

# Topic: Inflow to Export (I:E) Ratio on the San Joaquin River

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**Region:** Delta / San Joaquin Watershed

**Type of Idea:** Operational / Study

**Timeframe:** April 1<sup>st</sup> to May 31<sup>st</sup>

**Species and Lifestage:** Juvenile Steelhead (Out-Migration)

**Current Requirement** – Reclamation and DWR shall implement starting in 2012, a minimum of 4:1 for the Vernalis flow-to-combined export ratio (6,000 cfs inflow to 1,500 cfs export), based on a 14-day running average, from April 1st through May 31st, during above normal and wet years.

**Ideas** – With the HORB in place, a 3.3: 1 Ratio Vernalis flow-to-combined export ratio, based on a 14-day running average, from April 1st through May 31st, during above normal and wet years.

**Past Implementation** – Since 2012, as defined by the San Joaquin Valley Classification, the San Joaquin has been Critically Dry, Dry or Flood Conditions. Therefore the 4:1 ratio has never been implemented.

**Related Science –**

- The 3.3 equates to 4,950 cfs measured at Vernalis to 1,500 cfs export pumping, which is within the real time median flows of San Joaquin River flows (cfs) measured at Vernalis for water years 1922 through 1992 for the months of April and May;
- 4,950 cfs measured at Vernalis is similar outflow as in Baker and Morhardt 2001, which indicated that flows over 5,000 to 6,000 cfs at Vernalis were required to move into the linear phase of increasing fish escapement to the ocean;
- Relies on the Mainstem of the San Joaquin as the preferred route to Chipps Island, which is supported by Holbrook, Perry, and Adams 2008, and DWR 2014 Stipulation Study;
- Idea aligns with 2006 VAMP Annual Technical Report, that indicated increase flows and decreased exports relative to the flows should correspond to increased smolt survival and adult escapement 2.5 years later.

## Past comments of Current Requirement

- 1) "The BiOp does not clearly explain the rationale for imposing a 4:1 ratio in above normal and wet years" Consolidated Salmonid Cases' 2011 Summary Judgement;
- 2) "Overall, under the OMR flows tested and the conditions that occurred during the field study, there was little influence of OMR flows on steelhead tag movement during the study." 2014 DWR- Stipulation Study;
- 3) "The extent to which management actions such as reduced negative Old and Middle River (OMR) reverse flows, ratio of San Joaquin River inflow to exports (I:E), and ratio of exports to Delta inflow (E:I) affect through-Delta survival is uncertain. " 2017 Salmon Scoping Team

## Modeling-

Reclamation has performed some preliminary draft CalSim modeling of this idea. Changing the San Joaquin River Inflow to Export pumping ratio in Wet and Above Normal Years to 3.3 to 1 instead of 4 to 1 has a possible water supply benefit of between 30 and 60 Thousand Acre-feet in Above Normal and Wet water year types. It is anticipated that the average annual water supply benefit of this action could total around 20 Thousand-Acre Feet of additional CVP / SWP supplies, with an equivalent reduction in Delta outflow in April and May.

However, there is a slight increase in Delta outflow required in the months just beyond this action, of up to 5 thousand-acre-feet in May or June of Above Normal or Wet water years.