EWA and Delta Smelt

Could the EWA help in spring 1999? In a normal to wet water year like 1999 the EWA could have greatly helped alleviate salvage losses and water costs.

Basic Conditions in 1999

The basic conditions in 1999 were classic for a normal to wet water year with rainfall ending by April with a good snow pack in the northern Sierra and a poor snowpack in the southern Sierra. The delta smelt patterns were typical as well and reasonably predictable. Delta smelt and chinook salmon young are very vulnerable in such years as flows decline and exports increase in late spring. VAMP is perfectly built for this situation.

- High winter (Jan-Mar) rainfall in Sacramento Valley and with high Delta inflows, but low San Joaquin rainfall and inflows to Delta.

Winter flow at Freeport gradually rose in January to a peak of 70,000 cfs and 90,000 cfs in February. March flow fell from 70,000 cfs to 30,000 cfs. Yolo Bypass flows added additional pulses of 20,000-40,000 cfs in February and March.

- Low-to-moderate spring rainfall and runoff.

April Freeport flows were moderate at 25,000-40,000 cfs. By May Freeport flows fell from 25,000 cfs to 16,000 cfs.

- Delta smelt showed early in spring in Delta

April surveys showed smelt abundant in Central Delta and San Joaquin. Low abundance in North Delta and Sacramento River probably due to high inflows. With low San Joaquin flows, smelt appeared to stay in Central and West Delta. VAMP protections from mid-April through mid-May seemed to protect smelt.

- Delta smelt became more abundant in late May into June.

With growth to juvenile size, smelt increased in density at SWP pumping plant in latter third of May, reaching a peak at the end of the month, then gradually falling through mid-June. Despite low exports after VAMP (about 3000 cfs), moderate inflows (15,000-20,000 on Sacramento and 3,000-5,000 cfs on San Joaquin, moderate QWEST (3,000-8,000 cfs, and moderate Delta outflows (15,000-20,000 cfs) delta smelt remained abundant in the Central Delta, and vulnerable to pumping.

Delta Smelt 1999

With the cold high flow winter, smelt spawning and development likely came later than the average or drier year. Larvae may have been abundant in the Central Delta during the VAMP period in late April and early May. VAMP likely provided significant protection both to adult spawners and larvae.

With relatively low to moderate San Joaquin flows and QWEST, smelt young appeared to remain in the Central Delta and probably survived well with the good conditions. Abundance of juveniles was high by late May and continued through June.

Export Losses of Smelt

After VAMP (mid-May) exports increased to 3,000 cfs at the time when juvenile abundance was reaching its peak. Salvaged reached 36,000 for the 30-day period after mid May, far above the "Red Light Concern Level of 10,700. Daily salvage averaged about 1,500 as compared to the daily "Yellow Light" level of 400/day.

ESA Response

With the take limits being exceeded, consultation led to reductions in exports from the 3,000 cfs level back to the VAMP level of 1,500 cfs. While salvage numbers declined by mid-June, they still exceeded take limits, thus requiring continued restrictions on exports. No changes in San Joaquin and Sacramento flows were initiated.

Possible EWA Responses

With known concentrations of spawners and early larvae in the Central Delta in early April even before VAMP, EWA could have taken several options:

1. April flows could have been increased on the San Joaquin to move more of the spawning and larval population to the western Delta and Suisun Bay.
2. With low salvage, VAMP could have been delayed (using EWA insurance) until salvaged concentrations increased in early May, thus maximizing the potential benefits of the VAMP resources. (Note a concern for larval smelt would need to be addressed.)
3. In late May, with high salvage losses of smelt, exports could have been reduced more drastically (from 3,000 to 500 cfs).
4. A late May San Joaquin flow pulse could also have been initiated to help move fish west of the Central Delta and out of the south Delta (with the Head of Old River barrier open).
5. Export risk to high concentrations of juvenile smelt in late May and early June in the western Delta could have been reduced by a pulse of Sacramento flow that would move the fish to Suisun Bay and out of the influence of the south Delta pumps. (The ERP calls for a Sacramento pulse of nearly double this May's flow.)
6. If #'s 1-5 above still did not alleviate the salvage problem, then export limits and San Joaquin flow options could still be considered. (Note: that by June a large part of the smelt population was in the Western Delta and Suisun Bay; with items 1-5 this proportion would likely increase, subjecting even fewer smelt to salvage loss.)
7. Reductions in exports could be achieved using EWA assets in ground water banks and San Luis reservoir, or by borrowing San Luis storage knowing that chances would be good for gaining borrowed water back during the summer of a wet year. Assets NOD could also be shifted to San Luis beginning as early as late summer or fall. (Summer pumping is likely maximized by the projects to fill San Luis and meet summer demand.) A debt of about 5,000 cfs of export reductions for a month would be 300 TAF - a level well within the EWA capability. San Luis reservoir at 1 MAF in mid June was also capable of sustaining the debt.