

Implementing the Salmon Action Plan for 2017 Winter-Run Chinook Salmon in the Sacramento River

Foundation:

- NMFS Recovery Plan for Sacramento River winter-run Chinook salmon
- NMFS Species in the Spotlight
- Governor Brown's California Water Action Plan
- CDFW Ecosystem Restoration Program
- Sacramento Valley Salmon Recovery Program
- Insights into the Problems, Progress and Potential Solutions for Sacramento River Basin Native Anadromous Fish Restoration

Winter-Run Cycle:

This year's returning winter-run begin arriving in early December. Spawning and egg incubation begins in mid-April and continues through September. The emergence of fry (juvenile fish) occurs from July through September and those fish usually hold in the upstream areas to rear from October through February. The priority actions are linked to this cycle to provide in-the-river benefits to this upcoming year class of winter-run salmon.

Priority Actions:

The following are priority actions for Winter-run Chinook salmon on the Sacramento River that will be undertaken by the Salmon Action Plan partners to benefit each life-stage of salmon in 2017.

I. Upstream Migration / Straying Avoidance

The following action will be completed by December 2016 to benefit returning adult winter-run salmon migrating up the Sacramento River.

- Construction of Wallace Weir Fish Rescue Facility (\$12,000,000)

II. Egg Incubation - 2017 Operations for Temperature Management

A. The following will be completed and operational by February 1, 2017 to inform the 2017 Shasta Reservoir operations plan.

- Keswick Reservoir Thermal Profiler (\$35,000)
- Permanent installation of fiber optical cable (or alternative technology) in Shasta Reservoir to make temperature data available in real time (~\$100,000)

B. The following actions need to be initiated by January 2017 to allow for modeling to occur in real time and refined.

- Improve modelling tools to predict temperature resources (>\$500,000)
- Improve tools to model temperature operations (\$100,000)
- CV heat budget (just the watershed-reservoir component) to simulate inputs into Shasta Reservoir over the current season and through long-term climate change scenarios (~\$100,000)
- Sacramento River Bathymetry to improve flow model for entire river (but mainly applied to spawning habitat (~\$125,000)
- Disease impacts study on winter-run juvenile Chinook salmon (\$54,000)

III. Improved Spawning Habitat.

The following actions will be completed by April 2017 to benefit spawning winter-run.

- Habitat/Redd Monitoring in upper Sacramento River (Summer 2016)(\$35,000)
- Complete gravel spawning projects (i.e., Market Street gravel project)(\$350,000)
- Place additional gravel in the Sacramento River in a manner that creates functional spawning habitat upstream of the Highway 44 Bridge.

IV. Emerging Juvenile Fry and Smolts

The following actions will be completed by July 2017 to benefit emerged and rearing juvenile winter-run salmon.

- Install refugia (preferably natural structure) to reduce predation of emerged salmon (i.e., RGF pilot project) (\$100,000)
- Drift invertebrate (salmon prey) camera system to measure available food for juvenile salmon (~\$150,000)
- Restore side-channel, off-channel, floodplain habitat, and other (b)(13) projects to reduce predation, increase growth, and improve fitness.
 - Cypress Avenue Bridge (\$400,000)
 - Look for an opportunity to expedite floodplain reconnection projects on lower Battle Creek
 - Side-channel projects in Tehama County
- Eliminate or Reduce Lighting at In-River Structures on the Sacramento River

V. Monitoring for Out-Migrating Salmon

The following will be completed by August 2017 to monitor juvenile out migration and develop better estimates of salmon survivability.

- Implement new monitoring projects closer to spawning grounds (\$100,000 + annual monitoring costs)
- Spot monitoring for salmon during episodic high flow, high turbidity events (\$100,000)