VAMP is Gone

Do We Miss It

Introduction

The Vernalis Adaptive Management Program or VAMP ended in 2010 after nearly a decade of service protecting Delta fish and their habitats. VAMP was a combination of enhanced San Joaquin Delta inflows and Delta export reductions (limitations) during the spring period from mid-April to mid-May[1]. The goal of VAMP was to improve survival of San Joaquin chinook salmon smolts migrating through the Delta to the ocean, but VAMP's limitation on exports (to 1500 cfs) wound up doing so much more. This report summarizes the benefits VAMP provided, what has replaced VAMP, and what protections are now lacking. A summary of the remaining fish protections follows, followed by a discussion of events in each of the past three post-VAMP years.

NMFS OCAP BO

How well does the NMFS OCAP BO[2] replace VAMP? First, it provides Old and Middle River (OMR) negative flow limitations to limit exports. Second, it provides San Joaquin inflow to export ratio criteria to limit exports. Third, it retains spring closures of the Delta Cross Channel.

SMELT OCAP BO

The Smelt Biological Opinion[3] replaced the VAMP protections with OMR limitations in the range of -1250 to -6100 cfs.

Delta Water Quality Standards - 1641

Under 1641, a flow pulse (3100-8600 cfs depending on water year type) is required from the San Joaquin River into the Delta from mid April to mid May.

---

[1] http://www.sjrg.org/peerreview/review_vamp_panel_report_final_051110.pdf

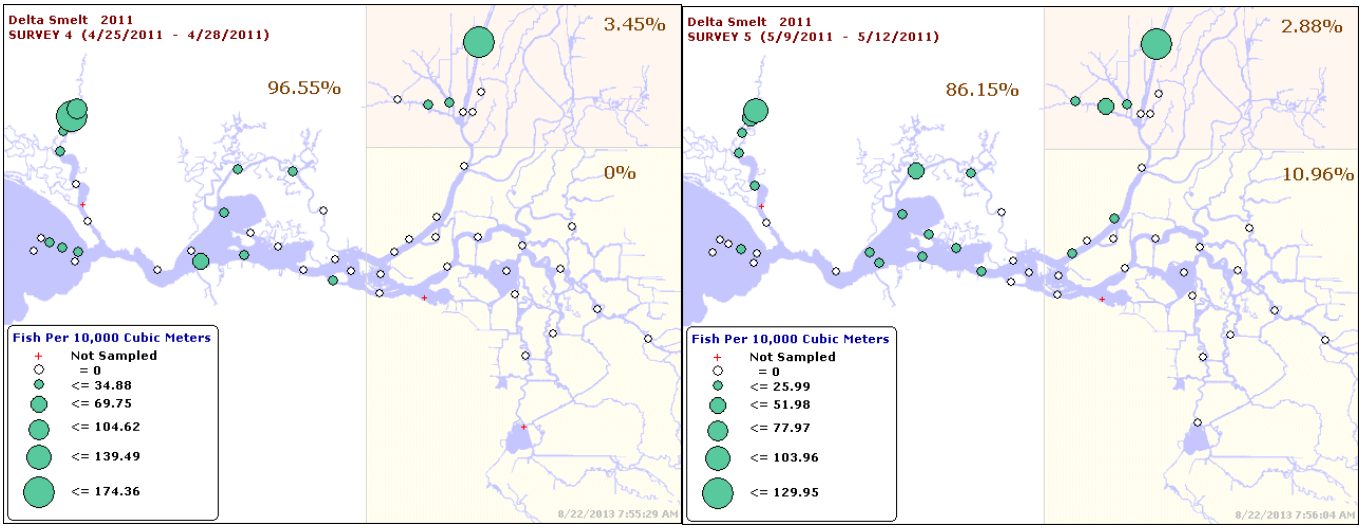
[2] http://www.swr.noaa.gov/ocap/doss/DOSS_annual_report_2011.pdf

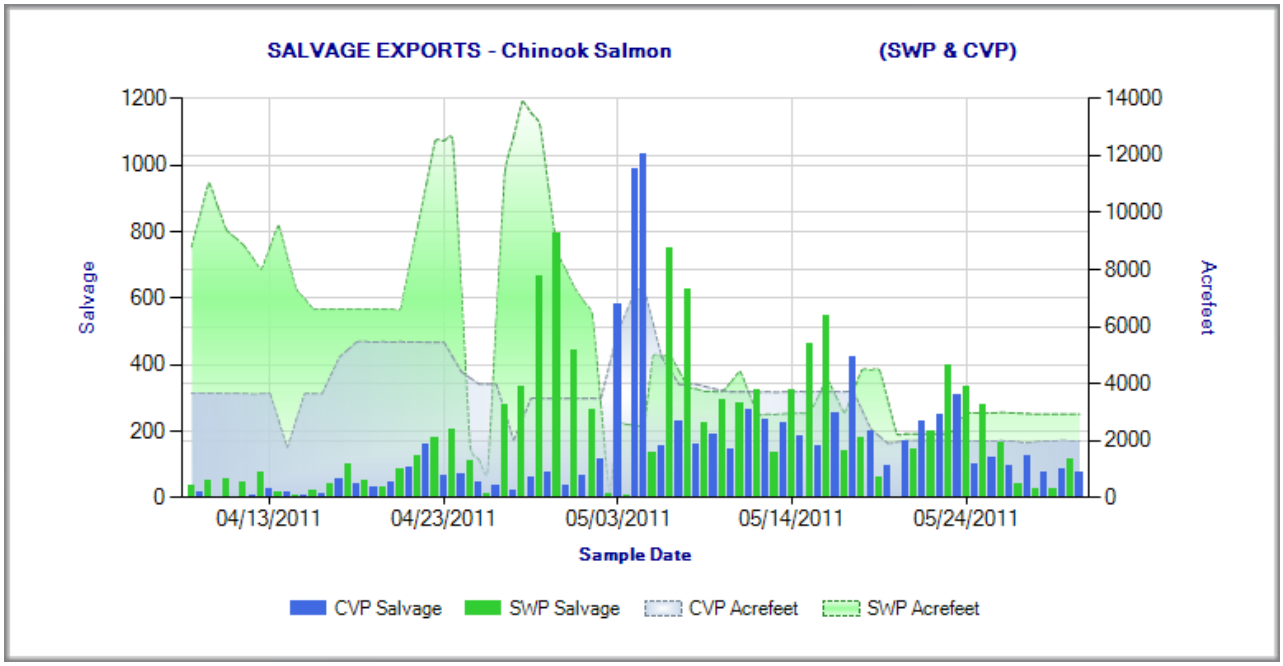
[3] http://www.fws.gov/sfbaydelta/cvp-swp/cvp-swp.cfm

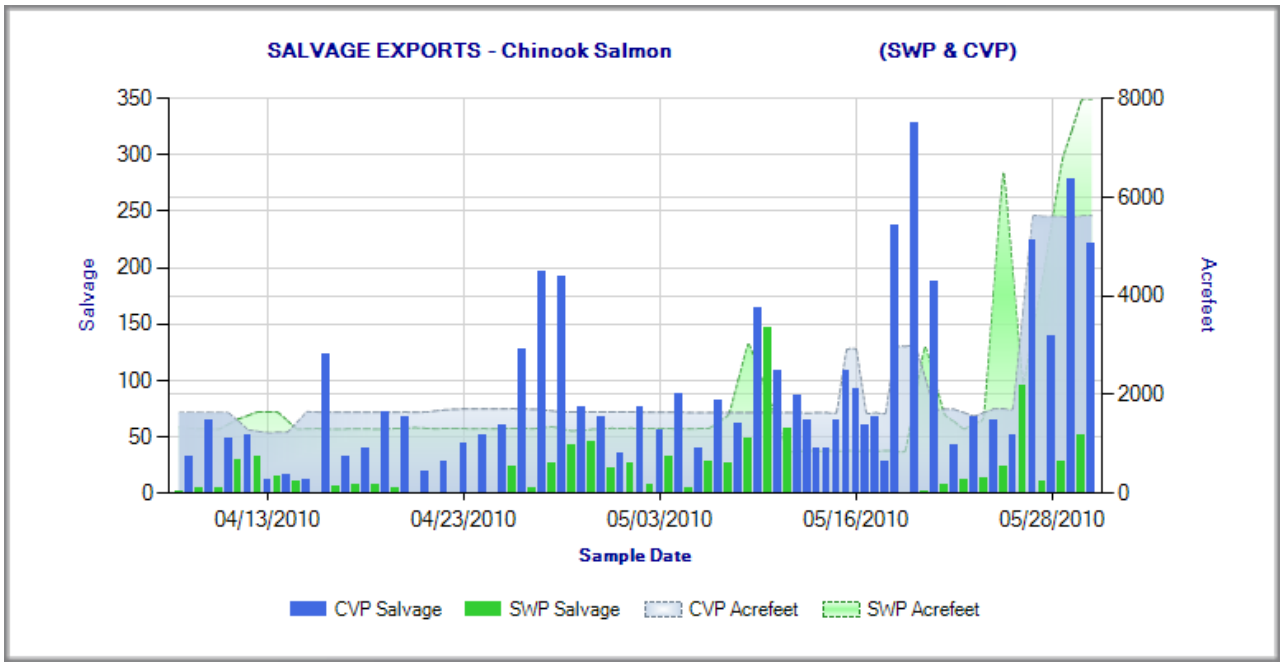
VAMP Period 2011

In 2011, the first year without VAMP, it was not missed, at least in terms of smelt protection. Year 2011 was a wet year with San Joaquin Delta inflows from mid April to mid May very high at 10,000-25,000 cfs, resulting in only a small percentage of the delta smelt population being in the Delta. Exports were 3,000-9,000 cfs, much higher than VAMP levels (1500 cfs in 2010). Smelt losses were very low, which was likely a major factor in the population recovery in 2011.

Salmon were salvaged in higher numbers because of the higher exports. Salvage was highest during peak exports. Salvage was roughly triple 2010 levels under VAMP 1500 cfs exports. With the Delta Cross Channel closed the burden of exposure to exports likely was on San Joaquin salmon.

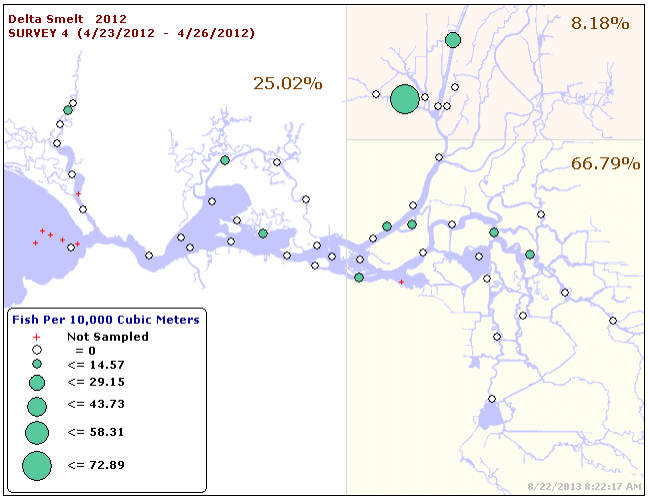


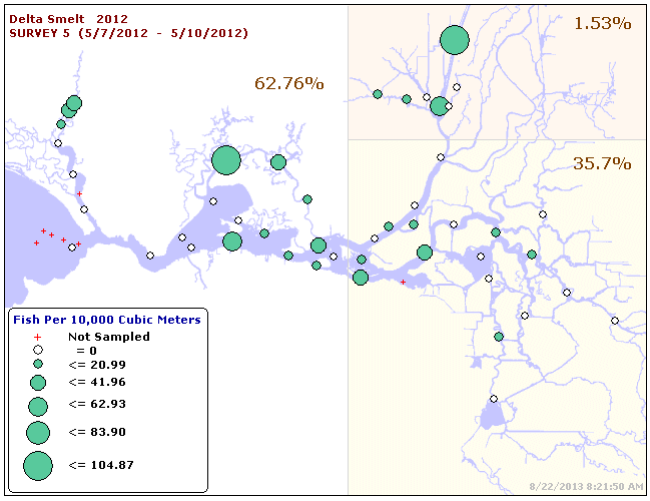




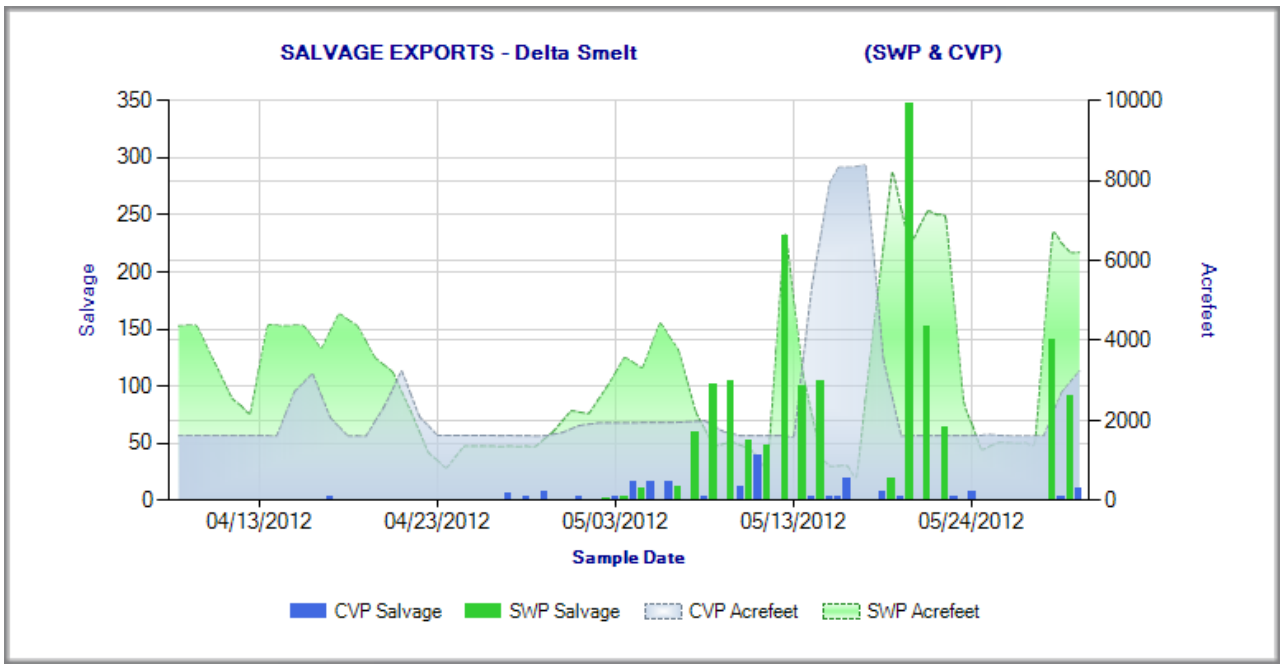
VAMP Period 2012

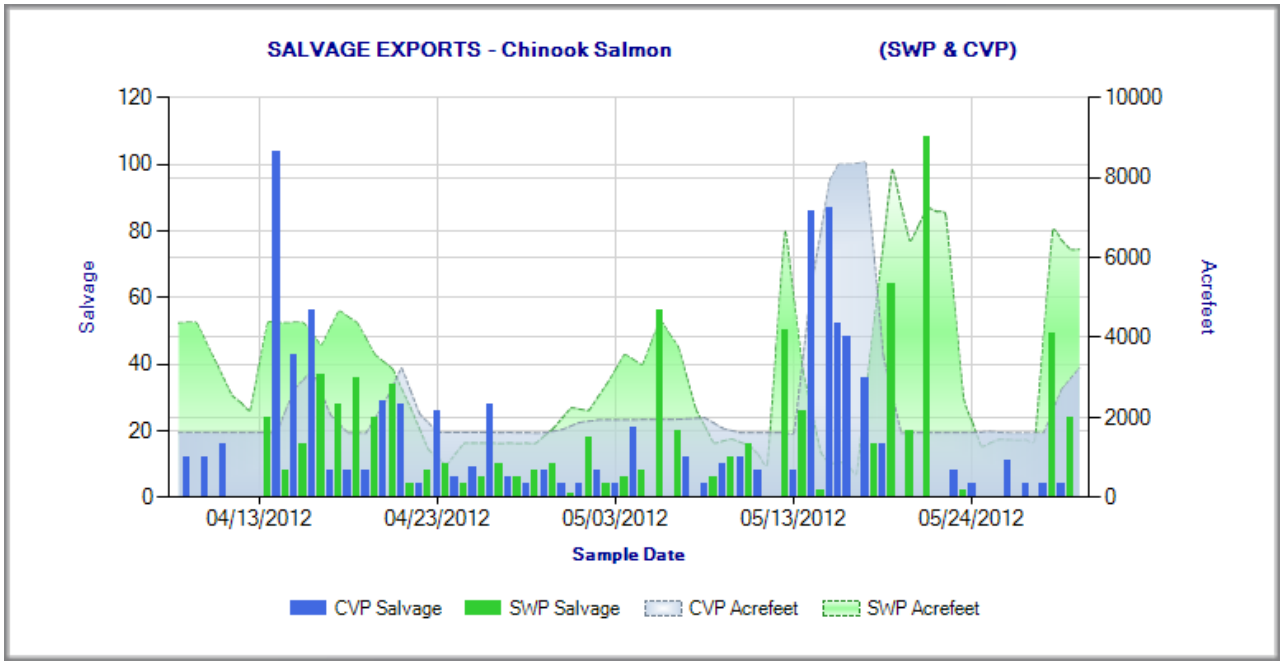
We really needed VAMP in the drier (Below Normal) 2012. A third to two-thirds of the smelt population was vulnerable to exports.

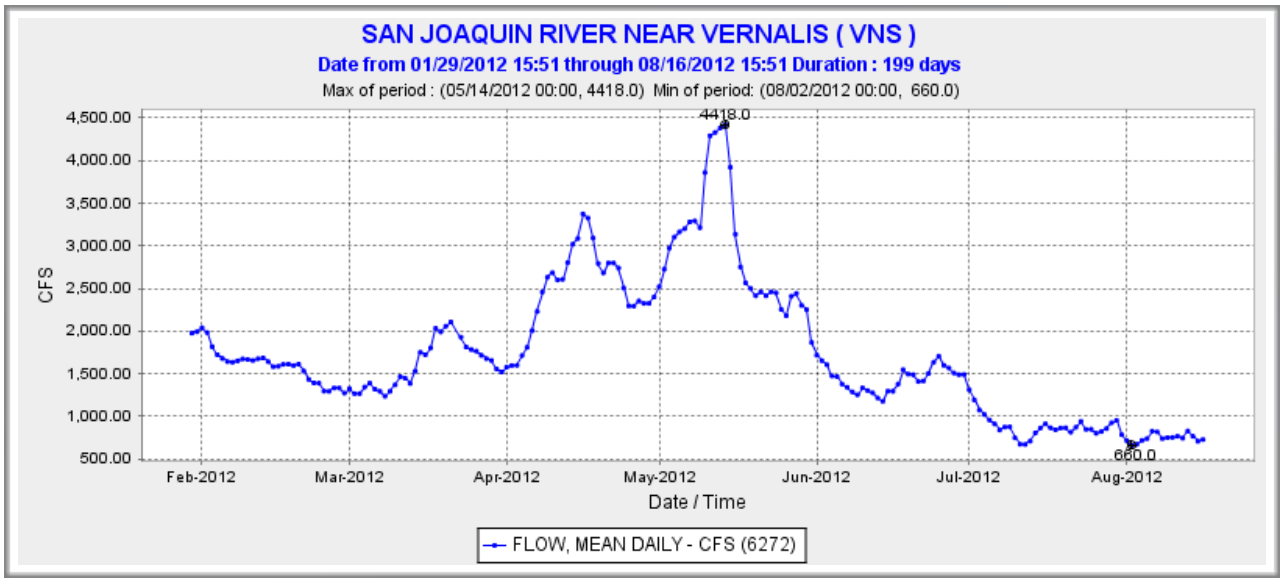




Some protections were provided by the BOs through limitations of exports and higher San Joaquin inflows, but exports reached 2000-4000 cfs (allowed with the pulsed flows) leading to a period of moderate smelt losses. Salmon salvage was relatively low under the low exports, but the closure of the DCC puts more of a burden on delta smelt and San Joaquin salmon.

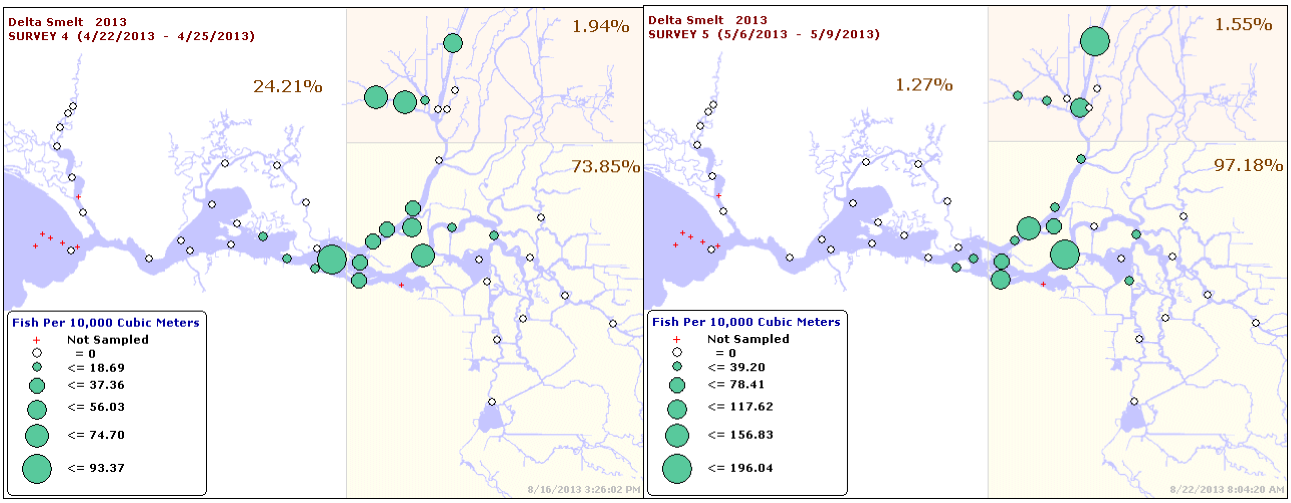

SALVAGE EXPORTS - Delta Smelt
(SWP & CVP)
Salvage
Acrefeet
350
300
250
200
150
100
50
0
10000
8000
6000
4000
2000
0
04/13/2012
04/23/2012
05/03/2012
05/13/2012
05/24/2012
Sample Date
CVP Salvage
SWP Salvage
CVP Acrefeet
SWP Acrefeet


SALVAGE EXPORTS - Chinook Salmon
(SWP & CVP)
Salvage
Acrefeet
120
100
80
60
40
20
0
10000
8000
6000
4000
2000
0
04/13/2012
04/23/2012
05/03/2012
05/13/2012
05/24/2012
Sample Date
CVP Salvage
SWP Salvage
CVP Acrefeet
SWP Acrefeet

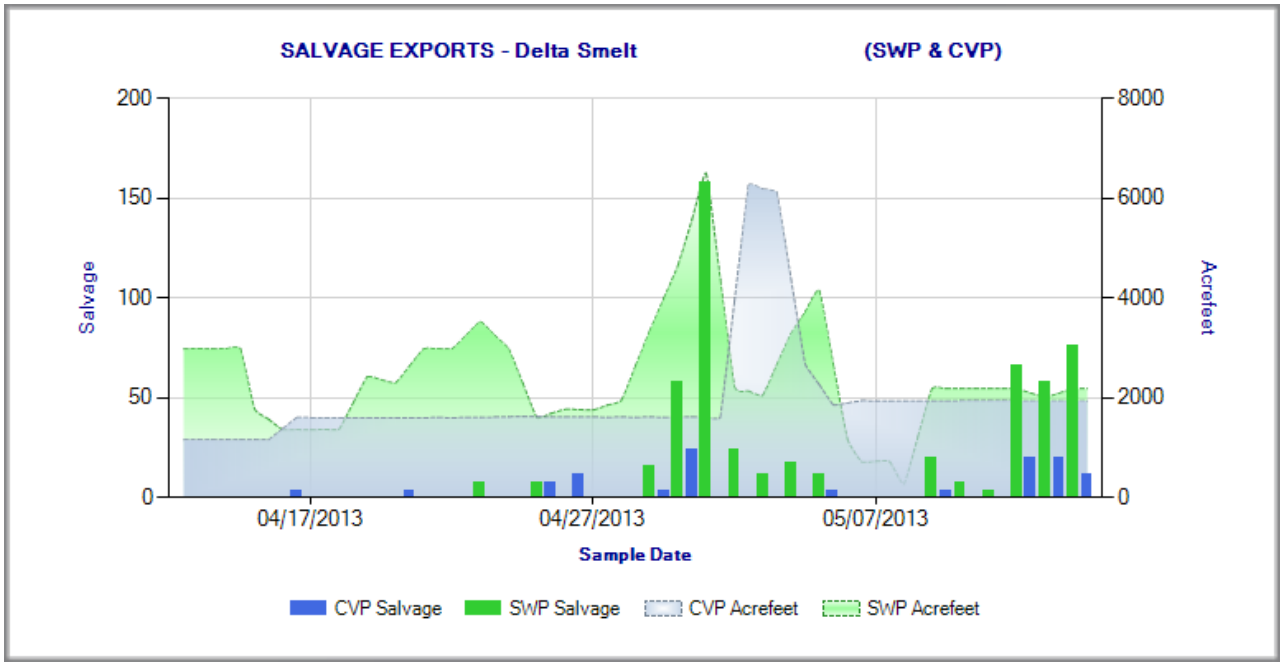

SAN JOAQUIN RIVER NEAR VERNALIS (VNS)
Date from 01/29/2012 15:51 through 08/16/2012 15:51 Duration : 199 days
Max of period : (05/14/2012 00:00, 4418.0) Min of period: (08/02/2012 00:00, 660.0)
4418.0
660.0
4,500.00
4,000.00
3,500.00
3,000.00
2,500.00
2,000.00
1,500.00
1,000.00
500.00
CFS
Feb-2012
Mar-2012
Apr-2012
May-2012
Jun-2012
Jul-2012
Aug-2012
Date / Time
FLOW, MEAN DAILY - CFS (6272)

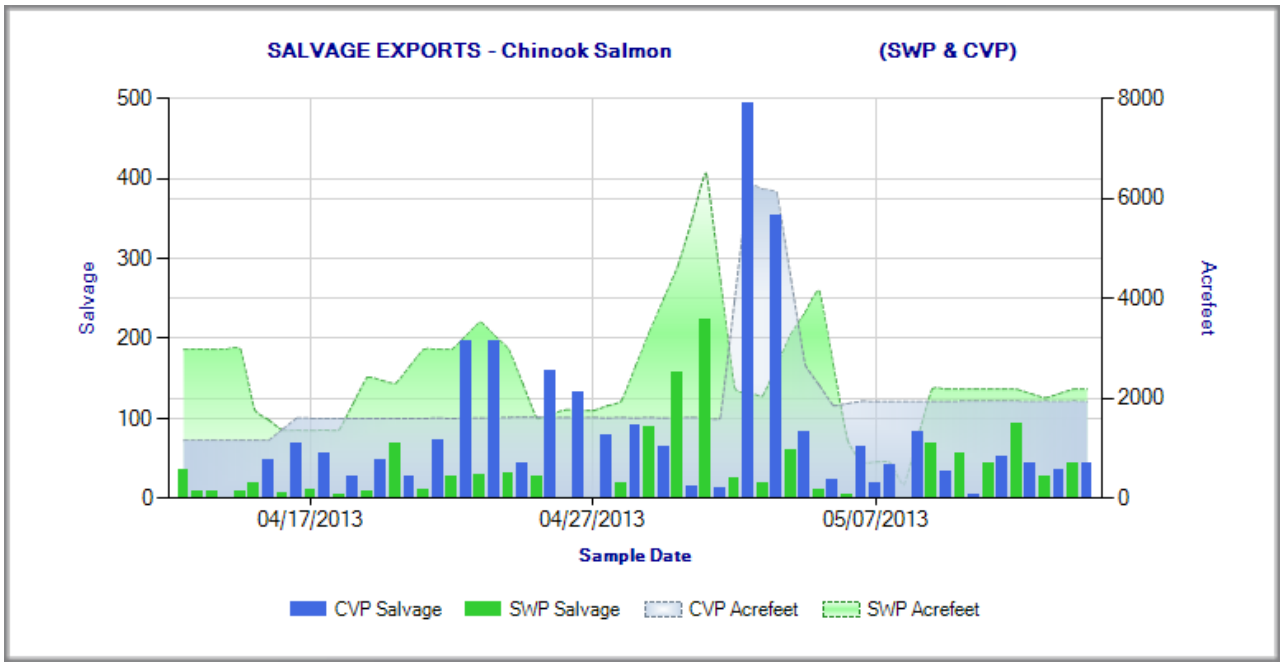
VAMP Period 2013

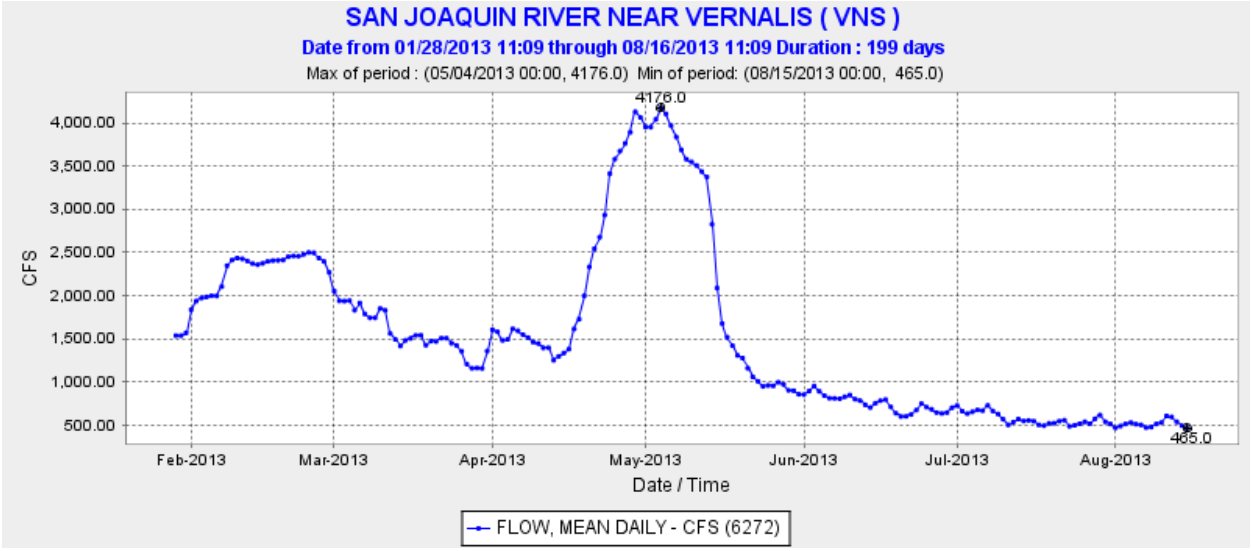
The loss of VAMP protections is hard on smelt and San Joaquin salmon in dry years like 2013. Much of the smelt population (74-98%) was in the Delta vulnerable to exports. Instead of 1500 cfs exports with VAMP, exports were 2000-4000 cfs (again allowed because of the flow pulse). With exports only controlled by OMR and I/E restrictions, exports ramped up during the late April-early May San Joaquin flow pulse, essentially negating any benefits of the pulse. In effect the pulse became a water transfer. Again,



with the DCC closed the burden of the higher exports without VAMP is on smelt and San Joaquin salmon.




SALVAGE EXPORTS - Chinook Salmon
(SWP & CVP)
Salvage
Acrefeet
500
400
300
200
100
0
8000
6000
4000
2000
0
04/17/2013
04/27/2013
05/07/2013
Sample Date
CVP Salvage
SWP Salvage
CVP Acrefeet
SWP Acrefeet


SAN JOAQUIN RIVER NEAR VERNALIS (VNS)
Date from 01/28/2013 11:09 through 08/16/2013 11:09 Duration : 199 days
Max of period : (05/04/2013 00:00, 4176.0) Min of period: (08/15/2013 00:00, 465.0)
4176.0
465.0
CFS
4,000.00
3,500.00
3,000.00
2,500.00
2,000.00
1,500.00
1,000.00
500.00
Feb-2013
Mar-2013
Apr-2013
May-2013
Jun-2013
Jul-2013
Aug-2013
Date / Time
FLOW, MEAN DAILY - CFS (6272)

Summary and Conclusions

The OMR and I/E limitations in the OCAP BOs help to limit exports during the critical mid-April to mid-May period, but not enough during San Joaquin flow pulses. Higher exports during the flow pulses also negate the benefits of the flow pulse, essentially providing a water transfer back to the south. With the DCC closed to protect Sacramento salmon and steelhead there is a maximum impact of exports on delta smelt and San Joaquin salmon and steelhead. A simple solution to help reduce these effects is to not allow the export of San Joaquin flow pulses designed to help San Joaquin salmon and steelhead pass through the Delta and improve water quality.