

Meeting Summary
FISH WORK GROUP
Tuesday May 15, 2018
CDFW Office, Arcata, CA

Tuesday, May 15, 2018: 1:00 PM

Participants

Core members: Kyle DeJulio (YTFP), Steve Gough (USFWS), Seth Naman (NMFS), Ken Lindke (coordinator, CDFW)

Other participants: Billy Matilton (core alternate, HVTFP), Bill Pinnix (core alternate, USFWS)

Action Items Derived During the Meeting

Action Item 1: Bill will discuss with Nick Som the validity of using an estimate of females in reaches 1-7 derived from carcass mark-recapture in reaches 1 and 2, and redd counts in reaches 3 through 7. If Nick agrees with this approach, Bill will compare this new metric with redd counts using the stock-recruit model (with juveniles as the recruits) that will be included in the juvenile synthesis report.

Action Item 2: Ken will compare the adult abundance estimates for fall Chinook upstream of Willow Creek Weir, and spring Chinook upstream of Junction City Weir, used by Joe Polos in his adult metric analysis to estimates in the CDFW megatables. Ken will also provide to Bill the full time series of adult abundance estimates needed for the juvenile synthesis report

Summary of Meeting by Agenda Item

Welcome and purpose of meeting

Ken described the recent history of meetings and discussions that led to today's meeting, as he understood them:

In a recent meeting among co-PIs of the adult synthesis report, it occurred to folks that we should include in that report the same adult data that will be used for adult-to-juvenile metrics (e.g., number of juveniles per adult) in the juvenile synthesis report. During that meeting, Bill described the metrics that Joe Polos had developed. Redd counts were to be used at Pear Tree, and a combination of mainstem redd counts and estimated redds (for years when no redd surveys were conducted) were to be used at Willow Creek. Joe had arrived at these data based on an AIC analysis motivated by earlier fish work group

discussions, but the conclusions of that analysis apparently had not been presented to the fish work group for consensus. Following the meeting of adult synthesis report co-PIs, Ken reviewed all available fish work group meeting notes since 2014 and confirmed that the work group had not developed consensus on the appropriate adult metric to be used in adult-to-juvenile metrics.

Ken then stated that the purpose of the current meeting was to develop consensus on the appropriate adult data to be used for adult-to-juvenile metrics for juvenile production at the Pear Tree and Willow Creek rotary screw traps.

Review of adult data under consideration

Ken, with the help of others, listed the relevant adult data that is available for consideration:

1. Mark-recapture estimates of adult fall Chinook escapement to natural spawning areas upstream of Willow Creek Weir,
2. Redd counts, presumably all from fall Chinook, between Willow Creek Weir and the Willow Creek rotary screw trap from 2002 to present,
3. Mark-recapture estimates of adult spring Chinook escapement to natural spawning areas upstream of Junction City Weir,
4. Single-pass dive counts of adult spring Chinook in the North Fork, South Fork, Canyon Creek, and New River in most years over the period of record for juvenile trapping,
5. Redd counts in the mainstem for all years of juvenile trapping at Pear Tree, but only 2002 to present at Willow Creek
6. Estimates of adult fall Chinook in carcass/redd reaches 1 and 2 based on carcass mark-recapture.

Bill asked whether abundance estimates at Junction City Weir could be used for adult abundance upstream of Pear Tree. Billy and Ken responded that the weir only traps the spring run, so it was not possible.

Review of adult-to-juvenile metrics currently proposed for use in the juvenile synthesis report

Bill provided a summary of the adult data currently proposed for use in adult-to-juvenile metrics in the juvenile synthesis report. These data and metrics were developed by Joe Polos prior to his recent retirement. The juvenile data for Pear Tree and Willow Creek rotary screw trap locations are simply the estimated annual emigration of juvenile Chinook past each respective trap site. For the Pear Tree site, the proposed adult data is total redd counts attributed to Chinook salmon in reaches 1-7. The probability that each individual redd was constructed by a Chinook Salmon is based on carcass recoveries, and the probabilities are then used to estimate the total number of Chinook redds. Redd count data are available for the mainstem beginning in 2002. For the

Willow Creek site, the proposed adult data is total redd counts attributed to Chinook salmon in the mainstem upstream of the trap site for the years 2002 to present, and estimated mainstem redds for the years 1988 to 2001. Redds were estimated prior to 2002 based on a regression between mainstem redds and adult Chinook abundance in natural spawning areas (fall and spring combined, from mark-recapture estimates at Willow Creek and Junction City weirs) because no redd surveys were conducted.

Discussion on appropriate adult data for adult-to-juvenile metric

Bill informed the group that the primary objectives for juvenile monitoring are different at each location. The objective at Pear Tree is to estimate juvenile emigration abundance, whereas at Willow Creek the objective is emigration timing, specifically the date of 80% emigration relative to temperature targets. The group agreed that adult-to-juvenile metrics at the two locations don't necessarily need to be comparable, but recognized that some people will likely want to do so. Bill pointed out that in addition to the different primary objectives, there are several other factors that limit the comparability of juvenile data at the two locations, not the least of which are differences in the timing and conditions under which trapping occurs.

Ken pointed out that the analysis Joe conducted to determine which adult metric to use at Willow Creek wasn't designed to determine the best metric relative to juvenile data, but rather the best adult data to predict mainstem redd counts. The analysis appears to have been premised on redd counts being the best adult metric for the Willow Creek site. Bill pointed out that using redds at Willow Creek was also motivated by wanting a comparable metric between the two locations, and the desire on the part of some program partners to estimate survival between the two trap sites. The group agreed that estimating survival is not possible with the current sampling design. There was general agreement among the group that it may not be necessary for the adult-to-juvenile metrics at the two locations to be directly comparable, and that it may be better to use the best adult data at each location.

Ken offered that there were additional options for adult data that had not yet been considered. One such option is to derive some new estimator for adult abundance upstream of Pear Tree so that both adult-to-juvenile metrics could be based on adult abundance. Steve pointed out that carcass mark-recapture estimates have been made in reaches 1-7, but have only continued in reaches 1-2 in recent years.

Kyle emphasized the value in having time series of adult abundance estimates at Willow Creek weir concurrent with juvenile trapping at the Willow Creek rotary screw trap, and redd count data concurrent with trapping data at Pear Tree. The group agreed this should be taken into consideration.

Steve noted that in high abundance years redd superimposition in reaches 1 and 2 can make it difficult to count all redds, and he expects that redd counts may have a substantial negative bias in such cases. Steve then proposed an adult metric for Pear Tree comprised of the sum of redd counts in reaches 3-7 and an estimate of adult females in reaches 1-2. Adult females can be estimated from carcass mark-recapture data. The group agreed that this was worthy of consideration, but that Bill should get Nick Som's opinion on whether it was statistically defensible. If yes, Bill will evaluate whether this new metric is better than redd counts relative to juvenile abundance in a stock recruit model.

The group reached consensus that either redd counts or Steve's proposed female metric should be used for the adult-to-juvenile metric at Pear Tree.

The group also reached consensus that the adult-to-juvenile metric at Willow Creek should use the sum of adult fall Chinook escapement to natural spawning grounds upstream of Willow Creek Weir and adult spring Chinook escapement to natural spawning grounds upstream of Junction City Weir. This consensus was reached after discussing the fact that redd counts between Willow Creek Weir and the Willow Creek rotary screw trap were negligible and excluding them would have no meaningful effects on results. In addition, redd counts in that area do not exist for the full period of record. The group also discussed dive counts of spring Chinook in tributaries, but also decided to exclude these because survey effort has been variable over the period of record, single pass dive counts are negatively bias to an unknown magnitude, and counts across all tributaries represented less than one percent of total adult Chinook abundance in nearly all years.

The group agreed that dive counts of spring Chinook should be included in the adult synthesis report, and that the authors should evaluate the effects of including dive counts in estimates of spring Chinook abundance.

4:00 PM Adjourn