Delta Smelt Working Group Meeting/Conference Call Minutes

December 16, 2005

Participating: Mike Chotkowski (USBR), Kevin Fleming (CDFG), Roger Guinee (USFWS, guest), Sheila Greene (CDWR, guest), Lenny Grimaldo (CDWR), Tracy Hinojosa (CDWR), Peter Johnsen (USFWS), Ann Lubas-Williams (USBR), Ryan Olah (USFWS, convener), Ted Sommer (CDWR), Kevin Sun (CDWR), Jim White (CDFG) and Victoria Poage (USFWS, scribe)

For Discussion:
Finalize delta smelt protection strategy

Handout:
Draft Delta Smelt Protection Strategy (Victoria Poage); attached

Recommendation for WOMT:
The Working Group recommends the implementation of the "Winter Action" of the Delta Smelt Protection Strategy, curtailing exports to achieve a 15% E/I ratio beginning January 3, 2006 and running at least through the month of January. If salvage should begin before January 3, the Working Group recommends that the 15% E/I be implemented immediately.

Roger Guinee summarized the interim placeholders for use of Environmental Water Account assets as designated by the B2 Interagency Team on December 1 and updated by OCO staff to better reflect projected costs for the VAMP period. The new EWA placeholders, based on the November forecast, are:

Exceedence	Dec	Jan	Feb	Mar	Apr	May
90%	50 TAF	90 TAF	50 TAF	0	39 TAF	22 TAF
50%	50 TAF	90 TAF	65 TAF	0	20 TAF	49 TAF

Implementing a 15% E/I would cost an additional 120 TAF of EWA assets through the end of January, bringing the cost of January actions to approximately 210 TAF, leaving approximately 65 TAF for the VAMP and, potentially, no assets with which to implement a pre-VAMP shoulder, depending on hydrology.

Kevin Fleming noted that the December sampling for the FMWT would not be completed until Monday, December 19. Unfortunately, the FMWT can't provide much insight into delta smelt distribution because overall numbers are so low.

The Working Group returned to discussions begun last year with regard to operation of the radial Gates at Clifton Court Forebay. Zach Hymanson's analysis showed that the hours of gate operation has a greater effect on channel velocity than does export pumping. Lenny Grimaldo has also looked at gate ops and come to the same conclusion: standard gate operations result in the same number of hours of operation, regardless of

pumping rates. Last year the Working Group identified a need for PTM runs that look at gate operations as a two-way node, but this work was never done. This work should be done this year. Despite the lack of an underlying mechanism, modification of gate operations may provide a means of influencing hydrodynamics in the south Delta.

For the remainder of the meeting the Working Group discussed potential protection actions for delta smelt. The Winter Action, which takes a precautionary approach, is intended to avoid or minimize the entrainment of adult spawners. The Working Group considered observations made by the Pelagic Organism Decline Project Work Team that indicate that winter salvage densities at the export facilities have increased during the last few years in relation to the Fall Mid-Water Trawl index (Herbold et al., 2005). The Working Group believed that to provide protection to pre-spawning adults, a substantial export curtailment would be needed, and based their recommendation for a 15% E/I ratio for the month of January on further observations made by the POD PWT (Herbold et al., 2005, Figure 9) which suggest that decreases in the E/I below 20% would result in a change of particle fate that could correspond to a decrease in fish salvage at the export facilities. Triggers for implementation were based upon Mike Chotkowski's analysis of historic salvage trends, which estimate that salvage would begin at the export facilities on approximately January 10. To avoid as much adult salvage as possible, the Working Group recommended that the action be implemented one week prior to the estimated beginning of salvage, on January 3, 2006.

Measuring the success of this action will be problematic, as there will be no way to know what would have happened absent the action; however, the Working Group should discuss potential means of measuring the success of the action. Kevin Fleming noted that the Spring Kodiak Trawl survey, which targets adult spawners, will not begin until late January. He also noted that we will not be able to make many inferences from the sampling data because there are so few adults this year.

Action Items:
1. Lenny Grimaldo will circulate his analysis of CCF gate operations via e-mail.
2. Mike Chotkowski will create a refined (e.g., more intuitive) graphical analysis of historical trends in salvage.
3. Victoria Poage will summarize the Working Group's recommendation and create a management brief to bring to WOMT on Tuesday, December 20.

Attachments:
1. Graphic from Herbold et al
2. Delta Smelt Protection Strategy

Reference:
Herbold, B., C. Armor, R. Baxter, M. Chotkowski, P. Coulston, M. Nobriga and T. Sommer. 2005. Historical patterns in salvage data. Interagency Ecological Program

Figure 8. Relationship of E:I ratio to number of particles entrained over a series of particle tracking model runs.

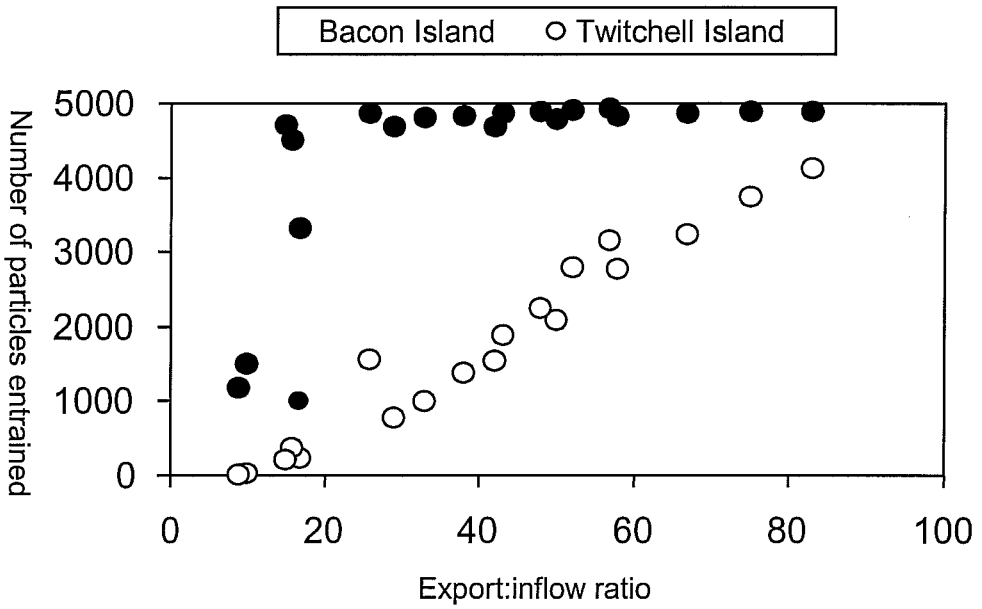
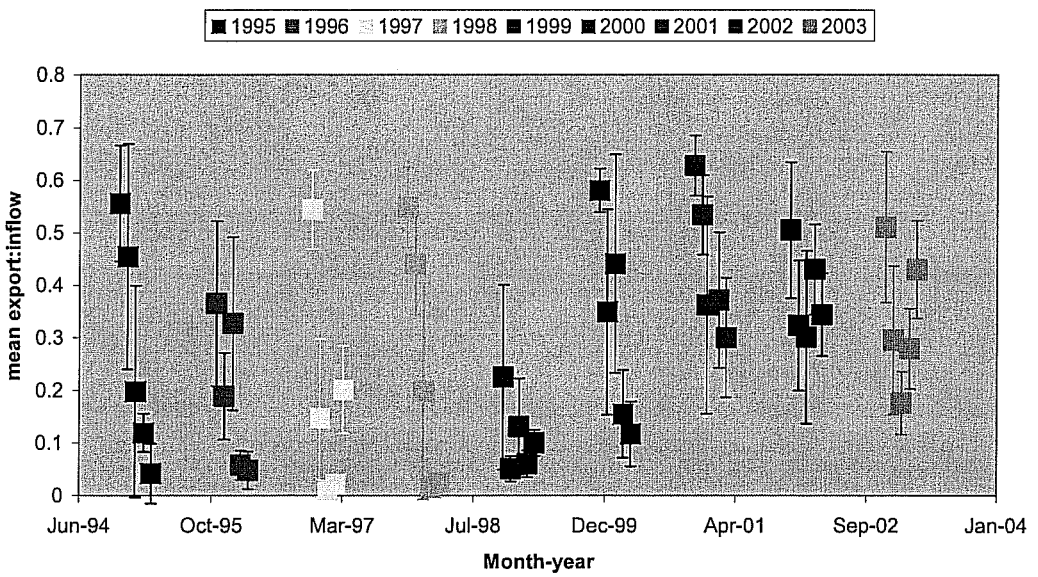


Figure 9. Monthly average export:inflow ratios ± 1 SD for November-March of water years
1995-2005. Data were taken from DAYFLOW. Note the 2005 data are draft data.



Source: Herbold et al., 2005

Delta Smelt Protection Strategy – Winter Action

Purpose and Description: Implement a substantial curtailment of exports in January to dissuade the movement of pre-spawning adults into the south and central Delta. By influencing the distribution of adults, we hope to avoid or substantially reduce the entrainment of spawners and their progeny, including losses of smelt less than 20 mm in length, which are not counted at the export facilities and whose losses have been neither quantified nor minimized through the use of environmental water in the past. The curtailment increment must be sufficient to reduce cross-Delta flows from the Sacramento River into the south and central Delta and to reduce the size of the export projects' zone of influence.

Assumptions:

1. Migrating adult delta smelt respond to flow, temperature, and salinity cues when moving into fresher water to spawn. Migrating adult delta smelt use tidal currents to facilitate their upstream migration.
2. The application of environmental water can influence the distribution of adult delta smelt and therefore greatly reduce the number of adults entering the south and central Delta to spawn.

Technical basis:

1. Recent observations indicating that winter salvage has increased relative to fall abundance have occurred coincidentally with recent abundance declines.
2. Salvage at the export facilities tends to follow increases in Delta inflow, suggesting freshwater flow pulses are a migratory cue.

Advantages:

1. If successful, will prevent or reduce entrainment of adult delta smelt at the export facilities and result in a spawning distribution that will also minimize the entrainment of larval and juvenile delta smelt.
2. If successful, will greatly reduce or eliminate the need for spring actions to protect larvae and juveniles.

Risks:

1. Factors influencing delta smelt spawning movements are unknown; increasing flow may cue movement but the primary driver may be something other than flow.
2. The increment and duration of the curtailment may be insufficient to influence adult distribution.
3. Environmental water resources are limited; if adults enter the south and central Delta to spawn, progeny will be vulnerable to entrainment and environmental water resources needed to mitigate young-of-year entrainment may be limited or exhausted.

Delta Smelt Protection Strategy – Spring Action

Purpose and Description: Implement a substantial curtailment of exports once adult delta smelt have begun to spawn. The timing of this action would be based on a combination of water temperature monitoring and monitoring of adult delta smelt egg stage based on Kodiak trawl collections. We hope to avoid or substantially reduce the entrainment of smelt less than 20 mm in length, which are not counted at the export facilities and whose losses have been neither quantified nor minimized through the use of environmental water in the past. The curtailment increment must be sufficient to reduce the size of the export projects' zone of influence.

Assumptions:

1. Delta smelt larvae are likely to respond to delta hydrodynamics similarly to neutrally buoyant particles modeled in simulations.
2. The application of environmental water can influence the distribution of larval delta smelt and therefore greatly reduce the number entrained.

Technical basis:

1. The life-history strategy of delta smelt larvae is one of using river currents to facilitate transport to low-salinity rearing habitats.

Advantages:

1. If successful, will prevent or reduce entrainment of larval and juvenile delta smelt allowing more young-of-year the potential to reach the adult stage.
2. If successful, will greatly reduce or eliminate the need for late spring/early summer actions to protect juveniles.

Risks:

1. Entrainment of adult delta smelt may exert a stronger influence on population dynamics than larval entrainment. Thus, the action may be taken too late to maximize cost:benefit ratios.
2. The increment and duration of the curtailment may be insufficient to influence larval distribution.
3. Environmental water resources are limited; if larvae do not exit the south and central Delta, they will remain vulnerable to entrainment. Concerns may arise about take limits during May and June. Environmental water resources needed to mitigate May-June salvage may be limited or exhausted.