

RECLAMATION

Managing Water in the West



Shasta Enlargement



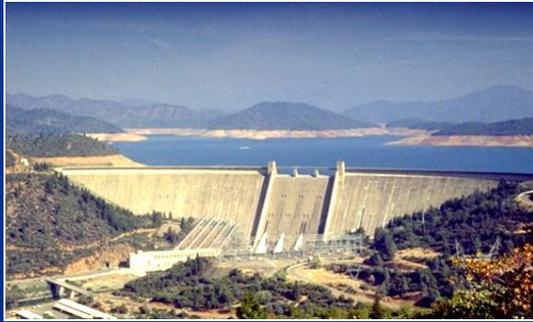
U.S. Department of the Interior
Bureau of Reclamation

Update & Current Status

- Draft Feasibility Report and Preliminary Draft EIS available for public review
- Continuing to evaluate benefits, costs, and impacts
- Engaging the public, stakeholders, agencies and elected officials
- Addressing concerns, answering questions, and developing partners

Reclamation Feasibility Studies

CALFED Bay-Delta Surface Storage



Shasta Enlargement

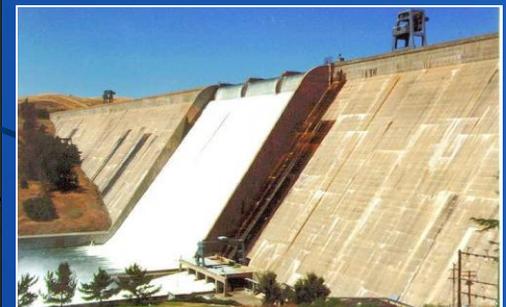
- Increase cold water pool to benefit anadromous fish
- Provide water supply reliability benefits



Los Vaqueros Expansion



North-of-the-Delta Offstream Storage (Sites Reservoir)



Upper San Joaquin River Storage (Temperance Flat)

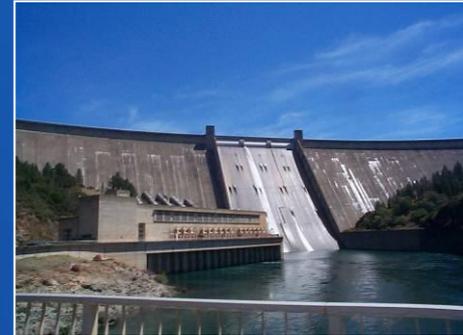
Current Shasta Project Facilities

Dam and Powerhouse

- 523 Feet Dam Height (602 feet above streambed)
- 710 MW Generating Capacity (5 units @ 142 MW)

Reservoir

- 4.55 Million Acre-Feet Storage Capacity
- 1.3 Million Acre-Feet Flood Control Space
- 5.7 Million Acre-Feet Mean Annual Runoff
- Provides about 55% of total annual CVP supply
- Managed for water supply, flood protection, power, recreation, water quality, and environmental benefits (flow & water temperature)



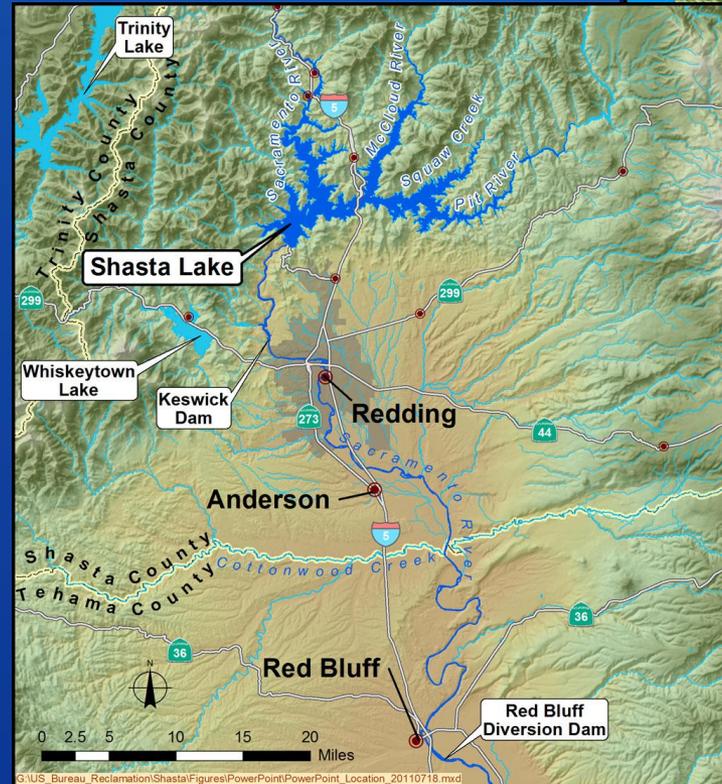
Study Areas

- **Primary Study Area**

- Shasta Dam & Reservoir area
- Sacramento River downstream to Red Bluff

- **Extended Study Area**

- Sacramento River basin downstream of Red Bluff
- Delta
- CVP/SWP Facilities and Service Areas



Planning Objectives

- **Primary Objectives**
 - Anadromous Fish Survival
 - Water Supply Reliability
- **Secondary Objectives**
 - Ecosystem Restoration
 - Reduce Flood Damage
 - Hydropower
 - Recreation
 - Water Quality



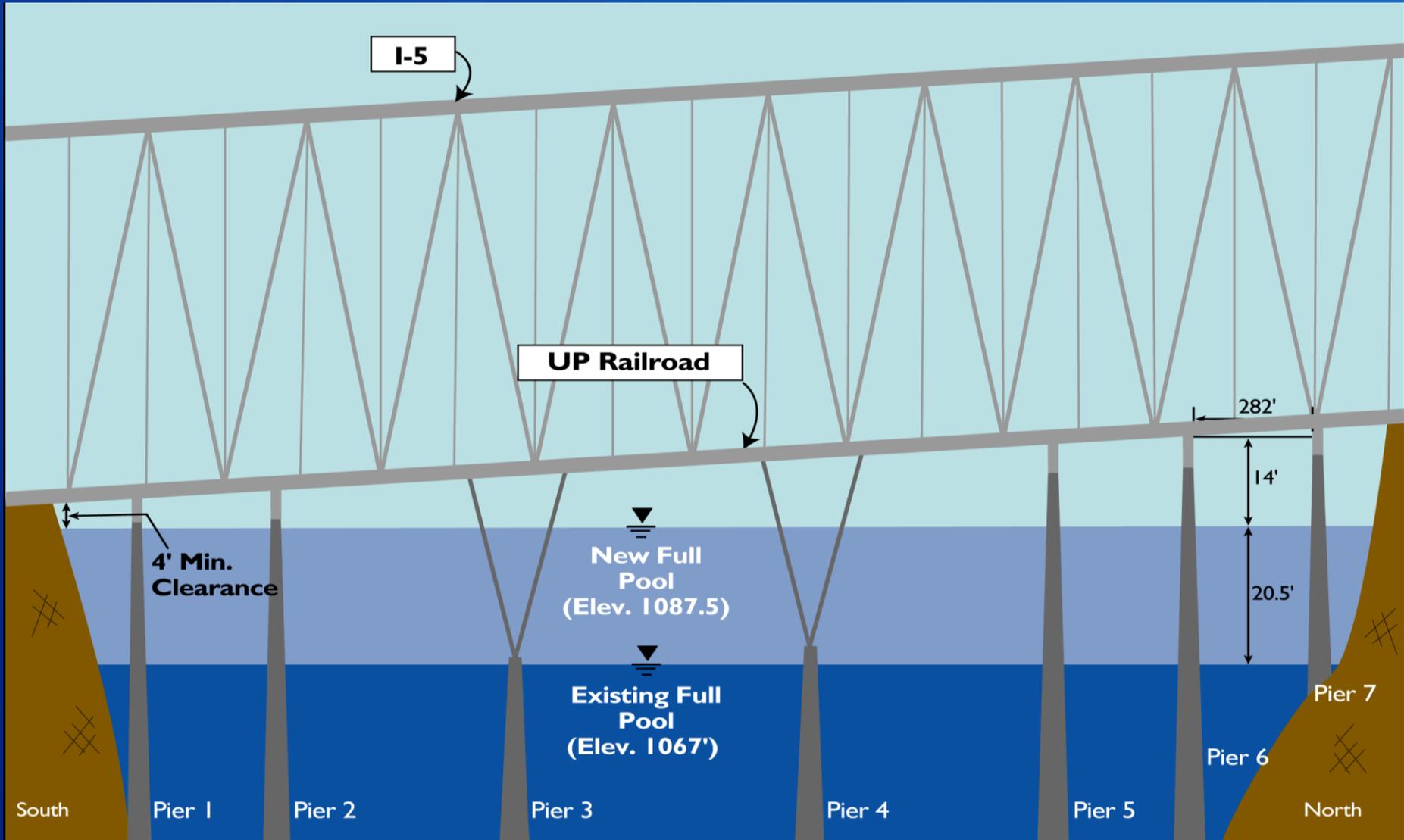
Alternatives/Comprehensive Plans

- No-Action Alternative
- Comprehensive Plans 1 – 3: Joint water supply reliability and anadromous fish survival focus
 - CP 1 - 6.5 foot dam raise
 - CP 2 - 12.5 foot dam raise
 - CP 3 - 18.5 foot dam raise
- Comprehensive Plan 4: Anadromous fish focus
 - 18.5 foot raise
 - Dedicates portion (60%) of new storage to permanent cold water pool
- Comprehensive Plan 5: Combination Plan
 - 18.5 foot raise
 - Joint water supply reliability and anadromous fish survival focus plus additional ecosystem restoration and recreation features

Comparison of Increased Storage for Alternatives

Feature	CP1	CP2	CP3	CP4	CP5
Raise Shasta Dam (feet)	6.5	12.5	18.5	18.5	18.5
Total Increased Storage (1,000 acre-feet)	256	443	634	634	634
Storage Dedicated to Anadromous Fish (1,000 acre-feet)	--	--	--	378	--

Pit River Bridge Limits Dam Raise to 18.5 Feet



March 5, 2012

Common Elements of Alternatives

- Raise Shasta Dam and Increase Reservoir Storage
 - Modify dam crest, wing dams, spillway and outlets
 - Modify temperature Control Device
 - Modify Hydropower Facilities
- Reservoir Area Relocations
 - Recreation Facilities
 - Vehicle & Railway Bridges
 - Road Segments
 - Dikes
 - Structures
 - Utilities
- Resource Protection and Mitigation



Benefits of Alternatives

Benefits*	CP 1	CP 2	CP 3	CP 4	CP 5
Primary Objectives					
Water Supply Reliability					
Critical & Dry Years Increased deliveries CVP/SWP (acre-feet)	76,400	105,100	133,400	76,400	133,400
Average Annual Increased deliveries CVP/SWP (acre-feet)	46,400	62,800	75,800	46,400	75,800
Increased water use efficiency funding	Yes	Yes	Yes	Yes	Yes
Increased emergency water supply response capability	Yes	Yes	Yes	Yes	Yes
Andromous Fish Survival					
Average annual increase in Anadromous fish (1,000 fish)*	366	234	607	1,199	607
Spawning Gravel Augmentation (tons)				10,000	10,000
Side-channel rearing habitat restoration (miles)				0.8	0.8

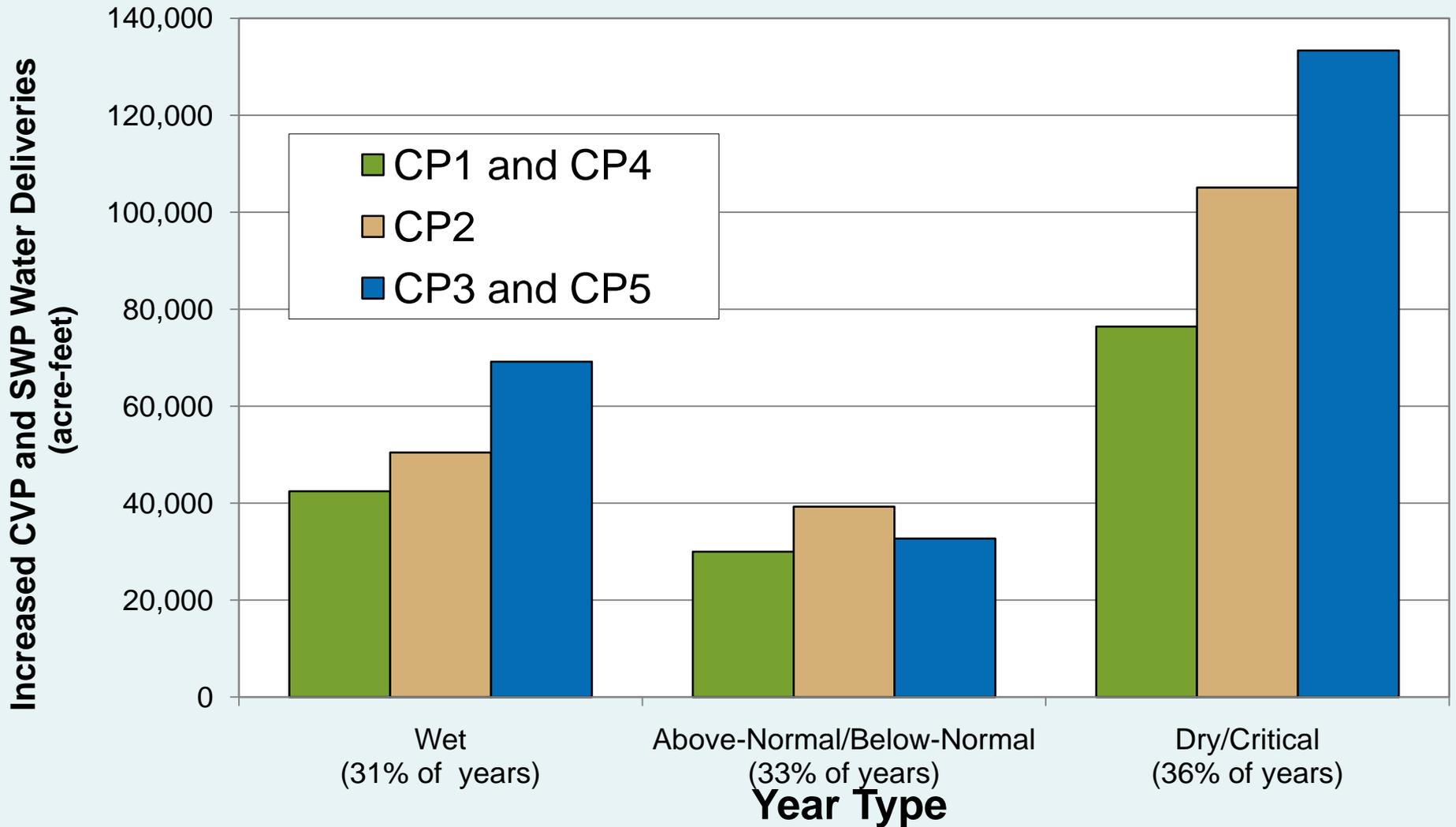
* These benefits were estimated from operational studies using the 2004/2005 Biological Opinions and monetized for economic analyses

Benefits of Alternatives

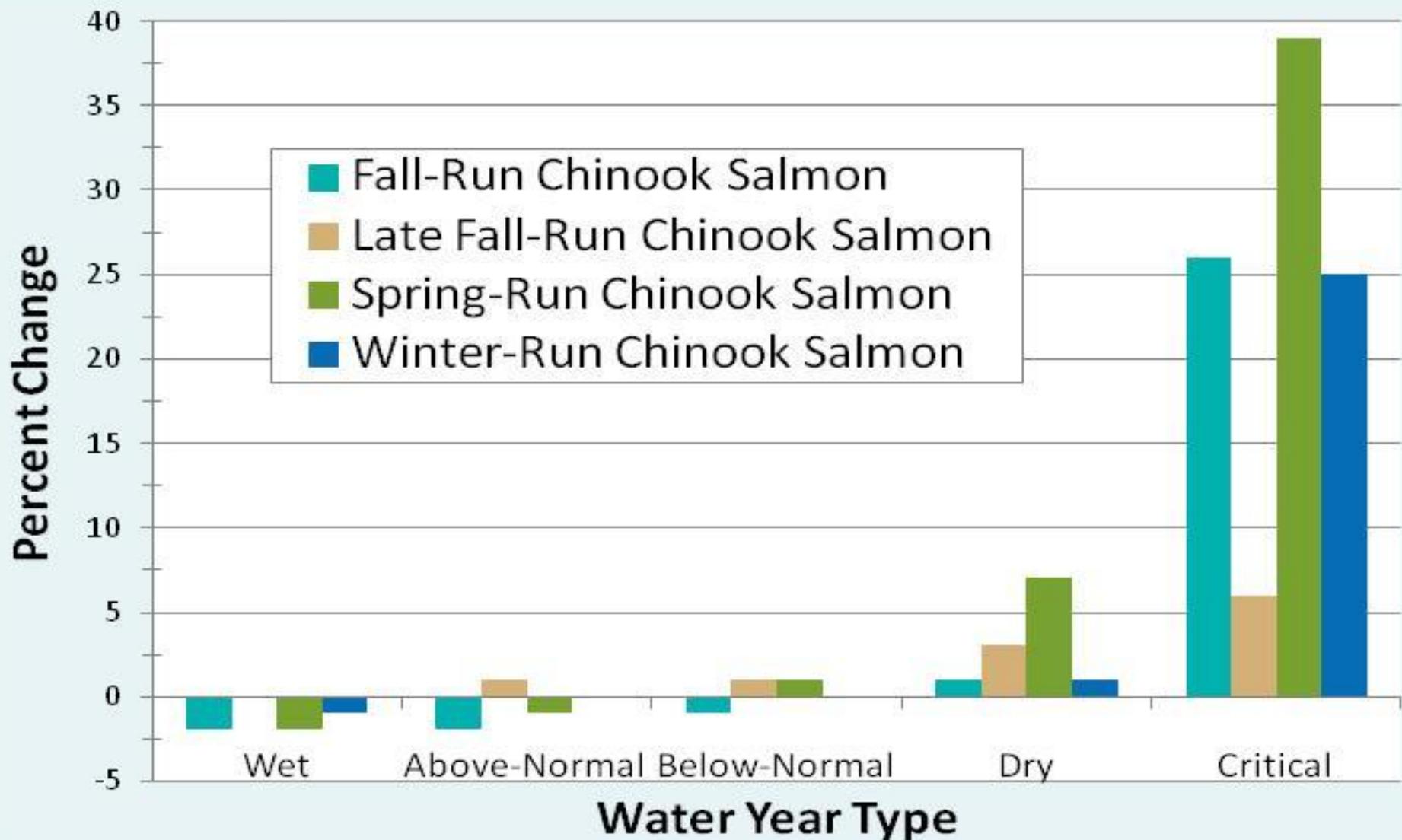
Benefits*	CP 1	CP 2	CP 3	CP 4	CP 5
Secondary Objectives					
Develop Additional Hydropower Generation					
Increased hydropower generation (GWh/year)*	42	68	96	138	96
Flood Damage Reduction					
Increased reservoir capacity to capture of flood flows	Yes	Yes	Yes	Yes	Yes
Preserve, Restore, and Enhance Ecosystem Resources					
Reservoir shoreline enhancement (acres)	-	-	-	-	130
Reservoir tributary aquatic habitat enhancement (miles)	-	-	-	-	6
Riparian and floodplain habitat restoration (acres)	-	-	-	2.9	2.9
Increased ability to meet flow and temperature requirements along the Upper Sacramento River	Yes	Yes	Yes	Yes	Yes
Preserve or Improve Water Quality					
Improved Delta water quality	Yes	Yes	Yes	Yes	Yes
Increased Delta emergency response capability	Yes	Yes	Yes	Yes	Yes
Preserve and Increase Recreation					
Recreation (increased user days, 1,000)*	83	141	224	224	224
Modernization of relocated recreation facilities	Yes	Yes	Yes	Yes	Yes

* These benefit types/categories were quantified and monetized for economic analyses

Water Supply Reliability



Anadromous Fish Survival (CP4)



Estimated Costs & Net Benefits

Annualized Costs and Benefits (in \$Millions)	Alternative Plans				
	CP 1	CP 2	CP 3	CP 4	CP 5
Total Construction Cost	\$827	\$913	\$1,064	\$1,070	\$1,073
Total Annual Cost	\$42.6	\$46.4	\$53.7	\$54.0	\$54.1
Annual Benefits	\$47.6	\$43.7	\$65.4	\$92.2	\$65.5
Net Annual Benefits	\$5.0	-\$2.7	\$11.7	\$38.2	\$11.4

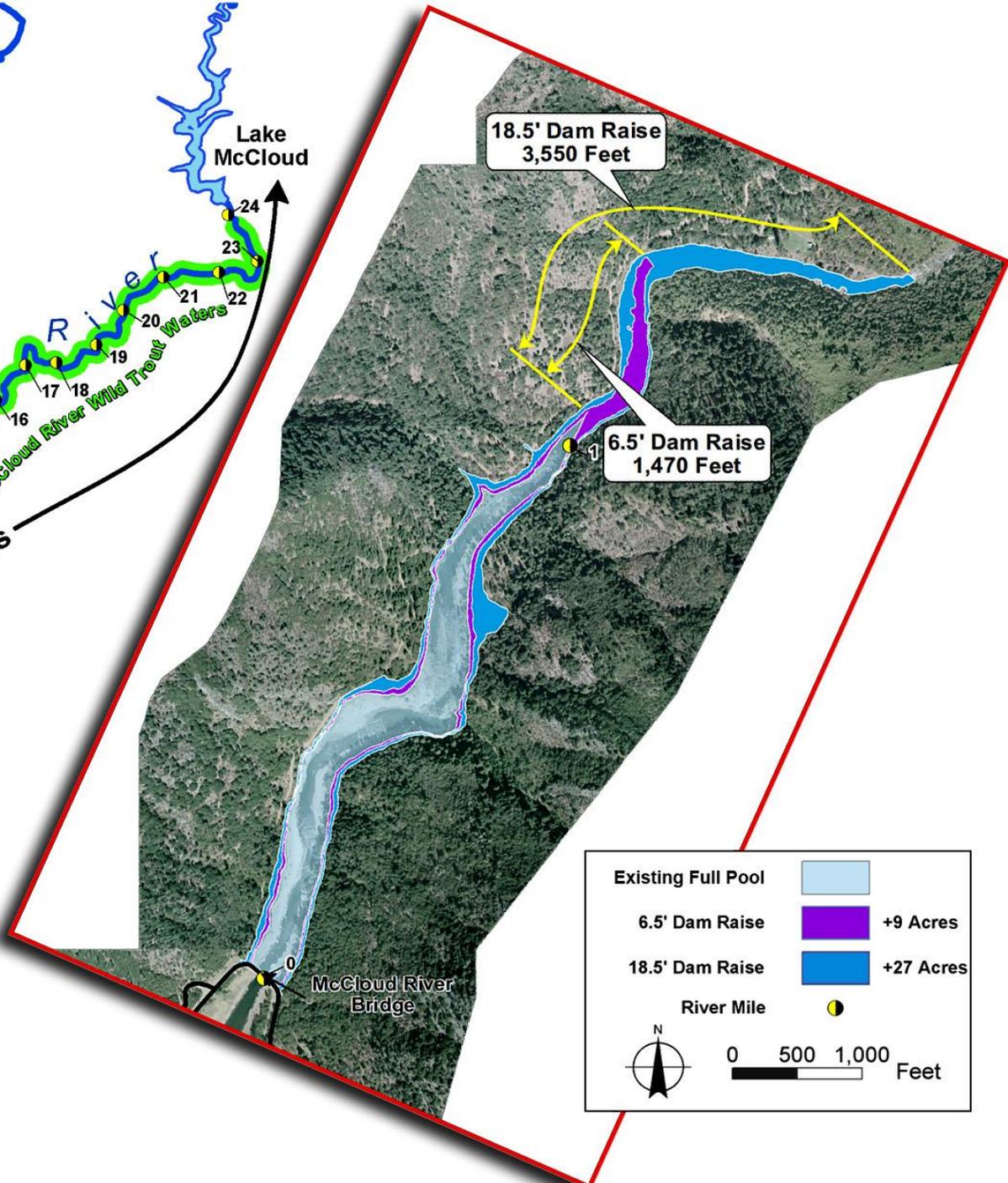
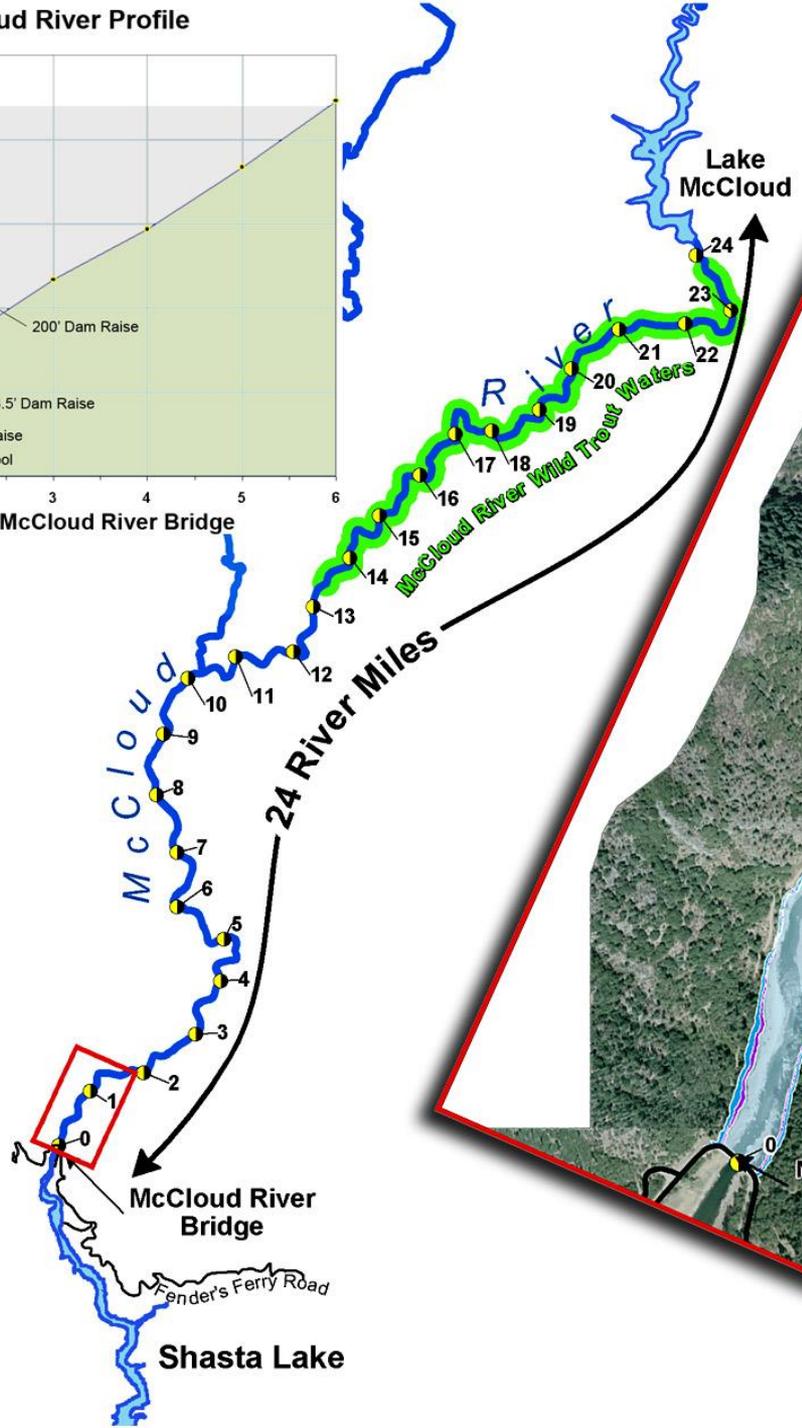
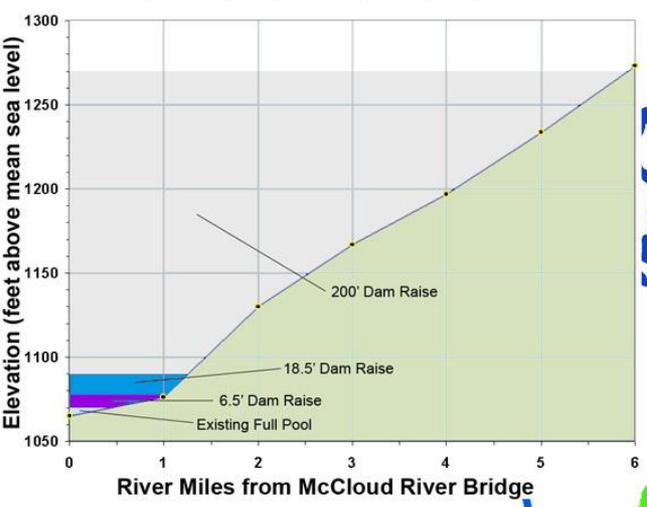


Greatest Net Economic Benefits

Example Cost Assignment (CP 4)

Purpose/Action	Total		Cost Assignment			
			Federal		Non-Federal	
	Percent	Cost (millions)	Percent	Cost (millions)	Percent	Cost (millions)
Irrigation Water Supply	12.4%	\$132	0%	\$0.0	100%	\$132
M&I Water Supply	18.6%	\$199	0%	\$0.0	100%	\$199
Fish & Wildlife Enhancement	61.2%	\$655	100%	\$654.9	0%	\$0
Hydropower	7.9%	\$84	0%	\$0.0	100%	\$84
Total	100%	\$1,070	61.2%	\$655	38.8%	\$415

Lower McCloud River Profile

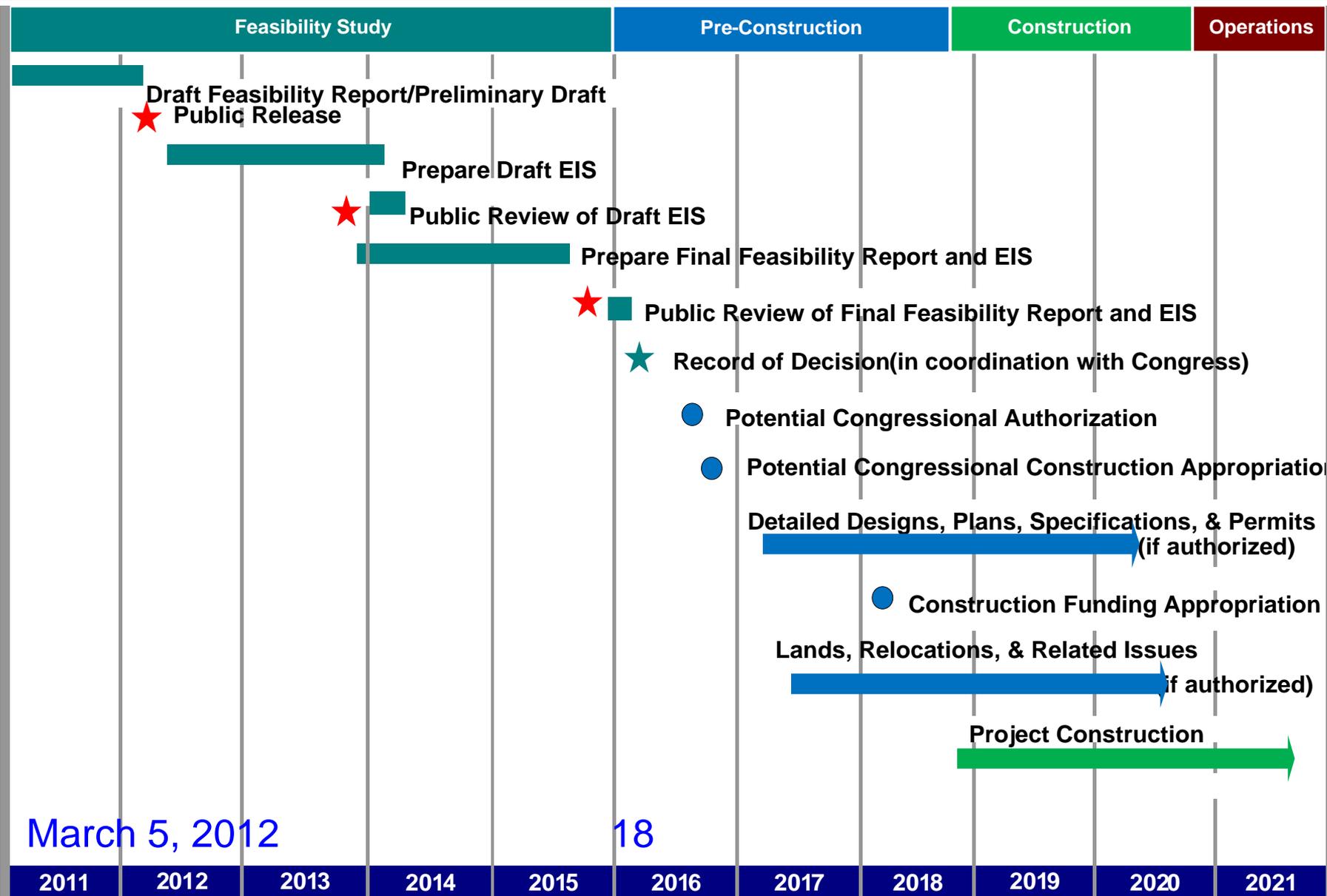


Existing Full Pool		
6.5' Dam Raise		+9 Acres
18.5' Dam Raise		+27 Acres
River Mile		

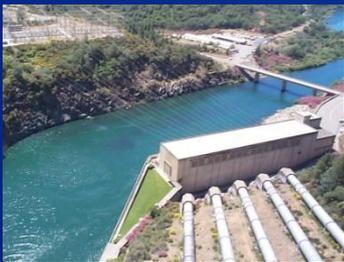
Next Steps

- **Refine and Evaluate Alternative Plans**
 - Conduct operational and related studies to assess changes to existing and future conditions with & w/out new Delta conveyance
 - Refine designs, update estimated costs and benefits evaluations
 - Perform economic and financial analyses
- **Update Environmental Effects Analyses and Refine Mitigation and Enhancement Measures**
- **Conduct Related Technical Studies**
 - Assess potential effects of Climate change
 - Water rights
- **Address Unresolved Issues**
 - Identify non-Federal sponsor(s)
 - Mc Cloud River – California Public Resources Code 5093.542
- **Stakeholder Coordination**

Schedule



Multiple Benefits of Shasta Enlargement



Additional Information

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<http://www.usbr.gov/mp/slwri/index.html>

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