	2001	0.69	**1.03**	1.53	0.69	**1.03**	1.53					
" "	" "	" "	Yankee Fork West Fk Spring CH	2001											

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					20% Hatchery Effectiveness			80% Hatchery Effectiveness							
ESU	NPCC Subbasin	Population	Spawning Agregation	End Year	Lower 95% CI	Lambda	Upper 95% CI	Lower 95% CI	Lambda	Upper 95% CI	End Year	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.
Snake River Steelhead	Multiple	Aggregate	ESU Snake R SH (TAC Report)	2001	0.75	**0.87**	1.01	0.62	**0.73**	0.86	1997	**0.83**	**0.72**	0.04	0.01
" "	" "	" "	Snake River A Total SH	2001											
" "	" "	" "	Snake River B Total SH	2001											
" "	Asotin	Asotin Creek (SNASO-s)	Asotin Cr SH	2001											
" "	Clearwater	Lochsa River (CRLOC-s)	*No Applicable Data Set*	*N/A*											
" "	" "	Lolo Creek (CRLOL-s)	*No Applicable Data Set*	*N/A*											
" "	" "	Lower Clearwater R (CRLMA-s)	*No Applicable Data Set*	*N/A*											
	" "	*North Fork Clearwater (CRNFC-s) (Historic population)*	*No Applicable Data Set*	*N/A*											
" "	" "	Selway River (CRSEL-s)	*No Applicable Data Set*	*N/A*											
" "	" "	South Fork Clearwater (CRSFC-s)	*No Applicable Data Set*	*N/A*											
" "	Grande Ronde	Joseph Creek (GRJOS-s)	Joseph Cr SH	2002	0.81	**1.05**	1.37	0.81	**1.05**	1.37					
" "	" "	Lower Grande Ronde (GRLMT-s)	*No Applicable Data Set*	*N/A*											
" "	" "	Upper Grande Ronde (GRUMA-s)	Upper Mainstem Grande Ronde SH	2000	0.76	**1.03**	1.39	0.74	**1.01**	1.37					
" "	" "	Wallowa River (GRWAL-s)	Wallowa SH	1996											
" "	Imnaha	Imnaha (IRMMT-s)	Camp Cr SH	2002	0.79	**1.05**	1.38	0.79	**1.05**	1.38					
" "	" "	" "	Imnaha R (Zumwalt/Camp Cr) SH	2000	0.75	**1.00**	1.35	0.72	**0.98**	1.34					
" "	" "	" "	*Little Sheep Creek Hatchery SH*	*2002*											
" "	" "	" "	Little Sheep Creek Wild SH	2002	0.76	**1.05**	1.43	0.76	**1.05**	1.43					
" "	Salmon River	Chamberlain Creek (SRCHA-s)	*No Applicable Data Set*	*N/A*											
" "	" "	Little Salmon and Lower almon Tribs (SRLSR-s)	*No Applicable Data Set*	*N/A*											
" "	" "	East Fork Salmon R (SREFS-s)	*No Applicable Data Set*	*N/A*											
" "	" "	Lemhi River (SRLEM-s)	*No Applicable Data Set*	*N/A*											
" "	" "	Lower Middle Fork (MFBIG-s)	*No Applicable Data Set*	*N/A*											
" "	" "	North Fork Salmon R (SRNFS-s)	*No Applicable Data Set*	*N/A*											
" "	" "	Pahsimeroi River (SRPAH-s)	*No Applicable Data Set*	*N/A*											

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				Updated Analysis							Comparable Biop Estimate			Absolute Change	
					20% Hatchery Effectiveness			80% Hatchery Effectiveness							
ESU	NPCC Subbasin	Population	Spawning Agregation	End Year	Lower 95% CI	Lambda	Upper 95% CI	Lower 95% CI	Lambda	Upper 95% CI	End Year	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.
Snake River Steelhead	Salmon River	Panther Creek (SRPAN-s)	*No Applicable Data Set*	*N/A*											
" "	" "	Secesh River (SFSEC-s)	*No Applicable Data Set*	*N/A*											
" "	" "	South Fork Salmon R (SFMAI-s)	*No Applicable Data Set*	*N/A*											
" "	" "	Upper Mainstem Salmon R (SRUMA-s)	*No Applicable Data Set*	*N/A*											
" "	" "	Upper Middle Fork Salmon R (MFUMA-s)	*No Applicable Data Set*	*N/A*											
" "	Snake Hell's Canyon	Hell's Canyon tribs (SNHCT-s)	*No Applicable Data Set*	*N/A*											
" "	Tucannon	Tucannon R (SNTUC-s)	Tucannon R SH	2001	0.66	**0.82**	1.02	0.60	**0.72**	0.85					
Upper Columbia River Spring Chinook Salmon	Entiat	Entiat R (UCENT)	Entiat R CH	2001	0.79	**0.93**	1.10	0.77	**0.91**	1.07	1998	0.85-0.89	0.81-0.89	0.04-0.08	0.03-0.10
" "	Methow	Methow R (UCMET)	Chewack R CH	2001	0.74	**1.01**	1.39	0.73	**0.99**	1.34					
" "	" "	" "	Lost R-Early Winters Cr CH	2001	0.73	**0.94**	1.20	0.72	**0.93**	1.20					
" "	" "	" "	Methow R CH (Total - Dam)	2001	0.72	1.00	1.40	0.70	0.97	1.35	1998	0.86-0.90	0.85-0.90	0.10-0.14	0.07-0.12
" "	" "	" "	Methow R CH (Total - Dam) - Modified	2001	0.88	1.03	1.21	0.88	1.01	1.17	1998	0.86-0.90	0.85-0.90	0.13-0.17	0.11-0.16
" "	" "	" "	Methow R Mainstem CH	2001	0.73	**0.97**	1.30	0.71	**0.94**	1.26					
" "	" "	" "	Twisp R CH	2001	0.70	**0.93**	1.24	0.70	**0.92**	1.22					
" "	Wenatchee	Wenatchee R (UCWEN)	Chiwawa R CH	2001	0.69	**0.92**	1.23	0.68	**0.90**	1.19					
" "	" "	" "	Icicle Cr CH	2001											
" "	" "	" "	Little Wenatchee R CH	2001	0.68	**0.88**	1.13	0.68	**0.88**	1.13					
" "	" "	" "	Nason Cr CH	2001	0.73	**0.92**	1.17	0.71	**0.90**	1.14					
" "	" "	" "	Upper Mainstem Wenatchee CH	2001	0.53	**0.91**	1.57	0.50	**0.88**	1.55					
" "	" "	Wenatchee R (UCWEN)	Wenatchee R CH (Total - Dam)	2001	0.69	**0.92**	1.24	0.68	**0.91**	1.20	1998	**0.80-0.88**	**0.80-0.88**	0.04-0.12	0.03-0.11
" "	" "	" "	White R CH	2001	0.75	**0.93**	1.15	0.75	**0.93**	1.15					
Upper Columbia River Steelhead	Methow	Methow R (UCMET-s)	Methow R SH	2001	0.66	**0.83**	1.03	0.51	**0.63**	0.77					
" "	Methow& Okanagan	Methow R (UCMET-s) & Okanagan R (UCOKA-s)	Above Wells SH	2001	0.64	**0.80**	0.99	0.49	**0.60**	0.73					
" "	Okanogan	Okanogan R (UCOKA-s)	*No Applicable Data Set*	*N/A*											
" "	Wenatchee	Wenatchee R (UCWEN-s)	*No Applicable Data Set*	*N/A*											
" "	Wenatchee&Entiat	Wenatchee R (UCWEN-s) & Entiat R (UCENT-s)	Wenatchee - Entiat R SH	2001	0.78	**0.93**	1.12	0.66	**0.77**	0.88					

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					20% Hatchery Effectiveness			80% Hatchery Effectiveness							
ESU	NPCC Subbasin	Population	Spawning Agregation	End Year	Lower 95% CI	Lambda	Upper 95% CI	Lower 95% CI	Lambda	Upper 95% CI	End Year	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.
Middle Columbia River Steelhead	Deschutes	Deschutes Eastside (DREST-s)	*No Applicable Data Set*	*N/A*											
" "	" "	Deschutes Eastside (DREST-s) & Westside (DRWST-s)	Deschutes R SH (Sherars)	2002	0.76	**0.95**	1.20	0.69	**0.85**	1.04					
" "	" "	Deschutes Westside (DRWST-s)	Shitike Cr SH	2002											
" "	" "	Deschutes Westside (DRWST-s)	*Warm Springs Hatchery SH*	*1999*											
" "	Fifteenmile	Fifteenmile Cr (MCFIF-s)	Fifteenmile Cr SH	2001											
" "	John Day	Lower Mainstem John Day (JDLMT-s)	Lower Mainstem John Day SH	2002	0.67	**0.99**	1.48	0.67	**0.99**	1.48					
" "	" "	Middle Fork John Day (JDMF-s)	Middle Fork John Day SH	2001	0.77	**1.00**	1.29	0.77	**1.00**	1.29					
" "	" "	North Fork John Day (JDNFJ-s)	Lower North Fork John Day SH	2002	0.70	**1.01**	1.45	0.70	**1.01**	1.45					
" "	" "	" "	Upper North Fork John Day	2002	0.81	**1.01**	1.24	0.81	**1.01**	1.24					
" "	" "	South Fork John Day (JDSF-s)	South Fork John Day SH	2002	0.80	**0.98**	1.20	0.80	**0.98**	1.20					
" "	" "	Upper Mainstem John Day (JDUMA-s)	Upper Mainstem John Day SH	2002	0.75	**0.99**	1.30	0.75	**0.99**	1.30					
" "	Klickitat	Klickitat R (MCKLI-s)	Klickitat R SH	2002											
" "	Palouse	Rock Creek (MCROC-s)	*No Applicable Data Set*	*N/A*											
" "	Yakima	Aggregate - Dam	Yakima R SH	2001	0.86	**1.14**	1.53	0.85	**1.13**	1.50	1994	**1.04**	**1.01**	0.11	0.12
" "	" "	Upper Mainstem (YRUMA-s)	*No Applicable Data Set*	*N/A*											
" "	" "	Naches River (YRNAC-s)	*No Applicable Data Set*	*N/A*											
" "	" "	Satus and Toppenish Creeks (YRTOS-s)	*No Applicable Data Set*	*N/A*											
Middle Columbia River Steelhead	Umatilla	Umatilla R (MCUMA-s)	Umatilla R SH	2002	0.84	**1.01**	1.22	0.80	**0.97**	1.18					
" "	Walla Walla	Walla Walla R (WWMAI-s)	Walla Walla R SH	2000											
" "	" "	Touchet R (WWTOU-s)	Touchet R SH	2001	0.85	**0.96**	1.07	0.83	**0.94**	1.06					

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					20% Hatchery Effectiveness			80% Hatchery Effectiveness							
ESU	NPCC Subbasin	Population	Spawning Agregation	End Year	Lower 95% CI	Lambda	Upper 95% CI	Lower 95% CI	Lambda	Upper 95% CI	End Year	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.
Columbia River Chum Salmon	Columbia Estuary	Big Creek (BIGC-CM)	*No Applicable Data Set*	*N/A*											
" "	" "	Chinook River (CHIN-CM)	*No Applicable Data Set*	*N/A*											
" "	" "	Clatskanie River (CLAT-CM)	*No Applicable Data Set*	*N/A*											
" "	" "	Mill Creek (MILL-CM)	*No Applicable Data Set*	*N/A*											
" "	" "	Young's Bay (YOUN-CM)	*No Applicable Data Set*	*N/A*											
" "	Columbia Gorge	Upper Gorge tribs (UGRG-CM)	*No Applicable Data Set*	*N/A*											
" "	Columbia Lower	Lower Gorge tribs (LGRG-CM)	Hardy Cr Chum	2000	0.88	**1.03**	1.21	0.88	**1.03**	1.21					
" "	" "	" "	Lower Gorge Chum	2000	0.94	**1.03**	1.13	0.94	**1.03**	1.13					
" "	Cowlitz	Cowlitz R. fall/summer (COWL-CM)	*No Applicable Data Set*	*N/A*											
" "	" "	Salmon Creek (SALM-CM)	*No Applicable Data Set*	*N/A*											
" "	Elochman	Elochman River (ELOC-CM)	*No Applicable Data Set*	*N/A*											
" "	Grays R	Grays R. (GRAY-CM)	Grays R Chum	2000	0.92	**1.09**	1.29	0.92	**1.09**	1.29					
" "	" "	" "	Grays River II Chum (Eli added 99,00 from Grays River I for 80-00)	1998											
" "	Kalama River	Kalama River (KALA-CM)	*No Applicable Data Set*	*N/A*											
" "	Lewis River	Lewis River (LEWS-CM)	*No Applicable Data Set*	*N/A*											
" "	Lower Columbia	Scappose Creek (SCAP-CM)	*No Applicable Data Set*	*N/A*											
" "	Sandy	Sandy R. (SAND-CM)	*No Applicable Data Set*	*N/A*											
" "	Washougal	Washougal R. (WASH-CM)	*No Applicable Data Set*	*N/A*											
" "	Willamette	Clackamas R. (CLCK-CM)	*No Applicable Data Set*	*N/A*											

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				Updated Analysis							Comparable Biop Estimate			Absolute Change	
					20% Hatchery Effectiveness			80% Hatchery Effectiveness							
ESU	NPCC Subbasin	Population	Spawning Agregation	End Year	Lower 95% CI	Lambda	Upper 95% CI	Lower 95% CI	Lambda	Upper 95% CI	End Year	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.
Lower Columbia River Chinook Salmon	Big White Salmon	Big White Salmon R Fall (BWSR-KF)	Big White Salmon R Fall CH	2001	0.67	**0.89**	1.18	0.66	**0.88**	1.17					
" "	" "	Big White Salmon Spring (BWSR-KS)	*No Applicable Data Set*	*N/A*											
" "	Columbia Estuary	Big Creek Fall (BIGC-KF)	Big Creek Fall CH	2001											
" "	" "	Clatskanie R Fall (CLAT-KF)	Clatskanie Fall CH	2001											
" "	" "	Mill Creek Fall (MILL-KF)	Mill Creek Fall CH	2001	0.69	**0.88**	1.13	0.62	**0.80**	1.03					
" "	" "	Young's Bay Fall (YOUN-KF)	Young's Bay Fall CH	2001											
" "	Columbia Gorge	Lower Gorge Tribs LGRG-KF)	*No Applicable Data Set*	*N/A*											
" "	" "	Upper Gorge Tribs (UGRG-KF)	Wind R Fall CH	2001	0.53	**0.87**	1.42	0.53	**0.87**	1.41					
" "	Cowlitz	Cispus R Spring (CISP-KS)	*No Applicable Data Set*	*N/A*											
" "	" "	Coweeman R Fall (COWE-KF)	Coweeman R Fall CH	2001	0.84	**1.13**	1.52	0.84	**1.13**	1.52					
" "	" "	Tilton R Spring (TILT-KS)	*No Applicable Data Set*	*N/A*											
" "	" "	Toutle R Fall (TOUT-KF)	*No Applicable Data Set*	*N/A*											
" "	" "	Toutle R Spring (TOUT-KS)	*No Applicable Data Set*	*N/A*											
" "	" "	Upper Cowlitz R Fall (UCWL-KF) + Lower Cowlitz R Fall (LCWL-KF)	Cowlitz R Fall CH	2000	0.59	**0.88**	1.31	0.48	**0.72**	1.09					
" "	" "	Upper Cowlitz R Spring (UCWL-KS)	Cowlitz R Spring CH	2001											
" "	Elochoman	Elochoman R Fall (ELOC-KF)	Elochoman R Fall CH	2001	0.63	**0.92**	1.36	0.53	**0.81**	1.22					
" "	Grays	Grays R Fall (GRAY-KF)	Grays R Fall CH	2001	0.60	**0.89**	1.33	0.57	**0.84**	1.23					
" "	Hood	Hood R Fall (HOOD-KF)	*No Applicable Data Set*	*N/A*											
" "	" "	Hood R Spring (HOOD-KS)	*No Applicable Data Set*	*N/A*											
" "	Kalama	Kalama R Fall (KALA-KF)	Kalama R Fall CH	2001	0.63	**0.93**	1.37	0.57	**0.84**	1.23	1996	**0.99**	**N.A.**	-0.06	N.A.
" "	" "	Kalama R Spring (KALA-KS)	Kalama R Spring CH	2001											
" "	Lewis	Lewis R. Late Fall (LEWL-KF)	EF Lewis CH (tule)	2000	0.92	**0.97**	1.03	0.91	**0.97**	1.03	1996	**0.99**	**N.A.**	-0.02	N.A.
" "	" "	" "	Lewis R Late Fall CH (brights)	2001	0.83	**0.95**	1.09	0.82	**0.94**	1.08	1996	**0.99**	**N.A.**	-0.03	N.A.

Table 3. Updated median population growth rate estimates (lambda), based on 1980 through most recent year available. Where comparable 2000 Biop estimates exist, the absolute difference in (updated - original) estimates is displayed.

				Updated Analysis							Comparable Biop Estimate			Absolute Change	
					20% Hatchery Effectiveness			80% Hatchery Effectiveness							
ESU	NPCC Subbasin	Population	Spawning Agregation	End Year	Lower 95% CI	Lambda	Upper 95% CI	Lower 95% CI	Lambda	Upper 95% CI	End Year	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.
Lower Columbia River Chinook Salmon	Lewis	Lewis R. Spring (LEWS-KS)	Lewis R. Spring CH	2001											
" "	" "	Salmon Creek Fall (SALM-KF)	*No Applicable Data Set*	*N/A*											
" "	Sandy	Sandy River Early Fall (SNDE-KF)	Sandy R Early Fall	2001											
" "	" "	Sandy River Late Fall (SNDL-KF)	Sandy R Late Fall CH	2001											
" "	Washougal	Washougal R Fall (WASH-KF)	Washougal R Fall CH	2001	0.79	**0.95**	1.15	0.69	**0.84**	1.02					
" "	Willamette	Clackamas R Fall Chinook (CLCK-KF)	Clackamas R Fall CH	2001											
Lower Columbia River Steelhead	Columbia Gorge	Lower Gorge Tributaries (LRG-SW)	*No Applicable Data Set*	*N/A*											
" "	" "	Upper Gorge Tributaries (UGRG-SW)	*No Applicable Data Set*	*N/A*											
" "	Cowlitz	Cispus R Winter (CISP-SW)	*No Applicable Data Set*	*N/A*											
" "	" "	Coweeman R Winter (COWE-SW)	Coweeman R Winter SH	2002											
" "	" "	Lower Cowlitz R Winter (LCWL-SW)	*No Applicable Data Set*	*N/A*											
" "	" "	N Fork Toutle R Winter (Green River) (NTOU-SW)	N Fork Toutle Winter SH	2002											
" "	" "	S Fork Toutle R Winter (STOU-SW)	S Fork Toutle Winter SH	2002											
" "	" "	Tilton R Winter (TILT-SW)	*No Applicable Data Set*	*N/A*											
" "	" "	Upper Cowlitz R Winter (UCWL-SW)	*No Applicable Data Set*	*N/A*											
" "	Hood	Hood R Summer (HOOD-SS)	Hood R Summer SH	2000											
" "	" "	Hood R Winter (HOOD-SW)	Hood R Winter SH	2000											
" "	Kalama	Kalama R Summer (KALA-SS)	Kalama R Summer SH	2003	0.66	**0.84**	1.08	0.56	**0.71**	0.92	1996	**0.91**	**0.77**	-0.07	-0.05
" "	" "	Kalama R Winter (KALA-SW)	Kalama R Winter SH	2002	0.87	**0.96**	1.07	0.82	**0.91**	1.01	1995	**0.97**	**0.90**	-0.01	0.00
" "	Lewis	E Fork Lewis R Summer (ELEW-SS)	EF Lewis R Summer SH	2003											
" "	" "	E Fk Lewis R Winter (ELEW-SW)	E Fk Lewis R Winter SH	1994											
" "	" "	N Fork Lewis R Summer (NLEW-SS)	*No Applicable Data Set*	*N/A*											

Table 3. Updated median population growth rate estimates (lambda), based on 1980 through most recent year available. Where comparable 2000 Biop estimates exist, the absolute difference in (updated - original) estimates is displayed.

				Updated Analysis							Comparable Biop Estimate			Absolute Change	
					20% Hatchery Effectiveness			80% Hatchery Effectiveness							
ESU	NPCC Subbasin	Population	Spawning Agregation	End Year	Lower 95% CI	Lambda	Upper 95% CI	Lower 95% CI	Lambda	Upper 95% CI	End Year	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.
Lower Columbia River Steelhead	Lewis	N Fk Lewis R Winter (NLEW-SW)	*No Applicable Data Set*	*N/A*											
" "	Sandy	Salmon Creek Winter (SALM-SW)	*No Applicable Data Set*	*N/A*											
" "	" "	Sandy R Winter (SAND-SW)	Sandy R Winter SH	2001	0.81	**0.91**	1.01	0.75	**0.84**	0.94	1996	**0.91**	**0.85**	-0.01	-0.01
" "	Washougal	Washougal R Summer (WASH-SS)	Washougal R Summer SH	2003											
" "	" "	Washougal R Winter (WASH-SW)	Washougal R Winter SH	2002											
" "	Willamette	Clackamas R Winter (CLCK-SW)	Clackamas R Winter SH	2001	0.76	**0.92**	1.12	0.74	**0.90**	1.11					
" "	Wind	Wind R Summer - (WIND-SS)	Wind R Summer SH	2003											
Upper Willamette River Chinook Salmon	Sandy	Sandy R Spring (SAND-KS)	Sandy R Spring CH	2001											
" "	Willamette	Aggregate	Willamette Falls Spring CH	2001											
" "	" "	Calapooia R Spring (CALA-KS)	*No Applicable Data Set*	*N/A*											
" "	" "	Clackamas R Spring (CLCK-KS)	Clackamas R Spring CH (NF Dam)	2002											
" "	" "	McKenzie R Spring (MCKZ-KS)	McKenzie R Spring CH (Leaburg Dam)	2001											
" "	" "	Middle Fork Willamette Spring (MFWL-KS)	*No Applicable Data Set*	*N/A*											
" "	" "	Mollala R Spring (MOLA-KS)	*No Applicable Data Set*	*N/A*											
" "	" "	N. Santiam R Spring (NSNT-KS)	*No Applicable Data Set*	*N/A*											
" "	" "	S. Santiam R Spring (SSNT-KS)	*No Applicable Data Set*	*N/A*											
Upper Willamette River Steelhead	Willamette	Aggregate	Willamette Falls Winter SH Dam Counts	2002											
" "	" "	Calapooia R Winter (CALA-SW)	Calapooia Winter SH	1997	0.81	**0.99**	1.22	0.81	**0.99**	1.22					
" "	" "	" "	Calapooia Winter SH (Redd Count)	2000											
" "	" "	Mollala R Winter (MOLA-SW)	Mollala R Winter SH	1997	0.89	**0.97**	1.04	0.82	**0.90**	0.98					
" "	" "	" "	Mollala R Winter SH (Redd Count)	2000	0.81	0.96	1.13	1.14	1.36	1.61					
" "	" "	N. Santiam R Winter (NSNT-SW)	N. Santiam Winter SH (Redd Count)	2000											
" "	" "	" "	N. Santiam Winter SH	1997	0.83	**0.95**	1.08	0.81	**0.92**	1.05					

Table 3. Updated median population growth rate estimates (lambda), based on 1980 through most recent year available. Where comparable 2000 Biop estimates exist, the absolute difference in (updated - original) estimates is displayed.

				Updated Analysis							Comparable Biop Estimate			Absolute Change	
					20% Hatchery Effectiveness			80% Hatchery Effectiveness							
ESU	NPCC Subbasin	Population	Spawning Agregation	End Year	Lower 95% CI	Lambda	Upper 95% CI	Lower 95% CI	Lambda	Upper 95% CI	End Year	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.	Lambda @ 20% Hatch. Eff.	Lambda @ 80% Hatch. Eff.
Upper Willamette River Steelhead	Willamette	S. Santiam R Winter (SSNT-SW)	Foster Dam Winter SH	2000											
" "	" "	" "	S. Santiam Winter SH	1997	0.79	**0.95**	1.14	0.77	**0.91**	1.07					
" "	" "	" "	S. Santiam Winter SH (Foster Dam)	2002											
" "	" "	" "	S. Santiam Winter SH (Redd Count)	2001											
" "	" "	Westside Tributaries Winter (WEST-SW)	*No Applicable Data Set*	*N/A*											

Table 4. Range of needed survival improvements to meet the critical jeopardy indicator metric over all data sets. Numbers represent survival multipliers (i.e., 1.04 = 1.04 times the current survival rate; 1.00 means no change is necessary)

	For Critical Indicator Metric			
	With No Additional Survival Improvements:		With Additional Survival Improvements From 2000 Biop	
	Lowest Estimate of Needed Survival Change From Tables 5-17	Highest Estimate of Needed Survival Change From Tables 5-17	Lowest Estimate of Needed Survival Change From Tables 5-17	Highest Estimate of Needed Survival Change From Tables 5-17
Snake River Fall Chinook Salmon	1.04	1.32	1.00	1.00
Snake River Spring/Summer Chinook Salmon	1.00	2.89	1.00	2.23
Snake River Steelhead	1.00	4.73	1.00	3.15
Upper Columbia River Spring Chinook Salmon	1.00	2.08	1.00	1.67
Upper Columbia River Steelhead	1.49	6.91	1.00	4.67
Middle Columbia River Steelhead	1.00	1.98	1.00	1.62
Columbia River Chum Salmon	1.00	1.00	1.00	1.00
Snake River Sockeye Salmon	N/A	N/A	N/A	N/A

Table 5 (Updated Table 9.7-7 in RPA). **Snake River fall chinook** estimates of current and expected median annual population growth rate (lambda), expected survival change from RPA, and additional per-generation survival improvements needed to achieve indicators of NMFS' jeopardy standard after implementing the **RPA**. This presentation assumes no adjustment to lambda to reflect harvest and hydro improvements.

									Additional Change In Survival Needed to Achieve:			
			1980-Present Lambda		Expected Survival Change		Expected Lambda		5% Extinction Risk In 100 Years		50% Recovery In 48 Years or Lambda = 1.0	
Subbasin	Population	Spawning Aggregation	Low[1]	High[2]	Low[3]	High[4]	Low[5]	High[6]	Low[7]	High[8]	Low[7]	High[8]
Snake-Hells Canyon, Snake-Lower	Snake River	Snake River Fall Total	0.94	1.02	1.00	1.00	0.94	1.02	1.00	1.03	1.04	1.32

1 "Low" represents assumption that hatchery-origin natural spawners have been 80% as effective as wild spawners historically.
2 "High" represents assumption that hatchery-origin natural spawners have been 20% as effective as wild spawners historically, except for the Imnaha (50% as effective).
3 "Low" represents
4 "High" represents
5 "Low" represents the "Low" 1980-Present lambda estimate multiplied by the "Low" survival improvement estimate, raised to the power of 1/mean generation time.
6 "High" represents the "High" 1980-Present lambda estimate multiplied by the "High" survival improvement estimate, raised to the power of 1/mean generation time.
7 "Low" represents the lowest estimate of needed survival improvement divided by the "High" estimate of the expected survival improvement.
8 "High" represents the highest estimate of needed survival improvement divided by the "Low" estimate of the expected survival improvement.

Note: The 48-year recovery period is treated as beginning in 1995. Therefore, calculations used a 41-year period from 2003
Note: This table includes only those spawning aggregations for which valid lambda calculations through at least 2000 are available

.....Box indicates estimates based on 50% probability of reaching interim recovery abundance levels in 48 years
.....All other recovery estimates are based on achieving lambda = 1.0 in 48 immediately

Table 6. (Updated TABLE 9.7-7 in RPA). **Snake River fall chinook** estimates of current and expected median annual population growth rate (lambda), expected survival change from RPA, and additional per-generation survival improvements needed to achieve indicators of NMFS' jeopardy standard after implementing the **RPA**. This presentation adjusts lambda as in the 2000 FCRPS Biop to reflect harvest and hydro improvements.

									Additional Change In Survival Needed to Achieve:			
			1980-Present Lambda		Expected Survival Change		Expected Lambda		5% Extinction Risk In 100 Years		50% Recovery In 48 Years or Lambda = 1.0	
Subbasin	Population	Spawning Aggregation	Low[1]	High[2]	Low[3]	High[4]	Low[5]	High[6]	Low[7]	High[8]	Low[7]	High[8]
Snake-Hells Canyon, Snake-Lower	Snake River	Snake River Fall Total	0.94	1.02	1.49	1.86	1.07	1.24	0.54	0.69	0.56	0.89

1 "Low" represents assumption that hatchery-origin natural spawners have been 80% as effective as wild spawners historically.
2 "High" represents assumption that hatchery-origin natural spawners have been 20% as effective as wild spawners historically, except for the Imnaha (50% as effective).
3 "Low" represents 2000 FCRPS Biop "low" survival improvement associated with base-current and current-RPA survival changes
4 "High" represents 2000 FCRPS Biop "high" survival improvement associated with base-current and current-RPA survival changes
5 "Low" represents the "Low" 1980-Present lambda estimate multiplied by the "Low" survival improvement estimate, raised to the power of 1/mean generation time.
6 "High" represents the "High" 1980-Present lambda estimate multiplied by the "High" survival improvement estimate, raised to the power of 1/mean generation time.
7 "Low" represents the lowest estimate of needed survival improvement divided by the "High" estimate of the expected survival improvement.
8 "High" represents the highest estimate of needed survival improvement divided by the "Low" estimate of the expected survival improvement.

Note: The 48-year recovery period is treated as beginning in 1995. Therefore, calculations used a 41-year period from 2003.
Note: **T**his table includes only those spawning aggregations for which valid lambda calculations through at least 2000 are available

…..Box indicates estimates based on 50% probability of reaching interim recovery abundance levels in 48 years
…..All other recovery estimates are based on achieving lambda = 1.0 in 48 immediately

Table 7 (Updated Table 9.7-6 in RPA). **Snake River spring/summer chinook** estimates of current and expected median annual population growth rate (lambda), expected survival change from RPA, and additional per-generation survival improvements needed to achieve indicators of NMFS' jeopardy standard after implementing the RPA. This presentation assumes no adjustment to lambda to reflect hydro improvements.

									Additional Change In Survival Needed to Achieve:			
			1980-Present Lambda		Expected Survival Change		Expected Lambda		5% Extinction Risk In 100 Years		50% Recovery In 48 Years or Lambda = 1.0	
Subbasin	Population	Spawning Aggregation	Low[1]	High[2]	Low[3]	High[4]	Low[5]	High[6]	Low[7]	High[8]	Low[7]	High[8]
Multiple	Aggregate	Snake R. Spring CH	0.78	0.91	1.00	1.00	0.78	0.91	1.16	2.12	1.50	2.89
" "	" "	Snake R Spr/Sum CH	0.77	0.90	1.00	1.00	0.77	0.90	1.09	1.86	1.49	2.56
" "	" "	Snake R. Summer CH	0.89	0.96	1.00	1.00	0.89	0.96	1.00	1.25	1.19	1.70
Grande Ronde	Catherine Cr	Catherine Cr Index CH	0.89	0.96	1.00	1.00	0.89	0.96	N.A	N.A	1.19	1.61
" "	Minam R.	Minam R CH	1.00	1.04	1.00	1.00	1.00	1.04	1.00	1.09	0.98	1.14
" "	Upper Mainstem	Upper Grande Ronde Index CH	0.79	0.87	1.00	1.00	0.79	0.87	N.A	N.A	1.77	2.59
" "	Wallowa R./Lostine R.	Lostine R Index CH	0.96	1.00	1.00	1.00	0.96	1.00	N.A	N.A	1.00	1.19
" "	" "	Wallowa R Spring CH	0.99	1.05	1.00	1.00	0.99	1.05	N.A	N.A	0.84	1.02
" "	Wenaha R	Wenaha R Index Spring CH	0.95	1.02	1.00	1.00	0.95	1.02	N.A	N.A	0.91	1.24
Imnaha	Big Sheep Ck	Big Sheep Ck CH	0.74	0.79	1.00	1.00	0.74	0.79	N.A	N.A	2.29	2.89
" "	Imnaha Mainstem	Imnaha R CH	0.92	0.98	1.00	1.00	0.92	0.98	N.A	N.A	1.32	1.76
Salmon (Middle Fork)	Bear Valley/Elk Creeks	Bear Valley - Elk Cr CH	1.07	1.07	1.00	1.00	1.07	1.07	1.00	1.00	0.93	0.93
" "	Big Cr	Big Cr Spring CH	1.06	1.06	1.00	1.00	1.06	1.06	1.00	1.00	0.75	0.75
" "	Camas Cr	Camas Cr CH	0.99	0.99	1.00	1.00	0.99	0.99	N.A	N.A	1.05	1.05
" "	Loon Cr	Loon Cr CH	1.09	1.09	1.00	1.00	1.09	1.09	N.A	N.A	0.68	0.68
" "	Marsh Cr	Marsh Cr CH	1.05	1.05	1.00	1.00	1.05	1.05	1.00	1.00	1.13	1.13
" "	Sulphur Cr	Sulphur Cr Spring CH	1.04	1.04	1.00	1.00	1.04	1.04	1.42	1.42	0.83	0.83
Salmon (South Fork)	EF SF Salmon/Johnson Cr	Johnson Cr CH	1.03	1.03	1.00	1.00	1.03	1.03	N.A	N.A	1.01	1.01
" "	Secesh R.	Secesh R Summer CH	1.07	1.07	1.00	1.00	1.07	1.07	N.A	N.A	0.74	0.75
" "	South Fork Salmon R.	Poverty Flat CH	1.04	1.04	1.00	1.00	1.04	1.04	1.00	1.00	0.85	0.85
" "	" "	South Fork Salmon Summer CH	1.06	1.07	1.00	1.00	1.06	1.07	N.A	N.A	0.75	0.77
" "	East Fork Salmon	East Fork Salmon Summer CH	1.02	1.02	1.00	1.00	1.02	1.02	N.A	N.A	0.92	0.92
" "	Lemhi R	Lemhi R CH	1.02	1.02	1.00	1.00	1.02	1.02	N.A	N.A	0.92	0.92
" "	Upper Valley Cr	Upper Valley Cr Spring CH	1.07	1.07	1.00	1.00	1.07	1.07	N.A	N.A	0.72	0.72
" "	Yankee Fork	Yankee Fork Summer CH	1.03	1.03	1.00	1.00	1.03	1.03	N.A	N.A	0.91	0.91
Tucannon	Tucannon R	Tucannon R Spring CH	0.88	0.93	1.00	1.00	0.88	0.93	1.23	1.39	1.78	2.28

1 "Low" represents assumption that hatchery-origin natural spawners have been 80% as effective as wild spawners historically.
2 "High" represents assumption that hatchery-origin natural spawners have been 20% as effective as wild spawners historically, except for the Imnaha (50% as effective).
3 "Low" represents
4 "High" represents
5 "Low" represents the "Low" 1980-Present lambda estimate multiplied by the "Low" survival improvement estimate, raised to the power of 1/mean generation time.
6 "High" represents the "High" 1980-Present lambda estimate multiplied by the "High" survival improvement estimate, raised to the power of 1/mean generation time.
7 "Low" represents the lowest estimate of needed survival improvement divided by the "High" estimate of the expected survival improvement.
8 "High" represents the highest estimate of needed survival improvement divided by the "Low" estimate of the expected survival improvement.

Note: The 48-year recovery period is treated as beginning in 1995. Therefore, calculations used a 41-year period from 2003.
Note: This table includes only those spawning aggregations for which valid lambda calculations through at least 2000 are available

….Box indicates estimates based on 50% probability of reaching interim recovery abundance levels in 48 years
….All other recovery estimates are based on achieving lambda = 1.0 in 48 immediately

Table 8 (Updated Table 9.7-6 in RPA). **Snake River spring/summer chinook** estimates of current and expected median annual population growth rate (lambda), expected survival change from RPA, and additional per-generation survival improvements needed to achieve indicators of NMFS' jeopardy standard after implementing the **RPA**. This presentation adjusts lambda as in the 2000 FCRPS Biop to reflect hydro improvements.

									Additional Change In Survival Needed to Achieve:			
			1980-Present Lambda		Expected Survival Change		Expected Lambda		5% Extinction Risk In 100 Years		50% Recovery In 48 Years or Lambda = 1.0	
Subbasin	Population	Spawning Aggregation	Low[1]	High[2]	Low[3]	High[4]	Low[5]	High[6]	Low[7]	High[8]	Low[7]	High[8]
Multiple	Aggregate	Snake R. Spring CH	0.78	0.91	1.30	1.38	0.83	0.98	0.84	1.64	1.08	2.23
" "	" "	Snake R Spr/Sum CH	0.77	0.90	1.30	1.38	0.83	0.98	0.79	1.44	1.08	1.98
" "	" "	Snake R. Summer CH	0.89	0.96	1.30	1.38	0.94	1.03	0.72	0.97	0.86	1.31
Grande Ronde	Catherine Cr	Catherine Cr Index CH	0.89	0.96	1.30	1.38	0.95	1.04	N.A	N.A	0.86	1.24
" "	Minam R.	Minam R CH	1.00	1.04	1.30	1.38	1.07	1.12	0.72	0.84	0.71	0.88
" "	Upper Mainstem	Upper Grande Ronde Index CH	0.79	0.87	1.30	1.38	0.84	0.94	N.A	N.A	1.28	2.00
" "	Wallowa R./Lostine R.	Lostine R Index CH	0.96	1.00	1.30	1.38	1.02	1.08	N.A	N.A	0.72	0.92
" "	" "	Wallowa R Spring CH	0.99	1.05	1.30	1.38	1.07	1.14	N.A	N.A	0.61	0.79
" "	Wenaha R	Wenaha R Index Spring CH	0.95	1.02	1.30	1.38	1.01	1.11	N.A	N.A	0.65	0.96
Imnaha	Big Sheep Ck	Big Sheep Ck CH	0.74	0.79	1.30	1.38	0.80	0.87	N.A	N.A	1.66	2.23
" "	Imnaha Mainstem	Imnaha R CH	0.92	0.98	1.30	1.38	0.97	1.05	N.A	N.A	0.96	1.35
Salmon (Middle Fork)	Bear Valley/Elk Creeks	Bear Valley - Elk Cr CH	1.07	1.07	1.30	1.38	1.13	1.15	0.72	0.77	0.67	0.72
" "	Big Cr	Big Cr Spring CH	1.06	1.06	1.30	1.38	1.12	1.14	0.72	0.77	0.54	0.58
" "	Camas Cr	Camas Cr CH	0.99	0.99	1.30	1.38	1.05	1.06	N.A	N.A	0.76	0.81
" "	Loon Cr	Loon Cr CH	1.09	1.09	1.30	1.38	1.15	1.17	N.A	N.A	0.49	0.53
" "	Marsh Cr	Marsh Cr CH	1.05	1.05	1.30	1.38	1.11	1.12	0.72	0.77	0.82	0.87
" "	Sulphur Cr	Sulphur Cr Spring CH	1.04	1.04	1.30	1.38	1.10	1.12	1.03	1.10	0.60	0.64
Salmon (South Fork)	EF SF Salmon/Johnson Cr	Johnson Cr CH	1.03	1.03	1.30	1.38	1.09	1.11	N.A	N.A	0.73	0.78
" "	Secesh R.	Secesh R Summer CH	1.07	1.07	1.30	1.38	1.14	1.16	N.A	N.A	0.54	0.58
" "	South Fork Salmon R.	Poverty Flat CH	1.04	1.04	1.30	1.38	1.11	1.12	0.72	0.77	0.61	0.65
" "	" "	South Fork Salmon Summer CH	1.06	1.07	1.30	1.38	1.13	1.15	N.A	N.A	0.54	0.60
" "	East Fork Salmon	East Fork Salmon Summer CH	1.02	1.02	1.30	1.38	1.10	1.12	N.A	N.A	0.66	0.71
" "	Lemhi R	Lemhi R CH	1.02	1.02	1.30	1.38	1.08	1.10	N.A	N.A	0.66	0.71
" "	Upper Valley Cr	Upper Valley Cr Spring CH	1.07	1.07	1.30	1.38	1.13	1.15	N.A	N.A	0.52	0.56
" "	Yankee Fork	Yankee Fork Summer CH	1.03	1.03	1.30	1.38	1.10	1.12	N.A	N.A	0.66	0.70
Tucannon	Tucannon R	Tucannon R Spring CH	0.88	0.93	1.30	1.38	0.94	1.01	0.89	1.07	1.29	1.76

1 "Low" represents assumption that hatchery-origin natural spawners have been 80% as effective as wild spawners historically.
2 "High" represents assumption that hatchery-origin natural spawners have been 20% as effective as wild spawners historically, except for the Imnaha (50% as effective).
3 "Low" represents
4 "High" represents
5 "Low" represents the "Low" 1980-Present lambda estimate multiplied by the "Low" survival improvement estimate, raised to the power of 1/mean generation time.
6 "High" represents the "High" 1980-Present lambda estimate multiplied by the "High" survival improvement estimate, raised to the power of 1/mean generation time.
7 "Low" represents the lowest estimate of needed survival improvement divided by the "High" estimate of the expected survival improvement.
8 "High" represents the highest estimate of needed survival improvement divided by the "Low" estimate of the expected survival improvement.

Note: The 48-year recovery period is treated as beginning in 1995. Therefore, calculations used a 41-year period from 200
Note: This table includes only those spawning aggregations for which valid lambda calculations through at least 2000 are availabl

.....Box indicates estimates based on 50% probability of reaching interim recovery abundance levels in 48 years
.....All other recovery estimates are based on achieving lambda = 1.0 in 48 immediately

Table 9 (Updated Table 9.7-11 in RPA). **Snake River steelhead** estimates of current and expected median annual population growth rate (lambda), expected survival change from RPA, and additional per-generation survival improvements needed to achieve indicators of NMFS' jeopardy standard after implementing the **RPA**. This presentation assumes no adjustment to lambda to reflect harvest or hydro improvements.

									Additional Change In Survival Needed to Achieve:			
			1980-Present Lambda		Expected Survival Change		Expected Lambda		5% Extinction Risk In 100 Years		Years or Lambda = 1.0	
Subbasin	Population	Spawning Aggregation	Low[1]	High[2]	Low[3]	High[4]	Low[5]	High[6]	Low[7]	High[8]	Low[7]	High[8]
Multiple	Aggregate	ESU Snake River SH (TAC Report	0.73	0.87	1.00	1.00	0.73	0.87	1.16	2.36	1.99	4.73
Grande Ronde	Joseph Creek	Joseph Cr SH	1.05	1.05	1.00	1.00	1.05	1.05	1.00	1.00	0.83	0.83
Grande Ronde	Upper Grande Ronde	Upper Mainstem Grande Ronde SH	1.01	1.03	1.00	1.00	1.01	1.03	NA	NA	0.87	0.96
Imnaha	Imnaha	Camp Cr SH	1.05	1.05	1.00	1.00	1.05	1.05	1.00	1.00	0.82	0.82
Imnaha	Imnaha	Imnaha R (Zumwalt/Camp Cr) SH	0.98	1.00	1.00	1.00	0.98	1.00	NA	NA	1.00	1.09
Imnaha	Imnaha	Little Sheep Creek Wild SH	1.05	1.05	1.00	1.00	1.05	1.05	1.00	1.00	0.83	0.83
Tucannon	Tucannon R	Tucannon R SH	0.72	0.82	1.00	1.00	0.72	0.82	2.10	3.64	2.47	4.47

1 "Low" represents assumption that hatchery-origin natural spawners have been 80% as effective as wild spawners historically.
2 "High" represents assumption that hatchery-origin natural spawners have been 20% as effective as wild spawners historically, except for the Imnaha (50% as effective).
3 "Low" represents
4 "High" represents
5 "Low" represents the "Low" 1980-Present lambda estimate multiplied by the "Low" survival improvement estimate, raised to the power of 1/mean generation time.
6 "High" represents the "High" 1980-Present lambda estimate multiplied by the "High" survival improvement estimate, raised to the power of 1/mean generation time.
7 "Low" represents the lowest estimate of needed survival improvement divided by the "High" estimate of the expected survival improvement.
8 "High" represents the highest estimate of needed survival improvement divided by the "Low" estimate of the expected survival improvement.

Note: The 48-year recovery period is treated as beginning in 1995. Therefore, calculations used a 41-year period from 2003.
Note: This table includes only those spawning aggregations for which valid lambda calculations through at least 2000 are available

.....Box indicates estimates based on 50% probability of reaching interim recovery abundance levels in 48 yea
.....All other recovery estimates are based on achieving lambda = 1.0 in 48 immediately

Table 10 (Updated Table 9.7-11 in RPA). **Snake River steelhead** estimates of current and expected median annual population growth rate (lambda), expected survival change from RPA, and additional per-generation survival improvements needed to achieve indicators of NMFS' jeopardy standard after implementing the **RPA**. This presentation adjusts lambda as in the 2000 FCRPS Biop to reflect harvest and hydro improvements.

										Additional Change In Survival Needed to Achieve:			
			1980-Present Lambda		Expected Survival Change		Expected Lambda		5% Extinction Risk In 100 Years		Years or Lambda = 1.0	
Subbasin	Population	Spawning Aggregation	Low[1]	High[2]	Low[3]	High[4]	Low[5]	High[6]	Low[7]	High[8]	Low[7]	High[8]
Multiple	Aggregate	ESU Snake River SH (TAC Report	0.73	0.87	1.50	1.61	0.79	0.96	0.72	1.57	1.24	3.15
Grande Ronde	Joseph Creek	Joseph Cr SH	1.05	1.05	1.50	1.61	1.16	1.18	0.62	0.67	0.51	0.55
Grande Ronde	Upper Grande Ronde	Upper Mainstem Grande Ronde SH	1.01	1.03	1.50	1.61	1.10	1.14	NA	NA	0.54	0.64
Imnaha	Imnaha	Camp Cr SH	1.05	1.05	1.50	1.61	1.15	1.17	0.62	0.67	0.51	0.55
Imnaha	Imnaha	Imnaha R (Zumwalt/Camp Cr) SH	0.98	1.00	1.50	1.61	1.08	1.12	NA	NA	0.62	0.72
Imnaha	Imnaha	Little Sheep Creek Wild SH	1.05	1.05	1.50	1.61	1.15	1.17	0.62	0.67	0.51	0.55
Tucannon	Tucannon R	Tucannon R SH	0.72	0.82	1.50	1.61	0.79	0.91	1.31	2.42	1.54	2.98

1 "Low" represents assumption that hatchery-origin natural spawners have been 80% as effective as wild spawners historically.
2 "High" represents assumption that hatchery-origin natural spawners have been 20% as effective as wild spawners historically, except for the Imnaha (50% as effective).
3 "Low" represents
4 "High" represents
5 "Low" represents the "Low" 1980-Present lambda estimate multiplied by the "Low" survival improvement estimate, raised to the power of 1/mean generation time.
6 "High" represents the "High" 1980-Present lambda estimate multiplied by the "High" survival improvement estimate, raised to the power of 1/mean generation time.
7 "Low" represents the lowest estimate of needed survival improvement divided by the "High" estimate of the expected survival improvement.
8 "High" represents the highest estimate of needed survival improvement divided by the "Low" estimate of the expected survival improvement.

Note: The 48-year recovery period is treated as beginning in 1995. Therefore, calculations used a 41-year period from 2003.
Note: This table includes only those spawning aggregations for which valid lambda calculations through at least 2000 are available

….Box indicates estimates based on 50% probability of reaching interim recovery abundance levels in 48 yea
….All other recovery estimates are based on achieving lambda = 1.0 in 48 immediately

Table 11 (Updated Table 9.7-8 in RPA). **Upper Columbia River spring chinook** estimates of current and expected median annual population growth rate (lambda), expected survival change from RPA, and additional per-generation survival improvements needed to achieve indicators of NMFS' jeopardy standard after implementing the RPA. This presentation assumes no adjustment to lambda to reflect hydro improvements.

										Additional Change In Survival Needed to Achieve:			
			1980-Present Lambda		Expected Survival Change		Expected Lambda		5% Extinction Risk In 100 Years		50% Recovery In 48 Years or Lambda =	
Subbasin	Population	Spawning Aggregation	Low[1]	High[2]	Low[3]	High[4]	Low[5]	High[6]	Low[7]	High[8]	Low[7]	High[8]
Entiat	Entiat R	Entiat R CH	0.91	0.93	1.00	1.00	0.91	0.93	1.23	1.33	1.72	1.88
Methow	Methow R	Chewack R CH	0.99	1.01	1.00	1.00	0.99	1.01	NA	NA	0.96	1.04
" "	" "	Lost R-Early Winters Cr CH	0.93	0.94	1.00	1.00	0.93	0.94	1.58	1.57	1.30	1.37
" "	" "	Methow R CH (Total - Dam	0.97	1.00	1.00	1.00	0.97	1.00	1.07	1.15	1.22	1.39
" "	" "	Methow R CH (Total - Dam) - Modifiec	1.01	1.03	1.00	1.00	1.01	1.03	NA	NA	1.09	1.19
" "	" "	Methow R Mainstem CH	0.94	0.97	1.00	1.00	0.94	0.97	NA	NA	1.14	1.31
" "	" "	Twisp R CH	0.92	0.93	1.00	1.00	0.92	0.93	NA	NA	1.37	1.44
Wenatchee	Wenatchee R	Chiwawa R CH	0.90	0.92	1.00	1.00	0.90	0.92	NA	NA	1.43	1.57
" "	" "	Little Wenatchee R CH	0.88	0.88	1.00	1.00	0.88	0.88	NA	NA	1.74	1.71
" "	" "	Nason Cr CH	0.90	0.92	1.00	1.00	0.90	0.92	NA	NA	1.43	1.58
" "	" "	Upper Mainstem Wenatchee CH	0.88	0.91	1.00	1.00	0.88	0.91	NA	NA	1.50	1.74
" "	" "	Wenatchee R CH	0.91	0.92	1.00	1.00	0.91	0.92	1.34	1.29	1.99	2.08
" "	" "	White R CH	0.93	0.93	1.00	1.00	0.93	0.93	NA	NA	1.37	1.37

1 "Low" represents assumption that hatchery-origin natural spawners have been 80% as effective as wild spawners historically.
2 "High" represents assumption that hatchery-origin natural spawners have been 20% as effective as wild spawners historically, except for the Imnaha (50% as effective).
Note: For as yet unknown reasons, lambda was higher under the 80% assumption than under the 20% assumption for four spawning aggregations, so "low" and "high" are reversed from the description in Fo
3 "Low" represents
4 "High" represents
5 "Low" represents the "Low" 1980-Present lambda estimate multiplied by the "Low" survival improvement estimate, raised to the power of 1/mean generation time.
6 "High" represents the "High" 1980-Present lambda estimate multiplied by the "High" survival improvement estimate, raised to the power of 1/mean generation time.
7 "Low" represents the lowest estimate of needed survival improvement divided by the "High" estimate of the expected survival improvement.
8 "High" represents the highest estimate of needed survival improvement divided by the "Low" estimate of the expected survival improvement.

Note: The 48-year recovery period is treated as beginning in 1995. Therefore, calculations used a 41-year period from 2003.
Note: This table includes only those spawning aggregations for which valid lambda calculations through at least 2000 are available

.....Box indicates estimates based on 50% probability of reaching interim recovery abundance levels in 48 yea
.....All other recovery estimates are based on achieving lambda = 1.0 in 48 immediately

Table 12 (Updated Table 9.7-8 in RPA). **Upper Columbia River spring chinook** estimates of current and expected median annual population growth rate (lambda), expected survival change from RPA, and additional per-generation survival improvements needed to achieve indicators of NMFS' jeopardy standard after implementing the RPA. This presentation adjusts lambda as in the 2000 FCRPS Biop to reflect hydro improvements.

										Additional Change In Survival Needed to Achieve:			
			1980-Present Lambda		Expected Survival Change		Expected Lambda		5% Extinction Risk In 100 Years		50% Recovery In 48 Years or Lambda =	
Subbasin	Population	Spawning Aggregation	Low[1]	High[2]	Low[3]	High[4]	Low[5]	High[6]	Low[7]	High[8]	Low[7]	High[8]
Entiat	Entiat R	Entiat R CH	0.91	0.93	1.37	1.55	0.98	1.03	0.79	0.97	0.87	1.08
Methow	Methow R	Chewack R CH	0.99	1.01	1.46	1.65	1.08	1.13	NA	NA	0.58	0.72
" "	" "	Lost R-Early Winters Cr CH	0.93	0.94	1.46	1.65	1.02	1.06	0.96	1.07	0.79	0.94
" "	" "	Methow R CH (Total - Dam	0.97	1.00	1.46	1.65	1.06	1.12	0.65	0.79	0.74	0.95
" "	" "	Methow R CH (Total - Dam) - Modifiec	1.01	1.03	1.46	1.65	1.10	1.16	#VALUE!	#VALUE!	0.66	0.82
" "	" "	Methow R Mainstem CH	0.94	0.97	1.46	1.65	1.03	1.09	NA	NA	0.69	0.89
" "	" "	Twisp R CH	0.92	0.93	1.46	1.65	1.00	1.04	NA	NA	0.83	0.98
Wenatchee	Wenatchee R	Chiwawa R CH	0.90	0.92	1.25	1.42	0.95	1.00	NA	NA	1.00	1.25
" "	" "	Little Wenatchee R CH	0.88	0.88	1.25	1.42	0.93	0.95	NA	NA	1.23	1.36
" "	" "	Nason Cr CH	0.90	0.92	1.25	1.42	0.95	1.00	NA	NA	1.01	1.26
" "	" "	Upper Mainstem Wenatchee CH	0.88	0.91	1.25	1.42	0.93	0.99	NA	NA	1.06	1.39
" "	" "	Wenatchee R CH	0.91	0.92	1.25	1.42	0.96	1.00	0.94	1.03	1.40	1.67
" "	" "	White R CH	0.93	0.93	1.25	1.42	0.98	1.01	NA	NA	0.97	1.10

1 "Low" represents assumption that hatchery-origin natural spawners have been 80% as effective as wild spawners historically.
2 "High" represents assumption that hatchery-origin natural spawners have been 20% as effective as wild spawners historically, except for the Imnaha (50% as effective).
Note: For as yet unknown reasons, lambda was higher under the 80% assumption than under the 20% assumption for four spawning aggregations, so "low" and "high" are reversed from the description in Fo
3 "Low" represents
4 "High" represents
5 "Low" represents the "Low" 1980-Present lambda estimate multiplied by the "Low" survival improvement estimate, raised to the power of 1/mean generation time.
6 "High" represents the "High" 1980-Present lambda estimate multiplied by the "High" survival improvement estimate, raised to the power of 1/mean generation time.
7 "Low" represents the lowest estimate of needed survival improvement divided by the "High" estimate of the expected survival improvement.
8 "High" represents the highest estimate of needed survival improvement divided by the "Low" estimate of the expected survival improvement.

Note: The 48-year recovery period is treated as beginning in 1995. Therefore, calculations used a 41-year period from 2003.
Note: This table includes only those spawning aggregations for which valid lambda calculations through at least 2000 are available

.....Box indicates estimates based on 50% probability of reaching interim recovery abundance levels in 48 yea
.....All other recovery estimates are based on achieving lambda = 1.0 in 48 immediately

Table 13 (Updated Table 9.7-12 in RPA). **Upper Columbia River steelhead** estimates of current and expected median annual population growth rate (lambda), expected survival change from RPA, and additional per-generation survival improvements needed to achieve indicators of NMFS' jeopardy standard after implementing the **RPA**. This presentation assumes no adjustment to lambda to reflect harvest or hydro improvements.

										Additional Change In Survival Needed to			
			1980-Present Lambda		Expected Survival Change		Expected Lambda		5% Extinction Risk In 100 Years		50% Recovery In 48 Years or Lambda = 1.0	
Subbasin	Population	Spawning Aggregation	Low[1]	High[2]	Low[3]	High[4]	Low[5]	High[6]	Low[7]	High[8]	Low[7]	High[8]
Methow	Methow R.	Methow R SH	0.63	0.83	1.00	1.00	0.63	0.83	2.23	6.18	2.47	6.91
Okanogan and Methow	Okanagan R and Methow R.	Above Wells SH	0.60	0.80	1.00	1.00	0.60	0.80	2.44	7.07	2.30	6.71
Wenatchee and Entiat	Wenatchee R. and Entiat R	Wenatchee - Entiat R SH	0.77	0.93	1.00	1.00	0.77	0.93	1.20	2.52	1.49	3.03

1 "Low" represents assumption that hatchery-origin natural spawners have been 80% as effective as wild spawners historically.
2 "High" represents assumption that hatchery-origin natural spawners have been 20% as effective as wild spawners historically, except for the Imnaha (50% as effective).
3 "Low" represents
4 "High" represents
5 "Low" represents the "Low" 1980-Present lambda estimate multiplied by the "Low" survival improvement estimate, raised to the power of 1/mean generation time.
6 "High" represents the "High" 1980-Present lambda estimate multiplied by the "High" survival improvement estimate, raised to the power of 1/mean generation time.
7 "Low" represents the lowest estimate of needed survival improvement divided by the "High" estimate of the expected survival improvement.
8 "High" represents the highest estimate of needed survival improvement divided by the "Low" estimate of the expected survival improvement.

Note: The 48-year recovery period is treated as beginning in 1995. Therefore, calculations used a 41-year period from 2003.
Note: **T**his table includes only those spawning aggregations for which valid lambda calculations through at least 2000 are available

…..Box indicates estimates based on 50% probability of reaching interim recovery abundance levels in 48 yea
…..All other recovery estimates are based on achieving lambda = 1.0 in 48 immediately

Table 14 (Updated Table 9.7-12 in RPA). **Upper Columbia River steelhead** estimates of current and expected median annual population growth rate (lambda), expected survival change from RPA, and additional per-generation survival improvements needed to achieve indicators of NMFS' jeopardy standard after implementing the **RPA**. This presentation adjusts lambda as in the 2000 FCRPS Biop to reflect harvest and hydro improvements.

									Additional Change In Survival Needed to			
			1980-Present Lambda		Expected Survival Change		Expected Lambda		5% Extinction Risk In 100 Years		50% Recovery In 48 Years or Lambda = 1.0	
Subbasin	Population	Spawning Aggregation	Low[1]	High[2]	Low[3]	High[4]	Low[5]	High[6]	Low[7]	High[8]	Low[7]	High[8]
Methow	Methow R.	Methow R SH	0.63	0.83	1.48	1.68	0.70	0.95	1.33	4.18	1.47	4.67
Okanogan and Methow	Okanagan R and Methow R.	Above Wells SH	0.60	0.80	1.48	1.68	0.67	0.92	1.45	4.77	1.37	4.53
Wenatchee and Entiat	Wenatchee R. and Entiat R	Wenatchee - Entiat R SH	0.77	0.93	1.31	1.49	0.83	1.03	0.81	1.92	1.00	2.31

1 "Low" represents assumption that hatchery-origin natural spawners have been 80% as effective as wild spawners historically.
2 "High" represents assumption that hatchery-origin natural spawners have been 20% as effective as wild spawners historically, except for the Imnaha (50% as effective).
3 "Low" represents
4 "High" represents
5 "Low" represents the "Low" 1980-Present lambda estimate multiplied by the "Low" survival improvement estimate, raised to the power of 1/mean generation time.
6 "High" represents the "High" 1980-Present lambda estimate multiplied by the "High" survival improvement estimate, raised to the power of 1/mean generation time.
7 "Low" represents the lowest estimate of needed survival improvement divided by the "High" estimate of the expected survival improvement.
8 "High" represents the highest estimate of needed survival improvement divided by the "Low" estimate of the expected survival improvement.

Note: The 48-year recovery period is treated as beginning in 1995. Therefore, calculations used a 41-year period from 2003.
Note: **T**his table includes only those spawning aggregations for which valid lambda calculations through at least 2000 are available

.....Box indicates estimates based on 50% probability of reaching interim recovery abundance levels in 48 yea
.....All other recovery estimates are based on achieving lambda = 1.0 in 48 immediately

Table 15 (Updated Table 9.7-13 in RPA). **Mid-Columbia River steelhead** estimates of current and expected median annual population growth rate (lambda), expected survival change from RPA, and additional per-generation survival improvements needed to achieve indicators of NMFS' jeopardy standard after implementing the **RPA**. This presentation assumes no adjustment to lambda to reflect harvest or hydro improvements.

									Additional Change In Survival Needed to Achieve:			
			1980-Present Lambda		Expected Survival Change		Expected Lambda		5% Extinction Risk In 100 Years		50% Recovery In 48 Years or Lambda = 1.0	
Subbasin	Population	Spawning Aggregation	Low[1]	High[2]	Low[3]	High[4]	Low[5]	High[6]	Low[7]	High[8]	Low[7]	High[8]
Deschutes	**Deschutes East and West Sides**	**Deschutes R SH**	0.85	0.95	1.00	1.00	0.85	0.95	NA	NA	1.24	1.98
John Day	**Lower Mainstem John Day**	**Lower Mainstem John Day SH**	0.99	0.99	1.00	1.00	0.99	0.99	NA	NA	1.03	1.03
" "	**Middle Fork John Day**	**Middle Fork John Day SH**	1.00	1.00	1.00	1.00	1.00	1.00	NA	NA	1.02	1.02
" "	**North Fork John Day**	**Lower North Fork John Day SH**	1.01	1.01	1.00	1.00	1.01	1.01	NA	NA	0.97	0.97
" "	**" "**	**Upper North Fork John Day SH**	1.01	1.01	1.00	1.00	1.01	1.01	NA	NA	0.98	0.98
" "	**South Fork John Day**	**South Fork John Day SH**	0.98	0.98	1.00	1.00	0.98	0.98	NA	NA	1.08	1.08
" "	**Upper Mainstem John Day**	**Upper Mainstem John Day SH**	0.99	0.99	1.00	1.00	0.99	0.99	1.00	1.00	1.05	1.05
Umatilla	**Umatilla**	**Umatilla R SH**	0.97	1.01	1.00	1.00	0.97	1.01	1.00	1.00	0.96	1.12
Walla Walla	**Touchet R**	**Touchet R SH**	0.94	0.96	1.00	1.00	0.94	0.96	1.00	1.00		
Yakima	**Upper Mainstem, Naches River, and Toppenish and Satus Creek**	**Yakima R SH**	1.13	1.14	1.00	1.00	1.13	1.14	1.00	1.00	0.56	0.58

1 "Low" represents assumption that hatchery-origin natural spawners have been 80% as effective as wild spawners historically.
2 "High" represents assumption that hatchery-origin natural spawners have been 20% as effective as wild spawners historically, except for the Imnaha (50% as effective).
3 "Low" represents
4 "High" represents
5 "Low" represents the "Low" 1980-Present lambda estimate multiplied by the "Low" survival improvement estimate, raised to the power of 1/mean generation time.
6 "High" represents the "High" 1980-Present lambda estimate multiplied by the "High" survival improvement estimate, raised to the power of 1/mean generation time.
7 "Low" represents the lowest estimate of needed survival improvement divided by the "High" estimate of the expected survival improvement.
8 "High" represents the highest estimate of needed survival improvement divided by the "Low" estimate of the expected survival improvement.

Note: The 48-year recovery period is treated as beginning in 1995. Therefore, calculations used a 41-year period from 2003.
Note: **T**his table includes only those spawning aggregations for which valid lambda calculations through at least 2000 are available

…..Box indicates estimates based on 50% probability of reaching interim recovery abundance levels in 48 years
…..All other recovery estimates are based on achieving lambda = 1.0 in 48 immediately

Table 16 (Updated Table 9.7-13 in RPA). **Mid-Columbia River steelhead** estimates of current and expected median annual population growth rate (lambda), expected survival change from RPA, and additional per-generation survival improvements needed to achieve indicators of NMFS' jeopardy standard after implementing the **RPA**. This presentation adjusts lambda as in the 2000 FCRPS Biop to reflect harvest and hydro improvements.

									Additional Change In Survival Needed to Achieve:			
			1980-Present Lambda		Expected Survival Change		Expected Lambda		5% Extinction Risk In 100 Years		50% Recovery In 48 Years or Lambda = 1.0	
Subbasin	Population	Spawning Aggregation	Low[1]	High[2]	Low[3]	High[4]	Low[5]	High[6]	Low[7]	High[8]	Low[7]	High[8]
Deschutes	**Deschutes East and West Sides**	**Deschutes R SH**	0.85	0.95	1.22	1.22	0.89	1.00	NA	NA	1.02	1.62
John Day	**Lower Mainstem John Day**	**Lower Mainstem John Day SH**	0.99	0.99	1.33	1.33	1.07	1.07	NA	NA	0.78	0.78
" "	**Middle Fork John Day**	**Middle Fork John Day SH**	1.00	1.00	1.33	1.33	1.07	1.07	NA	NA	0.76	0.76
" "	**North Fork John Day**	**Lower North Fork John Day SH**	1.01	1.01	1.33	1.33	1.09	1.09	NA	NA	0.73	0.73
" "	**" "**	**Upper North Fork John Day SH**	1.01	1.01	1.33	1.33	1.08	1.08	NA	NA	0.74	0.74
" "	**South Fork John Day**	**South Fork John Day SH**	0.98	0.98	1.33	1.33	1.06	1.06	NA	NA	0.81	0.81
" "	**Upper Mainstem John Day**	**Upper Mainstem John Day SH**	0.99	0.99	1.33	1.33	1.06	1.06	0.75	0.75	0.79	0.79
Umatilla	**Umatilla**	**Umatilla R SH**	0.97	1.01	1.33	1.33	1.05	1.09	0.75	0.75	0.72	0.84
Walla Walla	**Touchet R**	**Touchet R SH**	0.94	0.96	1.09	1.24	0.96	1.00	0.81	0.92		
Yakima	**Upper Mainstem, Naches River, and Toppenish and Satus Creek**	**Yakima R SH**	1.13	1.14	1.09	1.24	1.15	1.20	0.81	0.92	0.45	0.54

1 "Low" represents assumption that hatchery-origin natural spawners have been 80% as effective as wild spawners historically.
2 "High" represents assumption that hatchery-origin natural spawners have been 20% as effective as wild spawners historically, except for the Imnaha (50% as effective).
3 "Low" represents
4 "High" represents
5 "Low" represents the "Low" 1980-Present lambda estimate multiplied by the "Low" survival improvement estimate, raised to the power of 1/mean generation time.
6 "High" represents the "High" 1980-Present lambda estimate multiplied by the "High" survival improvement estimate, raised to the power of 1/mean generation time.
7 "Low" represents the lowest estimate of needed survival improvement divided by the "High" estimate of the expected survival improvement.
8 "High" represents the highest estimate of needed survival improvement divided by the "Low" estimate of the expected survival improvement.

Note: The 48-year recovery period is treated as beginning in 1995. Therefore, calculations used a 41-year period from 2003.
Note: **T**his table includes only those spawning aggregations for which valid lambda calculations through at least 2000 are available

…..Box indicates estimates based on 50% probability of reaching interim recovery abundance levels in 48 years
…..All other recovery estimates are based on achieving lambda = 1.0 in 48 immediately

Table 17 (Updated Table 9.7-16 in RPA). **Columbia River chum salmon** estimates of current and expected median annual population growth rate (lambda), expected survival change from RPA, and additional per-generation survival improvements needed to achieve indicators of NMFS' jeopardy standard after implementing the **RPA**. No survival improvements were estimated in Table 9.7-16.

									Additional Change In Survival Needed to Achieve:			
			1980-Present Lambda		Expected Survival Change		Expected Lambda		5% Extinction Risk In 100 Years		50% Recovery In 48 Years or Lambda = 1.0	
Subbasin	Population	Spawning Aggregation	Low[1]	High[2]	Low[3]	High[4]	Low[5]	High[6]	Low[7]	High[8]	Low[7]	High[8]
Columbia Lower	Lower Gorge	Hardy Cr Chum	1.03	1.03	1.00	1.00	1.03	1.03	1.00	1.00	0.89	0.89
Columbia Lower	Lower Gorge	Lower Gorge Chum	1.03	1.03	1.00	1.00	1.03	1.03	NA	NA	0.90	0.90
Grays R	Grays R	Grays R Chum	1.09	1.09	1.00	1.00	1.09	1.09	1.00	1.00	0.73	0.73

1 "Low" represents assumption that hatchery-origin natural spawners have been 80% as effective as wild spawners historically.
2 "High" represents assumption that hatchery-origin natural spawners have been 20% as effective as wild spawners historically, except for the Imnaha (50% as effective).
3 "Low" represents
4 "High" represents
5 "Low" represents the "Low" 1980-Present lambda estimate multiplied by the "Low" survival improvement estimate, raised to the power of 1/mean generation time.
6 "High" represents the "High" 1980-Present lambda estimate multiplied by the "High" survival improvement estimate, raised to the power of 1/mean generation time.
7 "Low" represents the lowest estimate of needed survival improvement divided by the "High" estimate of the expected survival improvement.
8 "High" represents the highest estimate of needed survival improvement divided by the "Low" estimate of the expected survival improvement.

Note: The 48-year recovery period is treated as beginning in 1995. Therefore, calculations used a 41-year period from 2003.
Note: **T**his table includes only those spawning aggregations for which valid lambda calculations through at least 2000 are available

…..Box indicates estimates based on 50% probability of reaching interim recovery abundance levels in 48 years
…..All other recovery estimates are based on achieving lambda = 1.0 in 48 immediately

Table 18. Updated median population growth rate estimates (lambda), from the earliest available data and fromm 1990 through the most recent year available

				Longest Series								1990-Most Recent						
						20% Hatchery Effectiveness			80% Hatchery Effectiveness				20% Hatchery Effectiveness			80% Hatchery Effectiveness		
ESU	NPPC Subbasin	Population	Spawning aggregation	Start Year	End Year	Lower 95%CI	Median Lambda	Upper 95%CI	Lower 95%CI	Median Lambda	Upper 95%CI	LastYear	Lower 95%CI	Median Lambda	Upper 95%CI	Lower 95%CI	Median Lambda	Upper 95%CI
Snake River Fall Chinook Salmon	**Snake-Hells Canyon, Snake-Lower**	**Snake River (SNMAI)**	**Snake River Fall Total**	1975	2001	0.81	**0.92**	1.04	0.89	**0.99**	1.10	2001	0.85	**1.00**	1.19	0.86	1.10	1.39
Snake River Spring/Summer Chinook Salmon	Multiple	Aggregate	Snake R. Spring CH	1979	2001	0.77	**0.92**	1.10	0.66	**0.79**	0.95	2001	0.31	**0.91**	2.62	0.30	0.76	1.91
" "	" "	" "	Snake R Spr/Sum CH	1980	1999	0.82	**0.90**	0.98	0.69	**0.77**	0.87	1999	0.43	**0.86**	1.73	0.42	0.74	1.29
" "	" "	" "	Snake R. Summer CH	1979	2001	0.85	**0.97**	1.10	0.79	**0.89**	1.02	2001	0.71	**0.97**	1.31	0.64	0.88	1.22
" "	Grande Ronde	Catherine Ck (GRCAT)	Catherine Ck CH	1953	1996	0.76	**0.89**	1.05	0.70	**0.86**	1.05	1996	N.A.	**0.91**	N.A.	N.A.	0.79	N.A.
" "	" "	" "	Catherine Cr Index CH	1957	2001	0.85	**0.96**	1.09	0.80	**0.93**	1.08	2001	0.56	**1.11**	2.21	0.41	1.04	2.63
" "	" "	*(GRLOO) (Historic*	*Lookingglass Cr CH*	*1957*	*2001*													
" "	" "	**Minam R (GRMIN)**	**Minam R CH**	1964	2001	0.82	**0.97**	1.15	0.79	**0.95**	1.13	2001	0.92	**1.08**	1.26	0.72	1.03	1.47
" "	" "	Upper Mainstem (GRUMA)	Upper Grande Ronde CH	1959	1996	0.74	**0.89**	1.08	0.68	**0.85**	1.07	1996	N.A.	**0.81**	N.A.	N.A.	0.68	N.A.
" "	" "	" "	Upper Grande Ronde Index CH	1960	2001	0.81	**0.91**	1.03	0.74	**0.87**	1.03	2001	0.50	**0.88**	1.53	0.33	0.81	1.96
" "	" "	**(GRLOS)**	**Lostine R Index CH**	1964	2001	0.85	**0.97**	1.11	0.82	**0.95**	1.10	2001	0.58	**1.15**	2.27	0.47	1.09	2.55
" "	" "	" "	Wallowa R Spring CH	1963	2001	0.72	**0.94**	1.23	0.69	**0.92**	1.22	2001	N.A.	**1.45**	N.A.	N.A.	1.38	N.A.
" "	" "	Wenaha R (GRWEN)	Wenaha R Index Spring CH	1963	2001	0.82	**0.96**	1.12	0.77	**0.92**	1.10	2001	0.68	**1.22**	2.18	0.49	1.13	2.64
" "	" "	" "	Wenaha R Spring CH	1964	1996	0.77	**0.90**	1.04	0.72	**0.86**	1.03	1996	N.A.	**1.07**	N.A.	N.A.	0.90	N.A.
" "	Imnaha	Big Sheep Ck (IRBSH)	Big Sheep Ck CH	1957	2000	0.59	**0.83**	1.18	0.57	**0.80**	1.14	2000	0.09	**0.96**	10.41	0.09	0.84	7.65
" "	" "	**Imnaha R Mainstem (IRMAI)**	**Imnaha R CH**	1953	2001	0.88	**0.96**	1.04	0.86	**0.93**	1.02	2001	0.50	**1.06**	2.24	0.43	0.94	2.04
" "	" "	" "	Lick Cr (Imnaha) CH	1964	2001													
" "	Tucannon	Tucannon R (SNTUC)	Tucannon R Spring CH	1979	2001	0.81	**0.93**	1.08	0.74	**0.89**	1.07	2001	0.45	**0.90**	1.78	0.44	0.82	1.55
" "	**Salmon (*Middle Fork*)**	**Bear Valley/Elk Creeks (MFBEA)**	**Bear Valley/Elk Cr CH**	1960	2001	0.84	**0.96**	1.09	0.84	**0.96**	1.09	2001	0.33	**1.02**	3.17	0.33	1.02	3.17
" "	" "	Big Cr (MFBIG)	Big Cr Spring CH	1957	2001	0.86	**0.97**	1.10	0.86	**0.97**	1.10	2001	0.34	**1.06**	3.26	0.34	1.06	3.26
" "	" "	" "	Big Cr Summer CH	1957	2001													
" "	" "	Camas Cr (MFCAM)	Camas Cr CH	1972	2001	0.91	**1.01**	1.12	0.91	**1.01**	1.12	2001	0.93	**1.04**	1.17	0.93	1.04	1.17
" "	" "	**Loon Cr (MFLOO)**	**Loon Ck CH**	1957	2001	N.A.	**0.98**	N.A.	N.A.	**0.98**	N.A.	2001	0.28	**1.19**	4.99	0.28	1.19	4.99
" "	" "	**Marsh Cr (MFMAR)**	**Marsh Cr CH**	1957	2001	0.86	**0.97**	1.10	0.86	**0.97**	1.10	2001	0.34	**1.02**	3.07	0.34	1.02	3.07
" "	" "	Middle Fork Salmon Above Indian Cr. (MFUMA)	*No Applicable data set*															
" "	" "	Middle Fork Salmon Below Indian Cr. (MFLMA)	*No Applicable data set*															
" "	" "	Pistol Cr (MFPIS)	*No Applicable data set*															
" "	" "	**Sulphur Creek (MFSUL)**	**Sulphur Cr Sp CH**	1957	2001	0.80	**0.96**	1.16	0.80	**0.96**	1.16	2001	0.24	**0.88**	3.21	0.24	0.88	3.21
" "	**Salmon (*S. Fork*)**	**EF SF Salmon/ Johnson Creek (SFEFS)**	**Johnson Creek**	1957	2001	0.89	**0.97**	1.05	0.89	**0.97**	1.05	2001	0.51	**0.97**	1.86	0.51	0.97	1.86
" "	" "	Secesh R. (SFSEC)	Lake Cr Summer CH	1952	1997	0.84	**0.97**	1.13	0.84	**0.97**	1.13	1997	0.59	**1.00**	1.69	0.59	1.00	1.69
" "	" "	" "	**Secesh R Summer CH**	1957	2001	0.87	**0.97**	1.07	0.87	**0.96**	1.07	2001	0.50	**1.10**	2.42	0.49	1.09	2.41
" "	" "	South Fork Salmon (SFMAI)	Poverty Flats	1957	2001	0.87	**0.96**	1.06	0.87	**0.96**	1.06	2001	0.39	**0.96**	2.33	0.39	0.96	2.33

Table 18. Updated median population growth rate estimates (lambda), from the earliest available data and fromm 1990 through the most recent year available

				Longest Series								1990-Most Recent						
						20% Hatchery Effectiveness			80% Hatchery Effectiveness				20% Hatchery Effectiveness			80% Hatchery Effectiveness		
ESU	NPPC Subbasin	Population	Spawning aggregation	Start Year	End Year	Lower 95%CI	Median Lambda	Upper 95%CI	Lower 95%CI	Median Lambda	Upper 95%CI	LastYear	Lower 95%CI	Median Lambda	Upper 95%CI	Lower 95%CI	Median Lambda	Upper 95%CI
Snake River Spring/Summer Chinook Salmon	**Salmon (*S. Fork*)**	" "	**South Fork Salmon Summer CH**	1957	2001	0.87	**0.97**	1.07	0.87	**0.96**	1.06	2001	0.48	**0.97**	1.99	0.47	0.96	1.95
" "	Salmon (*Tribs*)	Chamberlain Cr (SRCHA)	Chamberlain Cr CH	1952	1997													
" "	" "	Little Salmon R. (SRLSR)	*Rapid River (hatchery stock)*	*1972*	*2001*													
" "	Salmon (*Upper*)	E. Fork Salmon R. (SREFS)	East Fork Salmon Spring CH	1952	1997													
" "	" "	" "	East Fork Salmon Summer CH	1957	2001	0.82	**0.95**	1.09	0.82	**0.95**	1.09	2001	0.20	**1.01**	5.09	0.20	1.01	5.09
" "	" "	" "	Herd Cr CH	1958	1986													
" "	" "	**Lemhi R (SRLEM)**	**Lemhi R CH**	1957	2001	0.83	**0.96**	1.10	0.83	**0.96**	1.10	2001	0.45	**1.13**	2.86	0.45	1.13	2.86
" "	" "	NF Salmon River (SRNFS)	North Fork Spring CH	1960	2000													
" "	" "	Pahsimeroi R (SRPAH)	Pahsimeroi R CH	1980	2001													
" "	" "	*Panther Creek (SRPAN) (Historic population)*	*No Applicable data set*															
" "	" "	Salmon Above	Alturas Lake Cr CH	1957	2001													
" "	" "	Upper Mainstem Salmon Below Redfish Lake (SRLMA)	Upper Salmon Spring CH	1954	2001													
" "	" "	" "	Upper Salmon Summer CH	1957	1997													
" "	" "	**Valley Cr (SRVAL)**	**Upper Valley Cr Spring CH**	1957	2001	0.77	**0.98**	1.25	0.77	**0.98**	1.25	2001	0.39	**1.21**	3.77	0.39	1.21	3.77
" "	" "	" "	Upper Valley Cr Summer CH	1952	2000													
		Yankee Fork (SRYFS)	Yankee Fork Spring CH	1952	1997													
" "	" "	" "	**Yankee Fork Summer CH**	1960	2001	0.75	**0.94**	1.18	0.75	**0.94**	1.18	2001	0.11	**1.01**	9.30	0.11	1.01	9.30
" "	" "	" "	Yankee Fork West Fk Spring CH	1960	2001													
Snake River Steelhead	**Multiple**	**Aggregate**	**ESU Snake R SH (TAC Report)**	1980	2001	0.75	**0.87**	1.01	0.62	**0.73**	0.86	2001	0.46	**0.88**	1.67	0.38	0.71	1.33
" "	" "	" "	**Snake River A Total SH**	1985	2001	0.67	**0.85**	1.08	0.56	**0.70**	0.87	2001	0.46	**0.89**	1.73	0.38	0.72	1.37
" "	" "	" "	**Snake River B Total SH**	1985	2001	0.67	**0.81**	0.98	0.56	**0.68**	0.82	2001	0.50	**0.81**	1.31	0.42	0.67	1.05
" "	Asotin	Asotin Creek (SNASO-s)	Asotin Cr SH	1986	2001													
" "	Clearwater	Lochsa River (CRLOC-s)	*No Applicable data set*															
" "	" "	Lolo Creek (CRLOL-s)	*No Applicable data set*															
" "	" "	Lower Clearwater R (CRLMA-s)	*No Applicable data set*															
" "	" "	*North Fork Clearwater (CRNFC-s) (Historic population)*	*No Applicable data set*															
" "	" "	Selway River (CRSEL-s)	*No Applicable data set*															
" "	" "	South Fork Clearwater (CRSFC-s)	*No Applicable data set*															
" "	Grande Ronde	Joseph Creek (GRJOS-s)	Joseph Cr SH	1974	2002	0.88	**1.07**	1.30	0.88	**1.07**	1.30	2002	0.61	**1.02**	1.71	0.61	1.02	1.71
" "	" "	Lower Grande Ronde (GRLMT-s)	*No Applicable data set*															

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ESU	NPPC Subbasin	Population	Spawning aggregation	Start Year	End Year	Lower 95%CI	Median Lambda	Upper 95%CI	Lower 95%CI	Median Lambda	Upper 95%CI	LastYear	Lower 95%CI	Median Lambda	Upper 95%CI	Lower 95%CI	Median Lambda	Upper 95%CI
Snake River Steelhead	Grande Ronde	Upper Grande Ronde (GRUMA-s)	Upper Mainstem Grande Ronde SH	1967	2000	0.77	**0.96**	1.21	0.76	**0.95**	1.20	2000	0.75	**1.00**	1.33	0.73	0.97	1.28
" "	" "	Wallowa River (GRWAL-s)	Wallowa SH	1965	1996													
" "	Imnaha	Imnaha (IRMMT-s)	Camp Cr SH	1974	2002	0.88	**1.08**	1.32	0.88	**1.08**	1.32	2002	0.68	**1.01**	1.49	0.68	1.01	1.49
" "	" "	" "	Imnaha R (Zumwalt/Camp Cr) SH	1974	2000	0.85	**1.05**	1.30	0.82	**1.03**	1.29	2000	0.84	**0.94**	1.04	0.81	0.91	1.01
" "	" "	" "	*Little Sheep Creek Hatchery SH*	*1985*	*2002*													
" "	" "	" "	Little Sheep Creek Wild SH	1985	2002	0.76	**1.05**	1.43	0.76	**1.05**	1.43	2002	0.47	**1.08**	2.48	0.47	1.08	2.48
" "	Salmon River	Chamberlain Creek (SRCHA-s)	*No Applicable data set*															
" "	" "	Little Salmon and Lower almon Tribs (SRLSR-s)	*No Applicable data set*															
" "	" "	East Fork Salmon R (SREFS-s)	*No Applicable data set*															
" "	" "	Lemhi River (SRLEM-s)	*No Applicable data set*															
" "	" "	Lower Middle Fork (MFBIG-s)	*No Applicable data set*															
" "	" "	North Fork Salmon R (SRNFS-s)	*No Applicable data set*															
" "	" "	Pahsimeroi River (SRPAH-s)	*No Applicable data set*															
" "	" "	Panther Creek (SRPAN-s)	*No Applicable data set*															
" "	" "	Secesh River (SFSEC s)	*No Applicable data set*															
" "	" "	South Fork Salmon R (SFMAI-s)	*No Applicable data set*															
" "	" "	Upper Mainstem Salmon R (SRUMA-s)	*No Applicable data set*															
" "	" "	Upper Middle Fork Salmon R (MFUMA-s)	*No Applicable data set*															
" "	Snake Hell's Canyon	Hell's Canyon tribs (SNHCT-s)	*No Applicable data set*															
" "	Tucannon	Tucannon R (SNTUC-s)	Tucannon R SH	1987	2001	0.66	**0.82**	1.02	0.60	**0.72**	0.85	2001	0.70	**0.85**	1.03	0.62	0.73	0.86
Upper Columbia Spring Chinook Salmon	**Entiat**	**Entiat R (UCENT)**	**Entiat R CH**	1960	2001	0.88	**0.97**	1.06	0.87	**0.95**	1.05	2001	0.37	**0.93**	2.37	0.37	0.90	2.19
" "	Methow	Methow R (UCMET)	Chewack R CH	1960	2001	0.81	**0.96**	1.14	0.80	**0.94**	1.12	2001	0.24	**0.98**	4.00	0.25	0.95	3.65
" "	" "	" "	Lost R-Early Winters Cr CH	1958	2001	0.84	**0.95**	1.08	0.83	**0.95**	1.08	2001	0.28	**0.88**	2.75	0.29	0.87	2.59
" "	" "	" "	Methow R CH (Total - Dam)	1960	2001	0.84	**0.96**	1.10	0.83	**0.95**	1.09							
" "	" "	" "	Methow R CH (Total - Dam) - Modified	1960	2001	0.87	**0.97**	1.08	0.86	**0.96**	1.06	2001		**0.83**			0.83	
" "	" "	" "	Methow R Mainstem CH	1958	2001	0.87	**1.02**	1.09	0.85	**1.00**	1.07	2001	0.20	**0.96**	4.55	0.21	0.92	4.07
" "	" "	" "	Twisp R CH	1958	2001	0.82	**0.94**	1.08	0.81	**0.93**	1.07	2001	0.26	**0.86**	2.87	0.27	0.84	2.62
" "	Wenatchee	Wenatchee R (UCWEN)	Chiwawa R CH	1958	2001	0.85	**0.97**	1.11	0.84	**0.96**	1.11	2001	0.22	**0.91**	3.81	0.23	0.87	3.32
" "	" "	" "	Icicle Cr CH	1958	2001							2001						
" "	" "	" "	Little Wenatchee R CH	1958	2001	0.81	**0.96**	1.14	0.81	**0.96**	1.14	2001	0.27	**0.82**	2.50	0.27	0.82	2.47
" "	" "	" "	Nason Cr CH	1958	2001	0.86	**0.96**	1.07	0.84	**0.95**	1.07	2001	0.24	**0.91**	3.49	0.25	0.86	2.94
" "	" "	" "	Upper Mainstem Wenatchee CH	1959	2001	0.75	**0.93**	1.15	0.74	**0.92**	1.14	2001	0.15	**0.73**	3.58	0.17	0.68	2.83

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				Longest Series								1990-Most Recent						
						20% Hatchery Effectiveness			80% Hatchery Effectiveness				20% Hatchery Effectiveness			80% Hatchery Effectiveness		
ESU	NPPC Subbasin	Population	Spawning aggregation	Start Year	End Year	Lower 95%CI	Median Lambda	Upper 95%CI	Lower 95%CI	Median Lambda	Upper 95%CI	LastYear	Lower 95%CI	Median Lambda	Upper 95%CI	Lower 95%CI	Median Lambda	Upper 95%CI
Upper Columbia Spring Chinook Salmon	Wenatchee	" "	**Wenatchee R CH (Total - Dam)**	1960	2001	0.83	**0.96**	1.11	0.82	**0.95**	1.10	2001	0.19	**0.93**	4.47	0.21	0.89	3.89
" "	" "	" "	White R CH	1958	2001	0.87	**0.99**	1.13	0.87	**0.99**	1.13	2001	0.34	**0.93**	2.56	0.34	0.93	2.56
Upper Columbia Steelhead	**Methow**	**Methow R (UCMET-s)**	**Methow R CH**	1976	2001	0.70	**0.82**	0.96	0.53	**0.62**	0.72	2001	0.30	**0.85**	2.37	0.26	0.65	1.67
" "	Methow& Okanagan	Methow R (UCMET-s) & Okanagan R (UCOKA-s)	Above Wells SH	1976	2001	0.68	**0.79**	0.93	0.51	**0.59**	0.69	2001	0.29	**0.81**	2.22	0.24	0.61	1.54
" "	Okanogan	Okanogan R (UCOKA-s)	*No Applicable data set*															
" "	Wenatchee	Wenatchee R (UCWEN-s)	*No Applicable data set*															
" "	**Wenatchee&Entiat**	**Wenatchee R (UCWEN-s) & Entiat R (UCENT-s)**	**Wenatchee - Entiat R SH**	1976	2001	0.80	**0.94**	1.10	0.67	**0.76**	0.87	2001	0.56	**0.96**	1.66	0.47	0.78	1.30
Middle Columbia Steelhead	Deschutes	Deschutes Eastside (DREST-s)	*No Applicable data set*															
" "	" "	**Deschutes Eastside (DREST-s) & Westside (DRWST-s)**	**Deschutes R SH (Sherars)**	1978	2002	0.78	**0.97**	1.20	0.70	**0.86**	1.07	2002	0.50	**0.98**	1.93	0.46	0.85	1.55
" "	" "	Deschutes Westside (DRWST-s)	Shitike Cr SH	1976	2002													
" "	" "	" "	***Warm Springs Hatchery SH***	*1980*	*1999*	0.76	**0.94**	1.17	0.76	**0.94**	1.17	1999	0.28	**0.90**	2.94	0.28	0.90	2.94
" "	Fifteenmile	Fifteenmile Cr (MCFIFs)	Fifteenmile Cr SH	1964	2001	0.85	0.97	1.12	0.85	0.97	1.12	2001	1.12	1.13	1.13	1.12	1.13	1.13
" "	John Day	Lower Mainstem John Day (JDLMT-s)	Lower Mainstem John Day SH	1965	2002	0.81	**0.98**	1.18	0.81	**0.98**	1.18	2002	0.52	**0.99**	1.91	0.52	0.99	1.91
" "	" "	Middle Fork John Day (JDMF-s)	Middle Fork John Day SH	1974	2001	0.80	**0.97**	1.16	0.80	**0.97**	1.16	2001	0.44	**0.95**	2.05	0.44	0.95	2.05
" "	" "	North Fork John Day (JDNFJ-s)	Lower North Fork John Day SH	1976	2002	0.77	**1.01**	1.34	0.77	**1.01**	1.34	2002	0.84	**1.17**	1.63	0.84	1.17	1.63
" "	" "	" "	Upper North Fork John Day	1977	2002	0.85	**1.01**	1.21	0.85	**1.01**	1.21	2002	N.A.	**1.08**	N.A.	N.A.	1.08	N.A.
" "	" "	South Fork John Day (JDSF-s)	South Fork John Day SH	1974	2002	0.82	**0.97**	1.14	0.82	**0.97**	1.14	2002	0.57	**1.01**	1.79	0.57	1.01	1.79
" "	" "	Upper Mainstem John Day (JDUMA-s)	Upper Mainstem John Day SH	1974	2002	0.80	**0.97**	1.18	0.80	**0.97**	1.18	2002	0.55	**0.96**	1.69	0.54	0.96	1.68
" "	Klickitat	Klickitat R (MCKLI-s)	Klickitat R SH	1990	2002													
" "	Palouse	Rock Creek (MCROC-s)	*No Applicable data set*															
" "	**Yakima**	**Aggregate - Dam**	**Yakima R SH**	1980	2001	0.86	**1.14**	1.53	0.85	**1.13**	1.50	2001	0.51	**1.10**	2.35	0.51	1.09	2.32
" "	" "	Upper Mainstem (YRUMA-s)	*No Applicable data set*															
" "	" "	Naches River (YRNAC-s)	*No Applicable data set*															
" "	" "	Satus and Toppenish Creeks (YRTOS-s)	*No Applicable data set*															

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				Longest Series								1990-Most Recent						
						20% Hatchery Effectiveness			80% Hatchery Effectiveness				20% Hatchery Effectiveness			80% Hatchery Effectiveness		
ESU	NPPC Subbasin	Population	Spawning aggregation	Start Year	End Year	Lower 95%CI	Median Lambda	Upper 95%CI	Lower 95%CI	Median Lambda	Upper 95%CI	LastYear	Lower 95%CI	Median Lambda	Upper 95%CI	Lower 95%CI	Median Lambda	Upper 95%CI
Middle Columbia Steelhead	**Umatilla**	**Umatilla R (MCUMA-s)**	**Umatilla R SH**	1966	2002	0.91	**1.00**	1.09	0.88	**0.97**	1.07	2002	0.68	**1.04**	1.60	0.64	0.96	1.44
" "	Walla Walla	Walla Walla R (WWMAI-s)	Walla Walla R SH	1993	2000	N.A.	**0.90**	N.A.	N.A.	**0.88**	N.A.							
" "	" "	Touchet R (WWTOU-s)	Touchet R SH	1987	2001	0.85	**0.96**	1.07	0.83	**0.94**	1.06	2001	0.78	**0.98**	1.23	0.76	0.96	1.23
Columbia River Chum Salmon	Columbia Estuary	Big Creek (BIGC-CM)	*No Applicable data set*															
" "	" "	Chinook River (CHIN-CM)	*No Applicable data set*															
" "	" "	Clatskanie River (CLAT-CM)	*No Applicable data set*															
" "	" "	Mill Creek (MILL-CM)	*No Applicable data set*															
" "	" "	Young's Bay (YOUN-CM)	*No Applicable data set*															
" "	Columbia Gorge	Upper Gorge tribs (UGRG-CM)	*No Applicable data set*															
" "	Columbia Lower	Lower Gorge tribs (LGRG-CM)	Hardy Cr Chum	1957	2000	0.91	**1.00**	1.10	0.88	**1.03**	1.21	2000	0.67	**0.95**	1.35	0.94	1.04	1.15
" "	" "	" "	Lower Gorge Chum	1944	2000	0.91	**0.99**	1.08	0.91	**0.99**	1.08	2000	0.59	**1.00**	1.69	0.59	1.00	1.69
" "	Cowlitz	Cowlitz R. fall/summer (COWL-CM)	*No Applicable data set*															
" "	" "	Salmon Creek (SALM-CM)	*No Applicable data set*															
" "	Elochman	Elochman River (ELOC-CM)	*No Applicable data set*															
" "	Grays R	Grays R. (GRAY-CM)	Grays R Chum	1967	2000	0.94	**1.04**	1.15	0.92	**1.09**	1.29	2000	N.A.	**0.96**	N.A.	0.91	1.00	1.10
" "	" "	" "	Grays River II Chum (Eli added 99,00 from Grays River I for 80-00)	1967	1998													
" "	Kalama River	Kalama River (KALA-CM)	*No Applicable data set*															
" "	Lewis River	Lewis River (LEWS-CM)	*No Applicable data set*															
" "	Lower Columbia	Scappose Creek (SCAP-CM)	*No Applicable data set*															
" "	Sandy	Sandy R. (SAND-CM)	*No Applicable data set*															
" "	Washougal	Washougal R. (WASH CM)	*No Applicable data set*															
" "	Willamette	Clackamas R. (CLCK-CM)	*No Applicable data set*															
Lower Columbia Chinook Salmon	Big White Salmon	Big White Salmon R Fall (BWSR-KF)	Big White Salmon R Fall CH	1967	2001	0.70	**0.89**	1.13	0.69	**0.88**	1.12	2001	0.65	**0.88**	1.18	0.71	0.86	1.04
" "	" "	Big White Salmon Spring (BWSR-KS)	*No Applicable data set*															
" "	Columbia Estuary	Big Creek Fall (BIGC-KF)	Big Creek Fall CH	1970	2001													
" "	" "	Clatskanie R Fall (CLAT-KF)	Clatskanie Fall CH	1970	2001													

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				Longest Series								1990-Most Recent						
						20% Hatchery Effectiveness			80% Hatchery Effectiveness				20% Hatchery Effectiveness			80% Hatchery Effectiveness		
ESU	NPPC Subbasin	Population	Spawning aggregation	Start Year	End Year	Lower 95%CI	Median Lambda	Upper 95%CI	Lower 95%CI	Median Lambda	Upper 95%CI	LastYear	Lower 95%CI	Median Lambda	Upper 95%CI	Lower 95%CI	Median Lambda	Upper 95%CI
Lower Columbia Chinook Salmon	Columbia Estuary	Mill Creek Fall (MILL-KF)	Mill Creek Fall CH	1980	2001	0.69	**0.88**	1.13	0.62	**0.80**	1.03	2001	0.46	**0.81**	1.42	0.38	0.72	1.35
" "	" "	Young's Bay Fall (YOUN-KF)	Young's Bay Fall CH	1950	2001													
" "	Columbia Gorge	Lower Gorge Tribs LGRG-KF)	*No Applicable data set*															
" "	" "	Upper Gorge Tribs (UGRG-KF)	*No Applicable data set*															
" "	Cowlitz	Cispus R Spring (CISP-KS)	*No Applicable data set*															
" "	" "	Coweeman R Fall (COWE-KF)	Coweeman R Fall CH	1964	2001	0.89	**1.13**	1.44	0.89	**1.13**	1.44	2001	0.33	**1.05**	3.34	0.33	1.05	3.34
" "	" "	Tilton R Spring (TILT-KS)	*No Applicable data set*															
" "	" "	Toutle R Fall (TOUT-KF)	*No Applicable data set*															
" "	" "	Toutle R Spring (TOUT-KS)	*No Applicable data set*															
" "	" "	Upper Cowlitz R Fall (UCWL-KF) + Lower Cowlitz R Fall (LCWL-KF)	Cowlitz R Fall CH	1964	2000	0.64	**0.88**	1.21	0.52	**0.72**	1.00	2000	N.A.	**1.00**	N.A.	0.68	0.84	1.03
" "	" "	Upper Cowlitz R Spring (UCWL-KS)	*No Applicable data set*															
" "	Elochoman	Elochoman R Fall (ELOC-KF)	Elochoman R Fall CH	1964	2001	0.67	**0.92**	1.27	0.57	**0.81**	1.13	2001	0.33	**0.95**	2.76	0.23	0.85	3.15
" "	Grays	Grays R Fall (GRAY-KF)	Grays R Fall CH	1964	2001	0.65	**0.89**	1.24	0.61	**0.84**	1.15	2001	0.71	**0.92**	1.21	0.84	0.87	0.90
" "	Hood	Hood R Fall (HOOD-KF)	*No Applicable data set*															
" "	" "	Hood R Spring (HOOD-KS)	*No Applicable data set*															
" "	Kalama	Kalama R Fall (KALA-KF)	Kalama R Fall CH	1964	2001	0.68	**0.93**	1.28	0.61	**0.84**	1.15	2001	0.50	**0.90**	1.62	0.43	0.82	1.56
" "	" "	Kalama R Spring (KALA-KS)	Kalama R Spring CH	1980	2001													
" "	Lewis	Lewis R. Late Fall (LEWL-KF)	EF Lewis CH (tule)	1980	2000	0.92	**0.97**	1.03	0.91	**0.97**	1.03	2000	0.76	**1.00**	1.32	0.76	1.00	1.32
" "	" "	" "	Lewis R Late Fall CH (brights)	1964	2001	0.85	**0.95**	1.06	0.84	**0.94**	1.05	2001	0.73	**0.93**	1.20	0.72	0.92	1.19
" "	" "	Lewis R. Spring (LEWS-KS)	Lewis R. Spring CH	1980	2001													
" "	" "	Salmon Creek Fall (SALM-KF)	*No Applicable data set*															
" "	Sandy	Sandy River Early Fall (SNDE-KF)	Sandy R Early Fall	1988	2001													
" "	" "	Sandy River Late Fall (SNDL-KF)	Sandy R Late Fall CH	1984	2001	0.83	**0.94**	1.07	0.82	**0.94**	1.06	2001	0.61	**0.92**	1.39	0.60	0.91	1.38
" "	Washougal	Washougal R Fall (WASH-KF)	Washougal R Fall CH	1964	2001	0.82	**0.95**	1.11	0.71	**0.84**	0.99	2001	0.71	**0.89**	1.11	0.56	0.78	1.08
" "	Willamette	Clackamas R Fall Chinook (CLCK-KF)	Clackamas R Fall CH	1967	2001													

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ESU	NPPC Subbasin	Population	Spawning aggregation	Start Year	End Year	Lower 95%CI	Median Lambda	Upper 95%CI	Lower 95%CI	Median Lambda	Upper 95%CI	LastYear	Lower 95%CI	Median Lambda	Upper 95%CI	Lower 95%CI	Median Lambda	Upper 95%CI
Lower Columbia Steelhead	Columbia Gorge	Lower Gorge Tributaries (LRG-SW)	*No Applicable data set*															
" "	" "	Upper Gorge Tributaries (UGRG-SW)	*No Applicable data set*															
" "	Cowlitz	Cispus R Winter (CISP-SW)	*No Applicable data set*															
" "	" "	Coweeman R Winter (COWE-SW)	Coweeman R Winter SH	1987	2002	0.68	**0.87**	1.13	0.62	**0.80**	1.04	2002	0.52	**0.88**	1.50	0.48	0.81	1.37
" "	" "	Lower Cowlitz R Winter (LCWL-SW)	*No Applicable data set*															
" "	" "	N Fork Toutle R Winter (Green River) (NTOU-SW)	N Fork Toutle Winter SH	1989	2002	1.01	**1.06**	1.12	1.01	**1.06**	1.12	2002	N.A.	**1.04**	N.A.	N.A.	1.04	N.A.
" "	" "	S Fork Toutle R Winter (STOU-SW)	S Fork Toutle Winter SH	1984	2002	0.77	**0.94**	1.14	0.77	**0.93**	1.14	2002	0.50	**0.93**	1.72	0.50	0.93	1.72
" "	" "	Tilton R Winter (TILT-SW)	*No Applicable data set*															
" "	" "	Upper Cowlitz R Winter (UCWL-SW)	*No Applicable data set*															
" "	Hood	Hood R Summer (HOOD-SS)	Hood R Summer SH	1992	2000	N.A.	**0.75**	N.A.	N.A.	**0.60**	N.A.	2000	N.A.	**0.75**	N.A.	N.A.	0.60	N.A.
" "	" "	Hood R Winter (HOOD-SW)	Hood R Winter SH	1992	2000	N.A.	**0.96**	N.A.	N.A.	**0.87**	N.A.	2000	N.A.	**0.96**	N.A.	N.A.	0.87	N.A.
" "	Kalama	Kalama R Summer (KALA-SS)	Kalama R Summer SH	1977	2003	0.71	**0.88**	1.09	0.59	**0.74**	0.93	2003	0.55	**0.84**	1.26	0.47	0.73	1.13
" "	" "	Kalama R Winter (KALA-SW)	Kalama R Winter SH	1977	2002	0.90	**0.99**	1.08	0.85	**0.93**	1.02	2002	0.70	**0.97**	1.34	0.65	0.93	1.33
" "	Lewis	E Fork Lewis R Summer (ELEW-SS)	EF Lewis R Summer SH	1996	2003	N.A.	**1.25**	N.A.	N.A.	**1.17**	N.A.	2003	N.A.	**1.25**	N.A.	N.A.	1.17	N.A.
" "	" "	E Fk Lewis R Winter (ELEW-SW)	E Fk Lewis R Winter SH	1985	1994													
" "	" "	N Fork Lewis R Summer (NLEW-SS)	*No Applicable data set*															
" "	" "	N Fk Lewis R Winter (NLEW-SW)	Lewis R Winter	1985	1994													
" "	Sandy	Salmon Creek Winter (SALM-SW)	*No Applicable data set*															
" "	" "	Sandy R Winter (SAND-SW)	Sandy R Winter SH	1978	2001	0.83	**0.91**	1.00	0.77	**0.84**	0.93	2001	0.75	**0.86**	0.98	0.69	0.80	0.92
" "	Washougal	Washougal R Summer (WASH-SS)	Washougal R Summer SH	1986	2003	0.79	**1.00**	1.27	0.79	**1.00**	1.26	2003	0.69	**1.03**	1.54	0.69	1.02	1.51
" "	" "	Washougal R Winter (WASH-SW)	Washougal R Winter SH	1991	2002	0.75	**1.16**	1.78	0.75	**1.16**	1.78	2002	0.75	**1.16**	1.78	0.75	1.16	1.78
" "	Willamette	Clackamas R Winter (CLCK-SW)	*No Applicable data set*	1958	1998	0.87	**0.97**	1.08	0.85	**0.95**	1.06	1998	0.60	**0.86**	1.25	0.58	0.84	1.20
" "	Wind	Wind R Summer - (WIND-SS)	Wind R Summer SH	1989	2003	0.89	**0.97**	1.06	0.86	**0.95**	1.04							

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ESU	NPPC Subbasin	Population	Spawning aggregation	Start Year	End Year	Lower 95%CI	Median Lambda	Upper 95%CI	Lower 95%CI	Median Lambda	Upper 95%CI	LastYear	Lower 95%CI	Median Lambda	Upper 95%CI	Lower 95%CI	Median Lambda	Upper 95%CI
Upper Willamette Chinook Salmon	Sandy	Sandy R Spring (SAND-KS)	Sandy R Spring CH	1977	2001													
" "	Willamette	Aggregate	Willamette Falls Spring CH	1946	2001													
" "	" "	Calapooia R Spring (CALA-KS)	*No Applicable data set*															
" "	" "	Clackamas R Spring (CLCK-KS)	Clackamas R Spring CH (NF Dam)	1958	2002													
" "	" "	McKenzie R Spring (MCKZ-KS)	McKenzie R Spring CH (Leaburg Dam)	1970	2001	N.A.	**1.19**	N.A.	N.A.	**1.14**	N.A.							
" "	" "	Middle Fork Willamette Spring (MFWL-KS)	*No Applicable data set*															
" "	" "	Mollala R Spring (MOLA-KS)	*No Applicable data set*															
" "	" "	N. Santiam R Spring (NSNT-KS)	*No Applicable data set*															
" "	" "	S. Santiam R Spring (SSNT-KS)	*No Applicable data set*															
Upper Willamette Steelhead	Willamette	Aggregate	Willamette Falls Winter SH Dam Counts	1971	2002													
" "	" "	Calapooia R Winter (CALA-SW)	Calapooia Winter SH	1980	1997	0.81	**0.99**	1.22	0.81	**0.99**	1.22	1997	0.62	**1.05**	1.80	0.62	1.05	1.80
" "	" "	" "	Calapooia Winter SH (Redd Count)	1980	2000													
" "	" "	Mollala R Winter (MOLA-SW)	Mollala R Winter SH	1980	1997	0.89	**0.97**	1.04	0.82	**0.90**	0.98	1997	0.62	**1.03**	1.69	0.57	0.98	1.71
" "	" "	" "	Mollala R Winter SH (Redd Count)	1980	2000													
" "	" "	N. Santiam R Winter (NSNT-SW)	N. Santiam Winter SH (Redd Count)	1983	2000													
" "	" "	" "	N. Santiam Winter SH	1980	1997	0.83	**0.95**	1.08	0.81	**0.92**	1.05	1997	0.52	**0.94**	1.70	0.52	0.90	1.57
" "	" "	S. Santiam R Winter (SSNT-SW)	Foster Dam Winter SH	1973	2000													
			S. Santiam Winter SH	1980	1997	0.79	**0.95**	1.14	0.77	**0.91**	1.07	1997	0.52	**0.93**	1.68	0.52	0.93	1.68
			S. Santiam Winter SH (Foster Dam)	1967	2002													
" "	" "	" "	S. Santiam Winter SH (Redd Count)	1980	2001													
" "	" "	Westside Tributaries Winter (WEST-SW)	*No Applicable data set*															