

MANAGEMENT STRATEGY · ENVIRONMENT

Winter-run refuge flows with reintroduction

A management strategy in the COEQWAL scenario library

This strategy assigns seasonal flow requirements on the Sacramento and San Joaquin rivers designed primarily for winter-run Chinook salmon growth and out-migration survival, paired with operational logic that scales the flows back and reduces CVP allocations when projected Shasta storage falls below a cold-water threshold.

This brief describes “*winter-run refuge flows with reintroduction*”, one of 28 management strategies in the COEQWAL scenario library. Each strategy is simulated once under each of five hydroclimates; the references note at the end of this brief lists the model runs.

[Winter-run refuge flows](https://coeqwal.org/documents/Strategy_Documentation/strategy_brief_winter-run-refuge-flows.html) (https://coeqwal.org/documents/Strategy_Documentation/strategy_brief_winter-run-refuge-flows.html), with reintroduction specifies the same water management actions as Winter-run refuge flows. The two strategies share the same CalSim 3 simulation of the water system — the same model run, not a duplicate. They differ in one action that is not a water management action: reintroduction of winter-run Chinook salmon to cold-water habitat upstream of Shasta Dam. Reintroduction enters the modeling through the winter-run life cycle model, not through CalSim 3, so modeled results differ from Winter-run refuge flows only for the winter-run salmon key outcome. Results for the other eight key outcomes are identical by construction.

§2 WHAT THIS STRATEGY CHANGES

The strategy assigns seasonal flow requirements on the Sacramento and San Joaquin rivers with the stated aim of supporting winter-run Chinook salmon growth — through spills onto the Yolo Bypass — and out-migration survival.

Because Shasta reservoir storage supports summer cold-water habitat, the strategy includes additional operational logic: in spring months when estimated Shasta storage falls below 3,500 TAF, the salmon out-migration flows are incrementally reduced or eliminated and CVP allocations are reduced. The flow requirements are balanced against storage protection rather than imposed unconditionally.

§ 3 THE CONFIGURATION IN DETAIL

The table compares the eight operational fields that define this strategy against current operations — the strategy that represents existing operational rules, recent (2020) land use, and TUCPs. Rows that match current operations are shown in light gray; rows that differ are highlighted.

ASPECT	CURRENT OPERATIONS	THIS STRATEGY
TUCP actions	Active	Active
SGMA actions	None	None
Land use	2020 LandIQ	2020 LandIQ
Delta regulations	Standard	Standard
BiOps	2019 / 2020 ITP	2019 / 2020 ITP
Infrastructure	Standard	Standard
Flows	Standard	Flows on the Sacramento River assigned to improve salmon survival; balanced against allocation reductions for Shasta storage
Allocation / priorities	Standard	Standard

§ 4 LINEAGE AND SOURCE

This configuration was developed by the COEQWAL team using the functional-flows study as the starting point: the flow-requirement switches were expanded to cover the winter-run refuge flow locations and options, along with the additional logic for determining and setting flow levels and allocations. It is built on current operations under DWR's adjusted historical hydrology with the 2020 LandIQ land-use dataset. The CalSim model files for this strategy are referenced by the run IDs in the references note at the end of this brief.

§ 5 RELATED STRATEGIES

RELATED STRATEGIES — ENVIRONMENT

No flow requirements. Current operations without minimum flow requirements on Central Valley rivers.

Winter-run refuge flows. Sacramento River flow requirements and Shasta cold-water storage protection to support Sacramento River winter-run Chinook salmon life-cycle needs.

Functional environmental flows with reduced crop acreage. Functional flow requirements combined with reduced irrigated acreage across the Central Valley, reflecting groundwater management under SGMA.

Winter-run refuge flows with reduced crop acreage. The winter-run refuge flows combined with reduced irrigated acreage across the Central Valley, reflecting groundwater management under SGMA.

Increase Delta outflows (65% unimpaired flow target). USBR Alternative 3 for the Long-Term Operation of the Central Valley Project, with Delta outflow requirements set to roughly 65% of unimpaired volume.

Increase Delta outflows (55% unimpaired flow target). USBR Alternative 3 for the Long-Term Operation of the Central Valley Project, with Delta outflow requirements set to roughly 55% of unimpaired volume.

Functional environmental flows. Functional minimum flow requirements on tributaries to the Sacramento and San Joaquin rivers, derived from natural-flow estimates.

§6 WHAT THIS DOESN'T SAY

This brief describes a scenario representation in CalSim, not a real-world policy proposal or implementation plan. The strategy as modeled may not capture all details necessary to support direct translation to actual operations. The brief does not predict, evaluate, or recommend any outcome — it describes what the scenario changes about CalSim's representation of the system. For what the model produces under this strategy, see the result briefs referenced in §7.

§7 SEE RESULTS FOR THIS STRATEGY

To see modeled outcomes under this strategy across all nine key outcomes at the reference hydroclimate, see the *Rivers, salmon and the Delta ecosystem* theme brief.

To see outcomes at a specific location of interest, see the relevant LOI briefs — particularly those for locations on the Sacramento River.

Compare this strategy in the data explorer → (<https://coeqwal.org/explore?strategy=s0031-R>)

REFERENCES — MODEL RUNS

Each strategy is simulated once under each of five hydroclimates. The table lists the model run behind this strategy and the current-operations run it is compared against, for each hydroclimate, so any reader can trace this page to specific CalSim runs. The identifier this brief carries for each hydroclimate ends in -R, which is the web platform's scenario identity for this strategy; the CalSim 3 run underneath it is the run for Winter-run refuge flows, the same identifier without the suffix, s0031 under the historical hydroclimate.

HYDROCLIMATE	THIS STRATEGY	CURRENT OPERATIONS
Historical hydroclimate (adjusted)	s0031-R	s0020
Moderate climate stress (EC-Earth3-Veg)	s0144-R	s0134
Moderate-high climate stress (cc50)	s0072-R	s0047
High climate stress (cc95)	s0092-R	s0056
Extreme climate stress (TaiESM1)	s0118-R	s0108

COEQWAL · Collaboratory for Equity in Water Allocation

RunID s0031-R Web platform ID 3.4-R Brief v0.1 (generated draft) Updated August 21, 2026

[COEQWAL](https://coeqwal.org) (https://coeqwal.org)

[Return to COEQWAL Documentation](https://coeqwal.org/data) (https://coeqwal.org/data)