

Figure 1. Preliminary daily Chinook passage at Waterford and Tuolumne River flow at La Grange and Modesto. Total 2020 passage = 41,980 Chinook. Sampling period January 4 through March 16, 2020. Zero *O. mykiss* captured in 2020.

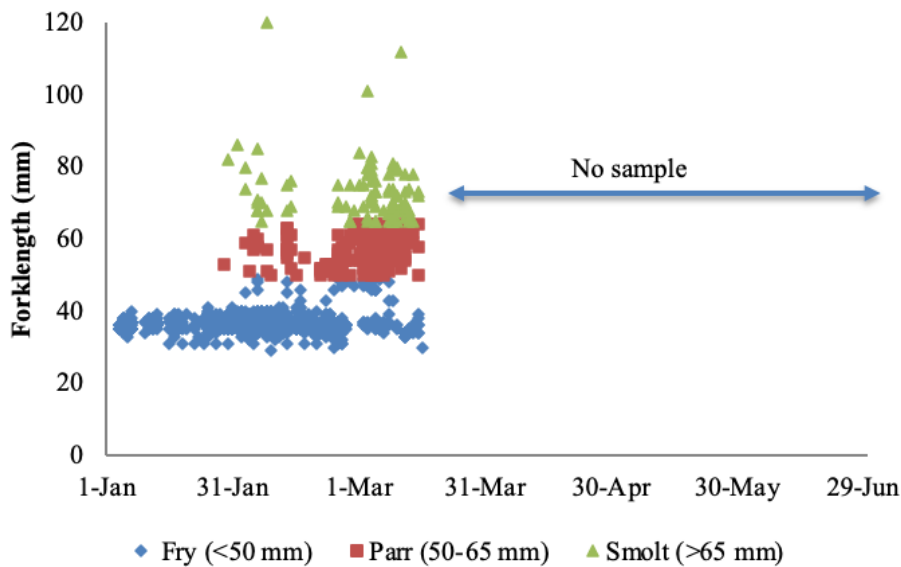


Figure 2. Daily forklength by lifestage of Chinook captured at Waterford, 2020.

NOTE: Sampling at Grayson occurred from January 8 through March 16, 2020, and only one Chinook fry was captured (February 12). Zero *O. mykiss* were captured at Grayson in 2020.

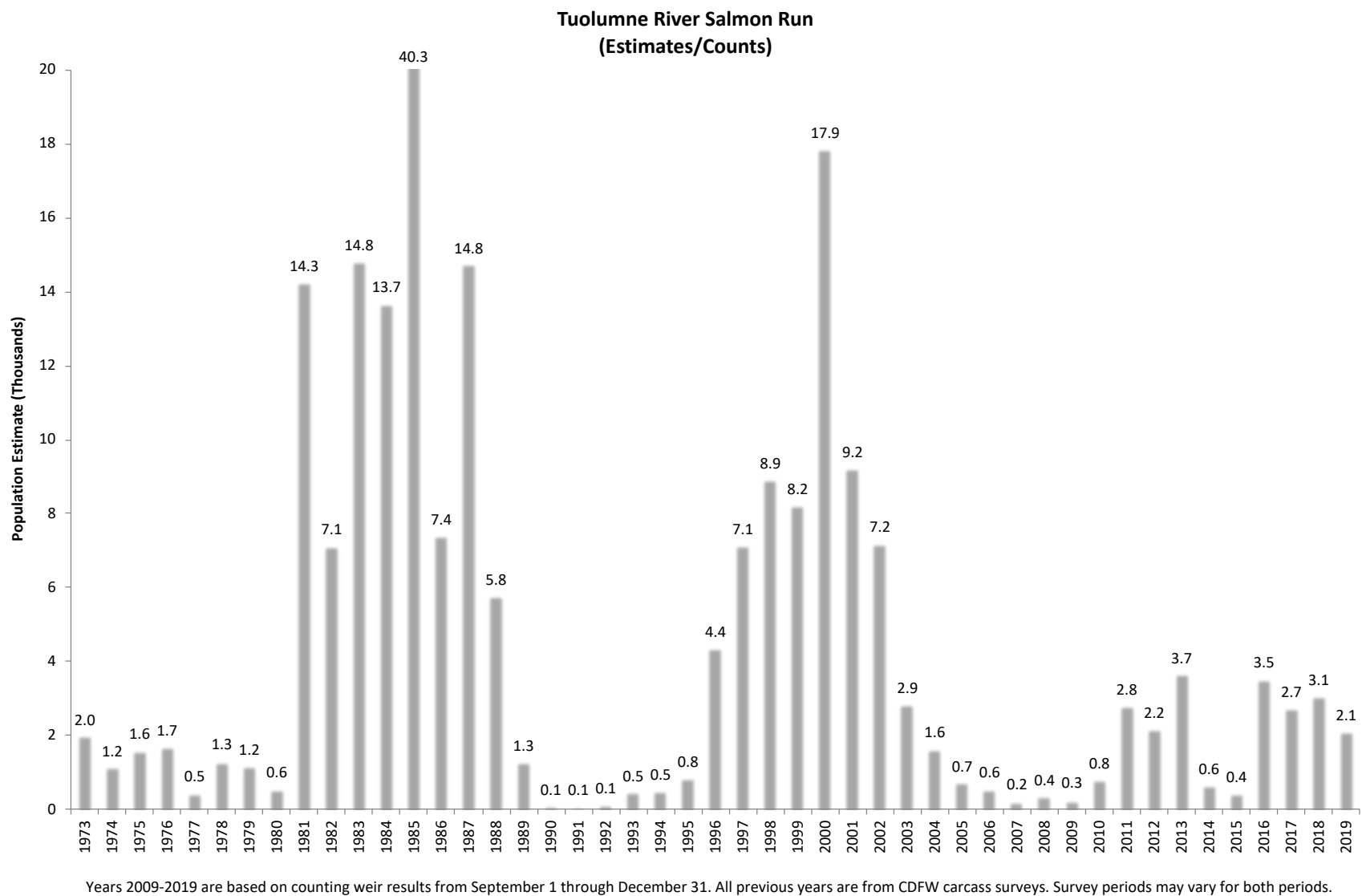


Figure 3. Tuolumne River annual Chinook salmon estimates (CDFW 1973-2008) and weir passages (FISHBIO 2009-2019).

Handouts changed slightly based on data collected in 2020. Passage estimates were run for Waterford, as included, instead of catch graph. Only one Chinook was captured at Grayson in 2020 so it wasn't necessary to make a graph. Seining was very truncated due to Covid-19 so not really much to show in graph either. Basically, only relevant graphs are displayed. The weir will be installed late September 2020.

Snorkel Survey PRELIMINARY Results for Chinook and *O. mykiss*

July 28 - 30, 2020

RM	Site	Description	Juvenile Chinook (<200mm)	Juvenile <i>O. mykiss</i> (<150mm)	Adult <i>O. mykiss</i> (>150mm)
50.7	Riffle A7	below La Grange	0	1	6
49.9	Riffle 2	below NLGB	0	8	28
49.1	Riffle 3B	upper Basso	0	8	19
48.0	Riffle 5B	above Basso Bridge	3	13	4
46.9	Riffle 7	upper Zanker	0	5	11
45.6	Riffle 13B	Zanker Ranch	13	5	0
42.9	Riffle 21	Bobcat Flat	0	0	2
42.3	Riffle 23C	Tuolumne River Resort	0	2	3
38.1	Riffle 31	7/11 Gravel	0	0	0
37.0	Riffle 35A	Santa Fe Gravel	0	0	0
35.3	Riffle 41A	Dierdorff Ranch	0	0	0
31.5	Riffle 57	below Hickman Bridge	0	0	0

Totals

16

42

73

Note:

Chinook at only two locations (RM 48.0 and RM 45.6)

O. mykiss observed primarily upstream of Basso Bridge (RM 47.5)

No salmonids observed below RM 42.3

Note: These are PRELIMINARY results.

Note: similar numbers of adult O. mykiss compared with last year, but very different distribution. Very different Chinook and juvenile O. mykiss observations compared to last year (but not necessarily all previous years). I did not have time to do much analysis.

DON PEDRO / TUOLUMNE RIVER WATERSHED

	9/9/2020 Wednesday	9/8/2020 Tuesday	9/7/2020 Monday	9/6/2020 Sunday	9/5/2020 Saturday	9/4/2020 Friday	9/3/2020 Thursday
Computed Natural Flow (cfs)	515	-99	192	-106	5	37	381
Don Pedro							
Elevation (Feet)	779.6	779.8	780.1	780.3	780.5	780.7	780.9
Storage (AF)	1,453,063	1,455,069	1,458,106	1,460,118	1,462,132	1,464,148	1,466,167
Gain/(-Loss) (AF)	-2,006	-3,037	-2,012	-2,014	-2,016	-2,019	-2,021
Avg. Inflow (cfs)	596	417	873	651	577	663	532
Avg. Flows at La Grange							
TID Canal (cfs)	1,108	1,364	1,216	989	1,031	1,046	1,007
MID Canal (cfs)	392	477	564	570	454	527	436
River (cfs)	108	108	108	108	108	108	107
Total (cfs)	1,607	1,948	1,888	1,666	1,593	1,681	1,551
Hetch Hetchy Reservoir							
Elevation (Feet)	3,771.8	3,772.4	3,772.9	3,773.4	3,774.0	3,774.4	3,775.0
Storage (AF)	295,152	296,256	297,176	298,100	299,210	299,950	301,060
Gain/(-Loss) (AF)	-1,104	-920	-924	-1,110	-740	-1,110	-744
Avg. Release (cfs)	491	502	500	495	491	493	464
Avg. Inflow (cfs)	-66	38	34	-65	118	-67	89
Cherry Valley Reservoir							
Elevation (Feet)	4,668.4	4,668.4	4,669.1	4,670.0	4,670.8	4,671.6	4,672.3
Storage (AF)	214,767	214,767	215,906	217,371	218,707	220,044	221,213
Gain/(-Loss) (AF)	0	-1,139	-1,465	-1,336	-1,337	-1,169	-501
Avg. Release (cfs)	140	711	727	685	574	573	260
Avg. Inflow (cfs)	140	137	-12	11	-100	-16	7
Lake Eleanor Reservoir							
Elevation (Feet)	4,655.7	4,655.8	4,655.8	4,655.8	4,655.9	4,656.0	4,656.0
Storage (AF)	22,146	22,239	22,239	22,239	22,332	22,425	22,425
Gain/(-Loss) (AF)	-93	0	0	-93	-93	0	-93
Avg. Release (cfs)	22	21	21	22	35	21	22
Avg. Inflow (cfs)	-25	21	21	-25	-12	21	-25
Avg. Div. to S.F. Pipeline (mgd)	249	249	249	249	249	249	249
Rain Fall (Inches)							
Hetch Hetchy	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cherry Valley	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moccasin	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sonora	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Yosemite	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Don Pedro	0.00	0.00	0.00	0.00	0.00	0.00	0.00

* Computed Natural Flow is a calculated value representing what the flow in the river at La Grange would be without human diversion, storage, or release. Due to the nature of the calculation, this value may be negative.
** Inflow is a calculated value representing the flow of water into a reservoir. Inflow to a reservoir is not necessarily equal to the Computed Natural Flow. Due to the nature of the calculation, this value may be negative.
Note: cfs is a rate of flow in cubic feet per second; a flow of 1 cfs over a 24-hour period (cfs/day) = 1.98 acre-feet (AF); mgd is a rate of flow in million gallons per day (megagallons per day); a flow rate of 1 mgd = 1.55 cfs; a flow of 1 mgd over a 24-hour period = 3.1 AF.

9/2/2020
Wednesday

-236 553 1,289 656 309 894 891

781
1,468,188
-1,017
-4
509
398
108
1,016

3,775
301,804
-1,116
495
-621

4,673
221,714
-1,337
619
-718

4,656
22,518
0
22
22
249

2

18

Surface Area (acres)							
Hetch Hetchy Reservoir	1,842	1,844	1,846	1,848	1,850	1,852	
	12	12	12	12	12	12	
Cherry Valley Reservoir	1,639	1,639	1,642	1,645	1,649	1,653	
	-5	-5	-5	-5	-5	-5	
Lake Eleanor Reservoir	919	920	920	920	921	921	
	-3	-3	-3	-3	-3	-3	
CCSF TOTAL EVAPORATION (cfs)	30	30	30	30	30	30	
Don Pedro Evaporation							
Surface Area (acres)	10,029	10,039	10,055	10,066	10,077	10,087	
Evaporation (cfs)	108	108	108	108	108	108	
Flow Below Dam (cfs)							
	1,607	1,948	1,888	1,666	1,593	1,681	1,551

Pat,

Not much has changed since my last update to you back in May. SRWA is continuing with the monthly water quality sampling through the infiltration gallery. The Design Build Contractor has begun their work on the overall SRWA project with construction completion planned for mid-2023.

Let me know if you have any questions. Thanks.

Bill Penney, P.E.

Turlock Irrigation District

SAN JOAQUIN VALLEY WATER YEAR HYDROLOGIC CLASSIFICATION

602020 INDEX

											San Joaquin Index	FERC Index
60-20-20	APRIL-JULY RUNOFF (AF)					OCTOBER-MARCH RUNOFF (AF)					602020 INDEX	(not the FERC Index)
YEAR	STANISLAUS	TUOLUMNE	MERCED	FRIANT	TOTAL	STANISLAUS	TUOLUMNE	MERCED	FRIANT	TOTAL	MINIMUM FLOW REQUIREMENT	RANKING
10	817,283	1,408,394	765,924	1,535,227	4,526,828	268,764	458,981	276,115	430,561	1,434,421	3,547,926	300,923 Above Normal INTERMEDIATE BN-AN
11	1,350,414	2,172,501	1,133,496	2,243,065	6,899,476	819,843	1,248,753	727,148	881,767	3,677,511	5,584,773	300,923 Wet MEDIAN WET/ MAXIMUM
12	394,507	609,424	300,876	558,917	1,863,724	216,256	254,324	117,856	244,726	833,162	2,184,867	127,636 Dry MEDIAN DRY
13	289,860	597,042	267,194	518,953	1,673,049	323,159	476,812	207,327	318,805	1,326,103	1,706,023	109,485 Critical MEDIAN CRITICAL WATER YEAR
14	232,171	423,354	180,810	375,485	1,211,820	123,348	166,401	57,498	113,744	460,991	1,160,495	94,000 Critical CRITICAL WATER YEAR AND BELOW
15	133,081	307,952	104,627	192,518	738,178	190,977	276,982	74,324	123,674	665,957	808,197	94,000 Critical CRITICAL WATER YEAR AND BELOW
16	568,262	1,020,077	494,607	892,555	2,975,501	498,761	783,833	351,782	391,110	2,025,486	2,352,037	139,384 Dry MEDIAN DRY
17	1,440,796	2,454,169	1,232,846	2,641,089	7,768,900	1,570,518	2,276,847	1,222,014	1,585,049	6,654,428	6,462,633	300,923 Wet MEDIAN WET/ MAXIMUM
18	588,162	1,011,627	459,456	947,685	3,006,930	378,596	620,658	273,637	368,411	1,641,302	3,032,418	283,109 Below Normal MEDIAN BELOW NORMAL
19	1,241,334	1,990,176	1,076,834	2,034,275	6,342,619	639,508	907,414	503,118	591,514	2,641,554	4,940,366	300,923 Wet MEDIAN WET/ MAXIMUM
20	437,802	686,861	358,258	670,195	2,153,116	216,128	269,451	124,028	192,804	802,411	2,352,352	139,406 Dry MEDIAN DRY

Dry San Joaquin Index =2,352,352

Average San Joaquin Index =2,352,352

BASE FLOW (Table a)													
C.F.S.													
	INDEX	31	28	31	30	31	30	31	31	30	31	30	31
	CUTOFF	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1 CRITICAL WATER YEAR AND BELOW	0	150	150	150	150	150	50	50	50	50	126	150	150
2 MEDIAN CRITICAL WATER YEAR	1,476	150	150	150	150	150	50	50	50	50	126	150	150
3 INTERMEDIATE C-D WATER YEAR	1,973	150	150	150	150	150	50	50	50	50	150	150	150
4 MEDIAN DRY	2,183	150	150	150	150	150	75	75	75	75	150	150	150
5 INTERMEDIATE D-BN	2,396	180	180	180	180	180	75	75	75	75	180	180	180
6 MEDIAN BELOW NORMAL	2,720	175	175	175	175	175	75	75	75	75	187	175	175
7 INTERMEDIATE BN-AN	3,080	300	300	300	300	300	250	250	250	250	300	300	300
8 MEDIAN ABOVE NORMAL	3,689	300	300	300	300	300	250	250	250	250	300	300	300
9 INTERMEDIATE AN-W	4,028	300	300	300	300	300	250	250	250	250	300	300	300
10 MEDIAN WET/ MAXIMUM	4,773	300	300	300	300	300	250	250	250	250	300	300	300

PULSE FLOWS (Table b)

A.F.

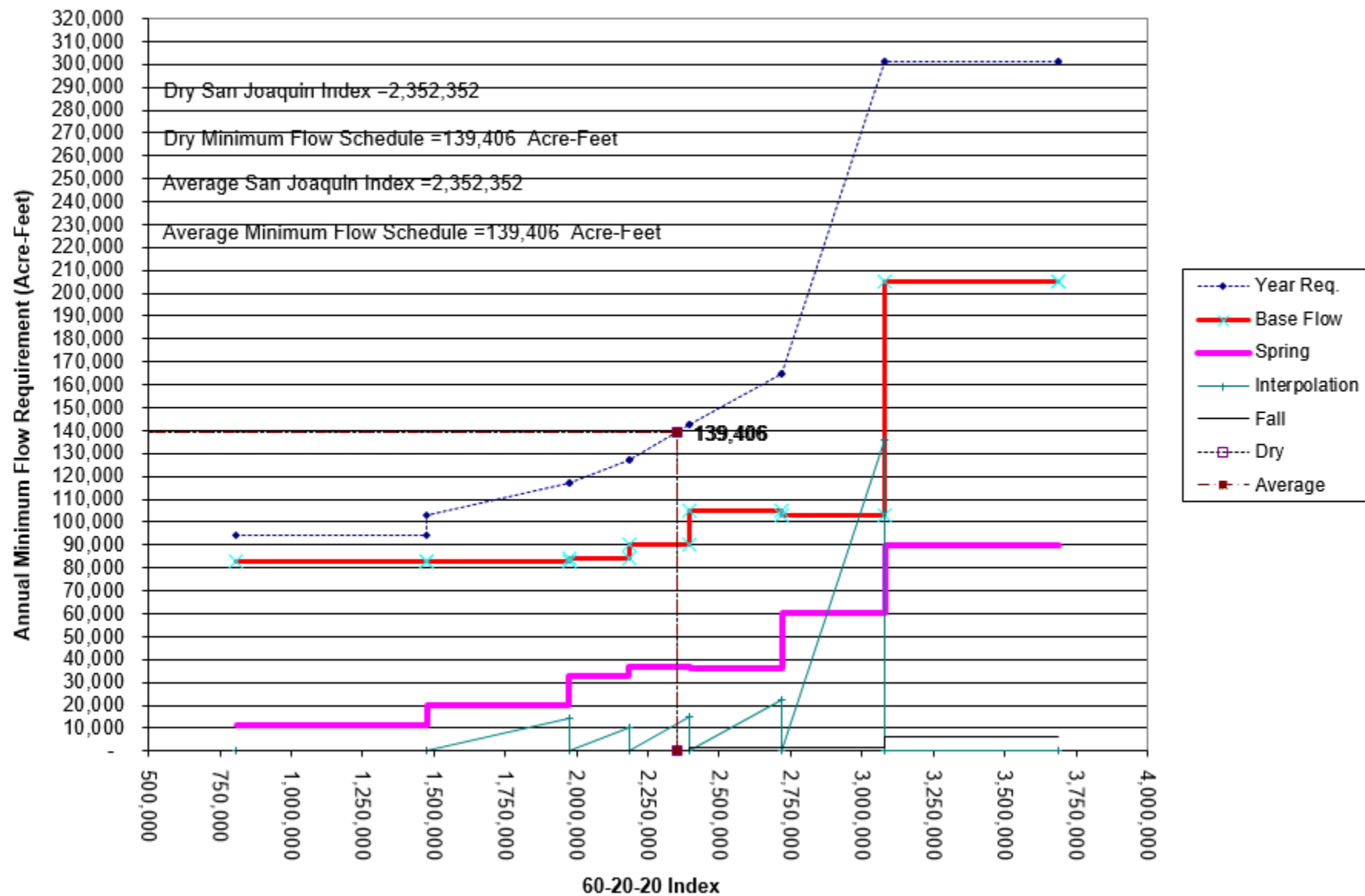
		31 JAN	28 FEB	31 MAR	30 APR	31 MAY	30 JUN	31 JUL	31 AUG	30 SEP	31 OCT	30 NOV	31 DEC
1 CRITICAL WATER YEAR AND BELOW	0				11,091								
2 MEDIAN CRITICAL WATER YEAR	1,476				20,091								
3 INTERMEDIATE C-D WATER YEAR	1,973				32,619								
4 MEDIAN DRY	2,183				37,060								
5 INTERMEDIATE D-BN	2,396				35,920						1,676		
6 MEDIAN BELOW NORMAL	2,720				60,027						1,736		
7 INTERMEDIATE BN-AN	3,080				89,882						5,950		
8 MEDIAN ABOVE NORMAL	3,689				89,882						5,950		
9 INTERMEDIATE AN-W	4,028				89,882						5,950		
10 MEDIAN WET / MAXIMUM	4,773				89,882						5,950		

TOTAL MINIMUM FLOW REQUIREMENT (Table c)

A.F.

		31 JAN	28 FEB	31 MAR	30 APR	31 MAY	30 JUN	31 JUL	31 AUG	30 SEP	31 OCT	30 NOV	31 DEC	TOTAL
1 CRITICAL WATER YEAR AND BELOW	0	9,223	8,331	9,223	20,017	9,223	2,975	3,074	3,074	2,975	7,736	8,926	9,223	94,000
2 MEDIAN CRITICAL WATER YEAR	1,476	9,223	8,331	9,223	29,017	9,223	2,975	3,074	3,074	2,975	7,736	8,926	9,223	103,000
3 INTERMEDIATE C-D WATER YEAR	1,973	9,223	8,331	9,223	41,545	9,223	2,975	3,074	3,074	2,975	9,223	8,926	9,223	117,016
4 MEDIAN DRY	2,183	9,223	8,331	9,223	45,986	9,223	4,463	4,612	4,612	4,463	9,223	8,926	9,223	127,506
5 INTERMEDIATE D-BN	2,396	11,068	9,997	11,068	46,631	11,068	4,463	4,612	4,612	4,463	12,744	10,711	11,068	142,502
6 MEDIAN BELOW NORMAL	2,720	10,760	9,719	10,760	70,440	10,760	4,463	4,612	4,612	4,463	13,240	10,413	10,760	165,003
7 INTERMEDIATE BN-AN	3,080	18,446	16,661	18,446	107,733	18,446	14,876	15,372	15,372	14,876	24,396	17,851	18,446	300,923
8 MEDIAN ABOVE NORMAL	3,689	18,446	16,661	18,446	107,733	18,446	14,876	15,372	15,372	14,876	24,396	17,851	18,446	300,923
9 INTERMEDIATE AN-W	4,028	18,446	16,661	18,446	107,733	18,446	14,876	15,372	15,372	14,876	24,396	17,851	18,446	300,923
10 MEDIAN WET/ MAXIMUM	10,000	18,446	16,661	18,446	107,733	18,446	14,876	15,372	15,372	14,876	24,396	17,851	18,446	300,923

TUOLUMNE RIVER MINIMUM FLOW REQUIREMENT (Figure 4)
Interpolation Volume



139,406 Annual Req.
(90,446) Base Flow
(37,060) Sprint Pulse Flow

11,900 Interpolation Amounts

Case	60-20-20 Index		Base Total		Pulse Total		Interpolation Total		Adjustment Total		FERC Total
90%	2,352,352	60-20-20 Index	90,446		37,060		11,900				139,406
		Scheduled Above	90,446		32,619		11,900		4,440		139,406
		Difference	(0)		4,441		(0)		(4,440)		0

Proposed Tuolumne River Flow Schedule
Based on DWR Values, 60-20-20 Index for 2020, Hydrologic Conditions
Schedule For 2020-2021 Fish Flow Year

DATE		Number of DAYS	BASE FLOW ¹			PULSE FLOW ²			INTERPOLATION FLOW			Other Adjusted Flow			TOTAL FERC FLOW	
			CFS	AF	ACCUM. A.F.	CFS	AF	ACCUM. A.F.	CFS	AF	ACCUM. A.F.	CFS	AF	ACCUM. A.F.	CFS	ACCUM. A.F.
07-Oct-2020	07-Oct-2020	1	150	298	34,215	0	0	32,619	0	0	0	0	0	0	150	66,834
08-Oct-2020	08-Oct-2020	1	150	298	34,512	0	0	32,619	0	0	0	0	0	0	150	67,132
09-Oct-2020	09-Oct-2020	1	150	298	34,810	0	0	32,619	0	0	0	0	0	0	150	67,429
10-Oct-2020	10-Oct-2020	1	150	298	35,107	0	0	32,619	200	397	397	0	0	0	350	68,123
11-Oct-2020	11-Oct-2020	1	150	298	35,405	0	0	32,619	400	793	1190	0	0	0	550	69,214
12-Oct-2020	12-Oct-2020	1	150	298	35,702	0	0	32,619	600	1,190	2380	0	0	0	750	70,702
13-Oct-2020	13-Oct-2020	1	150	298	36,000	0	0	32,619	800	1,587	3967	0	0	0	950	72,586
14-Oct-2020	14-Oct-2020	1	150	298	36,298	0	0	32,619	800	1,587	5554	0	0	0	950	74,470
15-Oct-2020	15-Oct-2020	1	150	298	36,595	0	0	32,619	800	1,587	7140	0	0	0	950	76,355
16-Oct-2020	16-Oct-2020	1	150	298	36,893	0	0	32,619	600	1,190	8331	0	0	0	750	77,842
17-Oct-2020	17-Oct-2020	1	150	298	37,190	0	0	32,619	400	793	9124	0	0	0	550	78,933
18-Oct-2020	18-Oct-2020	1	150	298	37,488	0	0	32,619	200	397	9521	0	0	0	350	79,627
19-Oct-2020	19-Oct-2020	1	150	298	37,785	0	0	32,619	200	397	9917	0	0	0	350	80,322
20-Oct-2020	20-Oct-2020	1	150	298	38,083	0	0	32,619	200	397	10314	0	0	0	350	81,016
21-Oct-2020	21-Oct-2020	1	150	298	38,380	0	0	32,619	600	1,190	11504	0	0	0	750	82,503
22-Oct-2020	22-Oct-2020	1	150	298	38,678	0	0	32,619	200	396	11900	600	1,191	1191	950	84,388
23-Oct-2020	23-Oct-2020	1	150	298	38,975	0	0	32,619	0	0	11900	600	1,190	2381	750	85,875
24-Oct-2020	24-Oct-2020	1	150	298	39,273	0	0	32,619	0	0	11900	600	1,190	3571	750	87,363
25-Oct-2020	25-Oct-2020	1	150	298	39,570	0	0	32,619	0	0	11900	300	595	4166	450	88,256
26-Oct-2020	26-Oct-2020	1	150	298	39,868	0	0	32,619	0	0	11900	138	275	4440	288	88,828
27-Oct-2020	27-Oct-2020	1	150	298	40,165	0	0	32,619	0	0	11900	0	0	4440	150	89,125
28-Oct-2020	28-Oct-2020	1	150	298	40,463	0	0	32,619	0	0	11900	0	0	4440	150	89,423
29-Oct-2020	29-Oct-2020	1	150	298	40,760	0	0	32,619	0	0	11900	0	0	4440	150	89,720
30-Oct-2020	30-Oct-2020	1	150	298	41,058	0	0	32,619	0	0	11900	0	0	4440	150	90,018
31-Oct-2020	31-Oct-2020	1	150	298	41,355	0	0	32,619	0	0	11900	0	0	4440	150	90,315
01-Nov-2020	01-Nov-2020	1	150	298	41,653	0	0	32,619	0	0	11900	0	0	4440	150	90,613
02-Nov-2020	02-Nov-2020	1	150	298	41,950	0	0	32,619	0	0	11900	0	0	4440	150	90,910
03-Nov-2020	03-Nov-2020	1	150	298	42,248	0	0	32,619	0	0	11900	0	0	4440	150	91,208
04-Nov-2020	04-Nov-2020	1	150	298	42,545	0	0	32,619	0	0	11900	0	0	4440	150	91,505
05-Nov-2020	05-Nov-2020	1	150	298	42,843	0	0	32,619	0	0	11900	0	0	4440	150	91,803
06-Nov-2020	06-Nov-2020	1	150	298	43,140	0	0	32,619	0	0	11900	0	0	4440	150	92,100
07-Nov-2020	07-Nov-2020	1	150	298	43,438	0	0	32,619	0	0	11900	0	0	4440	150	92,398