

Delta Smelt Working Group Meeting Notes

March 12, 2007

Participating: Gonzalo Castillo (USFWS), Kevin Fleming (CDFG), Lenny Grimaldo (CDWR), Bruce Herbold (EPA), Tracy Hinojosa (CDWR), Victoria Poage (USFWS), Jim White (CDFG), Ann Lubas-Williams (USBR), and Peter Johnsen (USFWS, convener and scribe)

For Discussion:

1. Delta smelt distribution
2. PTM runs for Sacramento River injection points
3. OMR flows and EWA update
4. Evaluation of current recommendation
5. Head-of-Old River barrier

Recommendation for WOMT:

No new recommendations at this time.

Meeting Notes:

1. The Delta Smelt Working Group reviewed the delta smelt distribution and maturity data from the third Spring Kodiak Trawl (SKT) that was conducted on March 5 through 9.

The trawl collected 60 adult delta smelt. With the exception of 2005 (n=27), the number collected was low compared to March surveys in other years. Total for February and March (n=167) is the second lowest since the survey started in 2002; the lowest number collected was last year with a March February combined catch of 154 delta smelt (supplemental surveys not included). However, a large variation is expected to be inherent in the SKT sampling itself. Variation between years in number of delta smelt sampled, especially in years with low abundance, should therefore be interpreted with caution. In addition to the low number of delta smelt collected, the Working Group also looked at number of stations where delta smelt were collected as an indicator of population status. Delta smelt were collected in 13 of the 39 stations included in the survey. Further, delta smelt females were only collected at six stations. This is the lowest number seen in any year.

Delta smelt were collected from Suisun Bay/Montezuma Slough, Sacramento River near the confluence with the San Joaquin River, and the Sacramento River Deep Water Ship Channel; none were collected from the Central or South Delta. The distribution was similar to the distribution during survey two. No additional salvage has occurred at the CVP and SWP water export facilities since last meeting but one delta smelt was observed incidental to the salvage at the CVP facility. The delta smelt was observed in the load-out bucket. That very little salvage has occurred suggests that delta smelt are still not present in the South Delta in any significant numbers. Based on the low salvage and SKT results to date, the Working Group continues to believe that a high proportion of the

delta smelt population will be spawning in the Sacramento River portion of the Delta. However, it should be noted that in this year of very low apparent abundance, the Working Group continues to interpret the distribution results with particular caution. Salvage (36 delta smelt) and incidental observations of delta smelt in the load-out buckets confirms that some delta smelt have moved into the Central and South Delta.

Sixty percent of female delta smelt that the third SKT collected were at gonadal development stage 3 (pre-spawning) but one mature female was also collected. About 60 percent of males were at gonadal development stage 4 (pre-spawning) but two males (9.1 percent of the catch) had mature gonads. No spent females or males were collected during the SKT survey 3. However, the previous supplemental survey collected 25 percent mature females and 13 percent mature males, suggesting that spawning has started or is imminent. Water temperatures in most areas of the Delta are approaching 13⁰C and delta smelt are therefore expected to have started to spawn despite the lack of spent fish in the Kodiak trawls. It takes about 10 to 12 days for eggs to hatch so it is likely that larvae will originate from the Cache Slough within two weeks. The 20-mm survey for larvae and juveniles will start tomorrow. DFG staff has posted the results of SKT sampling to the web (<http://www.delta.dfg.ca.gov/data/skt/>).

2. The Working Group reviewed PTM-runs provided by DWR staff for the February 26, 2007, meeting (February 26, 2007, meeting notes). Particles were injected at the following SKT stations: Station 815 (in the Central Delta), Station 711 (Sacramento River downstream of Cache Slough), and Station 704 (Sacramento River at the confluence). The outputs showed particle fates over the 31-day period for three values of Old River/Middle River (OR/MR) flow with both a dry (90%) and a wetter (50%) hydrology (Table 1). Based on the results of these PTM-runs, the Working Group identified the need to do PTM-runs for OR/MR flows of negative 6000 and negative 2000 to get a clearer understanding of the relationship between OR/MR flows and particle entrainment. All runs assumed that all barriers are out.

Table 1. PTM-runs for various Old River/Middle River flows. The additional runs requested by the Working Group for this meeting are shaded.

Scenario	Hydrology %	OMR value cfs	Sac Flow cfs	SJ Flow cfs	Banks PP cfs	Tracy PP cfs
A	50	-8000	33779	3000	7080	4300
B	90	-8000	15010	1667	6680	4300
G	50	-6000	33,779	3,000	4,500	4,300
H	90	-6000	15,010	1,667	3,800	4,300
C	50	-4000	33779	3000	2000	4300
D	90	-4000	15010	1667	1000	4300
I	50	-2000	33,779	3,000	300	3,200
J	90	-2000	15,010	1,667	300	2,400
E	50	0	33779	3000	300	1000
F	90	0	15010	1667	300	1000

Station 815 has a relative large total particle entrainment compared to stations 711 and 704 with high entrainment of particles at OR/MR flows less than negative 2,000 cfs (Table 2, Figure 1). Station 815 also has less difference in particle entrainment between wet and dry years (50% and 90% exceedens, respectively) than the two other stations. Relatively large reduction in particle entrainment for particles injected at station 711 occurred when OR/MR flows increased from negative 8,000 cfs to negative 6,000 cfs and from negative 6,000 to negative 4,000 (Table 2, Figure 2). The largest reduction in particle entrainment, from 17.5 percent to 4.4 percent, for particles injected at station 704 occurred when OR/MR flows increased from negative 8,000 cfs to 4,000 cfs (Table 2, Figure 3). Particle entrainment lower than one percent occurred at OR/MR flows at negative 2,000 cfs and negative 4,000 cfs for station 711 and 704, respectively (Table 2).

Table 2. Combined percent entrainment at CVP and SWP of particles injected at different stations over a 31-day period.

Particle fate	Percent particles @ CVP and SWP combined		
	815	711	704
Station			
Scenario A 50% exceedence, - 8000cfs	81	9.9	1.9
Scenario G 50% exceedence, - 6000cfs	59.2	3.4	0.7
Scenario C 50% exceedence, - 4000cfs	30.1	0.7	0.3
Scenario I 50% exceedence, - 2000cfs	5.0	0.1	0.0
Scenario E 50% exceedence, 0cfs	0	0	0
Scenario B 90% exceedence, - 8000cfs	91.1	32.5	17.5
Scenario H 90% exceedence, - 6000cfs	74.6	15	4.4
Scenario D 90% exceedence, - 4000cfs	35	4.1	0.7
Scenario J 90% exceedence, - 2000cfs	7.2	0.1	0.3
Scenario F 90% exceedence, 0cfs	0	0	0

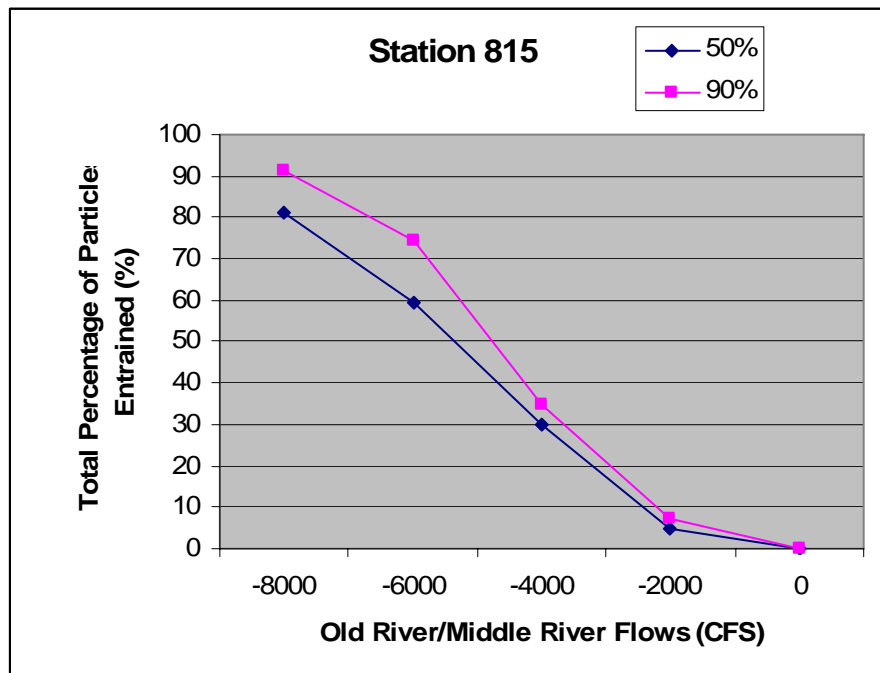


Figure 1. Total percentage of particles entrained at CVP and SWP after 31 days for particles released at Station 815.

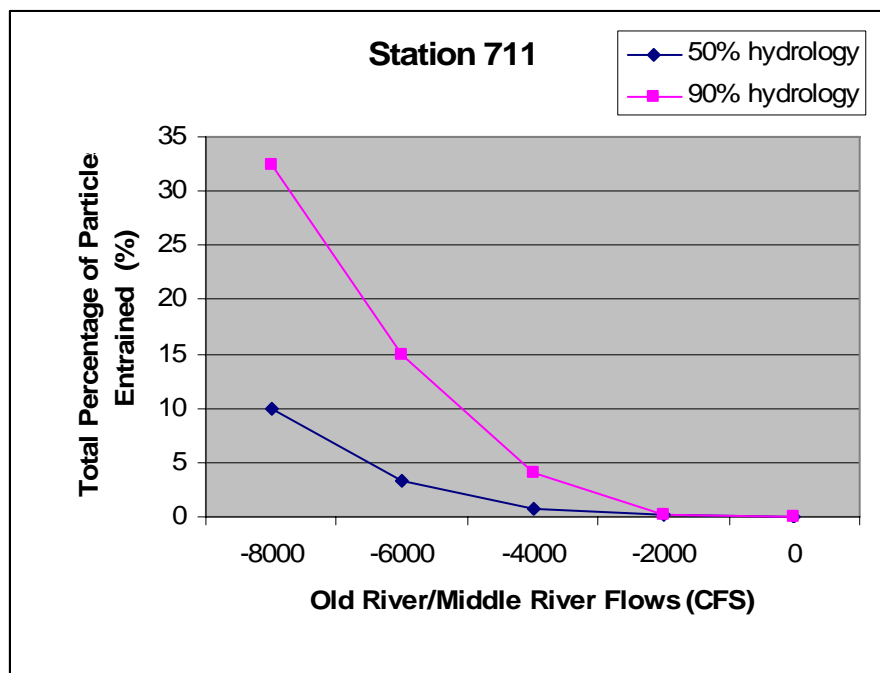


Figure 2. Total percentage of particles entrained at CVP and SWP after 31 days for particles released at Station 711.

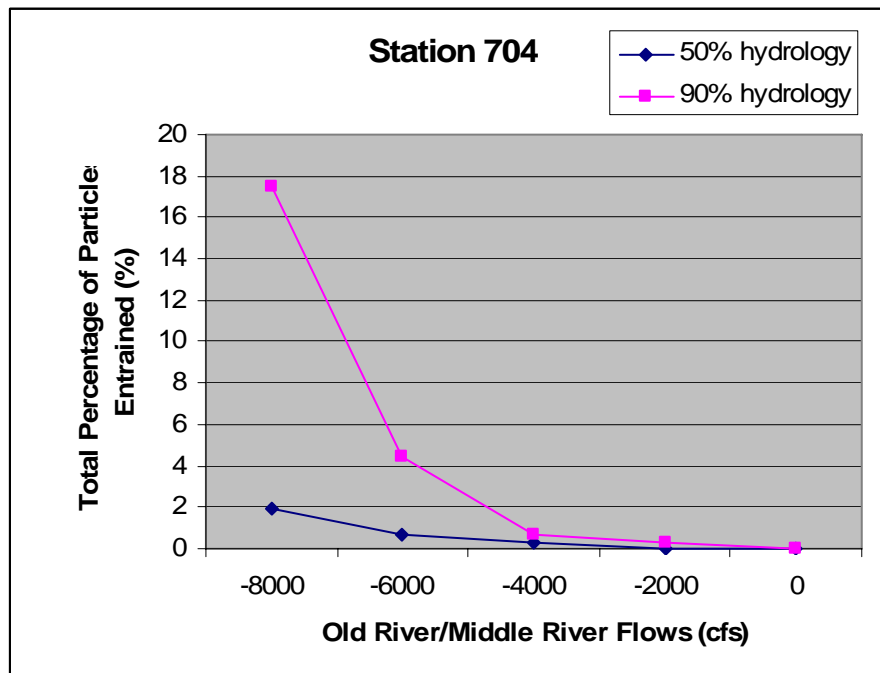


Figure 3. Total percentage of particles entrained at CVP and SWP after 31 days for particles released at Station 704.

3. Old River and Middle River combined five-day average flow was about negative 4,900 cfs. However, OR/MR daily flow was negative 5,620 cfs as of March 10, 2007. Last week's estimate of the current EWA debt in San Luis was approximately 95 to 105 acre feet (TAF). The action was at that time estimated to generate EWA debt of approximately four to six TAF per day to DWR. Current debt should then be between 106 and 146. The Working Group noted that EWA is sufficiently funded to have purchased assets available for the current action and potential spring actions.

4. The Working Group reviewed its earlier recommendation to continue moderating OR/MR flows and discussed the March 3, 2007, WOMT decision to change operation to meet an OR/MR flow of negative 5,000 cfs instead of targeting negative 4,000 cfs.

New analysis by DWR staff shows that the relationship between OR/MR flows and salvage also applies to other pelagic fish species. The relationship holds for winter (adult fish) as well as spring (larvae/juveniles) salvage. The consistency of this relationship across species suggests that variation in OR/MR flows causes the observed variation in salvage. The Working Group believes that these results further supports moderating OR/MR flows as an action to protect delta smelt. The Working Group therefore agreed not to change their current OR/MR flow recommendation since the moderated OR/MR flows may still help in avoiding salvage of pre-mature adult delta smelt in the Sacramento/San Joaquin River confluence.

The Working Group is concerned that the increasing pumping to produce an OR/MR flow of negative 5,000 cfs instead of negative 4,000 cfs may result in OR/MR flows below negative 5,000 cfs and, consequently, salvage of delta smelt. However, most delta

smelt are distributed in areas where they are less influenced by OR/MR flows. Further, analysis of the relationship between OR/MR flows and salvage shows that an OR/MR flow of negative 5,000 cfs may be at the threshold where salvage is still minimized. The change in operations may therefore still provide necessary protection. The Working Group therefore agreed that there is no need to recommend any changes to SWP's operations.

5. The Delta Smelt Working Group discussed potential spring moderation of OR/MR flows based on the result of the PTM runs described above, what is currently known of delta smelt distribution in the Delta, the presence of mature female delta smelt (stage 4), and current water temperatures. The Working Group expects that a recommended spring action will primarily be to protect from entrainment larvae that originate from the Sacramento River portion of the Delta. Based on the above PTM-runs, the Working Group believes that a likely recommendation to WOMET to protect delta smelt larvae originating in the Sacramento River portion of the Delta would include keeping OR/MR somewhere between negative 5,000 cfs and negative 2,000 cfs.

However, VAMP is scheduled to start on April 22. Since larvae are not expected to be present until two weeks, a recommended action to protect larvae may therefore be limited to the period between April 1 and April 22, and a potential post-VAMP action. The Working Group will discuss the need for any recommendation to protect larvae when the 20-mm survey results are available.

6. The Working Group acknowledges that it will need to inform WOMET as soon as possible if the group decides to change its earlier recommendation to forgo installation of the Head-of-Old River barrier. However, additional supplemental SKT and 20-mm survey results will be obtained within the next two weeks. Given the schedule for installation of the barriers, the Working Group agreed that it will wait for the additional data before deciding if sufficient protection to the delta smelt will be achieved if the Head-of-Old River and agricultural barriers are installed.

Next meeting: Monday, March 26 at 4:00 pm via conference call.

Submitted,
PJ