

A Review of the San Clemente Dam Removal & Carmel River Reroute Project

Kevan Urquhart,
Senior Fisheries Biologist & Carmel River Watermaster
MPWMD

Project Roles: 1) CDFW rep 2001-2006; 2) Technical
Advisory Committee member for MPWMD 2006 – 2015

<http://www.sanclementedamremoval.org/>



Lead Agencies & Staff

- California American Water [Cal-Am], J. Aman Gonzalez, P.E.
- NMFS, Joyce Ambrosius & Jacqueline Pearson-Meyer
- State Coastal Conservancy, Trish Chapman



L to R -Joyce A. & Trish C.

Design Build Team

- Design Build Team

- Granite Construction – Construction Lead



- Kleinfelder – Design Lead



- Tetrattech – Design Lead, Channel Restoration



- Owner's Team

- Water Systems Consulting – Construction Management



- AECOM – Owner's Engineer



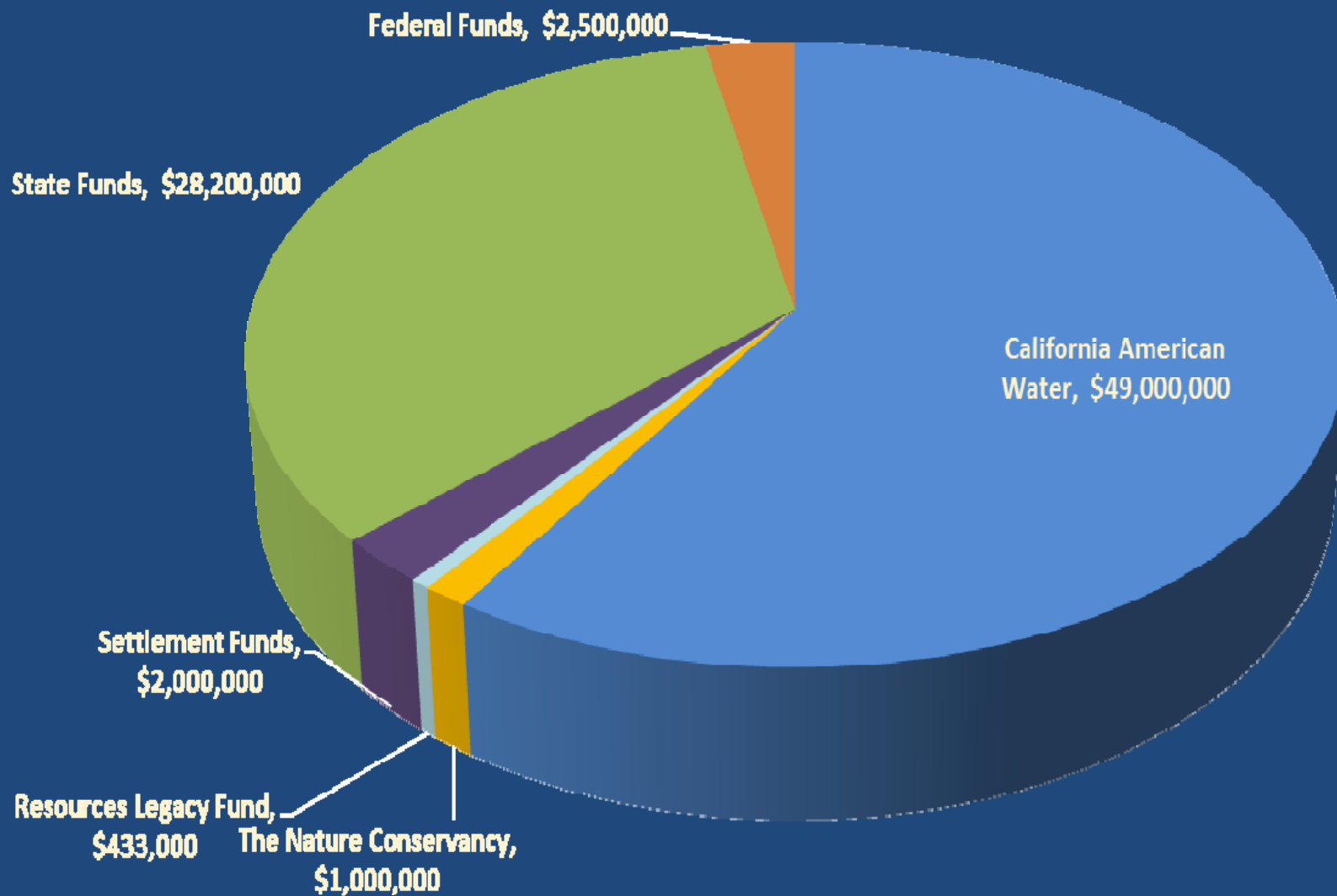
Slide 4

tc4

see sample slides

tchapman, 2/10/2016

\$83 Million Total Cost



Factors Driving Dam Removal

- Seismic Safety
 - Earthquake + Probable Maximum Flood = loss of life & damage ~1500 properties for 3+ miles downstream.
 - DWR-DSOD rated as the most unsafe dam left in CA
- Create Volitional Fish Passage
 - Removing the steepest fish ladder in western North America
 - Faster & better access to ~60% of the watershed's steelhead habitat
- Stream Function
 - Restore natural sediment transport & habitat connectivity

Original Impediments to Dam Removal

- CAW required by CPUC to select least cost alternative
- CAW required by DWR-DSOD to pick fastest alternative
- No feasible dam removal option was originally identified in first 2008 EIR
- CAW not familiar with restoration projects
- Long term liability for any removal project

Factors Driving the Reroute Option

- Reinforcement least expensive & “feasible”, but still subject to earthquake risk & unstable rock face on north abutment. Required harsh annual sluicing of accumulated sediment to maintain fish passage
- Community opposition to trucking sediment precluded dredging & recovery of ~1,200+ AF of storage or natural channel restoration
 - ~250,000 dump/~125,000 double trailer trucks required
~8-10 years, 6-12 m/yr, every 5-10 min, 24/7 or 9-4, weekdays
- Gradual dam removal & resuspension of ~1300 cubic yards of sediment created downstream flood liability for Cal-Am, may have affected habitat quality for up to 40+ years, & required interim trap and truck
- Minimize long term project liability final landowner

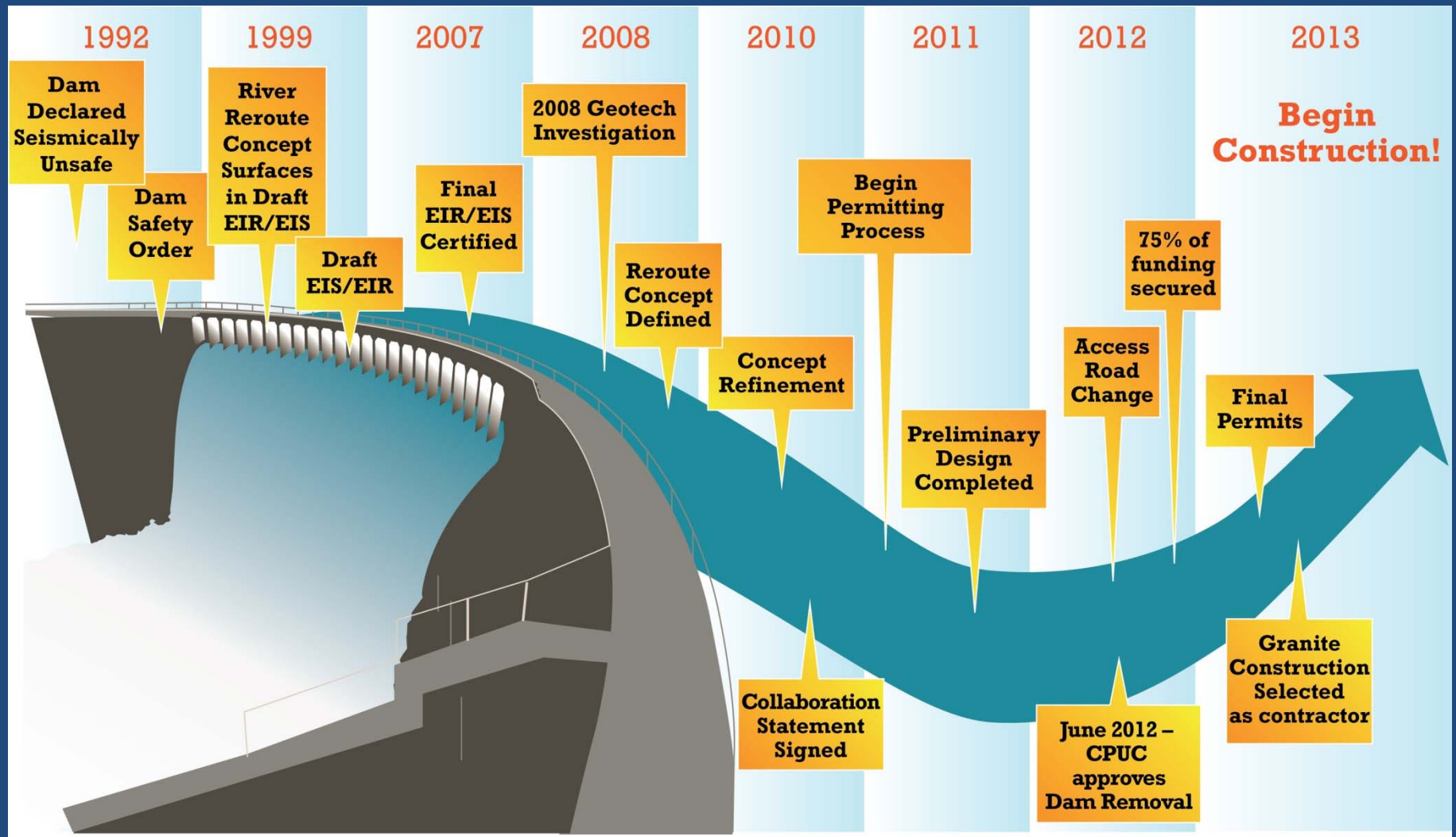
Negative Impacts of SCD and the Reservoir's Sediment Field

- Steep ladder may have delayed adult immigration & blocked smaller fish
- Annual draw-down for seismic safety from 2003-2014 curtailed late season adult immigration, & reduced downstream water quality
- Bare sediment field of inundation zone & minimum pool heated river water, created severe algal blooms, impaired downstream juvenile redistribution + fall pre-smolt emigration, & enhanced avian predation

Design Objectives

- Eliminate dam safety issue.
- Bank accumulated sediment on site, resistant to P.M.F. = 81,200 CFS & M.C. Earthquake = 6.7 Richter Scale
 - + Avoid trucking/sluicing impacts
- Restore volitional upstream passage for adults, and larger juveniles
 - + Enhance downstream passage & survival of juveniles
- Restore natural sediment transport for spawning gravel & beach replenishment
 - + restore habitat connectivity
- Create an aesthetic solution & convert to public land (BLM) linked to regional park & potential full river trail

Project Timeline



History of San Clemente Dam



- Constructed in 1921 by Del Monte Properties, later sold to California Water and Telephone Company; Purchased by CAW in the 1960's
- 106 feet tall concrete arch dam - Reservoir storage of 1,425/2,136 AF
- Spillway crest elevation of 525 feet -Spillway capacity of 20,800 CFS
- Declared seismically unsafe in 1992
- Ceased being used as a water supply in 2001 due to sedimentation & ESA



Recent Historic Photo - 1982



Stop Logs = + 711 AF of Storage



Flood Photo – 3/10/1995 @ 16,000 CFS



Failure Risk = Peak discharge of 76,700 CFS 5 minutes after dam breach

Sediment Field Intrusion



Storage Reduced From 1425 to <90 AF



Carmel River

San Clemente
Creek

San Clemente Dam

Pre-Project Site Video



Reroute and Removal Project



Active Project Drone Fly-Over

Recent Post Project Photos After Initial 1250+ CFS Peak Flow















Up to 5 Years of Post Project Evaluations

- NMFS-SWFSC: BACI study
- USGS: TSS monitoring
- CSUMB-WMI: Morphological Channel Monitoring & LWD Surveys
- MPWMD: Redd surveys
- Granite & MPWMD: Habitat Typing & BMI
- MPWMD & Cal-Am: SH counts above & below project - LPD T&T @ RM 25, & DIDSON @ RM3
- Potential cooperative PIT tagging & arrays w. MPWMD/NMFS-SWFSC/CSUMB-WMI

Lessons Learned

- Extensive outreach and site tours sustained community support
- On-line presence and live site cameras sustained transparency and community interest
- Be prepared for larger than expected effects of bypass flow losses & construction dewatering/treatment on downstream flow in dryer years
- Be prepared to modify permits to take advantage of water year types to enhance project efficiency & extend work window when feasible
- Feasible construction bypass flow pipes may not be optimal fish passage devices
- Secure Access to large rock and spawning gravel for channel construction far in advance
- Plan to recover or remobilize spawning gravel, if feasible
- Take advantage of the opportunity to do simultaneous river projects, yet avoid compounded risks by planning to manage cumulative impacts
- Design-build requires an extensive team of engaged expert advisors and regulators, with decision-making authority, readily available to make real-time management decisions on necessary project adjustments

What We're All Striving For

A Steelhead's Journey
by Ben Lovejoy



Old Carmel River Dam



Sluice Gate High & Low Flow Access

