April 25th 2D Hydraulic Model Meeting Action Items

There were two action items from this meeting. One was the development of a matrix showing modeling variables and performance indicators for the USFWS 2D model and the RMT 2D model. The second was a test of how well the USFWS 2D model represents the study reach. The representativeness test was necessary because, unlike the RMT model which was complete hydraulic coverage, the USFWS 2D model used a traditional sampling approach to achieve representation.

2D Model Variables and Performance Matrix

YCWA has completed the matrix for the RMT 2D model, but as of yet has not received input for the matrix from the FWS. If FWS is in attendance, the matrix can be completed at the meeting.

Representativeness Test of USFWS 2D Model

YCWA has completed the representativeness analysis of USFWS 2D model. The results are not included here since they would be better presented live with discussion and overheads at the June 22nd meeting.

April 25th Meeting and May 16th Conference Call HSC Action Items

Adult Rainbow HSC

Relicensing Participants expressed an interest in including adult rainbow trout as a target lifestage.

If adult rainbow trout are identified as a target species/lifestage for the Lower Yuba River instream flow study, YCWA proposes to apply HSC used in the Yuba-Bear/Drum-Spaulding Project Relicensing instream flow studies. These HSC have been added to the LYR HSC spreadsheets as file "Yuba RBThsc.xlsx".

Distinguishing Between Spring and Fall-run Chinook Redd Observations

Relicensing Participants expressed an interest in better understanding how the CDFG (1989), the USFWS (2007) and the RMT studies differentiated between spring-run and fall-run Chinook redds during surveys.

The three studies relied primarily on timing of observations relative to the known timing difference between spring-run and fall-run Chinook. Table 1 shows the general timing of spring and fall-run Chinook spawning in the Sacramento Basin.

Table 1. Range and peak of spring and fall-run Chinook salmon in the Sacramento Basin.

	Range/Peak	August	September	October	November	December
Spring-run[1]	Range	X	X	X		
	Peak		X			
Fall-run[2]	Range			X	X	X
	Peak				X	

[1]/ Yoshiyama et al. 1998
[2]/ Myers et al. 1998

CDFG, 1989: The focus of the CDFG study was the later fall-run Chinook. Redd and spawning observation data were collected in November 1986. The CDFG report did not discuss or distinguish spring-run as having unique habitat requirements from fall-run.

USFWS, 2007: USFWS redd surveys for spring-run Chinook were conducted twice during September, 2002. Redd surveys for fall-run Chinook were conducted during the month of November in 2001, 2002, and 2003.

RMT: RMT redd surveys were conducted during two spawning seasons 2009 – 2011 throughout the spawning periods of spring-run, fall-run, and late fall-run Chinook salmon and steelhead throughout the lower Yuba River. The runs were distinguished by date of new observation.

Chinook Holding HSC

Relicensing Participants expressed an interest in including Chinook holding HSC.

The availability of holding HSC for Chinook is limited. One of the reasons is that holding environmental variables and their values are difficult to establish because of the variety and inconsistency of the habitats Chinook select for holding. The following is a brief summary of literature regarding observed holding conditions. The values referenced in this summary are not intended for direct use as HSC. The descriptions include observations in smaller more turbulent streams than the Lower Yuba. The Licensee has included Chinook holding HSC from two sources in the LYR HSC spreadsheets, one for fall-run Chinook from the Stanislaus River (Aceituno 1990) and one for spring-run Chinook from the wind River, Washington (Wampler 1988). These HSC curves have been added to the HSC file "Yuba CHShsc revised.xlsx".

Seasonal Timing: Adult fall-run Chinook salmon holding occurs for a relatively short time period, ranging from a few days to a few months (Sommer et al. 2001). Adult spring-run Chinook salmon hold throughout the summer until approximately late-September or mid-October when they spawn (California Department of Water Resources 1982).

Holding Pool: Spring-run Chinook salmon select large deep pools, usually >6.6 ft deep (Moyle 2002). Pools in holding areas need to be sufficiently deep, cool, and oxygenated to allow over-summer survival of Chinook salmon (DWR et al. 2000).

Holding pools usually have a large bubble curtain at the head, underwater rocky ledges, and shade cover throughout the day. Spring-run Chinook salmon select pools with bedrock bottoms (Moyle 2002).

Adult spring-run Chinook salmon may also seek cover in smaller "pocket" water behind large rocks in fast water (Moyle et al. 1995). Holding pools for adult Spring-run Chinook salmon have been characterized as having cover such as bubble curtains (DWR et al. 2000).

Spring-run Chinook salmon adults prefer mean water column velocities of 0.49–2.6 ft/sec (Moyle 2002b). In Deer Creek, adult spring-run Chinook salmon preferred mean water velocities ranging from 2.0–2.6 ft/sec during a 1988 survey (Moyle et al. 1995).

Water Temperature: Records indicate that spring-run Chinook salmon in the Sacramento-San Joaquin River system spend the summer holding in large pools where summer temperatures are usually below 69.8°F–77°F (21°C–25°C) (Moyle et al. 1995). Sustained water temperatures above 80.6°F (27°C) are lethal to adult Spring Chinook salmon (Moyle et al. 1995).

Bioverification

Some Relicensing Participants expressed an interest in better understanding the RMT bioverification analyses conducted on its 2D model.

YCWA will endeavor to provide further explanation of the bioverification analysis, as needed. YCWA will ask Relicensing Participants at the June 22nd meeting which aspects of bioverification analysis requires further explanation and will invite Relicensing Participants to suggest how this would best be accomplished.

Relicensing Participants expressed an interest in how the USFWS 2D model was bioverified.

USFWS collected bioverification data at 146 redds during the spring-run Chinook salmon redd surveys. For fall-run Chinook validation, 422 redds were measured during redd surveys.

YCWA would prefer that the bioverification analysis method applied on the USFWS 2D model be explained by the USFWS.

Category of CDFG (1989) HSC

Relicensing Participants asked if the CDFG HSC were Category II or Category III.

The HSC curve development for all life stages looked at the effects of habitat availability on habitat use, but ultimately the October 1987 criteria workshop decided to develop HSC using

non-parametric tolerance limits applied to the utilization data alone. "Preliminary conditioning of use distributions by availability distributions produced results which were inadequate for describing preferred habitat conditions." (pg 12, Beak 1988 draft report).

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