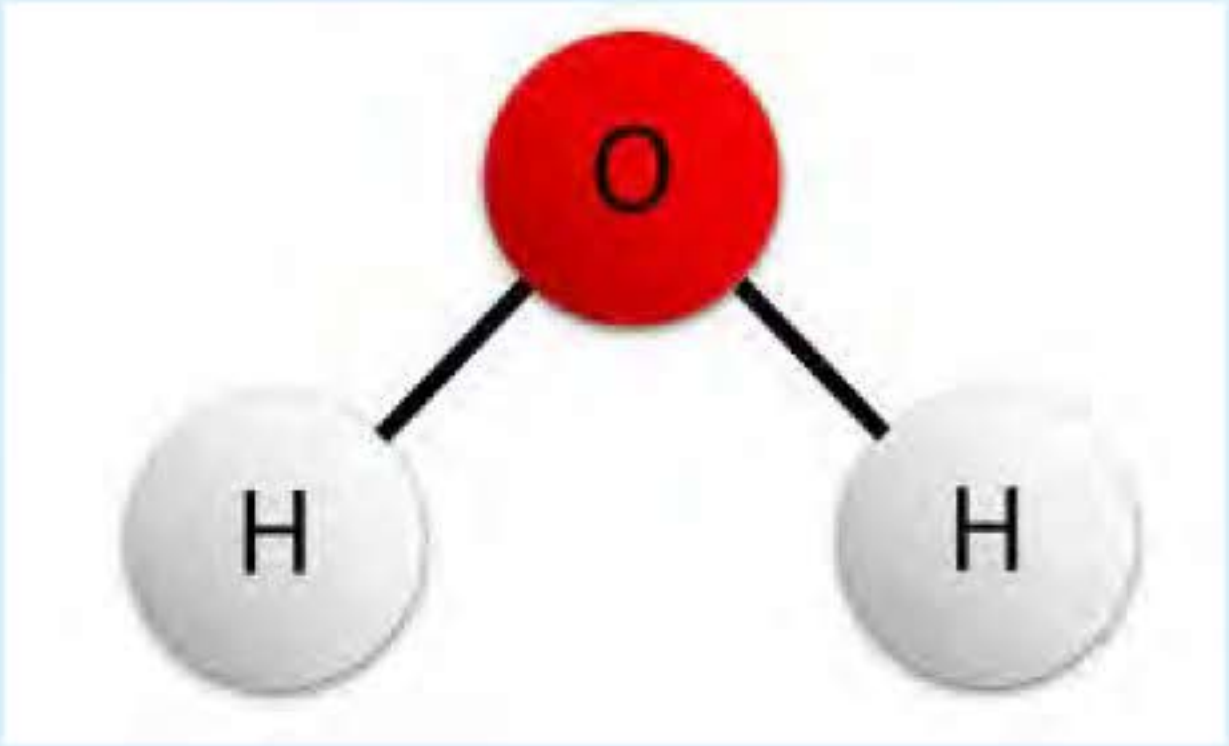
Water

What We Have
What We Need
What We Worry About

Sierra Renaissance Society
November 19, 2021

Dan Corcoran
Director of Operations

Water: Building Block of Life



Mission Statement

We are a public agency dedicated to providing high quality water, wastewater treatment, recycled water, hydropower, and recreation services in an environmentally and fiscally responsible manner.

Guiding Principles

100% Safety
Respect for the Individual
Excellent Customer Service
Fiscal Responsibility

What We Have

* Diversified water supply portfolio
* Natural hazards such as droughts, fires and floods
* Ongoing reinvestment needs of critical infrastructure
* Commitment to our customers

What We Need

* Maintain or improve service levels
* Improve system redundancy
* Proactively replace end of life infrastructure
* Avoid rate shock when implementing rate adjustments

What We Worry About

* Increasing hazards that have potential to impact service levels
* Ensuring public health and safety needs are always met
* Not meeting customer expectations and needs

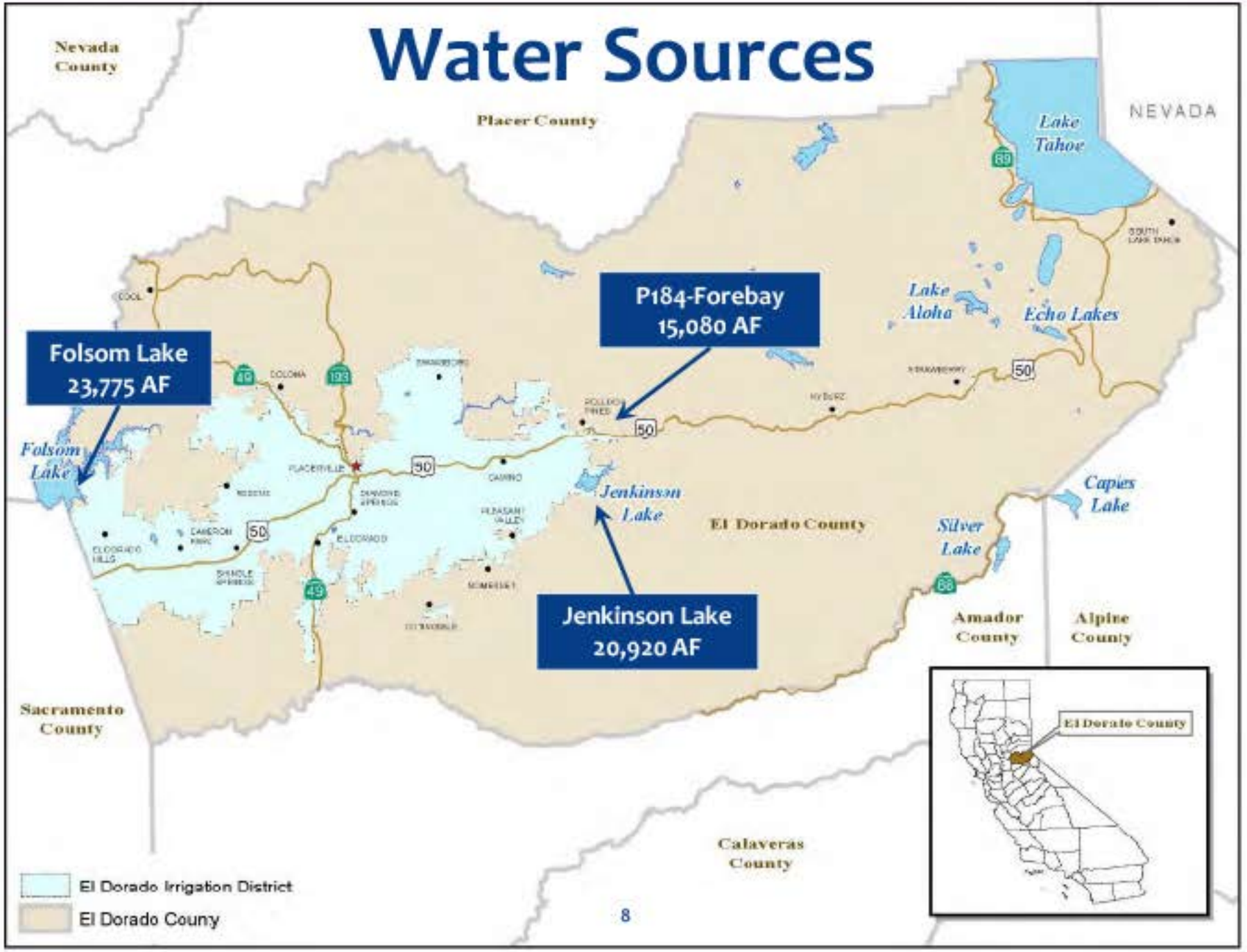
Water Conveyance, Treatment and Delivery

The reliable delivery of high-quality water is a complex task that requires 24/7 vigilance, millions of dollars invested in state-of-the-art treatment plants and equipment to meet regulatory requirements, and highly trained, professional employees.

* 3 water systems
* 5 treatment facilities
* 1,298 miles of pipelines
* 36 storage reservoirs
* 38 pump stations
* 42,394 services

A flume carries water from the high country to reservoirs and treatment plants

Water Sources



Summary of Existing Water Supplies

* System firm yield: 63,500 acre feet

  (Firm yield is the annual demand the integrated system can supply 95% of the time with shortages in remaining 5%)

* Normal raw water diversions: 30,000-34,000 acre feet
* Surplus supply for the next 20-25 years

Project 184 Hydropower

The hydroelectric division was established in 1999 when the Pacific Gas and Electric Company transferred ownership of the powerhouse to EID.

* 22.3 miles of canals
* 5 lakes/reservoirs – Lake Aloha, Echo Lake, Silver Lake, Caples Lake, Forebay Reservoir
* 21-megawatt powerhouse
* Generates an average of $3.5 million in revenue per year

Lake Aloha

8,114’ elevation

Echo Lake

7,405’ elevation

Caples Lake

7,794’ elevation

Silver Lake

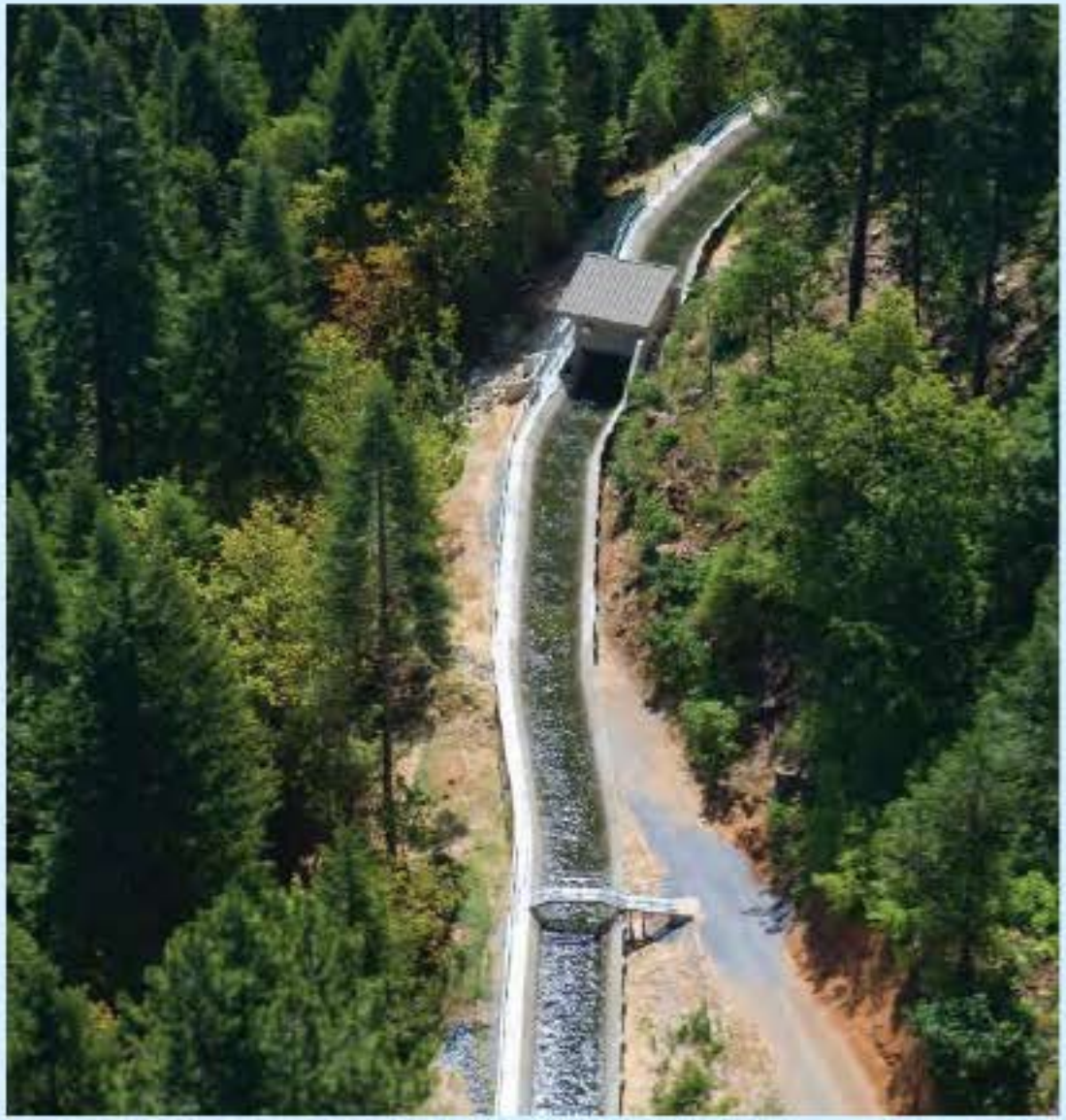
7,250’ elevation

Diversion Dam

The El Dorado Diversion Dam is located on the South Fork American River, about 1.5 miles downstream of the town of Kyburz, at an elevation of 3,910 feet.

The dam diverts water from the river into the 22.3-mile-long El Dorado Canal.

Flumes and Canals



Hazel Creek Tunnel

The Hazel Creek Tunnel provides a diversion point for sending water from Project 184 into Jenkinson Lake.

Forebay

Reservoir 1 Water Treatment Plant

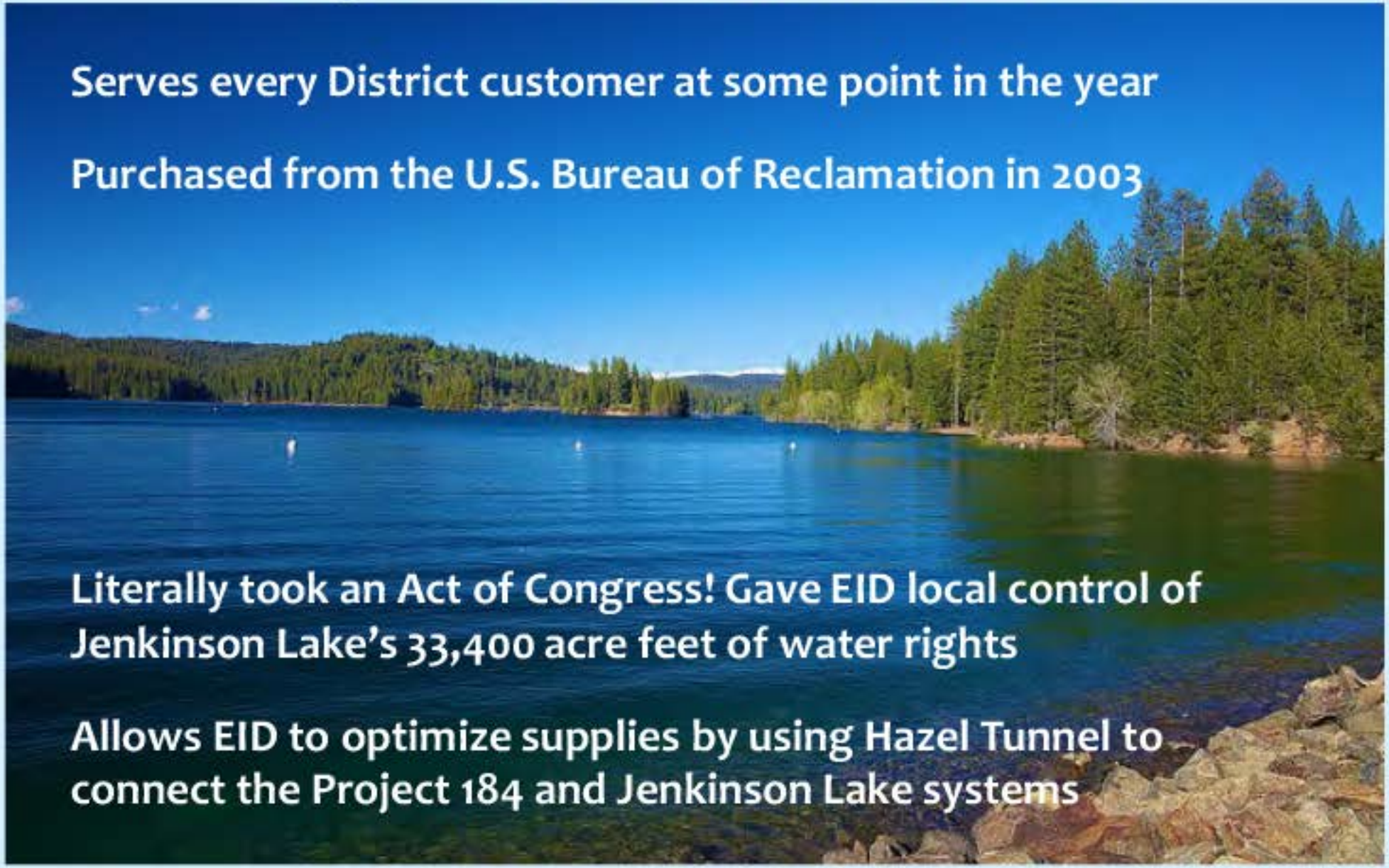
Penstock / Powerhouse

EID's 21-megawatt hydroelectric power plant generates revenue to offset the costs of delivering drinking water from upper mountain reservoirs.

Project 184 Water Rights

* Pre-1914 consumptive rights of 15,080 acre feet
* Permit 21112 – 17,000 acre feet
  - 1927 priority date
  - Point of diversion is Folsom Reservoir
  - Pursuing additional points of diversion to allow consumptive use higher up in the system by gravity

Sly Park's Jenkinson Lake



Serves every District customer at some point in the year

Purchased from the U.S. Bureau of Reclamation in 2003

Literally took an Act of Congress! Gave EID local control of Jenkinson Lake's 33,400 acre feet of water rights

Allows EID to optimize supplies by using Hazel Tunnel to connect the Project 184 and Jenkinson Lake systems

Reservoir A Water Treatment Plant

56 mgd production capacity

Folsom Reservoir

Pump Station at Folsom Reservoir

El Dorado Hills Water Treatment Plant

Water Supplies – El Dorado Hills

* Central Valley Project Water Service Contract
  - 7,550 acre feet (subject to municipal shortage policy)
* Ditch/Weber Warren Act Contract
  - 4,560 acre feet
* Project 184 (Permit 21112)
  - 17,000 acre feet

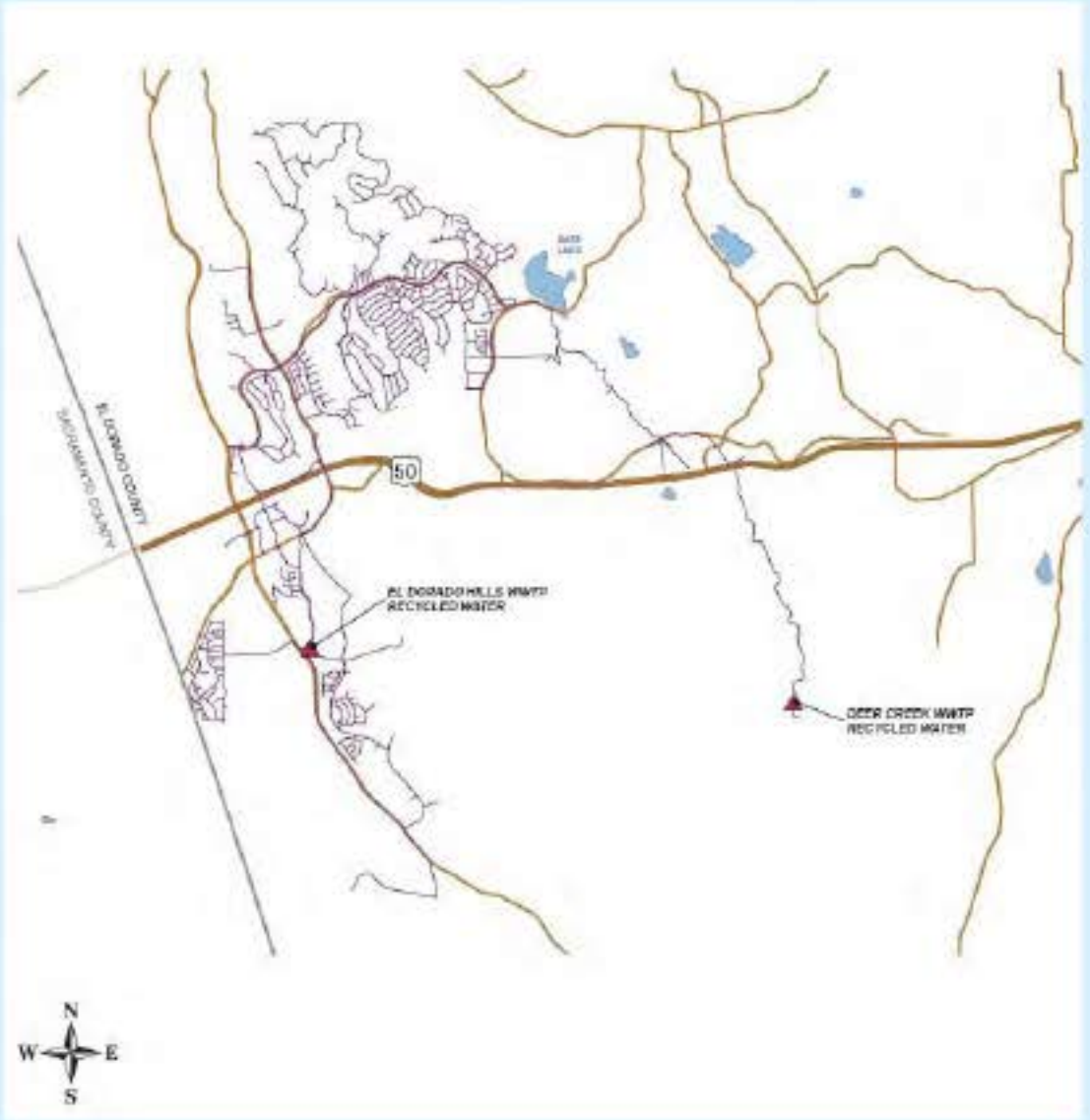
Recycled Water

EID treats and delivers about 3,500 acre feet (1.1 billion gallons) of recycled water annually. The recycled water program started in the late 1970s and is considered a leader in the recycled water industry.

* Produced at both El Dorado Hills and Deer Creek Wastewater Treatment Plants
* 93 miles of recycled pipelines
* 5 storage tanks
* 5 pump stations
* 5,635 services

Recycled Pipeline

Recycled Water System Map



Major Investments Underway

Folsom Lake Intake

The Folsom Lake Intake supplies raw water from Folsom Lake to the El Dorado Hills Water Treatment Plant where it is treated and then conveyed to customers in El Dorado Hills. The water supplied through this system is critical to provide reliable drinking water especially during the warmer months when water demands increase dramatically.

* Started in 2020
  - Complete early 2022
* Replace existing pumps with more reliable and efficient equipment
* Provide adequate raw water supply to meet growing demands of the El Dorado Hills community
* Provide temperature control

Solar at El Dorado Hills and Deer Creek Wastewater Treatment Plants

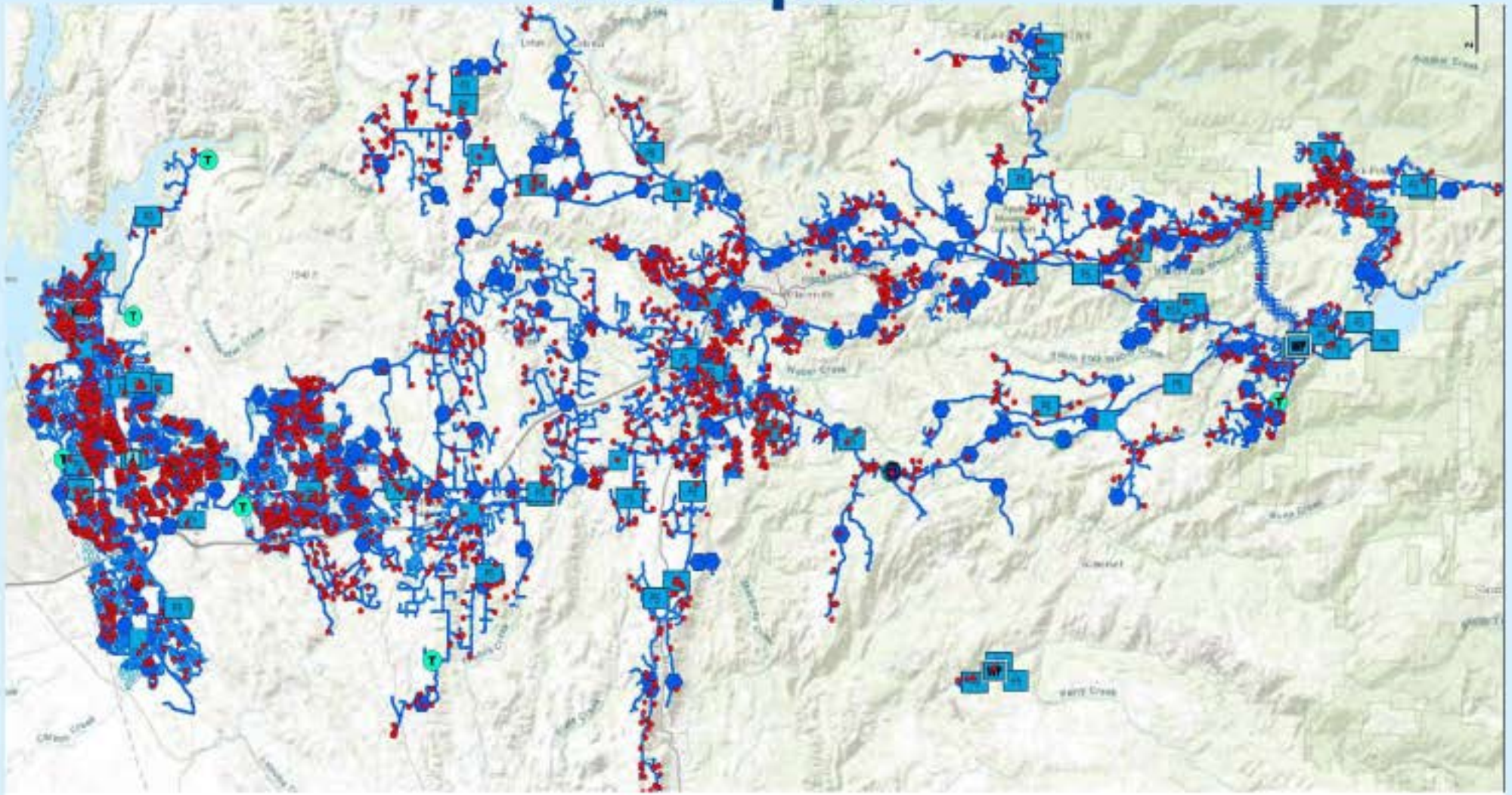
* Will offset approximately 60% of the total power consumption of the El Dorado Hills Wastewater Treatment Plant
* Deer Creek Wastewater Treatment Plant solar will offset approximately 70% of total plant consumption

Number of Unplanned Water Outages per 1,000 Accounts

Service Reliability				
Key Performance Indicators	Target[1]	Results 2018	Results 2019	Results 2020
Less than 4 hours	0.32 top 0.85 median 2.02 bottom	5.33 outages (208 outages)	5.31 outages (207 outages)	4.05 outages (158 outages)
4 to 12 hours	0.10 top 0.41 median 0.86 bottom	0.49 outages (19 outages)	0.82 outages (32 outages)	0.82 outages (32 outages)
Greater than 12 hours	0.00 top 0.01 median 0.05 bottom	0.05 outages (2 outages)	0.03 outages (1 outages)	0.03 outages (1 outages)

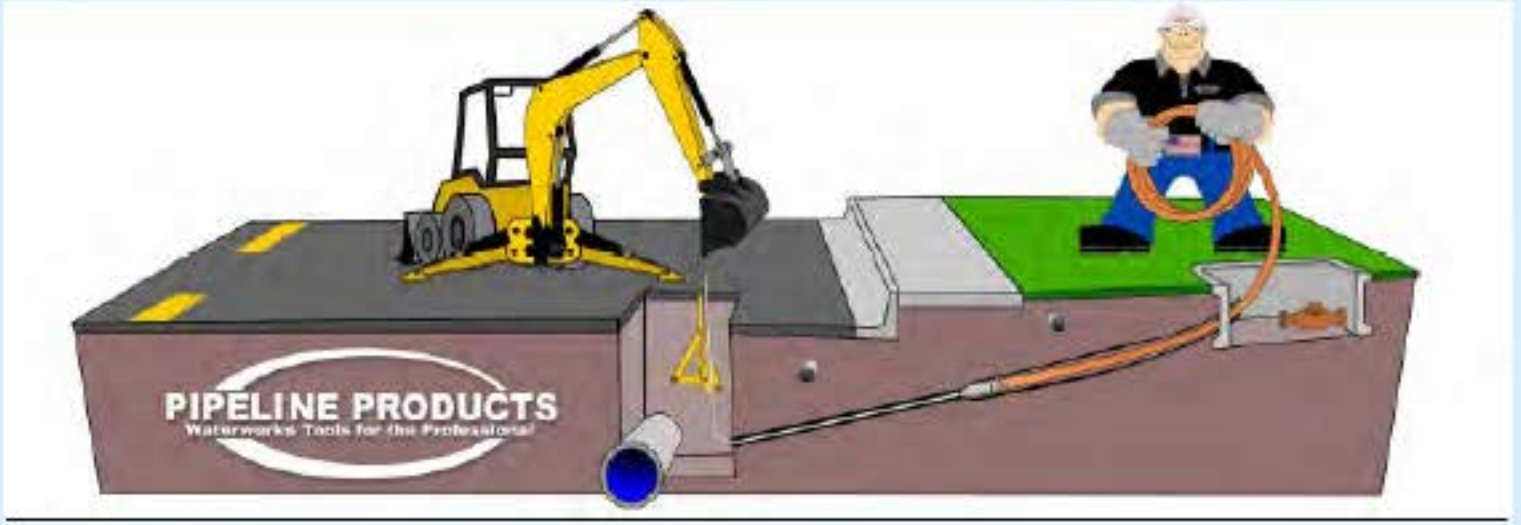
[1]American Water Works Association (AWWA) Benchmarking Performance Indicators for Water and Wastewater: 2020 Edition (nationwide statistics)

Water System Showing Leak "Hot Spots"



Over $40M in waterline replacement over 2022 – 2026 Capital Improvement Plan

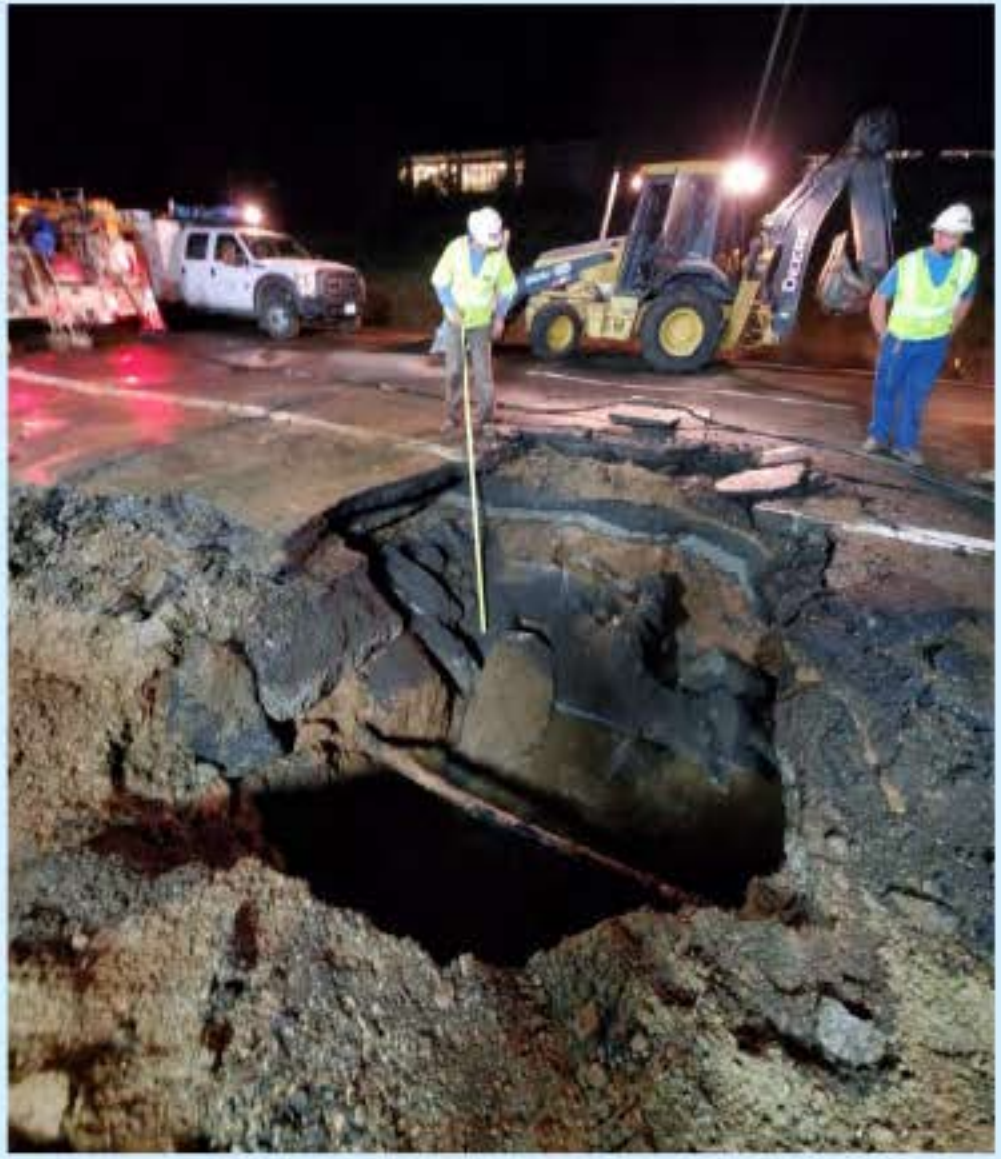
Distribution and Service Line Replacement



Transmission Main Inventory

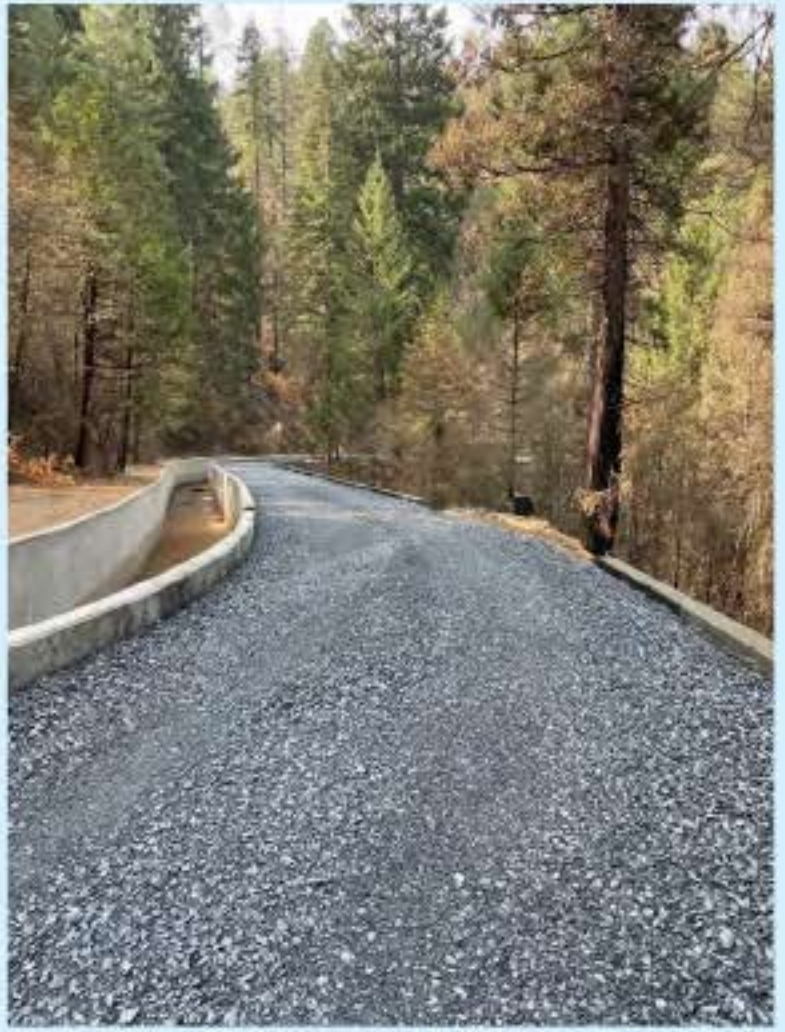
Name	Miles	Material	Year Installed	Size	Life	Years In Service
Camino Conduit	7.34	MLCC	1953	36" to 72"	75	66
El Dorado Main #1	18.11	MLCC/AC	1960	12" to 21"	75	59
Diamond Springs Main	12.03	MLCC	1961	16" to 36"	75	58
Pleasant Oak Main	13.79	MLCC/AC	1970/2005	24" to 36"	75	49/14
El Dorado Main #2	13.68	MLCC	1970	22" to 30"	75	49
Moosehall Transmission	3.51	MLCC/DIP	1989	24"	75/85	30
Sly Park Intertie	4.93	ODS	1978	16" to 24"	Inoperable	41
Gold Hill Intertie	18.3	DIP	1988	10" to 24"	85	31

Transmission Line Replacement



Continued Flume Replacement

Flume 38-40 Replacement Complete 2020-2021



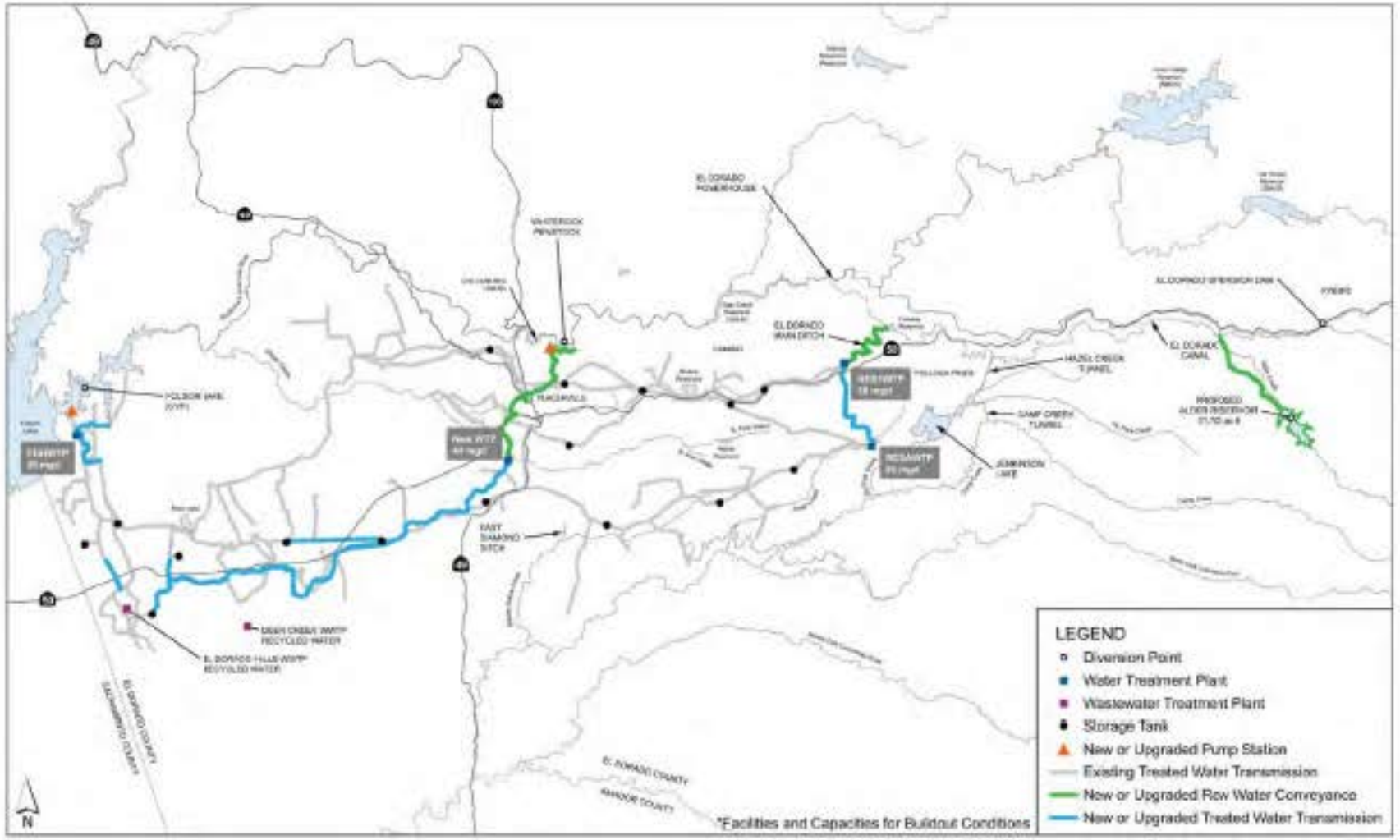
Upper Main Ditch Pipeline

Southpointe Lift Station Upgrade

Outingdale Water Treatment Plant Intake Replacement and Dam Rehabilitation

Silver Lake Dam Replacement

Future Water Supplies

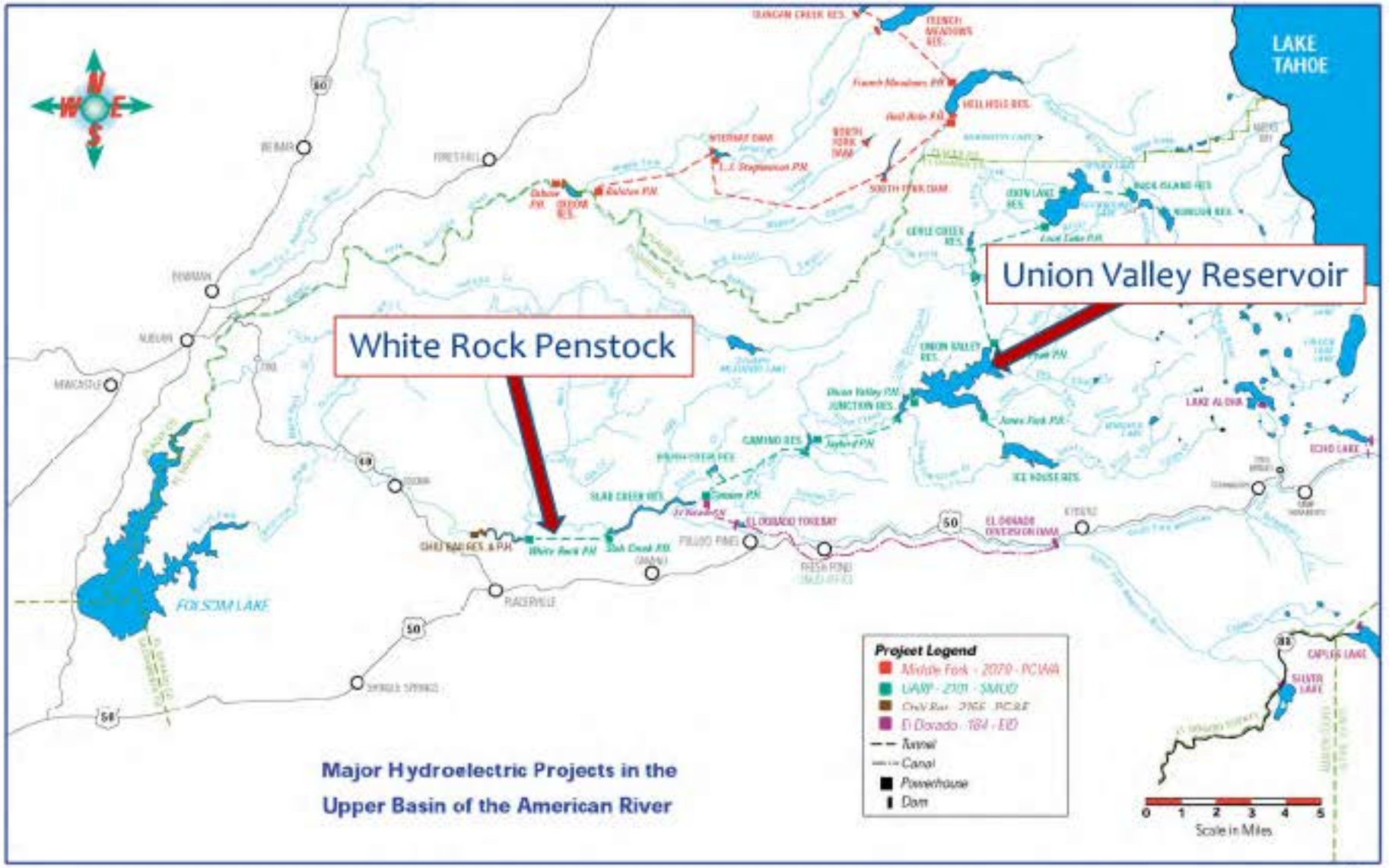


Recommended Water Resources Plan

Figure

Where Will New Water Supplies Come From?

* Future Water Supplies
  - Fazio Water: 7,500 acre feet
  - SMUD-El Dorado: up to 40,000 acre feet
* When: over the next 30 years
* Long-term infrastructure needs ($200 million+) paid for by new hook-up fees


LAKE TAHOE
Union Valley Reservoir
White Rock Penstock
FOLSOM LAKE
Project Legend
Tunnel
Canal
Powerhouse
Dam
Scale in Miles
0 1 2 3 4 5
Major Hydroelectric Projects in the
Upper Basin of the American River

Bray Reservoir site along Missouri Flat Road

Long-Term Vision and Planning

Water utilities must have long-term vision to implement successful multi-generation projects.

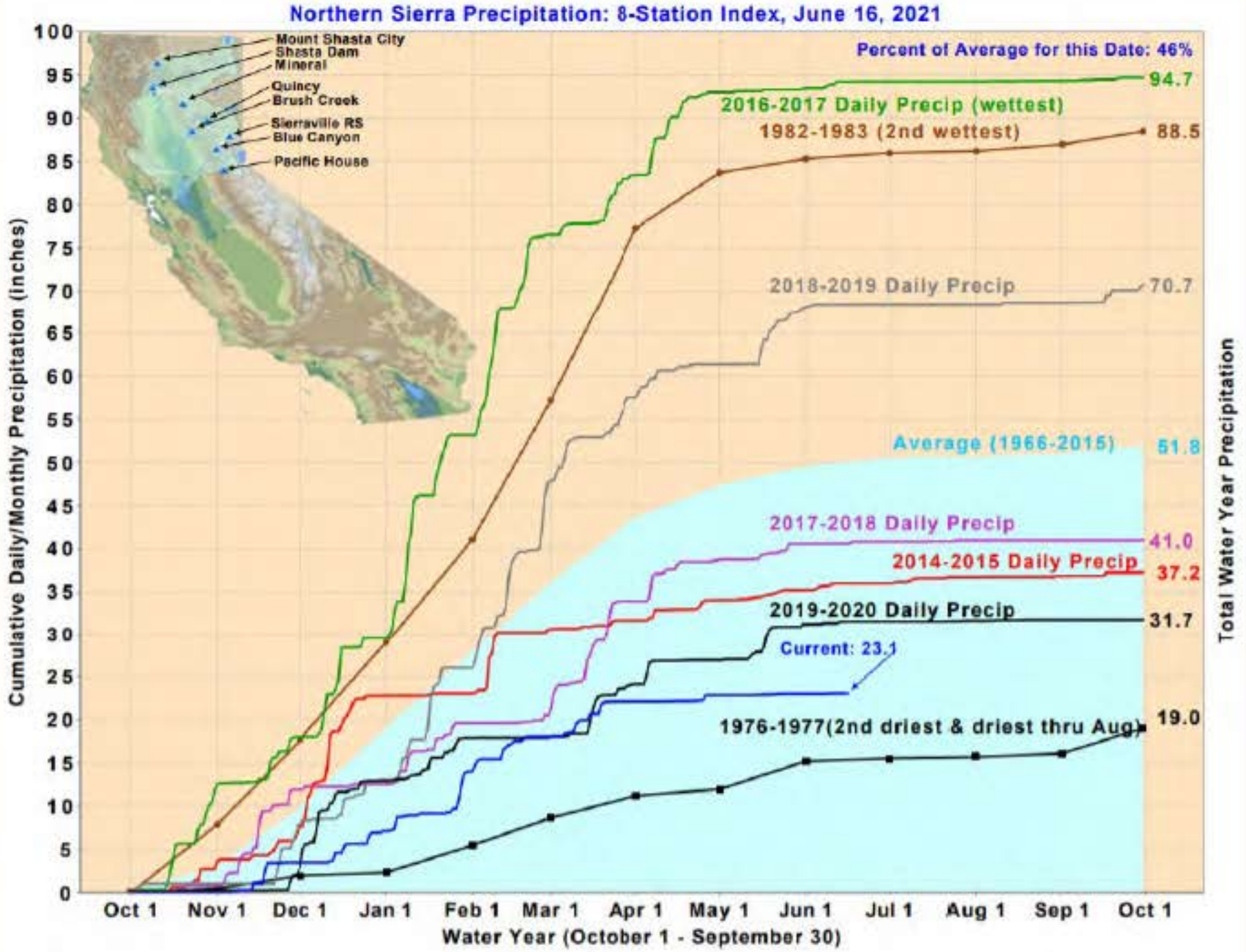
* Construct Project 184—1870s
* Construct Sly Park—1950s
* Hazel Creek Tunnel—1980s
* Buy Project 184—1990s
* Acquiring Permit 21112 Water—2000s
* Buy Sly Park—2000s

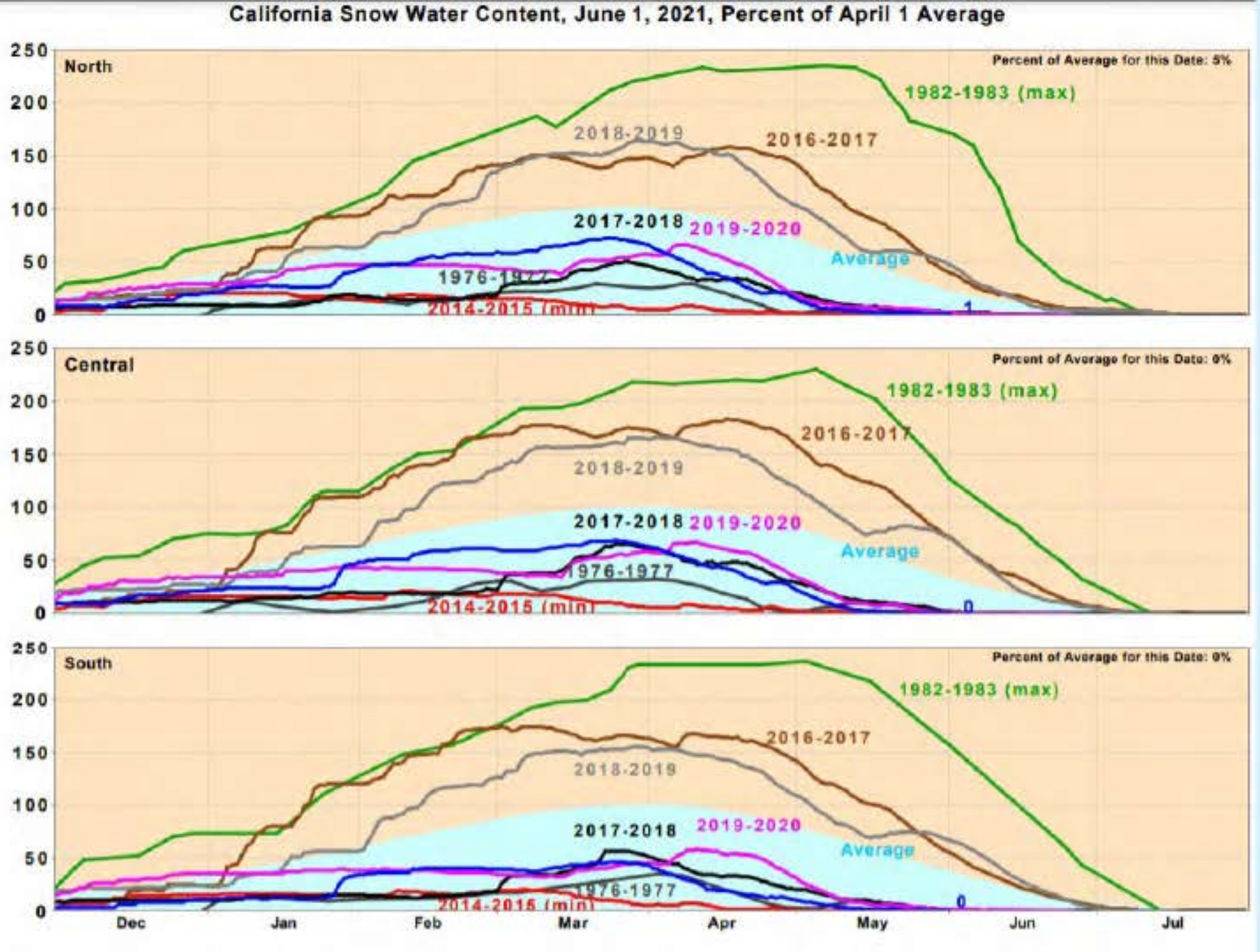
Long-Term Vision and Planning

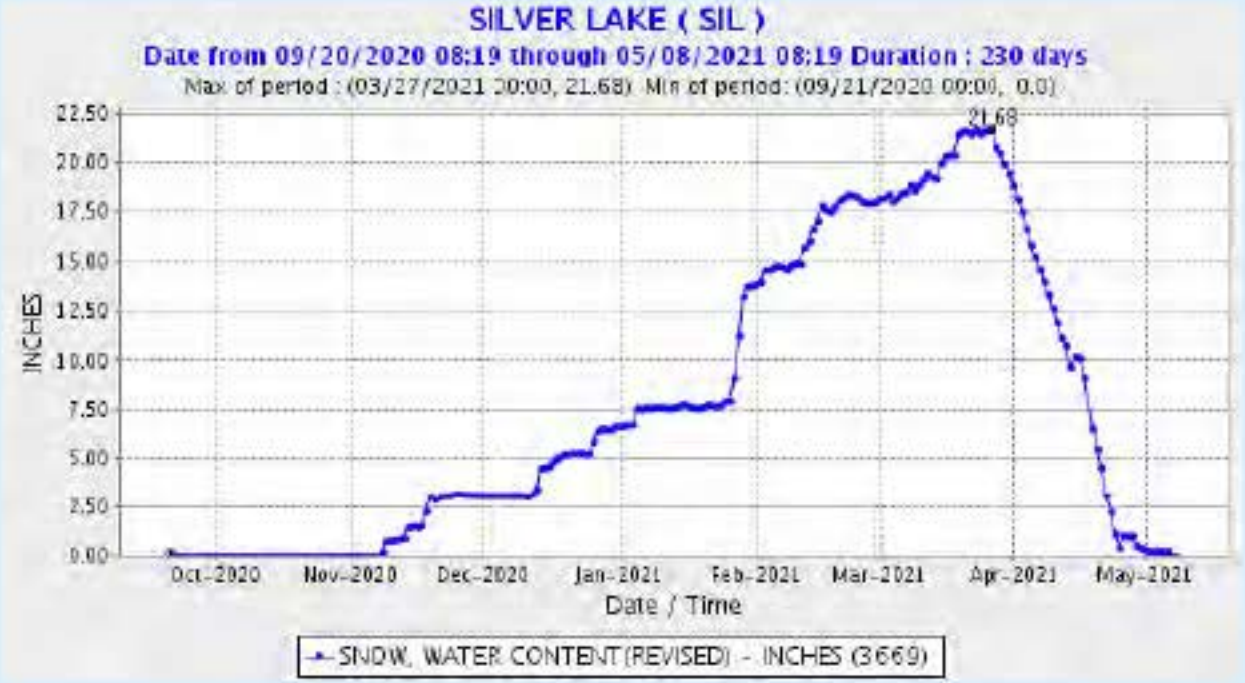
Includes

* Add points of diversion for Permit 21112— 2020-2025
* SMUD/El Dorado Water and Power Authority Water Rights— 2045+
* White Rock— 2045+

2021: A Year of Drought, Fire and… Flood?


Northern Sierra Precipitation: 8-Station Index, June 16, 2021
Mount Shasta City
Shasta Dam
Mineral
Quincy
Brush Creek
Sierraville RS
Blue Canyon
Pacific House
Percent of Average for this Date: 46%
2016-2017 Daily Precip (wettest)
94.7
1982-1983 (2nd wettest)
88.5
2018-2019 Daily Precip
70.7
Average (1966-2015)
51.8
2017-2018 Daily Precip
41.0
2014-2015 Daily Precip
37.2
2019-2020 Daily Precip
31.7
Current: 23.1
1976-1977(2nd driest & driest thru Aug)
19.0
Cumulative Daily/Monthly Precipitation (inches)
Total Water Year Precipitation
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Oct 1
Water Year (October 1 - September 30)

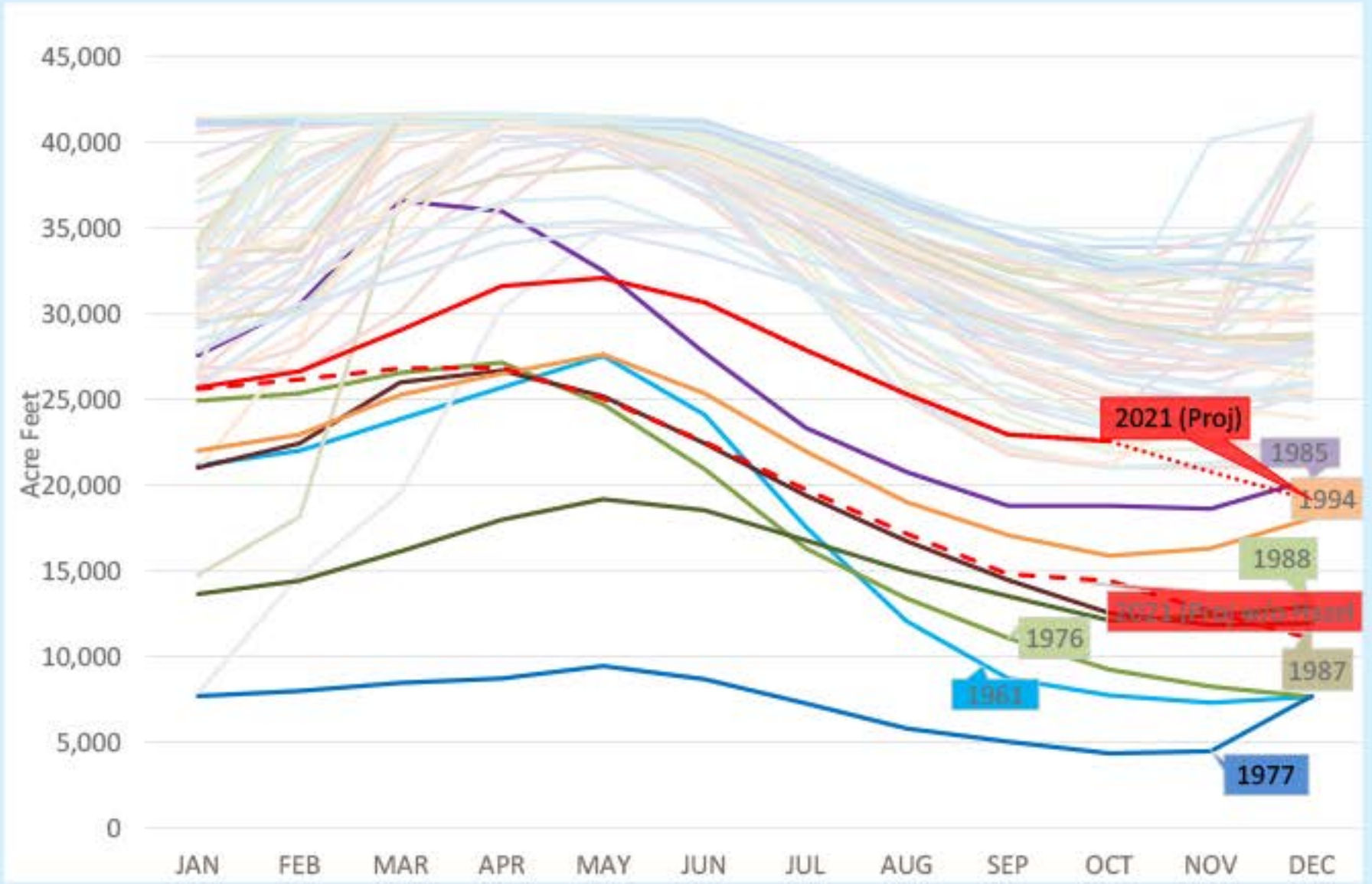

California Snow Water Content, June 1, 2021, Percent of April 1 Average
North
Percent of Average for this Date: 5%
1982-1983 (max)
2018-2019
2016-2017
2017-2018
2019-2020
Average
1976-1977
2014-2015 (min)
1
Central
Percent of Average for this Date: 0%
1982-1983 (max)
2016-2017
2018-2019
2017-2018
2019-2020
Average
1976-1977
2014-2015 (min)
0
South
Percent of Average for this Date: 0%
1982-1983 (max)
2016-2017
2018-2019
2017-2018
2019-2020
Average
1976-1977
2014-2015 (min)
0
250
200
150
100
50
0
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul


SILVER LAKE (SIL)
Date from 09/20/2020 08:19 through 05/08/2021 08:19 Duration : 230 days
Max of period : (03/27/2021 20:00, 21.68) Min of period: (09/21/2020 00:00, 0.0)
22.50
20.00
17.50
15.00
12.50
10.00
7.50
5.00
2.50
0.00
INCHES
21.68
Oct-2020
Nov-2020
Dec-2020
Jan-2021
Feb-2021
Mar-2021
Apr-2021
May-2021
Date / Time
SNOW, WATER CONTENT (REVISED) - INCHES (3669)

2021/2022 Water Strategy

* 2020/2021: Consecutive dry years
  - 2021 driest since 1977
- Import Project 184 supplies to Jenkinson Lake via Hazel Creek Tunnel
  - 8,100 acre feet delivered from Project 184 into Jenkinson Lake during 2021
* Managing Jenkinson Lake for carryover
  - Two-year water supply
  - Water supply prioritized over hydro-generation

Sly Park Storage History and 2021 Projection



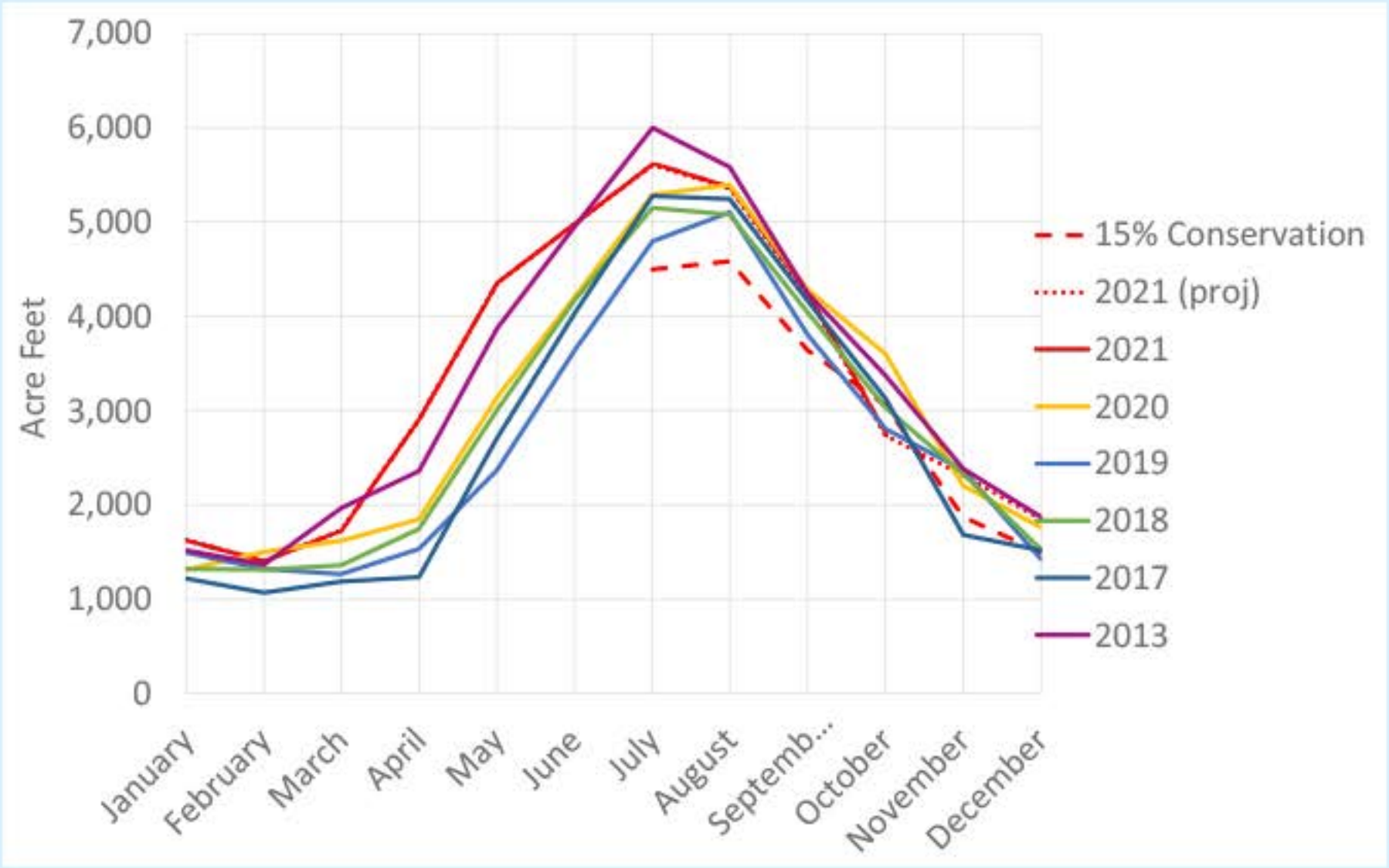
Drought Action Plan

Drought Stages		
Normal Water Supply	None	Normal
Slightly Restricted	Stage 1 Water Alert	Up to 15%
Moderately Restricted	Stage 2 Water Warning	Up to 30%
Severely Restricted	Stage 3 Water Crisis	Up to 50%
Extremely Restricted	Stage 4 Water Emergency	Greater than 50%

Drought Designation

* EID Board of Directors approved Stage 1 Water Alert on June 28
  - 15% voluntary conservation
  - No mandatory conservation within Stage 1
* Continue to evaluate conditions
  - Regular EID Board updates

District-wide Demand Last 5 Years Compared to 2013



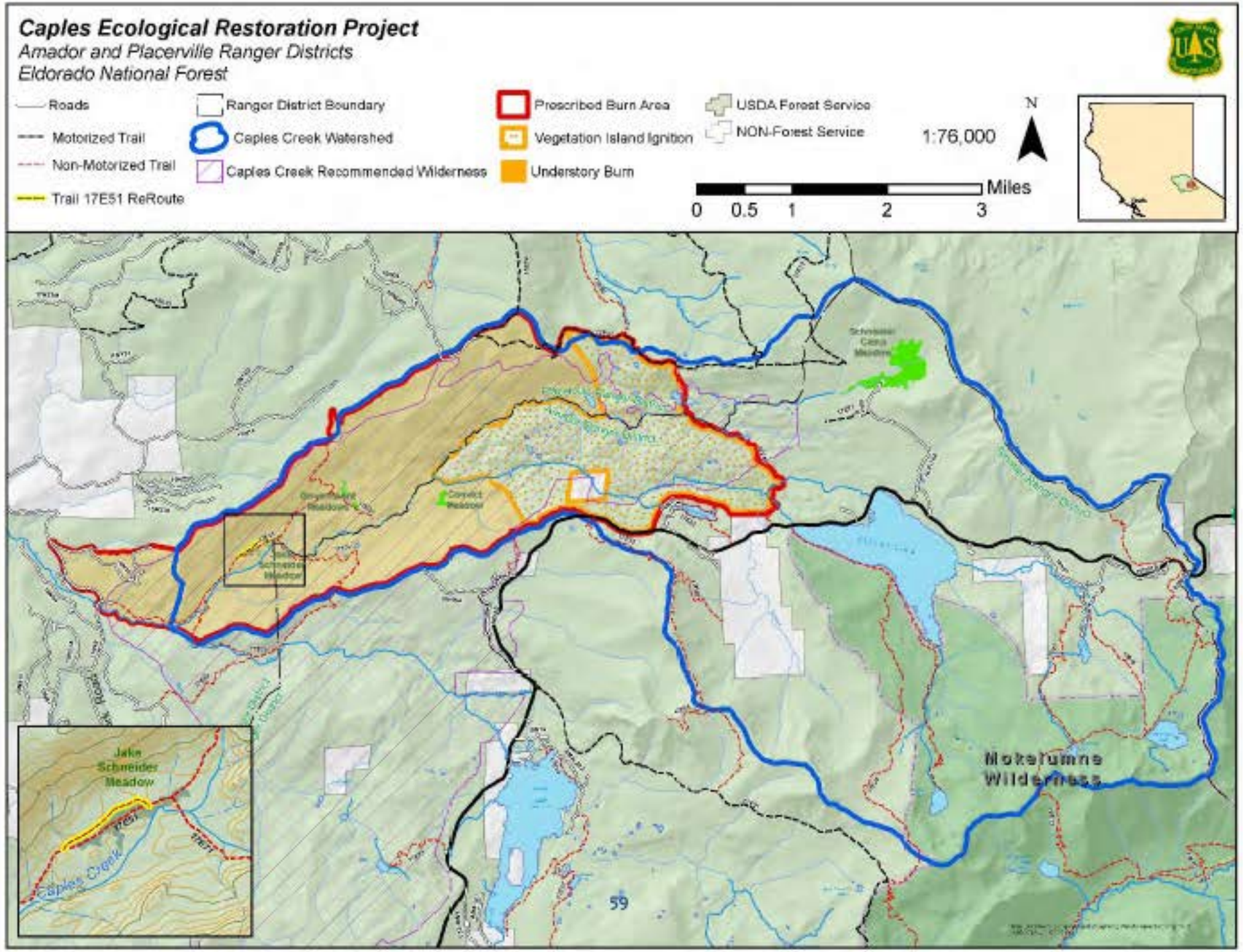
A Legacy of Fire Suppression

Caples Creek Watershed 1899
Historic (Desired) Conditions

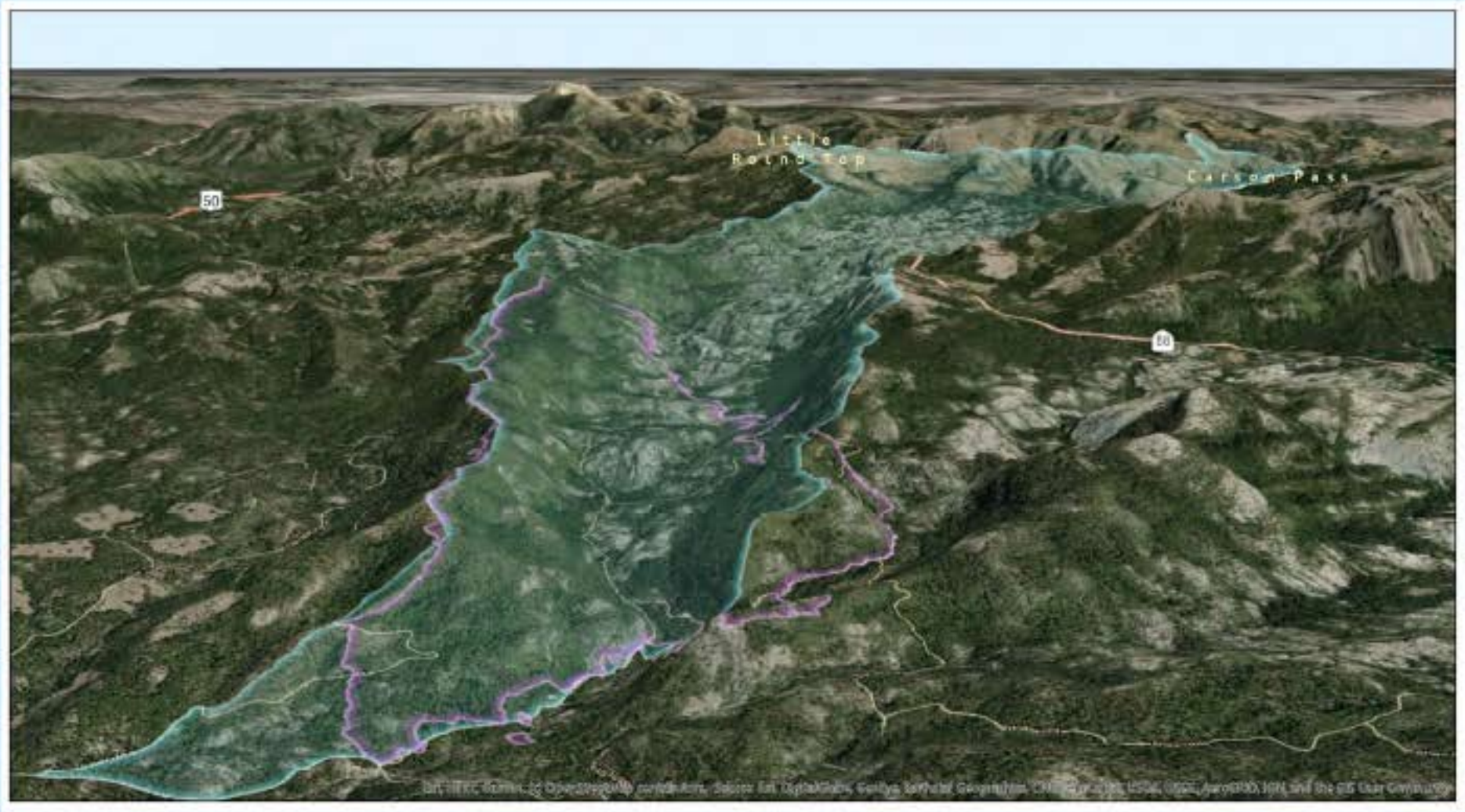
Caples Creek Watershed 2014
Heavy Understory and Dense Timber

Caples Creek Watershed 2017
Prescribed Fire

Caples Creek Watershed 2021
Post Caldor


Caples Ecological Restoration Project
Amador and Placerville Ranger Districts
Eldorado National Forest
Roads
Motorized Trail
Non-Motorized Trail
Trail 17E51 ReRoute
Ranger District Boundary
Caples Creek Watershed
Caples Creek Recommended Wilderness
Prescribed Burn Area
Vegetation Island Ignition
Understory Burn
USDA Forest Service
NON-Forest Service
1:76,000
N
Miles
0 0.5 1 2 3
Jake Schneider Meadow
Caples Creek
Mokelumne Wilderness
59

Fire Perimeter Overlaid with Caples Ecological Restoration Project



Pre-Burn Conditions

Abundant dead and downed trees, small trees and ladder fuels

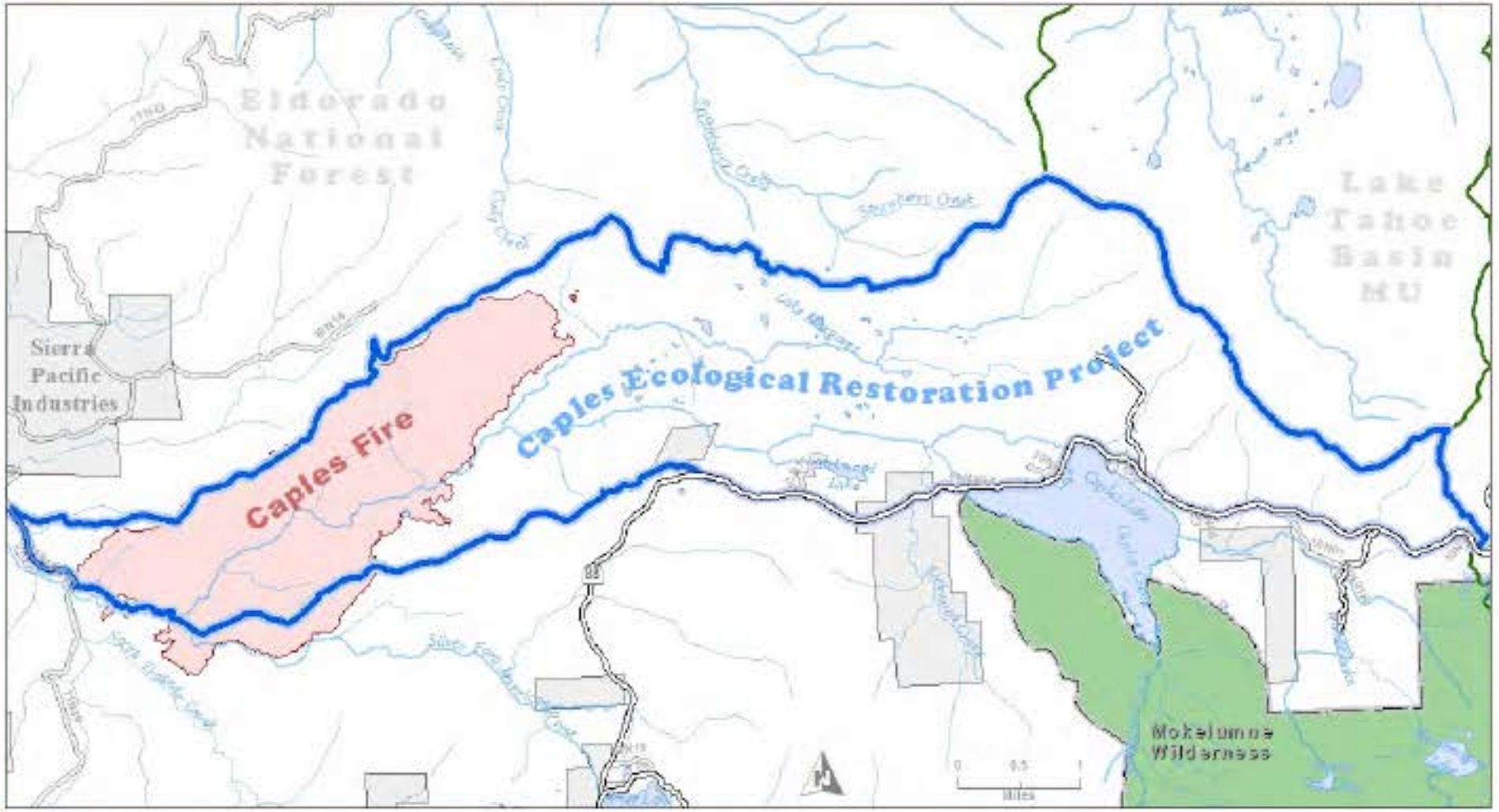
Legacy Tree Preparation

400 -700 year old trees with at least 40 inches of diameter

Post Fire Conditions

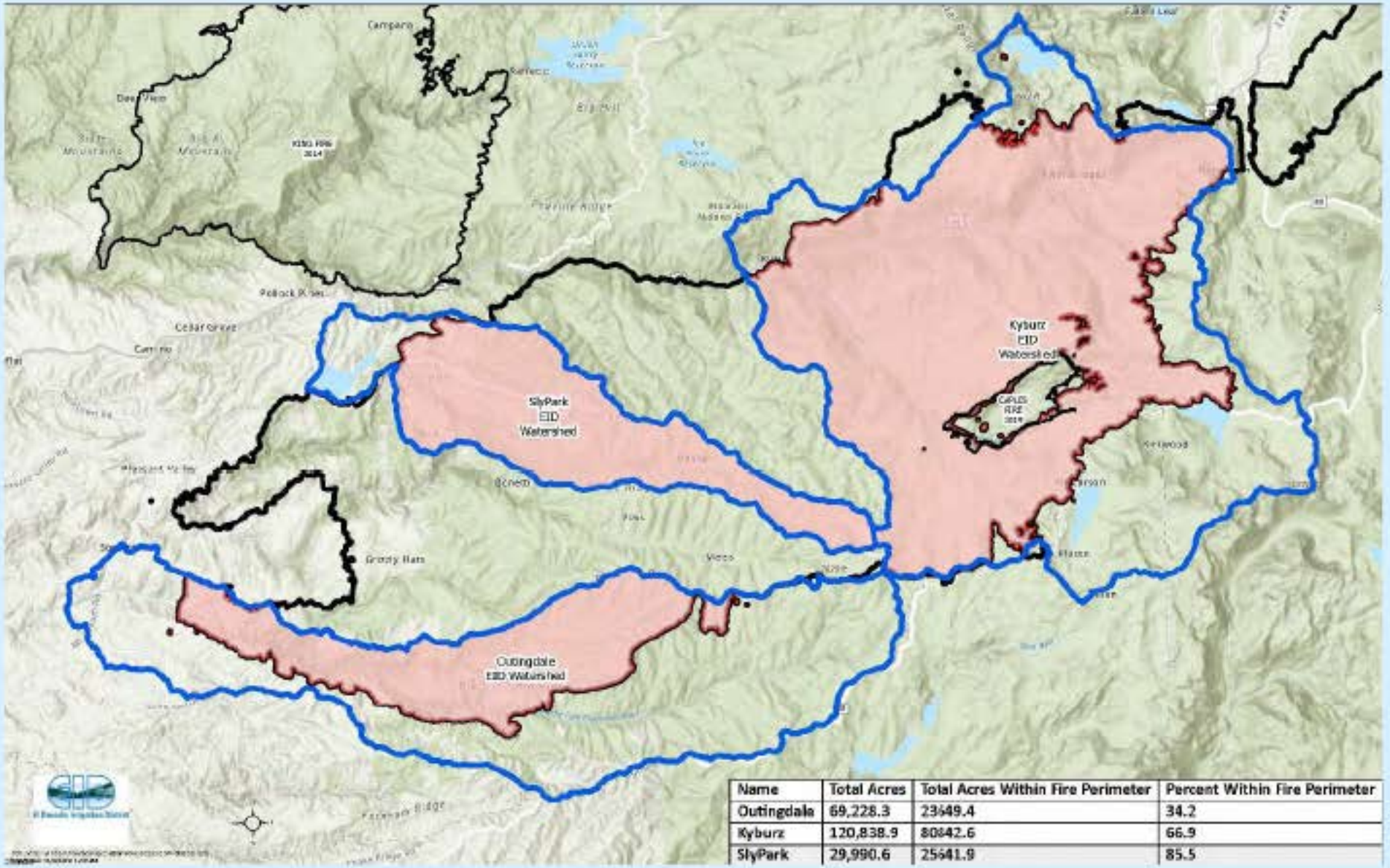
Post Fire Condition Area Thinned Before Burning

Legacy Trees Post Fire



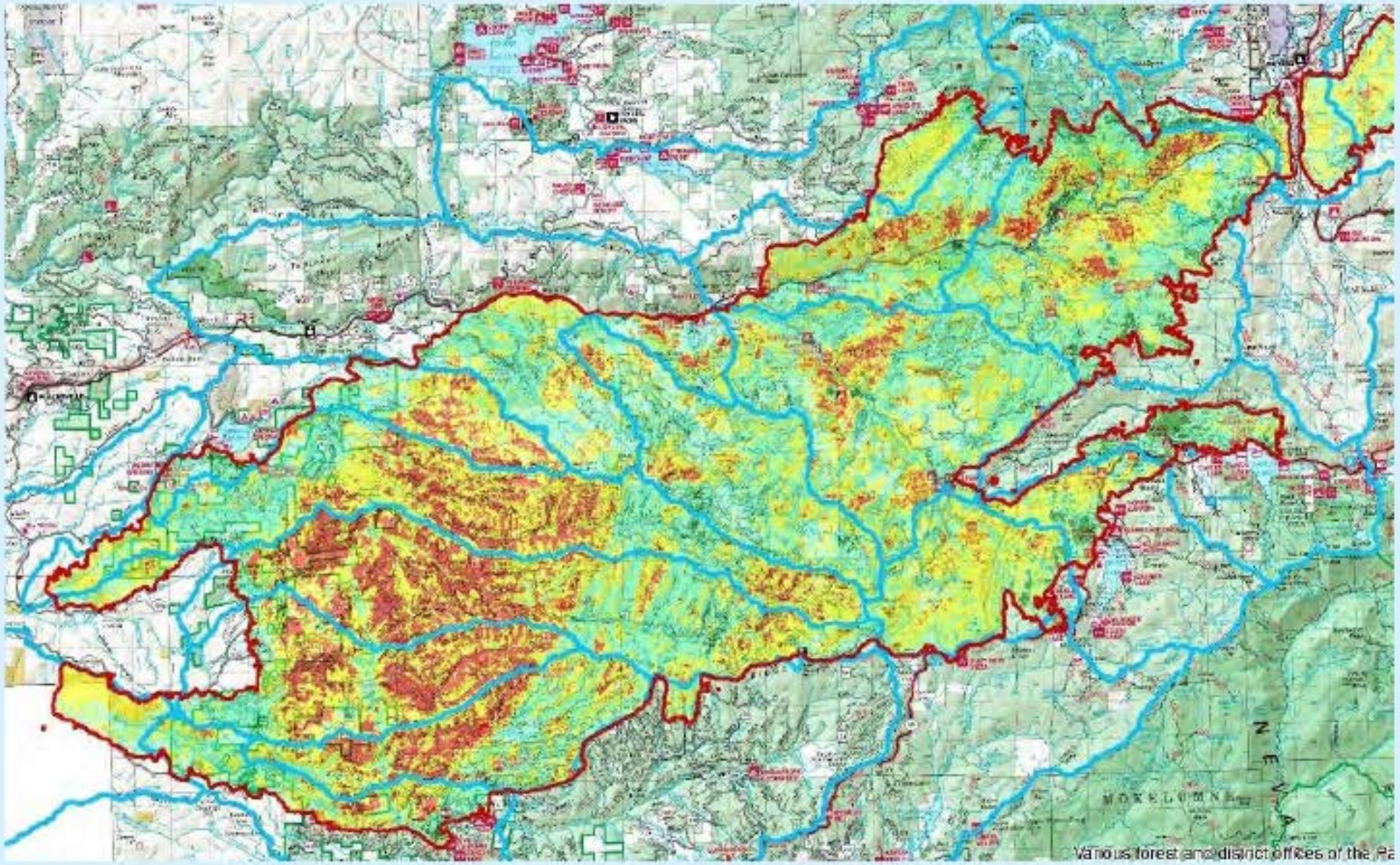
Fire Location	Acres
Inside Caples Ecological Restoration Project	2,663
Outside Caples Ecological Restoration Project	320
Grand Total	2,983

Caldor Footprint over EID watersheds



Name	Total Acres	Total Acres Within Fire Perimeter	Percent Within Fire Perimeter
Outingdale	69,228.3	23649.4	34.2
Kyburz	120,838.9	80842.6	66.9
SlyPark	29,990.6	25641.9	85.5

Caldor Burn Intensity



EID Caldor Losses

* Four wooden flumes destroyed
  - Conveys Project 184 pre-1914 consumptive water supplies
  - Forebay Reservoir storage maximized prior to flume loss
* Echo Conduit support structure damaged
* Various remote monitoring and command/control facilities destroyed
* Camp 2 house, large storage shed, various small buildings along canal burned
* Minor damage to communication infrastructure at Strawberry Water Treatment Plant

Flume 4

Flume 5

Flume 6

Flume 30

Caldor Impacts: Statistics

* 15th largest wildfire in California history
* Impacted source water for all five treatment plants
* Almost 10% of EID customers (11,000 people) under mandatory or voluntary evacuations for over two weeks

Caldor Impacts: Moving forward

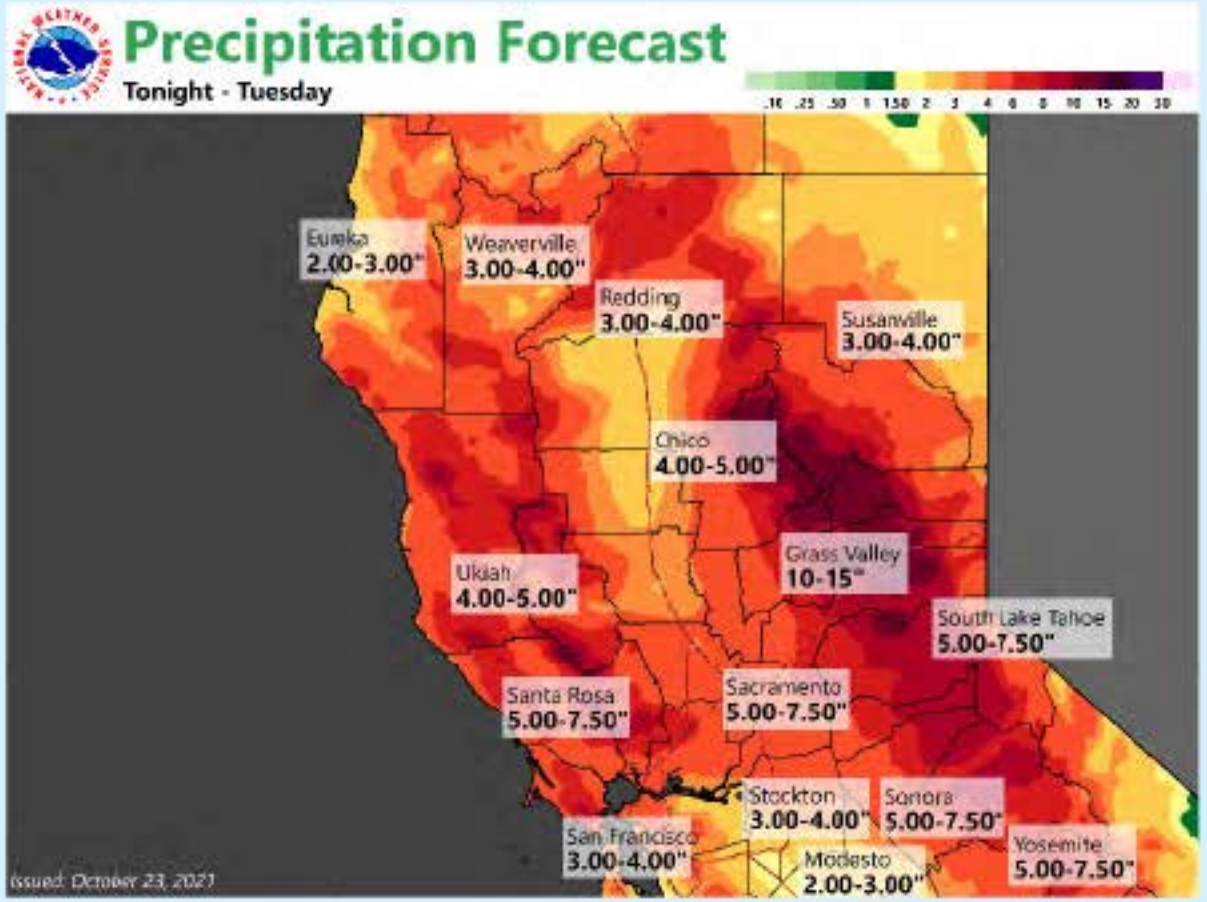
* Prioritizing restoration efforts based upon potential water supply impacts, weather-related impacts as seasons transition, and FEMA and insurance coordination
* Evaluating multiple scenarios for canal restoration to ensure full Project 184 pre-1914 water rights will be available to EID in 2022
* Planning for significant debris management
  - Project 184 and Jenkinson Lake operations

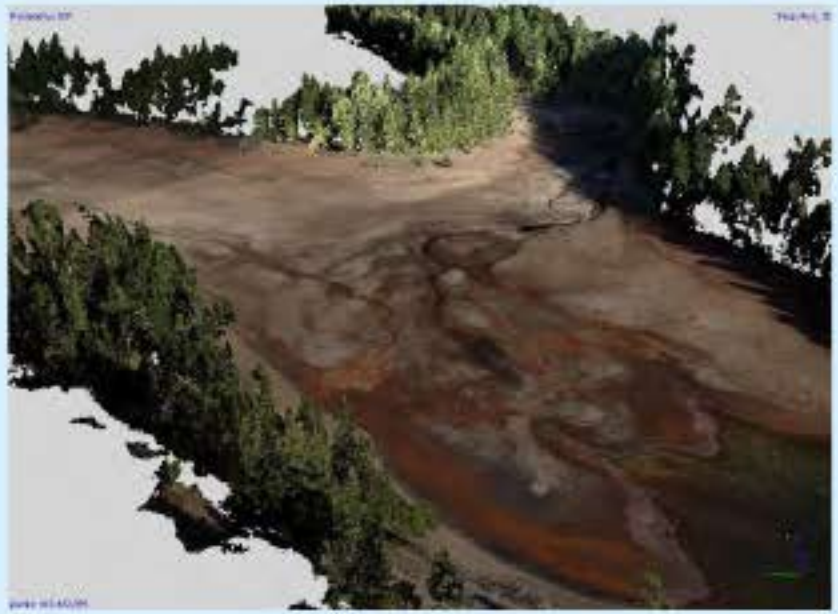
October Atmospheric river

October 21-25: 11.76 inches at Sly Park Dam

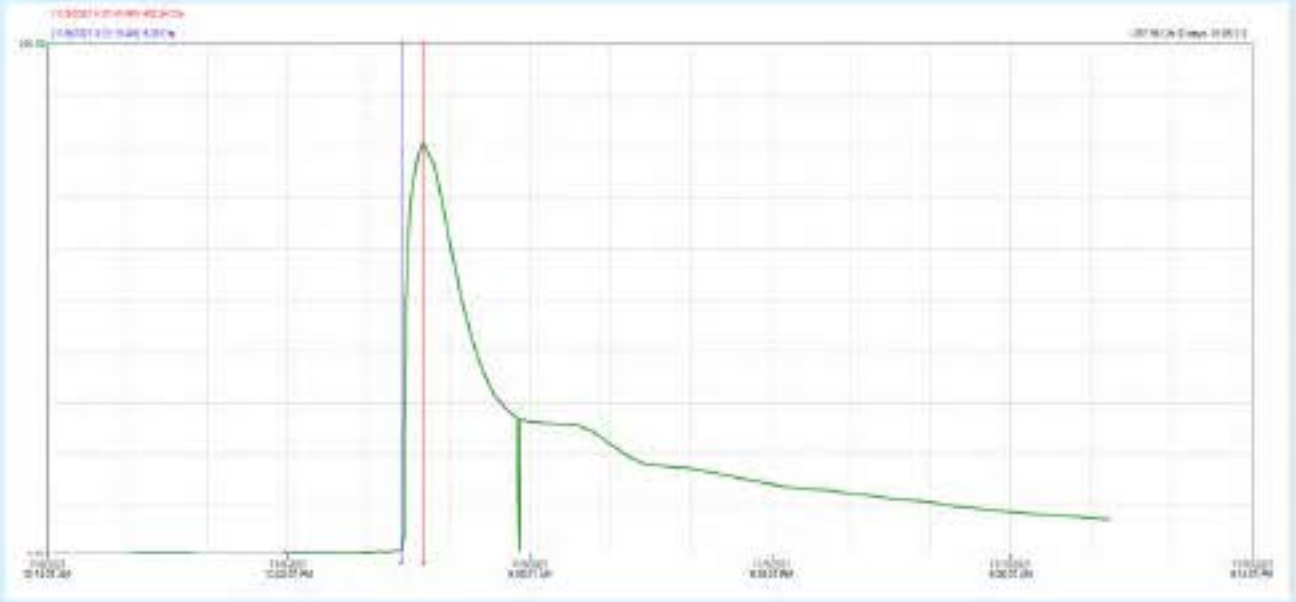
October 24: 6.0 inches

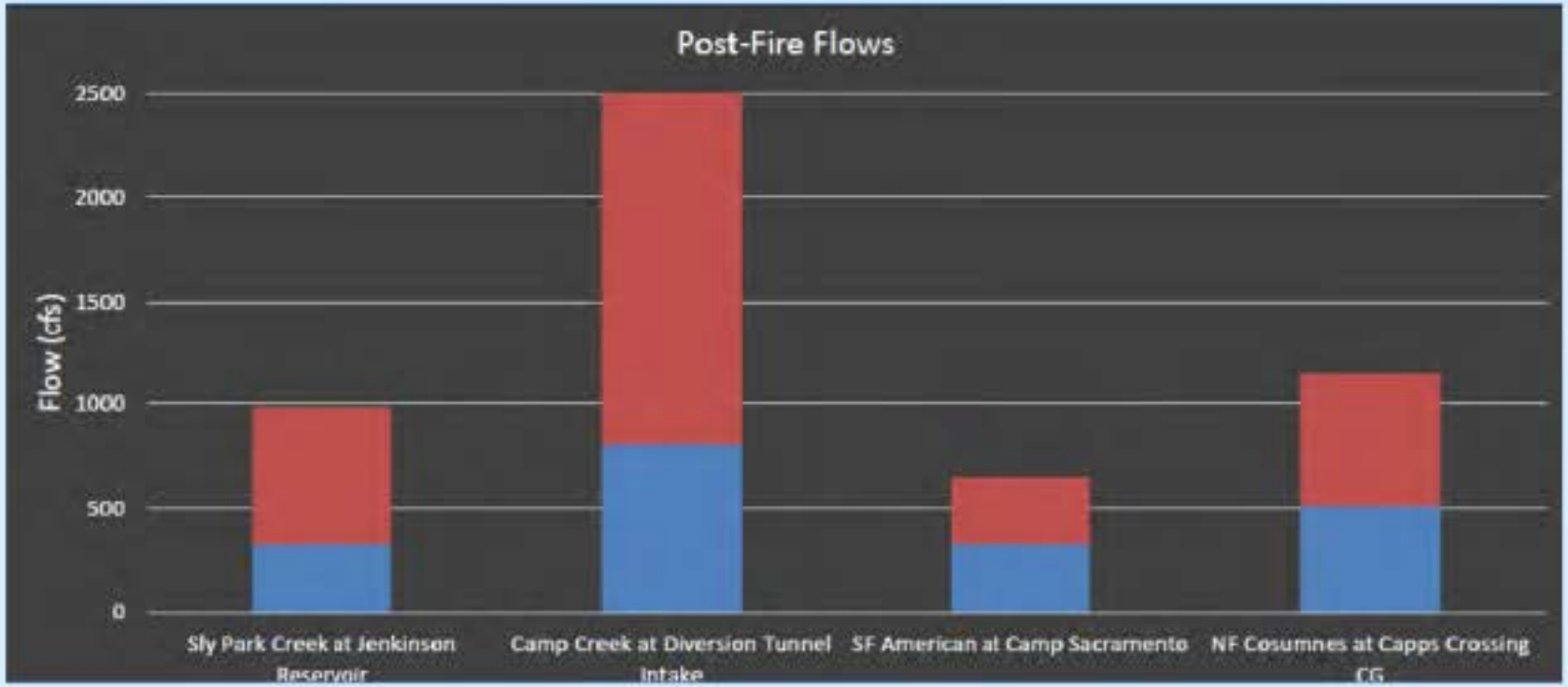
November 8-9: 1.20 inches at Sly Park Dam





Sly Park Inlet




Post-Fire Flows
2500
2000
1500
1000
500
0
Flow (cfs)
Sly Park Creek at Jenkinson Reservoir
Camp Creek at Diversion Tunnel Intake
SF American at Camp Sacramento
NF Cosumnes at Capps Crossing CG

Closing Thoughts

* The District is one of the most well-positioned water suppliers in the region to meet the near- and long-term needs of our growing community.
* The recent range of natural conditions (drought, flood, fire, PSPS) have reinforced the need for continued reinvestment.
* Each investment must be carefully analyzed to ensure we are making responsible decisions in the timing and nature to guarantee a safe and secure water supply for the generations that lay ahead.