

1. Effects of the Action

1.1. CVP/SWP Wide

1.1.1. Divert and store water consistent with obligations under water rights and decisions by the State Water Resources Control Board

1.1.2. Shasta Critical Determinations and Allocations to Water Service and Water Repayment Contractors

1.1.3. 2018 Revised Coordinated Operations Agreement

1.2. Upper Sacramento

1.2.1. Seasonal Operations

1.2.1.1. Shasta Winter Ops.

1.2.1.1.1. Flood Control Ops.

1.2.1.1.2. Bend Bridge <100,000 cfs

1.2.1.1.3. "Winter – Spring Minimum flows (D-1641?)"

1.2.1.1.4. Fall and Winter Refill and Redd Maintenance

1.2.1.2. Shasta Spring Ops.

1.2.1.2.1. Flood Control Ops.

1.2.1.2.2. Balanced Shasta/Folsom (Instream demands & Outflow)

1.2.1.2.3. Refill (TCD Ops.)

1.2.1.2.4. Spring Pulse Flows

1.2.1.2.5. Spring Management of Spawning Locations

1.2.1.2.6. Shasta Cold Water Pool Management

1.2.1.3. Shasta Summer Ops.

1.2.1.3.1. Balanced Shasta/Folsom/Trinity (Instream demands, Outflow and Temp.)

1.2.1.3.2. Shasta Cold Water Pool Management

1.2.1.3.2.1. Tier 1

1.2.1.3.2.2. Tier 2

1.2.1.3.2.3. Tier 3

1.2.1.3.2.4. Tier 4

1.2.1.3.2.4.1. Temperature Management

1.2.1.3.2.4.2. LSNFH Production (Intervention)

1.2.1.3.2.4.3. Adult Rescues (Intervention)

1.2.1.3.2.4.4. Juvenile Trap and Haul (Intervention)

1.2.1.4. Shasta Fall Ops.

1.2.1.4.1. Balanced Shasta/Folsom/Trinity (Instream demands, Delta req. and Redd dewatering)

1.2.1.4.2. Shasta Cold Water Pool Management

1.2.1.4.3. Fall and Winter Refill and Redd Maintenance

1.2.1.4.4. Rice Decomposition Smoothing

1.2.2. Operation of a Shasta Dam Raise

1.2.3. Conservation Measures

1.2.3.1. Cold Water Management Tools

1.2.3.1.1. Battle Creek Restoration

- 1.2.3.1.2. Lower Intakes near Wilkins Slough
- 1.2.3.1.3. Shasta Temperature Control Device Improvements
- 1.2.3.2. Spawning and Rearing Habitat Restoration
 - 1.2.3.2.1. Spawning Gravel Injection
 - 1.2.3.2.2. 40 - 60 Acres side channel habitat
 - 1.2.3.2.3. Small Screen Program

1.3. Trinity

1.3.1. Seasonal Operations

- 1.3.1.1. Trans-basin diversion
 - 1.3.1.1.1. Sacramento temperature objectives.
- 1.3.1.2. Reservoir releases
 - 1.3.1.2.1. Trinity River temperature objectives
 - 1.3.1.2.2. End-of-year carryover storage (>600 TAF)

1.3.2. Trinity River ROD

- 1.3.2.1. Long-Term Plan to Protect Adult Salmon in the Lower Klamath River
- 1.3.2.2. Seasonal Operations
 - 1.3.2.2.1. Sacramento Temperature Objectives
 - 1.3.2.2.2. Trinity Temperature Objectives
 - 1.3.2.2.3. End of year Carryover storage

1.3.3. Grass Valley Creek flows from Buckhorn Dam

- 1.3.3.1. water rights permit 18879
 - 1.3.3.1.1. Minimum flows
 - 1.3.3.1.2. Flushing flows
 - 1.3.3.1.3. Spring Pulse Flows
 - 1.3.3.1.4. Fall spawning and attraction flows

1.3.4. Whiskeytown Reservoir Operations

- 1.3.4.1. Power generation and recreation
- 1.3.4.2. Sacramento Temperature Objectives
 - 1.3.4.2.1. Sacramento Temperature Objectives
 - 1.3.4.2.2. Sacramento water quality (Spring Creek Debris Dam)
- 1.3.4.3. Temperature management
 - 1.3.4.3.1. Summer Temperatures
 - 1.3.4.3.2. Fall Temperatures
- 1.3.4.4. Clear Creek Flows
 - 1.3.4.4.1. Minimum instream flows
 - 1.3.4.4.2. 10,000 AF Spring pulse flow
 - 1.3.4.4.3. Channel maintenance flows (10,000 AF)
- 1.3.4.5. Clear Creek Restoration Program
- 1.3.4.6. Balanced Sacramento/Trinity/Clear Creek

1.4. Feather River

1.4.1. FERC Project #2100-134

- 1.4.1.1. Instream Flows (D-1641)

1.4.1.2. Local deliveries and exports to Banks pumping

1.5. American River

1.5.1. Seasonal Operations

1.5.1.1. Power Generation

1.5.1.1.1. Power Bypass (Drought Declaration)

1.5.1.2. Winter Ops.

1.5.1.2.1. Flood Control

1.5.1.2.2. Limited releases >4,000 cfs

1.5.1.2.3. Chinook Redd dewatering (Jan – Feb)

1.5.1.3. Spring Ops.

1.5.1.3.1. Flood Control

1.5.1.3.2. Limited releases >4,000 cfs

1.5.1.3.3. Steelhead Redd dewatering (Feb – May)

1.5.1.3.4. Spring Pulse Flow (reshaping)

1.5.1.4. Summer Ops.

1.5.1.4.1. Delta WQ (D-1641)

1.5.1.4.2. Temperature Management

1.5.1.4.3. Drought Temperature Management

1.5.1.5. Fall Ops.

1.5.1.5.1. Delta WQ (D-1641)

1.5.1.5.2. Temperature Management

1.5.1.5.3. Redd Dewatering

1.5.2. 2017 Flow Management Standard Releases and “Planning Minimum”

1.5.2.1. Minimum flow schedule/index

1.5.2.2. “Planning Minimum” (TBD 2019?)

1.5.2.3. Spring Pulse Flow (Mar – April)

1.5.3. Spawning and Rearing Habitat Restoration

1.6. Bay-Delta

1.6.1. Delta Cross Channel Operations

1.6.1.1. D-1641 WQ Sacramento Flows > 20,000 – 25,000

1.6.1.2. Oct. – Nov. 30 (fish presence)

1.6.1.3. Dec. – May 20 (closed)

1.6.1.4. May 21 – June 15 (14 days closed)

1.6.1.5. Dec/Jan (Drought)

1.6.1.6. Delta Cross-Channel Gate Improvements

1.6.2. Agricultural Barriers

1.6.2.1. Old River @ Tracy (April/July – Nov.)

1.6.2.2. Middle River (April/July – Nov.)

1.6.2.3. Grant Line Canal (April/July – Nov.)

1.6.3. Contra Costa Water District Rock Slough Operations

1.6.3.1. Intake volume (350 cfs, 195 TAF annual)

1.6.4. North Bay Aqueduct

- 1.6.4.1. Jan 15 – Mar. 31 (Dry and CD years)
- 1.6.5. Water Transfers
 - 1.6.5.1. July – Nov.
 - 1.6.5.2. Effects of developing water supplies
- 1.6.6. Suisun Marsh
 - 1.6.6.1. Suisun Marsh Preservation Agreement
 - 1.6.6.2. Suisun Marsh Salinity Control Gates Operation
 - 1.6.6.3. Suisun Marsh Food Subsidies
- 1.6.7. Export Operations
 - 1.6.7.1. OMR Management
 - 1.6.7.1.1. Onset: 14-day avg. >-5,000 cfs
 - 1.6.7.1.1.1. “First Flush” (IEWPP) Dec. 1 – Jan. 31
 - 1.6.7.1.1.2. Jan 1, 5% rule (WR, SR or St)
 - 1.6.7.1.2. End: June 30 Or BOTH:
 - 1.6.7.1.2.1. CCR 25°C
 - 1.6.7.1.2.2. 95% past Chipps OR Mossdale 72°F
 - 1.6.7.1.3. Additional RT OMR Restrictions
 - 1.6.7.1.3.1. Turbidity Bridge Avoidance
 - 1.6.7.1.3.2. Larval and Juvenile Delta Smelt
 - 1.6.7.1.3.3. Wild Central Valley Steelhead Protection
 - 1.6.7.1.3.4. Salvage or Loss Thresholds
 - 1.6.7.1.3.4.1. 50%
 - 1.6.7.1.3.4.2. 75%
 - 1.6.7.1.4. Storm-Related OMR Flexibility
 - 1.6.7.2. Entrainment and Salvage Actions
 - 1.6.7.2.1. Minimum Export Rate (HHS 1,500 cfs)
 - 1.6.7.2.2. Tracy Fish Collection Facility
 - 1.6.7.2.2.1. Predator Removal (CO₂ injection)
 - 1.6.7.2.2.2. Tracy Fish Facility Improvements
 - 1.6.7.2.3. Skinner Fish Facility
 - 1.6.7.2.3.1. Skinner Fish Facility Improvements
 - 1.6.7.2.3.1.1. Predator Removal
 - 1.6.7.2.3.1.2. Clifton Court Aquatic Weed Removal
 - 1.6.7.2.3.1.2.1. Operational minimization procedures
 - 1.6.7.2.3.2. Release Sites
- 1.6.8. Conservation Measures
 - 1.6.8.1. Additional Measures
 - 1.6.8.1.1. Operations
 - 1.6.8.1.1.1. Fall Delta Smelt Habitat
 - 1.6.8.1.1.2. San Joaquin Basin Steelhead Telemetry Study
 - 1.6.8.1.1.3. Sacramento Deepwater Ship Channel
 - 1.6.8.1.1.4. North Delta Food Subsidies / Colusa Basin Drain
 - 1.6.8.1.2. Habitat Restoration
 - 1.6.8.1.2.1. Tidal Habitat Restoration 8,000 acres (2008 BiOp)

- 1.6.8.1.2.2. Yolo Bypass SHR and Fish Passage Project
- 1.6.8.1.2.3. Predator Hot Spot Removal
- 1.6.8.1.3. Fish Intervention
 - 1.6.8.1.3.1. Reintroduction efforts from Fish Conservation and Culture Lab
 - 1.6.8.1.3.2. Delta Fish Species Conservation Hatchery

1.7. Stanislaus

1.7.1. Seasonal Operations

- 1.7.1.1. Flood Control
 - 1.7.1.1.1. Tulloch Lake
- 1.7.1.2. Stanislaus Stepped Release Plan
 - 1.7.1.2.1. "60-20-20" Classification
- 1.7.1.3. Alteration of Stanislaus DO Requirement
- 1.7.1.4. Stanislaus Watershed Team

1.7.2. Conservation Measures

- 1.7.2.1. Spawning and Rearing Habitat Restoration
- 1.7.2.2. Temperature Management Study

1.8. San Joaquin

1.8.1. San Joaquin River Restoration Program

1.8.2. Conservation Measures

- 1.8.2.1. Lower SJR Habitat