

Minutes of the Meeting of the Delta Smelt Working Group  
October 21, 2004 at USFWS

Attending: Kevin Fleming (CDFG), Matt Nobriga (CDWR), Mike Chotkowski (USBR), Zach Hymanson (CBDA), Bruce Herbold (USEPA), Ryan Olah (USFWS), Gonzalo Castillo (USFWS, by phone) and Victoria Poage (USFWS, scribe)

Subject: Implementing a pre-VAMP shoulder for delta smelt in 2005

Original Agenda:

1. Briefly summarize what is known to date about the various studies and monitoring plans for the Delta in 2005.
2. Develop specific technical criteria for a pre-VAMP shoulder, including the basis for recommending a pre- versus a post-VAMP shoulder.
3. Hypotheses, methods, conceptual models, what we hope to learn/accomplish, etc from implementation of a pre-VAMP shoulder.

Handouts:

1. Bar graph plotting the Recovery Index against cumulative adult salvage, including 50% and 75% concern levels (Kevin Fleming)
2. Powerpoint slide illustrating potential export curtailments (inception, duration, cost of water in TAF), based upon water temperature (Zach Hymanson)

Minutes of Meeting

Upcoming Delta Smelt Work

1. All routine monitoring surveys (Spring Kodiak Survey, 20-mm Survey, Summer Tow-Net Survey) are scheduled.
2. In accordance with the agreement in the OCAP BO to terminate NBA fish monitoring, a pilot larval fish survey using the former NBA budget will operate in the Delta from the end of January until funding is exhausted. The purpose of the pilot larval survey is to see whether it is practical and worthwhile to piggyback larval sampling on the existing 20-mm Survey, to better evaluate the distribution of larvae too small to be retained effectively by the 20mm Survey. The 20mm Survey does not sample small larvae well. Our interest in the small larvae is enhanced by current plans to experiment with pre-VAMP shoulder actions. In 2005, the survey is a pilot effort to investigate methods, including the logistical feasibility of running a larval survey concurrently with the 20mm survey. Results from the first year will not be definitive.
3. Pilot 30-hour delta smelt behavioral studies will be implemented this year as part of the IEP South Delta Studies, sampling various parts of the Delta, and will also evaluate

hydrologic conditions. During each 30-hour field study, fishes will be serially sampled by simultaneously deploying small boat-mounted nets in three channel habitats (center channel surface, center channel bottom, and channel edge). Detailed physical data, including water velocity profiles through the channel cross-section beneath the boat, will be collected in conjunction with the fish samples. Field sites have not yet been decided, but likely locations include Old River and the CVP/SWP diversion points. It is uncertain whether enough delta smelt larvae will be collected in this pilot study to draw robust conclusions about delta smelt behavior.

4. The hydroacoustic element of the South Delta Studies has been discontinued, but the lead investigator (Mike Horn, USBR Denver) may instead run an egg and larval survey at locations just outside CCF and the CVP fish salvage facility.

5. The Spring Kodiak Survey will include trial deployment of an otter trawl at some locations, to try to evaluate the hypothesis that sex ratios vary by depth once spawning has begun.

#### Discussion

1. The 2004 Fall Mid-Water Trawl survey has yielded a delta smelt recovery index of 25, which is below the DSRAM criterion value of 74. We are therefore concerned about the status of the delta smelt population. The 2004 FMWT index was the fourth-lowest since survey sampling began. No other DSRAM risk indicators are operative at this time of year.

2. Using the index from the DSRAM, the concern level for adult delta smelt take from December-March will be 900 adults at the 50<sup>th</sup> percentile and 3-4,000 at the 75<sup>th</sup> percentile. We have no recommendations for management action at this time. Based on our discussion, and a figure provided by Kevin Fleming, we believe that 2005 EWA assets should be used early in the year, to protect spawning adults and their larvae from entrainment.

3. The development of advanced particle tracking tools that can operate on Pete Smith's Si3D hydrodynamic model have not yet borne fruit because of problems adapting Si3D to run on the delta grid. However, DSM-2 particle tracking will be available in 2005. The group will recommend during the next DAT call that these tools be used to investigate potential differences between normal and "gates-open" gate operation scenarios at Clifton Court Forebay during the VAMP period. The group would like to review the PTM results prior to making any specific recommendations on a pre-VAMP shoulder.

4. Discussion of a pre-VAMP shoulder included review of analyses by Kevin Fleming (CDFG) and Zach Hymanson (CBDA). Kevin has found a relationship between spring exports and the TNS index using a smoothing technique called LOWESS regression. Because there is a significant linear relationship between the 20mm and TNS abundance indices, we hypothesize that the strongest direct effects of export operations on the larval to juvenile portion of the life cycle is entrainment of larvae too small to be collected

effectively by the gear used by the 20-mm Survey. These small larvae are not counted at the salvage facilities. This hypothesis also is consistent with comparatively high export levels immediately prior to VAMP, and distributions of larvae collected by the 20mm survey that often show considerable proportions of the population residing in the central and southern delta.

Zach Hymanson suggested using Delta water temperatures as the trigger for initiation and termination of the shoulder-on-VAMP export curtailment instead of tacking on an additional two weeks of export curtailment to the VAMP action. Laboratory data and analyses by Bennett suggest water temperature is a reasonable indicator of delta smelt spawning. The idea is to try and match the spring export curtailment to the spawning/hatching period. This is in contrast to implementing a two-week export at the beginning or end of the VAMP action, which tends to occur during the same period each year. Zach presented an example of how the use of water temperature would have translated into an export curtailment action in 2002 using the period when water temperatures ranged from 15 – 20 C. This example also estimates the water costs of two possible modes of action (fixed rate of curtailment vs. step increases). There was general support for using water temperatures as the trigger for initiation and termination of the Shoulder-on-VAMP export curtailment action. Initially, we suggested using the water temperature stations evaluated by Ted Sommer in development of the DSRAM. In addition, Mike Chotkowski suggested using a 3-day moving average of water temperature as the trigger to allow us to better anticipate the initiation and termination of the curtailment action.

The group discussed hypotheses and performance measures for a shoulder-on-VAMP export curtailment action that is based on water temperatures. Both an increase in number of delta smelt sampled by the 20-mm Survey, and increases in salvage at the export facilities after VAMP would be consistent with a decrease in entrainment mortality of larval delta smelt.

With the present post-VAMP shoulder, delta smelt salvage often begins first at the CVP, but peaks later and at much higher numbers at the SWP. A change in salvage dynamics at the SWP (i.e., peak salvage that is more consistent in magnitude to CVP salvage levels) might also indicate an effect of a pre-VAMP shoulder action by reducing the number of young delta smelt < 20 mm that accumulate in Clifton Court Forebay. However, changing young delta smelt salvage dynamics at the SWP might also require changing Clifton Court intake gate operations during the spring export curtailments to realize a measure reduction in the entrainment of young delta smelt into Clifton Court Forebay.

We agreed that better monitoring would help better evaluate how well salvage indexes the population-level effects of entrainment. Devising cost-effective changes to the current constellation of monitoring programs in order to achieve these ends (while preserving existing monitoring time series) is a somewhat difficult problem that will probably require several years to resolve. No proposals to begin this analysis were discussed.

## Outcomes:

For 2005, we will follow the DSRAM, with added emphasis on Delta temperatures to determine the need for a pre-VAMP shoulder. No additional sampling will be possible. However, an effort should be undertaken to conduct a rigorous study in 2006; FWS staff will take the lead on coordination and documentation.

## Action items:

- Mike Dege: review data on Delta temperatures and exports to illuminate the relationship between the timing of the water temperature increase from 15 to 20 degrees and the timing of VAMP operations, in order to work out criteria for implementation and cost to EWA in acre-feet of assets for various pre-vamp shoulder options.
- Gonzalo Castillo: spearhead study documentation efforts for 2006
- Matt Nobriga: work with DWR staff to set up PTM runs needed to evaluate the likely hydrodynamic effects of operating Clifton Court Forebay in a "gates open" mode during VAMP
- Victoria Poage: draft and distribute minutes, contact Art Hinojosa about PTM and bring recommendation of PTM to the DAT and the WOMT

Next planned meeting: Thursday, January 13, 1-4 pm at USFWS; a laptop and a projector will be on hand. Anybody who brings data, figures, or other materials should provide them electronically rather than uselessly imperiling thousands of hectares of virgin forest.

Submitted,  
VLP