



— BUREAU OF —
RECLAMATION

Long-Term Operation – Initial Alternatives

Appendix N – New Melones Stepped Release Plan

Central Valley Project, California

Interior Region 10 – California-Great Basin

Mission Statements

The U.S. Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated Island Communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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1. Introduction

The New Melones Stepped Release Plan addresses the volume of instream flows that can occur over a multi-year hydrology without affecting reservoir levels to the extent of depleting the water pool to cause the release of warm water.

Reclamation's management questions for the formulation of an alternative include:

- What is the relationship between releases and downstream water temperatures?
- What reservoir storage levels result in the release of warm water?
- Does the long-term instream release result in storage levels that would result in the release of warm water that would affect salmonid survival?
- What risks occur from operating to a 75% exceedance forecast early in the water year?
- What hydrograph shape optimizes Central Valley steelhead anadromy and survival? Is there a flow intensity threshold to cue migration?
- What is the optimal pulse flow timing by water year type to increase salmonid survival, increase life history diversity, and contribute to successful spawning in the adult population? What migratory phenotypes (i.e., fry, parr, smolts) are more likely to survive under different flow regimes?
- How do releases on the Stanislaus River affect the Water Quality Control Plan (WQCP) and exports?

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2. Performance Metrics

Performance metrics describe criteria that can be measured, estimated, or calculated relevant to informing trade-offs for alternative management actions.

2.1 Biological

Fisheries metrics consider direct observations and environmental surrogates including:

- **Water Temperature for Juveniles and Eggs**
 - The survival temperature threshold for juvenile steelhead is less than or equal to 68 degrees Fahrenheit (°F) from May 1 to November 1.
 - The temperature threshold for steelhead egg incubation is less than or equal to 54°F from December 1 to May 31.

The steelhead on the Stanislaus River generally move upstream to spawn between July and March; juvenile steelhead out-migrate between January and June (NMFS 2014). Reservoir releases combined with other environmental conditions will affect water temperature, dissolved oxygen level, and other habitat attributes that will influence the timing, condition and survival of eggs in the spawning redds. Decrease in flows generally results in warmer water temperatures in the winter; however, winter water temperatures are colder than adult migration temperature needs. The New Melones Stepped Release Plan promotes increased storage at New Melones Reservoir, which can help the development of a larger cold water pool. More cold water in the reservoir may help lower water temperatures downstream of Goodwin Dam, which would benefit steelhead in all life stages in the lower Stanislaus River.

The fisheries metrics address the volume of instream flows that can occur over a multi-year hydrology without affecting reservoir levels to the extent of depleting the cold water pool to cause the release of warm water.

2.2 Water Supply

Water supply metrics consider the multipurpose beneficial uses of New Melones including:

- CVP water service contracts
- Senior water right holders (Oakdale Irrigation District and South San Joaquin Irrigation District)
- State Water Resources Control Board Water Right Decision 1641 (D-1641) standards and its dissolved oxygen requirement

- Flood conservation pool release

CalSim II would support the evaluation of water supply metrics.

2.3 NEPA Resources

Analysis of the range of alternatives as required by the National Environmental Policy Act is anticipated to describe changes in the multiple resources areas. Key resources are anticipated to include surface water supply, water quality, groundwater resources, aquatic resources, terrestrial biological resources, regional economics, land use and agricultural resources, cultural resources, socioeconomics, environmental justice, climate change, and power generation.

3. Methods

Reclamation solicited input from the stakeholders and agencies for the knowledge base paper (Steelhead Juvenile Production Estimate). Reclamation identified the following datasets, literature, and models to help in evaluating the New Melones Stepped Release Plan.

3.1 Datasets

Several efforts to characterize historical and ongoing steelhead monitoring programs in the California Central Valley have been completed over the past two decades. A few years after the completion of the Central Valley Steelhead Monitoring Plan, a series of related monitoring projects, identified as the Central Valley Steelhead Monitoring Program (CVSMP), were initiated on the Sacramento River and its tributaries (Fortier et al. 2014). Appendix G provides pertinent information for the datasets for steelhead.

CalFish (2019). CalFish – A California cooperative anadromous fish and habitat data program. Middle Sacramento River salmon and Steelhead monitoring. Available: <https://www.calfish.org/ProgramsData/ConservationandManagement/CentralValleyMonitoring/SacramentoValleyTributaryMonitoring/MiddleSacramentoRiverSalmonandSteelheadMonitoring.aspx>.

SacPAS: Central Valley Prediction & Assessment of Salmon provides a platform for data queries of juvenile steelhead salvage and loss. Available: http://www.cbr.washington.edu/sacramento/data/juv_salvage_loss.html.

Use CalFishTrack to understand juvenile steelhead routing and survival into the Delta. <https://oceanview.pfeg.noaa.gov/CalFishTrack/>

3.2 Literature

The documents listed below were compiled from the 2019 BiOps, 2020 ITP, fact sheets produced for the February 2021 joint Delta Science Program – U.S. Bureau of Reclamation Steelhead Workshop, and a Google Scholar search.

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3.3 Models

Modeling is in progress.

- CalSim II
- HEC-5Q

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4. Lines of Evidence

Analysis of the LTO relies on multiple lines of evidence from datasets, literature, and models. The following analyses contribute to understanding effects.

Lines of Evidence is currently under development and will be provided for Draft Public EIS.

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5. Initial Options Analysis

Modeling is pending and will be provided for Public Draft Environmental Impact Statement.

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6. Conclusions

What is the relationship between releases and downstream water temperatures?

- Modeling is under development.

What reservoir storage levels result in the release of warm water?

- Modeling is under development.

Does the long-term instream release result in storage levels that would result in the release of warm water that would affect salmonid survival?

- Modeling is under development.

What risks occur from operating to a 75% exceedance forecast early in the water year?

- Modeling is under development.

What hydrograph shape optimizes steelhead anadromy and survival? Is there a flow intensity threshold to cue migration?

- Conclusions are under development.

What is the optimal pulse flow timing by water year type to increase salmonid survival, increase life history diversity, and contribute to successful spawning adult population? What migratory phenotypes (i.e., fry, parr, smolts) are more likely to survive under different flow regimes?

- Conclusions are under development.

How do releases on the Stanislaus River affect WQCP and exports?

- Modeling is under development.

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7. References

- References are listed in Section 3, Methods, and are under development