

# California Sportfishing Protection Alliance



**State Water Resources Control Board  
Sacramento River Temperature Management  
21 April 2021 Workshop**

# Droughts Are Normal

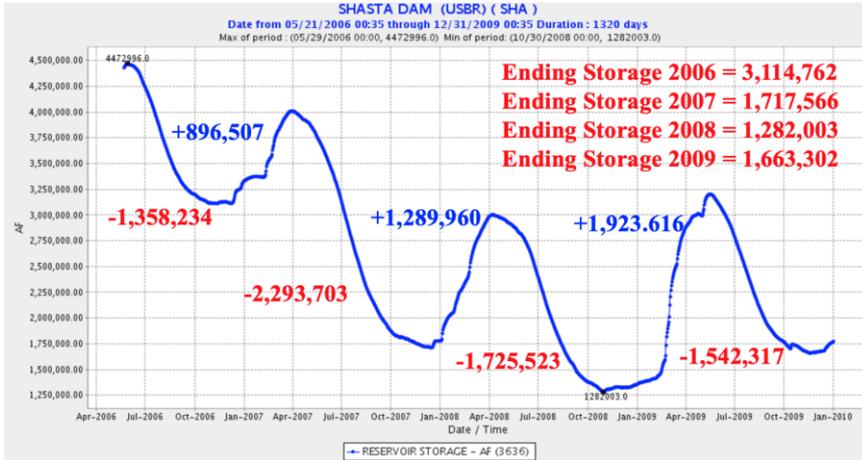
- In the last 103 years, there have been 11 multi-year droughts in California of large-scale extent, spanning 43 years.
- Over the last 20 years, Critical to Below Normal water years occurred 71.5% of the time and Above Normal to Wet water years occurred 28.5% of the time.
- Yet, the State and Federal Projects operate as if there is no tomorrow. During droughts, they operate to deliver as much water as possible, leaving little carryover storage to guard against a subsequent dry year.
- **This has been the pattern in every drought over the last five decades.**



# A Consistent Pattern

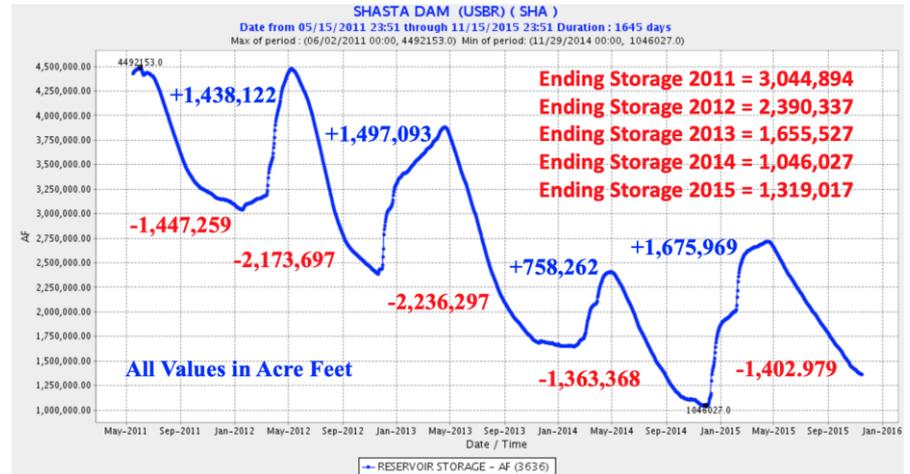
## Shasta Storage 2006-2009

2006 Wet, 2007 Dry, 2008 Critical, 2009 Dry



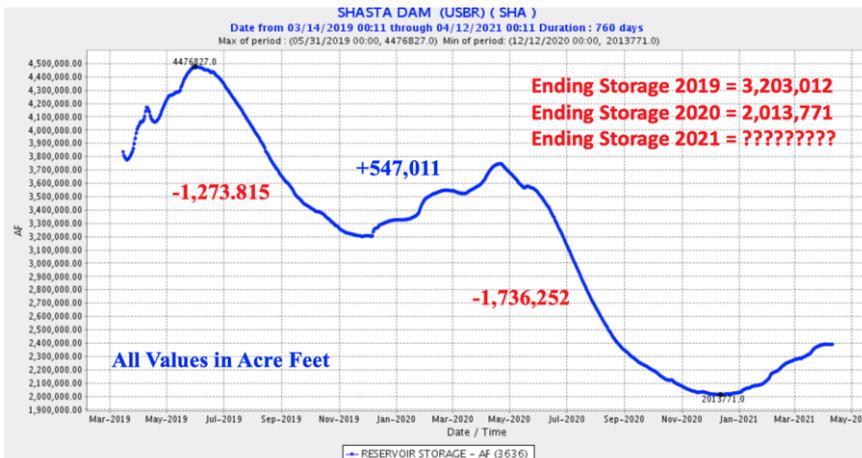
## Shasta Storage 2011-2015

2011 Wet, 2012 Below Normal, 2013 Dry, 2014 Critical, 2015 Critical

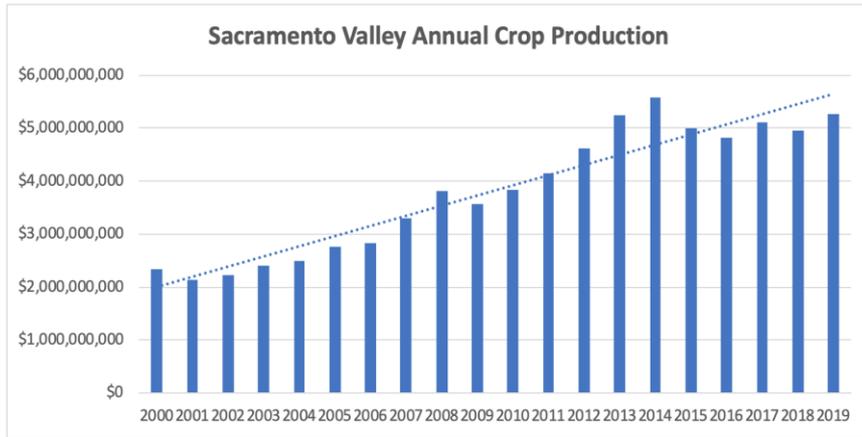


## Shasta Storage 2019-2021

2019 Wet, 2020 Dry, 2021 Critical



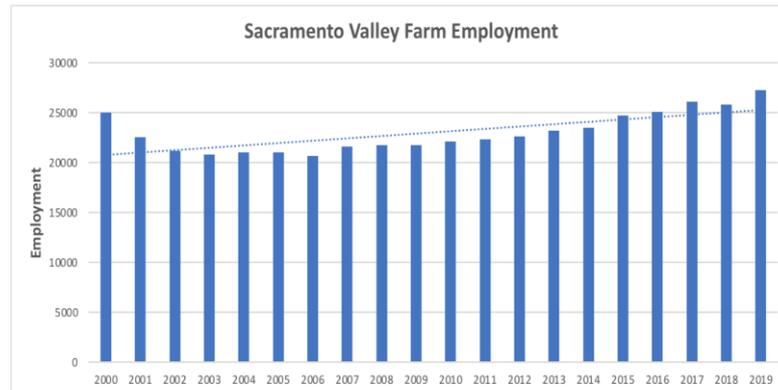
# Farms Prosper During Droughts



**Sacramento Valley Annual Crop Production (2000-2004 v. 2015-2019) Increased 71.4%**

Water Year: W D D AB BN BN W D C D BN W BN D C C BN W BN W D  
 Agricultural Commissioner Annual Reports: Butte, Colusa, Glenn, Yuba, Sutter, Sacramento, Solano, Yolo and Tehama Counties

**Sacramento Valley Annual Farm Employment (2000-2004 v. 2015-2019) Increased 16.6%**



Water Year: W D D AB BN BN W D C D BN W BN D C C BN W BN W D  
 Employment by Industry Data, California Employment Development Department

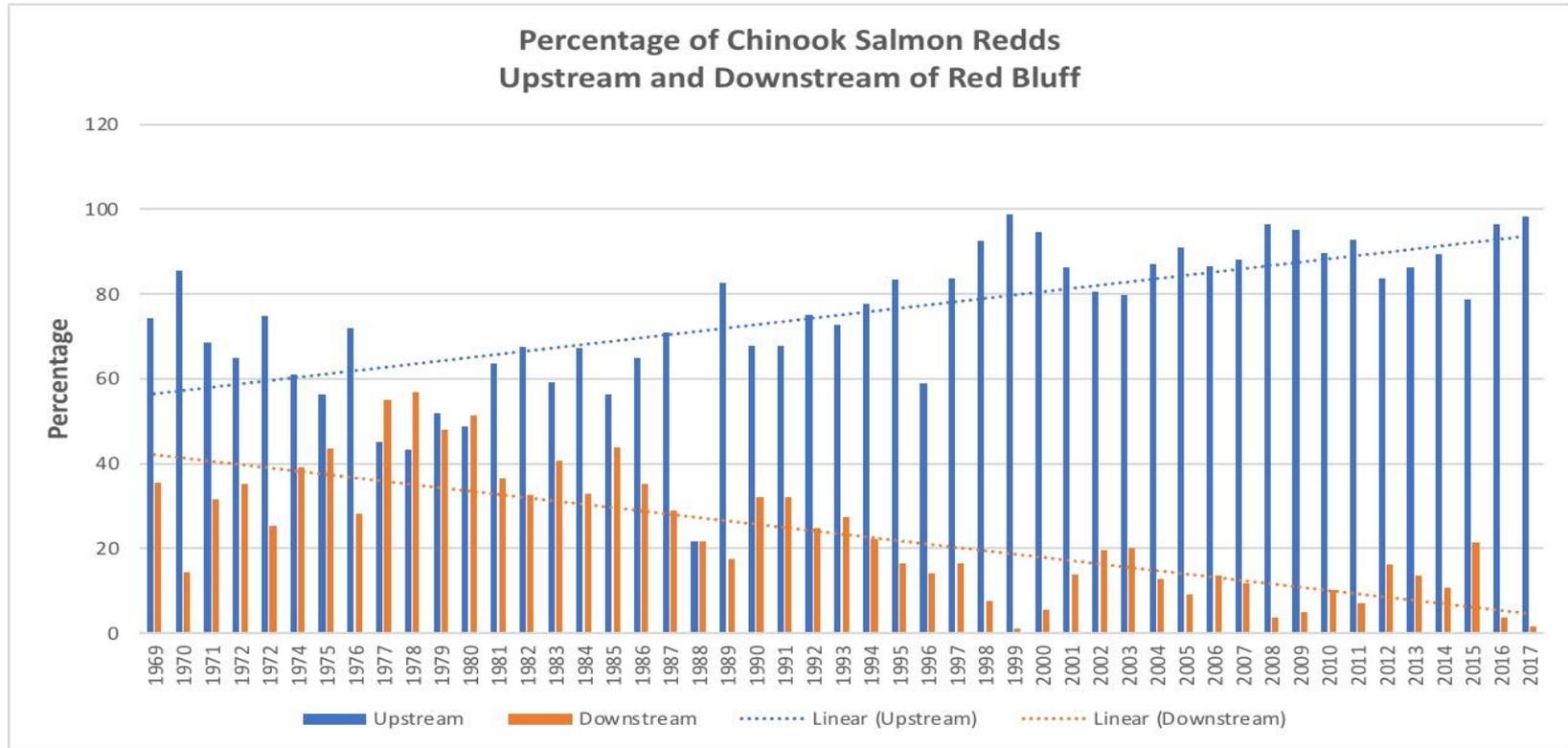


# On the Other Hand, Fish Suffer

- Sacramento River mainstem winter run, spring run and fall run Chinook salmon escapement (1970-1974 v. 2015-2019) have declined 91.0, 99.9 and 79.7 percent, respectively. (CDFW Grand Tab)
- Abundance indices (1967-1971 vs. 2016-2020) for striped bass, Delta smelt, longfin smelt, splittail and threadfin shad have declined 98.1, 99.8, 99.8, 99.3 and 94.3 percent, respectively. (CDFW Fall Midwater Trawl)
- In the three Critical Water Years since 2000 (2008, 1014, 2015), NMFS estimates that winter-run chinook salmon egg to fry survival was 14, 4 and 3 percent, respectively. (NMFS 2019 BO)
- **Failure to meet Sacramento River and Delta water quality objectives during a drought sequence could send species into extinction.**



# Failure to Meet Downstream Temperature Objectives Has led to Compression of Salmon Spawning Contributing to Superimposition of Redds



Summary Tables, Salmonid Populations of the Upper Sacramento River Basin in 2018, CDFW.

**Percentage of spawning redds below Red Bluff (1969-1978 v. 2008-2017), decreased from 36.5% to 9.3%, while percentage of redds above Red Bluff increased from 64.6% to 90.7%.**



# The Board Must Enforce WR Order 90-05

- WR Order 90-05 enforces Basin Plan water quality objectives in the upper Sacramento River and the requirements of Cal. Const. Art. X, Section 2, Water Code Section 275 and the Public Trust Doctrine. WR Order 90-05, p. 2
- USBR must meet 56°F at Red Bluff, subject to controllable factors and upstream compliance point are only allowed, subject to uncontrollable factors. WR Orders 90-05 (pp. 54-55) & 92-02 (p. 9)
- Water deliveries are controllable factors and water necessary to protect cold water is not available for delivery. WR Order 92-02, p. 9
- **The Board must enforce Order 90-05 by ensuring there is sufficient cold water to meet temperature objectives before there are commitments to specific water deliveries.**



# USBR Bound by Contracts & BO, SWRCB is Not

- USBR supplies 100% of contracted water to Sacramento Settlement Contractors, except in critical water years when it supplies 75%.
- 2019 NMFS Biological Opinion allows lethal egg mortality temperatures during Tier 4 years.
- USBR & Sacramento River Temperature Task Group triages water left over, after contracted deliveries are announced, into a Temperature Management Plan the Board is expected to approve.
- At no point in this process does anyone consider how a reduction in deliveries to Settlement Contractors would better protect fisheries.
- **Board is not bound by USBR contracts & Biological Opinions. The Board is bound by it's constitutional, Basin Plan, water rights and public trust responsibilities.**



# Water Transfers????

- Sacramento Settlement Contractors seek to transfer several hundred thousand AF of water for export. USBR is proposing a “forbearance agreement” to delay transfers until later in the year, claiming it will increase cold water storage and protect salmon.
- We note that a similar forbearance agreement process was employed in 2015. And egg-to-fry survival was 3% and 85% of winter-run Chinook salmon were killed below Shasta Dam.
- In addition to a number of redirected impacts, water transfers will undermine critically needed Shasta carryover storage should next year be dry or critical.
- **Water necessary to comply with water quality objectives is not available for delivery and contractors should not be permitted to profit from the sale of unneeded water during a drought!**



# Expectations

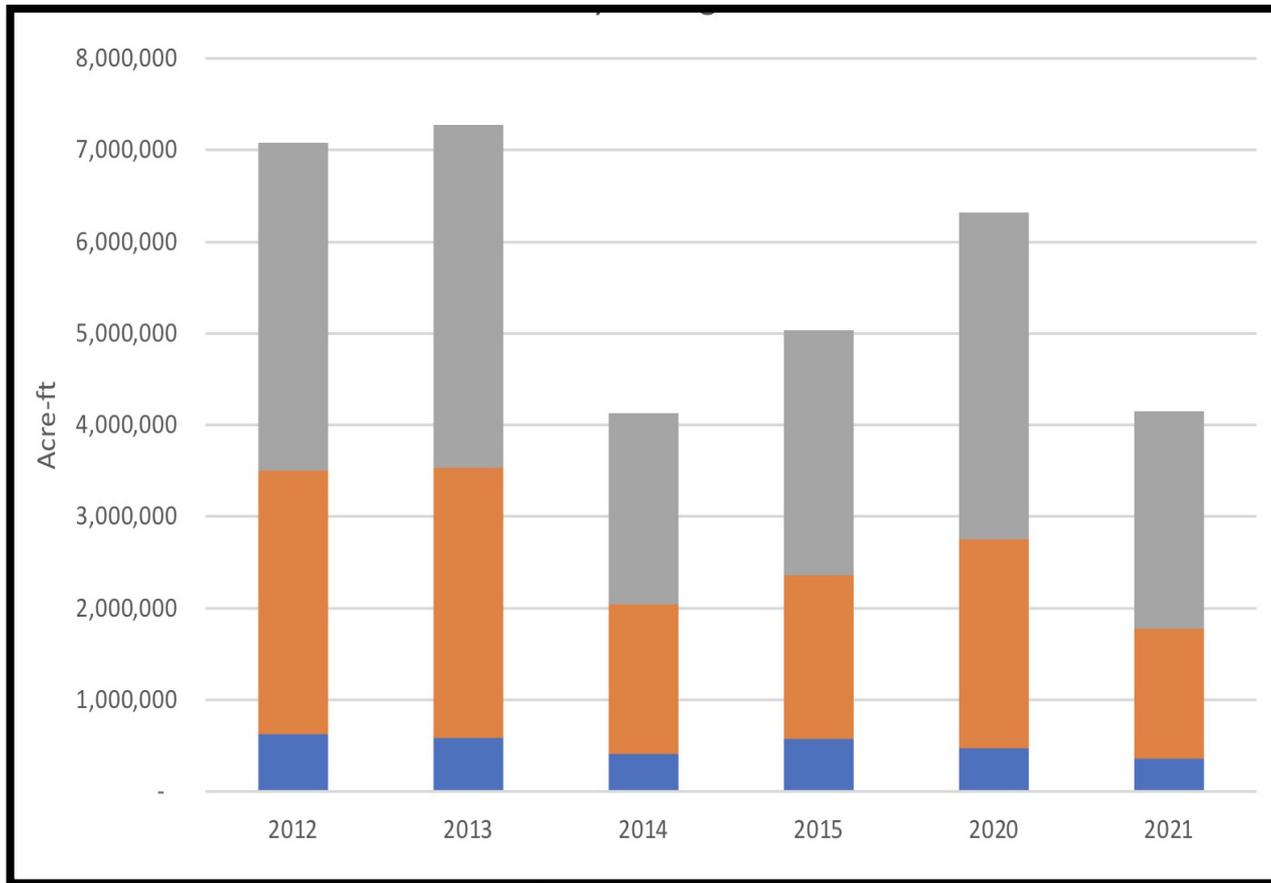
- USBR bluntly rejected Board staff's request to evaluate how different water delivery alternatives could achieve temperature objectives at compliance points.
- We expect the Board to honor our Settlement Agreement to have staff evaluate "whether water supply delivery alternatives may achieve temperature compliance at temperature control points Red Bluff Diversion Dam, Bend Bridge, Jelly's Ferry, Ball's Ferry, Clear Creek and Keswick Dam." (Settlement Agreement, pp. 2-3.)
- We expect those evaluations to be available concurrent with USBR's draft Temperature Management Plan.
- **We expect that any TMP approval will be conditioned on ensuring that there is sufficient cold water to protect fisheries and adequate carryover storage, should next year be another dry or critical year.**



# **Five Measures to Protect Fish in 2021**

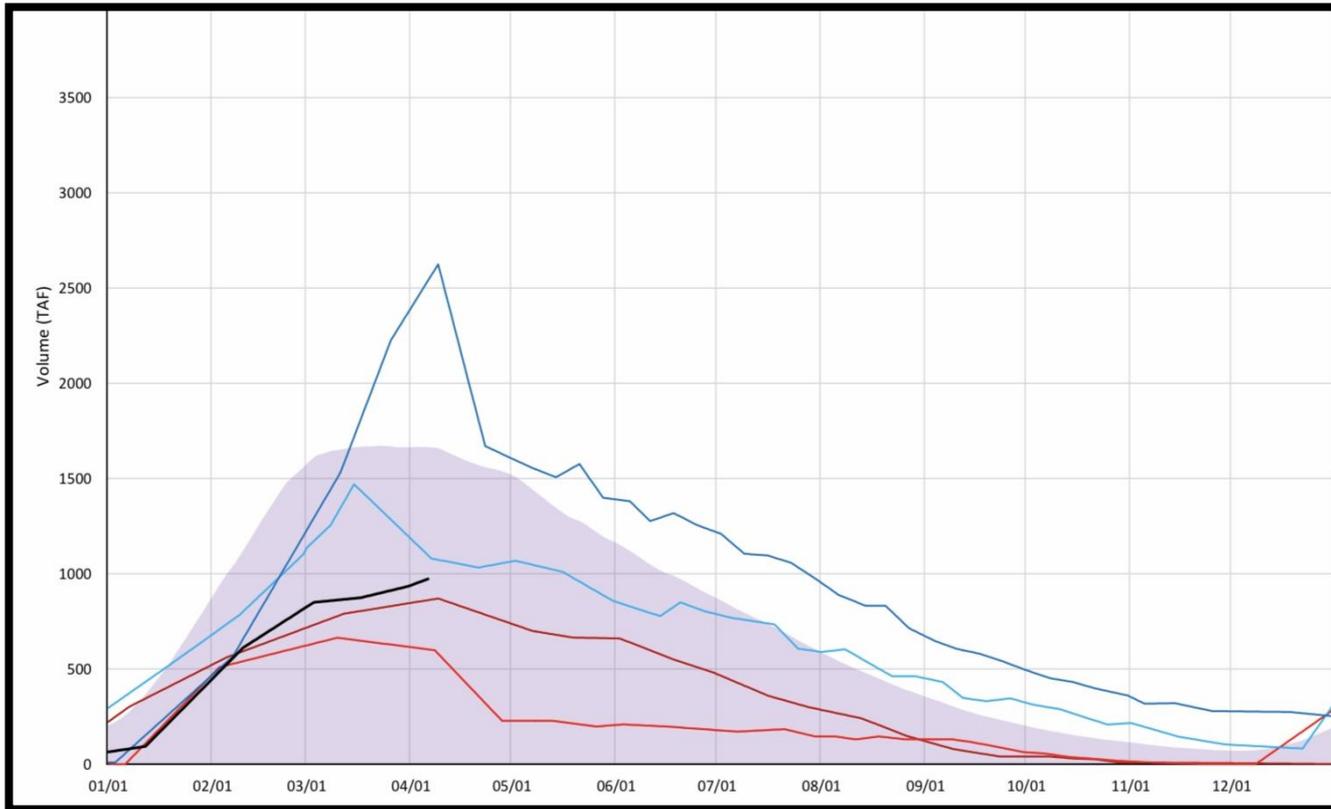
**Tom Cannon  
Fisheries Biologist  
Consultant to California Sportfishing Protection  
Alliance  
April 21, 2021**

# End-of-March Storage Conditions



- End-of-March Shasta Storage (grey) is critical in 2021
- Folsom (blue) and Oroville (orange) also very low
- Trinity (not shown) also very low

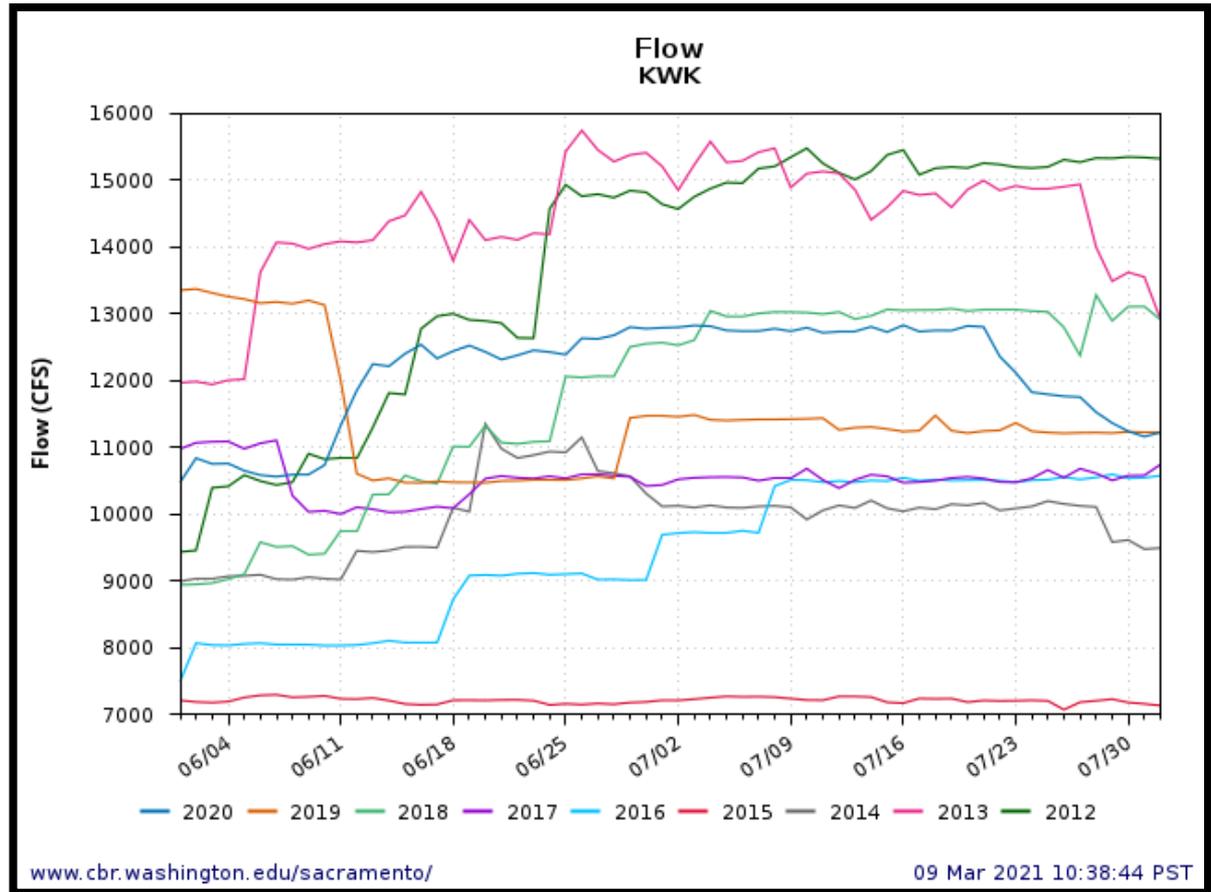
# Cold-Water Pool Storage



- Shasta 2021 Cold-Water Storage (black line) is critical
- Higher than 2014 and 2015 (red lines)
- Lower than 2020 (light blue line)

# 1. Minimize Shasta Deliveries

- 2021 is critical year, 2015 all over again
  - Total 2021 Keswick release should be less than or equal to 2015 (bottom line on graph)
  - Note that high deliveries in 2020 (dark blue line on graph) were high risk, depleted storage
  - Compare 2020 with more conservative ops in 2018, pre-2019
- Biological Opinion



## 2. Take Advantage of Spring Trinity Diversions

- Cooler Trinity releases (SPP) in spring (2021) help offset warmer Shasta releases from Keswick.
- Maximum effect is achieved by keeping overall releases low
- Diversions from Trinity must be low enough to preserve Trinity Lake cold-water pool

D A T E	Mean Daily Water Temperatures (°F)									
	TCD <sup>1</sup>	SHD	SPP <sup>1</sup>	KWK	SAC	CCR <sup>2</sup>	BSF	JLF	BND	RDB
Mar	49.7	49.1	48.5	49.7	50.1	50.5	51.4	51.9	52.6	52.5
04/01	50.2	49.7	49.7	51.1	51.8	<b>52.7</b>	54.6	55.8	56.8	57.0
04/02	50.0	49.4	49.5	51.4	52.0	<b>52.7</b>	54.7	55.9	56.8	57.3
04/03	50.0	49.5	49.4	51.1	51.8	<b>52.6</b>	54.3	55.4	56.2	56.8
04/04	49.9	49.5	49.1	50.7	51.6	<b>52.4</b>	54.2	55.4	56.3	56.7
04/05	49.9	49.3	49.7	50.6	51.5	<b>52.4</b>	54.5	55.9	56.8	57.2
04/06	49.9	? 49.4	-	50.9	51.8	<b>52.5</b>	54.5	55.8	56.8	57.4
04/07	49.8	49.5	-	50.8	51.8	<b>52.6</b>	54.9	56.2	57.1	57.6
04/08	49.9	? 49.6	50.2	50.9	51.6	<b>52.3</b>	54.3	55.7	56.7	57.4
04/09	50.1	? 49.8	49.8	50.8	51.7	<b>52.4</b>	54.2	55.4	56.3	56.9
04/10	49.9	50.2	49.8	50.8	51.6	<b>52.3</b>	54.4	55.7	56.7	57.2
04/11	50.7	51.7	49.6	51.1	51.8	<b>52.5</b>	54.3	55.5	56.6	57.1
04/12	51.1	50.5	49.9	51.9	52.3	<b>53.0</b>	? 54.5	55.7	56.7	57.1

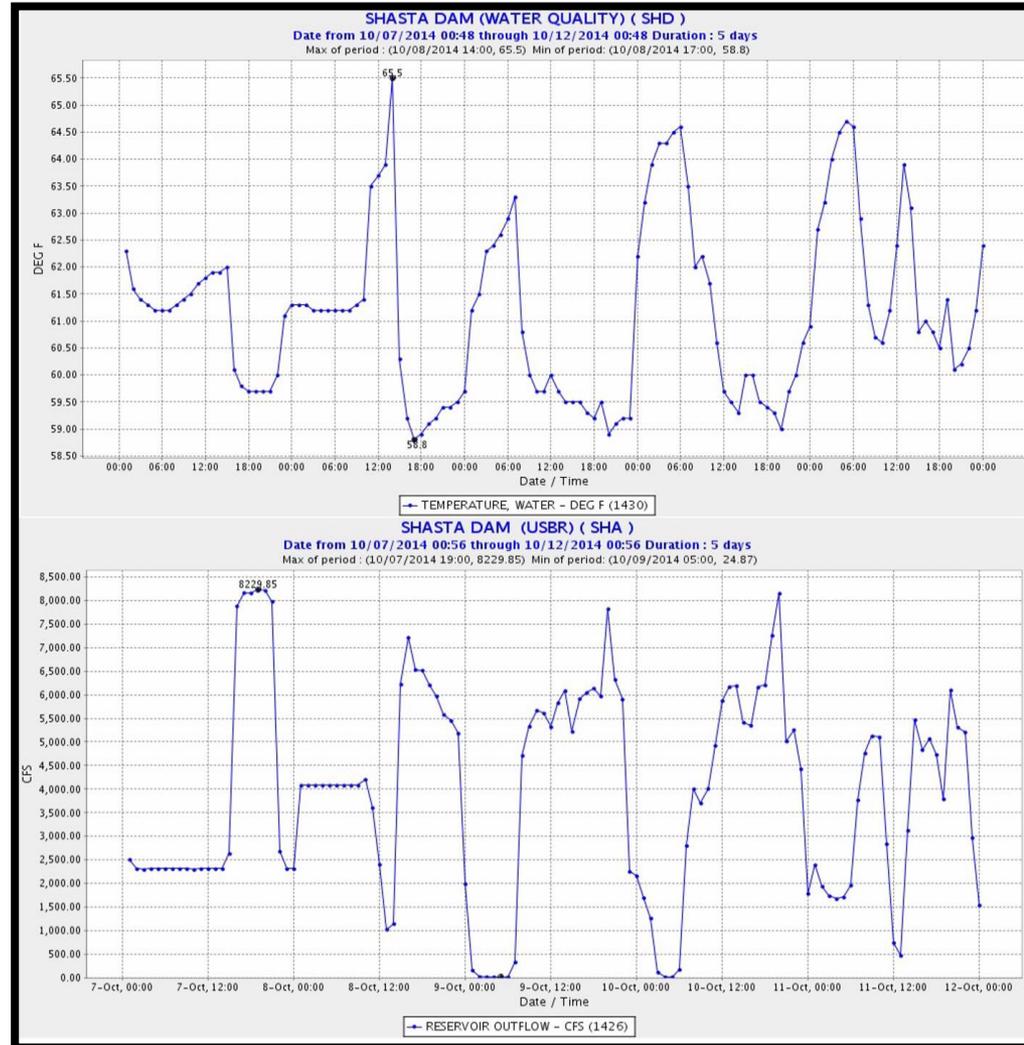
# 3. Limit Trinity Diversion in Summer

- Limit Trinity diversions (SPP) in summer to levels needed to maintain flow of cold water through Lewiston Lake, cold water in Trinity River (2020 data)
- Takes Shasta cold water to cool SPP Trinity water entering Keswick in summer

DATE	Mean Daily Water Temperatures (°F)									
	TCD <sup>1</sup>	SHD	SPP <sup>1</sup>	KWK	SAC	CCR	BSF <sup>2</sup>	JLF	BND	RDB
Jun	51.3	50.5	52.8	51.9	52.4	53.1	54.8	56.1	56.9	57.9
07/01	51.8	51.1	53.9	52.3	52.6	53.3	<b>54.7</b>	55.9	56.7	57.6
07/02	51.7	51.1	54.0	52.6	52.9	53.6	<b>55.0</b>	56.2	57.0	57.9
07/03	51.9	51.2	54.0	52.6	53.0	53.6	<b>55.1</b>	56.3	57.1	58.1
07/04	52.0	51.5	54.1	52.7	53.0	53.7	<b>55.1</b>	56.2	57.0	58.0
07/05	52.1	51.4	54.1	52.9	53.3	53.9	<b>55.3</b>	56.5	57.2	58.1
07/06	51.7	51.1	54.2	52.9	53.3	53.9	<b>55.4</b>	56.6	57.3	58.3
07/07	51.9	51.1	54.3	52.6	53.0	53.6	<b>55.2</b>	56.4	57.2	58.2
07/08	52.0	51.2	54.4	52.7	53.0	53.6	<b>55.1</b>	56.3	57.1	58.1
07/09	52.0	51.2	54.4	52.9	53.2	53.6	<b>55.3</b>	56.5	57.3	58.3
07/10	52.2	51.4	54.5	52.9	53.3	53.8	<b>55.4</b>	56.6	57.4	58.5
07/11	52.1	51.3	54.7	53.1	53.5	54.1	<b>55.7</b>	56.8	57.6	58.6
07/12	51.9	51.0	54.7	53.1	53.5	54.0	<b>55.7</b>	56.9	57.8	58.8
07/13	52.2	51.3	54.8	52.9	53.4	53.9	<b>55.6</b>	56.9	57.7	58.8
07/14	52.4	51.4	54.8	53.1	53.5	54.0	<b>55.6</b>	56.9	57.7	58.8
07/15	52.5	51.6	54.9	53.2	53.6	54.2	<b>55.9</b>	57.1	58.0	59.1
07/16	52.0	51.2	55.0	53.3	53.7	54.4	<b>56.1</b>	57.4	58.3	59.4
07/17	51.9	50.8	55.0	53.0	53.5	54.1	<b>55.9</b>	57.3	58.2	59.4
07/18	52.0	51.0	55.1	52.9	53.3	53.7	<b>55.5</b>	56.7	57.7	59.0
07/19	51.9	50.9	55.2	53.0	53.4	54.0	<b>55.6</b>	56.7	57.6	58.6
07/20	51.9	50.9	55.2	53.0	53.4	54.0	<b>55.8</b>	57.0	57.9	59.1
07/21	52.1	51.1	55.3	52.9	53.4	53.9	<b>55.6</b>	56.8	57.7	59.0
07/22	52.1	50.9	55.4	53.1	53.4	53.8	<b>55.4</b>	56.5	57.4	58.5
07/23	51.6	50.8	55.5	53.0	53.3	53.8	<b>55.4</b>	56.4	57.3	58.2
07/24	51.7	50.5	55.5	52.9	53.4	54.0	<b>55.8</b>	57.0	57.8	58.8
07/25	51.7	50.6	55.6	52.9	53.3	53.8	<b>55.6</b>	56.8	57.8	58.9
07/26	51.8	50.6	55.7	52.9	53.3	53.8	<b>55.5</b>	56.8	57.7	58.9
07/27	52.0	50.8	55.8	53.0	53.4	54.0	<b>55.8</b>	57.0	57.9	59.0
07/28	51.8	50.7	55.9	53.1	53.5	54.1	<b>55.9</b>	57.1	58.0	59.2
07/29	51.3	50.2	55.9	53.1	53.6	54.2	<b>56.0</b>	57.3	58.2	59.3
07/30	51.3	50.2	56.0	52.6	53.2	53.7	<b>55.6</b>	56.9	57.8	59.1
07/31	51.4	50.2	56.1	52.5	53.1	53.7	<b>55.4</b>	56.6	57.5	58.7

# 4. Modify Hydropower Peaking

- Hydropeaking operations cause warm water releases from Shasta
- Amount of water going through the powerhouses affects the layer of water in Shasta Reservoir that the TCD draws from.
- Low intake rates during non-peaking times appear to draw a greater proportion of warmer surface waters from Shasta Reservoir.



# 5. Avoid Redirected Impacts

- Maintain Delta outflow and EC standards
- Preserve Folsom and Oroville storage by limiting deliveries off the Sacramento River, letting more Sacramento water reach the Delta
- Maintain sufficient cold water in Trinity Reservoir to protect Trinity River temperatures throughout water year

