Summary of CalLite Modeling Scenarios Prepared for Fish Agencies

Updated June 4, 2009

The "Reference" Series:

Scenario 0_1: D-1641

Assumptions:

- Existing facilities and D-1641 regulations
- 2030 level of development and demands

Scenario 0_2: DRERIP#1

Assumptions:

- Dual conveyance assumptions per Dec 19, 2008 BDCP Overview document
- Modified Fremont Weir enabling spills to occur at elevation 17.5 ft NAVD88 (~15,000 cfs Sac R at Fremont flow) as compared to current weir elevation of 33.5 ft (~56,000 cfs Fremont flow). Flows capped at 5,000 cfs and only considered operable during Dec-Apr.
- Hood Bypass flow requirements

Minimum Hood Bypass Flow Requriement (cfs)

	Water Year Type				
Month	W	AN	BN	D	C
Jan	11000	11000	11000	11000	11000
Feb	11000	11000	11000	11000	11000
Mar	11000	11000	11000	11000	11000
Apr	11000	11000	11000	11000	11000
May	11000	11000	11000	11000	11000
Jun	11000	11000	11000	11000	11000
Jul	5000	5000	5000	5000	5000
Aug	5000	5000	5000	5000	5000
Sep	7000	7000	7000	7000	7000
Oct	7000	7000	7000	7000	7000
Nov	7000	7000	7000	7000	7000
Dec	11000	11000	11000	11000	11000

Max Hood Diversion Fraction of Flows Above Min Bypass Flow Requriement

	Month											
Qsac (cfs)	1	2	3	4	5	6	7	8	9	10	11	12
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
11000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
11001	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
20000	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
30000	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
40000	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
200000	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
999999	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65

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- Old and Middle River flow requirements

Month	W	AN	BN	D	C
Jan	-3500	-3500	-3500	-3500	-3500
Feb	-3500	-3500	-3500	-3500	-3500
Mar	-3500	-3500	-3500	-3500	-3500
Apr	-3500	-3500	-3500	-3500	-3500
May	-3500	-3500	-3500	-3500	-3500
Jun	-3500	-3500	-3500	-3500	-3500
Jul	-5000	-5000	-5000	-5000	-5000
Aug	-5000	-5000	-5000	-5000	-5000
Sep	-5000	-5000	-5000	-5000	-5000
Oct	-5000	-5000	-5000	-5000	-5000
Nov	-5000	-5000	-5000	-5000	-5000
Dec	-3500	-3500	-3500	-3500	-3500

- Delta Cross Channel gate assumptions

DCC = Delta Cross Channel Gates Closure
number of days gate is OPEN (days)

Month	W	AN	BN	D	C
Jan	0	0	0	0	0
Feb	0	0	0	0	0
Mar	0	0	0	0	0
Apr	0	0	0	0	0
May	0	0	0	0	0
Jun	0	0	0	0	0
Jul	31	31	31	31	31
Aug	31	31	31	31	31
Sep	15	15	15	15	15
Oct	15	15	15	15	15
Nov	0	0	0	0	0
Dec	0	0	0	0	0

- Rio Vista flow requirements

Sacramento River at Rio Vista minimum flow (cfs)

	Water Year Type				
Month	W	AN	BN	D	C
Jan	3000	3000	3000	3000	3000
Feb	3000	3000	3000	3000	3000
Mar	3000	3000	3000	3000	3000
Apr	3000	3000	3000	3000	3000
May	3000	3000	3000	3000	3000
Jun	3000	3000	3000	3000	3000
Jul	3000	3000	3000	3000	3000
Aug	3000	3000	3000	3000	3000
Sep	3000	3000	3000	3000	3000
Oct	4000	4000	4000	4000	3000
Nov	4500	4500	4500	4500	3500
Dec	4500	4500	4500	4500	3500

The "A" Series:

General Assumptions

Unless otherwise specified all assumptions are consistent with those of DRERIP#1. The following assumptions are common to all within the "A" series of scenarios.

- Fremont Weir/Yolo bypass assumptions per DRERIP#1
- Delta Cross Channel gate operations per DRERIP#1
- Rio Vista flow requirements per DRERIP#1
- Old and Middle River flow requirements

Month	W	AN	BN	D	C
Jan	-5000	-4000	-3000	-2000	-2000
Feb	-5000	-4000	-3000	-2000	-2000
Mar	-5000	-4000	-3000	-2000	-2000
Apr	-5000	-1000	-1000	-1000	-1000
May	-5000	-1000	-1000	-1000	-1000
Jun	-5000	-4000	-3000	-2000	-2000
Jul	-99999	-99999	-99999	-99999	-99999
Aug	-99999	-99999	-99999	-99999	-99999
Sep	-99999	-99999	-99999	-99999	-99999
Oct	-99999	-99999	-99999	-99999	-99999
Nov	-99999	-99999	-99999	-99999	-99999
Dec	-5000	-4000	-3000	-2000	-2000

- San Joaquin export-inflow ratio

Multiplier

Month	W	AN	BN	D	C
Jan	99.00	99.00	99.00	99.00	99.00
Feb	99.00	99.00	99.00	99.00	99.00
Mar	99.00	99.00	99.00	99.00	99.00
Apr	0.25	0.25	0.33	0.50	1.00
May	0.25	0.25	0.33	0.50	1.00
Jun	99.00	99.00	99.00	99.00	99.00
Jul	99.00	99.00	99.00	99.00	99.00
Aug	99.00	99.00	99.00	99.00	99.00
Sep	99.00	99.00	99.00	99.00	99.00
Oct	99.00	99.00	99.00	99.00	99.00
Nov	99.00	99.00	99.00	99.00	99.00
Dec	99.00	99.00	99.00	99.00	99.00

Scenario 1_3

Assumptions:

- Hood Bypass flows per DRERIP#1 assumptions (below)

Scenario 1_4

Assumptions:

- Hood Bypass flows modified from DRERIP#1 to make 15,000 cfs the base requirement. Percentage assumptions were maintained same as DRERIP scenarios.

Minimum Hood Bypass Flow Requriement (cfs)

	Water Year Type				
Month	**W**	**AN**	**BN**	**D**	**C**
Jan	15000	15000	15000	15000	15000
Feb	15000	15000	15000	15000	15000
Mar	15000	15000	15000	15000	15000
Apr	15000	15000	15000	15000	15000
May	15000	15000	15000	15000	15000
Jun	15000	15000	15000	15000	15000
Jul	5000	5000	5000	5000	5000
Aug	5000	5000	5000	5000	5000
Sep	7000	7000	7000	7000	7000
Oct	7000	7000	7000	7000	7000
Nov	7000	7000	7000	7000	7000
Dec	15000	15000	15000	15000	15000

Max Hood Diversion Fraction of Flows Above Min Bypass Flow Requriement

	Month											
Qsac (cfs)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
15000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
15001	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
20000	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
30000	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
40000	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
200000	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
999999	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65

Scenario 1_5

Assumptions:

- Same as Scenario 1_4, except 15,000 cfs base targets changed to 20,000 cfs.

Scenario 2_4

Assumptions:

- Hood Bypass flows modified per tables below. These changes apply base targets based on water year type and season. The percentage assumptions were stated as 55% of flow above 15,000 cfs should also bypass. When the 13,000 cfs base target was set in place, the percentage was reduced to 45%. Due to the structure of the Hood Bypass in CalLite, it was not possible to set different percentages for the same month

based on water year type. The percentages specified for W/AN/BN water year types were thus applied for all year types.

Minimum Hood Bypass Flow Requriement (cfs)

	Water Year Type				
Month	W	AN	BN	D	C
Jan	15000	15000	15000	13000	13000
Feb	15000	15000	15000	13000	13000
Mar	15000	15000	15000	15000	15000
Apr	15000	15000	15000	15000	15000
May	13000	13000	13000	15000	15000
Jun	13000	13000	13000	13000	13000
Jul	5000	5000	5000	5000	5000
Aug	5000	5000	5000	5000	5000
Sep	7000	7000	7000	7000	7000
Oct	7000	7000	7000	7000	7000
Nov	7000	7000	7000	7000	7000
Dec	13000	13000	13000	13000	13000

Max Hood Diversion Fraction of Flows Above Min Bypass Flow Requriement

	Month											
Qsac (cfs)	1	2	3	4	5	6	7	8	9	10	11	12
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
13000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
13001	0.00	0.00	0.00	0.00	0.55	0.55	1.00	1.00	1.00	1.00	1.00	0.55
15000	0.00	0.00	0.00	0.00	0.55	0.55	1.00	1.00	1.00	1.00	1.00	0.55
15001	0.45	0.45	0.45	0.45	0.55	0.55	1.00	1.00	1.00	1.00	1.00	0.55
40000	0.45	0.45	0.45	0.45	0.55	0.55	1.00	1.00	1.00	1.00	1.00	0.55
200000	0.45	0.45	0.45	0.45	0.55	0.55	1.00	1.00	1.00	1.00	1.00	0.55
999999	0.45	0.45	0.45	0.45	0.55	0.55	1.00	1.00	1.00	1.00	1.00	0.55

Scenario 2_5

Assumptions:

- Same assumptions as Scenario 2_4, except 15,000 cfs base targets changed to 20,000 cfs and 13,000 cfs base target changed to 15,000 cfs.

The "B" Series:

General Assumptions

Unless otherwise specified all assumptions are consistent with those of DRERIP#1. The following assumptions are common to all within the "B" series of scenarios.

- Fremont Weir/Yolo bypass assumptions per DRERIP#1
- Delta Cross Channel gate operations per DRERIP#1
- Rio Vista flow requirements modified for Sep-Nov in W and AN year types

Month	W	AN	BN	D	C
Jan	3000	3000	3000	3000	3000
Feb	3000	3000	3000	3000	3000
Mar	3000	3000	3000	3000	3000
Apr	3000	3000	3000	3000	3000
May	3000	3000	3000	3000	3000
Jun	3000	3000	3000	3000	3000
Jul	3000	3000	3000	3000	3000
Aug	3000	3000	3000	3000	3000
Sep	7500	7500	3000	3000	3000
Oct	7500	7500	4000	4000	3000
Nov	7500	7500	4500	4500	3500
Dec	4500	4500	4500	4500	3500

- Old and Middle River flow requirements (replaced -1000 with -2000 from "A" series)

Month	W	AN	BN	D	C
Jan	-5000	-4000	-3000	-2000	-2000
Feb	-5000	-4000	-3000	-2000	-2000
Mar	-5000	-4000	-3000	-2000	-2000
Apr	-5000	-2000	-2000	-2000	-2000
May	-5000	-2000	-2000	-2000	-2000
Jun	-5000	-4000	-3000	-2000	-2000
Jul	-99999	-99999	-99999	-99999	-99999
Aug	-99999	-99999	-99999	-99999	-99999
Sep	-99999	-99999	-99999	-99999	-99999
Oct	-99999	-99999	-99999	-99999	-99999
Nov	-99999	-99999	-99999	-99999	-99999
Dec	-5000	-4000	-3000	-2000	-2000

Scenario 3_3

Assumptions:

- Hood Bypass flows per DRERIP#1 assumptions (below)

Minimum Hood Bypass Flow Requriement (cfs)

	Water Year Type				
Month	W	AN	BN	D	C
Jan	11000	11000	11000	11000	11000
Feb	11000	11000	11000	11000	11000
Mar	11000	11000	11000	11000	11000
Apr	11000	11000	11000	11000	11000
May	11000	11000	11000	11000	11000
Jun	11000	11000	11000	11000	11000
Jul	5000	5000	5000	5000	5000
Aug	5000	5000	5000	5000	5000
Sep	7000	7000	7000	7000	7000
Oct	7000	7000	7000	7000	7000
Nov	7000	7000	7000	7000	7000
Dec	11000	11000	11000	11000	11000

Max Hood Diversion Fraction of Flows Above Min Bypass Flow Requriement

	Month											
Qsac (cfs)	1	2	3	4	5	6	7	8	9	10	11	12
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
11000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
11001	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
20000	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
30000	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
40000	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
200000	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
999999	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65

Scenario 3_4

Assumptions:

- Hood Bypass to be more protective during Mar-Apr for salmon protection. This further protection is set by specifying that 75% of flow above the base target of 11,000 cfs is also required. Hood bypass base targets are same as DRERIP#1.

Max Hood Diversion Fraction of Flows Above Min Bypass Flow Requriement

	Month											
Qsac (cfs)	1	2	3	4	5	6	7	8	9	10	11	12
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
11000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
11001	0.55	0.45	0.25	0.25	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
20000	0.55	0.45	0.25	0.25	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
30000	0.55	0.45	0.25	0.25	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
40000	0.55	0.45	0.25	0.25	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
200000	0.55	0.45	0.25	0.25	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
999999	0.55	0.45	0.25	0.25	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65

Scenario 3_5

Assumptions:

- Same as Scenario 3_4, except bypass percentage is changed from 75% to 90%.

Scenario 4_4

Assumptions:

- Hood Bypass to be more protective during Feb and May for winter run salmon and native fish protection. This further protection is set by specifying that 75% of flow above the base target of 11,000 cfs is also required. Hood bypass base targets are same as DRERIP#1.

Max Hood Diversion Fraction of Flows Above Min Bypass Flow Requriement

	Month											
Qsac (cfs)	1	2	3	4	5	6	7	8	9	10	11	12
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
11000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
11001	0.55	0.25	0.45	0.45	0.25	0.65	1.00	1.00	1.00	1.00	1.00	0.65
20000	0.55	0.25	0.45	0.45	0.25	0.65	1.00	1.00	1.00	1.00	1.00	0.65
30000	0.55	0.25	0.45	0.45	0.25	0.65	1.00	1.00	1.00	1.00	1.00	0.65
40000	0.55	0.25	0.45	0.45	0.25	0.65	1.00	1.00	1.00	1.00	1.00	0.65
200000	0.55	0.25	0.45	0.45	0.25	0.65	1.00	1.00	1.00	1.00	1.00	0.65
999999	0.55	0.25	0.45	0.45	0.25	0.65	1.00	1.00	1.00	1.00	1.00	0.65

Scenario 4_5

Assumptions:

- Same as Scenario 4_4, except bypass percentage is changed from 75% to 90%.

The "A-B" Hybrid Series:

General Assumptions

Unless otherwise specified all assumptions are consistent with those of DRERIP#1. The following assumptions are common to all within the A-B Hybrid series of scenarios.

- Fremont Weir/Yolo bypass assumptions per DRERIP#1
- Delta Cross Channel gate operations per DRERIP#1
- Rio Vista flow requirements

Sacramento River at Rio Vista minimum flow (cfs)

	Water Year Type				
Month	**W**	**AN**	**BN**	**D**	**C**
Jan	3000	3000	3000	3000	3000
Feb	3000	3000	3000	3000	3000
Mar	3000	3000	3000	3000	3000
Apr	3000	3000	3000	3000	3000
May	3000	3000	3000	3000	3000
Jun	3000	3000	3000	3000	3000
Jul	3000	3000	3000	3000	3000
Aug	3000	3000	3000	3000	3000
Sep	7500	7500	3000	3000	3000
Oct	7500	7500	4000	4000	3000
Nov	7500	7500	4500	4500	3500
Dec	4500	4500	4500	4500	3500

- Old and Middle River flow requirements

Month	W	AN	BN	D	C
Jan	-5000	-4000	-3000	-2000	-2000
Feb	-5000	-4000	-3000	-2000	-2000
Mar	-5000	-4000	-3000	-2000	-2000
Apr	-5000	-1000	-1000	-1000	-1000
May	-5000	-1000	-1000	-1000	-1000
Jun	-5000	-4000	-3000	-2000	-2000
Jul	-99999	-99999	-99999	-99999	-99999
Aug	-99999	-99999	-99999	-99999	-99999
Sep	-99999	-99999	-99999	-99999	-99999
Oct	-99999	-99999	-99999	-99999	-99999
Nov	-99999	-99999	-99999	-99999	-99999
Dec	-5000	-4000	-3000	-2000	-2000

- San Joaquin export-inflow ratio

Multiplier

Month	W	AN	BN	D	C
Jan	99.00	99.00	99.00	99.00	99.00
Feb	99.00	99.00	99.00	99.00	99.00
Mar	99.00	99.00	99.00	99.00	99.00
Apr	0.25	0.25	0.33	0.50	1.00
May	0.25	0.25	0.33	0.50	1.00
Jun	99.00	99.00	99.00	99.00	99.00
Jul	99.00	99.00	99.00	99.00	99.00
Aug	99.00	99.00	99.00	99.00	99.00
Sep	99.00	99.00	99.00	99.00	99.00
Oct	99.00	99.00	99.00	99.00	99.00
Nov	99.00	99.00	99.00	99.00	99.00
Dec	99.00	99.00	99.00	99.00	99.00

Scenario 5_3

Assumptions:

- Hood Bypass flows modified from DRERIP#1 to make 20,000 cfs the base requirement. Percentage assumptions were maintained same as DRERIP scenarios.

Minimum Hood Bypass Flow Requriement (cfs)

	Water Year Type				
Month	**W**	**AN**	**BN**	**D**	**C**
Jan	20000	20000	20000	20000	20000
Feb	20000	20000	20000	20000	20000
Mar	20000	20000	20000	20000	20000
Apr	20000	20000	20000	20000	20000
May	20000	20000	20000	20000	20000
Jun	20000	20000	20000	20000	20000
Jul	5000	5000	5000	5000	5000
Aug	5000	5000	5000	5000	5000
Sep	7000	7000	7000	7000	7000
Oct	7000	7000	7000	7000	7000
Nov	7000	7000	7000	7000	7000
Dec	20000	20000	20000	20000	20000

Max Hood Diversion Fraction of Flows Above Min Bypass Flow Requriement

	Month											
Qsac (cfs)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
20000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
20001	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
25000	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
30000	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
40000	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
200000	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65
999999	0.55	0.45	0.45	0.45	0.55	0.65	1.00	1.00	1.00	1.00	1.00	0.65

Scenario 5_4

Assumptions:

- Same as Scenario 5_3, except with the following changes to reservoir release patterns:
- Target flow on Sacramento River at Keswick, Feather River at Thermalito, and American River at Nimbus during April-May, set at 75% of the inflow Shasta, Oroville, and Folsom, respectively. Flow caps applied per table based on reservoir storage to limit effects on coldwater pool management and low carryover.

Reservoir Bypass Flow Caps (Shasta)					
	Cap1	Storage1	Cap2	Storage2	Cap3
Feb	10,000	2800	6,625	2400	3250
Mar	10,000	3000	6,625	2600	3250
Apr	10,000	3200	6,625	2800	3250
May	10,000	3000	6,625	2600	3250
Jun	10,000	2800	6,625	2400	3250

Reservoir Bypass Flow Caps (Oroville)					
	Cap1	Storage1	Cap2	Storage2	Cap3
Feb	4,000	2000	2,375	1300	750
Mar	4,000	2200	2,375	1500	750
Apr	4,000	2400	2,375	1700	750
May	4,000	2200	2,375	1500	750
Jun	4,000	2000	2,375	1300	750

Reservoir Bypass Flow Caps (Folsom)					
	Cap1	Storage1	Cap2	Storage2	Cap3
Feb	3,000	350	1,900	250	800
Mar	3,000	400	1,900	300	800
Apr	3,000	450	1,900	350	800
May	3,000	400	1,900	300	800
Jun	3,000	350	1,900	250	800

Scenario 5_5

Assumptions:

- Same as Scenario 5_4, except with the 75% of inflow target applying during February-June.

Scenario 6_3

Assumptions:

- Same as 5_5, except with Hood Bypass flows modified per tables below:

Minimum Hood Bypass Flow Requriement (cfs)

	Water Year Type				
Month	**W**	**AN**	**BN**	**D**	**C**
Jan	15000	15000	15000	15000	15000
Feb	15000	15000	15000	15000	15000
Mar	20000	20000	20000	20000	20000
Apr	20000	20000	20000	20000	20000
May	15000	15000	15000	15000	15000
Jun	11000	11000	11000	11000	11000
Jul	5000	5000	5000	5000	5000
Aug	5000	5000	5000	5000	5000
Sep	7000	7000	7000	7000	7000
Oct	7000	7000	7000	7000	7000
Nov	7000	7000	7000	7000	7000
Dec	11000	11000	11000	11000	11000

Max Hood Diversion Fraction of Flows Above Min Bypass Flow Requriement

	Month											
Qsac (cfs)	1	2	3	4	5	6	7	8	9	10	11	12
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
11000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
11001	0.00	0.00	0.00	0.00	0.00	0.45	1.00	1.00	1.00	1.00	1.00	0.45
15000	0.00	0.00	0.00	0.00	0.00	0.45	1.00	1.00	1.00	1.00	1.00	0.45
15001	0.45	0.45	0.00	0.00	0.45	0.45	1.00	1.00	1.00	1.00	1.00	0.45
20000	0.45	0.45	0.00	0.00	0.45	0.45	1.00	1.00	1.00	1.00	1.00	0.45
20001	0.45	0.45	0.45	0.45	0.45	0.45	1.00	1.00	1.00	1.00	1.00	0.45
999999	0.45	0.45	0.45	0.45	0.45	0.45	1.00	1.00	1.00	1.00	1.00	0.45

Scenario 6_4

Assumptions:

- Same as 5_5, except with Hood Bypass flows modified per tables below:

Minimum Hood Bypass Flow Requriement (cfs)

	Water Year Type				
Month	W	AN	BN	D	C
Jan	17000	17000	17000	17000	17000
Feb	17000	17000	17000	17000	17000
Mar	17000	17000	17000	17000	17000
Apr	17000	17000	17000	17000	17000
May	17000	17000	17000	17000	17000
Jun	11000	11000	11000	11000	11000
Jul	5000	5000	5000	5000	5000
Aug	5000	5000	5000	5000	5000
Sep	7000	7000	7000	7000	7000
Oct	7000	7000	7000	7000	7000
Nov	7000	7000	7000	7000	7000
Dec	11000	11000	11000	11000	11000

Max Hood Diversion Fraction of Flows Above Min Bypass Flow Requriement

	Month											
Qsac (cfs)	1	2	3	4	5	6	7	8	9	10	11	12
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
11000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
11001	0.00	0.00	0.00	0.00	0.00	0.45	1.00	1.00	1.00	1.00	1.00	0.45
17000	0.00	0.00	0.00	0.00	0.00	0.45	1.00	1.00	1.00	1.00	1.00	0.45
17001	0.45	0.45	0.45	0.45	0.45	0.45	1.00	1.00	1.00	1.00	1.00	0.45
20000	0.45	0.45	0.45	0.45	0.45	0.45	1.00	1.00	1.00	1.00	1.00	0.45
20001	0.45	0.45	0.45	0.45	0.45	0.45	1.00	1.00	1.00	1.00	1.00	0.45
999999	0.45	0.45	0.45	0.45	0.45	0.45	1.00	1.00	1.00	1.00	1.00	0.45

Scenario 6_5

Assumptions:

- Same as 5_5, except with Hood Bypass flows modified per tables below:

Minimum Hood Bypass Flow Requriement (cfs)

	Water Year Type				
Month	W	AN	BN	D	C
Jan	15000	15000	15000	15000	15000
Feb	15000	15000	15000	15000	15000
Mar	20000	20000	20000	20000	20000
Apr	20000	20000	20000	20000	20000
May	15000	15000	15000	15000	15000
Jun	11000	11000	11000	11000	11000
Jul	5000	5000	5000	5000	5000
Aug	5000	5000	5000	5000	5000
Sep	7000	7000	7000	7000	7000
Oct	7000	7000	7000	7000	7000
Nov	7000	7000	7000	7000	7000
Dec	11000	11000	11000	11000	11000

Max Hood Diversion Fraction of Flows Above Min Bypass Flow Requriement

	Month											
Qsac (cfs)	1	2	3	4	5	6	7	8	9	10	11	12
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
7001	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
11000	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
11001	0.00	0.00	0.00	0.00	0.00	0.45	1.00	1.00	1.00	1.00	1.00	0.45
15000	0.00	0.00	0.00	0.00	0.00	0.45	1.00	1.00	1.00	1.00	1.00	0.45
15001	0.55	0.55	0.00	0.00	0.55	0.45	1.00	1.00	1.00	1.00	1.00	0.45
20000	0.55	0.55	0.00	0.00	0.55	0.45	1.00	1.00	1.00	1.00	1.00	0.45
20001	0.55	0.55	0.65	0.65	0.55	0.45	1.00	1.00	1.00	1.00	1.00	0.45
999999	0.55	0.55	0.65	0.65	0.55	0.45	1.00	1.00	1.00	1.00	1.00	0.45

Scenario 7_3

Assumptions:

- Target flow on Sacramento River at Keswick, Feather River at Thermalito, and American River at Nimbus during April-May, set at 75% of the inflow Shasta, Oroville, and Folsom, respectively. Flow caps applied per table based on reservoir storage to limit effects on coldwater pool management and low carryover.

Reservoir Bypass Flow Caps (Shasta)					
	Cap1	Storage1	Cap2	Storage2	Cap3
Feb	10,000	2800	6,625	2400	3250
Mar	10,000	3000	6,625	2600	3250
Apr	10,000	3200	6,625	2800	3250
May	10,000	3000	6,625	2600	3250
Jun	10,000	2800	6,625	2400	3250

Reservoir Bypass Flow Caps (Oroville)					
	Cap1	Storage1	Cap2	Storage2	Cap3
Feb	4,000	2000	2,375	1300	750
Mar	4,000	2200	2,375	1500	750
Apr	4,000	2400	2,375	1700	750
May	4,000	2200	2,375	1500	750
Jun	4,000	2000	2,375	1300	750

Reservoir Bypass Flow Caps (Folsom)					
	Cap1	Storage1	Cap2	Storage2	Cap3
Feb	3,000	350	1,900	250	800
Mar	3,000	400	1,900	300	800
Apr	3,000	450	1,900	350	800
May	3,000	400	1,900	300	800
Jun	3,000	350	1,900	250	800

- Fremont Weir/Yolo bypass assumptions per DRERIP#1
- Delta Cross Channel gate operations per DRERIP#1
- Rio Vista flow requirements

Sacramento River at Rio Vista minimum flow (cfs)

	Water Year Type				
Month	**W**	**AN**	**BN**	**D**	**C**
Jan	3000	3000	3000	3000	3000
Feb	3000	3000	3000	3000	3000
Mar	3000	3000	3000	3000	3000
Apr	3000	3000	3000	3000	3000
May	3000	3000	3000	3000	3000
Jun	3000	3000	3000	3000	3000
Jul	3000	3000	3000	3000	3000
Aug	3000	3000	3000	3000	3000
Sep	7500	7500	3000	3000	3000
Oct	7500	7500	4000	4000	3000
Nov	7500	7500	4500	4500	3500
Dec	4500	4500	4500	4500	3500

- Old and Middle River flow requirements

OMR = Combined Old and Middle River minimum flov

Month	**W**	**AN**	**BN**	**D**	**C**
Jan	-5000	-4000	-3000	-2000	-2000
Feb	-5000	-4000	-3000	-2000	-2000
Mar	-5000	-4000	-3000	-2000	-2000
Apr	-5000	-2000	-1500	-1500	-1500
May	-5000	-2000	-1500	-1500	-1500
Jun	-5000	-4000	-3000	-2000	-2000
Jul	-99999	-99999	-99999	-99999	-99999
Aug	-99999	-99999	-99999	-99999	-99999
Sep	-99999	-99999	-99999	-99999	-99999
Oct	-99999	-99999	-99999	-99999	-99999
Nov	-99999	-99999	-99999	-99999	-99999
Dec	-5000	-4000	-3000	-2000	-2000

- San Joaquin export-inflow ratio

Multiplier

Month	W	AN	BN	D	C
Jan	99.00	99.00	99.00	99.00	99.00
Feb	99.00	99.00	99.00	99.00	99.00
Mar	99.00	99.00	99.00	99.00	99.00
Apr	0.25	0.25	0.33	0.50	1.00
May	0.25	0.25	0.33	0.50	1.00
Jun	99.00	99.00	99.00	99.00	99.00
Jul	99.00	99.00	99.00	99.00	99.00
Aug	99.00	99.00	99.00	99.00	99.00
Sep	99.00	99.00	99.00	99.00	99.00
Oct	99.00	99.00	99.00	99.00	99.00
Nov	99.00	99.00	99.00	99.00	99.00
Dec	99.00	99.00	99.00	99.00	99.00

- Hood Bypass flows modified per tables below:

Minimum Hood Bypass Flow Requriement (cfs)

	Water Year Type				
Month	W	AN	BN	D	C
Jan	15000	15000	15000	15000	15000
Feb	15000	15000	15000	15000	15000
Mar	20000	20000	20000	20000	20000
Apr	20000	20000	20000	20000	20000
May	15000	15000	15000	15000	15000
Jun	13000	13000	13000	13000	13000
Jul	5000	5000	5000	5000	5000
Aug	5000	5000	5000	5000	5000
Sep	7000	7000	7000	7000	7000
Oct	7000	7000	7000	7000	7000
Nov	7000	7000	7000	7000	7000
Dec	15000	15000	15000	15000	15000

Max Hood Diversion Fraction of Flows Above Min Bypass Flow Requirement

	Month											
Qsac (cfs)	1	2	3	4	5	6	7	8	9	10	11	12
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00
13000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00
13001	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.00	1.00	1.00	0.00
15000	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.00	1.00	1.00	0.00
15001	0.45	0.45	0.00	0.00	0.45	0.45	0.00	0.00	0.00	1.00	1.00	0.45
20000	0.45	0.45	0.00	0.00	0.45	0.45	0.00	0.00	0.00	1.00	1.00	0.45
20001	0.45	0.45	0.45	0.45	0.45	0.45	0.00	0.00	0.00	1.00	1.00	0.45
999999	0.45	0.45	0.45	0.45	0.45	0.45	0.00	0.00	0.00	1.00	1.00	0.45