Delta Smelt Working Group Meeting Minutes

July 10, 2006

Participating: Gonzalo Castillo (USFWS), Kevin Fleming (DFG), Bruce Herbold (USEPA), Ted Sommer (DWR), Matt Nobriga (DWR), Ann Lubas-Williams (USBR), Tracy Pettit (DWR), Tracy Hinojosa (DWR), Ryan Olah (USFWS), convener and scribe, Jim White (DFG), and Lenny Grimaldo (DWR).

For Discussion:
Continue discussions on possible fish actions for upcoming season

Recommendation for WOMT: The Working Group formally requests that DWR provide initial estimates of the cost in terms of water volumes to first achieve and then maintain a net outflow of 11,400 cfs at Chipps Island from September through November.

Minutes:

Ted Sommer presented an outline of potential actions (see attachment 1) that the Working Group used to rank potential actions to protect delta smelt. The Working Group developed a ranking system for each of the potential actions to clarify the action's biological basis and its likelihood of successful implementation in the next 12 months:

Biological Basis in the next 12 months		Likelihood of successful implementation in	
0.	None (for the specific season)		
1.	Reasonable biology	A.	Not worth Doing
2.	Supporting pattern in data	B.	Maybe
3.	Correlation Present	C.	Very Likely
4.	Some causation known		
5.	Strongly supported by evidence		

Based on these criteria, the Working Group then assigned a ranking to each hypothesis under each season. These rankings were intended to apply only to water year 2007, and could change based on hydrology, new data, or species status.

Based on this exercise, the Working Group identified the need for a description of likely conditions this fall based on hydrologic forecast modeling. Since outflows may potentially be as low as 7,000 cfs net outflow, the Working Group requested that the following initial modeling take place:

- Based on the latest hydrologic forecasts, what would be the cost in terms of water volumes to first achieve and then maintain a net outflow of 11,400 cfs at Chipps Island from September through November? [Note that between the time that the meeting occurred and the notes were produced, DWR estimated that maintaining 11,400 cfs at Chipps Island would require

approximately 600 TAF of water in the median hydrology, and approximately twice as much in the dry hydrology.]

Additional modeling:

- Assuming that the 11,400 cfs net outflow was implemented, what would be the flows in Old and Middle River, given a variety of combined inflows and export rates? The best approach to this may be to vary San Joaquin River flow, export flow and Old/Middle River flow in a single nomograph at some specific Sacramento River flow. Several nomographs could be produced for various increments of Sacramento River flow; this concept needs to be refined and, perhaps, simplified before a formal request is made of DWR.

Action Items:

1. DWR will perform the initially-requested modeling and the group will then convene to discuss the results.
2. The Working Group will refine their request for additional modeling to examine flows at Old and Middle Rivers.

Next Scheduled Meeting: TBA, based on modeling results.

Submitted,

RO/vp

Attachment 1

ALTERNATIVES TO IMPROVE DELTA SMELT ABUNDANCE DURING THE NEXT YEAR

Draft Revised July 17, 2006

Assumptions

- This review focuses on actions that could be realistically conducted during the next year.
- The list is intended as talking points to evaluate the potential efficacy and feasibility of alternatives. It is not a set of recommendations.
- There are likely other actions—this is a starting point!
- Each action includes a partial list of useful metrics of the success of that alternative.
- Additional information is needed to document the supporting evidence for each alternative.

Fall Actions (September-November)

1. Habitat Improvements

Hypothesis: Higher fall flows (total delta outflow) will increase the amount of habitat for delta smelt.

Measures:
Fish: FMWT distribution, following year's TNS abundance, condition, size, energy density,growth.
Clams: Biomass, distribution, grazing rate(may be affecting habitat quality).
Food supply: Zooplankton density, Chlorophyll a, smelt diets.
Habitat: EQ index (turbidity, ec), X2

Ranking: 3/4 C-We have a relationship between habitat and summer production and fall flows are forecasted to be low (maybe around 7,000 cfs ouflow)

2. Reduce Entrainment Losses (Mortality)

Hypothesis: Increased (more positive) Old and Middle River flows will reduce losses of adults.

Measures:
Fish: FMWT distribution, TNS abundance, salvage,
Hydrology: Exports, OR & MR flows.
Modeling: ptm experiments

Ranking: 3C-based on Pete Smith of USGS's relationship

Hypothesis: Reducing Delta Cross Channel closures will reduce losses of adults.

Measures:
Fish: FMWT distribution, TNS abundance, salvage,
Hydrology: Exports, OR & MR flows.

Modeling: ptm experiments

Ranking: 2C-based on conceptual understanding of Delta hydrodynamics and recent ptm work.

3. Food Supply

Hypothesis: Increased San Joaquin River flow to Suisun Bay will deliver more phytoplankton and zooplankton to support adults and egg production.

Measures:

Fish: TNS & FMWT abundance, condition, size, energy density.
Clams: Biomass, distribution, grazing rate.
Food supply: Zooplankton density, chlorophyll a, smelt diets.
Hydrology: SJR flow, exports, OR & MR flows, particle tracking.

Ranking: 1B

Hypothesis: Increased flow from Yolo Bypass (e.g. managed wetlands) will deliver more phytoplankton and zooplankton to support adults and egg production.

Measures:

Fish: 20 mm abundance and distribution, TNS & FMWT abundance, condition, size, energy density, salvage.
Clams: Biomass, distribution, grazing rate.
Food supply: Zooplankton density, chlorophyll a, smelt diets.
Hydrology: Sac flow, Cache Slough flow, particle tracking, hydrodynamics?

Ranking: 1B

Overbite Clam Hypothesis: Additional outflow will restrict Asian clam abundance
Ranking: 2B

Winter Actions (December-February)

1. Habitat Improvements

Hypothesis: Higher flows during late winter will increase the amount of habitat (e.g. X2) for delta smelt.

Measures:

Fish: FMWT & Kodiak trawl distribution, subsequent TNS abundance, condition, energy density, growth.
Habitat: X2

Ranking: 0

2. Reduce Losses (Mortality)

Hypothesis: Export reduction during "first flush" of delta tributaries will reduce losses of adults.

Measures:

Fish: FMWT distribution, TNS abundance, salvage,
Hydrology: Exports, inflow, outflow.
Modeling: ptm experiments

Ranking: 4C-fish are entrained during these times, based on historical salvage and Pete Smith's USGS work

Hypothesis: Increased (more positive) Old and Middle River flows will reduce losses of adults and result in a better spawning distribution.

Measures:

Fish: FMWT distribution, TNS abundance, salvage.
Hydrology: Exports, OR & MR flows.
Modeling: ptm experiments

Ranking: 4C-fish are entrained during these times, based on historical salvage and Pete Smith's USGS work

Hypothesis: Reducing Delta Cross Channel closures will reduce losses of adults and result in a better spawning distribution..

Measures:

Fish: FMWT distribution, TNS abundance, salvage,
Hydrology: Exports, OR & MR flows.
Modeling: ptm experiments

Ranking: 2C-based on conceptual understanding of Delta hydrodynamics and recent ptm work.

3. Food Supply

Hypothesis: Increased San Joaquin River flow to Suisun Bay will deliver more phytoplankton and zooplankton to support adult spawners. This action may also help to lower entrainment of fish.

Measures:

Fish: FMWT distribution, subsequent TNS abundance, condition, size, energy density, salvage.
Clams: Biomass, distribution, grazing rate.
Food supply: Zooplankton density, chlorophyll a, smelt diets.
Hydrology: SJR flow, exports, OR & MR flows.

Ranking: 0-there is evidence that material if provided, but it is too late for spawning adults

Hypothesis: Increased flow from Yolo Bypass will deliver more phytoplankton and zooplankton to promote egg production.

Measures:

Fish: subsequent 20 mm abundance and distribution, TNS & FMWT abundance, condition, size, energy density, salvage.
Clams: Biomass, distribution, grazing rate.
Food supply: Zooplankton density, chlorophyll a, smelt diets.
Hydrology: Sac flow, Cache Slough flow, particle tracking, hydrodynamics?

Ranking: 0

Spring Actions (March-May)

1. Habitat Improvements

Hypothesis: Higher flows during spring will increase the amount of habitat (e.g. X2) for delta smelt.

Measures:

Fish: 20 mm abundance, TNS abundance, condition, energy density, growth.
Habitat: X2
Food: Zooplankton, chlorophyll a, diets.

Ranking: 2B-Supportive pattern-efforts have shown that more flow will increase habitat

2. Reduce Losses (Mortality)

Hypothesis: Increased (more positive) Old and Middle River flows will reduce losses of larval and juvenile smelt.

Measures:

Fish: 20 mm abundance and distribution, TNS abundance & distribution, salvage, larval losses (e.g. Kimmerer method).
Hydrology: Exports, OR & MR flows.

Ranking: 4C-based on USGS work

3. Food Supply

Hypothesis: Increased San Joaquin River flow to Suisun Bay will deliver more phytoplankton and zooplankton to support young smelt. This action may also help to lower entrainment of fish.

Measures:

Fish: 20 mm abundance and distribution, TNS abundance and distribution, condition, size, energy density.
Clams: Biomass, distribution, grazing rate.
Food supply: Zooplankton density, chlorophyll a, smelt diets.
Hydrology: SJR flow, exports, OR & MR flows.

Ranking: 2B-critical period, first feeding, these sources do provide food

Hypothesis: Increased flow from Yolo Bypass (inflow or managed wetlands) will deliver more phytoplankton and zooplankton to support young smelt.

Measures:

Fish: 20 mm abundance and distribution, TNS abundance and distribution, condition, size, energy density.
Clams: Biomass, distribution, grazing rate.
Food supply: Zooplankton density, chlorophyll a, smelt diets.
Hydrology: Sac flow, Cache Slough flow, particle tracking, hydrodynamics?

Ranking: 2B-critical period, first feeding, these sources do provide food

Summer Actions (June-August)

1 Habitat Improvements

Hypothesis: Higher flows during summer will increase the amount of habitat (lower salinity, somewhat higher turbidity) for delta smelt.

Measures:

Fish: 20 mm abundance and water quality data, TNS & MWT abundance and water quality data, condition, energy density, growth.
Habitat: X2
Food: Zooplankton, chlorophyll a, diets.

Ranking: 3B-Matt Nobriga's analysis does show a relationship

Hypothesis: Increased turbidity via macrophyte removal will increase the amount of habitat for delta smelt.

Measures:

Fish: TNS & MWT abundance, condition, energy density, growth.
Habitat: EQ (ec & turbidity)
Food: Zooplankton, chlorophyll a, diets.

Ranking: 2A-turbidity is higher in summer and smelt distribution is related to turbidity

2 Food Supply

Hypothesis: Increased San Joaquin River flow to Suisun Bay will deliver more phytoplankton and zooplankton to support juvenile smelt. .

Measures:

Fish: TNS & FMWT abundance, condition, size, energy density.
Clams: Biomass, distribution, grazing rate.
Food supply: Zooplankton density, chlorophyll a, smelt diets.
Hydrology: SJR flow, exports, OR & MR flows, particle tracking.

Ranking: 4B-good evidence here-these sources both provide food

Hypothesis: Increased flow from Yolo Bypass (inflow or managed wetlands) will deliver more phytoplankton and zooplankton to support young smelt.

Measures:

Fish: 20 mm abundance and distribution, TNS & FMWT abundance,
condition, size, energy density.
Clams: Biomass, distribution, grazing rate.
Food supply: Zooplankton density, chlorophyll a, smelt diets.
Hydrology: Sac flow, Cache Slough flow, particle tracking, hydrodynamics?

Ranking: 4B-good evidence here-these sources both provide food