Appendix K

Tables and Figures Supporting the Impact Assessment of the South Delta Improvements Program on Fish, Alternatives 1, 2A–2C, 3B, 4B

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Tables and Figures Supporting the Impact Assessment of the South Delta Improvements Program on Fish, Alternatives 1, 2A–2C, 3B, 4B

Contents

Appendix K

Tables and Figures Supporting the Impact Assessment of the SDIP on Fish, Alternatives 1, 2A–2C, 3B, 4B

Alternative 1 (No Action Alternative)

Table K.1-1. Frequency of Spawning Habitat Availability for Steelhead and Chinook Salmon in the Sacramento, Feather, and American Rivers for Alternative 1, 1922–1994 Simulation (2001 Operations)

Proportion of Spawning Habitat Available (%)	Fall-Run Chinook Salmon	Late Fall–Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
Feather River					
<+100%	219	219	292	219	365
<+90%	0	0	0	0	0
<+80%	0	0	0	0	0
<+70%	0	0	0	0	0
<+60%	0	0	0	0	0
<+50%	0	0	0	0	0
<+40%	0	0	0	0	0
<+30%	0	0	0	0	0
<+20%	0	0	0	0	0
<+10%	0	0	0	0	0
0%	0	0	0	0	0

Proportion of Spawning Habitat Available (%)	Fall-Run Chinook Salmon	Late Fall–Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
Sacramento River at Keswick					
<+100%	212	212	290	213	356
<+90%	7	7	2	6	9
<+80%	0	0	0	0	0
<+70%	0	0	0	0	0
<+60%	0	0	0	0	0
<+50%	0	0	0	0	0
<+40%	0	0	0	0	0
<+30%	0	0	0	0	0
<+20%	0	0	0	0	0
<+10%	0	0	0	0	0
0%	0	0	0	0	0
American River at Nimbus					
<+100%	163	169	229	157	292
<+90%	14	21	44	19	32
<+80%	8	4	0	4	8
<+70%	22	20	13	30	23
<+60%	3	2	1	0	4
<+50%	9	0	1	8	3
<+40%	0	0	0	0	0
<+30%	0	3	4	1	3
<+20%	0	0	0	0	0
<+10%	0	0	0	0	0
0%	0	0	0	0	0

Table K.1-2. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Keswick for Alternative 1, 1922–1993 Simulation (2001 Operations)

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.0	410	410	432	216	554	554	864	648	576	411	720	504	491	322	864	576	485	498	864	432
0.9	9	9	0	0	9	9	0	0	0	1	0	0	2	8	0	0	8	5	0	0
0.8	2	3	0	0	2	3	0	0	0	3	0	0	0	5	0	0	3	0	0	0
0.7	3	0	0	0	3	0	0	0	0	1	0	0	3	0	0	0	2	1	0	0
0.6	5	1	0	0	5	1	0	0	0	3	0	0	5	3	0	0	5	0	0	0
0.5	3	1	0	0	3	1	0	0	0	0	0	0	3	1	0	0	1	0	0	0
0.4	0	2	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0
0.3	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.1	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
0.0	0	4	0	0	0	4	0	0	0	13	0	0	0	17	0	0	0	0	0	0

Table K.1-3. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Bend Bridge for Alternative 1, 1922–1993 Simulation (2001 Operations)

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.0	401	409	432	216	545	535	859	648	576	304	715	504	482	277	859	576	480	380	858	432
0.9	15	10	0	0	15	26	5	0	0	86	5	0	7	42	5	0	11	93	6	0
0.8	3	1	0	0	3	1	0	0	0	14	0	0	2	9	0	0	5	18	0	0
0.7	2	3	0	0	2	5	0	0	0	6	0	0	2	5	0	0	1	8	0	0
0.6	5	0	0	0	5	0	0	0	0	0	0	0	5	0	0	0	4	2	0	0

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
0.5	0	2	0	0	0	2	0	0	0	0	0	0	0	2	0	0	1	0	0	0
0.4	3	1	0	0	3	1	0	0	0	1	0	0	3	1	0	0	2	1	0	0
0.3	2	1	0	0	2	1	0	0	0	0	0	0	2	1	0	0	0	1	0	0
0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
0.1	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
0.0	0	5	0	0	0	5	0	0	0	21	0	0	0	23	0	0	0	0	0	0

Table K.1-4. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Red Bluff for Alternative 1, 1922–1993 Simulation (2001 Operations)

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.0	397	406	432	216	541	497	858	648	573	153	714	504	475	225	858	576	473	331	858	432
0.9	14	13	0	0	14	59	5	0	3	169	5	0	9	66	5	0	16	70	6	0
0.8	7	1	0	0	7	6	1	0	0	49	1	0	6	20	1	0	6	40	0	0
0.7	2	1	0	0	2	1	0	0	0	20	0	0	2	12	0	0	2	33	0	0
0.6	4	2	0	0	4	2	0	0	0	12	0	0	4	8	0	0	3	8	0	0
0.5	2	2	0	0	2	4	0	0	0	4	0	0	2	3	0	0	2	9	0	0
0.4	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	3	0	0
0.3	2	2	0	0	2	2	0	0	0	3	0	0	2	3	0	0	2	4	0	0
0.2	2	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0
0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
0.0	1	5	0	0	1	5	0	0	0	22	0	0	1	23	0	0	0	4	0	0

Table K.1-5. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Feather River at Thermalito for Alternative 1, 1922–1994 Simulation (2001 Operations)

	Fall-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.0	176	345	418	175	143	140	742	573	371	271	736	391
0.9	45	16	10	32	48	9	59	2	56	26	77	32
0.8	19	11	3	5	45	8	29	0	19	14	26	5
0.7	24	7	1	2	49	7	9	1	18	11	12	2
0.6	27	13	0	2	47	12	10	0	28	6	5	2
0.5	26	7	0	0	40	7	3	0	8	9	5	0
0.4	16	5	0	0	22	6	3	0	2	3	2	0
0.3	18	9	0	0	22	9	2	0	0	2	0	0
0.2	14	3	0	0	15	4	4	0	1	6	0	0
0.1	11	0	0	0	13	0	1	0	0	4	0	0
0.0	56	16	0	0	60	158	2	0	1	152	1	0

Table K.1-6. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the American River at Sunrise for Alternative 1, 1922–1993 Simulation (2001 Operations)

	Fall-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.0	189	307	420	184	377	276	793	400
0.9	15	50	12	23	40	31	64	23
0.8	7	26	0	9	5	9	5	9
0.7	52	11	0	0	35	8	0	0
0.6	70	11	0	0	28	5	0	0
0.5	39	3	0	0	6	9	1	0
0.4	21	3	0	0	7	3	1	0
0.3	17	3	0	0	0	4	0	0

Base Index	Fall-Run Chinook Salmon				Steelhead			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
0.2	11	3	0	0	3	4	0	0
0.1	1	0	0	0	1	4	0	0
0.0	10	15	0	0	2	151	0	0

Table K.1-7. Frequency of Water Temperature Survival Indices for Coho Salmon (i.e., Based on criteria for Chinook Salmon) in the Trinity River at Lewiston for Alternative 1, 1922–1994 Simulation (2001 Operations)

Base Index	Coho Salmon			
	Adult Migration	Spawning /Incubation	Juvenile Rearing	Smolt Migration
1.0	277	288	862	288
0.9	6	0	2	0
0.8	3	0	0	0
0.7	0	0	0	0
0.6	0	0	0	0
0.5	0	0	0	0
0.4	1	0	0	0
0.3	0	0	0	0
0.2	0	0	0	0
0.1	1	0	0	0
0.0	0	0	0	0

Alternative 1 2020 Conditions

Table K.1-8. Frequency of Spawning Habitat Availability for Steelhead and Chinook Salmon in the Sacramento, Feather, and American Rivers for Alternative 1, 1922–1994 Simulation (2020 Operations)

Proportion of Spawning Habitat Available (%)	Fall-Run Chinook Salmon	Late Fall–Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
Feather River					
<+100%	219			219	365
<+90%	0			0	0
<+80%	0			0	0
<+70%	0			0	0
<+60%	0			0	0
<+50%	0			0	0
<+40%	0			0	0
<+30%	0			0	0
<+20%	0			0	0
<+10%	0			0	0
0%	0			0	0
Sacramento River at Keswick					
<+100%	208	209	292	214	352
<+90%	11	10	0	5	13
<+80%	0	0	0	0	0
<+70%	0	0	0	0	0
<+60%	0	0	0	0	0
<+50%	0	0	0	0	0
<+40%	0	0	0	0	0
<+30%	0	0	0	0	0
<+20%	0	0	0	0	0
<+10%	0	0	0	0	0

Proportion of Spawning Habitat Available (%)	Fall-Run Chinook Salmon	Late Fall–Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
0%	0	0	0	0	0
American River at Nimbus					
<+100%	143				273
<+90%	17				26
<+80%	11				11
<+70%	27				30
<+60%	8				10
<+50%	12				11
<+40%	1				1
<+30%	0				3
<+20%	0				0
<+10%	0				0
0%	0				0

Table K.1-9. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Keswick for Alternative 1, 1922–1993 Simulation (2020 Operations)

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.0	407	408	432	216	551	552	864	648	576	410	720	504	490	318	864	576	479	499	864	432
0.9	11	6	0	0	11	6	0	0	0	1	0	0	2	6	0	0	14	4	0	0
0.8	4	4	0	0	4	4	0	0	0	4	0	0	2	6	0	0	4	0	0	0
0.7	2	1	0	0	2	1	0	0	0	2	0	0	2	2	0	0	0	1	0	0
0.6	7	2	0	0	7	2	0	0	0	1	0	0	7	3	0	0	6	0	0	0
0.5	1	2	0	0	1	2	0	0	0	0	0	0	1	2	0	0	1	0	0	0
0.4	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
0.3	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
0.2	0	1	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0	0
0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.0	0	6	0	0	0	6	0	0	0	13	0	0	0	19	0	0	0	0	0	0

Table K.1-10. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Bend Bridge for Alternative 1, 1922–1993 Simulation (2020 Operations)

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.0	398	403	432	216	542	526	860	648	576	291	716	504	481	264	860	576	473	381	860	432
0.9	17	13	0	0	17	32	4	0	0	98	4	0	7	49	4	0	18	87	4	0
0.8	4	1	0	0	4	1	0	0	0	12	0	0	3	9	0	0	5	19	0	0
0.7	1	1	0	0	1	2	0	0	0	5	0	0	1	4	0	0	1	12	0	0
0.6	4	3	0	0	4	4	0	0	0	3	0	0	4	4	0	0	3	1	0	0
0.5	4	2	0	0	4	2	0	0	0	1	0	0	4	3	0	0	2	1	0	0
0.4	1	2	0	0	1	2	0	0	0	0	0	0	1	2	0	0	1	0	0	0
0.3	3	1	0	0	3	1	0	0	0	0	0	0	3	1	0	0	1	2	0	0
0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0
0.0	0	6	0	0	0	6	0	0	0	21	0	0	0	23	0	0	0	0	0	0

Table K.1-11. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Red Bluff for Alternative 1, 1922–1993 Simulation (2020 Operations)

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.0	388	397	432	216	532	486	859	648	573	146	715	504	469	211	859	576	468	328	859	432
0.9	23	18	0	0	23	67	5	0	3	170	5	0	15	73	5	0	21	74	5	0
0.8	7	2	0	0	7	6	0	0	0	52	0	0	6	23	0	0	7	34	0	0
0.7	1	1	0	0	1	1	0	0	0	19	0	0	1	8	0	0	0	30	0	0
0.6	5	2	0	0	5	2	0	0	0	10	0	0	5	8	0	0	3	15	0	0
0.5	1	3	0	0	1	4	0	0	0	8	0	0	1	8	0	0	3	5	0	0
0.4	3	1	0	0	3	2	0	0	0	2	0	0	3	2	0	0	1	8	0	0
0.3	2	1	0	0	2	1	0	0	0	3	0	0	2	2	0	0	0	3	0	0
0.2	2	1	0	0	2	1	0	0	0	0	0	0	2	1	0	0	1	2	0	0
0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.0	0	6	0	0	0	6	0	0	0	22	0	0	0	24	0	0	0	5	0	0

Table K.1-12. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Feather River at Thermalito for Alternative 1, 1922–1994 Simulation (2020 Operations)

	Fall-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.0	173	345	419	175	144	141	752	572	370	271	748	391
0.9	47	17	8	33	47	9	54	3	55	26	75	33
0.8	17	8	4	3	42	5	28	0	22	14	20	3
0.7	26	6	1	3	50	6	9	1	16	10	9	3
0.6	32	13	0	2	54	12	6	0	25	6	8	2
0.5	31	8	0	0	47	8	3	0	12	10	1	0
0.4	23	4	0	0	27	5	7	0	1	2	1	0

Base Index	Fall-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
0.3	14	10	0	0	16	10	1	0	1	2	1	0
0.2	8	4	0	0	11	4	1	0	1	5	1	0
0.1	11	1	0	0	11	1	0	0	0	4	0	0
0.0	50	16	0	0	55	159	3	0	1	154	0	0

Table K.1-13. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the American River at Sunrise for Alternative 1, 1922–1993 Simulation (2020 Operations)

Base Index	Fall-Run Chinook Salmon				Steelhead			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.0	169	303	406	174	360	278	732	390
0.9	34	34	22	26	54	28	119	26
0.8	3	27	4	11	8	8	9	11
0.7	28	14	0	5	6	8	0	5
0.6	52	7	0	0	40	7	2	0
0.5	35	9	0	0	14	5	1	0
0.4	30	5	0	0	10	4	0	0
0.3	33	4	0	0	7	4	1	0
0.2	17	7	0	0	1	4	0	0
0.1	13	0	0	0	2	4	0	0
0.0	18	22	0	0	2	154	0	0

Table K.1-14. Frequency of Water Temperature Survival Indices for Coho Salmon (i.e., Based on Criteria for Chinook Salmon) in the Trinity River at Lewiston for Alternative 1, 1922–1994 Simulation (2020 Operations)

	Coho Salmon			
Base Index	Adult Migration	Spawning /Incubation	Juvenile Rearing	Smolt Migration
1.0	278	288	864	288
0.9	6	0	0	0
0.8	1	0	0	0
0.7	3	0	0	0
0.6	0	0	0	0
0.5	0	0	0	0
0.4	0	0	0	0
0.3	0	0	0	0
0.2	0	0	0	0
0.1	0	0	0	0
0.0	0	0	0	0

Alternative 2A

Table K.2A-1. Frequency of Change (Relative to Alternative 1) in Spawning Habitat Availability for Steelhead and Chinook Salmon in the Feather, Sacramento, and American Rivers for Alternative 2A, 1922–1994 Simulation (2001 Operations)

Change in Percentage Area	Sacramento River					Feather River			American River	
	Fall-Run Chinook Salmon	Late Fall–Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead	Fall-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead	Fall-Run Chinook Salmon	Steelhead
<+100%	0	0	0	0	0	0	0	0	0	0
<+90%	0	0	0	0	0	0	0	0	0	0
<+80%	0	0	0	0	0	0	0	0	0	0
<+70%	0	0	0	0	0	0	0	0	0	0
<+60%	0	0	0	0	0	0	0	0	0	0
<+50%	0	0	0	0	0	0	0	0	0	0
<+40%	0	0	0	0	0	0	0	0	2	1
<+30%	0	0	0	0	0	0	0	0	2	0
<+20%	0	0	0	0	0	0	0	0	4	3
<+10%	0	0	0	0	0	0	0	0	6	5
0%	219	219	292	219	365	219	219	365	183	342
>-10%	0	0	0	0	0	0	0	0	17	10
>-20%	0	0	0	0	0	0	0	0	1	3
>-30%	0	0	0	0	0	0	0	0	1	1
>-40%	0	0	0	0	0	0	0	0	3	0
>-50%	0	0	0	0	0	0	0	0	0	0
>-60%	0	0	0	0	0	0	0	0	0	0
>-70%	0	0	0	0	0	0	0	0	0	0
>-80%	0	0	0	0	0	0	0	0	0	0
>-90%	0	0	0	0	0	0	0	0	0	0
>=-100%	0	0	0	0	0	0	0	0	0	0

Table K.2A-2. Frequency of Occurrence of the Percentage Change in Flow from Alternative 1 That Could Affect Rearing Habitat Area for Steelhead and Chinook Salmon in the Sacramento, Feather, and American Rivers for Alternative 2A, 1922–1994 Simulation (2001 Operations)

	Sacramento River					Feather River			American River	
Percentage Change in Flow	Fall-Run Chinook Salmon	Late Fall–Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead	Fall-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead	Fall-Run Chinook Salmon	Steelhead
<+100%	0	0	0	0	0	0	0	0	0	2
<+90%	0	0	0	0	0	0	0	1	0	0
<+80%	0	0	0	0	0	0	1	3	0	0
<+70%	0	0	0	0	0	0	0	0	1	3
<+60%	0	0	0	0	0	0	0	2	0	1
<+50%	1	1	2	1	2	0	0	2	0	2
<+40%	0	1	1	1	1	1	1	4	3	5
<+30%	2	0	3	3	3	0	0	2	2	4
<+20%	3	3	6	5	6	1	2	2	2	11
<+10%	0	0	0	0	0	0	0	0	0	0
0%	429	572	702	486	848	430	499	830	417	802
>-10%	0	0	0	0	0	0	0	0	0	0
>-20%	2	2	8	7	8	0	2	7	7	22
>-30%	0	5	6	6	6	3	3	5	1	8
>-40%	1	0	2	2	2	0	0	1	1	6
>-50%	0	0	0	0	0	0	0	1	1	1
>-60%	0	0	0	0	0	2	2	4	1	3
>-70%	0	0	0	0	0	0	0	0	0	4
>-80%	0	0	0	0	0	0	0	0	0	0
>-90%	0	0	0	0	0	0	0	1	0	0
>=-100%	0	0	0	0	0	0	0	0	0	0

Table K.2A-3. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Keswick for Alternative 2A, 1922–1993 Simulation (2001 Operations)

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.1	5	6	0	0	5	6	0	0	0	3	0	0	4	7	0	0	6	3	0	0
0.0	418	409	432	216	562	553	862	648	576	417	718	504	497	328	862	576	482	500	863	432
>-0.1	9	15	0	0	9	15	2	0	0	10	2	0	3	21	2	0	16	1	1	0
>-0.2	0	1	0	0	0	1	0	0	0	2	0	0	0	3	0	0	0	0	0	0
>-0.3	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2A-4. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Bend Bridge for Alternative 2A, 1922–1993 Simulation (2001 Operations)

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.1	10	6	0	0	10	8	1	0	1	40	1	0	9	27	1	0	1	8	1	0

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
0.0	402	415	432	216	546	555	861	648	572	369	717	504	485	307	861	576	487	487	860	432
>-0.1	19	10	0	0	19	12	2	0	3	22	2	0	9	24	2	0	16	9	3	0
>-0.2	1	0	0	0	1	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0
>-0.3	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2A-5. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Red Bluff for Alternative 2A, 1922–1993 Simulation (2001 Operations)

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.2	0	0	0	0	0	0	0	0	0	5	0	0	0	3	0	0	0	3	0	0
<+0.1	8	6	0	0	8	7	1	0	2	72	1	0	7	35	1	0	1	12	1	0
0.0	405	413	432	216	549	549	859	647	571	311	715	503	487	280	859	575	492	473	859	432
>-0.1	18	12	0	0	18	19	4	1	3	41	4	1	9	38	4	1	11	15	4	0
>-0.2	1	0	0	0	1	0	0	0	0	2	0	0	1	2	0	0	0	1	0	0
>-0.3	0	1	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2A-6. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Feather River below Thermalito for Alternative 2A, 1922–1993 Simulation (2001 Operations)

Change in the Index	Fall-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	1	0	0	0	1	0	1	0	0	0	0	0
<+0.3	4	0	0	0	4	0	0	0	0	0	2	0
<+0.2	7	2	1	1	9	2	5	0	3	0	2	1
<+0.1	51	10	3	6	57	10	41	1	12	6	36	6
0.0	306	405	427	201	359	334	781	574	458	493	795	417
>-0.1	54	10	1	8	64	9	28	1	28	5	24	8
>-0.2	7	1	0	0	8	1	3	0	3	0	4	0
>-0.3	0	2	0	0	0	2	2	0	0	0	1	0
>-0.4	1	1	0	0	1	1	2	0	0	0	0	0

Table K.2A-7. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the American River at Sunrise for Alternative 2A, 1922–1993 Simulation (2001 Operations)

Change in the Index	Fall-Run Chinook Salmon				Steelhead			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0	0	0	0	0
<+0.3	2	2	0	0	0	1	0	0
<+0.2	10	2	0	1	0	0	0	1
<+0.1	64	21	2	6	22	5	21	6
0.0	297	368	428	203	443	490	829	419
>-0.1	48	34	1	5	33	6	14	5
>-0.2	7	4	1	1	4	1	0	1
>-0.3	4	0	0	0	2	0	0	0
>-0.4	0	0	0	0	0	1	0	0

Table K.2A-8. Frequency of Water Temperature Survival Indices for Coho Salmon Life Stages in the Trinity River at Lewiston for Alternative 2A, 1922–1993 Simulation (2001 Operations)

	Coho Salmon			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0
<+0.3	0	0	0	0
<+0.2	0	0	0	0
<+0.1	4	0	1	0
0.0	280	288	860	288
>-0.1	3	0	3	0
>-0.2	1	0	0	0
>-0.3	0	0	0	0
>-0.4	0	0	0	0

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Table K.2A-9. Frequency of Change (Relative to Alternative 1) in Spawning Habitat Availability for Steelhead and Chinook Salmon in the Feather, Sacramento, and American Rivers for Alternative 2A, 1922–1994 Simulation (2020 Operations)

Change in Percentage Area	Sacramento River					Feather River			American River	
	Fall-Run Chinook Salmon	Late Fall–Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead	Fall-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead	Fall-Run Chinook Salmon	Steelhead
<+100%	0	0	0	0	0	0	0	0	0	0
<+90%	0	0	0	0	0	0	0	0	0	0
<+80%	0	0	0	0	0	0	0	0	0	0
<+70%	0	0	0	0	0	0	0	0	0	0
<+60%	0	0	0	0	0	0	0	0	0	0
<+50%	0	0	0	0	0	0	0	0	0	0
<+40%	0	0	0	0	0	0	0	0	0	0
<+30%	0	0	0	0	0	0	0	0	1	2
<+20%	0	0	0	0	0	0	0	0	5	1
<+10%	0	0	0	0	0	0	0	0	12	12
0%	218	219	292	219	365	219	219	365	178	342
>-10%	1	0	0	0	0	0	0	0	17	6
>-20%	0	0	0	0	0	0	0	0	0	0
>-30%	0	0	0	0	0	0	0	0	6	2
>-40%	0	0	0	0	0	0	0	0	0	0
>-50%	0	0	0	0	0	0	0	0	0	0
>-60%	0	0	0	0	0	0	0	0	0	0
>-70%	0	0	0	0	0	0	0	0	0	0
>-80%	0	0	0	0	0	0	0	0	0	0
>-90%	0	0	0	0	0	0	0	0	0	0
>=-100%	0	0	0	0	0	0	0	0	0	0

Table K.2A-10. Frequency of Occurrence of the Percentage Change in Flow from Alternative 1 That Could Affect Rearing Habitat Area for Steelhead and Chinook Salmon in the Sacramento, Feather, and American Rivers for Alternative 2A, 1922–1994 Simulation (2020 Operations)

	Sacramento River					Feather River			American River	
Percentage Change in Flow	Fall-Run Chinook Salmon	Late Fall–Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead	Fall-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead	Fall-Run Chinook Salmon	Steelhead
<+100%	0	0	0	0	0	0	0	1	0	0
<+90%	0	0	0	0	0	0	0	2	0	0
<+80%	0	0	0	0	0	0	0	3	0	0
<+70%	0	0	0	0	0	0	0	0	0	0
<+60%	0	0	0	0	0	0	1	1	0	1
<+50%	0	0	1	1	1	0	0	0	0	2
<+40%	0	0	0	0	0	1	1	4	1	1
<+30%	1	1	2	2	2	1	2	5	1	3
<+20%	2	2	4	3	4	0	0	2	9	17
<+10%	0	0	0	0	0	0	0	0	0	0
0%	432	575	709	491	855	433	500	843	424	827
>-10%	0	0	0	0	0	0	0	0	0	0
>-20%	0	6	10	10	10	2	2	3	0	5
>-30%	2	0	2	2	2	0	0	0	2	10
>-40%	0	0	1	1	1	0	1	2	0	5
>-50%	1	0	1	1	1	0	1	2	0	1
>-60%	0	0	0	0	0	0	1	1	0	1
>-70%	0	0	0	0	0	0	0	0	0	2
>-80%	0	0	0	0	0	0	0	0	0	0
>-90%	0	0	0	0	0	0	0	0	0	0
>=-100%	0	0	0	0	0	0	0	0	0	0

Table K.2A-11. Frequency of Change in Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Keswick for Alternative 2A, 1922–1993 Simulation (2020 Operations)

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.0	407	408	432	216	551	552	864	648	576	410	720	504	490	318	864	576	479	499	864	432
0.9	11	6	0	0	11	6	0	0	0	1	0	0	2	6	0	0	14	4	0	0
0.8	4	4	0	0	4	4	0	0	0	4	0	0	2	6	0	0	4	0	0	0
0.7	2	1	0	0	2	1	0	0	0	2	0	0	2	2	0	0	0	1	0	0
0.6	7	2	0	0	7	2	0	0	0	1	0	0	7	3	0	0	6	0	0	0
0.5	1	2	0	0	1	2	0	0	0	0	0	0	1	2	0	0	1	0	0	0
0.4	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
0.3	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
0.2	0	1	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0	0
0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.0	0	6	0	0	0	6	0	0	0	13	0	0	0	19	0	0	0	0	0	0

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
<+0.3	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
<+0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.1	5	9	0	0	5	9	0	0	1	5	0	0	5	11	0	0	8	2	0	0
0.0	416	403	432	216	560	547	864	648	574	422	720	504	493	326	864	576	486	501	864	432
>-0.1	10	17	0	0	10	17	0	0	1	3	0	0	5	18	0	0	10	0	0	0
>-0.2	0	1	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	1	0	0
>-0.3	1	1	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2A-12. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Bend Bridge for Alternative 2A, 1922–1993 Simulation (2020 Operations)

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.0	398	403	432	216	542	526	860	648	576	291	716	504	481	264	860	576	473	381	860	432
0.9	17	13	0	0	17	32	4	0	0	98	4	0	7	49	4	0	18	87	4	0
0.8	4	1	0	0	4	1	0	0	0	12	0	0	3	9	0	0	5	19	0	0
0.7	1	1	0	0	1	2	0	0	0	5	0	0	1	4	0	0	1	12	0	0
0.6	4	3	0	0	4	4	0	0	0	3	0	0	4	4	0	0	3	1	0	0
0.5	4	2	0	0	4	2	0	0	0	1	0	0	4	3	0	0	2	1	0	0
0.4	1	2	0	0	1	2	0	0	0	0	0	0	1	2	0	0	1	0	0	0
0.3	3	1	0	0	3	1	0	0	0	0	0	0	3	1	0	0	1	2	0	0
0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0
0.0	0	6	0	0	0	6	0	0	0	21	0	0	0	23	0	0	0	0	0	0

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.3	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
<+0.2	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
<+0.1	12	9	0	0	12	10	1	0	1	36	1	0	10	26	1	0	9	8	1	0
0.0	407	406	432	216	551	548	861	648	572	364	717	504	484	291	861	576	481	492	862	432
>-0.1	12	15	0	0	12	16	2	0	3	29	2	0	9	39	2	0	14	3	1	0
>-0.2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
>-0.3	1	1	0	0	1	1	0	0	0	1	0	0	1	2	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2A-13. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Red Bluff for Alternative 2A, 1922–1993 Simulation (2020 Operations)

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.3	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
<+0.2	0	0	0	0	0	0	0	0	0	7	0	0	0	3	0	0	0	1	0	0
<+0.1	11	7	0	0	11	9	2	0	2	59	2	0	11	35	2	0	7	6	1	0
0.0	407	406	432	216	551	547	861	648	572	325	717	504	481	272	861	576	489	488	861	432
>-0.1	13	17	0	0	13	18	1	0	2	37	1	0	11	45	1	0	8	9	2	0
>-0.2	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0
>-0.3	1	1	0	0	1	1	0	0	0	2	0	0	1	2	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2A-14. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Feather River below Thermalito for Alternative 2A, 1922–1993 Simulation (2020 Operations)

	Fall-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	1	0	0	0	1	0	1	0	0	0	0	0
<+0.3	3	0	0	0	4	0	0	0	0	0	2	0
<+0.2	9	3	1	1	10	3	7	0	1	0	1	1
<+0.1	50	12	2	3	56	10	27	0	13	8	33	3
0.0	304	404	427	210	368	335	790	576	465	491	793	426
>-0.1	48	11	2	2	48	10	32	0	22	4	30	2
>-0.2	11	0	0	0	11	0	4	0	3	1	4	0
>-0.3	1	0	0	0	1	0	2	0	0	0	1	0
>-0.4	3	2	0	0	3	2	1	0	0	0	0	0

Table K.2A-15. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the American River at Sunrise for Alternative 2A, 1922–1993 Simulation (2020 Operations)

Change in the Index	Fall-Run Chinook Salmon				Steelhead			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	2	0	0	0	0	0	0	0
<+0.3	5	2	0	0	0	0	0	0
<+0.2	7	4	0	1	1	0	0	1
<+0.1	61	17	6	7	25	8	25	7
0.0	300	368	423	201	438	490	820	417
>-0.1	51	35	3	6	37	5	18	6
>-0.2	3	3	0	1	1	1	1	1
>-0.3	2	1	0	0	1	0	0	0
>-0.4	1	1	0	0	1	0	0	0

Table K.2A-16. Frequency of Water Temperature Survival Indices for Coho Salmon Life Stages in the Trinity River at Lewiston for Alternative 2A, 1922–1993 Simulation (2020 Operations)

Change in the Index	Coho Salmon			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0
<+0.3	0	0	0	0
<+0.2	0	0	0	0
<+0.1	2	0	2	0
0.0	282	288	862	288
>-0.1	4	0	0	0
>-0.2	0	0	0	0
>-0.3	0	0	0	0
>-0.4	0	0	0	0

Alternative 2B

Table K.2B-1. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the American River at Sunrise for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2B, 1922–1993 Simulation (2001 Operations)

	Fall-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	189	307	420	184	377	276	793	400
0.90	15	50	12	23	40	31	64	23
0.80	7	26	0	9	5	9	5	9
0.70	52	11	0	0	35	8	0	0
0.60	70	11	0	0	28	5	0	0
0.50	39	3	0	0	6	9	1	0
0.40	21	3	0	0	7	3	1	0
0.30	17	3	0	0	0	4	0	0
0.20	11	3	0	0	3	4	0	0
0.10	1	0	0	0	1	4	0	0
0.00	10	15	0	0	2	151	0	0

Frequency of Change in Index

	Fall-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.6	0	0	0	0	0	0	0	0
<+0.5	0	0	0	0	0	0	0	0
<+0.4	0	0	0	0	0	0	0	0
<+0.3	0	0	0	0	0	1	0	0
<+0.2	5	2	0	0	0	0	0	0
<+0.1	61	20	2	7	17	6	16	7
0	327	383	429	206	462	491	841	422

	Fall-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
>-0.1	35	22	1	3	24	3	7	3
>-0.2	2	4	0	0	0	2	0	0
>-0.3	2	0	0	0	1	0	0	0
>-0.4	0	0	0	0	0	1	0	0
>-0.5	0	0	0	0	0	0	0	0
>-0.6	0	1	0	0	0	0	0	0

Table K.2B-2. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Feather River below Thermalito for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2B, 1922–1993 Simulation (2001 Operations)

	Fall-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	176	345	418	175	143	140	742	573	371	271	736	391
0.90	45	16	10	32	48	9	59	2	56	26	77	32
0.80	19	11	3	5	45	8	29	0	19	14	26	5
0.70	24	7	1	2	49	7	9	1	18	11	12	2
0.60	27	13	0	2	47	12	10	0	28	6	5	2
0.50	26	7	0	0	40	7	3	0	8	9	5	0
0.40	16	5	0	0	22	6	3	0	2	3	2	0
0.30	18	9	0	0	22	9	2	0	0	2	0	0
0.20	14	3	0	0	15	4	4	0	1	6	0	0
0.10	11	0	0	0	13	0	1	0	0	4	0	0
0.00	56	16	0	0	60	158	2	0	1	152	1	0

Frequency of Change in Index

Change in the Index	Fall-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
	Adult Migration	Spawning /Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning /Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning /Incubation	Juvenile Rearing	Smolt Migration
<+0.6	0	0	0	0	0	0	0	0	0	0	0	0
<+0.5	1	0	0	0	1	0	1	0	0	0	0	0
<+0.4	1	0	0	0	1	0	0	0	0	0	0	0
<+0.3	6	1	0	0	6	1	4	0	0	0	1	0
<+0.2	6	2	0	0	6	2	0	0	2	0	4	0
<+0.1	54	8	1	2	53	5	38	1	13	7	36	2
0	322	401	427	208	389	334	801	574	474	494	806	424
>-0.1	40	15	4	4	44	13	18	1	15	3	16	4
>-0.2	1	1	0	2	1	1	1	0	0	0	0	2
>-0.3	0	1	0	0	2	1	0	0	0	0	1	0
>-0.4	1	2	0	0	1	2	1	0	0	0	0	0
>-0.5	0	0	0	0	0	0	0	0	0	0	0	0
>-0.6	0	1	0	0	0	1	0	0	0	0	0	0

Table K.2B-3. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Bend Bridge for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2B, 1922–1993 Simulation (2001 Operations)

Base Index	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	401	409	432	216	545	535	859	648	576	304	715	504	482	277	859	576	480	380	858	432
0.90	15	10	0	0	15	26	5	0	0	86	5	0	7	42	5	0	11	93	6	0
0.80	3	1	0	0	3	1	0	0	0	14	0	0	2	9	0	0	5	18	0	0
0.70	2	3	0	0	2	5	0	0	0	6	0	0	2	5	0	0	1	8	0	0
0.60	5	0	0	0	5	0	0	0	0	0	0	0	5	0	0	0	4	2	0	0
0.50	0	2	0	0	0	2	0	0	0	0	0	0	0	2	0	0	1	0	0	0

Base Index	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
0.40	3	1	0	0	3	1	0	0	0	1	0	0	3	1	0	0	2	1	0	0
0.30	2	1	0	0	2	1	0	0	0	0	0	0	2	1	0	0	0	1	0	0
0.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
0.10	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
0.00	0	5	0	0	0	5	0	0	0	21	0	0	0	23	0	0	0	0	0	0

Frequency of Change in Index

Change in the Index	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.1	11	3	0	0	11	3	1	1	1	25	1	1	11	15	1	1	5	6	1	0
0	414	425	432	216	558	568	862	647	574	394	718	503	489	333	862	575	494	494	863	432
>-0.1	7	4	0	0	7	5	1	0	1	13	1	0	4	12	1	0	5	3	0	0
>-0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
>-0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2B-4. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Keswick for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2B, 1922–1993 Simulation (2001 Operations)

	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	410	410	432	216	554	554	864	648	576	411	720	504	491	322	864	576	485	498	864	432
0.90	9	9	0	0	9	9	0	0	0	1	0	0	2	8	0	0	8	5	0	0
0.80	2	3	0	0	2	3	0	0	0	3	0	0	0	5	0	0	3	0	0	0
0.70	3	0	0	0	3	0	0	0	0	1	0	0	3	0	0	0	2	1	0	0
0.60	5	1	0	0	5	1	0	0	0	3	0	0	5	3	0	0	5	0	0	0
0.50	3	1	0	0	3	1	0	0	0	0	0	0	3	1	0	0	1	0	0	0
0.40	0	2	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0
0.30	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
0.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.10	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
0.00	0	4	0	0	0	4	0	0	0	13	0	0	0	17	0	0	0	0	0	0

Frequency of Change in Index

	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.2	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
<+0.1	8	1	0	0	8	1	0	1	1	3	0	1	7	2	0	1	6	3	0	0
0	420	423	432	216	564	567	863	647	575	426	719	503	494	348	863	575	494	501	864	432
>-0.1	4	8	0	0	4	8	1	0	0	2	1	0	3	9	1	0	4	0	0	0
>-0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
>-0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2B-5. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Red Bluff for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2B, 1922–1993 Simulation (2001 Operations)

	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	397	406	432	216	541	497	858	648	573	153	714	504	475	225	858	576	473	331	858	432
0.90	14	13	0	0	14	59	5	0	3	169	5	0	9	66	5	0	16	70	6	0
0.80	7	1	0	0	7	6	1	0	0	49	1	0	6	20	1	0	6	40	0	0
0.70	2	1	0	0	2	1	0	0	0	20	0	0	2	12	0	0	2	33	0	0
0.60	4	2	0	0	4	2	0	0	0	12	0	0	4	8	0	0	3	8	0	0
0.50	2	2	0	0	2	4	0	0	0	4	0	0	2	3	0	0	2	9	0	0
0.40	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	3	0	0
0.30	2	2	0	0	2	2	0	0	0	3	0	0	2	3	0	0	2	4	0	0
0.20	2	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0
0.10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
0.00	1	5	0	0	1	5	0	0	0	22	0	0	1	23	0	0	0	4	0	0

Frequency of Change in Index

Change in the Index	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.2	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	1	0	0
<+0.1	11	2	0	0	11	2	1	0	2	53	1	0	13	24	1	0	5	11	1	0
0	414	422	432	216	558	564	862	648	572	350	718	504	487	307	862	576	495	484	863	432
>-0.1	7	8	0	0	7	10	1	0	2	26	1	0	4	27	1	0	4	7	0	0
>-0.2	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0
>-0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>=-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2B-6. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Trinity River at Lewiston for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2B, 1922–1993 Simulation (2001 Operations)

	Coho Salmon			
Base Index	Adult Migration	Spawning Incubation	Juvenile Rearing	Smolt Migration
1.00	277	288	862	288
0.90	6	0	2	0
0.80	3	0	0	0
0.70	0	0	0	0
0.60	0	0	0	0
0.50	0	0	0	0
0.40	1	0	0	0
0.30	0	0	0	0
0.20	0	0	0	0
0.10	1	0	0	0
0.00	0	0	0	0

Frequency of Change in Index

	Coho Salmon			
Change in the Index	Adult Migration	Spawning Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0
<+0.3	0	0	0	0
<+0.2	0	0	0	0
<+0.1	2	0	1	0
0	284	288	861	288
>-0.1	0	0	2	0
>-0.2	2	0	0	0
>-0.3	0	0	0	0
>-0.4	0	0	0	0

Table K.2B-7. Frequency of Change (Relative to Alternative 1) in Spawning Habitat Area for Steelhead and Chinook Salmon in the American River at Nimbus for Alternative 2B, 1922–1994 Simulation (2001 Operations)

Proportion of Spawning Habitat Available (%)	Spawning	
	Fall Run Chinook Salmon	Steelhead
<+100%	163	292
<+90%	14	32
<+80%	8	8
<+70%	22	23
<+60%	3	4
<+50%	9	3
<+40%	0	0
<+30%	0	3
<+20%	0	0
<+10%	0	0
0%	0	0

Table K.2B-8. Frequency of Change (Relative to Alternative 1) in Rearing Habitat Area for Steelhead and Chinook Salmon in the American River at Nimbus for Alternative 2B, 1922–1994 Simulation (2001 Operations)

	Rearing	
Percentage Change in Flow	Fall Run Chinook Salmon	Steelhead
<+100%	1	1
<+90%	0	0
<+80%	0	0
<+70%	1	3
<+60%	1	1
<+50%	0	0
<+40%	1	2
<+30%	2	3
<+20%	4	8
<+10%	0	0
0%	418	828
>-10%	0	0
>-20%	7	20
>-30%	1	1
>-40%	0	5
>-50%	1	1
>-60%	0	1
>-70%	0	1
>-80%	0	0
>-90%	0	0
>=-100%	0	0

Table K.2B-9. Frequency of Change (Relative to Alternative 1) in Rearing Habitat Area for Steelhead and Chinook Salmon in the Feather River below Thermalito for Alternative 2B, 1922–1994 Simulation (2001 Operations)

	Rearing		
Percentage Change in Flow	Fall Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+100%	0	0	0
<+90%	0	0	0
<+80%	0	0	0
<+70%	0	0	0
<+60%	0	0	0
<+50%	0	0	1
<+40%	0	0	2
<+30%	0	1	2
<+20%	1	1	3
<+10%	0	0	0
0%	433	502	852
>-10%	0	0	0
>-20%	0	2	5
>-30%	1	1	2
>-40%	0	0	1
>-50%	2	2	3
>-60%	1	1	3
>-70%	0	0	0
>-80%	0	0	0
>-90%	0	0	0
>=-100%	0	0	0

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Table K.2B-10. Frequency of Change (Relative to Alternative 1) in Spawning Habitat Area for Steelhead and Chinook Salmon in the American River at Nimbus for Alternative 2B, 1922–1994 Simulation (2020 Operations)

	Spawning	
Percentage Change in Flow	Fall-Run Chinook Salmon	Steelhead
<+100%	0	0
<+90%	0	0
<+80%	0	0
<+70%	0	0
<+60%	0	0
<+50%	0	0
<+40%	0	0
<+30%	1	2
<+20%	1	1
<+10%	4	4
0%	193	349
>-10%	15	6
>-20%	4	3
>-30%	1	0
>-40%	0	0
>-50%	0	0
>-60%	0	0
>-70%	0	0
>-80%	0	0
>-90%	0	0
>=-100%	0	0

Table K.2B-11. Frequency of Change (Relative to Alternative 1) in Rearing Habitat Area for Steelhead and Chinook Salmon in the American River at Nimbus for Alternative 2B, 1922–1994 Simulation (2020 Operations)

	Rearing	
Percentage Change in Flow	Fall-Run Chinook Salmon	Steelhead
<+100%	0	0
<+90%	0	0
<+80%	0	0
<+70%	0	0
<+60%	0	0
<+50%	2	2
<+40%	1	1
<+30%	0	2
<+20%	4	5
<+10%	0	0
0%	426	848
>-10%	0	0
>-20%	4	10
>-30%	0	5
>-40%	0	1
>-50%	0	0
>-60%	0	1
>-70%	0	0
>-80%	0	0
>-90%	0	0
>=-100%	0	0

Table K.2B-12. Frequency of Change (Relative to Alternative 1) in Spawning Habitat Availability for Steelhead and Chinook Salmon in the Feather River Below Thermalito for Alternative 2B, 1922–1994 Simulation (2020 Operations)

	Spawning		
Change in Percentage Area	Fall-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+100%	0	0	0
<+90%	0	0	0
<+80%	0	0	0
<+70%	0	0	0
<+60%	0	0	0
<+50%	0	0	0
<+40%	0	0	0
<+30%	0	0	0
<+20%	0	0	0
<+10%	0	0	0
0%	219	219	364
>-10%	0	0	1
>-20%	0	0	0
>-30%	0	0	0
>-40%	0	0	0
>-50%	0	0	0
>-60%	0	0	0
>-70%	0	0	0
>-80%	0	0	0
>-90%	0	0	0
>=-100%	0	0	0

	Spawning		
Proportion of Spawning Habitat Available (%)	Fall-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+100%	219	219	365
<+90%	0	0	0
<+80%	0	0	0
<+70%	0	0	0

Change in Percentage Area	Spawning		
	Fall-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+60%	0	0	0
<+50%	0	0	0
<+40%	0	0	0
<+30%	0	0	0
<+20%	0	0	0
<+10%	0	0	0
0%	0	0	0

Table K.2B-13. Frequency of Change (Relative to Alternative 1) in Rearing Habitat Area for Steelhead and Chinook Salmon in the Feather River Below Thermalito for Alternative 2B, 1922–1994 Simulation (2020 Operations)

Percentage Change in Flow	Rearing		
	Fall-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+100%	0	0	0
<+90%	0	0	0
<+80%	0	0	1
<+70%	0	0	0
<+60%	0	0	0
<+50%	0	0	0
<+40%	0	1	2
<+30%	3	3	3
<+20%	1	1	2
<+10%	0	0	0
0%	431	502	861
>-10%	0	0	0
>-20%	0	0	0
>-30%	1	1	1
>-40%	0	0	1
>-50%	1	1	3

Percentage Change in Flow	Rearing		
	Fall-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
>-60%	1	2	2
>-70%	0	0	0
>-80%	0	0	0
>-90%	0	0	0
>=-100%	0	0	0

Table K.2B-14. Frequency of Change (Relative to Alternative 1) in Spawning Habitat Availability for Steelhead and Chinook Salmon in the Sacramento River at Keswick for Alternative 2B, 1922–1994 Simulation (2020 Operations)

Change in Percentage Area	Spawning				
	Fall-Run Chinook Salmon	Late Fall–Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+100%	0	0	0	0	0
<+90%	0	0	0	0	0
<+80%	0	0	0	0	0
<+70%	0	0	0	0	0
<+60%	0	0	0	0	0
<+50%	0	0	0	0	0
<+40%	0	0	0	0	0
<+30%	0	0	0	0	0
<+20%	0	0	0	0	0
<+10%	0	0	0	0	0
0%	219	219	292	219	365
>-10%	0	0	0	0	0
>-20%	0	0	0	0	0
>-30%	0	0	0	0	0
>-40%	0	0	0	0	0
>-50%	0	0	0	0	0
>-60%	0	0	0	0	0
>-70%	0	0	0	0	0

Change in Percentage Area	Spawning				
	Fall-Run Chinook Salmon	Late Fall–Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
>-80%	0	0	0	0	0
>-90%	0	0	0	0	0
>=-100%	0	0	0	0	0
Proportion of Spawning Habitat Available (%)	Spawning				
	Fall-Run Chinook Salmon	Late Fall–Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+100%	208	209	292	214	352
<+90%	11	10	0	5	13
<+80%	0	0	0	0	0
<+70%	0	0	0	0	0
<+60%	0	0	0	0	0
<+50%	0	0	0	0	0
<+40%	0	0	0	0	0
<+30%	0	0	0	0	0
<+20%	0	0	0	0	0
<+10%	0	0	0	0	0
0%	0	0	0	0	0

Table K.2B-15. Frequency of Change (Relative to Alternative 1) in Rearing Habitat Availability for Steelhead and Chinook Salmon in the Sacramento River at Keswick for Alternative 2B, 1922–1994 Simulation (2020 Operations)

Change in Percentage Area	Rearing				
	Fall-Run Chinook Salmon	Late Fall–Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+100%	0	0	0	0	0
<+90%	0	0	0	0	0
<+80%	0	0	0	0	0
<+70%	0	0	0	0	0
<+60%	0	0	0	0	0
<+50%	0	0	0	0	0
<+40%	0	1	2	2	2
<+30%	1	0	1	1	1

Change in Percentage Area	Rearing				
	Fall-Run Chinook Salmon	Late Fall–Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+20%	2	0	2	2	2
<+10%	0	0	0	0	0
0%	432	581	718	499	864
>-10%	0	0	0	0	0
>-20%	1	2	5	5	5
>-30%	2	0	2	2	2
>-40%	0	0	0	0	0
>-50%	0	0	0	0	0
>-60%	0	0	0	0	0
>-70%	0	0	0	0	0
>-80%	0	0	0	0	0
>-90%	0	0	0	0	0
>=-100%	0	0	0	0	0
Proportion of Spawning Habitat Available (%)	Spawning				
	Fall-Run Chinook Salmon	Late Fall–Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+100%	208	209	292	214	352
<+90%	11	10	0	5	13
<+80%	0	0	0	0	0
<+70%	0	0	0	0	0
<+60%	0	0	0	0	0
<+50%	0	0	0	0	0
<+40%	0	0	0	0	0
<+30%	0	0	0	0	0
<+20%	0	0	0	0	0
<+10%	0	0	0	0	0
0%	0	0	0	0	0

Table K.2B-16. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Feather River below Thermalito for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2B, 1922–1993 Simulation (2020 Operations)

	Fall-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	173	345	419	175	144	141	752	572	370	271	748	391
0.90	47	17	8	33	47	9	54	3	55	26	75	33
0.80	17	8	4	3	42	5	28	0	22	14	20	3
0.70	26	6	1	3	50	6	9	1	16	10	9	3
0.60	32	13	0	2	54	12	6	0	25	6	8	2
0.50	31	8	0	0	47	8	3	0	12	10	1	0
0.40	23	4	0	0	27	5	7	0	1	2	1	0
0.30	14	10	0	0	16	10	1	0	1	2	1	0
0.20	8	4	0	0	11	4	1	0	1	5	1	0
0.10	11	1	0	0	11	1	0	0	0	4	0	0
0.00	50	16	0	0	55	159	3	0	1	154	0	0

Frequency of Change in Index

	Fall-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.6	0	0	0	0	0	0	0	0	0	0	0	0
<+0.5	0	0	0	0	0	0	0	0	0	0	0	0
<+0.4	1	0	0	0	1	0	1	0	0	0	0	0
<+0.3	2	0	0	0	2	0	0	0	0	0	2	0
<+0.2	13	2	0	0	13	2	3	0	2	1	0	0
<+0.1	65	8	1	4	67	6	38	1	11	4	35	4
0	314	406	428	209	380	339	805	575	478	495	813	425
>-0.1	33	14	3	3	36	11	13	0	13	3	11	3
>-0.2	1	0	0	0	1	0	3	0	0	0	3	0
>-0.3	0	0	0	0	1	0	1	0	0	0	0	0
>-0.4	2	2	0	0	2	2	0	0	0	1	0	0
>-0.5	1	0	0	0	1	0	0	0	0	0	0	0
>-0.6	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2B-17. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the American River at Sunrise for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2B, 1922–1993 Simulation (2020 Operations)

	Fall-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	169	303	406	174	360	278	732	390
0.90	34	34	22	26	54	28	119	26
0.80	3	27	4	11	8	8	9	11
0.70	28	14	0	5	6	8	0	5
0.60	52	7	0	0	40	7	2	0
0.50	35	9	0	0	14	5	1	0
0.40	30	5	0	0	10	4	0	0
0.30	33	4	0	0	7	4	1	0
0.20	17	7	0	0	1	4	0	0
0.10	13	0	0	0	2	4	0	0
0.00	18	22	0	0	2	154	0	0

Frequency of Change in Index

	Fall-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.6	0	0	0	0	0	0	0	0
<+0.5	0	0	0	0	0	0	0	0
<+0.4	0	0	0	0	0	0	0	0
<+0.3	2	1	0	0	0	0	0	0
<+0.2	5	3	0	1	1	0	0	1
<+0.1	58	20	2	1	27	7	15	1
0	335	377	426	207	453	493	837	423
>-0.1	31	26	4	7	23	4	12	7

>-0.2	1	3	0	0	0	0	0	0
>-0.30	0	2	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0
>-0.5	0	0	0	0	0	0	0	0
>-0.6	0	0	0	0	0	0	0	0

Table K.2B-18. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Bend Bridge for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2B, 1922–1993 Simulation (2020 Operations)

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	398	403	432	216	542	526	860	648	576	291	716	504	481	264	860	576	473	381	860	432
0.90	17	13	0	0	17	32	4	0	0	98	4	0	7	49	4	0	18	87	4	0
0.80	4	1	0	0	4	1	0	0	0	12	0	0	3	9	0	0	5	19	0	0
0.70	1	1	0	0	1	2	0	0	0	5	0	0	1	4	0	0	1	12	0	0
0.60	4	3	0	0	4	4	0	0	0	3	0	0	4	4	0	0	3	1	0	0
0.50	4	2	0	0	4	2	0	0	0	1	0	0	4	3	0	0	2	1	0	0
0.40	1	2	0	0	1	2	0	0	0	0	0	0	1	2	0	0	1	0	0	0
0.30	3	1	0	0	3	1	0	0	0	0	0	0	3	1	0	0	1	2	0	0
0.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.10	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0
0.00	0	6	0	0	0	6	0	0	0	21	0	0	0	23	0	0	0	0	0	0

Frequency of Change in Index

Change in the Index	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.1	3	5	0	0	3	6	0	0	0	26	0	0	2	19	0	0	4	1	0	0
0	424	418	432	216	568	560	864	648	576	382	720	504	499	312	864	576	494	501	864	432
>-0.1	5	9	0	0	5	10	0	0	0	23	0	0	3	29	0	0	6	2	0	0
>-0.2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
>-0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2B-19. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Keswick for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2B, 1922–1993 Simulation (2020 Operations)

Base Index	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	407	408	432	216	551	552	864	648	576	410	720	504	490	318	864	576	479	499	864	432
0.90	11	6	0	0	11	6	0	0	0	1	0	0	2	6	0	0	14	4	0	0
0.80	4	4	0	0	4	4	0	0	0	4	0	0	2	6	0	0	4	0	0	0
0.70	2	1	0	0	2	1	0	0	0	2	0	0	2	2	0	0	0	1	0	0
0.60	7	2	0	0	7	2	0	0	0	1	0	0	7	3	0	0	6	0	0	0
0.50	1	2	0	0	1	2	0	0	0	0	0	0	1	2	0	0	1	0	0	0

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
0.40	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
0.30	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
0.20	0	1	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0	0
0.10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.00	0	6	0	0	0	6	0	0	0	13	0	0	0	19	0	0	0	0	0	0

Frequency of Change in Index

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.1	3	2	0	0	3	2	0	0	1	2	0	0	0	2	0	0	5	1	0	0
0	427	424	432	216	571	568	864	648	575	425	720	504	503	348	864	576	495	502	864	432
>-0.1	2	6	0	0	2	6	0	0	0	5	0	0	1	10	0	0	4	1	0	0
>-0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2B-20. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Red Bluff for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2B, 1922–1993 Simulation (2020 Operations)

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	388	397	432	216	532	486	859	648	573	146	715	504	469	211	859	576	468	328	859	432
0.90	23	18	0	0	23	67	5	0	3	170	5	0	15	73	5	0	21	74	5	0
0.80	7	2	0	0	7	6	0	0	0	52	0	0	6	23	0	0	7	34	0	0
0.70	1	1	0	0	1	1	0	0	0	19	0	0	1	8	0	0	0	30	0	0
0.60	5	2	0	0	5	2	0	0	0	10	0	0	5	8	0	0	3	15	0	0
0.50	1	3	0	0	1	4	0	0	0	8	0	0	1	8	0	0	3	5	0	0
0.40	3	1	0	0	3	2	0	0	0	2	0	0	3	2	0	0	1	8	0	0
0.30	2	1	0	0	2	1	0	0	0	3	0	0	2	2	0	0	0	3	0	0
0.20	2	1	0	0	2	1	0	0	0	0	0	0	2	1	0	0	1	2	0	0
0.10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.00	0	6	0	0	0	6	0	0	0	22	0	0	0	24	0	0	0	5	0	0

Frequency of Change in Index

	Fall-Run Chinook Salmon				Fall-/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.2	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0
<+0.1	5	4	0	0	5	4	0	0	2	47	0	0	7	29	0	0	2	7	0	0
0	418	417	432	216	562	561	863	648	573	351	719	504	490	294	863	576	498	491	864	432
>-0.1	9	11	0	0	9	11	1	0	1	29	1	0	7	35	1	0	4	6	0	0
>-0.2	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0
>-0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>=-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2B-21. Frequency of Water Temperature Survival Indices for Coho Salmon Life Stages in the Trinity River at Lewiston for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2B, 1922–1993 Simulation (2020 Operations)

	Coho Salmon			
Base Index	Adult Migration	Spawning Incubation	Juvenile Rearing	Smolt Migration
1.00	278	288	864	288
0.90	6	0	0	0
0.80	1	0	0	0
0.70	3	0	0	0
0.60	0	0	0	0
0.50	0	0	0	0
0.40	0	0	0	0
0.30	0	0	0	0
0.20	0	0	0	0
0.10	0	0	0	0
0.00	0	0	0	0

Frequency of Change in Index

	Coho Salmon			
Change in the Index	Adult Migration	Spawning Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0
<+0.3	0	0	0	0
<+0.2	0	0	0	0
<+0.1	1	0	0	0
0	285	288	864	288
>-0.1	2	0	0	0
>-0.2	0	0	0	0
>-0.30	0	0	0	0
>-0.4	0	0	0	0

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Alternative 2C

Table K.2C-1. Frequency of Spawning Habitat Availability for Steelhead and Chinook Salmon in the American River at Nimbus for Alternative 1, 1922–1994 Simulation (2001 Operations)

Change in Percentage Area	Spawning	
	Fall Run Chinook Salmon	Steelhead
<+100%	0	0
<+90%	0	0
<+80%	0	0
<+70%	0	0
<+60%	0	0
<+50%	0	0
<+40%	0	1
<+30%	0	0
<+20%	3	4
<+10%	6	5
0%	186	341
>-10%	20	9
>-20%	2	3
>-30%	0	0
>-40%	2	2
>-50%	0	0
>-60%	0	0
>-70%	0	0
>-80%	0	0
>-90%	0	0
>=-100%	0	0

Table K.2C-2. Frequency of Change (Relative to Alternative 1) in Spawning Habitat Area for Steelhead and Chinook Salmon in the American River at Nimbus for Alternative 2C, 1922–1994 Simulation (2001 Operations)

Proportion of Spawning Habitat Available (%)	Spawning	
	Fall Run Chinook Salmon	Steelhead
<+100%	163	292
<+90%	14	32
<+80%	8	8
<+70%	22	23
<+60%	3	4
<+50%	9	3
<+40%	0	0
<+30%	0	3
<+20%	0	0
<+10%	0	0
0%	0	0

Table K.2C-3. Frequency of Change (Relative to Alternative 1) in Rearing Habitat Area for Steelhead and Chinook Salmon in the American River at Nimbus for Alternative 2C, 1922–1994 Simulation (2001 Operations)

Percentage Change in Flow	Rearing	
	Fall Run Chinook Salmon	Steelhead
<+100%	1	1
<+90%	0	0
<+80%	0	1
<+70%	2	3
<+60%	0	0
<+50%	0	0
<+40%	1	2
<+30%	2	5
<+20%	5	11
<+10%	0	0
0%	417	812

Percentage Change in Flow	Rearing	
	Fall Run Chinook Salmon	Steelhead
>-10%	0	0
>-20%	7	26
>-30%	0	5
>-40%	1	4
>-50%	1	2
>-60%	0	1
>-70%	0	1
>-80%	0	0
>-90%	0	0
>=-100%	0	0

Table K.2C-4. Ambient Air Quality Monitoring Data from the Visalia North Church Street Monitoring Station (2001 Operations)

Proportion of Spawning Habitat Available (%)	Spawning		
	Fall Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+100%	219	219	365
<+90%	0	0	0
<+80%	0	0	0
<+70%	0	0	0
<+60%	0	0	0
<+50%	0	0	0
<+40%	0	0	0
<+30%	0	0	0
<+20%	0	0	0
<+10%	0	0	0
0%	0	0	0

Table K.2C-5. Frequency of Change (Relative to Alternative 1) in Rearing Habitat Area for Steelhead and Chinook Salmon in the Feather River below Thermalito for Alternative 2C, 1922–1993 Simulation (2001 Operations)

Percentage Change in Flow	Rearing		
	Fall Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+100%	0	0	0
<+90%	0	0	0
<+80%	0	0	0
<+70%	0	1	1
<+60%	0	0	0
<+50%	0	0	0
<+40%	1	1	2
<+30%	0	0	2
<+20%	0	0	2
<+10%	0	0	0
0%	434	503	853
>-10%	0	0	0
>-20%	0	2	4
>-30%	1	1	6
>-40%	0	1	1
>-50%	0	0	0
>-60%	2	2	3
>-70%	0	0	1
>-80%	0	0	0
>-90%	0	0	0
>=-100%	0	0	0

Table K.2C-6. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Red Bluff for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2C, 1922–1993 Simulation (2001 Operations)

	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	397	406	432	216	541	497	858	648	573	153	714	504	475	225	858	576	473	331	858	432
0.90	14	13	0	0	14	59	5	0	3	169	5	0	9	66	5	0	16	70	6	0
0.80	7	1	0	0	7	6	1	0	0	49	1	0	6	20	1	0	6	40	0	0
0.70	2	1	0	0	2	1	0	0	0	20	0	0	2	12	0	0	2	33	0	0
0.60	4	2	0	0	4	2	0	0	0	12	0	0	4	8	0	0	3	8	0	0
0.50	2	2	0	0	2	4	0	0	0	4	0	0	2	3	0	0	2	9	0	0
0.40	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	3	0	0
0.30	2	2	0	0	2	2	0	0	0	3	0	0	2	3	0	0	2	4	0	0
0.20	2	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0
0.10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
0.00	1	5	0	0	1	5	0	0	0	22	0	0	1	23	0	0	0	4	0	0

Frequency of Change in Index

	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning /Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.2	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2	0	0
<+0.1	9	3	0	0	9	3	1	0	2	53	1	0	11	24	1	0	5	12	1	0
0	417	425	432	216	561	566	862	648	572	348	718	504	490	313	862	576	495	481	863	432
>-0.1	6	4	0	0	6	7	1	0	2	29	1	0	3	21	1	0	4	8	0	0
>-0.2	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0

	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
>-0.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2C-7. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the American River at Sunrise for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2C, 1922–1993 Simulation (2001 Operations)

	Fall-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	189	307	420	184	377	276	793	400
0.90	15	50	12	23	40	31	64	23
0.80	7	26	0	9	5	9	5	9
0.70	52	11	0	0	35	8	0	0
0.60	70	11	0	0	28	5	0	0
0.50	39	3	0	0	6	9	1	0
0.40	21	3	0	0	7	3	1	0
0.30	17	3	0	0	0	4	0	0
0.20	11	3	0	0	3	4	0	0
0.10	1	0	0	0	1	4	0	0
0.00	10	15	0	0	2	151	0	0

Frequency of Change in Index

	Fall-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+1.0	0	0	0	0	0	0	0	0
<+0.9	0	0	0	0	0	0	0	0
<+0.8	0	0	0	0	0	0	0	0
<+0.7	0	0	0	0	0	0	0	0
<+0.6	0	0	0	0	0	0	0	0
<+0.5	0	0	0	0	0	0	0	0
<+0.4	0	0	0	0	0	0	0	0
<+0.3	0	0	0	0	0	1	0	0
<+0.2	6	1	0	0	1	1	0	0
<+0.1	60	25	3	7	16	5	17	7
0	331	376	429	206	463	493	840	422
>-0.1	29	26	0	3	23	2	7	3
>-0.2	4	3	0	0	0	1	0	0
>-0.3	2	0	0	0	1	0	0	0
>-0.4	0	0	0	0	0	1	0	0
>-0.5	0	1	0	0	0	0	0	0
>-0.6	0	0	0	0	0	0	0	0
>-0.7	0	0	0	0	0	0	0	0
>-0.8	0	0	0	0	0	0	0	0
>-0.9	0	0	0	0	0	0	0	0
>=-1.0	0	0	0	0	0	0	0	0

Table K.2C-8. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Feather River below Thermalito for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2C, 1922–1993 Simulation (2001 Operations)

	Fall-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	176	345	418	175	143	140	742	573	371	271	736	391
0.90	45	16	10	32	48	9	59	2	56	26	77	32
0.80	19	11	3	5	45	8	29	0	19	14	26	5
0.70	24	7	1	2	49	7	9	1	18	11	12	2
0.60	27	13	0	2	47	12	10	0	28	6	5	2
0.50	26	7	0	0	40	7	3	0	8	9	5	0
0.40	16	5	0	0	22	6	3	0	2	3	2	0
0.30	18	9	0	0	22	9	2	0	0	2	0	0
0.20	14	3	0	0	15	4	4	0	1	6	0	0
0.10	11	0	0	0	13	0	1	0	0	4	0	0
0.00	56	16	0	0	60	158	2	0	1	152	1	0

Frequency of Change in Index

	Fall-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.6	0	0	0	0	0	0	0	0	0	0	0	0
<+0.5	0	0	0	0	0	0	1	0	0	0	0	0
<+0.4	1	0	0	0	1	0	2	0	0	0	0	0
<+0.3	5	1	0	0	5	1	1	0	0	0	2	0
<+0.2	4	0	1	1	6	0	2	0	1	0	3	1
<+0.1	60	5	1	4	62	4	35	1	11	7	29	4
0	325	407	429	208	389	337	807	574	476	493	815	424
>-0.1	36	14	1	3	40	13	14	1	16	3	14	3
>-0.2	1	1	0	0	1	1	1	0	0	1	0	0

	Fall-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
>-0.3	0	1	0	0	0	1	0	0	0	0	1	0
>-0.4	0	2	0	0	0	2	1	0	0	0	0	0
>-0.5	0	0	0	0	0	0	0	0	0	0	0	0
>-0.6	0	1	0	0	0	1	0	0	0	0	0	0

Table K.2C-9. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Trinity River at Lewiston for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2C, 1922–1993 Simulation (2001 Operations)

	Coho Salmon			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	277	288	862	288
0.90	6	0	2	0
0.80	3	0	0	0
0.70	0	0	0	0
0.60	0	0	0	0
0.50	0	0	0	0
0.40	1	0	0	0
0.30	0	0	0	0
0.20	0	0	0	0
0.10	1	0	0	0
0.00	0	0	0	0

Frequency of Change in Index

	Coho Salmon			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0
<+0.3	0	0	0	0
<+0.2	0	0	0	0
<+0.1	1	0	1	0
0	285	288	861	288
>-0.1	0	0	2	0
>-0.2	2	0	0	0
>-0.3	0	0	0	0
>-0.4	0	0	0	0

Table K.2C-10. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Bend Bridge for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2C, 1922–1993 Simulation (2001 Operations)

	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	401	409	432	216	545	535	859	648	576	304	715	504	482	277	859	576	480	380	858	432
0.90	15	10	0	0	15	26	5	0	0	86	5	0	7	42	5	0	11	93	6	0
0.80	3	1	0	0	3	1	0	0	0	14	0	0	2	9	0	0	5	18	0	0
0.70	2	3	0	0	2	5	0	0	0	6	0	0	2	5	0	0	1	8	0	0
0.60	5	0	0	0	5	0	0	0	0	0	0	0	5	0	0	0	4	2	0	0
0.50	0	2	0	0	0	2	0	0	0	0	0	0	0	2	0	0	1	0	0	0
0.40	3	1	0	0	3	1	0	0	0	1	0	0	3	1	0	0	2	1	0	0
0.30	2	1	0	0	2	1	0	0	0	0	0	0	2	1	0	0	0	1	0	0
0.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
0.10	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
0.00	0	5	0	0	0	5	0	0	0	21	0	0	0	23	0	0	0	0	0	0

Frequency of Change in Index

	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.2	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
<+0.1	7	3	0	0	7	3	1	1	0	26	1	1	7	14	1	1	5	8	1	0
0	418	425	432	216	562	567	862	647	575	392	718	503	493	336	862	575	495	491	863	432
>-0.1	6	4	0	0	6	6	1	0	1	14	1	0	3	10	1	0	4	4	0	0
>-0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
>-0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2C-11. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Bend Bridge for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2C, 1922–1993 Simulation (2001 Operations)

	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	401	409	432	216	545	535	859	648	576	304	715	504	482	277	859	576	480	380	858	432
0.90	15	10	0	0	15	26	5	0	0	86	5	0	7	42	5	0	11	93	6	0
0.80	3	1	0	0	3	1	0	0	0	14	0	0	2	9	0	0	5	18	0	0
0.70	2	3	0	0	2	5	0	0	0	6	0	0	2	5	0	0	1	8	0	0
0.60	5	0	0	0	5	0	0	0	0	0	0	0	5	0	0	0	4	2	0	0
0.50	0	2	0	0	0	2	0	0	0	0	0	0	0	2	0	0	1	0	0	0
0.40	3	1	0	0	3	1	0	0	0	1	0	0	3	1	0	0	2	1	0	0
0.30	2	1	0	0	2	1	0	0	0	0	0	0	2	1	0	0	0	1	0	0
0.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
0.10	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
0.00	0	5	0	0	0	5	0	0	0	21	0	0	0	23	0	0	0	0	0	0

Frequency of Change in Index

Change in the Index	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.2	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
<+0.1	7	3	0	0	7	3	1	1	0	26	1	1	7	14	1	1	5	8	1	0
0	418	425	432	216	562	567	862	647	575	392	718	503	493	336	862	575	495	491	863	432
>-0.1	6	4	0	0	6	6	1	0	1	14	1	0	3	10	1	0	4	4	0	0
>-0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
>-0.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2C-12. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Keswick for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2C, 1922–1993 Simulation (2001 Operations)

Base Index	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	410	410	432	216	554	554	864	648	576	411	720	504	491	322	864	576	485	498	864	432
0.90	9	9	0	0	9	9	0	0	0	1	0	0	2	8	0	0	8	5	0	0
0.80	2	3	0	0	2	3	0	0	0	3	0	0	0	5	0	0	3	0	0	0
0.70	3	0	0	0	3	0	0	0	0	1	0	0	3	0	0	0	2	1	0	0
0.60	5	1	0	0	5	1	0	0	0	3	0	0	5	3	0	0	5	0	0	0
0.50	3	1	0	0	3	1	0	0	0	0	0	0	3	1	0	0	1	0	0	0
0.40	0	2	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0
0.30	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0

0.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.10	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
0.00	0	4	0	0	0	4	0	0	0	13	0	0	0	17	0	0	0	0	0	0

Frequency of Change in Index

	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.2	1	0	0	0	1	0	0	0	0	2	0	0	1	1	0	0	0	0	0	0
<+0.1	6	3	0	0	6	3	1	1	0	4	1	1	4	6	1	1	6	3	1	0
0	422	423	432	216	566	567	862	647	576	424	718	503	497	346	862	575	494	501	863	432
>-0.1	3	6	0	0	3	6	1	0	0	2	1	0	2	7	1	0	4	0	0	0
>-0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Alternative 2C 2020 Conditions

Table K.2C-13. Frequency of Change (Relative to Alternative 1) in Spawning Habitat Area for Steelhead and Chinook Salmon in the American River at Nimbus for Alternative 2C, 1922–1994 Simulation (2020 Operations)

Change in Percentage Area	Spawning	
	Fall Run Chinook Salmon	Steelhead
<+100%	0	0
<+90%	0	0
<+80%	0	0
<+70%	0	0
<+60%	0	0
<+50%	0	0
<+40%	0	0
<+30%	1	2
<+20%	3	1
<+10%	9	8
0%	187	346
>-10%	12	6
>-20%	6	2
>-30%	1	0
>-40%	0	0
>-50%	0	0
>-60%	0	0
>-70%	0	0
>-80%	0	0
>-90%	0	0
>=-100%	0	0

Table K.2C-14. Frequency of Change (Relative to Alternative 1) in Rearing Habitat Area for Steelhead and Chinook Salmon in the American River at Nimbus for Alternative 2C, 1922–1994 Simulation (2020 Operations)

	Rearing	
Percentage Change in Flow	Fall Run Chinook Salmon	Steelhead
<+100%	0	0
<+90%	0	0
<+80%	0	0
<+70%	0	0
<+60%	0	0
<+50%	2	2
<+40%	1	2
<+30%	1	2
<+20%	7	12
<+10%	0	0
0%	422	838
>-10%	0	0
>-20%	3	9
>-30%	1	6
>-40%	0	3
>-50%	0	0
>-60%	0	1
>-70%	0	0
>-80%	0	0
>-90%	0	0
>=-100%	0	0

Table K.2C-15. Frequency of Change (Relative to Alternative 1) in Spawning Habitat Area for Steelhead and Chinook Salmon in the Feather River below Thermalito for Alternative 2C, 1922–1994 Simulation (2020 Operations)

	Spawning		
Change in Percentage Area	Fall Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+100%	0	0	0
<+90%	0	0	0
<+80%	0	0	0
<+70%	0	0	0
<+60%	0	0	0
<+50%	0	0	0
<+40%	0	0	0
<+30%	0	0	0
<+20%	0	0	0
<+10%	0	0	0
0%	219	219	365
>-10%	0	0	0
>-20%	0	0	0
>-30%	0	0	0
>-40%	0	0	0
>-50%	0	0	0
>-60%	0	0	0
>-70%	0	0	0
>-80%	0	0	0
>-90%	0	0	0
>=-100%	0	0	0

	Spawning		
Proportion of Spawning Habitat Available (%)	Fall-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+100%	219	219	365
<+90%	0	0	0
<+80%	0	0	0
<+70%	0	0	0

Change in Percentage Area	Spawning		
	Fall Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+60%	0	0	0
<+50%	0	0	0
<+40%	0	0	0
<+30%	0	0	0
<+20%	0	0	0
<+10%	0	0	0
0%	0	0	0

Table K.2C-16. Frequency of Change (Relative to Alternative 1) in Rearing Habitat Area for Steelhead and Chinook Salmon in the Feather River below Thermalito for Alternative 2C, 1922–1993 Simulation (2020 Operations)

Percentage Change in Flow	Rearing		
	Fall Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+100%	0	0	0
<+90%	0	0	0
<+80%	0	0	1
<+70%	0	0	0
<+60%	0	0	0
<+50%	0	0	1
<+40%	0	0	1
<+30%	2	3	4
<+20%	0	1	4
<+10%	0	0	0
0%	434	503	853
>-10%	0	0	0
>-20%	2	2	4
>-30%	0	0	2
>-40%	0	0	2
>-50%	0	1	2

Percentage Change in Flow	Rearing		
	Fall Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
>-60%	0	1	1
>-70%	0	0	0
>-80%	0	0	0
>-90%	0	0	0
>=-100%	0	0	0

Table K.2C-17. Frequency of Change (Relative to Alternative 1) in Spawning Habitat Availability for Steelhead and Chinook Salmon in the Sacramento River at Keswick for Alternative 2C, 1922–1994 Simulation (2020 Operations)

Change in Percentage Area	Spawning				
	Fall-Run Chinook Salmon	Late Fall–Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+100%	0	0	0	0	0
<+90%	0	0	0	0	0
<+80%	0	0	0	0	0
<+70%	0	0	0	0	0
<+60%	0	0	0	0	0
<+50%	0	0	0	0	0
<+40%	0	0	0	0	0
<+30%	0	0	0	0	0
<+20%	0	0	0	0	0
<+10%	0	0	0	0	0
0%	218	219	292	219	365
>-10%	1	0	0	0	0
>-20%	0	0	0	0	0
>-30%	0	0	0	0	0
>-40%	0	0	0	0	0
>-50%	0	0	0	0	0
>-60%	0	0	0	0	0
>-70%	0	0	0	0	0

Change in Percentage Area	Spawning				
	Fall-Run Chinook Salmon	Late Fall–Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
>-80%	0	0	0	0	0
>-90%	0	0	0	0	0
>=-100%	0	0	0	0	0
Proportion of Spawning Habitat Available (%)	Spawning				
	Fall-Run Chinook Salmon	Late Fall–Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+100%	208	209	292	214	352
<+90%	11	10	0	5	13
<+80%	0	0	0	0	0
<+70%	0	0	0	0	0
<+60%	0	0	0	0	0
<+50%	0	0	0	0	0
<+40%	0	0	0	0	0
<+30%	0	0	0	0	0
<+20%	0	0	0	0	0
<+10%	0	0	0	0	0
0%	0	0	0	0	0

Table K.2C-18. Frequency of Change (Relative to Alternative 1) in Rearing Habitat Availability and Spawning Habitat Area for Steelhead and Chinook Salmon in the Sacramento River at Keswick for Alternative 2C, 1922–1994 Simulation (2020 Operations)

Change in Percentage Area	Rearing				
	Fall Run Chinook Salmon	Late-Fall Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+100%	0	0	0	0	0
<+90%	0	0	0	0	0
<+80%	0	0	0	0	0
<+70%	0	0	0	0	0
<+60%	0	0	0	0	0
<+50%	0	0	0	0	0

Change in Percentage Area	Rearing				
	Fall Run Chinook Salmon	Late-Fall Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+40%	1	0	2	2	2
<+30%	0	1	1	1	1
<+20%	1	1	2	1	2
<+10%	0	0	0	0	0
0%	433	579	717	500	863
>-10%	0	0	0	0	0
>-20%	1	2	5	5	5
>-30%	2	1	3	2	3
>-40%	0	0	0	0	0
>-50%	0	0	0	0	0
>-60%	0	0	0	0	0
>-70%	0	0	0	0	0
>-80%	0	0	0	0	0
>-90%	0	0	0	0	0
>=-100%	0	0	0	0	0
Proportion of Spawning Habitat Available (%)	Spawning				
	Fall-Run Chinook Salmon	Late Fall–Run Chinook Salmon	Winter-Run Chinook Salmon	Spring-Run Chinook Salmon	Steelhead
<+100%	208	209	292	214	352
<+90%	11	10	0	5	13
<+80%	0	0	0	0	0
<+70%	0	0	0	0	0
<+60%	0	0	0	0	0
<+50%	0	0	0	0	0
<+40%	0	0	0	0	0
<+30%	0	0	0	0	0
<+20%	0	0	0	0	0
<+10%	0	0	0	0	0
0%	0	0	0	0	0

Table K.2C-19. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Red Bluff for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2C, 1922–1993 Simulation (2020 Operations)

	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	388	397	432	216	532	486	859	648	573	146	715	504	469	211	859	576	468	328	859	432
0.90	23	18	0	0	23	67	5	0	3	170	5	0	15	73	5	0	21	74	5	0
0.80	7	2	0	0	7	6	0	0	0	52	0	0	6	23	0	0	7	34	0	0
0.70	1	1	0	0	1	1	0	0	0	19	0	0	1	8	0	0	0	30	0	0
0.60	5	2	0	0	5	2	0	0	0	10	0	0	5	8	0	0	3	15	0	0
0.50	1	3	0	0	1	4	0	0	0	8	0	0	1	8	0	0	3	5	0	0
0.40	3	1	0	0	3	2	0	0	0	2	0	0	3	2	0	0	1	8	0	0
0.30	2	1	0	0	2	1	0	0	0	3	0	0	2	2	0	0	0	3	0	0
0.20	2	1	0	0	2	1	0	0	0	0	0	0	2	1	0	0	1	2	0	0
0.10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.00	0	6	0	0	0	6	0	0	0	22	0	0	0	24	0	0	0	5	0	0

Frequency of Change in Index

	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning /Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
<+0.1	6	5	0	0	6	5	0	0	3	48	0	0	8	31	0	0	4	7	1	0
0	416	419	432	216	560	563	863	648	572	354	719	504	488	300	863	576	496	488	862	432
>-0.1	10	8	0	0	10	8	1	0	1	28	1	0	8	28	1	0	4	7	1	0
>-0.2	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0

Base Index	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
>-0.30	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2C-20. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the American River at Sunrise for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2C, 1922–1993 Simulation (2020 Operations)

Base Index	Fall-Run Chinook Salmon				Steelhead			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	169	303	406	174	360	278	732	390
0.90	34	34	22	26	54	28	119	26
0.80	3	27	4	11	8	8	9	11
0.70	28	14	0	5	6	8	0	5
0.60	52	7	0	0	40	7	2	0
0.50	35	9	0	0	14	5	1	0
0.40	30	5	0	0	10	4	0	0
0.30	33	4	0	0	7	4	1	0
0.20	17	7	0	0	1	4	0	0
0.10	13	0	0	0	2	4	0	0
0.00	18	22	0	0	2	154	0	0

Frequency of Change in Index

	Fall-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+1.0	0	0	0	0	0	0	0	0
<+0.9	0	0	0	0	0	0	0	0
<+0.8	0	0	0	0	0	0	0	0
<+0.7	0	0	0	0	0	0	0	0
<+0.6	0	0	0	0	0	0	0	0
<+0.5	0	0	0	0	0	0	0	0
<+0.4	0	0	0	0	0	0	0	0
<+0.3	1	1	0	0	0	0	0	0
<+0.2	6	3	0	1	1	0	0	1
<+0.1	52	18	5	5	17	6	15	5
0	331	377	422	200	455	490	835	416
>-0.1	41	26	5	10	31	8	13	10
>-0.2	1	6	0	0	0	0	1	0
>-0.3	0	1	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0
>-0.5	0	0	0	0	0	0	0	0
>-0.6	0	0	0	0	0	0	0	0
>-0.7	0	0	0	0	0	0	0	0
>-0.8	0	0	0	0	0	0	0	0
>-0.9	0	0	0	0	0	0	0	0
>=-1.0	0	0	0	0	0	0	0	0

Table K.2C-21. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Feather River below Thermalito for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2C, 1922–1993 Simulation (2020 Operations)

	Fall-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	173	345	419	175	144	141	752	572	370	271	748	391
0.90	47	17	8	33	47	9	54	3	55	26	75	33
0.80	17	8	4	3	42	5	28	0	22	14	20	3
0.70	26	6	1	3	50	6	9	1	16	10	9	3
0.60	32	13	0	2	54	12	6	0	25	6	8	2
0.50	31	8	0	0	47	8	3	0	12	10	1	0
0.40	23	4	0	0	27	5	7	0	1	2	1	0
0.30	14	10	0	0	16	10	1	0	1	2	1	0
0.20	8	4	0	0	11	4	1	0	1	5	1	0
0.10	11	1	0	0	11	1	0	0	0	4	0	0
0.00	50	16	0	0	55	159	3	0	1	154	0	0

Frequency of Change in Index

	Fall-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.6	0	0	0	0	0	0	0	0	0	0	0	0
<+0.5	0	0	0	0	0	0	0	0	0	0	0	0
<+0.4	0	0	0	0	0	0	2	0	0	0	0	0
<+0.3	5	0	0	0	6	0	0	0	0	0	1	0
<+0.2	11	1	1	1	12	1	5	0	1	0	2	1
<+0.1	65	11	2	4	65	9	36	1	14	6	35	4
0	313	408	428	208	379	338	805	575	474	494	812	424
>-0.1	32	9	1	3	35	9	12	0	14	3	11	3
>-0.2	3	1	0	0	4	1	1	0	1	0	3	0

	Fall-Run Chinook Salmon				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
>-0.3	1	0	0	0	1	0	3	0	0	0	0	0
>-0.4	1	2	0	0	1	2	0	0	0	1	0	0
>-0.5	1	0	0	0	1	0	0	0	0	0	0	0
>-0.6	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2C-22. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Trinity River at Lewiston for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2C, 1922–1993 Simulation (2020 Operations)

	Coho Salmon			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	278	288	864	288
0.90	6	0	0	0
0.80	1	0	0	0
0.70	3	0	0	0
0.60	0	0	0	0
0.50	0	0	0	0
0.40	0	0	0	0
0.30	0	0	0	0
0.20	0	0	0	0
0.10	0	0	0	0
0.00	0	0	0	0

Frequency of Change in Index

Change in the Index	Coho Salmon			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0
<+0.3	0	0	0	0
<+0.2	1	0	0	0
<+0.1	1	0	1	0
0	285	288	863	288
>-0.1	1	0	0	0
>-0.2	0	0	0	0
>-0.3	0	0	0	0
>-0.4	0	0	0	0

Table K.2C-23. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Bend Bridge for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2C, 1922–1993 Simulation (2020 Operations)

	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	398	403	432	216	542	526	860	648	576	291	716	504	481	264	860	576	473	381	860	432
0.90	17	13	0	0	17	32	4	0	0	98	4	0	7	49	4	0	18	87	4	0
0.80	4	1	0	0	4	1	0	0	0	12	0	0	3	9	0	0	5	19	0	0
0.70	1	1	0	0	1	2	0	0	0	5	0	0	1	4	0	0	1	12	0	0
0.60	4	3	0	0	4	4	0	0	0	3	0	0	4	4	0	0	3	1	0	0
0.50	4	2	0	0	4	2	0	0	0	1	0	0	4	3	0	0	2	1	0	0
0.40	1	2	0	0	1	2	0	0	0	0	0	0	1	2	0	0	1	0	0	0
0.30	3	1	0	0	3	1	0	0	0	0	0	0	3	1	0	0	1	2	0	0
0.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.10	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0
0.00	0	6	0	0	0	6	0	0	0	21	0	0	0	23	0	0	0	0	0	0

Frequency of Change in Index

	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Change in the Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.1	6	5	0	0	6	7	0	0	1	28	0	0	7	23	0	0	8	4	0	0
0	418	417	432	216	562	558	864	648	574	383	720	504	491	313	864	576	490	498	863	432
>-0.1	8	10	0	0	8	11	0	0	1	20	0	0	6	24	0	0	6	2	1	0
>-0.2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
>-0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table K.2C-24. Frequency of Water Temperature Survival Indices for Chinook Salmon and Steelhead Life Stages in the Sacramento River at Keswick for the No Action and Frequency of Change in the Water Temperature Survival Indices for Alternative 2C, 1922–1993 Simulation (2020 Operations)

	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
Base Index	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
1.00	407	408	432	216	551	552	864	648	576	410	720	504	490	318	864	576	479	499	864	432
0.90	11	6	0	0	11	6	0	0	0	1	0	0	2	6	0	0	14	4	0	0
0.80	4	4	0	0	4	4	0	0	0	4	0	0	2	6	0	0	4	0	0	0
0.70	2	1	0	0	2	1	0	0	0	2	0	0	2	2	0	0	0	1	0	0
0.60	7	2	0	0	7	2	0	0	0	1	0	0	7	3	0	0	6	0	0	0
0.50	1	2	0	0	1	2	0	0	0	0	0	0	1	2	0	0	1	0	0	0
0.40	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
0.30	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
0.20	0	1	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0	0
0.10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.00	0	6	0	0	0	6	0	0	0	13	0	0	0	19	0	0	0	0	0	0

Frequency of Change in Index

Change in the Index	Fall-Run Chinook Salmon				Fall/Late Fall–Run Chinook Salmon				Winter-Run Chinook				Spring-Run Chinook Salmon				Steelhead			
	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration	Adult Migration	Spawning/ Incubation	Juvenile Rearing	Smolt Migration
<+0.4	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
<+0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<+0.1	3	4	0	0	3	4	0	0	2	4	0	0	2	7	0	0	7	2	0	0
0	425	419	432	216	569	563	864	648	574	423	720	504	498	341	864	576	492	502	864	432
>-0.1	4	9	0	0	4	9	0	0	0	3	0	0	4	11	0	0	5	0	0	0
>-0.2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
>-0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>-0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

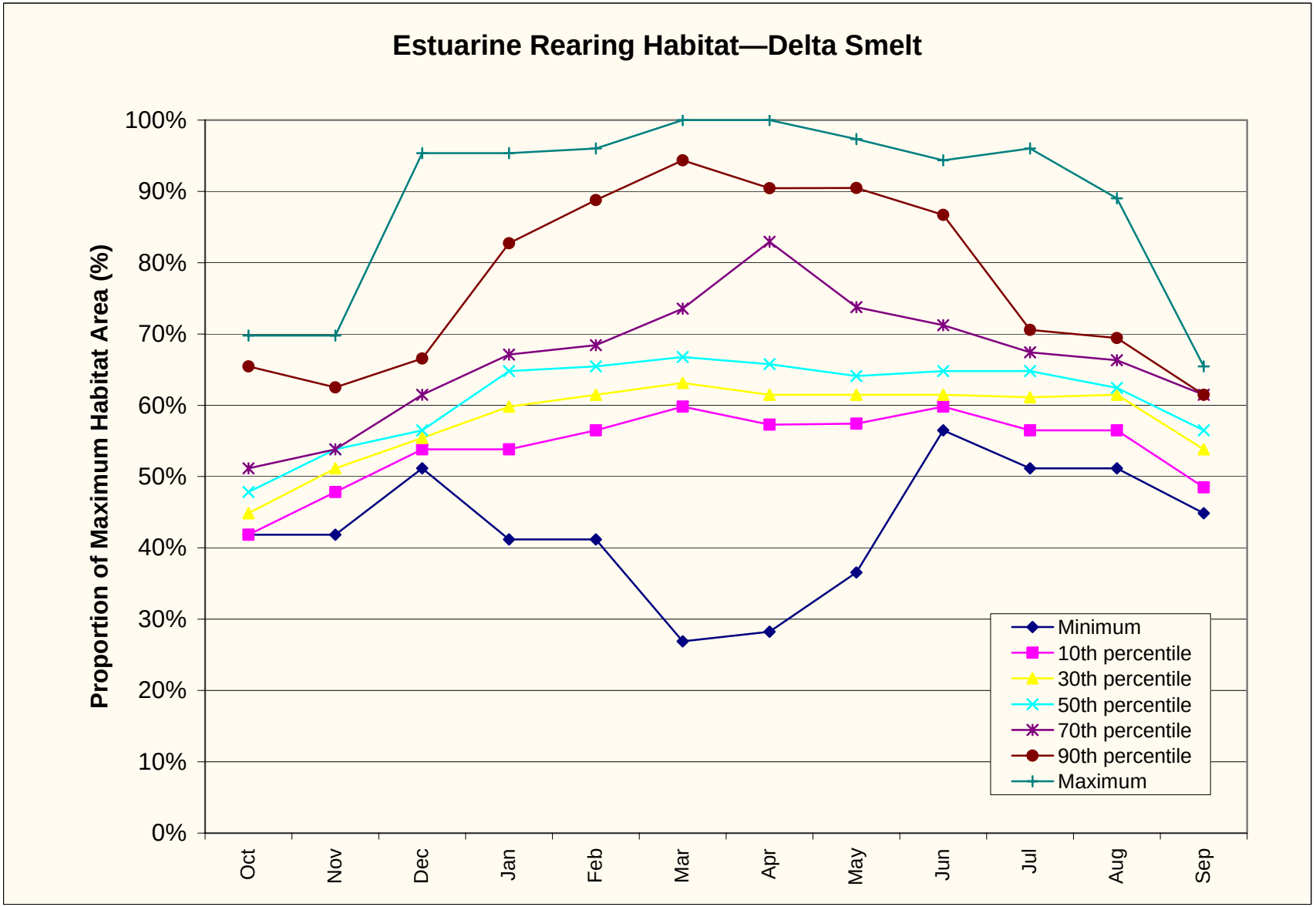

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Figure K.1-1

Occurrence of Estuarine Rearing Habitat Area (i.e., Proportion of Maximum Area) for Delta Smelt under Alternative 1, 1922–1994 Simulation (2020 Operations)

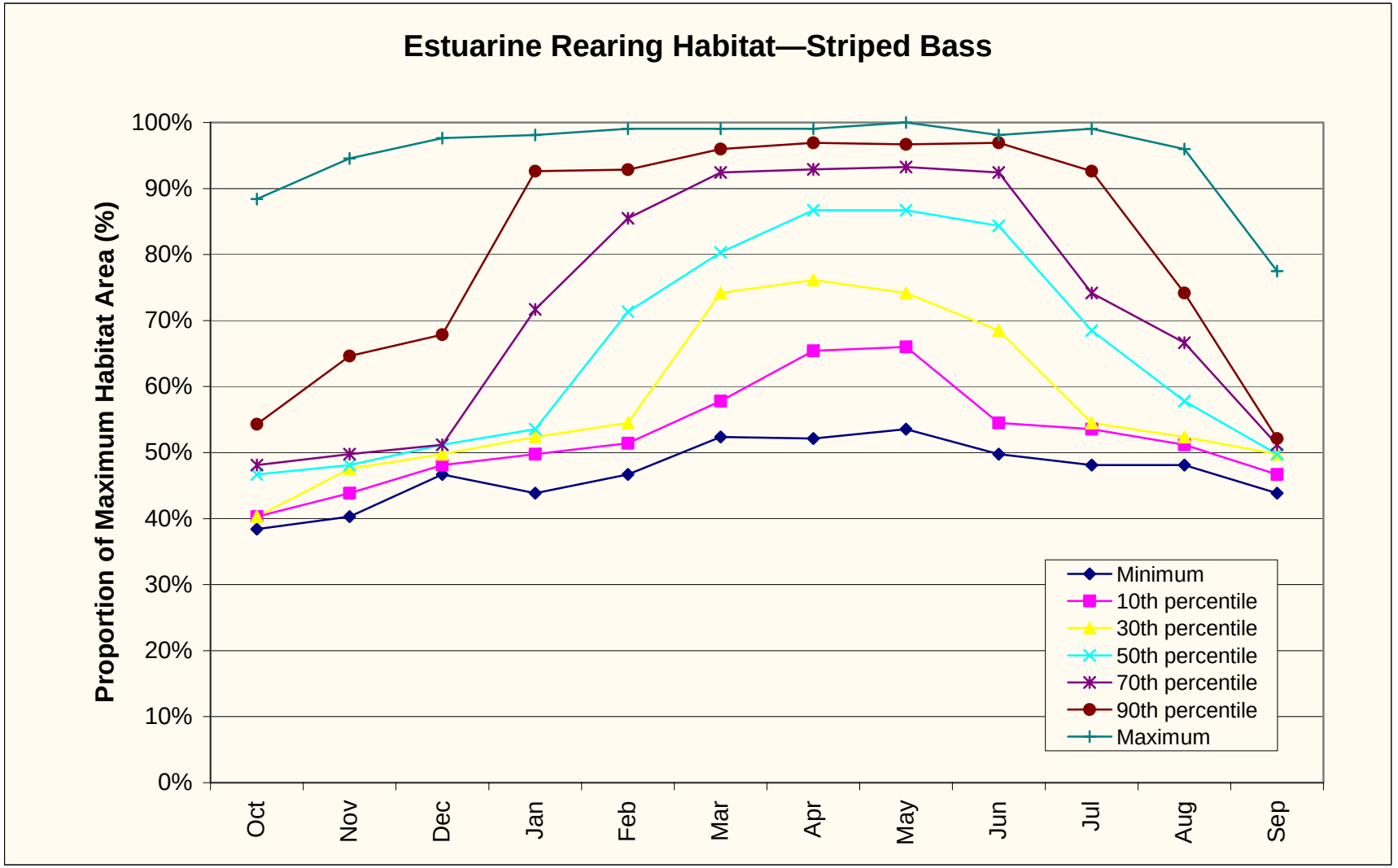

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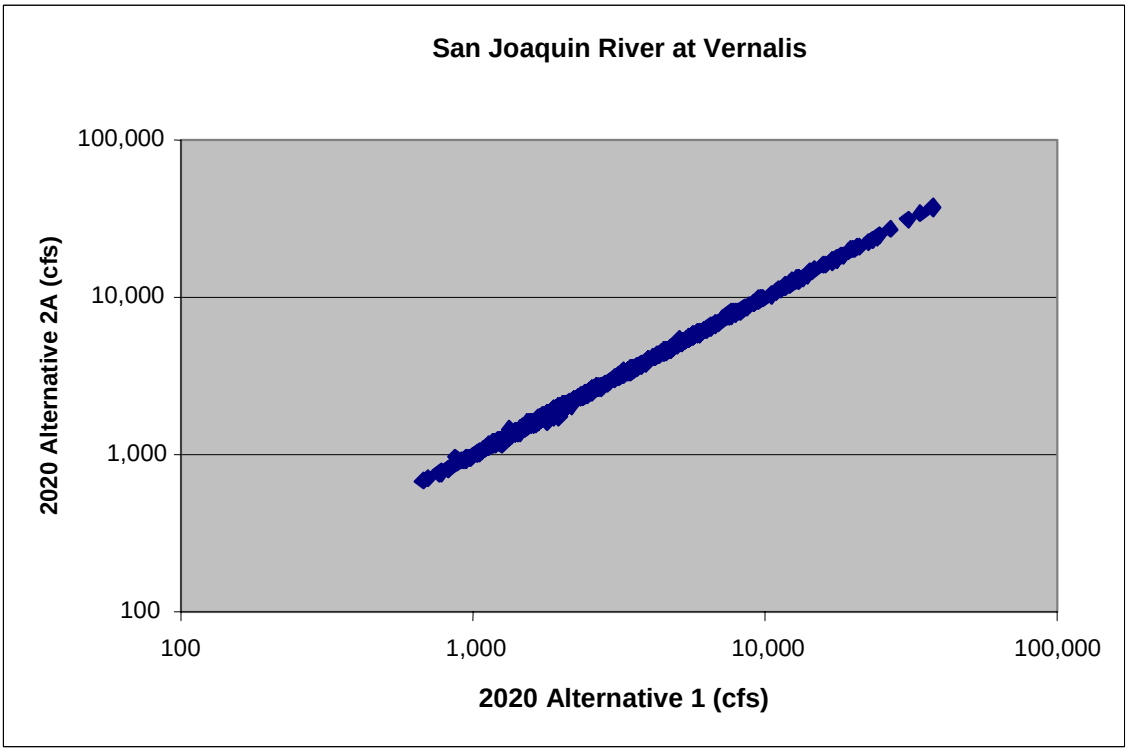
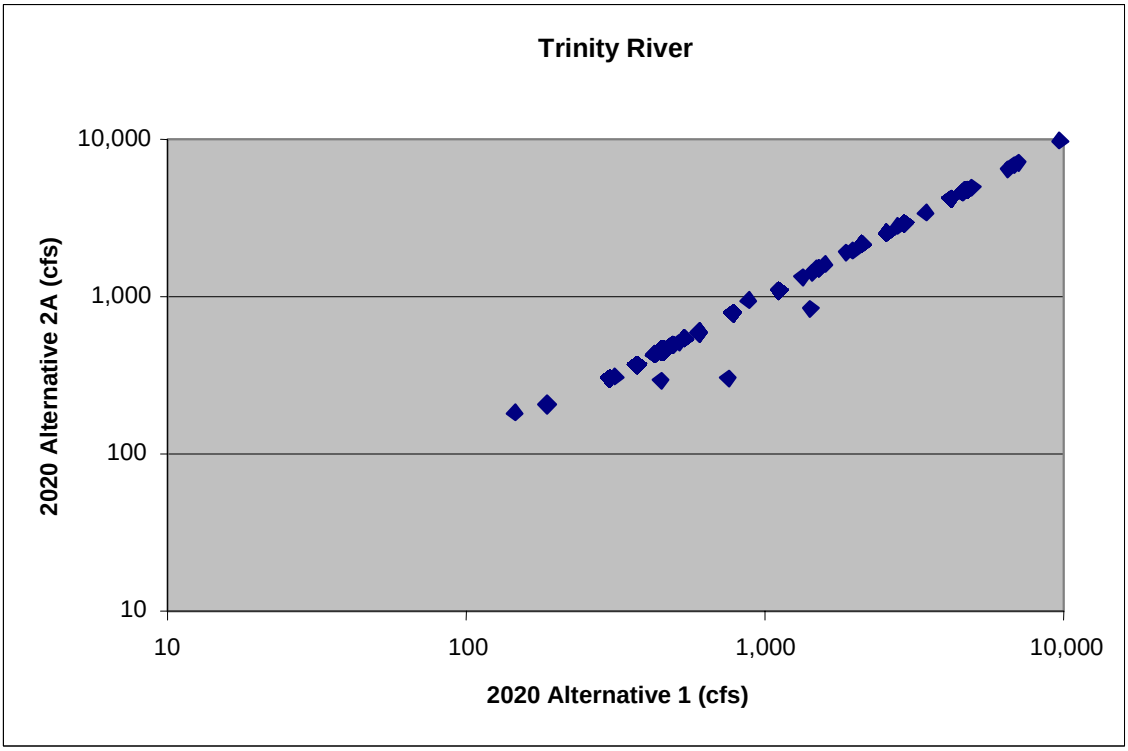
Figure K.1-2

Occurrence of Estuarine Rearing Habitat Area (i.e., Proportion of Maximum Area) for Striped Bass under Alternative 1, 1922–1994 Simulation (2020 Operations)





Note: Points that fall above the 45° diagonal indicate flows higher than Alternative 1. Points that fall below indicate flows lower than Alternative 1. Point on the diagonal line indicates that flows are the same as under Alternative 1.

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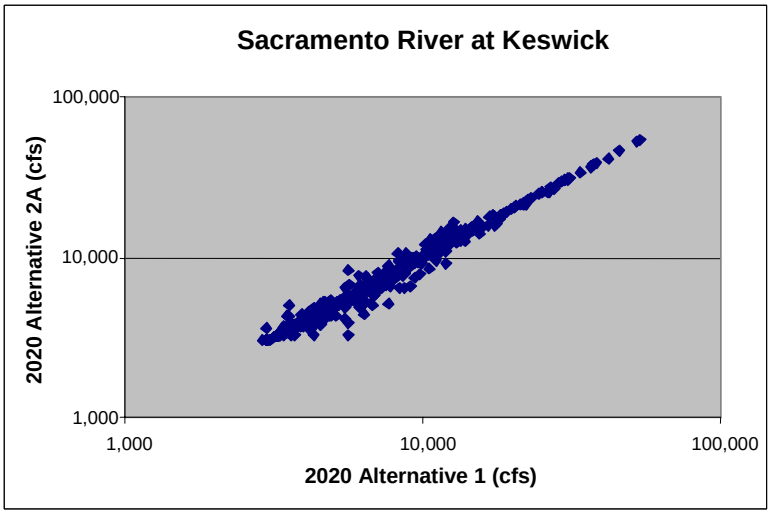
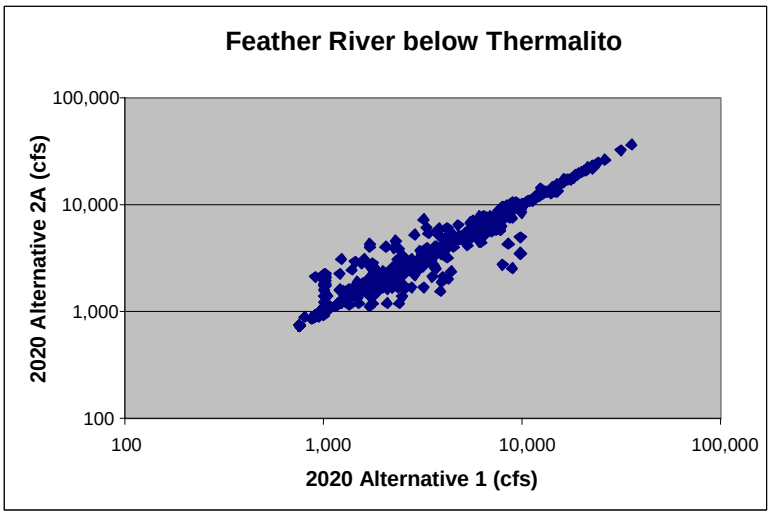
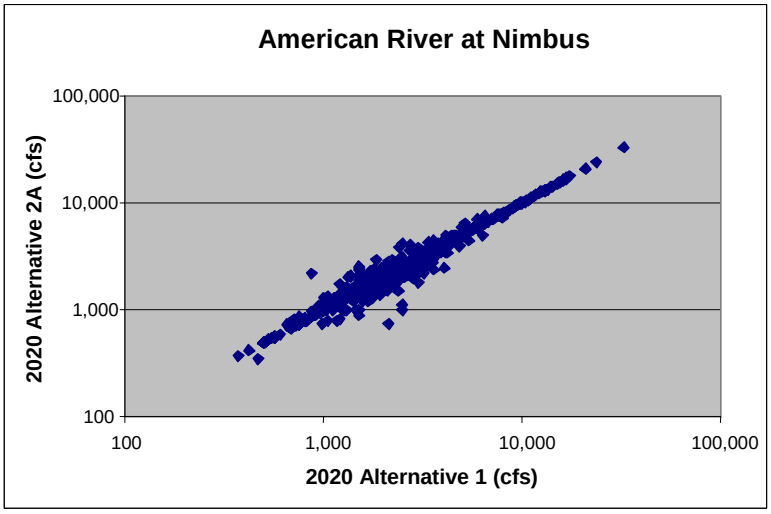
Figure K.2A-1

Comparison of Monthly Average Flow in the San Joaquin and Trinity Rivers under Alternative 1 and 2A, 1922–1994 Simulation (2020 Operations)







Note: Points that fall above the 45° diagonal indicate flows higher than Alternative 1. Points that fall below indicate flows lower than Alternative 1. Point on the diagonal line indicates that flows are the same as under Alternative 1.

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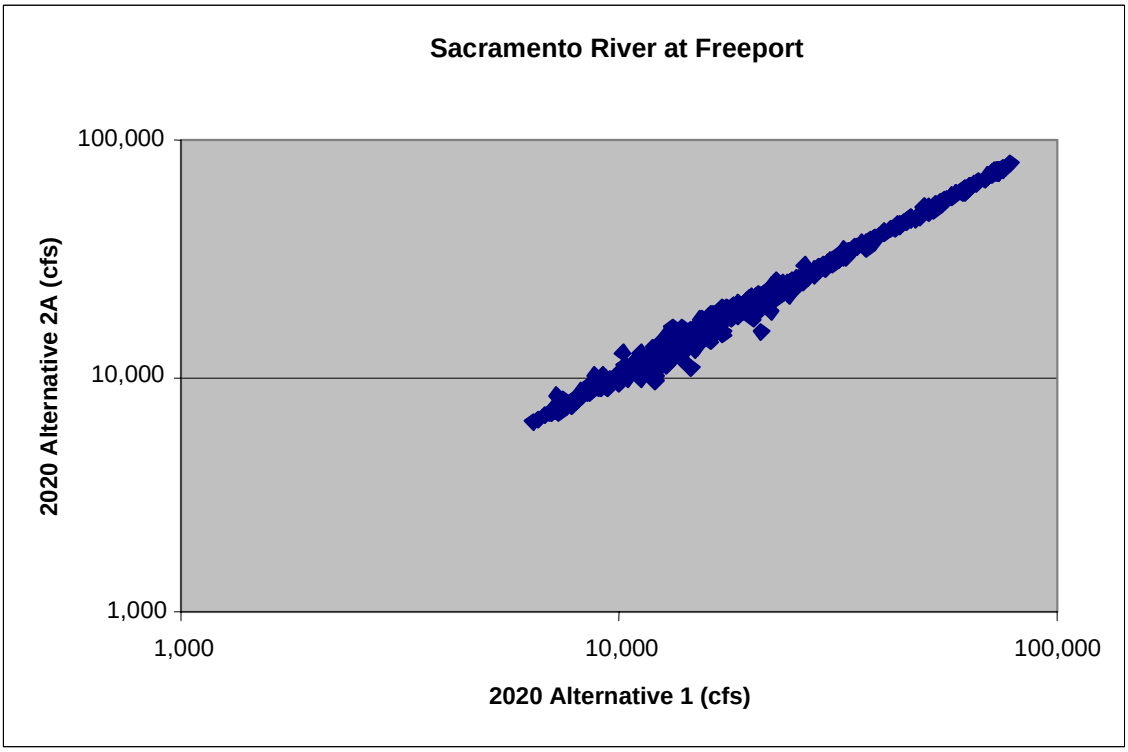
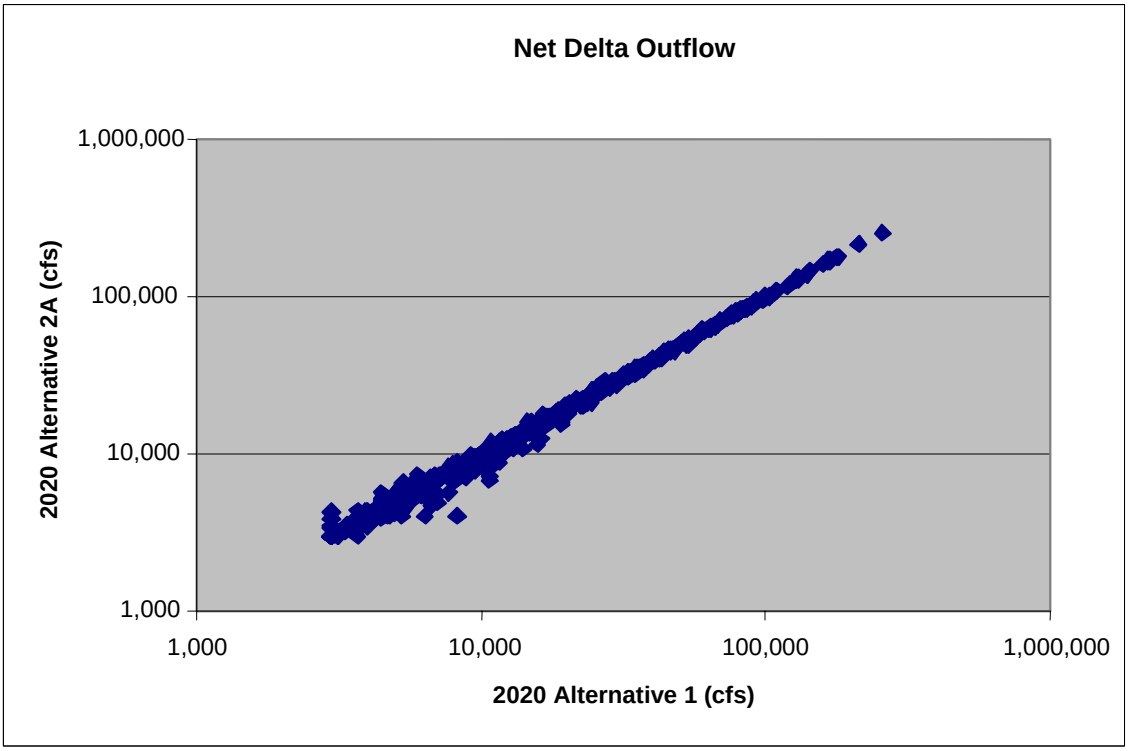
Figure K.2A-2

Comparison of Monthly Average Flow in the Sacramento, Feather, and American Rivers under Alternatives 1 and 2A, 1922–1994 Simulation (2020 Operations)





Note: Points that fall above the 45° diagonal indicate flows higher than Alternative 1. Points that fall below indicate flows lower than Alternative 1. Point on the diagonal line indicates that flows are the same as under Alternative 1.

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Figure K.2A-3

Comparison of Monthly Average Flow in the Sacramento River at Freeport and Monthly Average Delta Outflow under Alternatives 1 and 2A, 1922–1994 Simulation (2020 Operations)

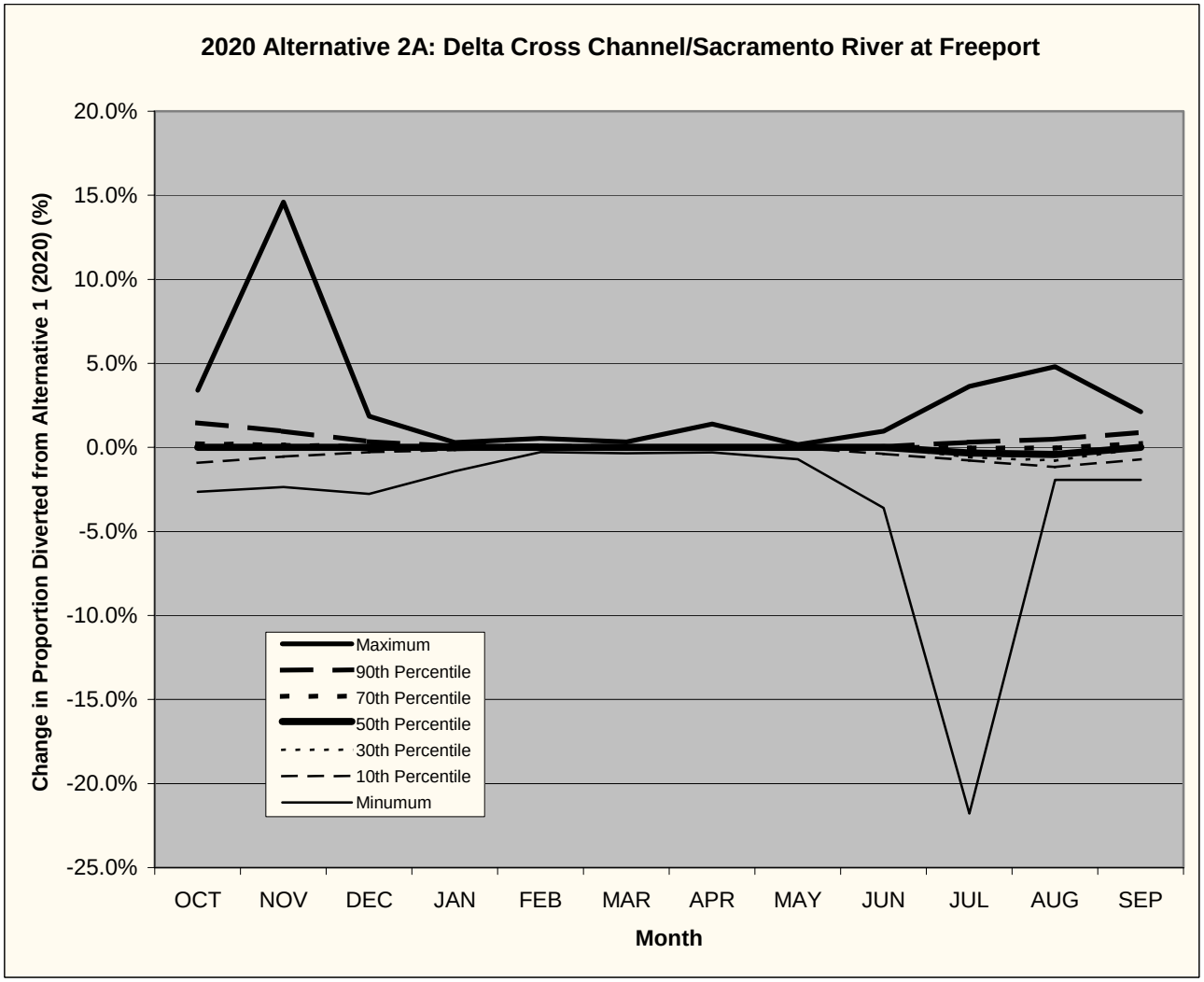

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Figure K.2A-4

Comparison of the Proportion of Sacramento River Flow Drawn into the Delta Cross Channel and Georgiana Slough under Alternatives 1 and 2A, 1922–1994 Simulation (2020 Operations)

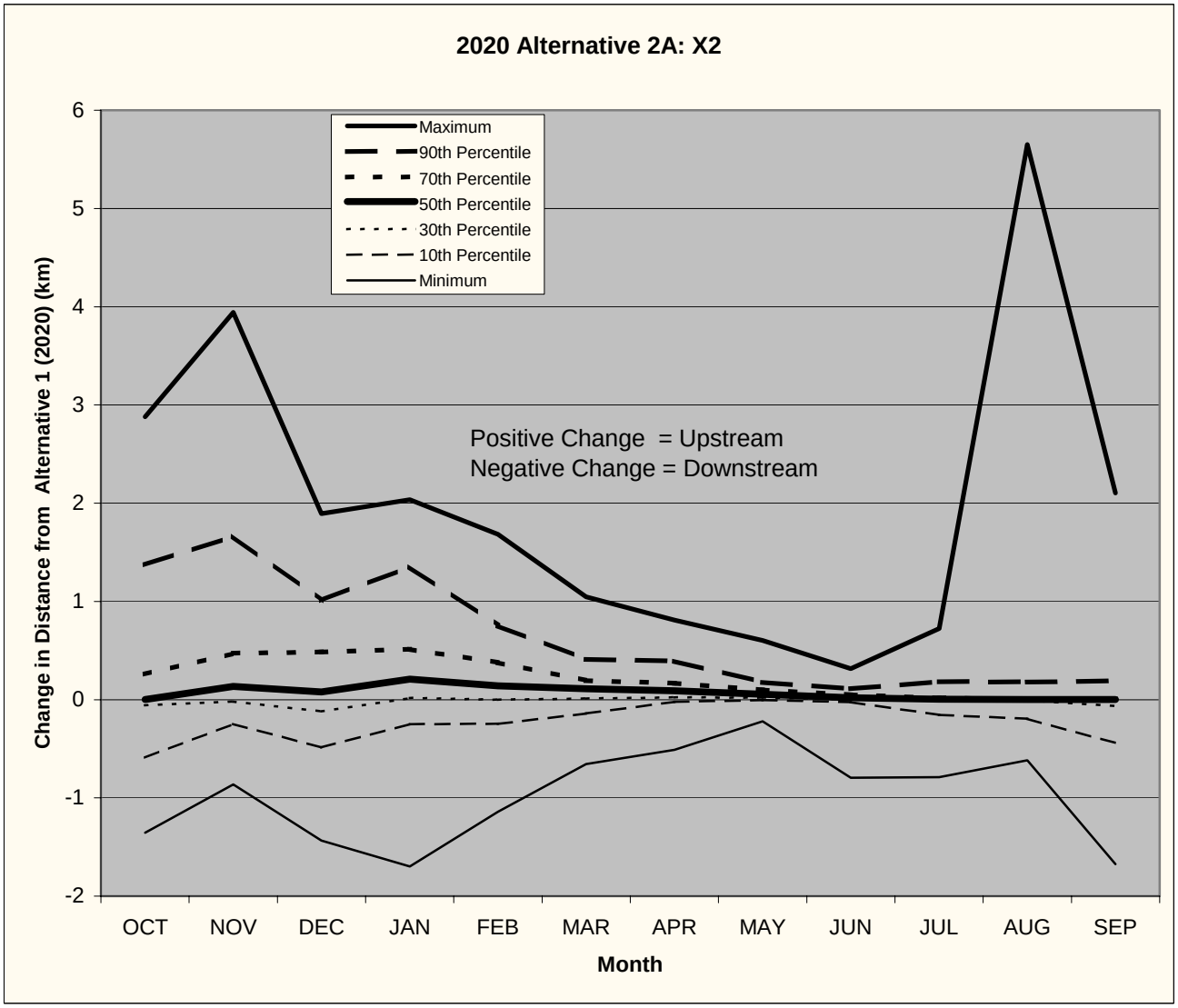

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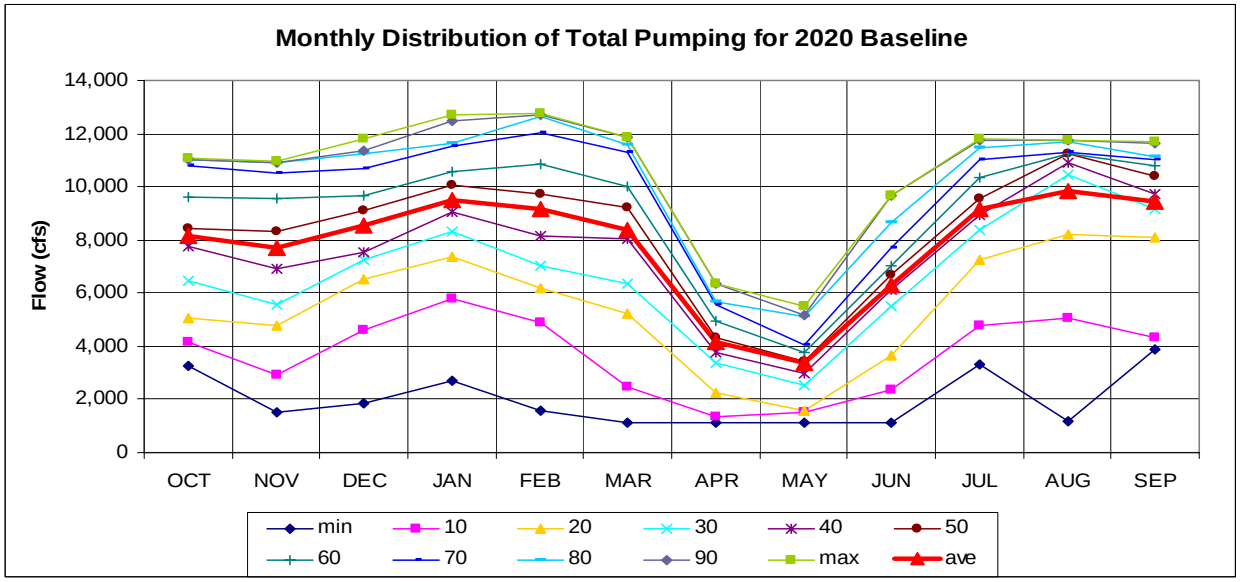
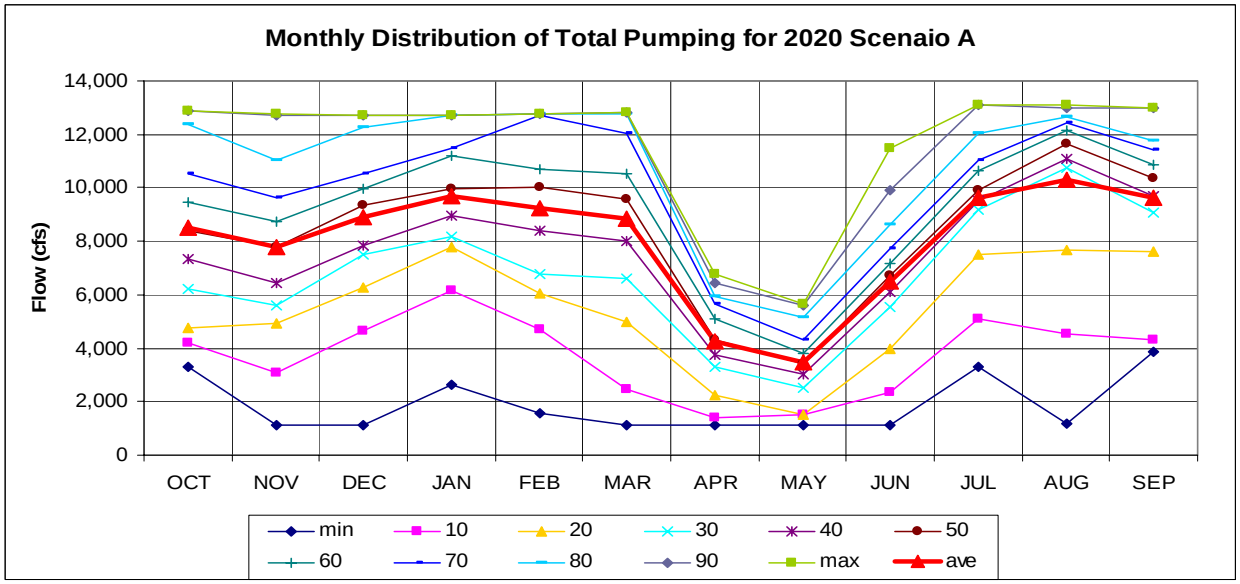
Figure K.2A-5

Comparison of X2 Location under Alternative 2A with X2 Location under Alternative 1, 1922–1994 Simulation (2020 Operations)





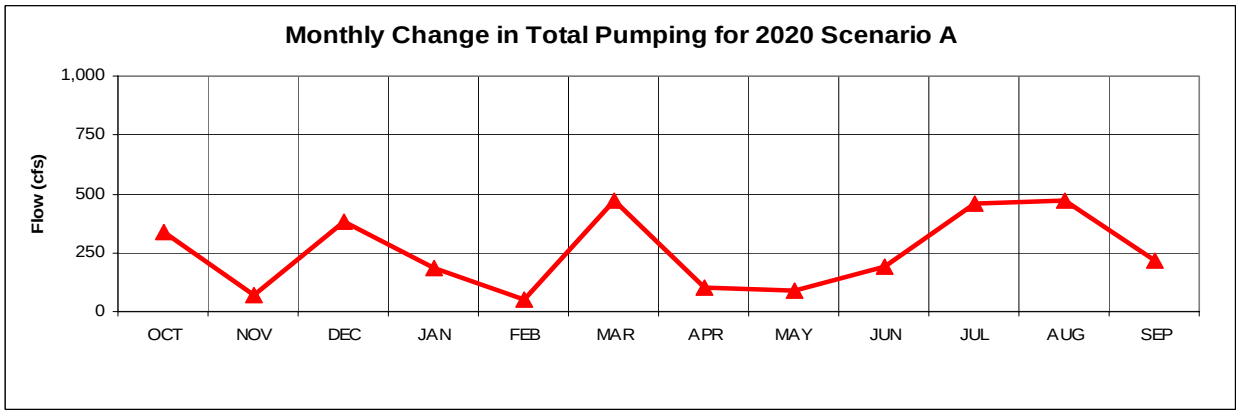


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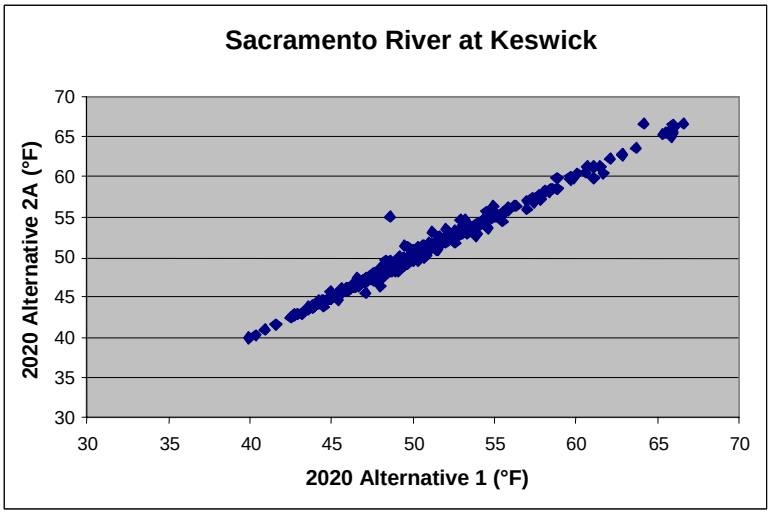
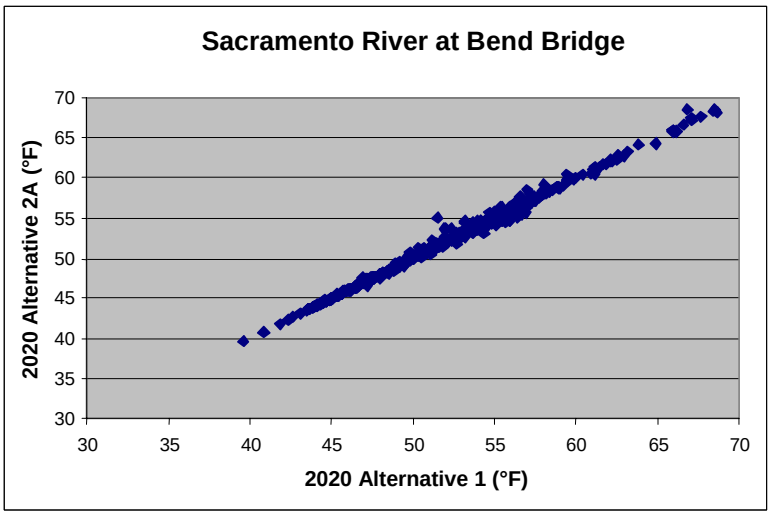
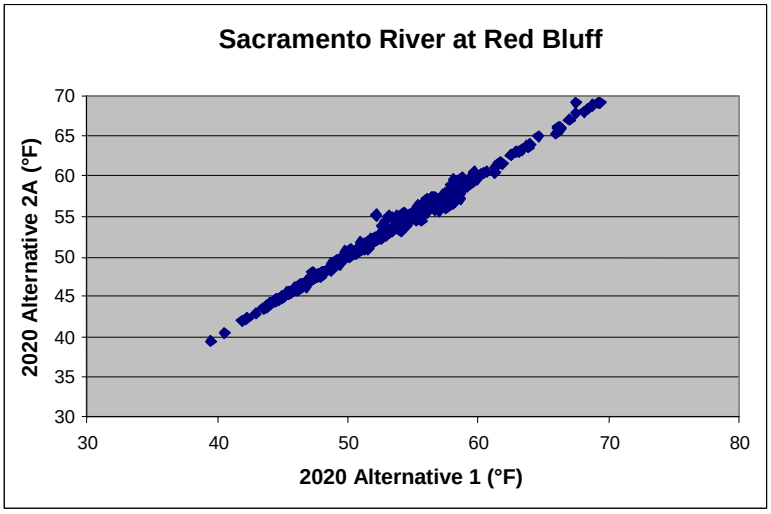
Figure K.2A-6

Comparison of Monthly Range (Percentiles) of Combined SWP and CVP Pumping under Alternative 2A with Pumping under Alternative 1, 1922–1994 Simulation (2020 Operations)







Note: Points that fall above the 45° diagonal indicate flows higher than Alternative 1. Points that fall below indicate flows lower than Alternative 1. Point on the diagonal line indicates that flows are the same as under Alternative 1.

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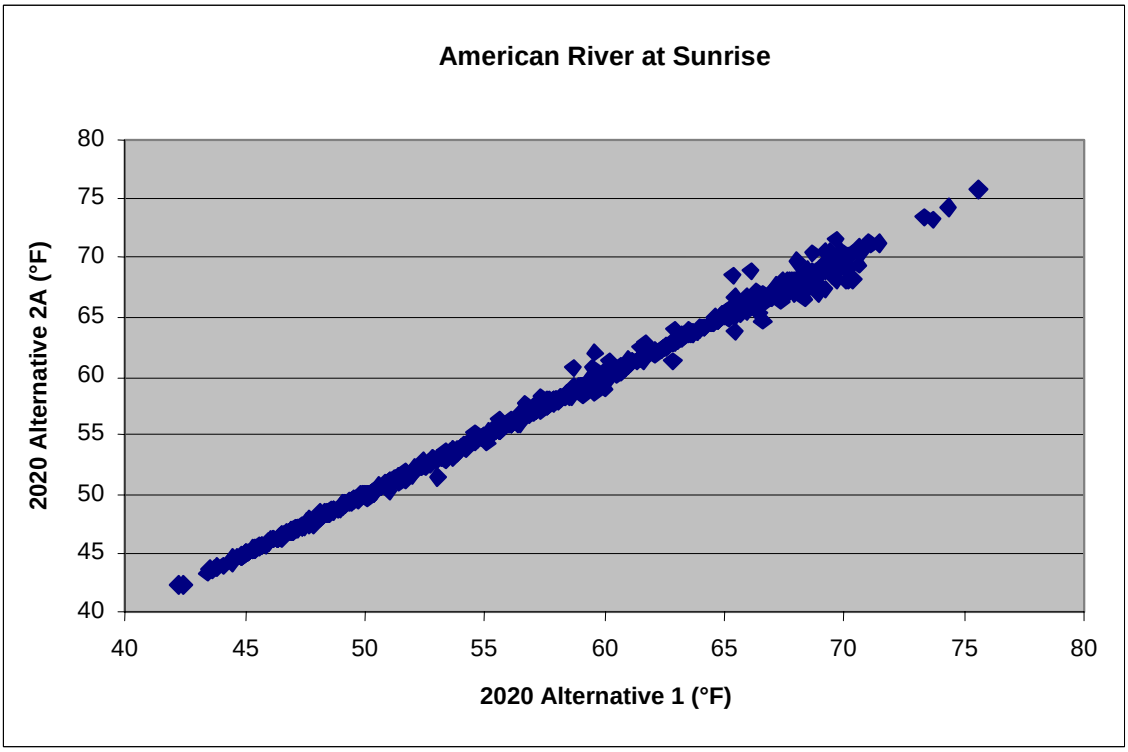
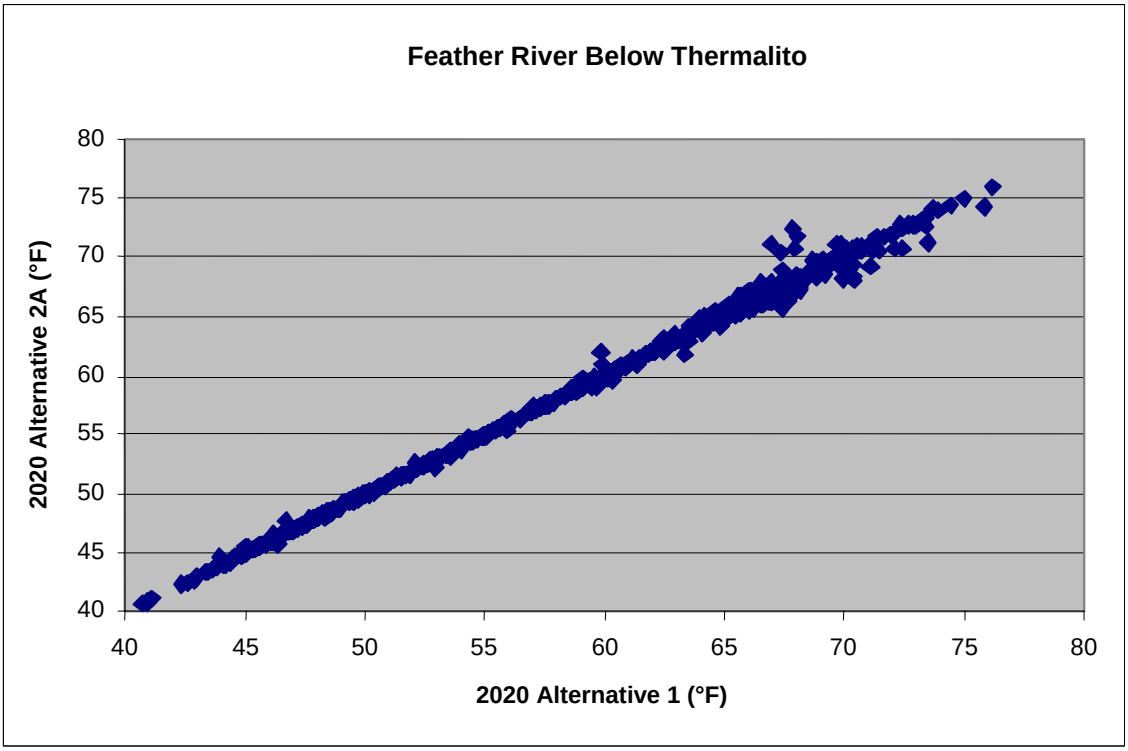
Figure K.2A-7

Comparison of Water Temperature under Alternative 2A at Keswick, Bend Bridge, and Red Bluff on the Sacramento River with Water Temperature under Alternative 1, 1922–1994 Simulation (2020 Operations)





Note: Points that fall above the 45° diagonal indicate flows higher than Alternative 1. Points that fall below indicate flows lower than Alternative 1. Point on the diagonal line indicates that flows are the same as under Alternative 1.

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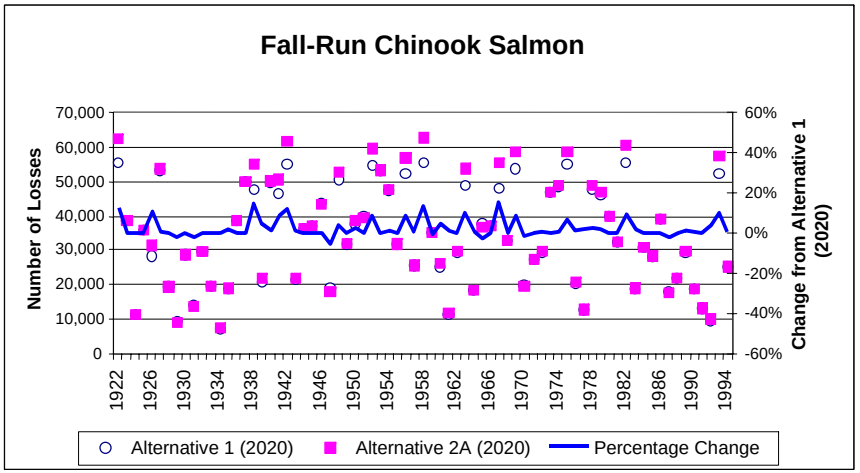
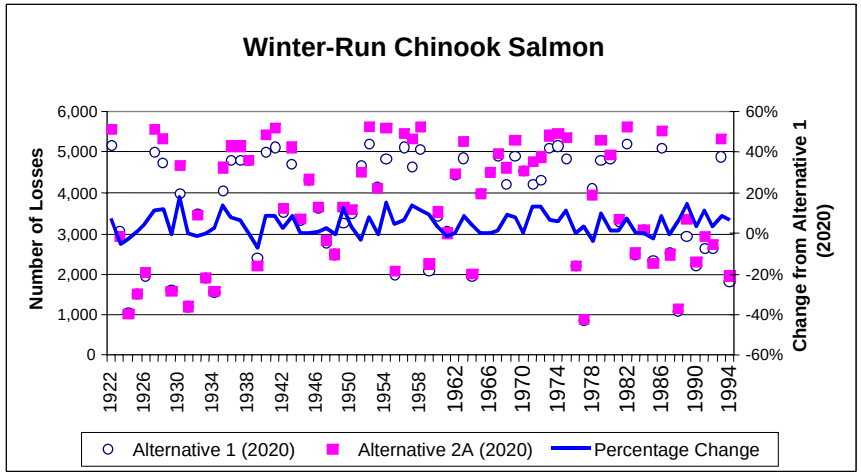
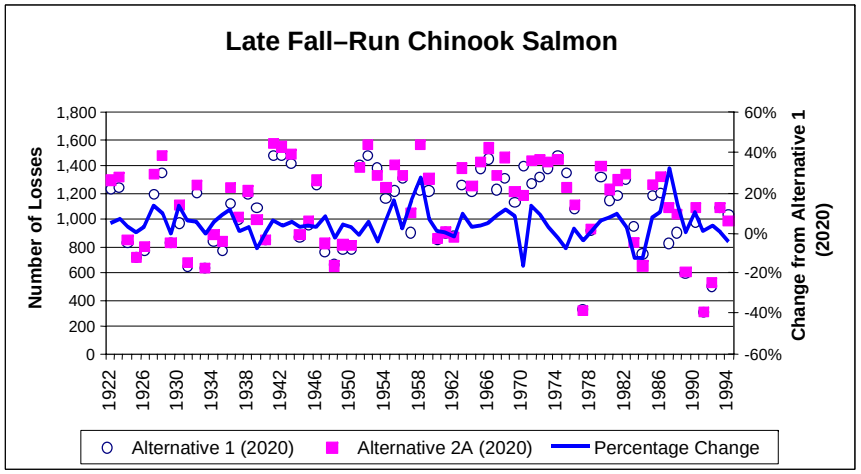
Figure K.2A-8

Comparison of Water Temperature under Alternative 2A on the Feather and American Rivers with Water Temperature under Alternative 1, 1922–1994 Simulation (2020 Operations)







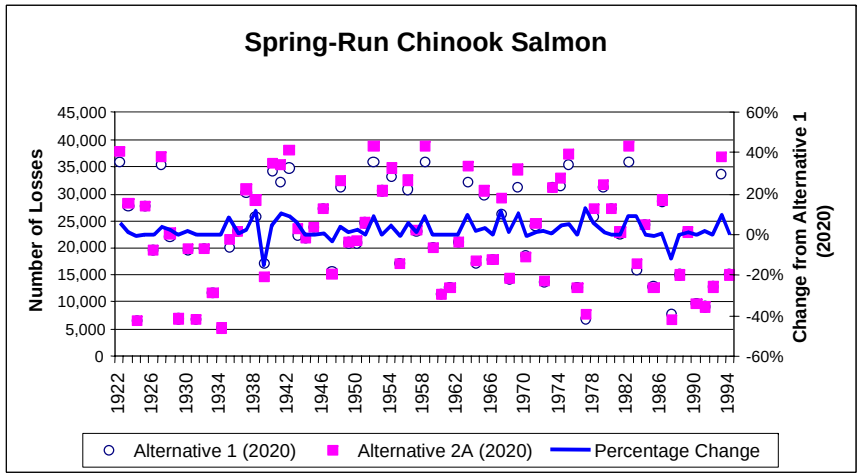


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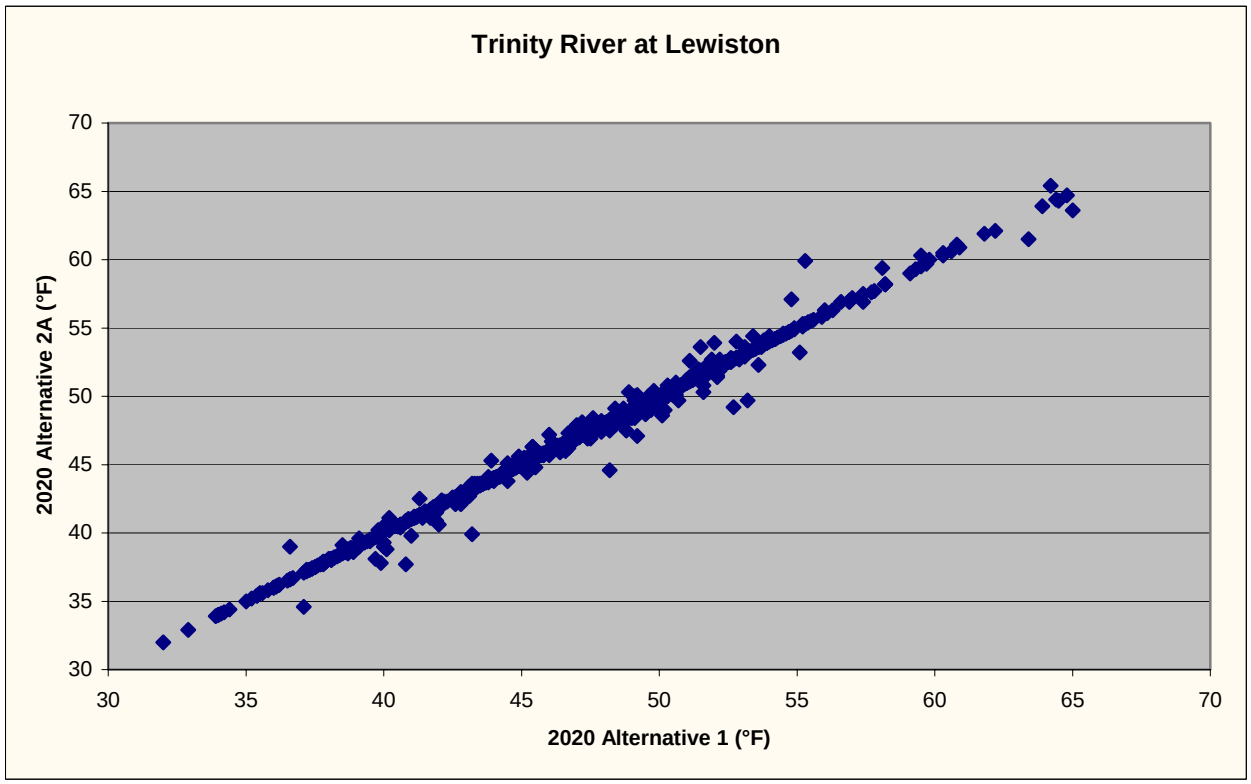
Figure K.2A-9

Simulated Entrainment Loss for Fall-, Late Fall–, Winter-, and Spring-Run Chinook Salmon under Alternatives 1 and 2A, 1922–1994 Simulation (2020 Operations)



Note: Points that fall above the 45° diagonal indicate flows higher than Alternative 1. Points that fall below indicate flows lower than Alternative 1. Point on the diagonal line indicates that flows are the same as under Alternative 1.

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Figure K.2A-10

Comparison of Water Temperature under Alternative 2A on the Trinity River with Water Temperature under Alternative 1, 1922–1994 Simulation (2020 Operations)

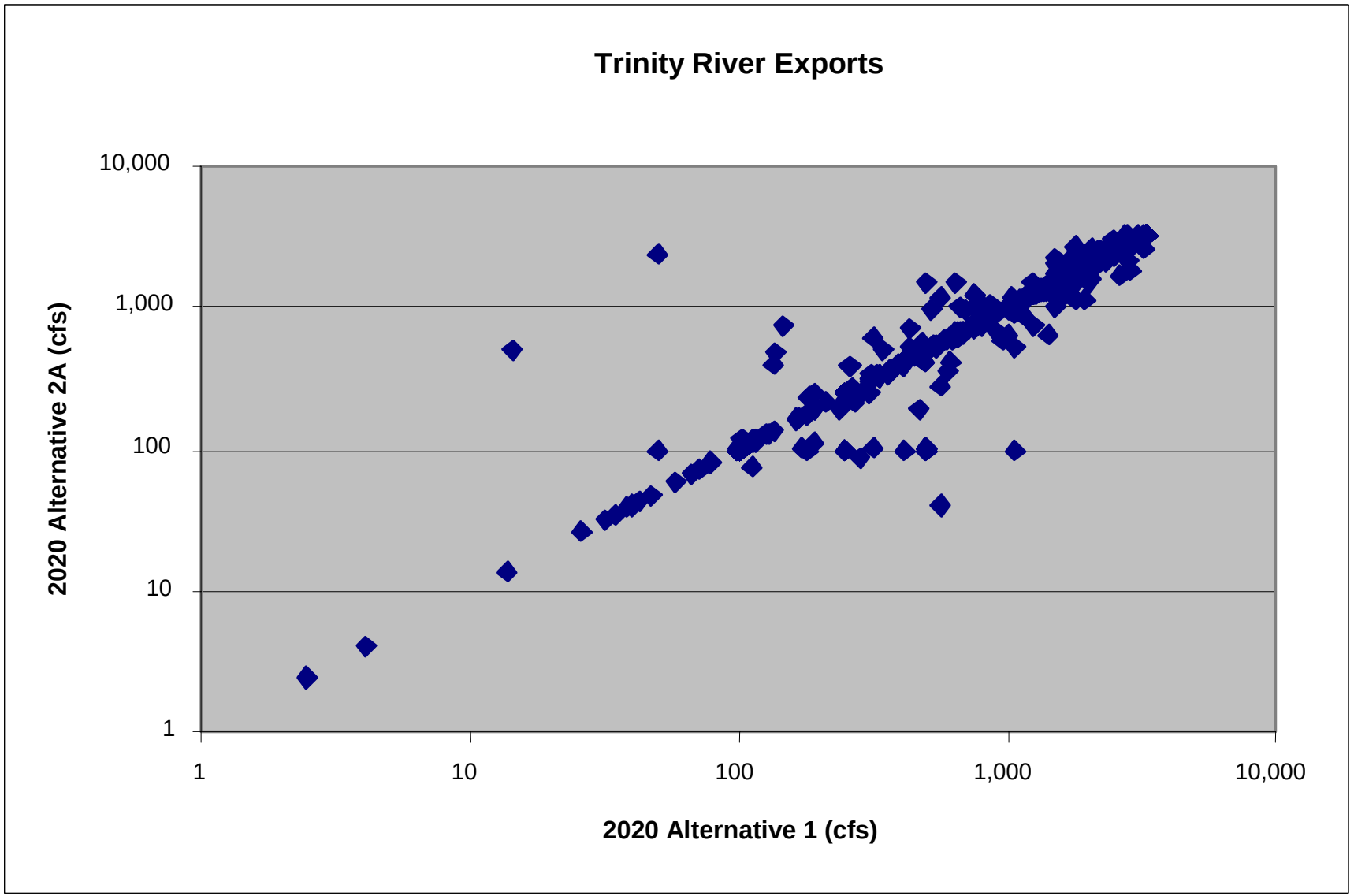

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Figure K.2A-11

Comparison of Water Exports from the Trinity River under Alternatives 2A with Exports under Alternative 1, 1922–1994 Simulation (2020 Operations)

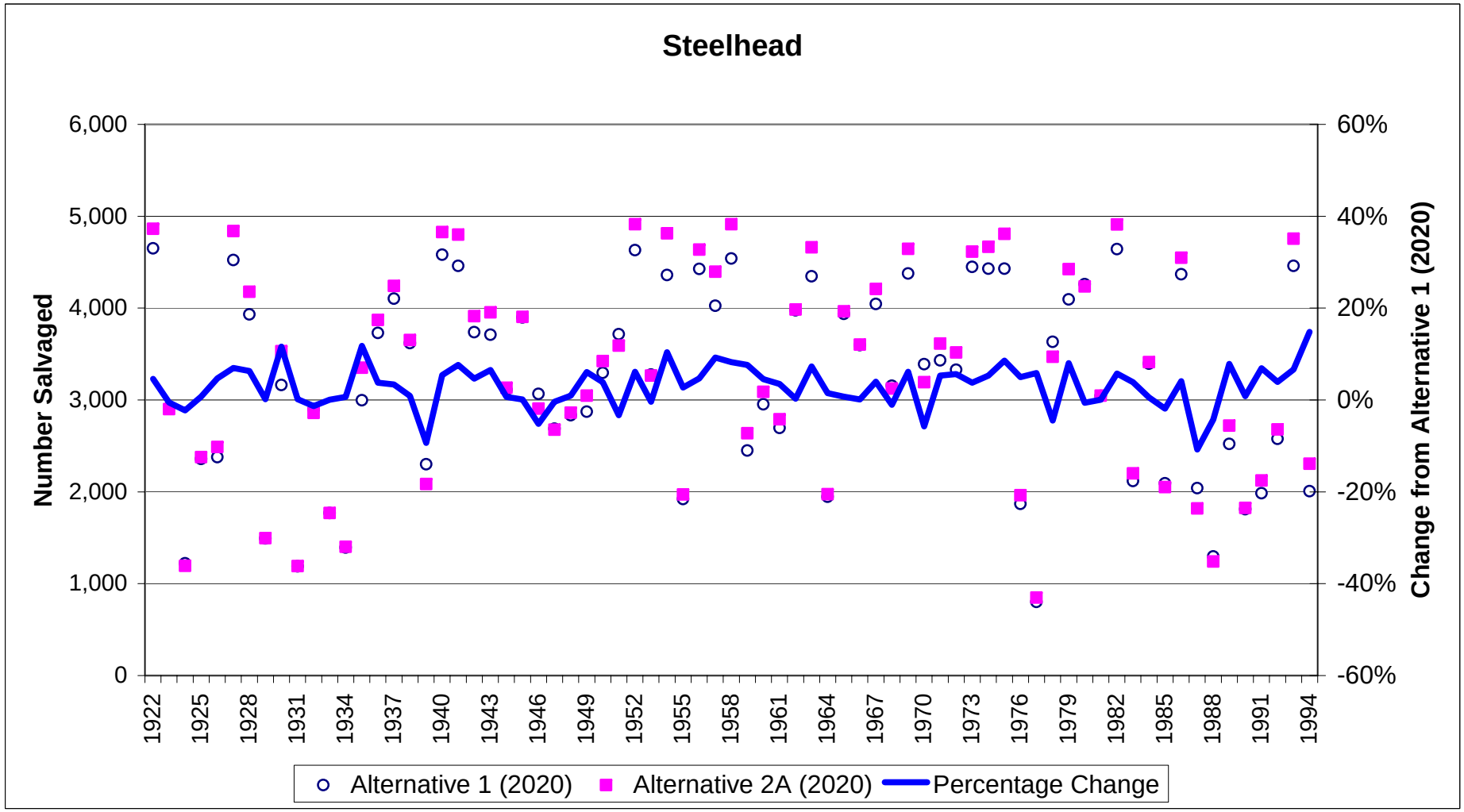

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Figure K.2A-12

Simulated Salvage Steelhead under Alternatives 1 and 2A, 1922–1994 Simulation (2020 Operations)

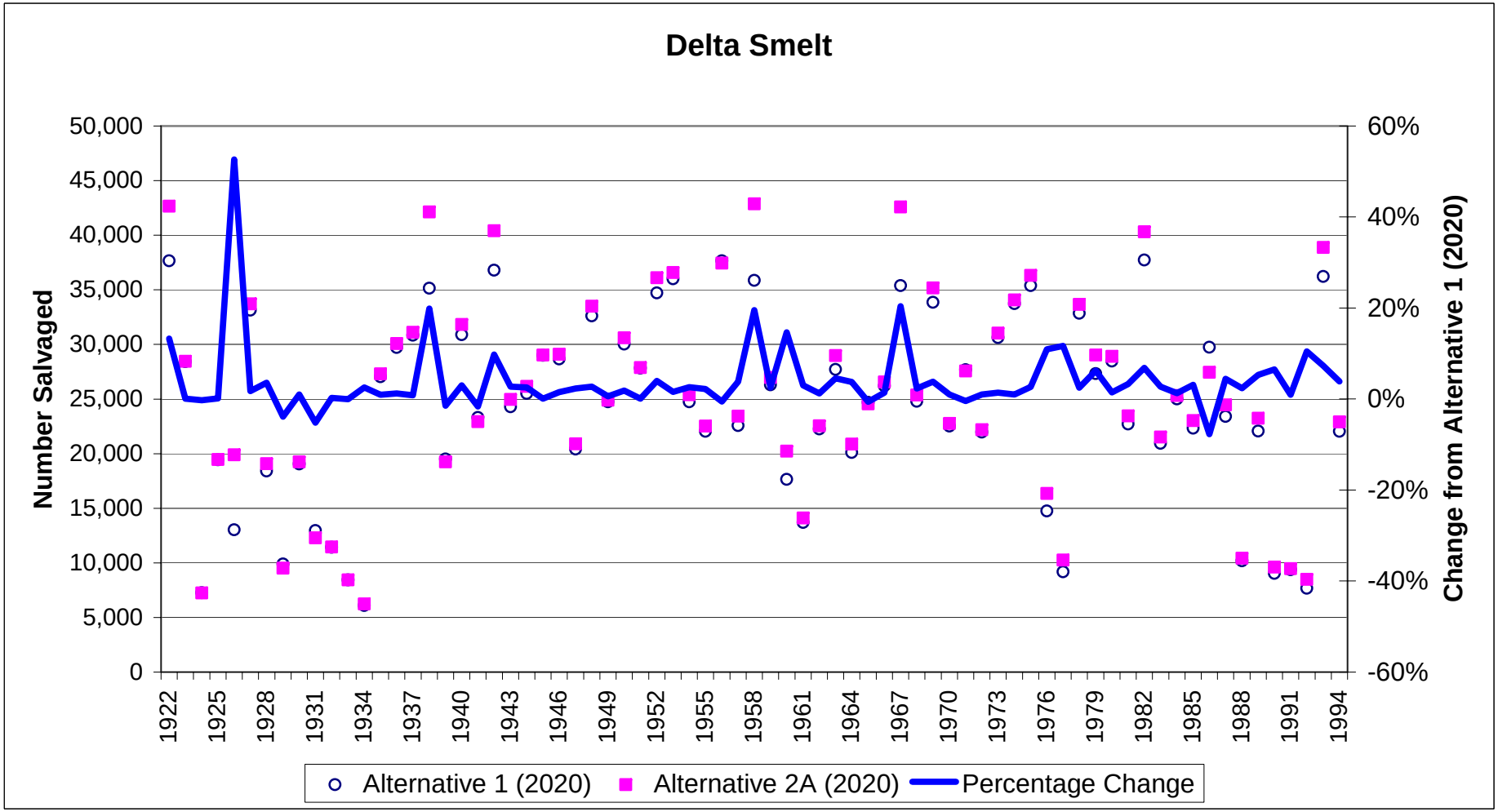

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Figure K.2A-13

Simulated Salvage for Delta Smelt under Alternatives 1 and 2A, 1922–1994 Simulation (2020 Operations)

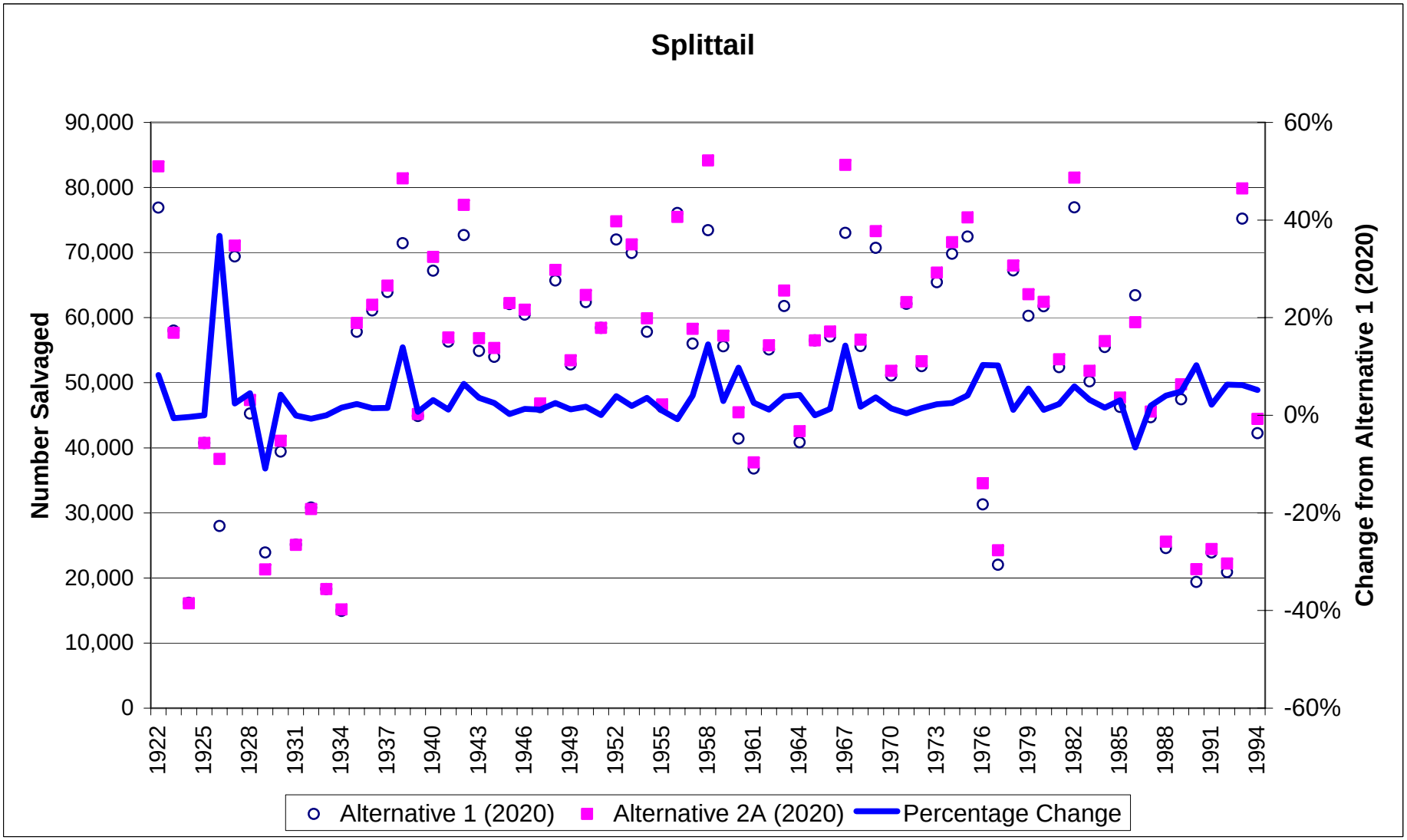

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Figure K.2A-14

Simulated Salvage for Splittail under Alternatives 1 and 2A, 1922–1994 Simulation (2020 Operations)

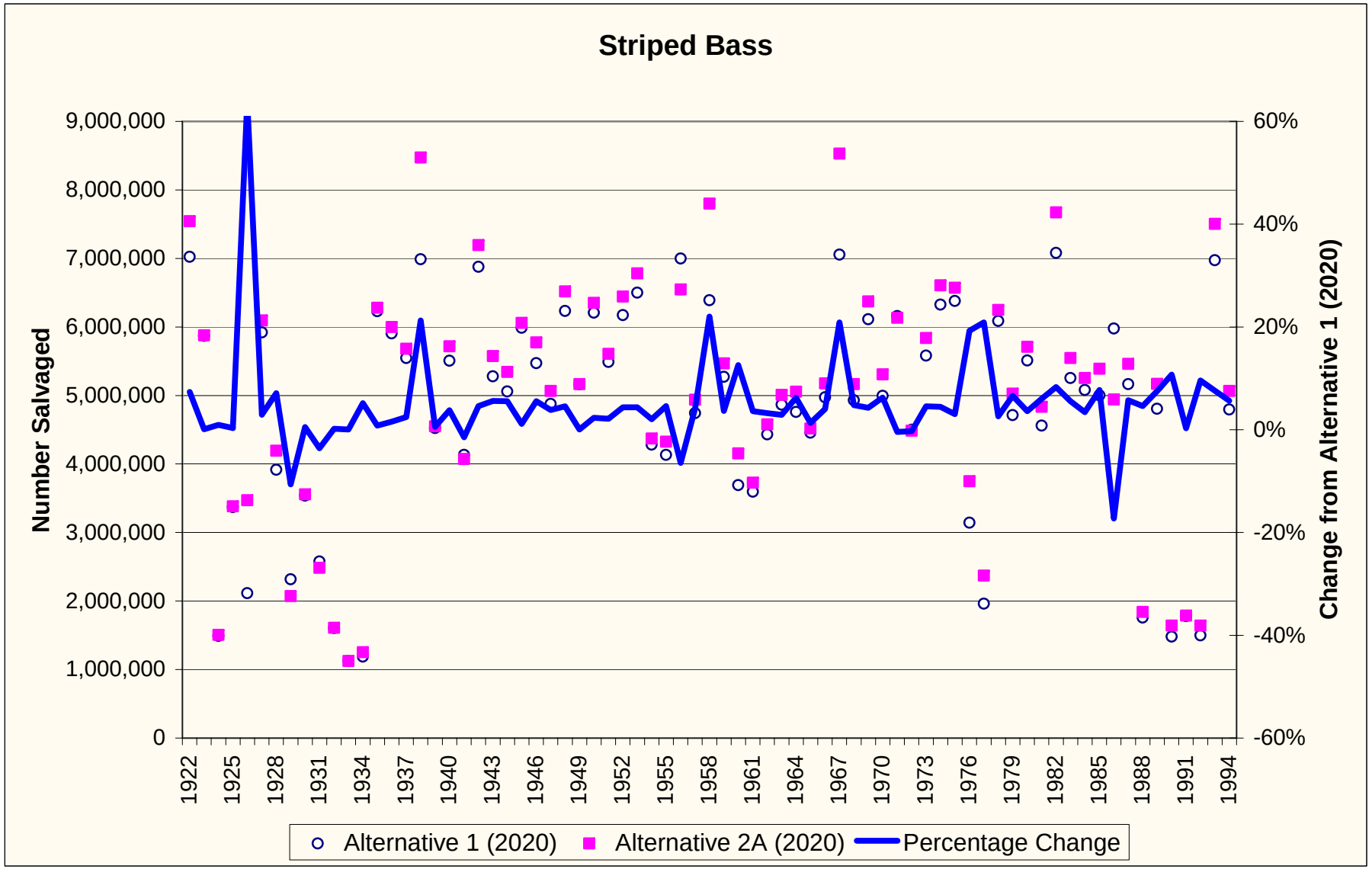

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Figure K.2A-15

Simulated Salvage for Striped Bass under Alternatives 1 and 2A, 1922–1994 Simulation (2020 Operations)

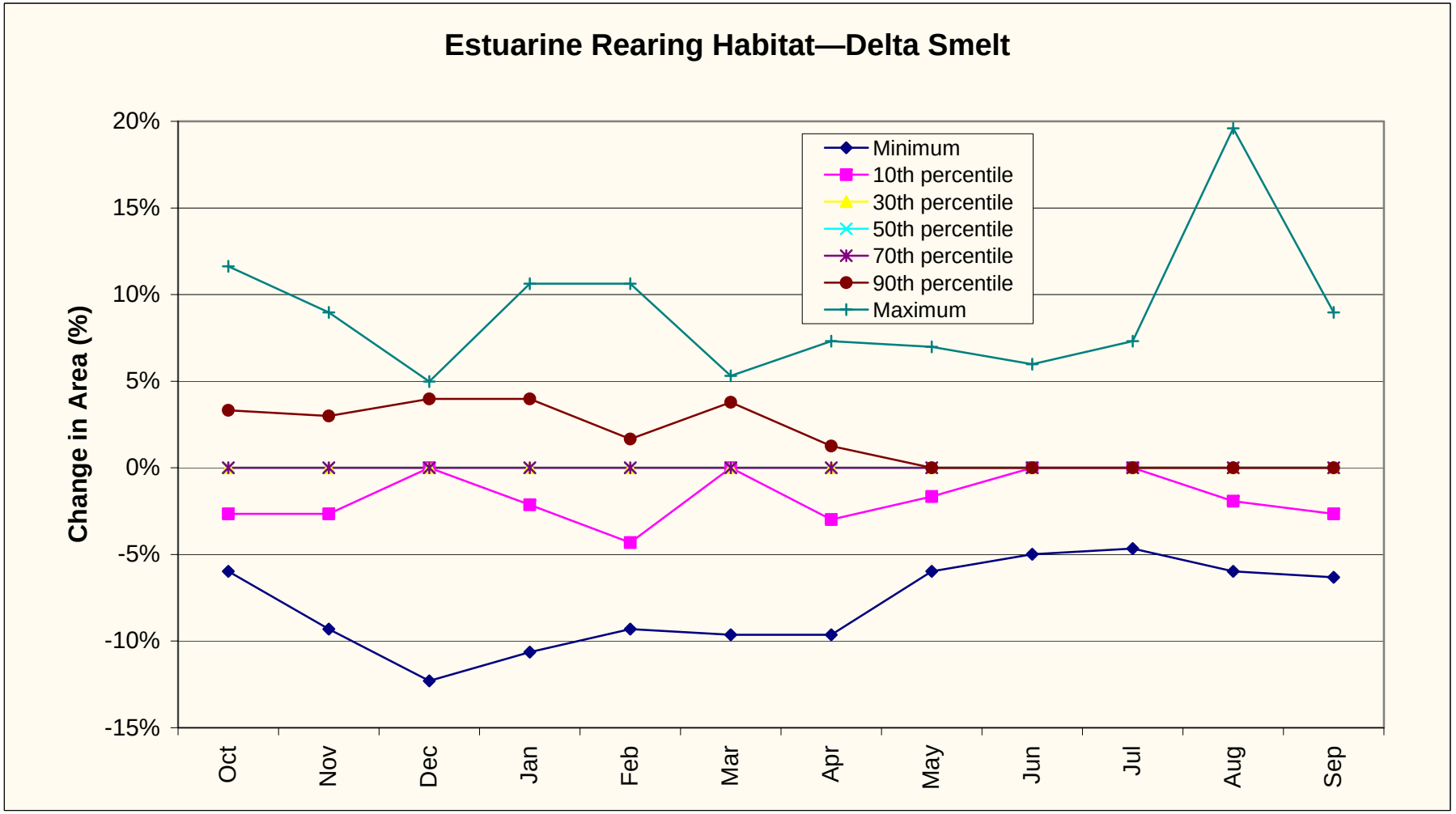

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Figure K.2A-16

Change in the Proportion of Estuarine Rearing Habitat Area, Relative to Alternative 1, for Delta Smelt under Alternative 2A, 1922–1994 Simulation (2020 Operations)

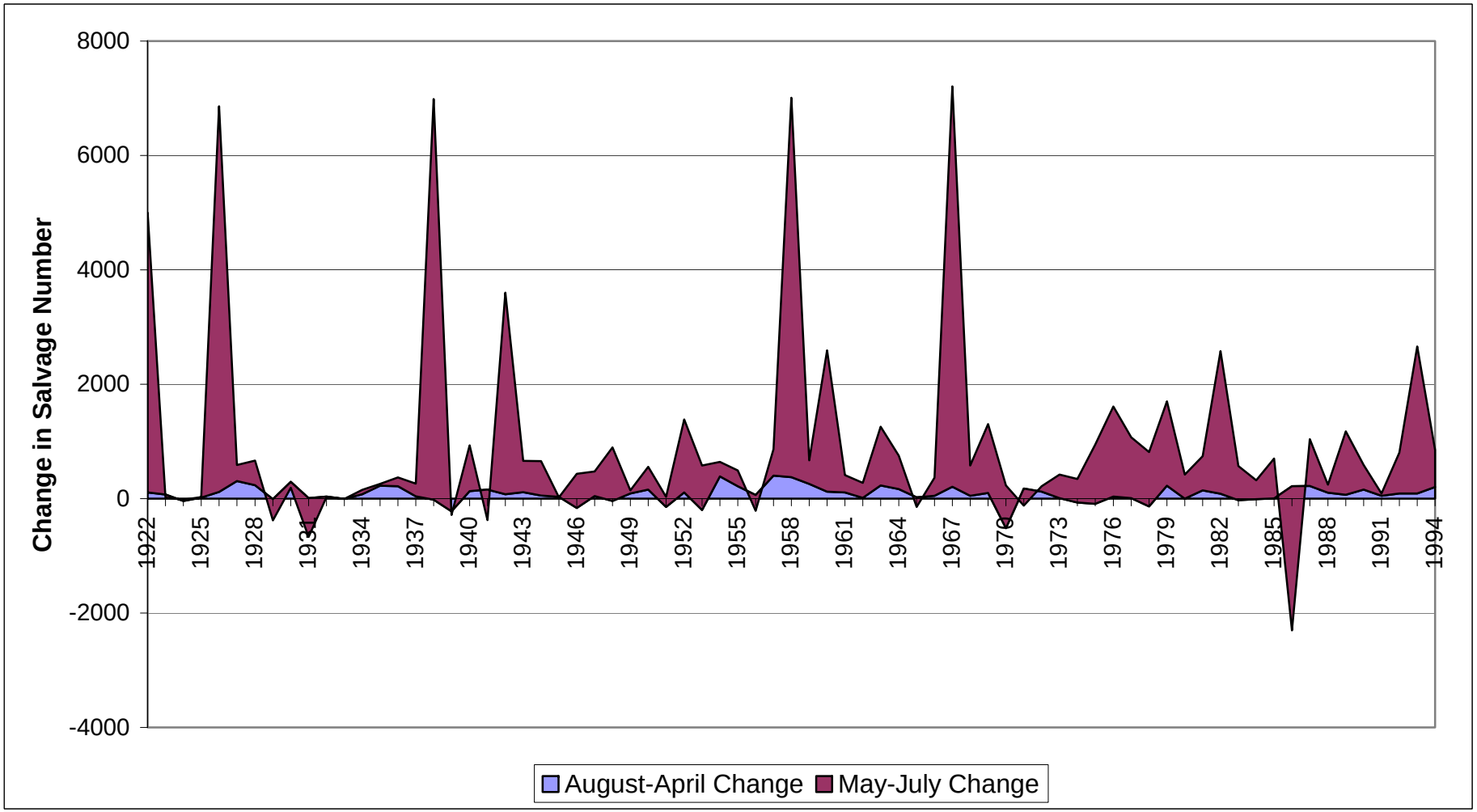

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Figure K.2A-17

Annual Increase in Delta Smelt Salvage for May–July Periods under Alternative 2A, 1922–1994 Simulation (2020 Operations)

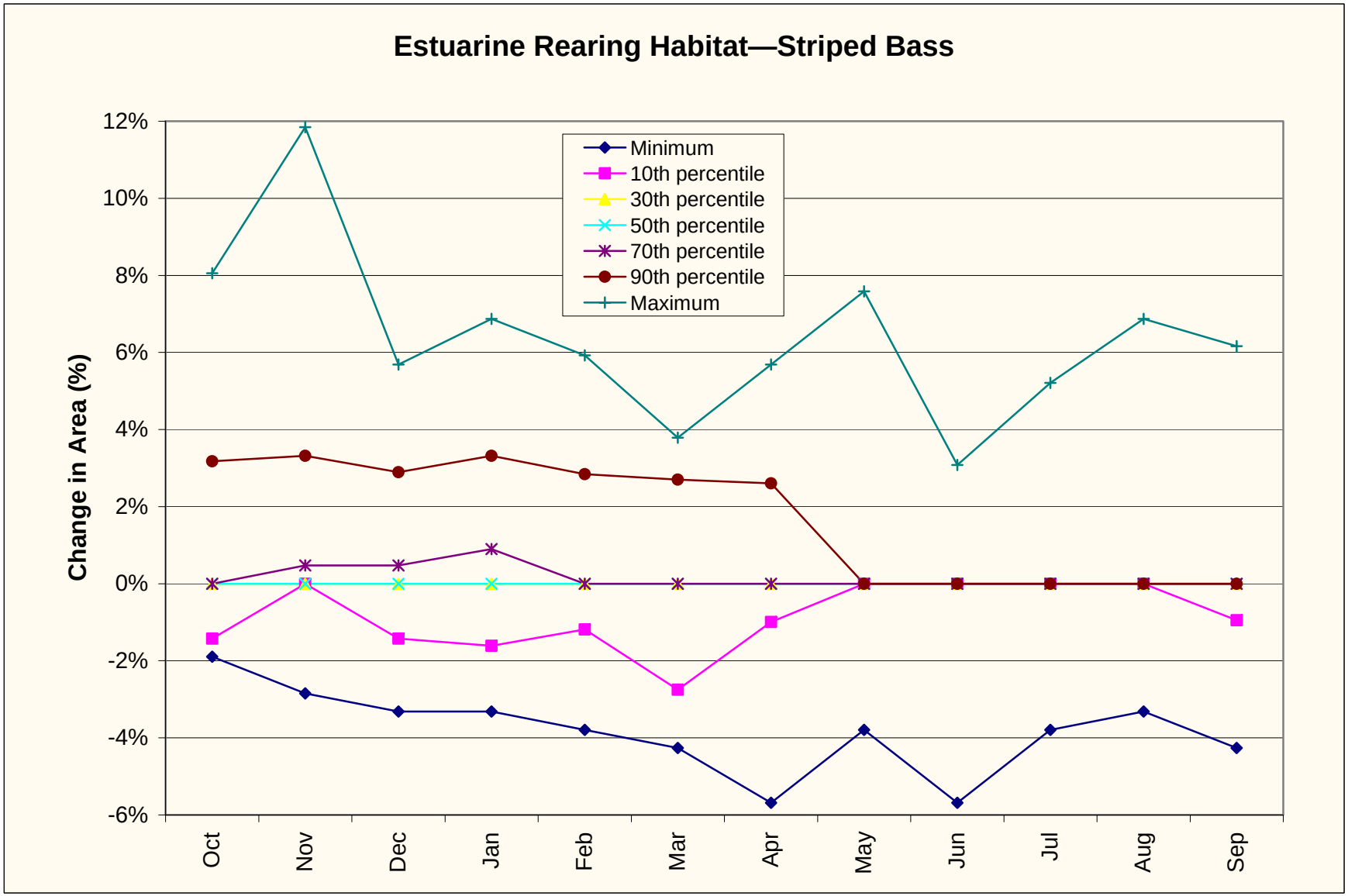

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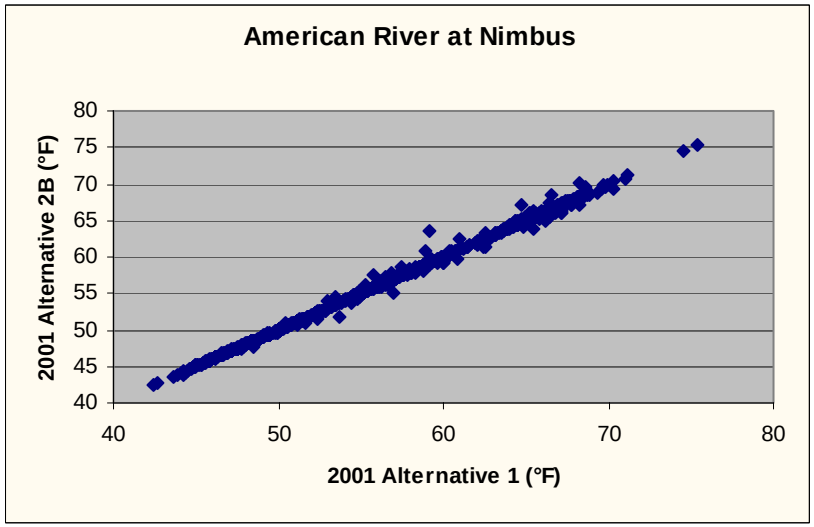
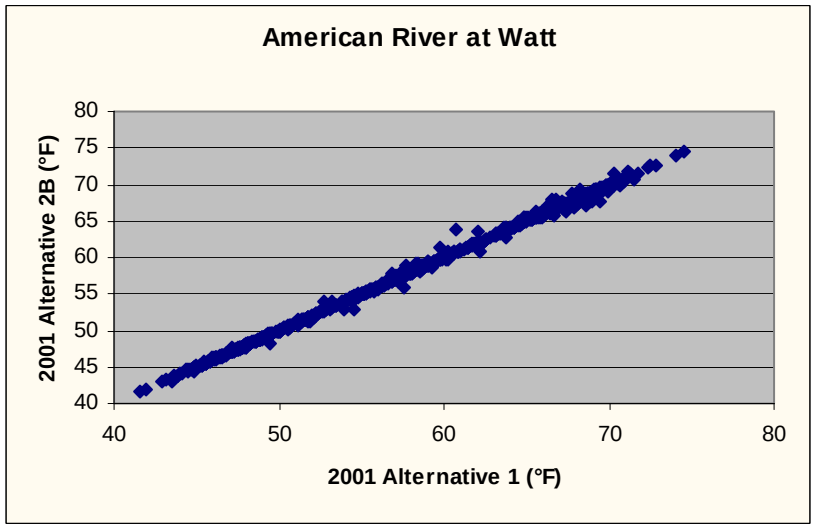
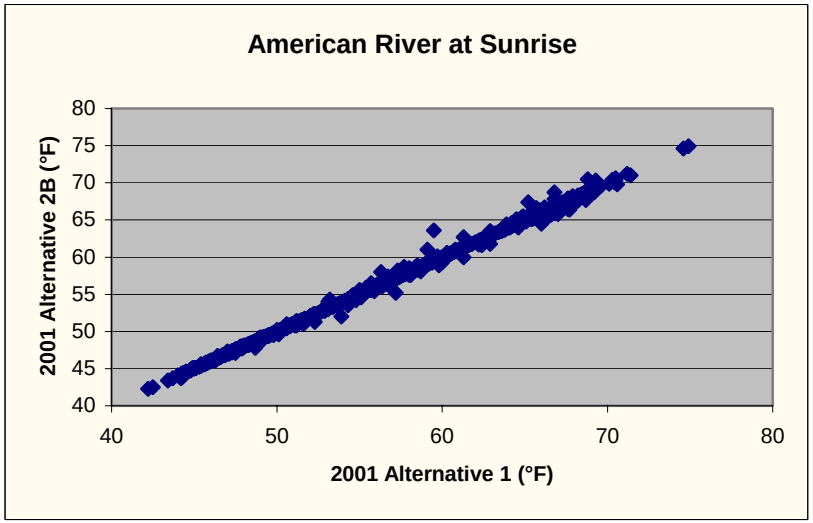
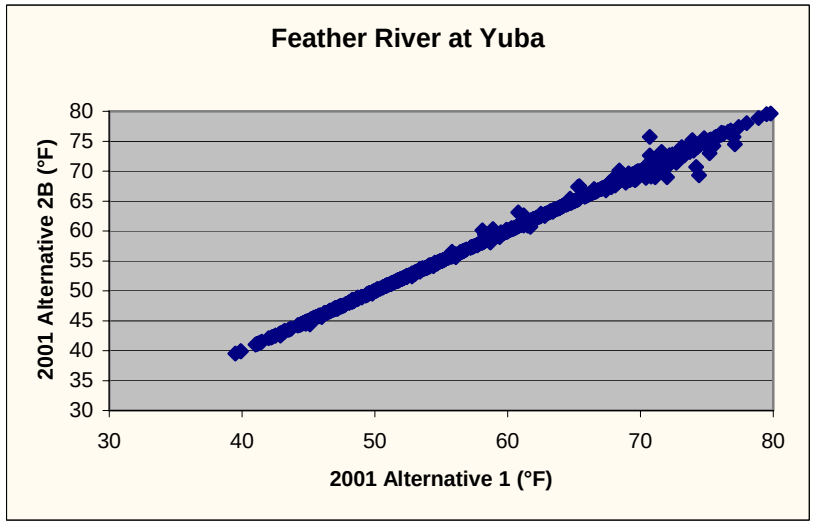
Figure K.2A-18

Change in the Proportion of Estuarine Rearing Habitat Area, Relative to Alternative 1, for Striped Bass under Alternative 2A, 1922–1994 Simulation (2020 Operations)









Note: Data for Alternatives 3B and 4B would be the same as for Alternative 2B because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2B, 3B, and 4B.

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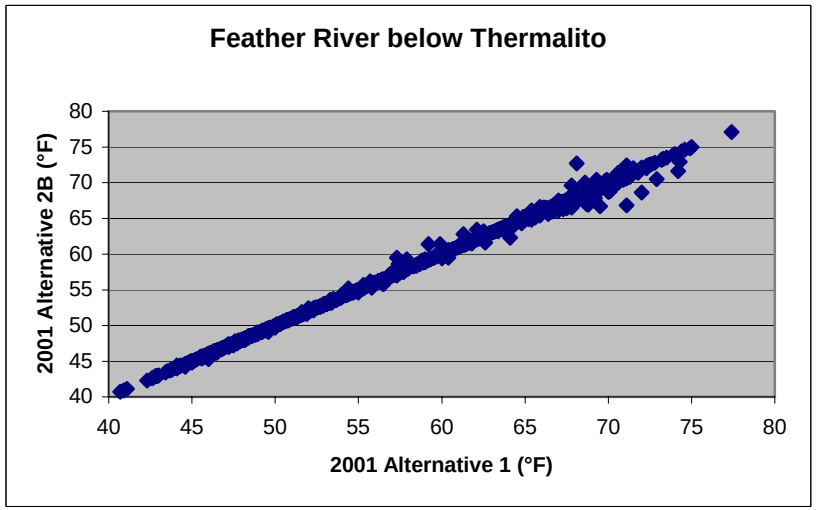
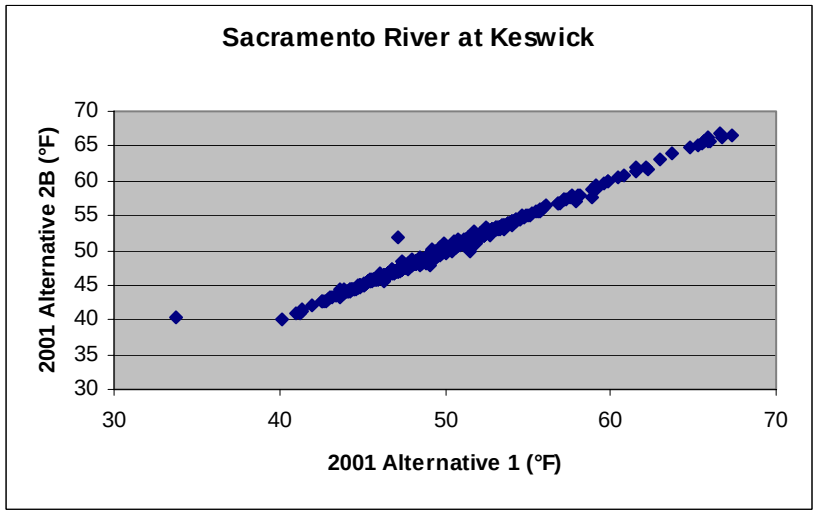
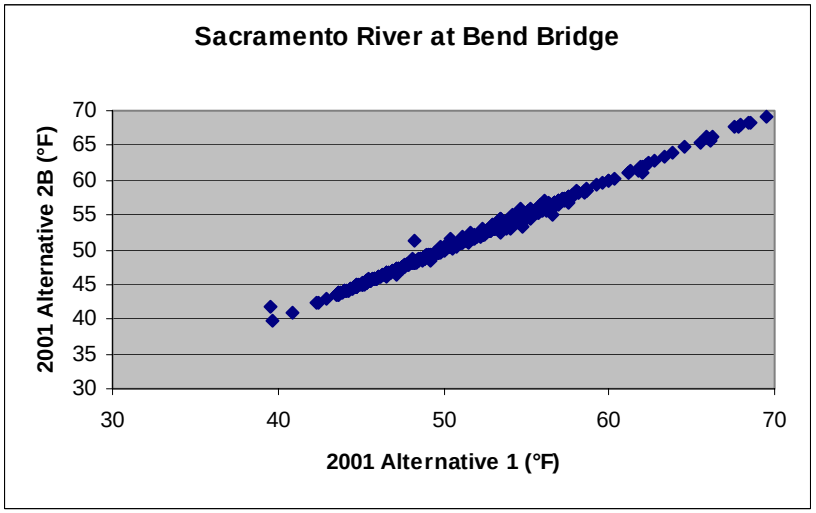
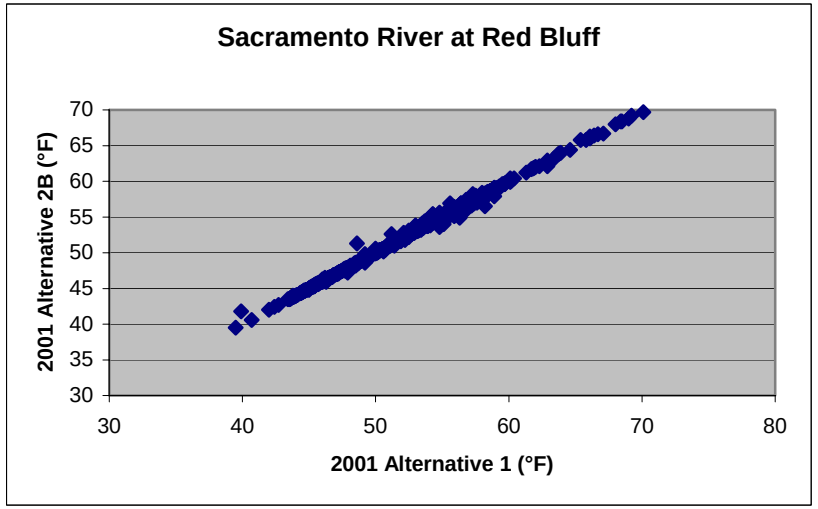
Figure K.2B-1a

2001 CALSIM Temperature Data and Graphs for Alternative 2B









Note: Data for Alternatives 3B and 4B would be the same as for Alternative 2B because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2B, 3B, and 4B.

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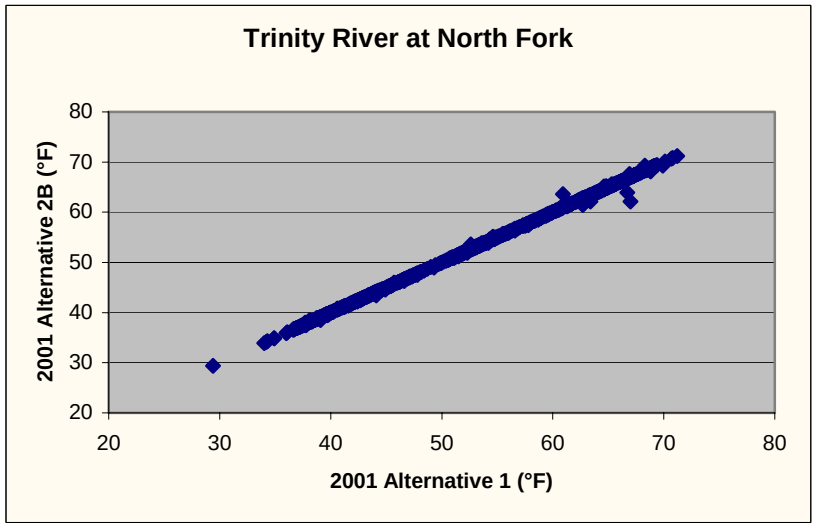
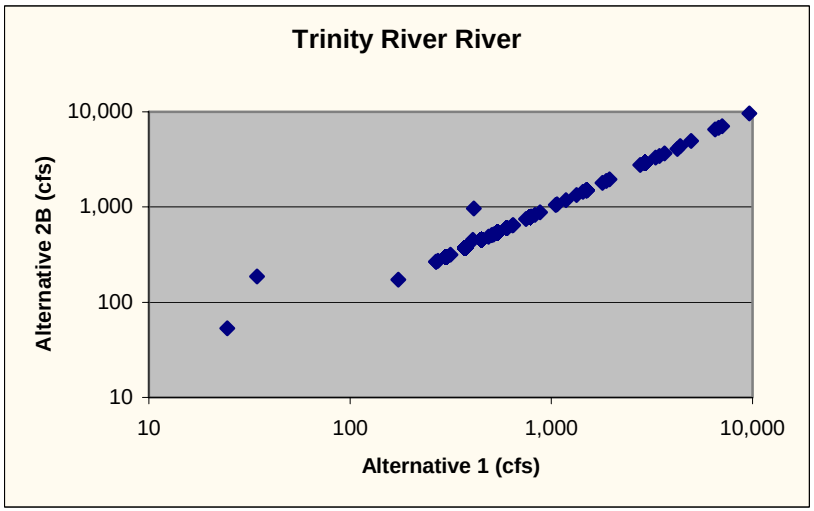
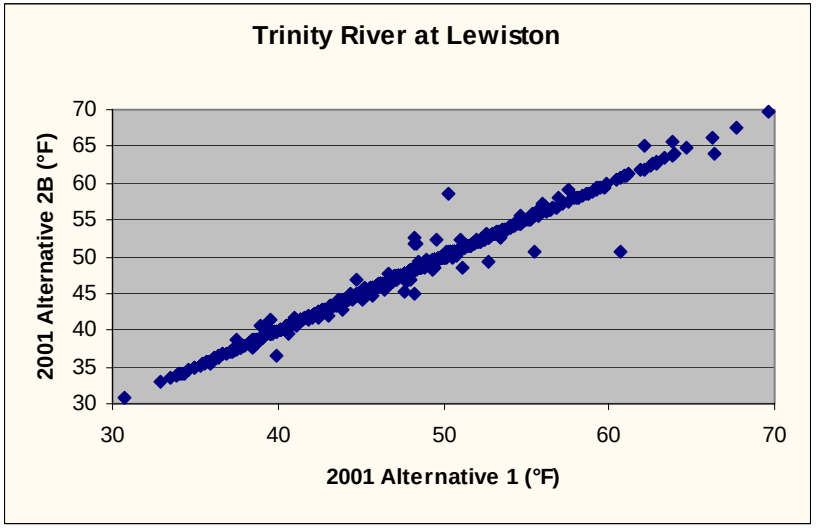
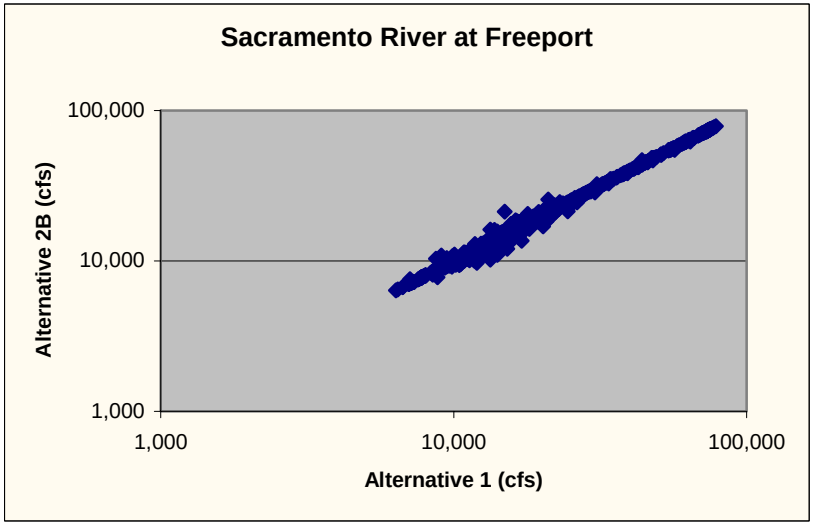
Figure K.2B-1b

2001 CALSIM Temperature Data and Graphs for Alternative 2B









Note: Data for Alternatives 3B and 4B would be the same as for Alternative 2B because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2B, 3B, and 4B.

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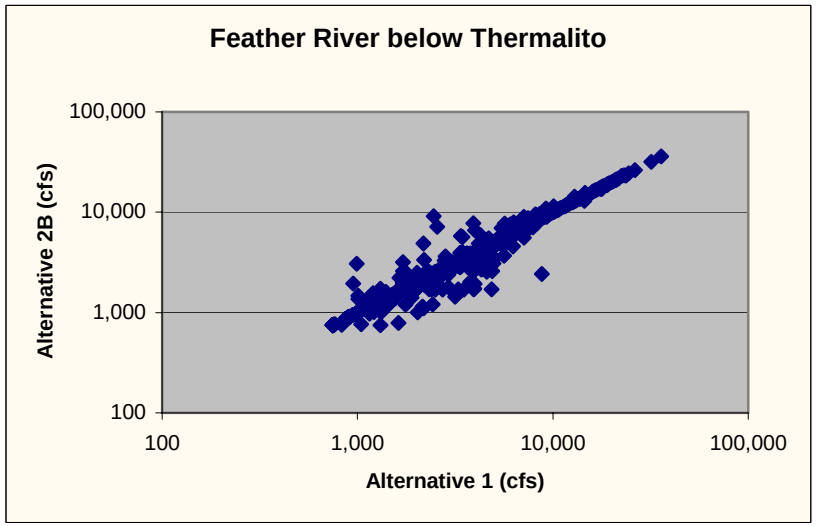
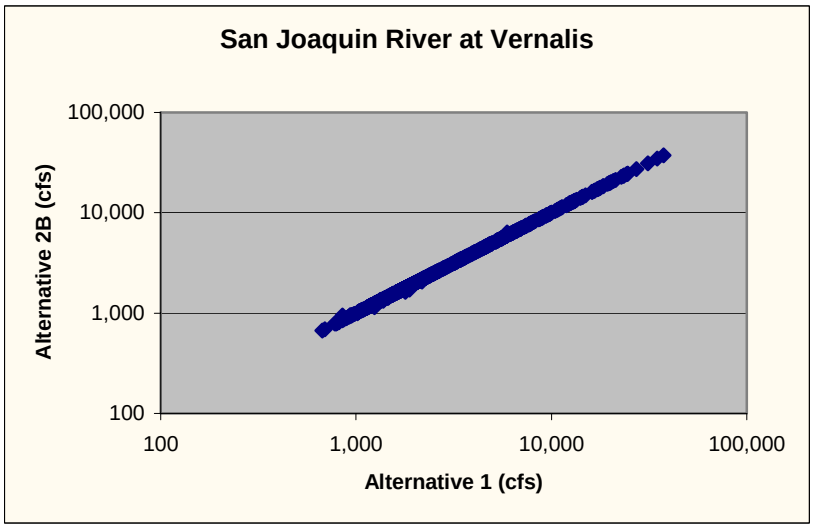
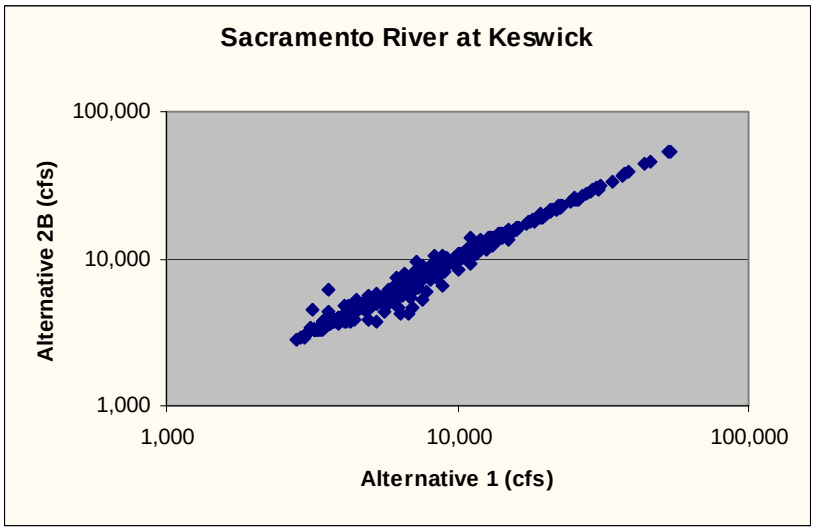
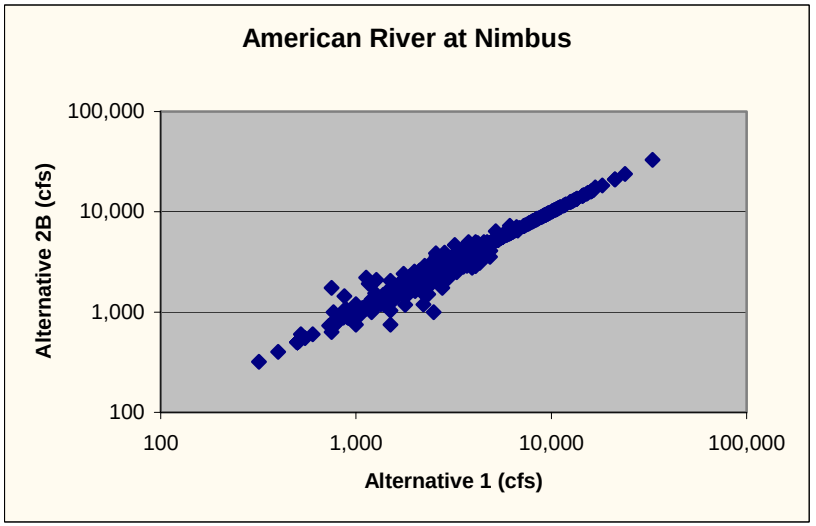
Figure K.2B-1c

2001 CALSIM Temperature Data and Graphs for Alternative 2B









Note: Data for Alternatives 3B and 4B would be the same as for Alternative 2B because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2B, 3B, and 4B.

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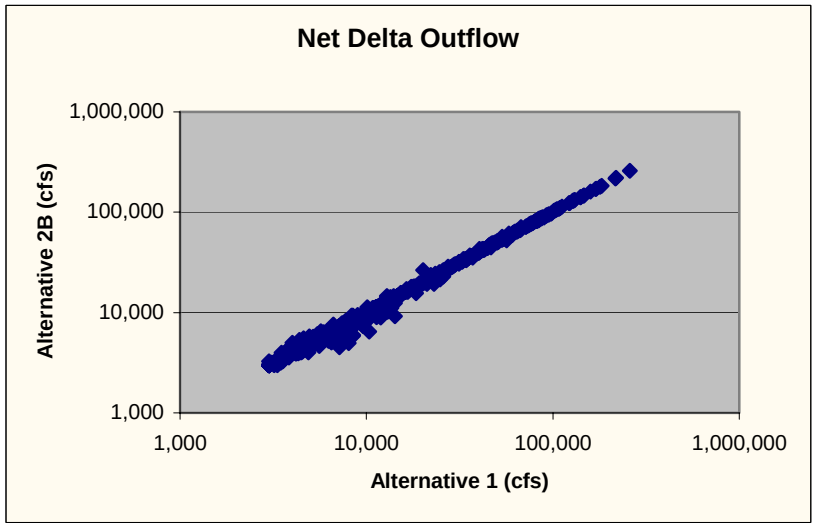
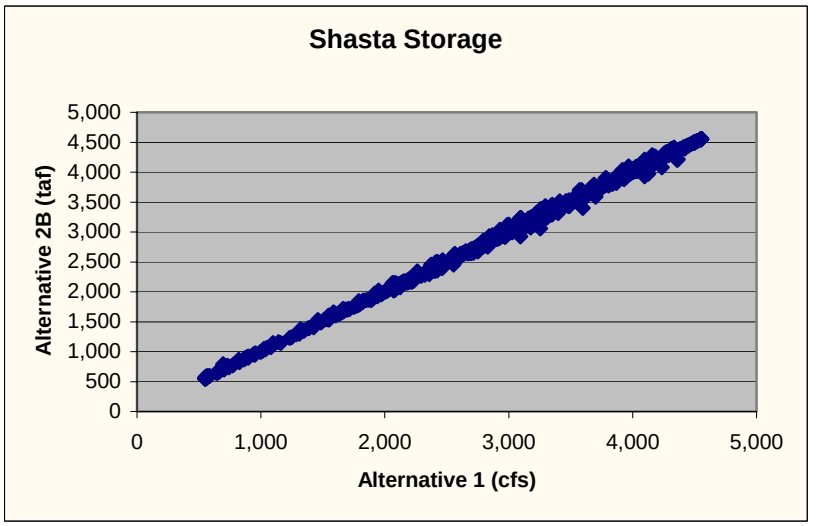
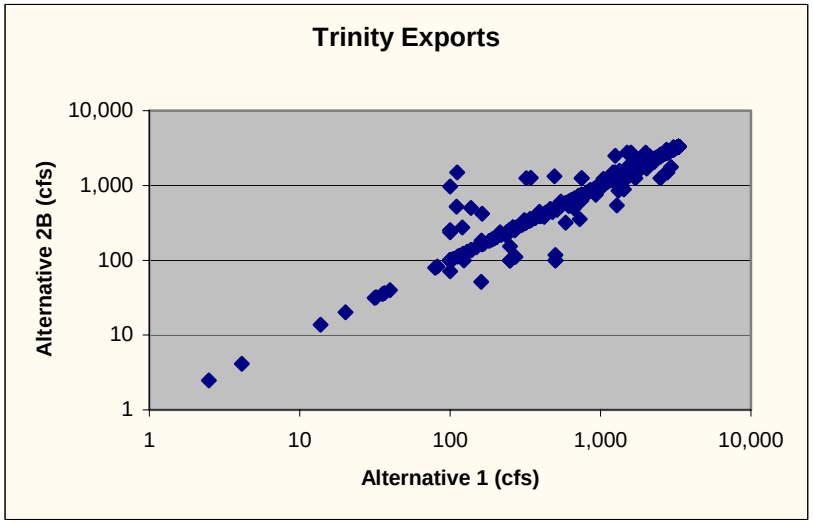
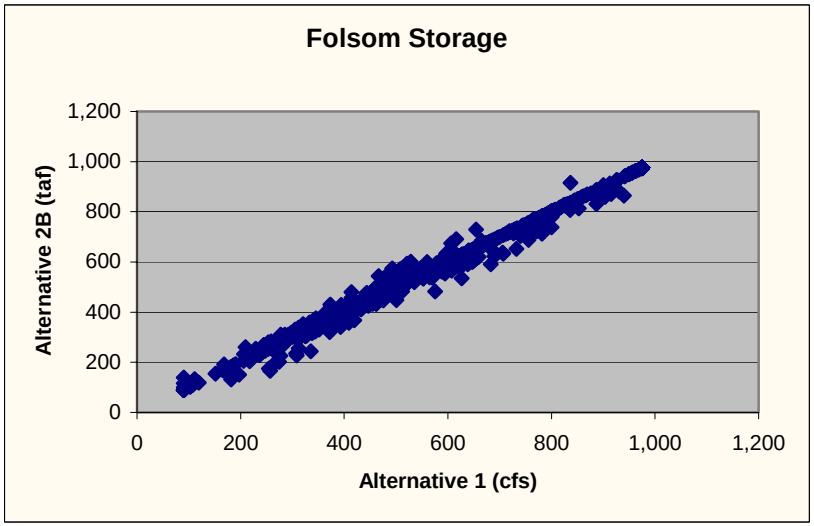
Figure K.2B-2a

2001 CALSIM Hydrology Data and Graphs for Alternative 2B









Note: Data for Alternatives 3B and 4B would be the same as for Alternative 2B because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2B, 3B, and 4B.

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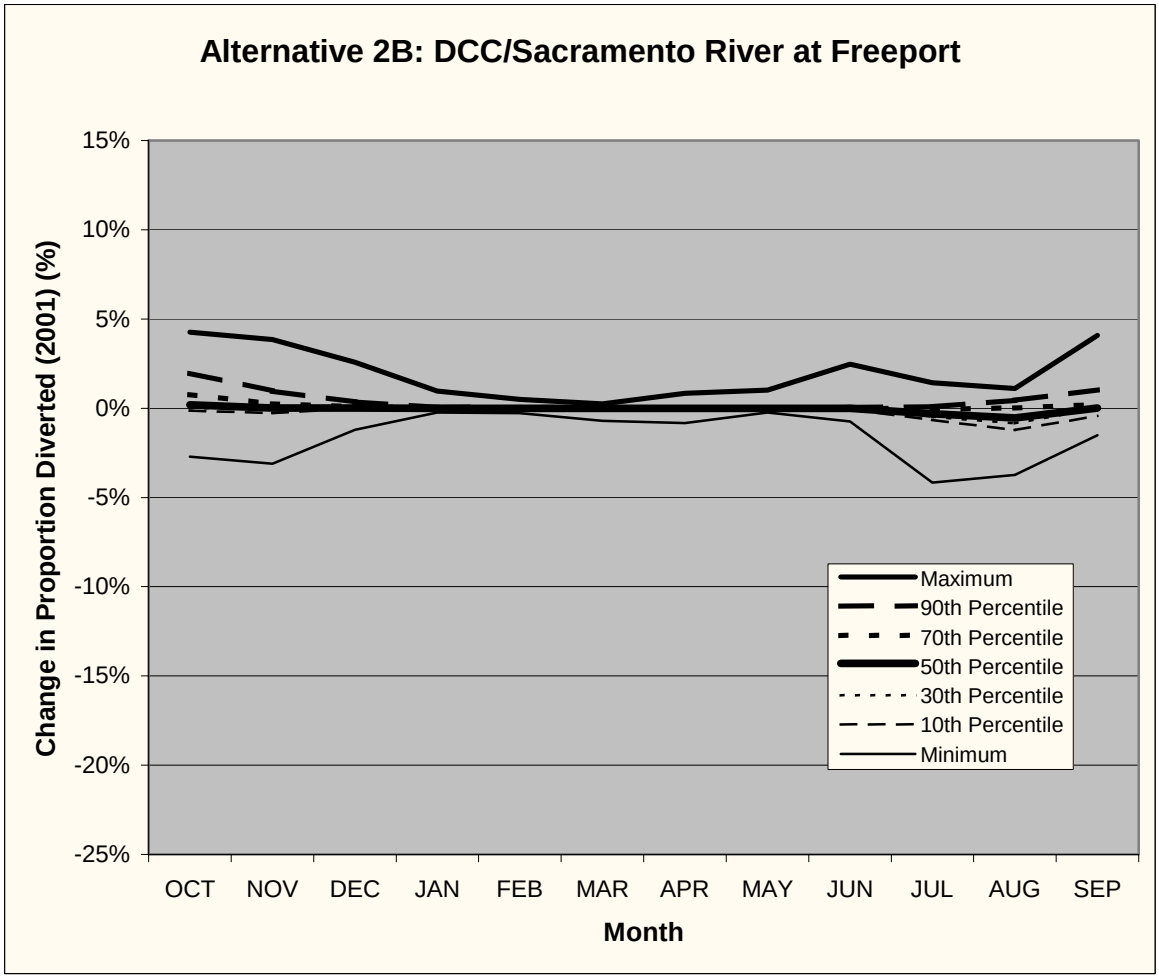
Figure K.2B-2b

2001 CALSIM Hydrology Data and Graphs for Alternative 2B



Note: Data for Alternatives 3B and 4B would be the same as for Alternative 2B because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2B, 3B, and 4B.

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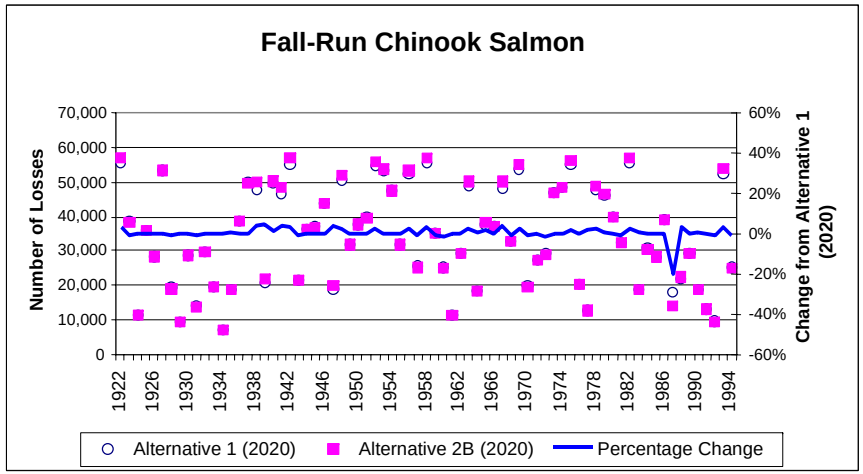
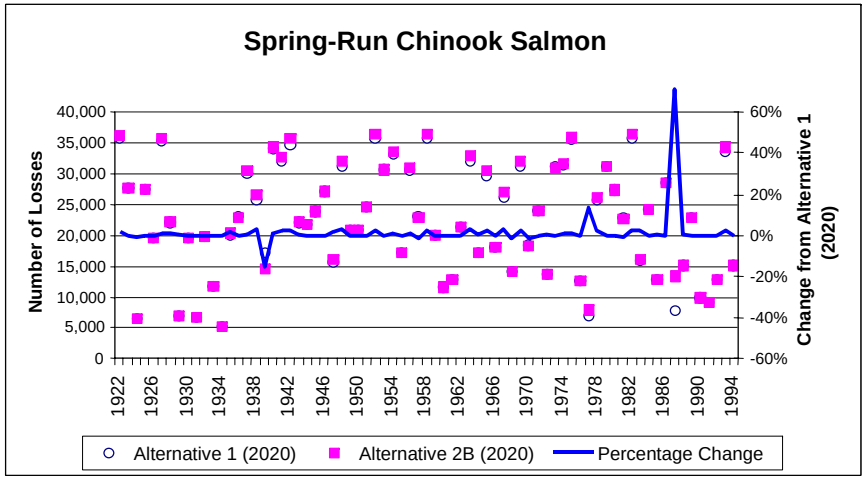
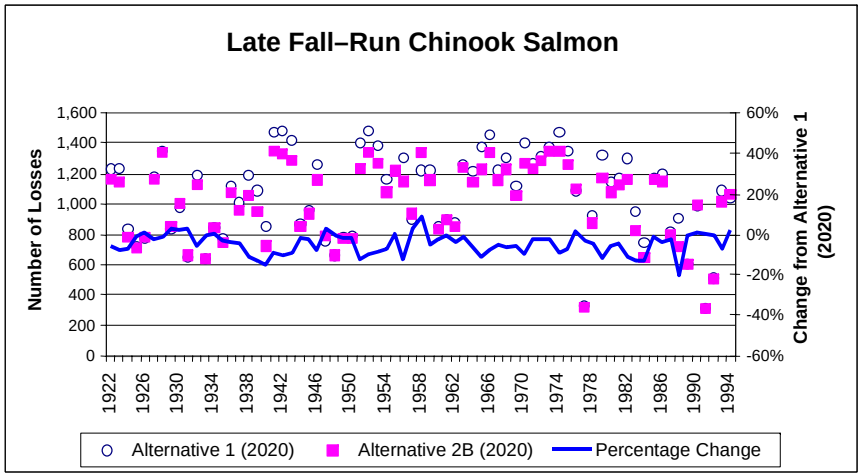
Figure K.2B-2c

2001 CALSIM Hydrology Data and Graphs for Alternative 2B







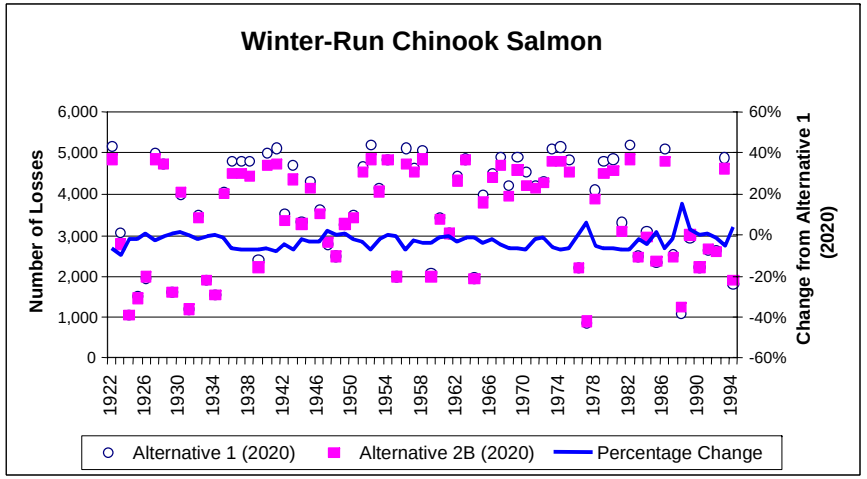


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Figure K.2B-3

Simulated Entrainment Loss for Fall-, Late Fall–, Winter-, and Spring-Run Chinook Salmon under Alternatives 1 and 2B, 1922–1994 Simulation (2020 Operations)

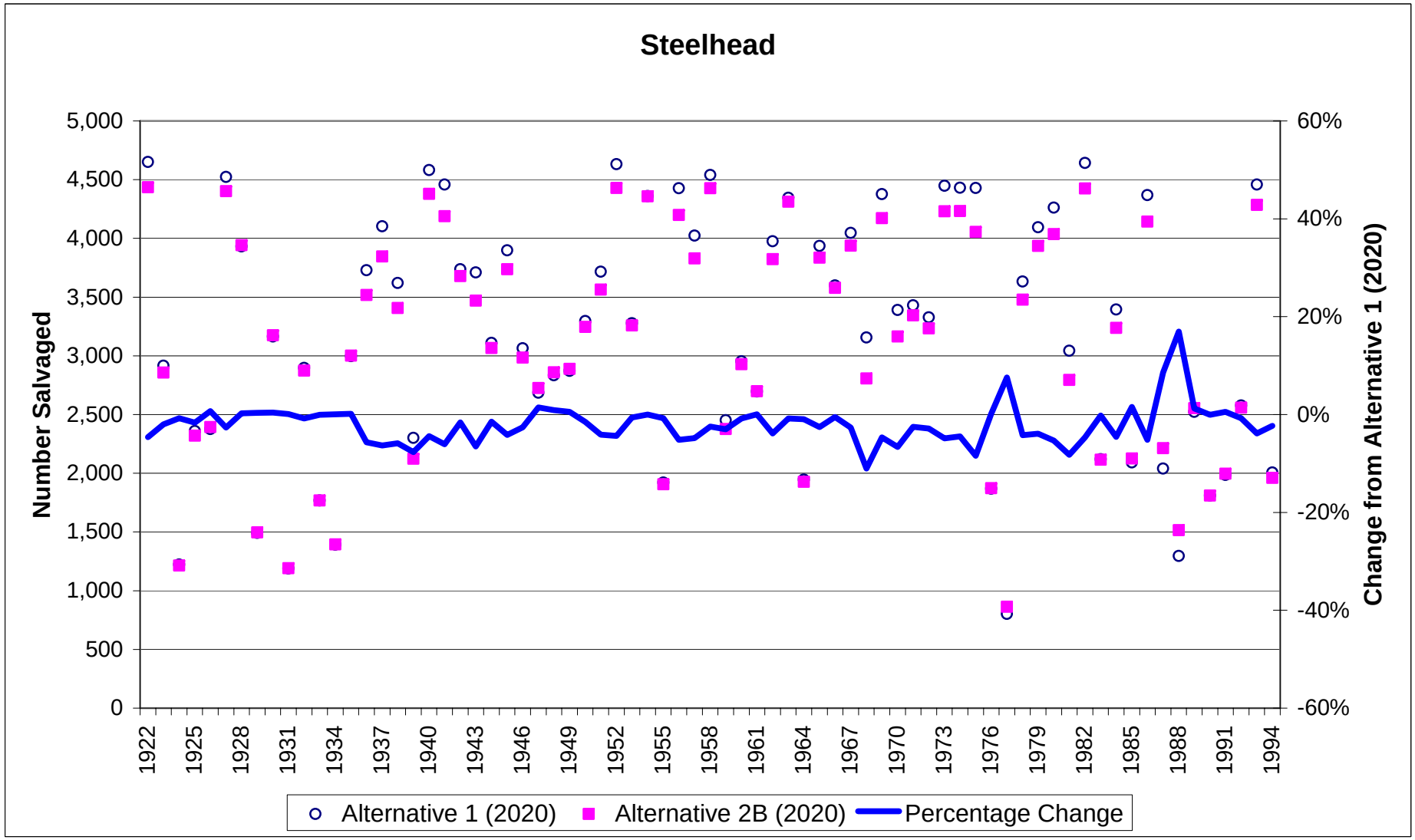

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Figure K.2B-4

Simulated Salvage Steelhead under Alternatives 1 and 2B, 1922–1994 Simulation (2020 Operations)

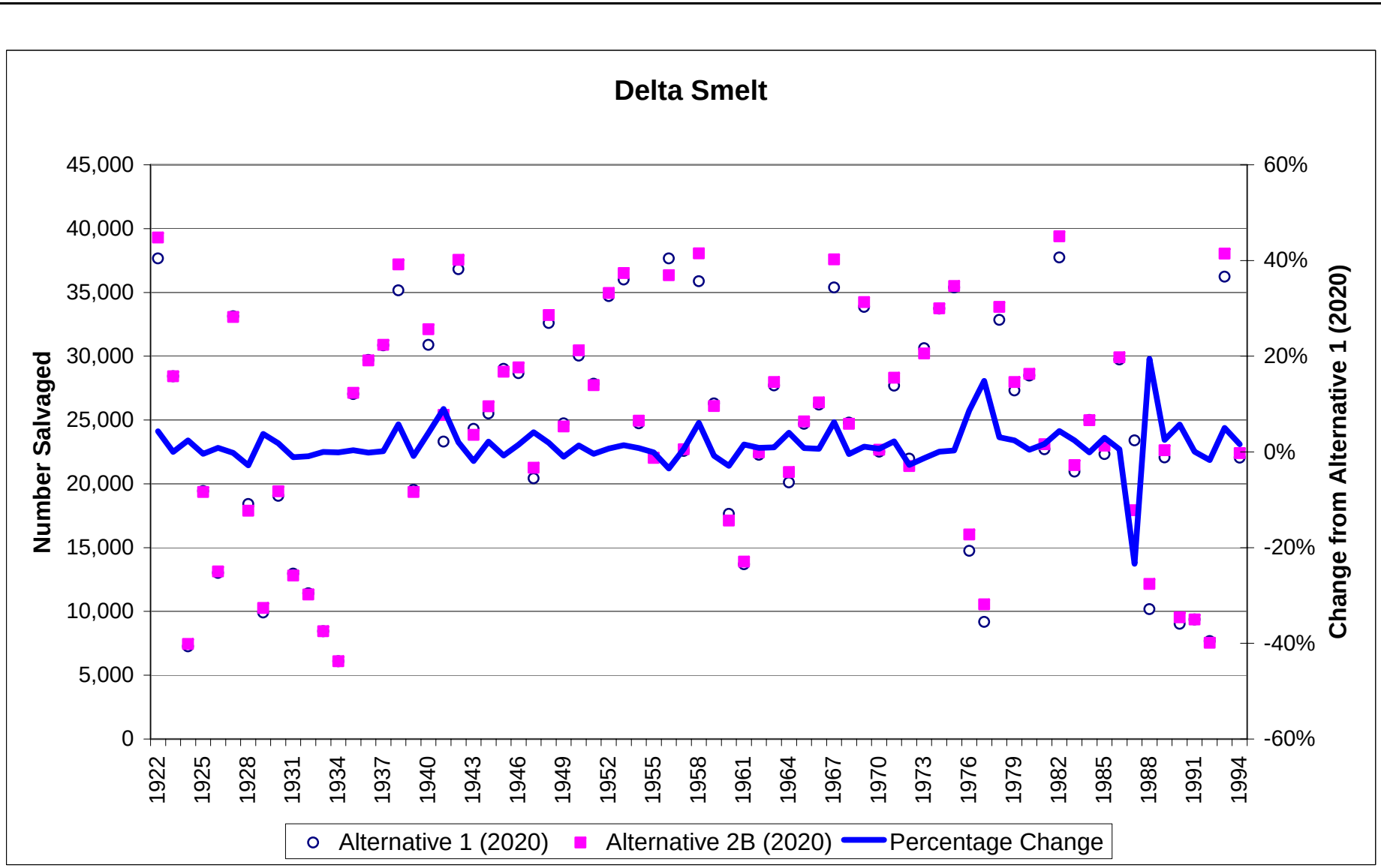

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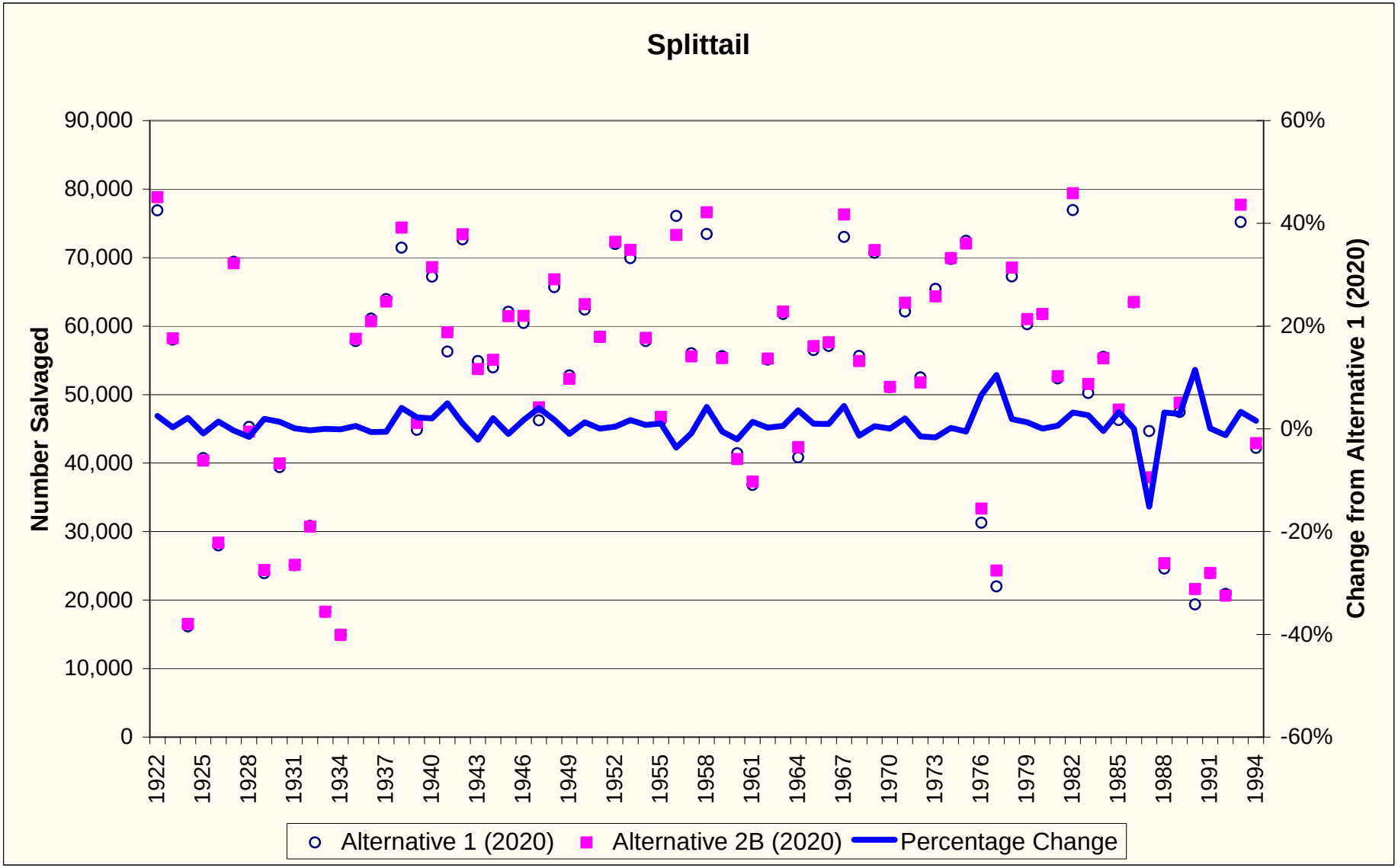
Figure K.2B-5

Simulated Salvage for Delta Smelt under Alternatives 1 and 2B, 1922–1994 Simulation (2020 Operations)



02053.02 101

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Figure K.2B-6

Simulated Salvage for Splittail under Alternatives 1 and 2B, 1922–1994 Simulation (2020 Operations)

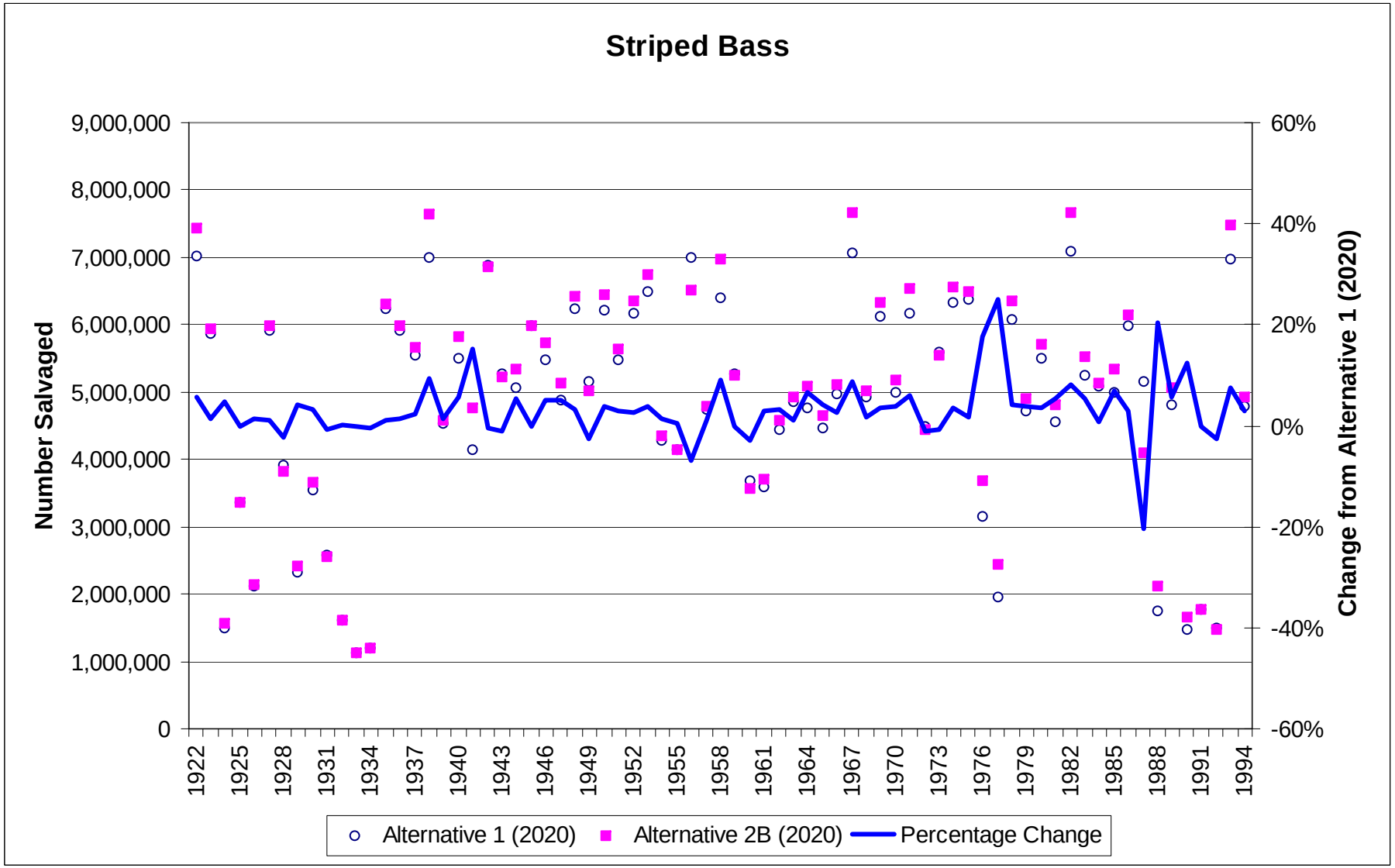

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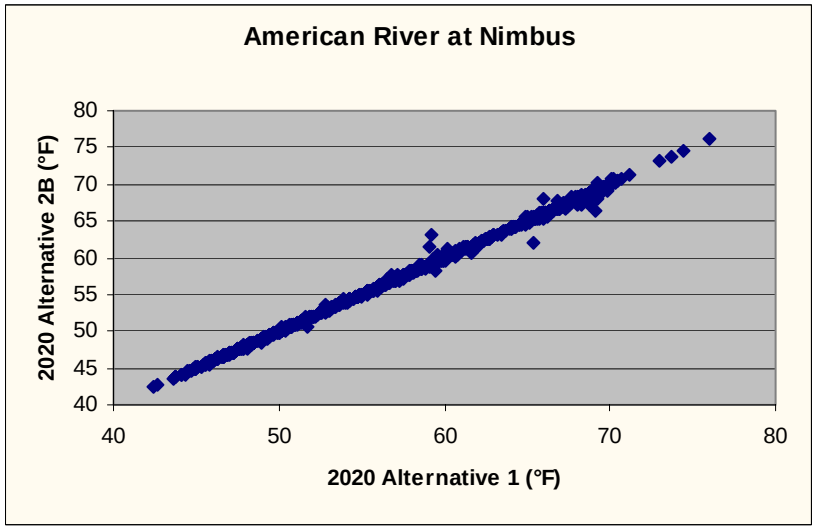
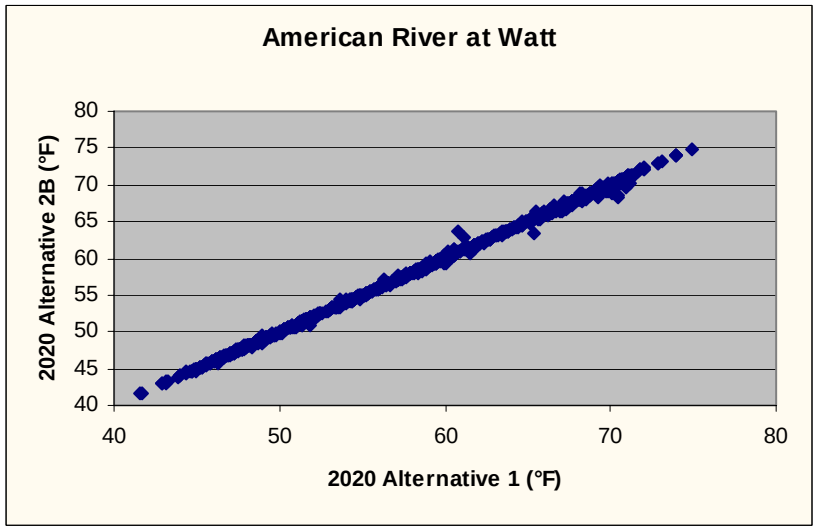
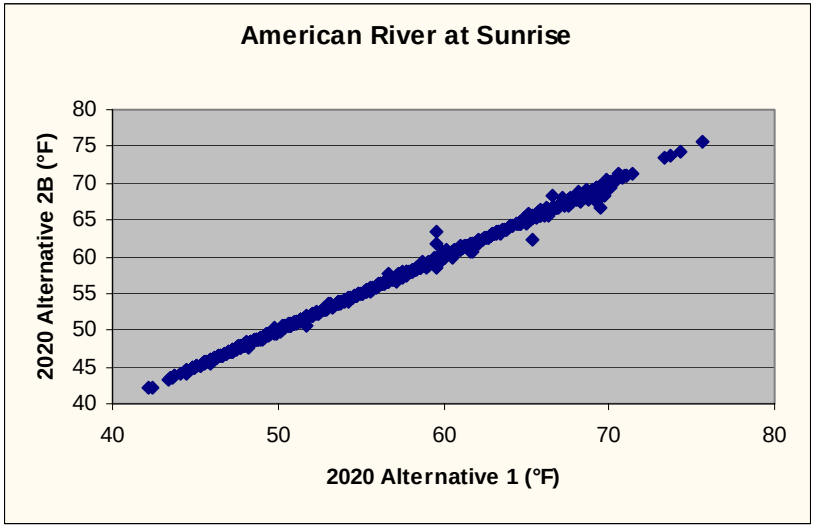
Figure K.2B-7

Simulated Salvage for Striped Bass under Alternatives 1 and 2B, 1922–1994 Simulation (2020 Operations)







Note: Data for Alternatives 3B and 4B would be the same as for Alternative 2B because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2B, 3B, and 4B.

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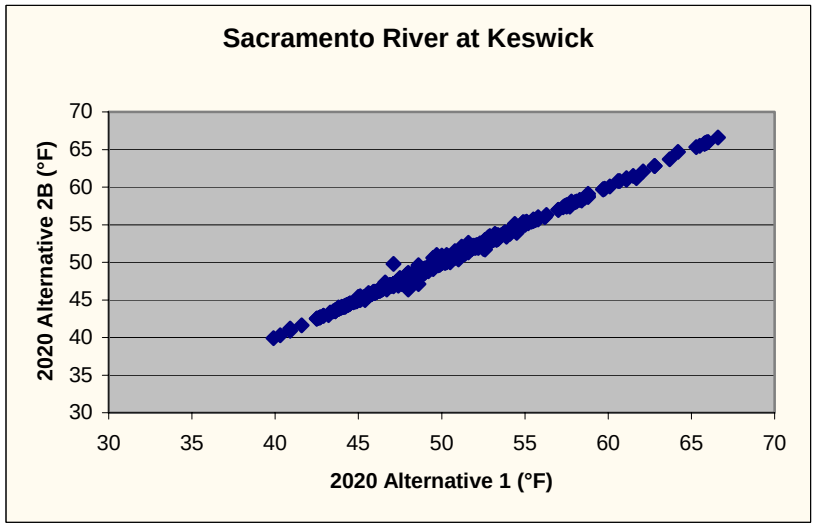
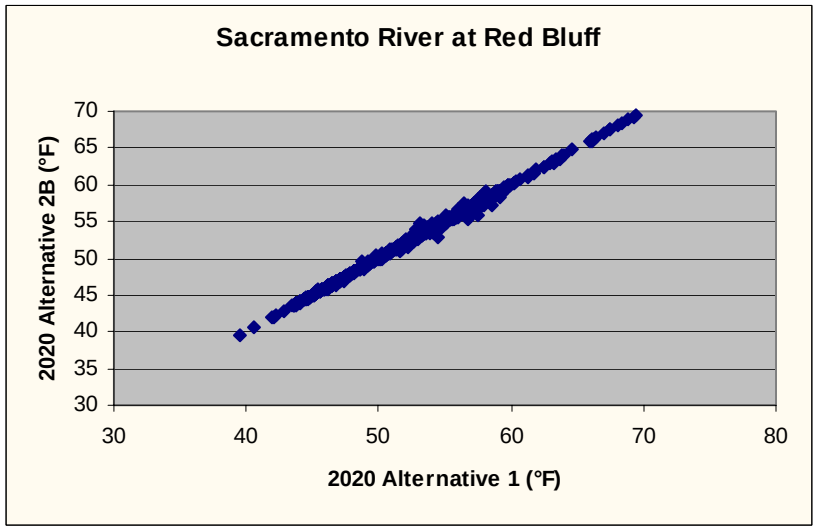
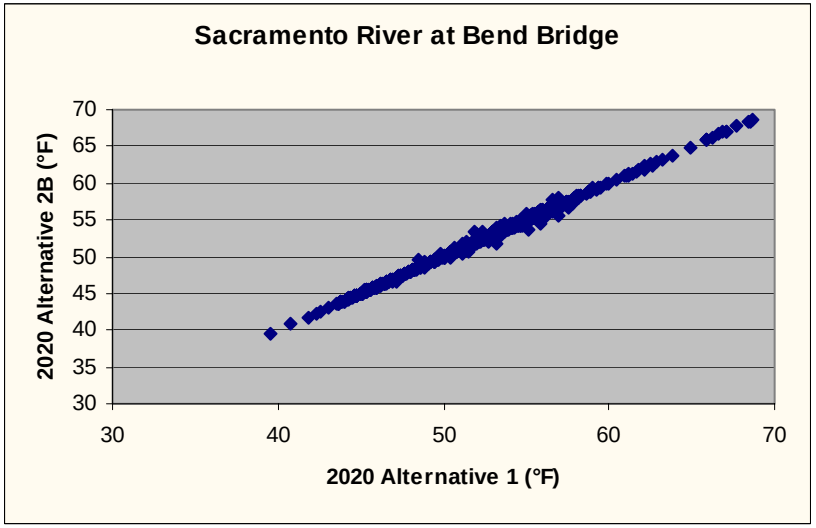
Figure K.2B-8a

2020 CALSIM Temperature Data and Graphs for Alternative 2B







Note: Data for Alternatives 3B and 4B would be the same as for Alternative 2B because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2B, 3B, and 4B.

02053.02 101

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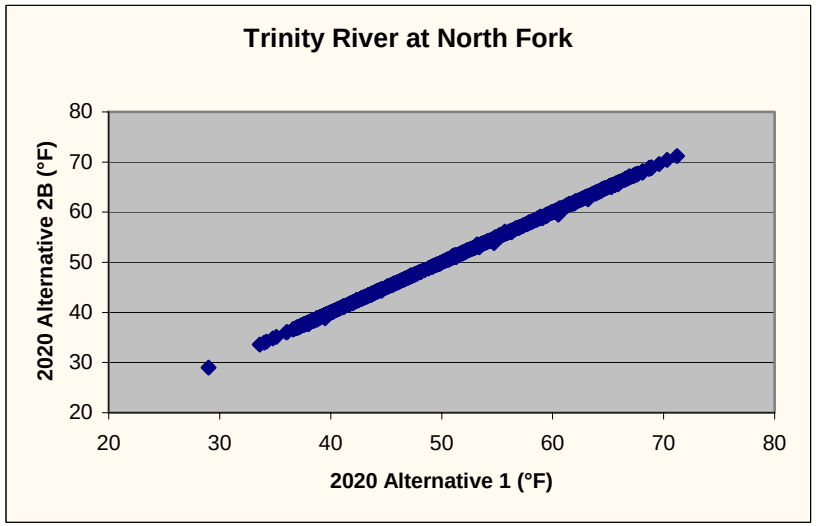
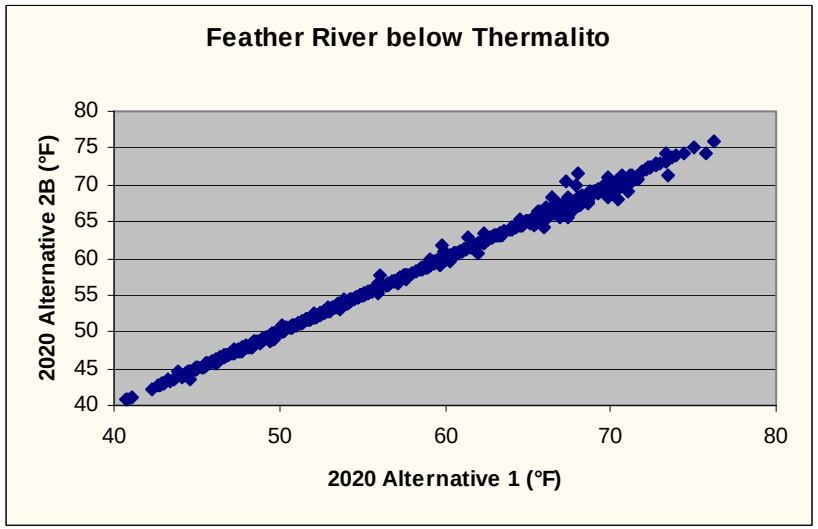
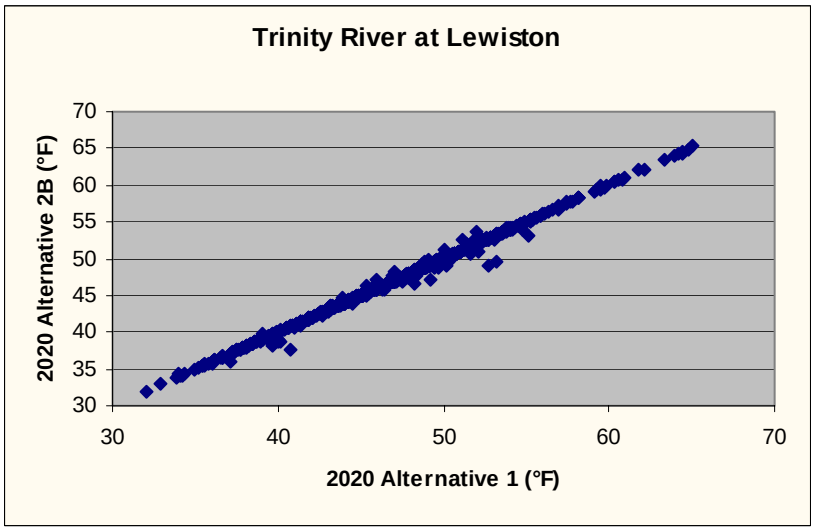
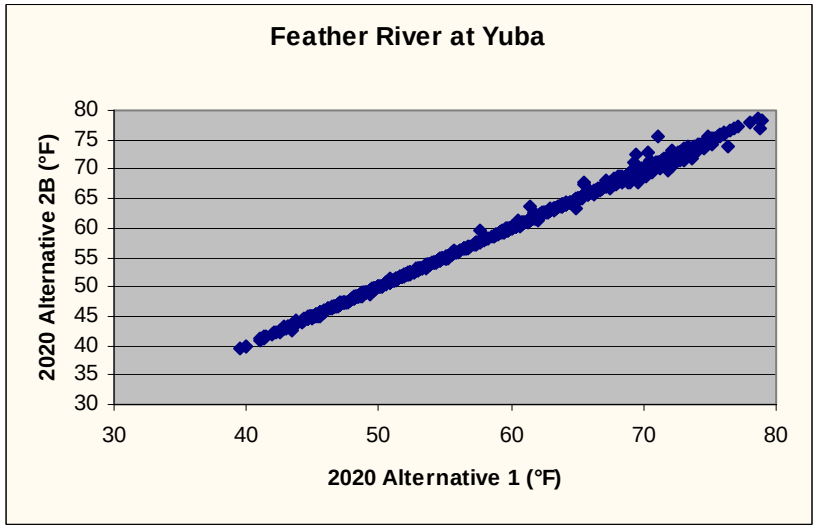
Figure K.2B-8b

2020 CALSIM Temperature Data and Graphs for Alternative 2B









Note: Data for Alternatives 3B and 4B would be the same as for Alternative 2B because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2B, 3B, and 4B.

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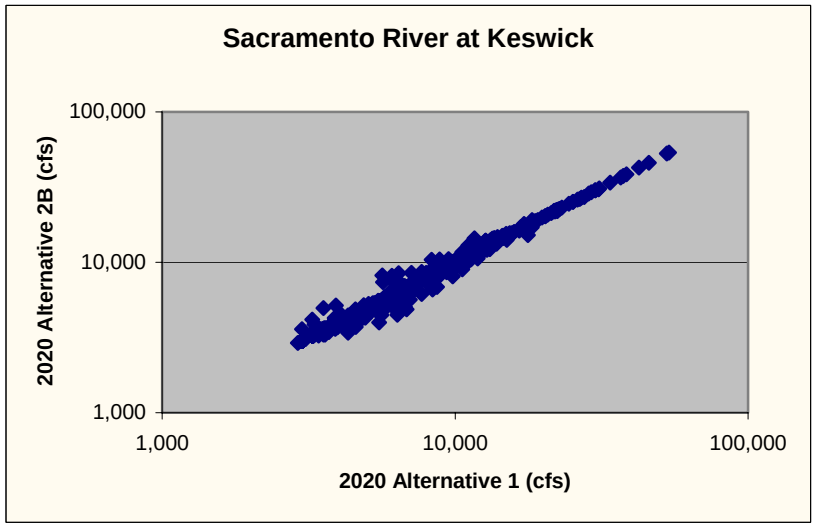
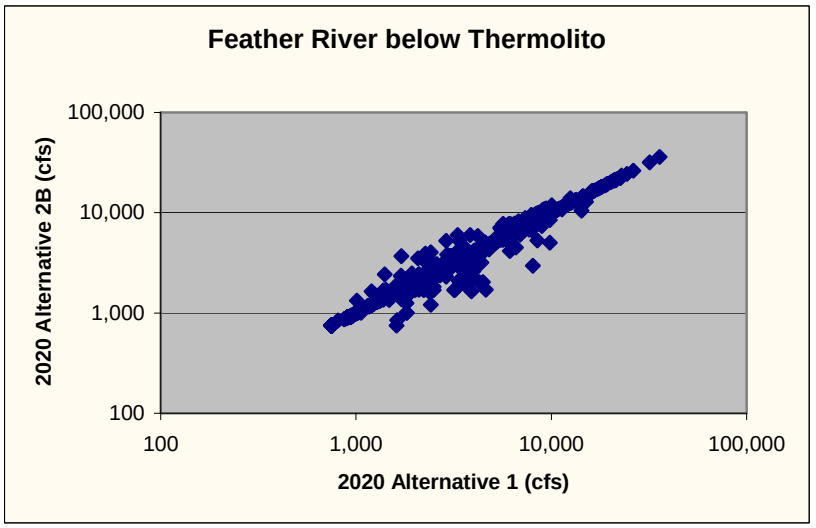
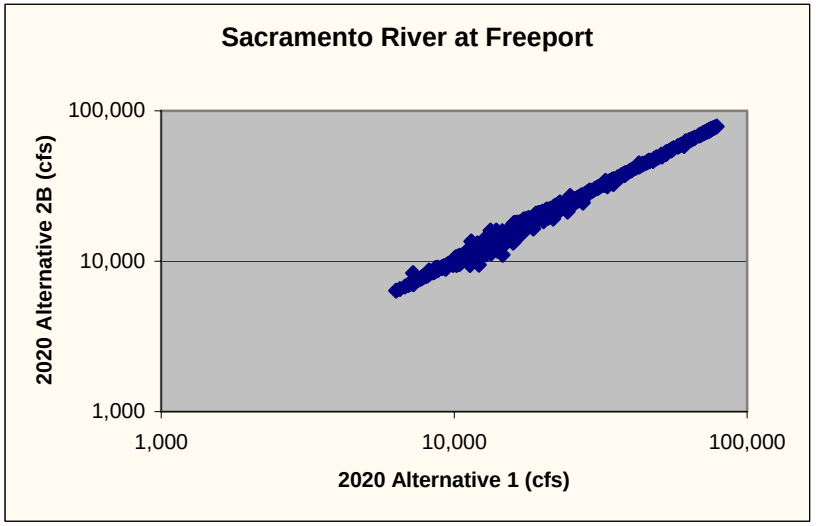
Figure K.2B-8c

2020 CALSIM Temperature Data and Graphs for Alternative 2B







Note: Data for Alternatives 3B and 4B would be the same as for Alternative 2B because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2B, 3B, and 4B.

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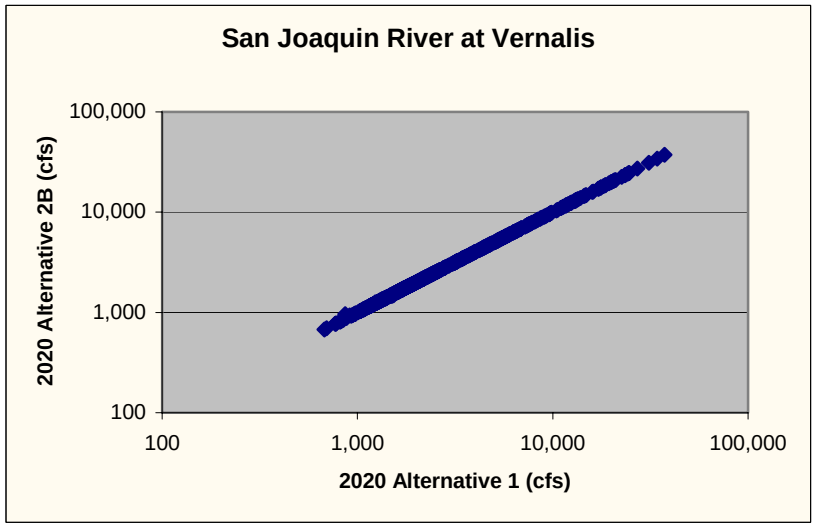
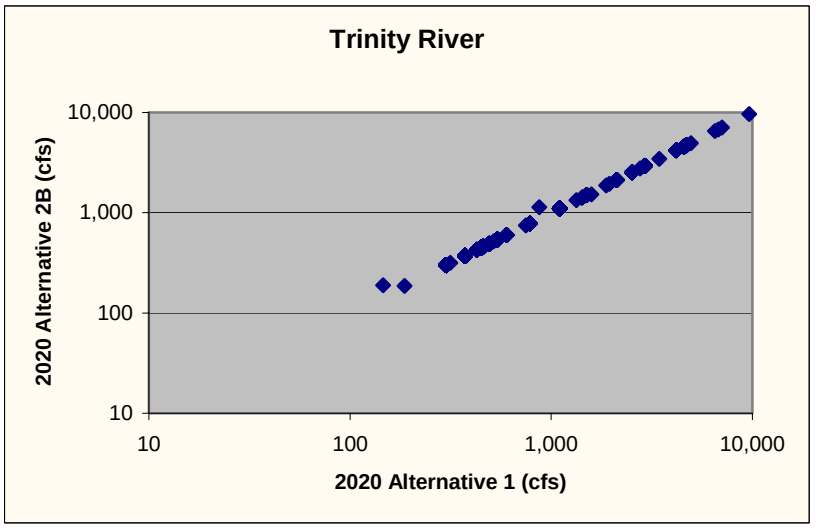
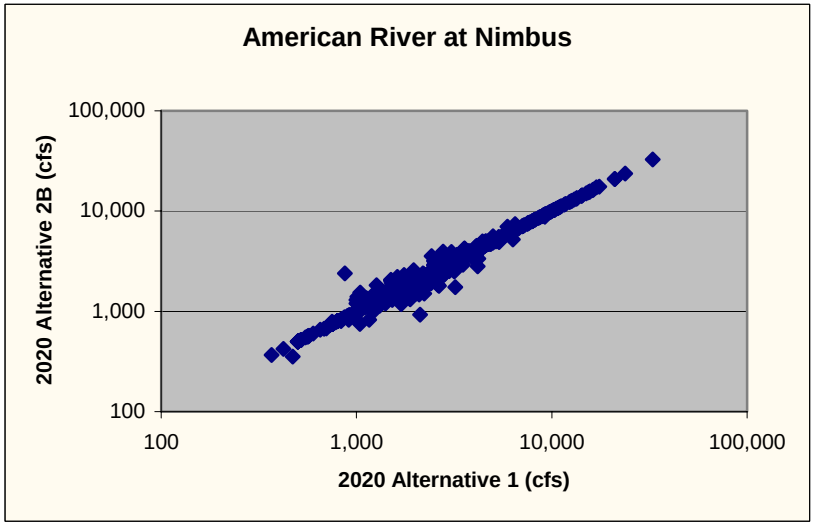
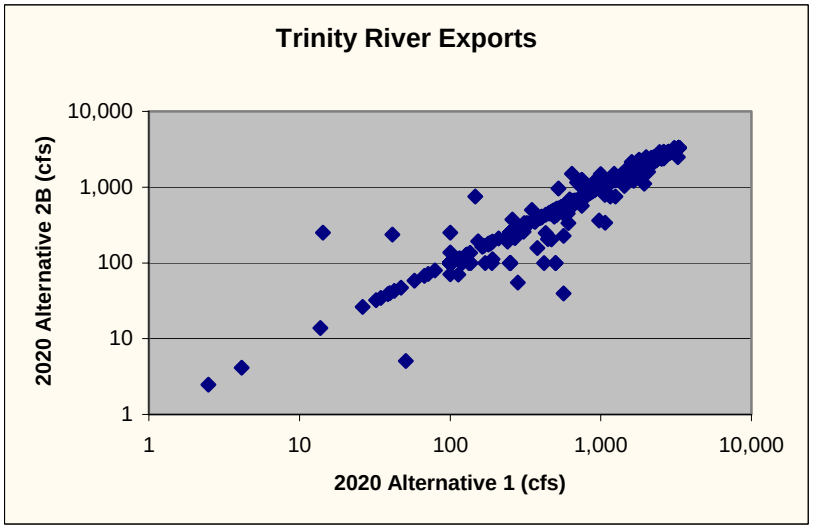
Figure K.2B-9a

2020 CALSIM Hydrology Data and Graphs for Alternative 2B









Note: Data for Alternatives 3B and 4B would be the same as for Alternative 2B because they have same operational component. Therefore, these graphs represent the data for Alternatives 2B, 3B, and 4B.

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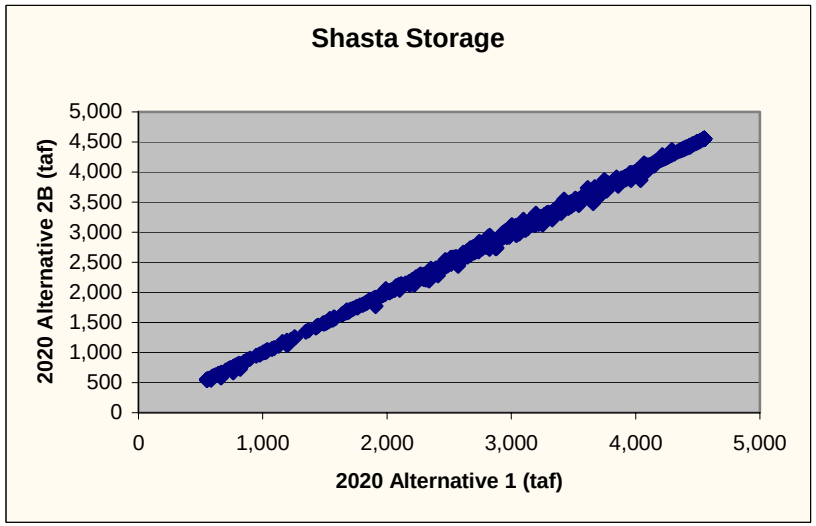
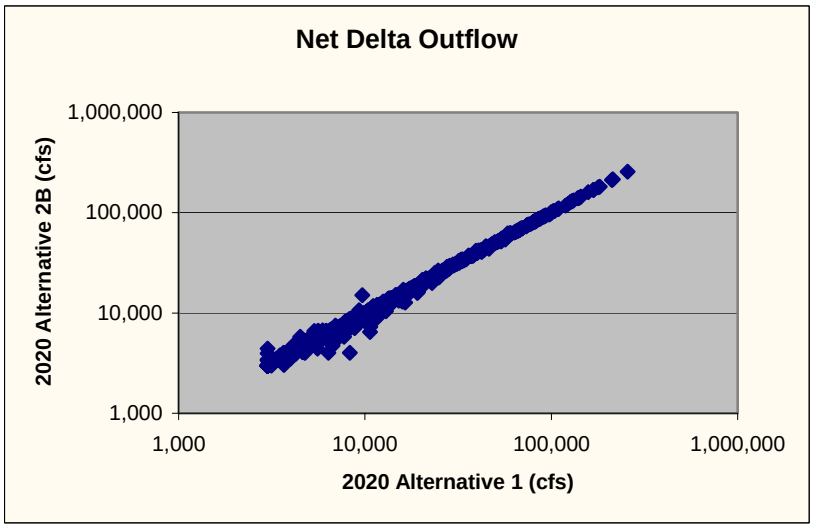
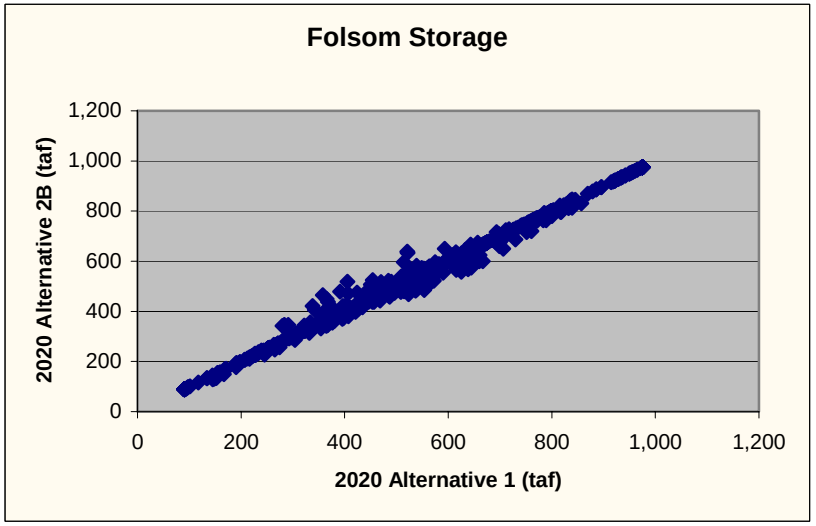
Figure K.2B-9b

2020 CALSIM Hydrology Data and Graphs for Alternative 2B







Note: Data for Alternatives 3B and 4B would be the same as for Alternative 2B because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2B, 3B, and 4B.

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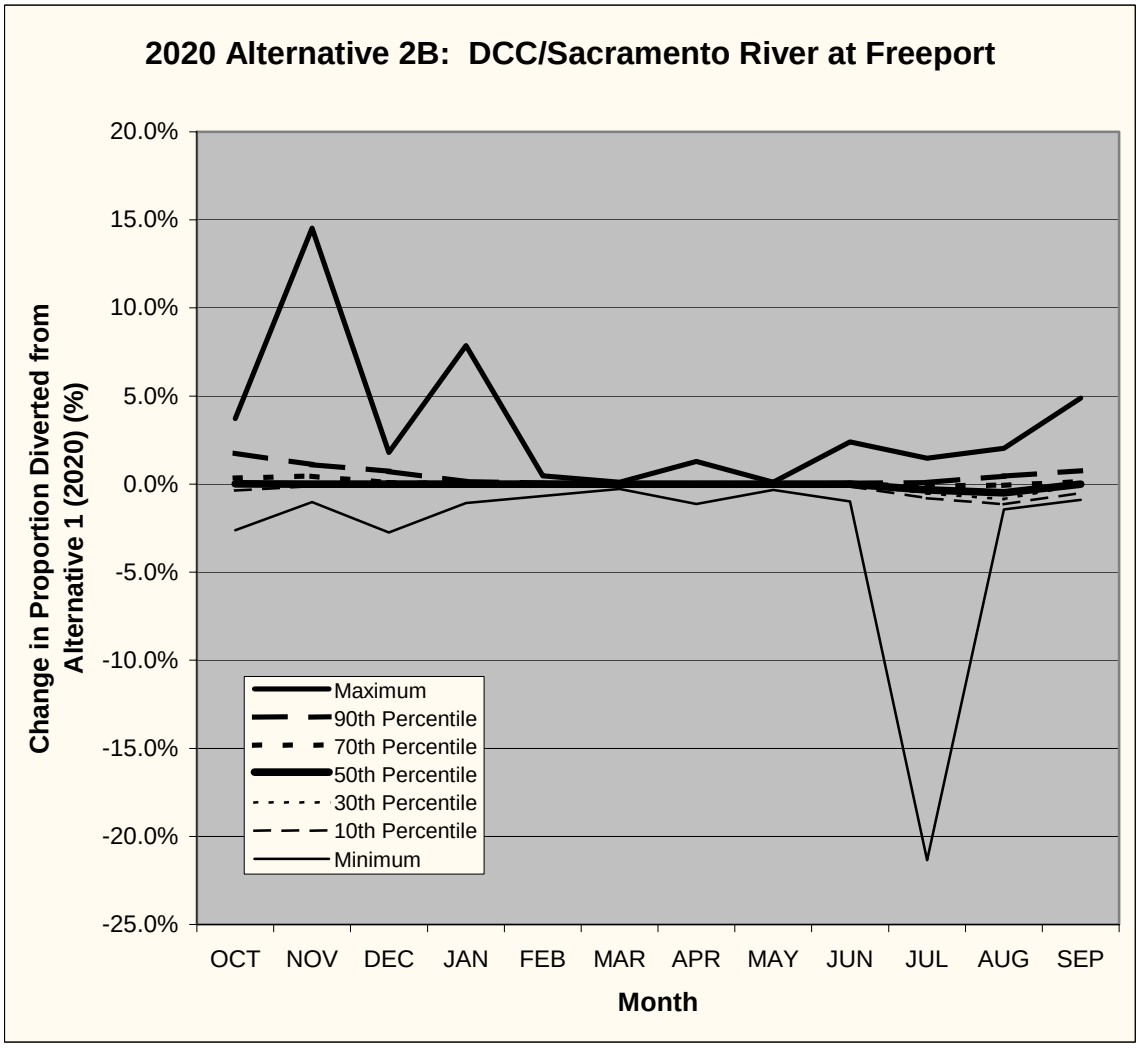
Figure K.2B-9c

2020 CALSIM Hydrology Data and Graphs for Alternative 2B



Note: Data for Alternatives 3B and 4B would be the same as for Alternative 2B because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2B, 3B, and 4B.

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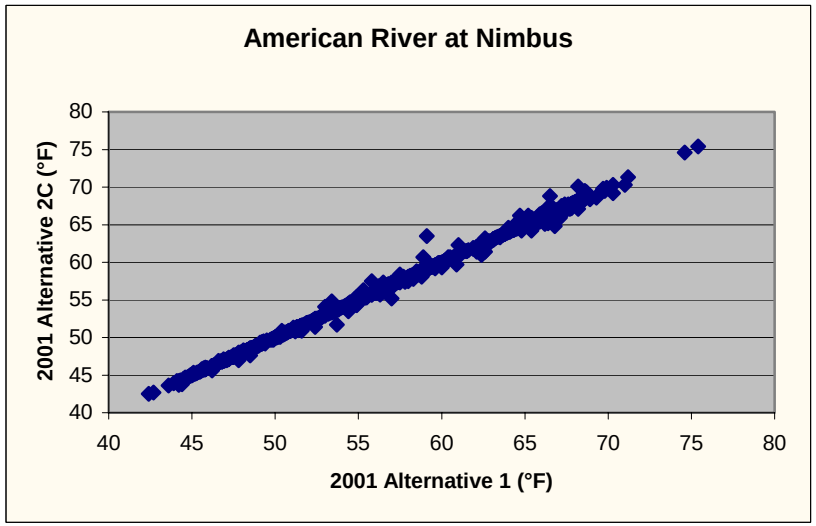
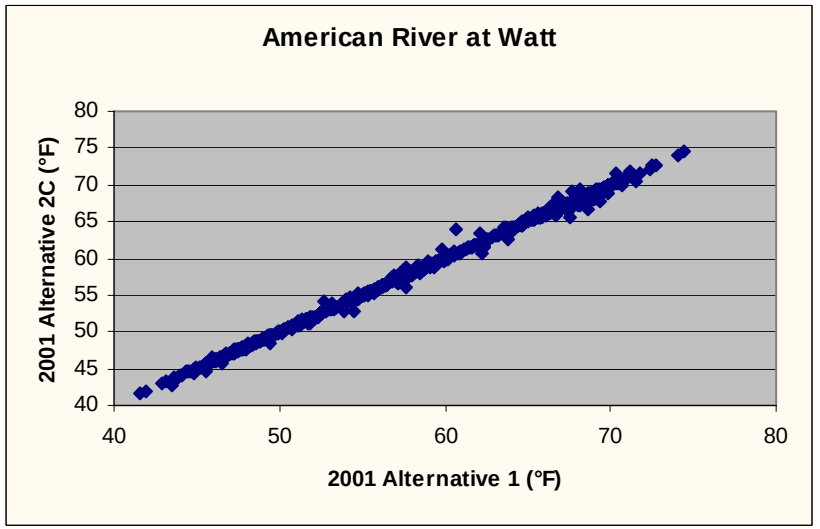
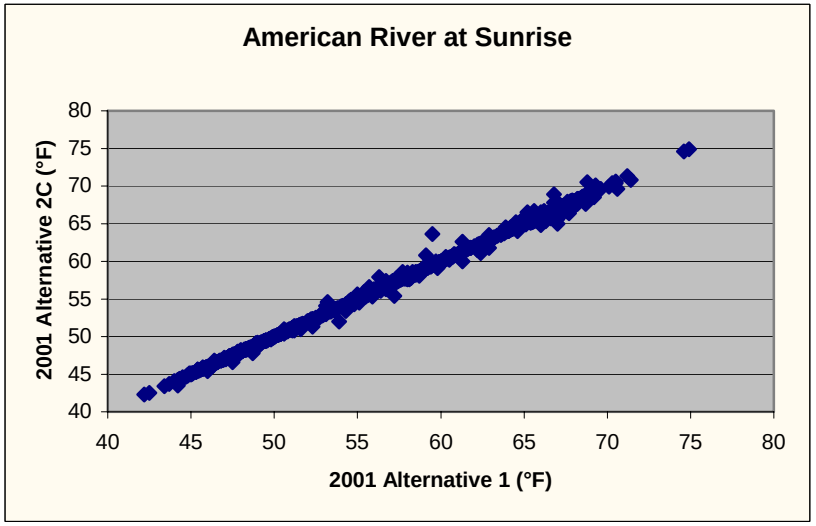
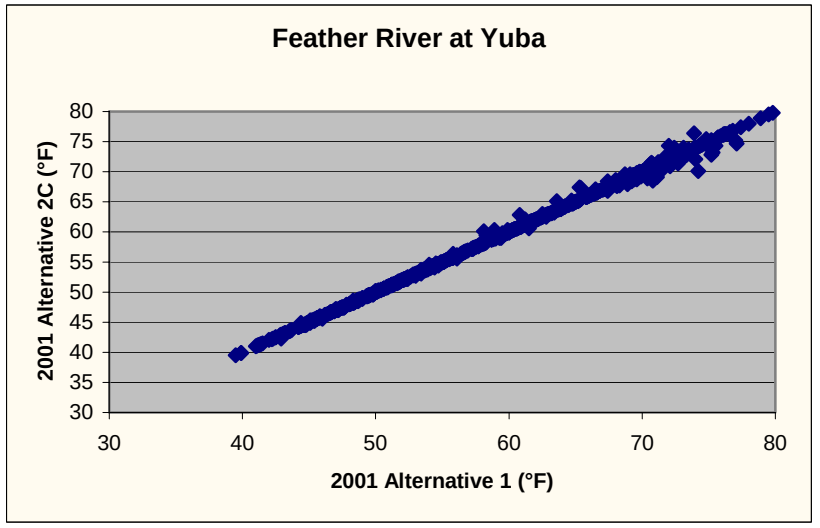
Figure K.2B-9d

2020 CALSIM Hydrology Data and Graphs for Alternative 2B









Note: Data for Alternatives 3C and 4C would be the same as for Alternative 2C because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2C, 3C, and 4C.

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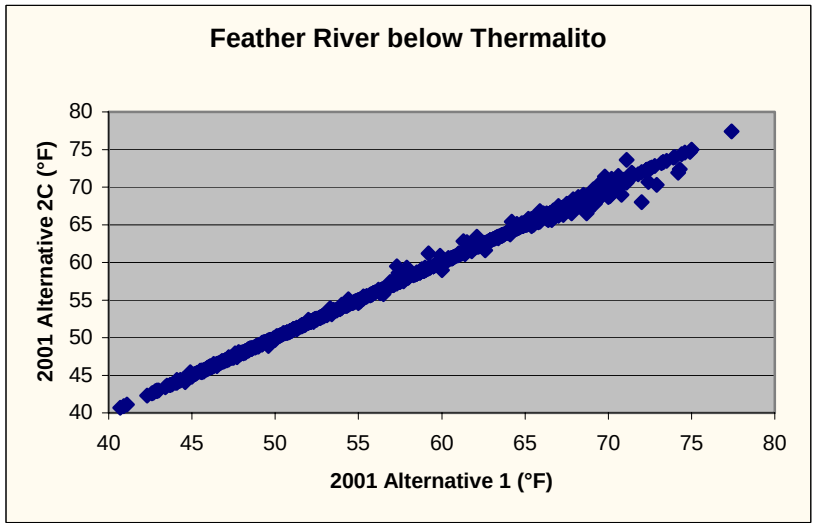
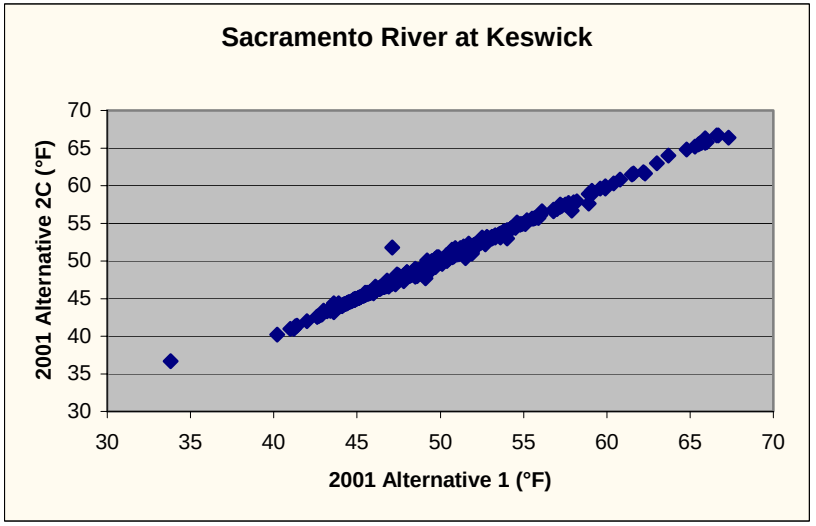
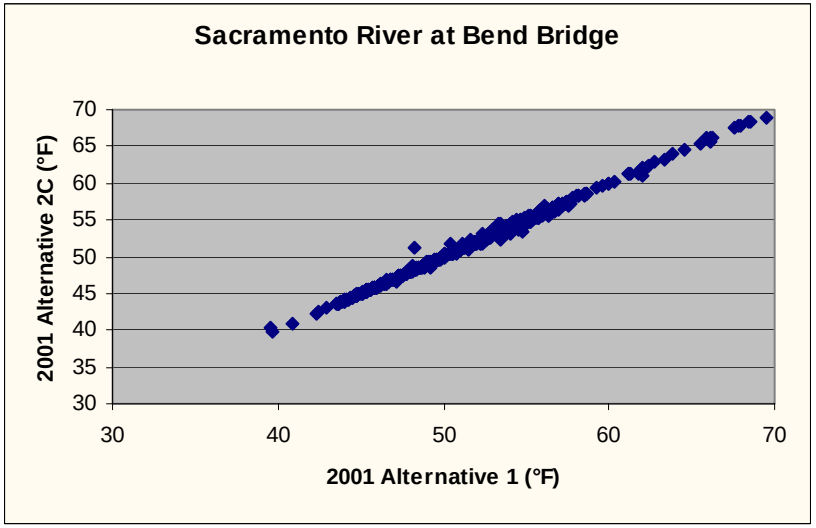
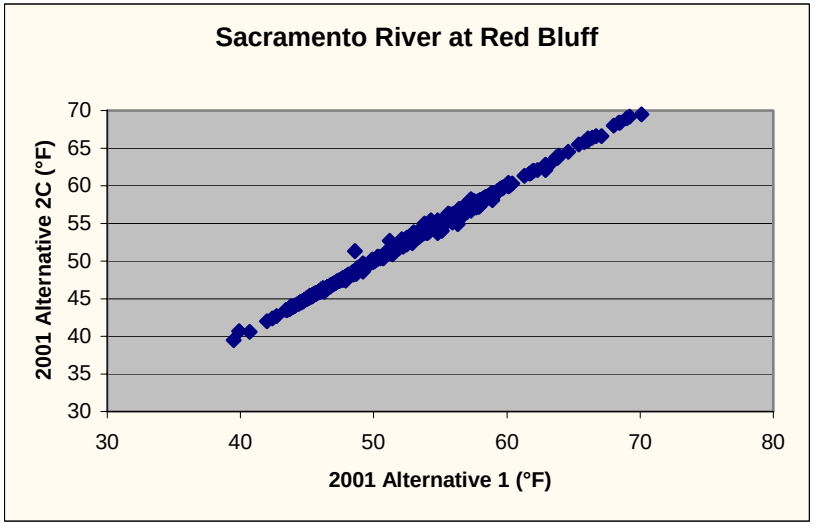
Figure K.2C-1a

2001 CALSIM Temperature Data and Graphs for Alternative 2C









Note: Data for Alternatives 3C and 4C would be the same as for Alternative 2C because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2C, 3C, and 4C.

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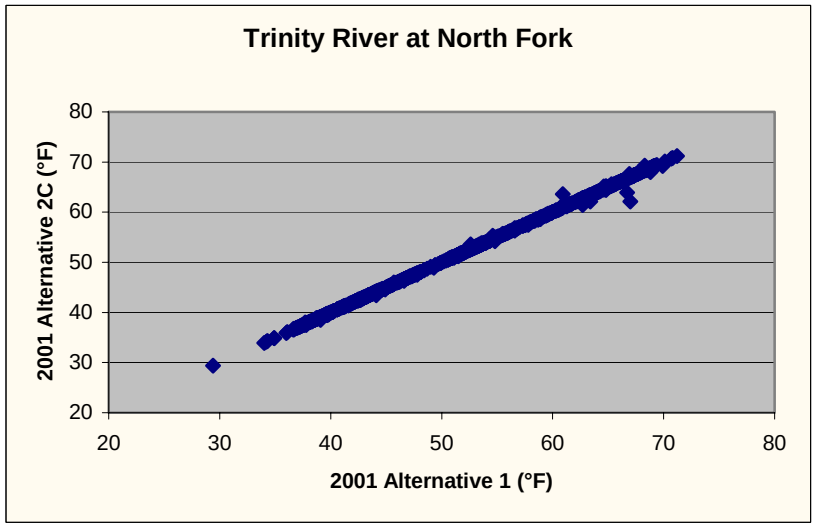
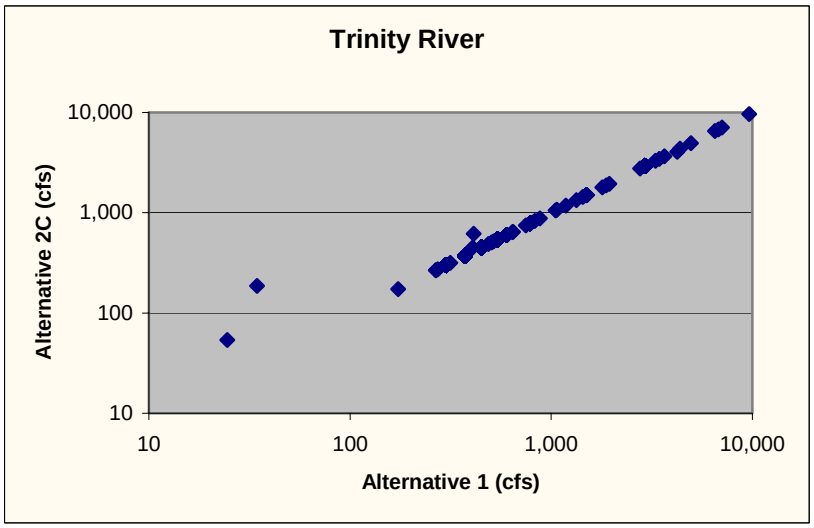
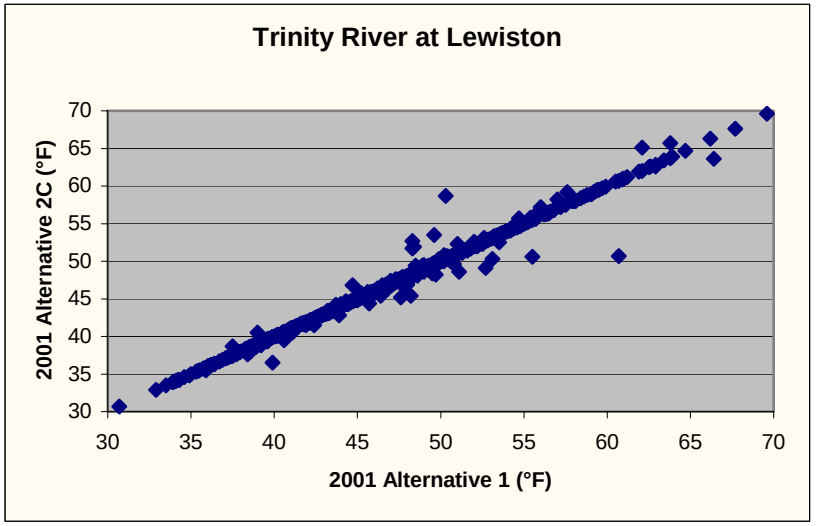
Figure K.2C-1b

2001 CALSIM Temperature Data and Graphs for Alternative 2C







Note: Data for Alternatives 3C and 4C would be the same as for Alternative 2C because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2C, 3C, and 4C.

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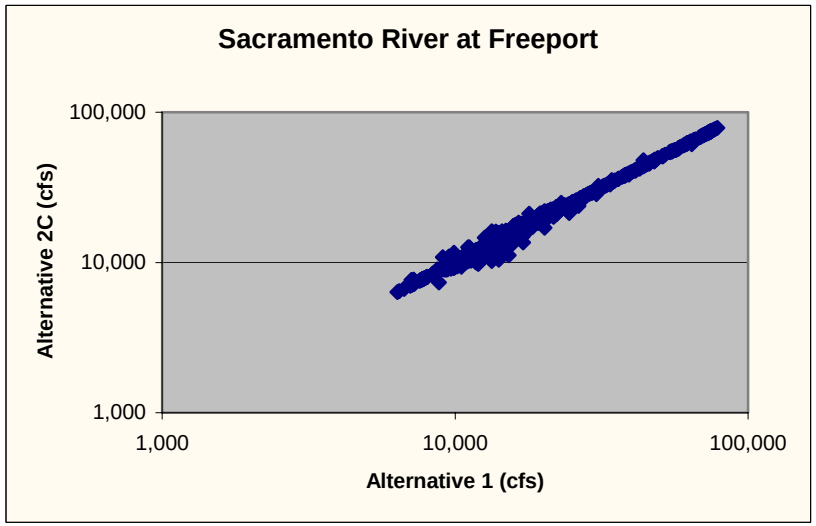
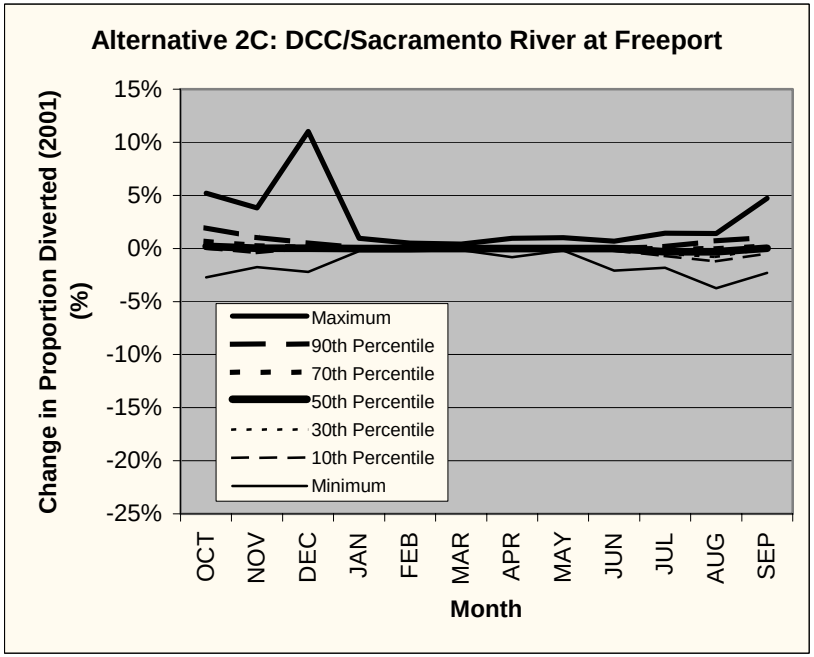
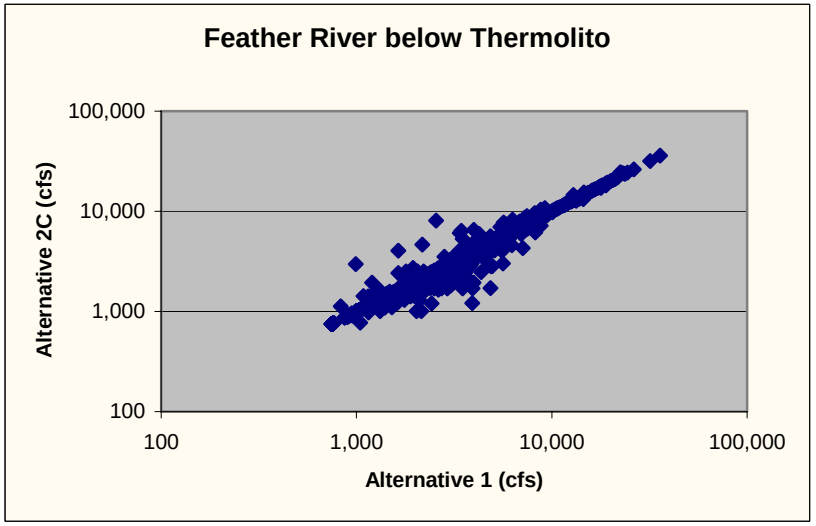
Figure K.2C-1c

2001 CALSIM Temperature Data and Graphs for Alternative 2C







Note: Data for Alternatives 3C and 4C would be the same as for Alternative 2C because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2C, 3C, and 4C.

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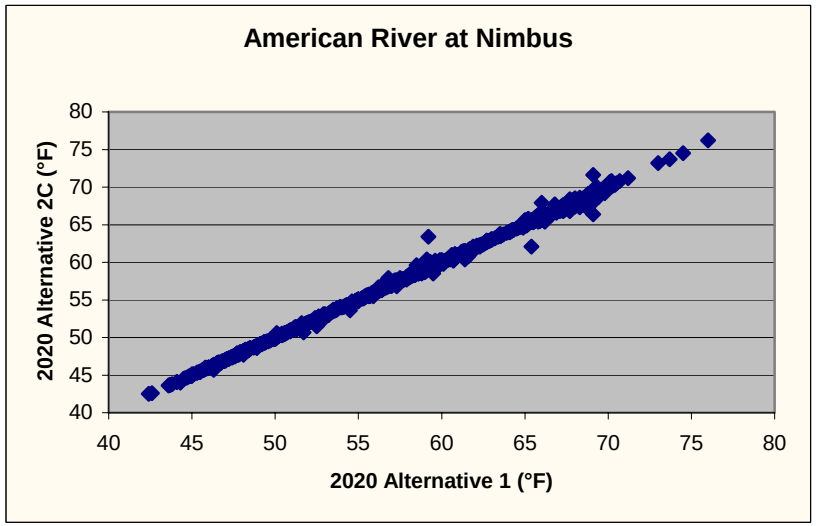
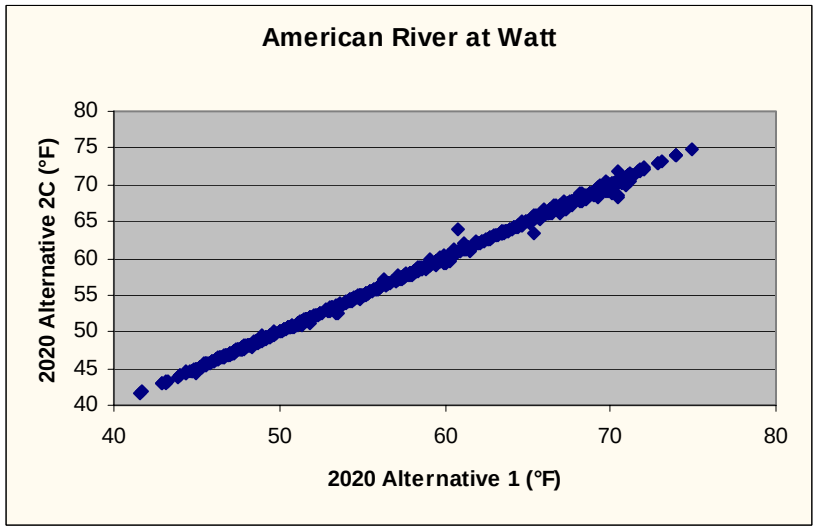
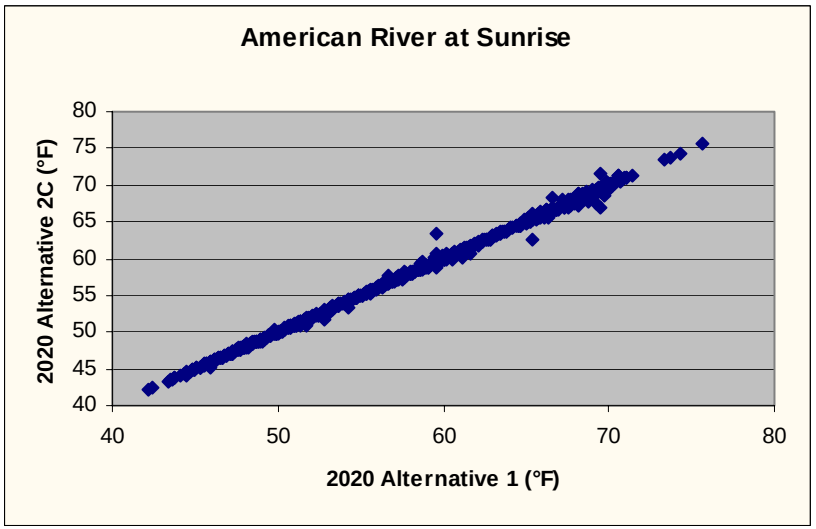
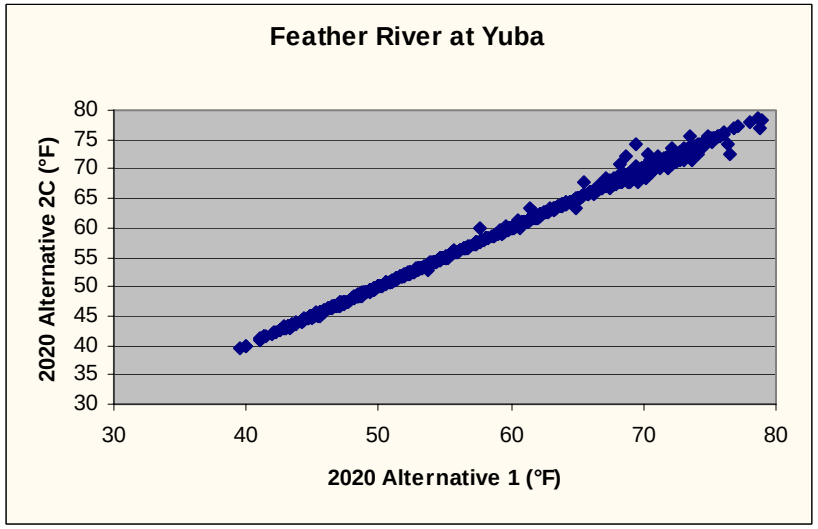
Figure K.2C-2

2001 CALSIM Hydrology Data and Graphs for Alternative 2C









Note: Data for Alternatives 3C and 4C would be the same as for Alternative 2C because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2C, 3C, and 4C.

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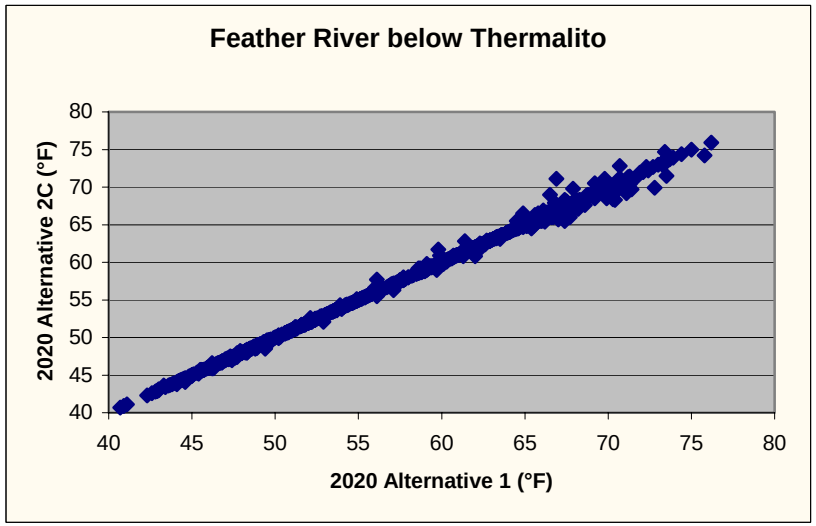
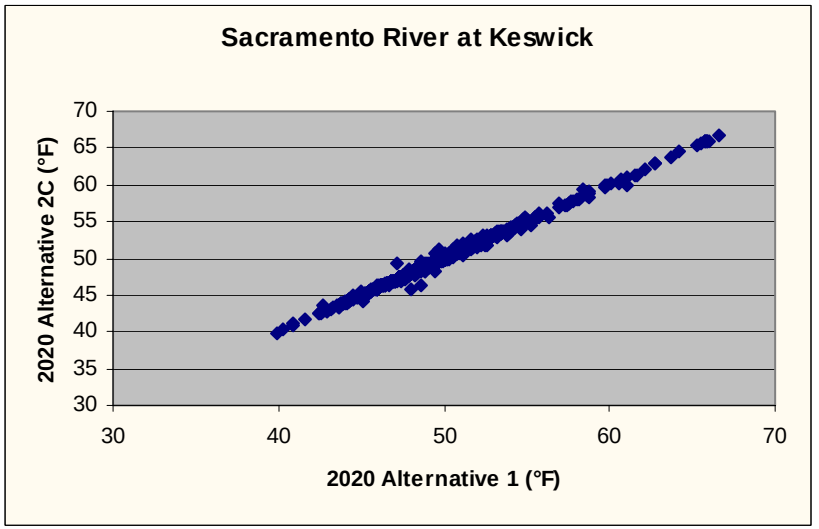
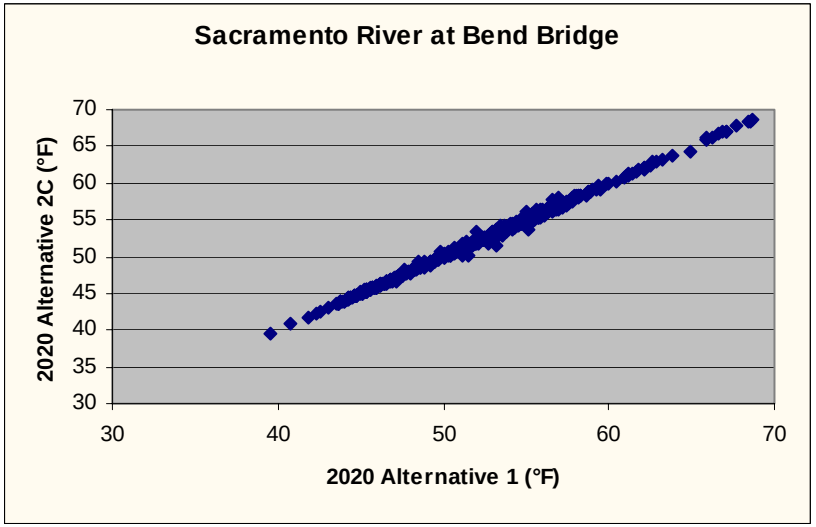
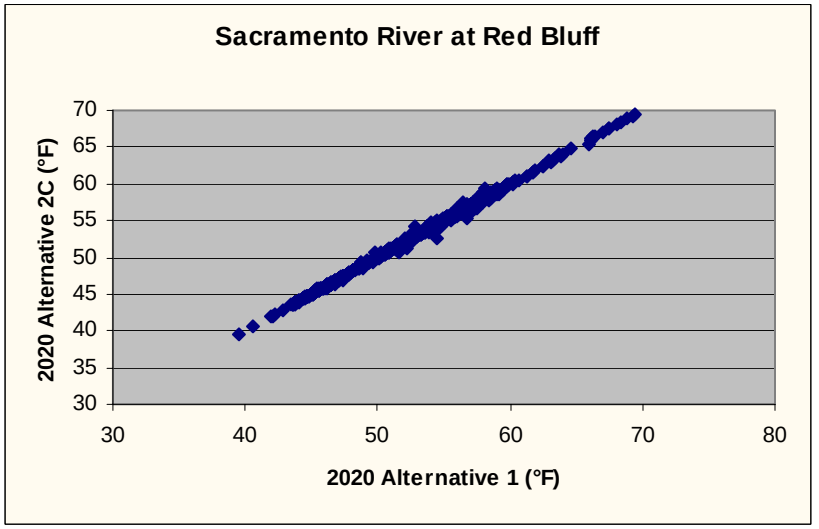
Figure K.2C-3a

2020 CALSIM Temperature Data and Graphs for Alternative 2C









Note: Data for Alternatives 3C and 4C would be the same as for Alternative 2C because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2C, 3C, and 4C.

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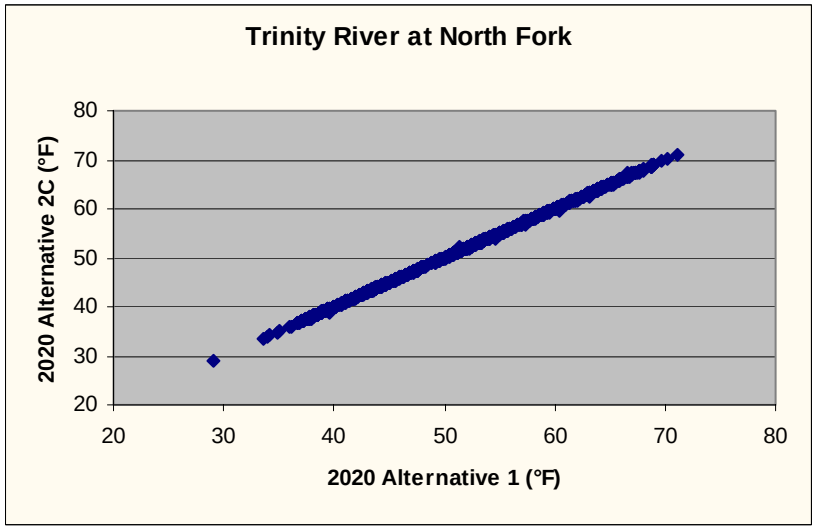
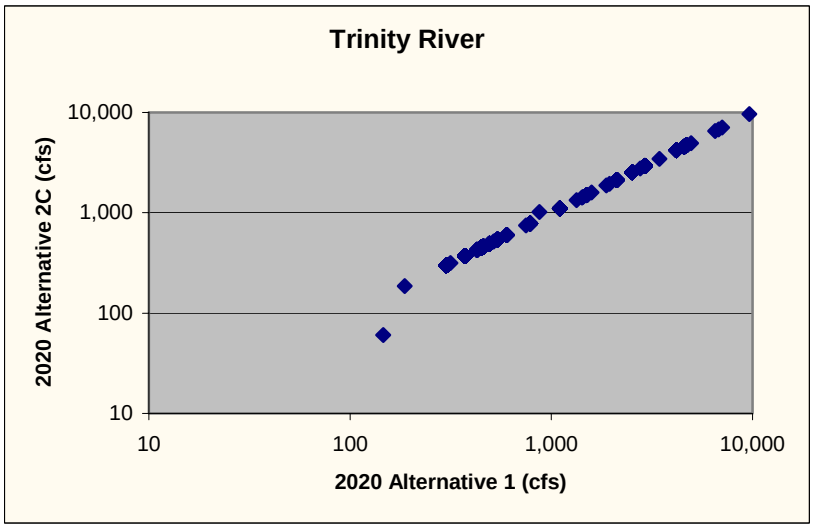
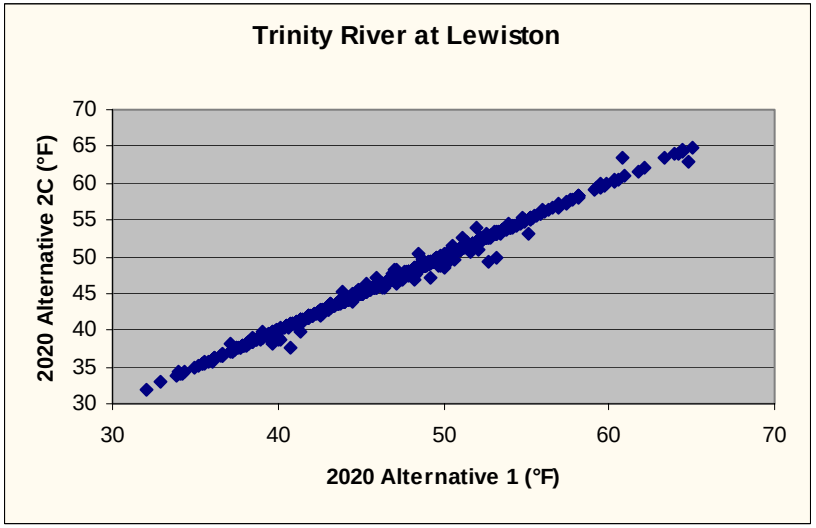
Figure K.2C-3b

2020 CALSIM Temperature Data and Graphs for Alternative 2C







Note: Data for Alternatives 3C and 4C would be the same as for Alternative 2C because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2C, 3C, and 4C.

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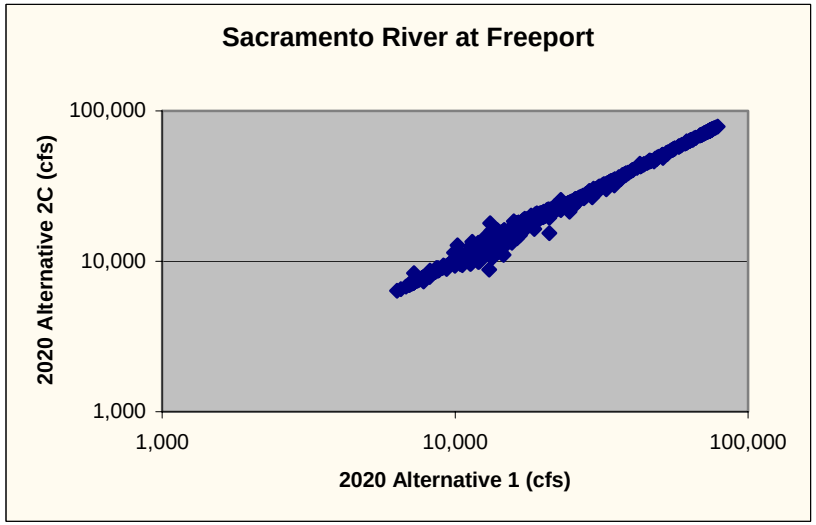
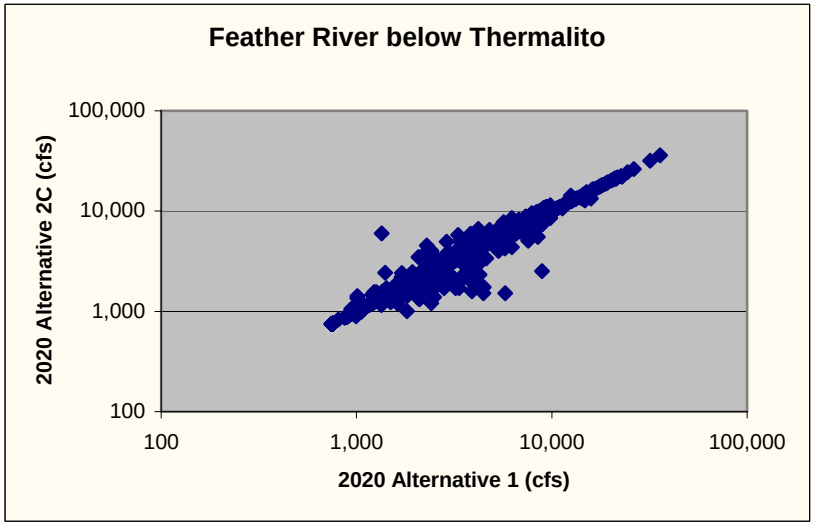
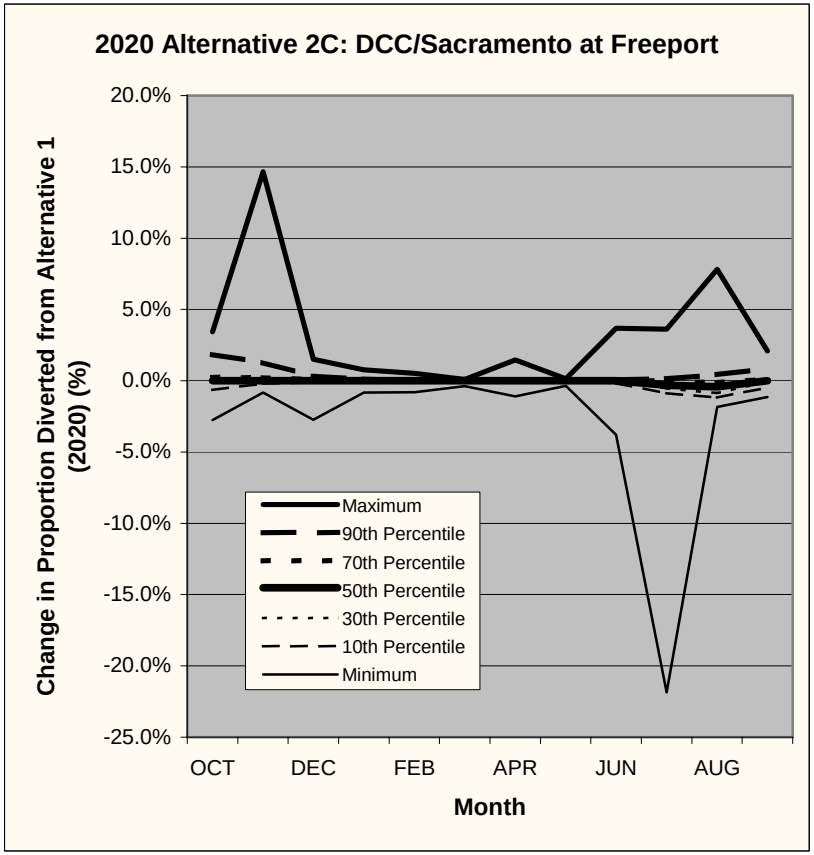
Figure K.2C-3c

2020 CALSIM Temperature and Hydrology Data and Graphs for Alternative 2C







Note: Data for Alternatives 3C and 4C would be the same as for Alternative 2C because they have the same operational component. Therefore, these graphs represent the data for Alternatives 2C, 3C, and 4C.

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Figure K.2C-4

2020 CALSIM Hydrology Data and Graphs for Alternative 2C