From: Barbara Byrne - NOAA Federal <barbara.byrne@noaa.gov>
Sent: Wednesday, May 29, 2019 4:41 PM
To: Brian Ellrott - NOAA Federal
Cc: Stuart, Jeff; Cathy Marcinkevage - NOAA Federal; Yip, Garwin
Subject: Re: ROC LTO: WRLCM Delta survival

Prelim results from WRLCM summarized only for Jan-May. Based on WRLCM description (WRLCM Description 17 May2019.doc in CVP ROCON\LCM_Files folder), temporal structure limits YOY outmigration fo Dec-Apr (see table embedded below); looks like survival can be estimated with a one month lag leading to survival estimates for Jan-May.

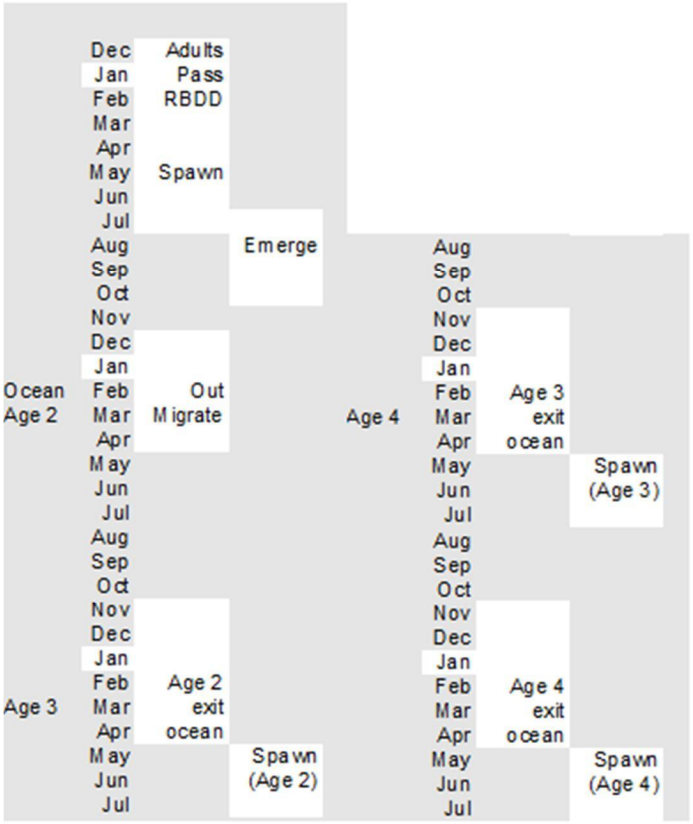

Figure 2. Temporal structure of the winter-run Chinook salmon, each cohort begins in March of the brood year. Figure from Grover et al. (2004).

On Wed, May 29, 2019 at 4:29 PM Brian Ellrott - NOAA Federal <brian.ellrott@noaa.gov> wrote:

> Do we need to talk about the fall months (Oct Nov) in the Delta Effects section pasted below?
>
> **Winter-run Chinook Salmon Life Cycle Model (WRLCM)**[BBforJS1]
>
> The WRLCM can estimate survival of emigrating winter-run Chinook salmon smolts to Chipps Island that have reared in different habitats within the Sacramento River system, including those that have reared in the

Delta. Although not a strict one-to-one comparison, the results of the WRLCM that estimates the survival of smolts rearing in the Delta to Chipps Island under the PA and COS conditions can be compared to the through-Delta survival estimates of the DPM in a parallel fashion. Factors which reduce survival (flows, exports, routing into the interior Delta, etc.) are components of both models. The WRLCM estimates that winter-run Chinook salmon smolts that emigrate in January of Wet water year types will have slightly better median survival (3.2 percent) under the PA than the COS. Survival estimates remain higher for the PA compared to the COS in February and March, but are slightly less than January during the Wet water year types. By April and May, the survival under the PA is estimated to be less than the COS, up to 7 percent (absolute) in April, and 3 percent in May. The reductions in survival under the PA are likely due to the increases in south Delta exports during these months compared to the COS conditions, which are modeled using the equations from Newman (2003) relating exports to survival. This reduction in survival during the month of April for winter-run Chinook salmon smolts originating in the Delta holds true for all water year types for the months of April and May, though most winter-run Chinook salmon juveniles have exited the Delta by mid-April. The estimates of survival to Chipps Island for Delta origin winter-run Chinook salmon smolts is consistently higher for the COS conditions compared to the PA conditions for the remaining water year types. April consistently has the greatest difference in survival between the PA and COS conditions, with up to 9.4 percent difference in below normal years. Overall the PA has lower survival rates for winter-run Chinook salmon smolts emigrating to Chipps Island for fish originating in the Delta, except for the period of January through March in Wet water year types. This parallels the general findings of the DPM for winter-run Chinook salmon migrating through the Delta, which found reduced survival for the PA for Below Normal, Dry, and Critical water year types, and only slightly higher survival for Wet and Above Normal water year types.

[BBforJS1]Coordination with Cathy on her WR LCM model write-up still pending.

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