

**Alternatives to the San Joaquin Inflow-to-Export Ratio  
for Reclamation to Consider in Its Initial Actions Environmental Assessment**  
NMFS July 19, 2018

Reclamation has shared a draft Environmental Assessment (EA) for “*Initial Actions for the Reinitiation of Consultation on the Coordinated Long-term Operation of the Central Valley Project and State Water Project*,” including proposing specific actions to replace current Reasonable and Prudent Alternative (RPA) actions in the NMFS 2009 Biological Opinion on the long-term operations of the Central Valley Project (CVP) and State Water Project (SWP; 2009 NMFS BiOp). The EA states that, based on Reclamation’s interpretation of recent science, the Proposed Action will not create “...additional adverse effects to listed species beyond those analyzed in the 2008 and 2009 [Biological Opinions]...”.

NMFS, however, has concerns that many of the proposed elements may not meet this standard. For example, Reclamation proposes the following operation in lieu of the Action IV.2.1 (the I:E ratio action) in the 2009 NMFS BiOp:

- Operate to a 1:1 inflow-to-export ratio for all Water Year Hydrologic Classifications in the San Joaquin Valley including transfers, as measured as a 3-day running average at Vernalis on the San Joaquin River.

Reclamation has conducted multiple brainstorming meetings, workshops, and technical teams in the development of the near-term actions currently in the draft EA. NMFS thinks that some of those brainstormed alternatives (not exhaustive) should be included and considered within the EA to provide a broader range of alternatives to Reclamation’s proposed 1:1 I:E ratio. Therefore, NMFS offers some potential alternatives<sup>1</sup> to be considered in the EA.

**NEAR-TERM IDEAS FOR ALTERNATIVES TO THE I:E RATIO IN ACTION IV.2.1**

*The current implementation of Action IV.2.1 (I:E ratio varies by San Joaquin yeartype; Head of Old River Barrier is installed when possible) is covered by the “No Action Alternative” in the EA.*

In order to meet timeframes and intent of near-term operations, and changes to current RPA need to be non-controversial and equally protective of current RPA measure. The following three actions could be pursued independently or jointly.

1. Operationalize/streamline WIIN Act Section 4001 on transfers, voluntary sales, and releases. Specifically,  
“adopt a 1:1 inflow to export ratio for the increment of increased flow, as measured as a 3-day running average at Vernalis during the period from April 1 through May 31, that results from the voluntary sale, transfer, or exchange, unless the Secretary of the Interior and Secretary of Commerce determine in writing that a 1:1 inflow to export ratio for that increment of increased flow will cause additional adverse effects on listed salmonid species beyond the range of the effects anticipated to occur to the

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<sup>1</sup> Note that NMFS has not conducted effects analyses on any of the suggested alternatives. Reclamation will need to conduct the effects analyses in order to determine if they are equally or more protective to the listed species than RPA Action IV.2.1.

listed salmonid species for the duration of the salmonid biological opinion using the best scientific and commercial data available; and subject to the condition that any individual sale, transfer, or exchange using a 1:1 inflow to export ratio adopted under the authority of this section may only proceed if...” [WIIN Act Section 4001(b)(7)]

“...such voluntary sale, transfer, or exchange of water results in flow that is in addition to flow that otherwise would occur in the absence of the voluntary sale, transfer, or exchange.” [WIIN Act Section 4001(b)(7)(C)]

Reclamation will need to analyze the potential effects of the change in ratio, and potentially mitigate if there are additional adverse effects (see the list of measures to reduce risk of additional adverse effects below) so that the end result is equally or more protective than the current RPA action.

2. Implement the April-May OMR restrictions in the California WaterFix (CWF) consultation [summarized in NMFS’ California WaterFix Biological Opinion (Table 3.3-1 in Appendix A2)]. During the development of the April-May Action in CWF, Ron Milligan (Reclamation-CVO) took a leadership role, working with NMFS and others to convert the San Joaquin I:E ratio into a linear inflow to OMR equation. There was consensus across the five agencies at the time. The benefits of this approach are to reduce the likelihood of arbitrary large stair steps between ratios in different water year types (e.g., at the last minute, changing from a 2:1 to a 3:1 ratio resulting from a change in the San Joaquin water year type) that may have significant water costs and achieve substantially similar benefits to species. This would also provide for more certainty in planning for water transfers. The thinking at the time was that this Action would be substituted for the San Joaquin I:E ratio during the next reinitiation on consultation. This linear equation could be paired with the WIIN Act adjustment that transferred water be exported at 1:1 above the baseline I:E ratio. This equation would set the baseline in lieu of the I:E ratio.

Excerpt from CWF:

*“Allowable OMR flows depend on gaged flow measured at Vernalis<sup>2</sup>, and will be determined by a linear relationship. If Vernalis flow is below 5,000 cfs, OMR flows will not be more negative than -2000 cfs. If Vernalis is 6,000 cfs, OMR flows will not be less than +1000 cfs. If Vernalis is 10,000 cfs, OMR flows will not be less than +2,000 cfs. If Vernalis is 15,000 cfs, OMR flows will not be less than +3,000 cfs. If Vernalis is at or exceeds 30,000 cfs, OMR flows will not be less than 6,000 cfs.”*

3. Implement phase I of RPA Action IV.2.1, specifically:

- Flows at Vernalis (7-day running average shall not be less than 7 percent of the target requirement) shall be based on the New Melones Index<sup>3</sup>. In addition to the Goodwin flow schedule for the Stanislaus River prescribed in Action III.1.3 and Appendix 2-E,

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<sup>2</sup> When OMR target is based on Vernalis flow, will be a function of 5-day average measured flow.

<sup>3</sup> The New Melones Index is a summation of end of February New Melones Reservoir storage and forecasted inflow using 50% exceedance from March through September.

Reclamation shall increase its releases at Goodwin Reservoir, if necessary, in order to meet the flows required at Vernalis, as provided in the following table. NMFS expects that tributary contributions of water from the Tuolumne and Merced rivers, through the SJRA, will continue through 2011 and that the installation of a fish barrier at the Head of Old River will continue to occur during this period as permitted.

New Melones Index (TAF)	Minimum flow required at Vernalis (cfs)
0-999	No new requirements
1000-1399	D1641 requirements or 1500, whichever is greater
1400-1999	D1641 requirements or 3000, whichever is greater
2000-2499	4500
2500 or greater	6000

- Combined CVP and SWP exports shall be restricted through the following:

Flows at Vernalis (cfs)	Combined CVP and SWP Export
0-6,000	1,500 cfs
6,000-21,7504	4:1 (Vernalis flow:export ratio)
21,750 or greater	Unrestricted until flood recedes below 21,750

This alternative requires that the Head of Old River Barrier be installed as practicable for the current ambient conditions.

**PREPARING FOR ALTERNATIVES TO I:E RATIO IN LONG-TERM OPS CONSULTATION:**

NMFS recommends that Reclamation consider building an alternative for the long-term consultation based on a new adaptive management approach with a sound experimental design to test key alternative hypotheses (e.g., exports are important in addition to inflow in some circumstances in influencing juvenile salmon behavior, etc). This experimental approach should build on lessons learned from VAMP, the six-year steelhead study, and the CSAMP/CAMT gap analysis report and recent Delta salmonid research workshop (that occurred on May 22, 2018). The experiment would likely need to test both more restrictive and less restrictive approaches to the current RPA, given low survivals in the South Delta. A power analysis should be conducted to determine the sample size necessary in order to detect the results we are looking for. This experimental operational approach could be paired with habitat restoration and or predator management actions/studies in the Delta and on the main stem San Joaquin River.

<sup>4</sup> Flood warning stage at Vernalis is 24.5 feet, flow is 21,750 cfs at this point. Flood stage is 29 feet with a corresponding flow of 34,500 cfs. Data from CDEC looking at April 8-9, 2006 period. As such, recognizing that the flows associated with these stages do vary, the trigger allowing unrestricted exports will be a Vernalis stage of 24.5 feet.

NMFS recommends that an expert team be convened within the next 2 months and given a charge to develop this experimental design by a date certain. NMFS would like to offer names of key scientists that should be involved in this effort, if Reclamation decides to use this approach.

In addition to an experimental operational regime, NMFS encourages Reclamation to consider actions in the April-May period to reduce risk of additional adverse effects to listed species due to modifications to implementation of Action IV.2.1, or increase learning, or both:

1. Preferential pumping through the CVP.
2. Increase San Joaquin River flows.
3. Consider diurnal radial gate operations at Clifton Court Forebay to minimized openings during the daytime (ideally, linked with study to determine whether listed species are more active at night near the facilities)
4. Establish steelhead-based loss triggers to either off-ramp the alternative implementation or require an OMR action response (for example something like 4 and 8 fish/TAF instead of the 8 and 12 fish/TAF in Action IV.2.3 of the 2009 NMFS BiOp) to protect steelhead emigrating from the San Joaquin River moving through the Old River corridor route.
5. Design an experiment to go along with flexed operations, as in the 2012 Joint Stipulation.
6. Improve habitat within the Delta, especially considering heat map approach in SST report..
7. If the fish collection facility is undergoing maintenance and salvage is not 100% functional, then exports should be reduced or steelhead loss density triggers made more sensitive.
8. Accelerate design and construction of an operable barrier at HOR, per CalWaterFix.