Appendix AB-N, New Melones Stepped Release Plan

Attachment N.1 Stanislaus River Water Temperature Analysis

N.1.1 Model Overview

This analysis enumerates the frequency at which mean monthly HEC-5Q simulated water temperatures exceed water temperature index values or occur outside index ranges for multiple fish species in the Stanislaus River. Index values and ranges were primarily obtained from the scientific literature and agency reports for each species and life stage at multiple locations within the river. Two additional performance metrics for water temperature were included to assess how the SRP affects water temperature conditions for Central Valley steelhead. Frequencies were calculated for the baseline and each alternative at one or more locations of life stage presence in the river by water year type. For the EIS analysis, the incremental change between the baseline and each alternative was then calculated.

N.1.2 Model Development

N.1.2.1 Methods

Water temperature was simulated in HEC-5Q for water years 1922 through 2020 for the Stanislaus River. Outputs from HEC-5Q were used as inputs to the analysis.

Water temperature index values were compiled for the life stages present in the Stanislaus River for Central Valley steelhead (Table N.1-1). These index values were primarily taken from Appendix AB-C and Appendix AB-D of the Biological Assessment. Water temperature index values and ranges were compiled for the life stages present in the Stanislaus River for following non-listed species: fall-run Chinook salmon, Pacific lamprey, river lamprey, hardhead, Sacramento hitch, striped bass, American shad, and largemouth bass (Table N.1-2). These values and ranges were primarily taken from the 2017 Sites Reservoir Project Draft EIR/EIS (Sites Project Authority and Bureau of Reclamation 2017), Appendix 12D, Water Temperature Index Value Selection Rationale, with supplemental information taken from the scientific literature as necessary. Index values and index ranges used in this analysis typically characterize the suitable, optimal, acceptable, and observed temperature range needed for survival, growth, or presence. In addition to these values, the two temperature values were included to evaluate how the stepped release plan may affect steelhead:

- The survival temperature threshold for juvenile steelhead is less than or equal to 68 degrees Fahrenheit (°F) from May 1 to October 31.

- The temperature threshold for steelhead egg incubation is less than or equal to 54°F from December 1 to May 31.

The analysis calculates the frequency that modeled water temperatures under the baseline and each alternative would either exceed the temperature index value or occur outside the index range for a given species and life stage. The analysis uses a monthly time step, and the percent of months exceeding the index value or occurring outside the index range was computed over the entire 98-water year simulation period for each San Joaquin Valley (60-20-20) water year type. Frequencies of exceedance for each alternative are compared to baseline conditions, in keeping with guidance on the proper use of model outputs, to calculate the incremental effect of the alternative. To best characterize potential differences, the analysis evaluates frequencies by water year type for all months of life stage presence combined and within the reach of river where the life stage is present.

Table N.1-1. Water Temperature Index Values for Central Valley Steelhead in the Stanislaus River.

Species	Life Stage	Months of Presence	Model Output Locations	Temperature Index Value/Range (°F)	Temperature Index References
Steelhead	Adult Migration and Holding	Jul-Mar	Orange Blossom Bridge, above confluence	41-66.2	Migration impairment (Keefer et al. 2009)
Steelhead	Adult Migration and Holding	Jul-Mar	Orange Blossom Bridge, above confluence	69.8	Lethal limit to adult migrants (Coutant 1970)
Steelhead	Adult Migration and Holding	Jul-Mar	Orange Blossom Bridge, above confluence	59.9	Pathogen virulence threshold (McCullough 1999)
Steelhead	Spawning	Dec-May	Orange Blossom Bridge	45-55	Successful spawning range (Bell 1991, FERC 1993, Richter and Kolmes 2005)
Steelhead	Spawning	Dec-May	Orange Blossom Bridge	59.9	Pathogen virulence threshold (McCullough 1999)
Steelhead	Kelt Emigration	Feb-Jun	Orange Blossom Bridge, above confluence	66.2	Migration impairment (Keefer et al. 2009)
Steelhead	Kelt Emigration	Feb-Jun	Orange Blossom Bridge, above confluence	69.8	Lethal to adult migrating steelhead (Coutant 1970)
Steelhead	Kelt Emigration	Feb-Jun	Orange Blossom Bridge, above confluence	59.9	Pathogen virulence threshold (McCullough 1999)
Steelhead	Egg Incubation and Fry Emergence	Dec-Jul	Orange Blossom Bridge	45-52	Optimal incubation temperature (McCullough et al. 2001)
Steelhead	Egg Incubation and Fry Emergence	Dec-Jul	Orange Blossom Bridge	59.9	Fry pathogen virulence threshold (McCullough 1999)
Steelhead	Egg Incubation	Dec-May	Orange Blossom Bridge	54	Stepped release plan egg metric (Appendix AB-N)
Steelhead	Juvenile Rearing	Year-round	Orange Blossom Bridge, above confluence	66.2	Upper limit of optimum temperatures for juvenile steelhead growth, assuming maximum ration levels (Myrick 1998; Myrick and Cech 2001)

Species	Life Stage	Months of Presence	Model Output Locations	Temperature Index Value/Range (°F)	Temperature Index References
Steelhead	Juvenile Rearing and Outmigration	Year-round	Orange Blossom Bridge, above confluence	59.9	Pathogen virulence threshold (McCullough 1999)
Steelhead	Juvenile Outmigration	Year-round	Orange Blossom Bridge, above confluence	55	Upper limit of successful smoltification (Zaugg & Wagner 1973; Wedemeyer et al. 1980; U.S. Environmental Protection Agency 2003)
Steelhead	Juvenile Rearing and Outmigration	May-Oct	Orange Blossom Bridge	68	Stepped release plan juvenile rearing metric (Appendix AB-N)

Table N.1-2. Water Temperature Index Values and Index Ranges for Non-Listed Fish Species in the Stanislaus River.

Species	Life Stage	Months of Presence	Model Output Locations	Temperature Index Value/Range (°F)	Temperature Index References
Fall-run Chinook salmon	Adult Migration	Jul-Dec	Orange Blossom Bridge, above confluence	37.9-68	Successful migration upper limit (Reiser and Bjornn 1979, Goniea et al. 2006)
Fall-run Chinook salmon	Adult Migration	Jul-Dec	Orange Blossom Bridge, above confluence	59.9	Pathogen virulence threshold (McCullough 1999)
Fall-run Chinook salmon	Adult Holding and Spawning	Oct-Jan	Orange Blossom Bridge	42.1-55	Spawning initiation range (McCullough 1999)
Fall-run Chinook salmon	Adult Holding and Spawning	Oct-Jan	Orange Blossom Bridge	59.9	Pathogen virulence threshold (McCullough 1999)
Fall-run Chinook salmon	Egg Incubation and Fry Emergence	Dec-Mar	Orange Blossom Bridge	42.8-56[1]	Slater 1963, USFWS 1999, Myrick and Cech 2004, Bratovich et al. 2012, Martin et al. 2017

[1] Exact endpoints fall somewhere between 53.6°F and 56°F, with recommended upper thermal optimum of 53.6°F to 55.9°F (Myrick and Cech 2004, Martin et al. 2017)

Species	Life Stage	Months of Presence	Model Output Locations	Temperature Index Value/Range (°F)	Temperature Index References
Fall-run Chinook salmon	Egg Incubation and Fry Emergence	Dec-Mar	Orange Blossom Bridge	59.9	Pathogen virulence threshold (McCullough 1999)
Fall-run Chinook salmon	Juvenile Rearing	Mar-Jun	Orange Blossom Bridge	55.4-68	Optimum temperature for growth, smoltification, and predation vulnerability (Myrick and Cech 2002, Marine and Cech 2004)
Fall-run Chinook salmon	Juvenile Rearing and Outmigration	Mar-Jun	Orange Blossom Bridge	75.2	UILT (Brett 1952, Brett et al. 1982, Myrick and Cech 2004)
Fall-run Chinook salmon	Juvenile Outmigration	Mar-Jun	Orange Blossom Bridge	59.9	Pathogen virulence threshold (McCullough 1999)
Pacific Lamprey	Spawning and Egg Incubation	April-Aug	Orange Blossom Bridge	50-64	Observed range of high survival and low occurrence of embryonic developmental abnormalities (Meeuwig et al. 2003, 2005)
Pacific Lamprey	Ammocoete Rearing and Emigration	Year-round	Orange Blossom Bridge, above confluence	72	Upper limit for high survival and low occurrence of developmental abnormalities (Meeuwig et al. 2003, 2005)
Western River Lamprey	Spawning and Egg Incubation	Feb-Jul	Orange Blossom Bridge	50-64	Observed range of high survival and low occurrence of embryonic developmental abnormalities (Meeuwig et al. 2003, 2005)
Western River Lamprey	Ammocoete Rearing and Emigration	Year-round	Orange Blossom Bridge, above confluence	72	Upper limit for high survival and low developmental abnormalities (Meeuwig et al. 2003, 2005)
Hardhead	Spawning	Apr-Jun	Orange Blossom Bridge	59-64	Optimal range (Wang 1986)
Hardhead	Non-spawning Adults	Year-round	Orange Blossom Bridge	57.2-78.8	Commonly observed range (Thompson et al. 2012)
Striped Bass	Spawning, Embryo Incubation, and Initial Rearing	Apr-Jun	Orange Blossom Bridge	59-68	Optimal range (Moyle 2002)

Species	Life Stage	Months of Presence	Model Output Locations	Temperature Index Value/Range (°F)	Temperature Index References
Striped Bass	Larvae, Fry, and Juvenile Rearing and Emigration	Year-round	Orange Blossom Bridge, above confluence	61-71	Optimal range (Fay et al. 1983)
American Shad	Spawning and Larval Rearing	Apr-Jun	Orange Blossom Bridge	62-75	Optimal range (Moyle 2002)
American Shad	Juvenile Rearing and Emigration	Jul-Nov	Orange Blossom Bridge, above confluence	63-77	Optimal range (Moyle 2002)
Threadfin Shad	Spawning	Apr-Aug	Orange Blossom Bridge	63-77	Optimal range (Moyle 2002)
Threadfin Shad	Non-spawning Adult	Year-round	Orange Blossom Bridge	63-77	Optimal range (Moyle 2002)
Largemouth Bass	Spawning	Apr-Jun	Orange Blossom Bridge	52.7-84.2	Observed range (Stuber et al. 1982)
Largemouth Bass	Non-spawning Adult	Year-round	Orange Blossom Bridge	77-86	Optimal range for growth (Moyle 2002)
Smallmouth Bass	Non-spawning Adult	Jun-Aug	Orange Blossom Bridge	>66	Lower end of observed summer-time range (Moyle 2002)
Smallmouth Bass	Non-spawning Adult	Year-round	Orange Blossom Bridge	77-80	Optimal range for growth (Moyle 2002)
Spotted Bass	Spawning	Apr-Jun	Orange Blossom Bridge	58.1-73.4	Observed range (Aasen and Henry 1981)
Spotted Bass	Non-Spawning Adult	Jun-Aug	Orange Blossom Bridge	75-87	Preferred range (Moyle 2002)

N.1.2.2 Assumptions / Uncertainty

One limitation of the analysis is that, due to model limitations, a monthly mean time step was the smallest time step available for water temperature model outputs. As a result, the intra-month variation around the monthly mean cannot be evaluated, which introduces uncertainty in the results.

Another limitation of the analysis is that it treats all exceedances above the temperature criteria as equal because no magnitude of exceedance was calculated. A 0.1°C magnitude of exceedance could be very different to a steelhead than a 10°C magnitude of exceedance. However, as defined in Appendix AB-N, *New Melones Stepped Release Plan*, the temperature criteria did not include magnitude of exceedance.

An assumption of this analysis is that all fish at and around the model output locations experience the same temperature as the model output. Small-scall differences in water temperature related to depth, shade, water movement, and a large number of other factors are common in streams (Poole et al. 2001), but this was not accounted for in the analysis. This introduced uncertainty in the results.

N.1.2.3 Code and Data Repository

Code and analysis outputs are available from Reclamation upon request.

N.1.3 Results

N.1.3.1 HEC 5Q Water Temperature Model Outputs

HEC 5Q water temperature model outputs are provided in this attachment to aid the reader in visually interpreting the results of the analysis. By drawing or imagining a horizontal line that intersects the y-axis at each water temperature value listed in Table N.1-1 and Table N.1-2, the reader can determine the frequency above or below the value by viewing the resulting probability of exceedance along the x-axis for each model scenario. Model outputs are presented by month for two locations in the Stanislaus River: Orange Blossom Bridge and above the confluence with the San Joaquin River. Figure N.1-1 presents exceedance curves of modeled monthly water temperatures at Orange Blossom Bridge for all months and water year types combined for each model scenario. Figure N.1-2 through Figure N.1-13 present exceedance curves of modeled monthly water temperatures at Orange Blossom Bridge for all water year types combined by month.

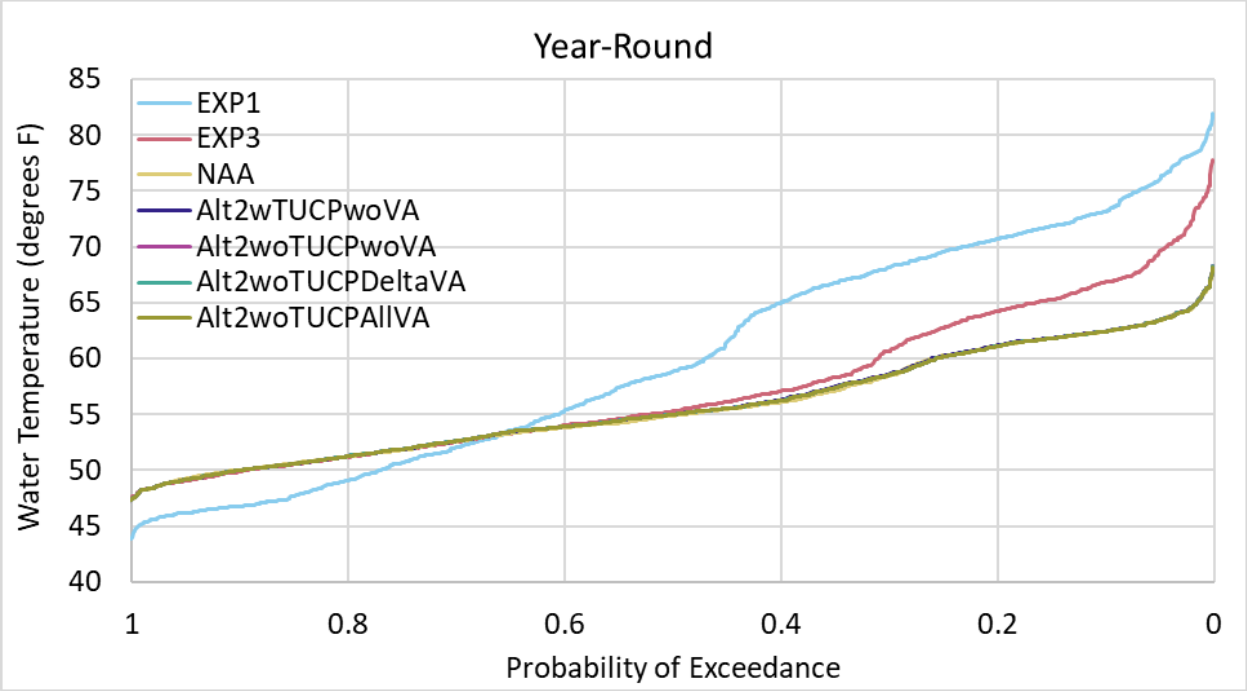

Figure N.1-1. Exceedance plot of modeled water temperatures, Stanislaus River at Orange Blossom Bridge, year-round.

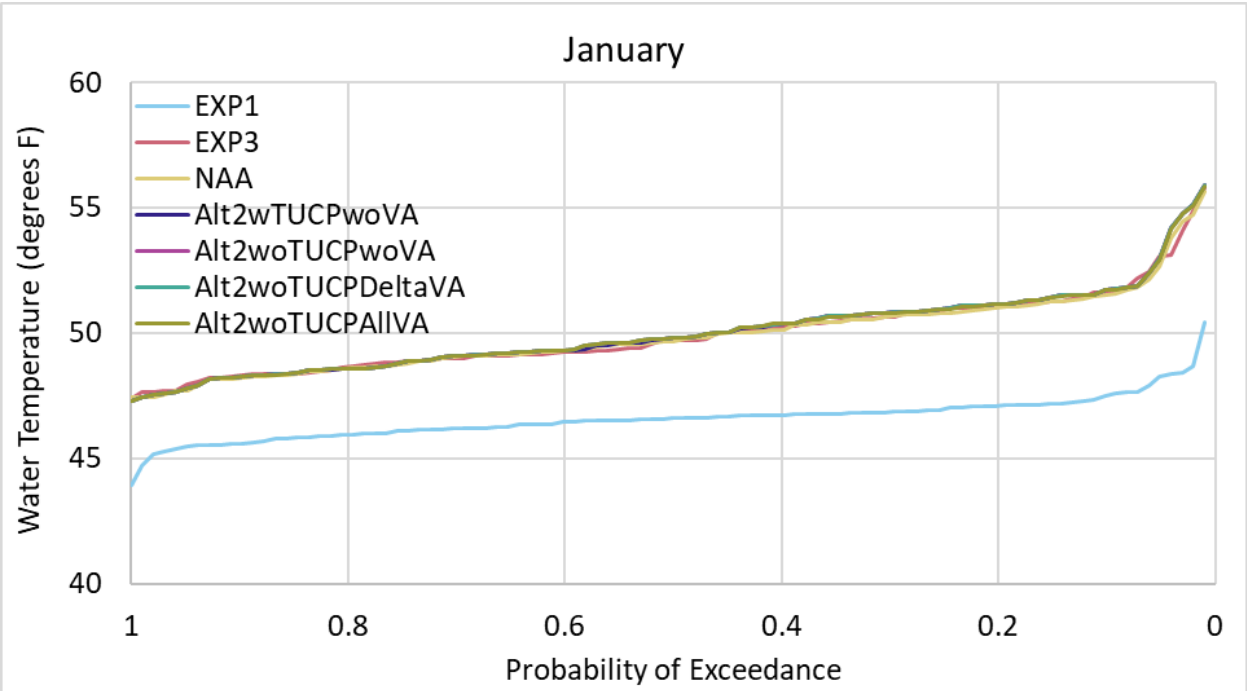

Figure N.1-2. Exceedance plot of modeled water temperatures, Stanislaus River at Orange Blossom Bridge, January.

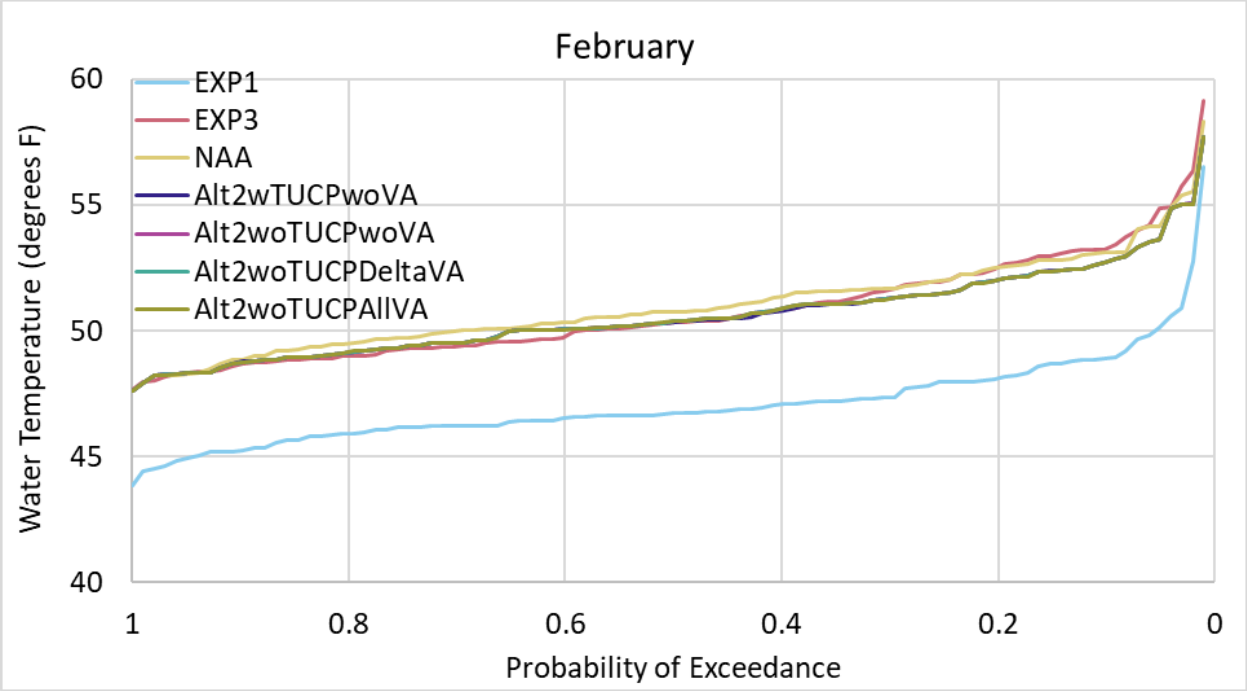

Figure N.1-3. Exceedance plot of modeled water temperatures, Stanislaus River at Orange Blossom Bridge, February.

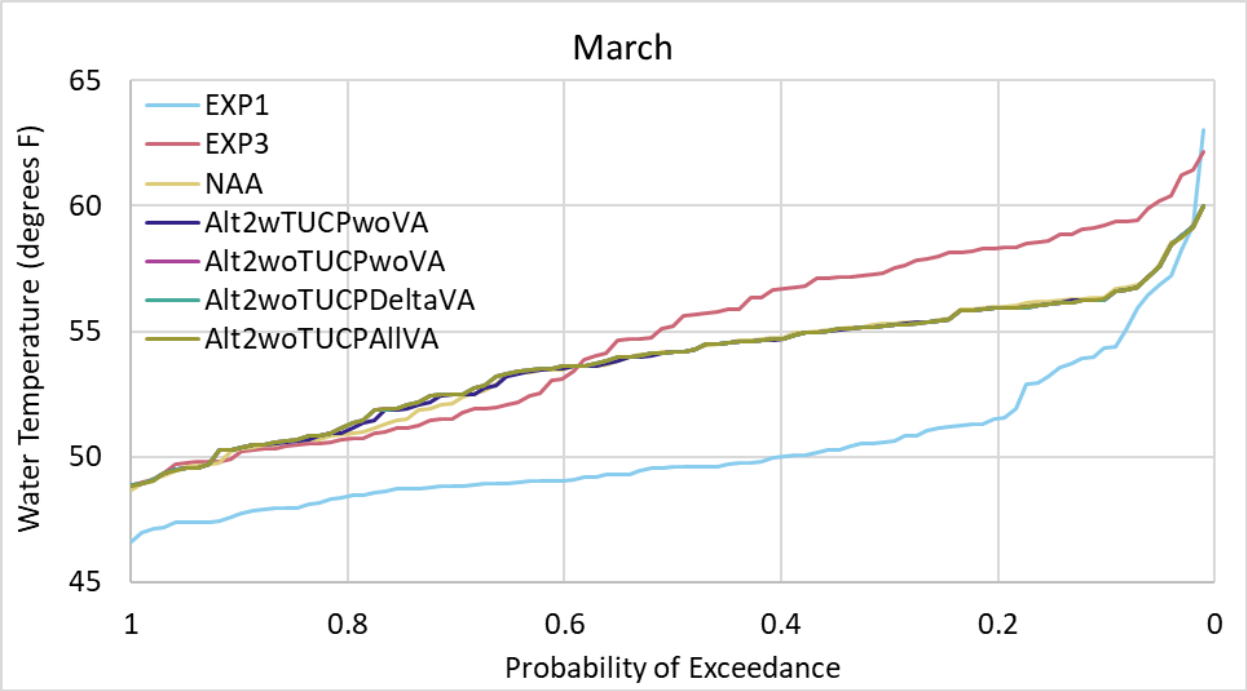

Figure N.1-4. Exceedance plot of modeled water temperatures, Stanislaus River at Orange Blossom Bridge, March.

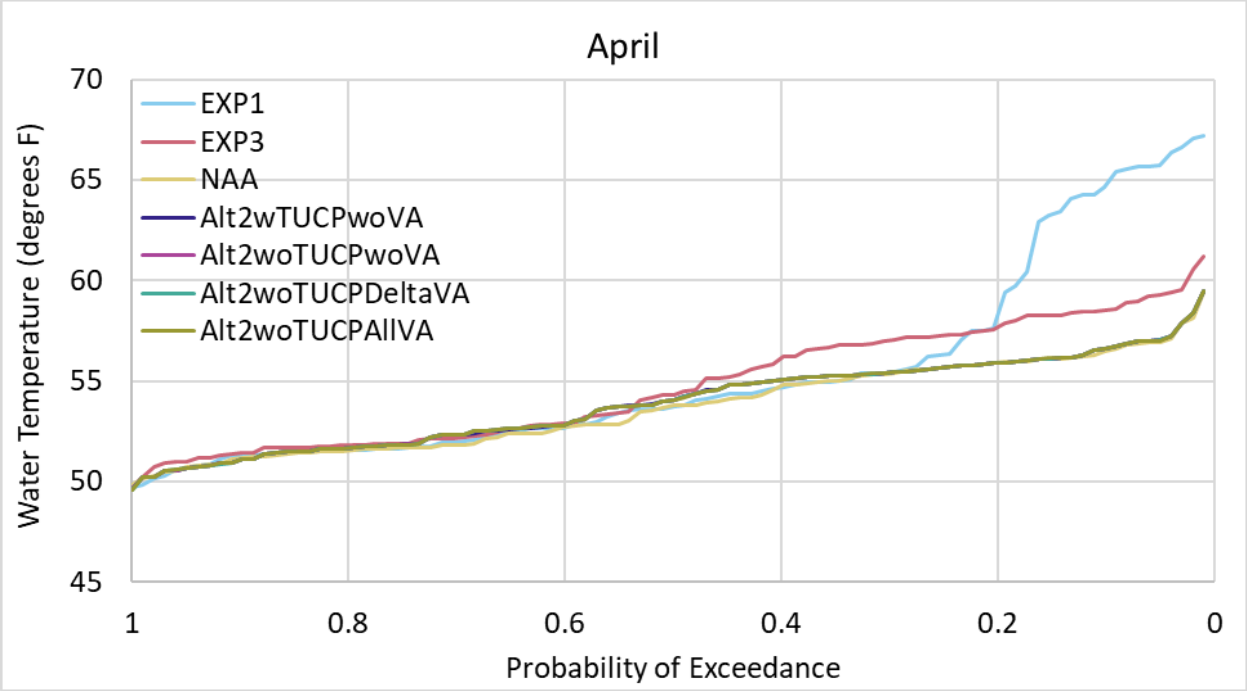

Figure N.1-5. Exceedance plot of modeled water temperatures, Stanislaus River at Orange Blossom Bridge, April.

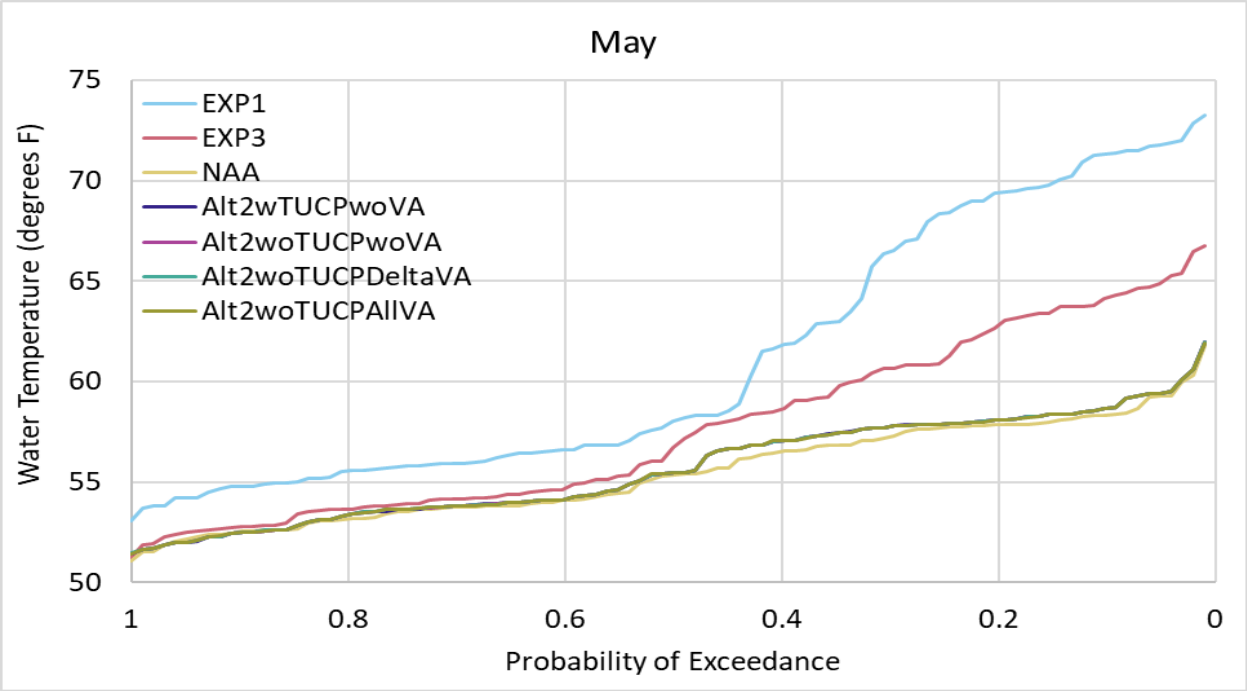

Figure N.1-6. Exceedance plot of modeled water temperatures, Stanislaus River at Orange Blossom Bridge, May.

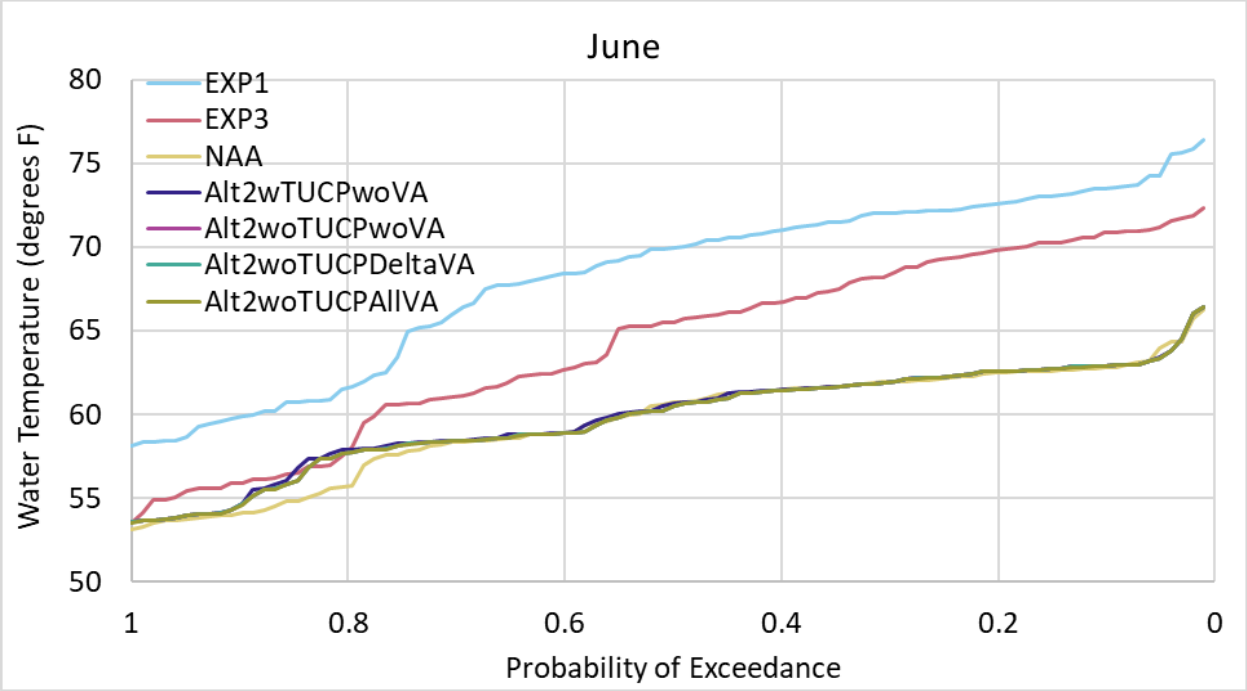

Figure N.1-7. Exceedance plot of modeled water temperatures, Stanislaus River at Orange Blossom Bridge, June.

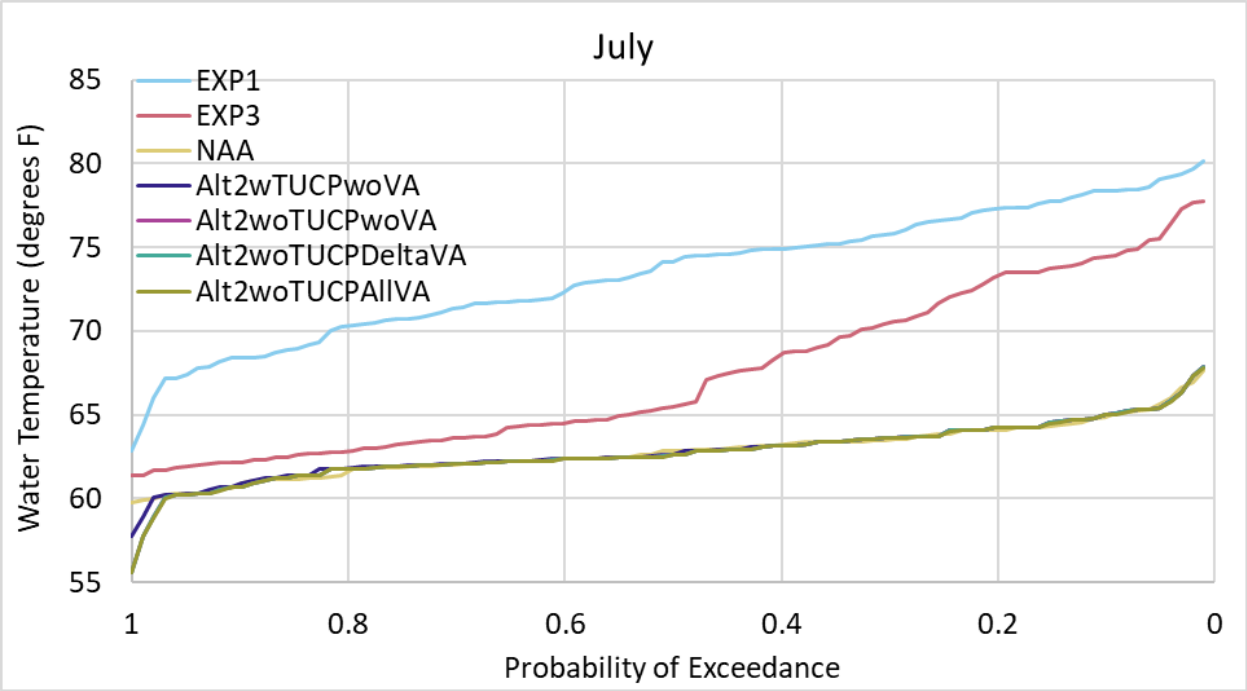

Figure N.1-8. Exceedance plot of modeled water temperatures, Stanislaus River at Orange Blossom Bridge, July.

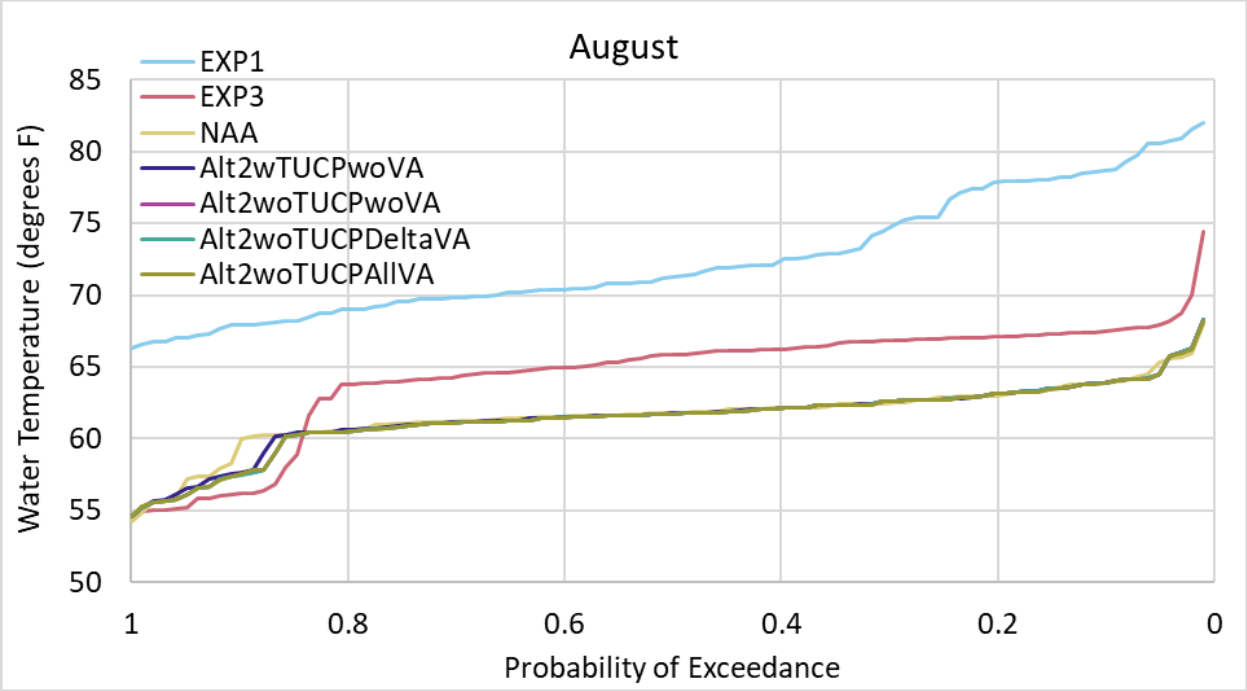

Figure N.1-9. Exceedance plot of modeled water temperatures, Stanislaus River at Orange Blossom Bridge, August.

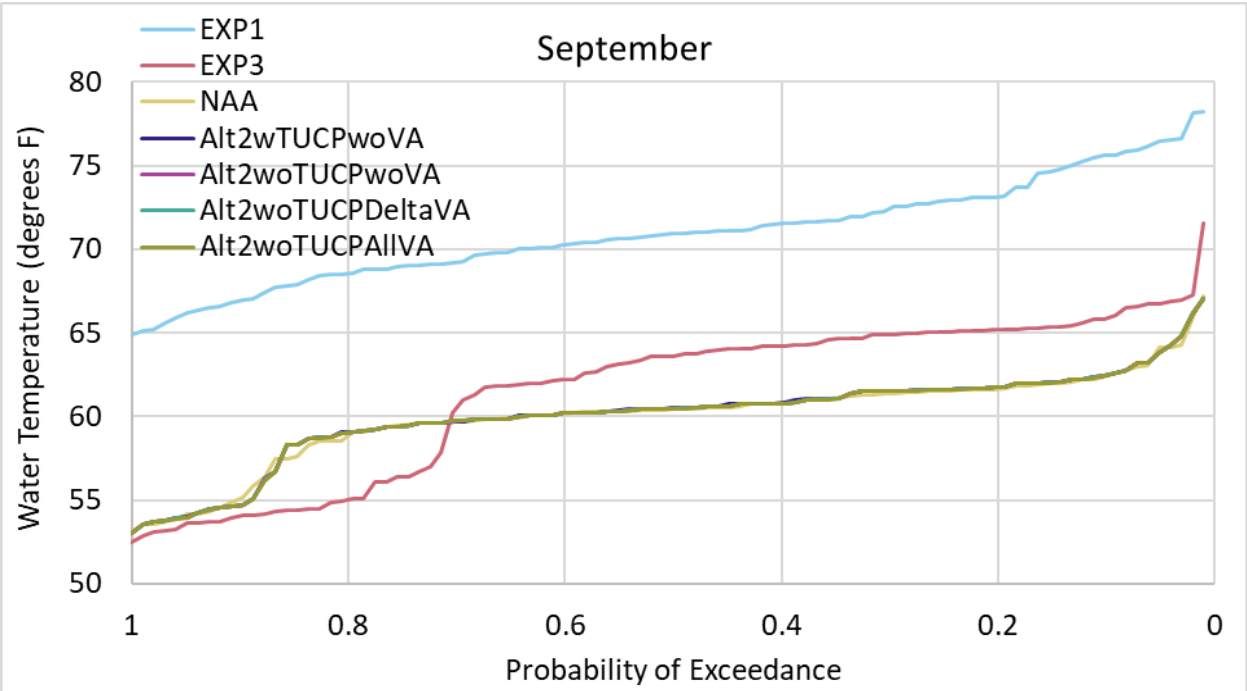

Figure N.1-10. Exceedance plot of modeled water temperatures, Stanislaus River at Orange Blossom Bridge, September.

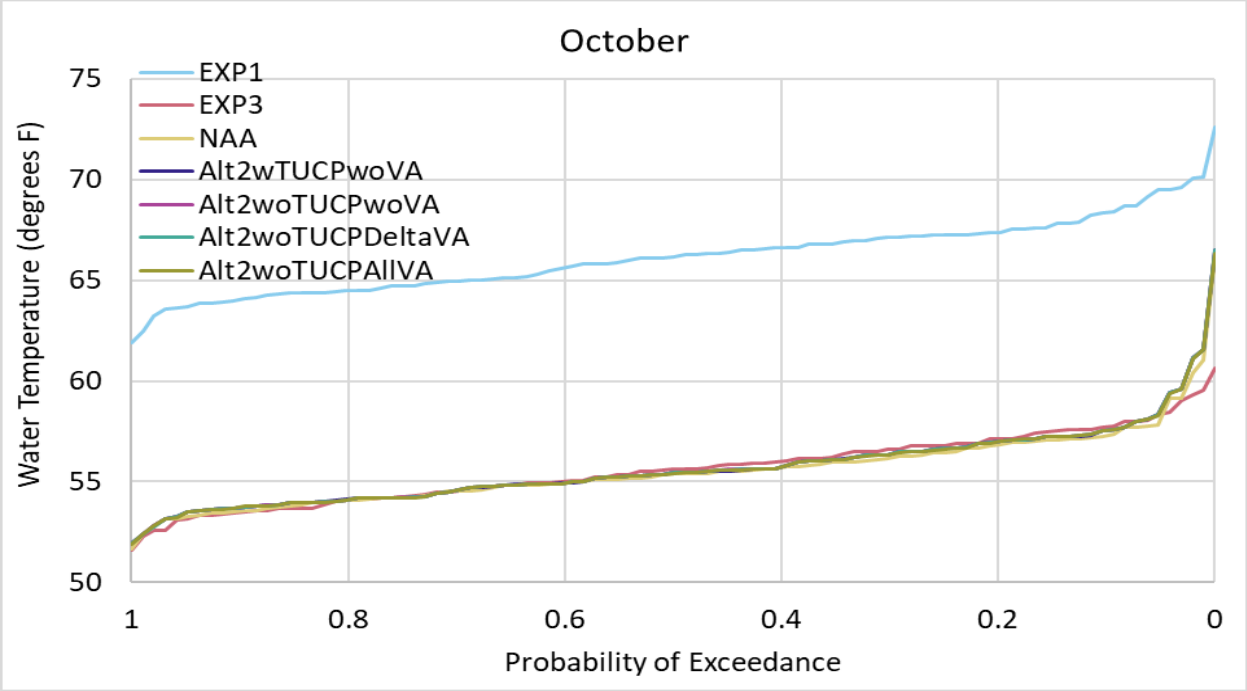

Figure N.1-11. Exceedance plot of modeled water temperatures, Stanislaus River at Orange Blossom Bridge, October.

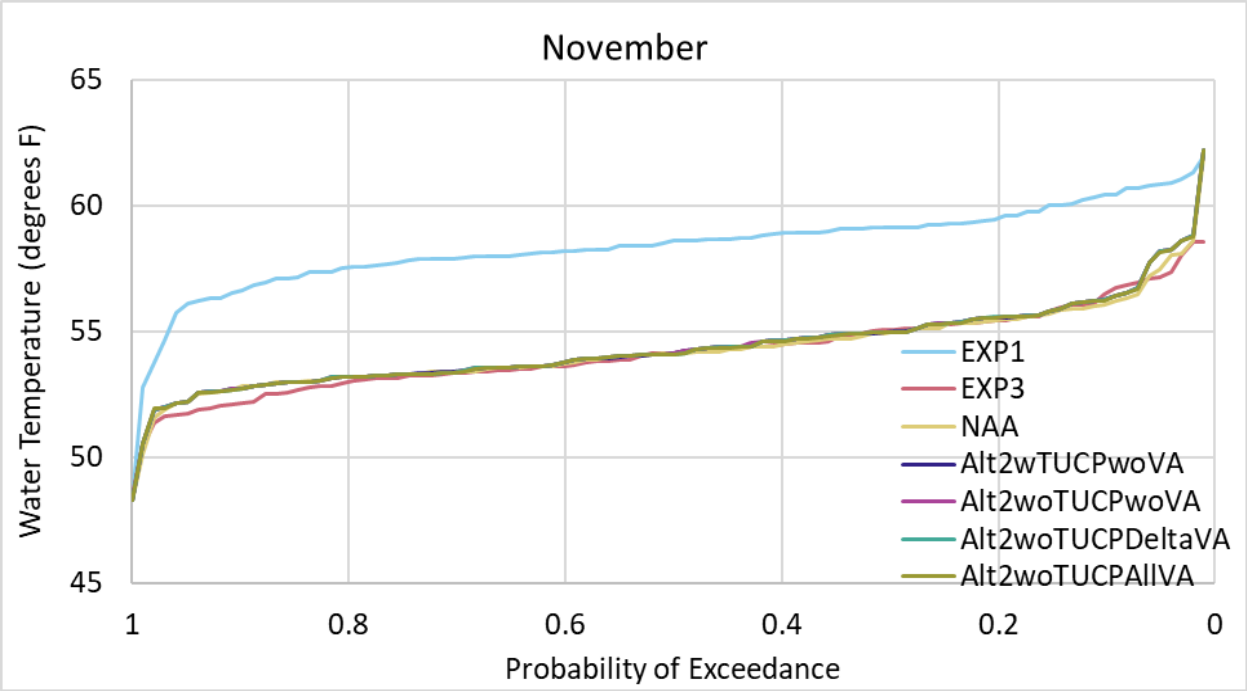

Figure N.1-12. Exceedance plot of modeled water temperatures, Stanislaus River at Orange Blossom Bridge, November.

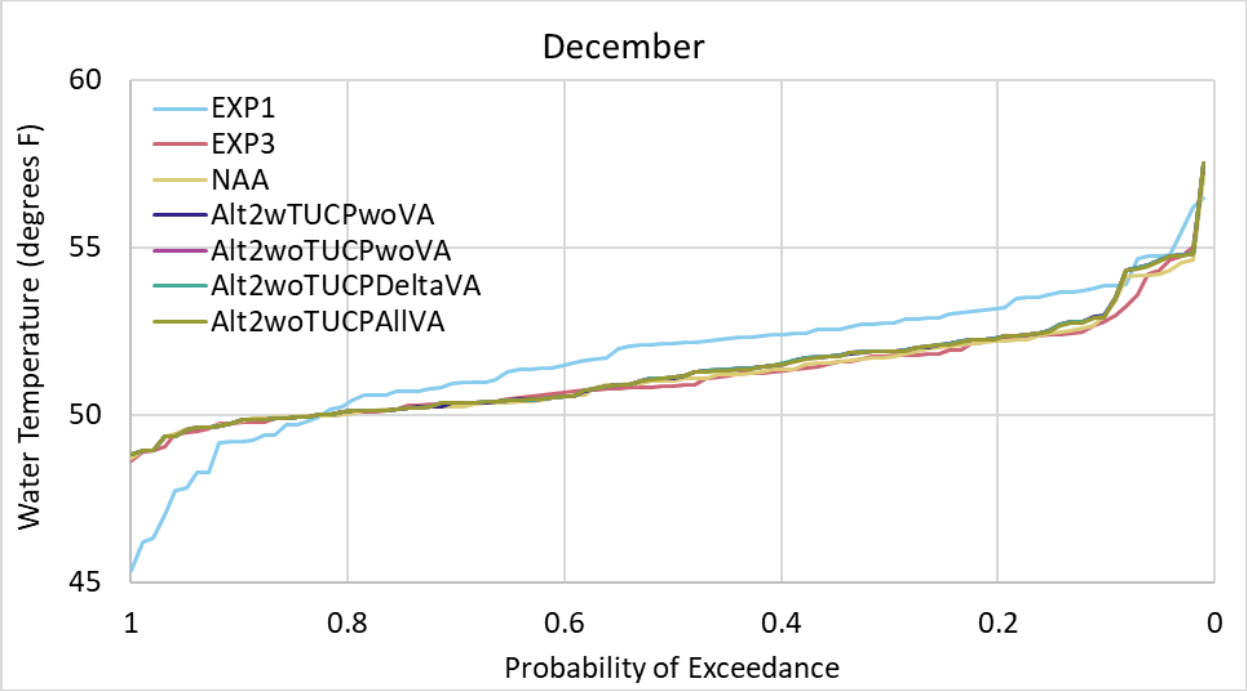

Figure N.1-13. Exceedance plot of modeled water temperatures, Stanislaus River at Orange Blossom Bridge, December.

Figure N.1-14 presents exceedance curves of modeled monthly water temperatures above the San Joaquin River confluence for all months combined for each model scenario. Figure N.1-15 through Figure N.1-26 present exceedance curves of modeled monthly water temperatures above the San Joaquin River confluence for each month separately.

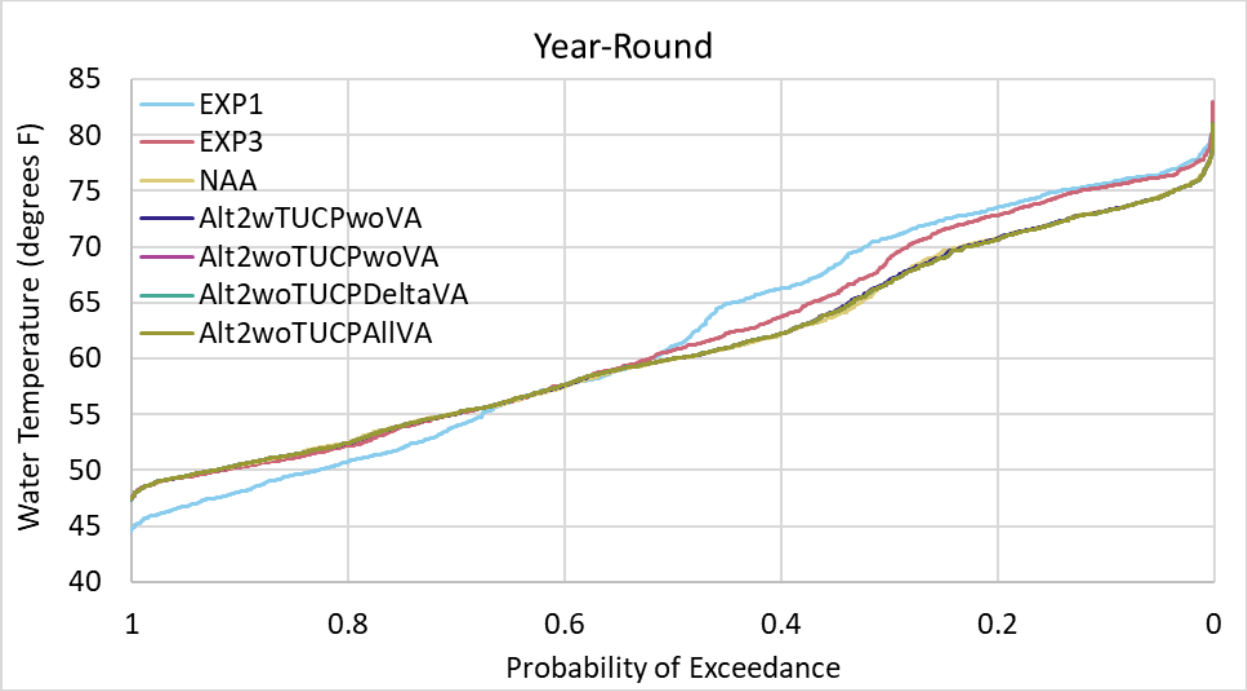

Figure N.1-14. Exceedance plot of modeled water temperatures, Stanislaus River above confluence with San Joaquin River, year-round.

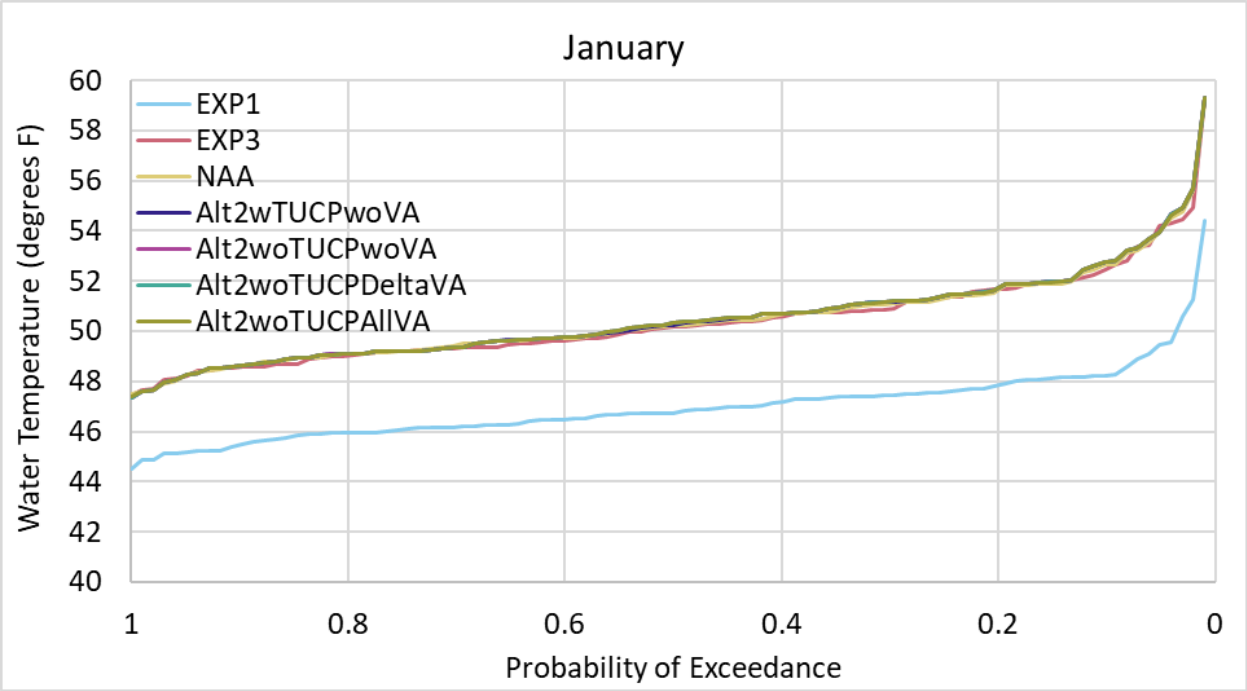

Figure N.1-15. Exceedance plot of modeled water temperatures, Stanislaus River above confluence with San Joaquin River, January.

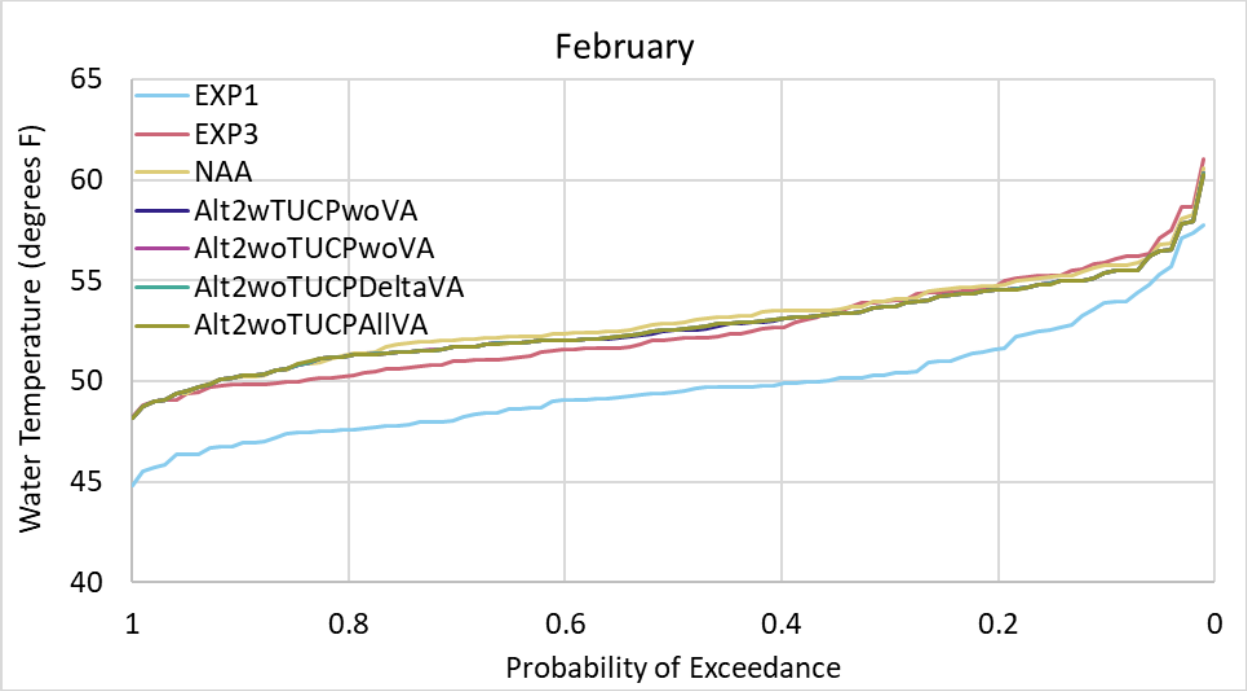

Figure N.1-16. Exceedance plot of modeled water temperatures, Stanislaus River above confluence with San Joaquin River, February.

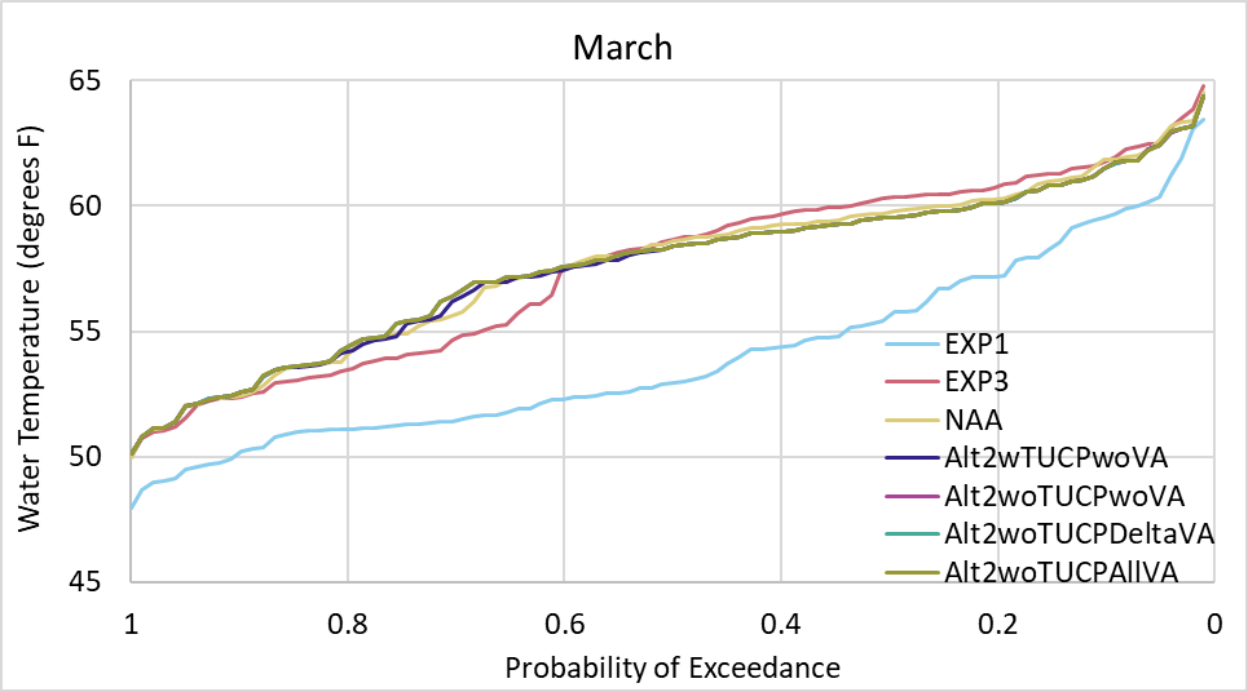

Figure N.1-17. Exceedance plot of modeled water temperatures, Stanislaus River above confluence with San Joaquin River, March.

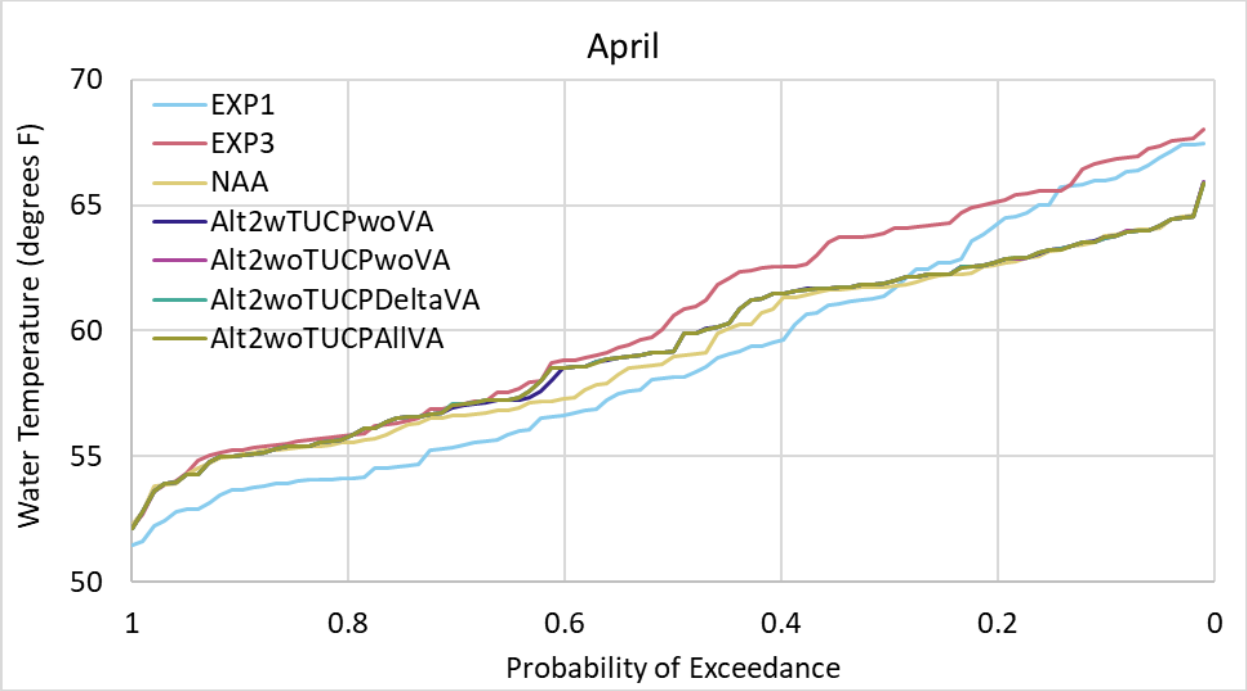

Figure N.1-18. Exceedance plot of modeled water temperatures, Stanislaus River above confluence with San Joaquin River, April.

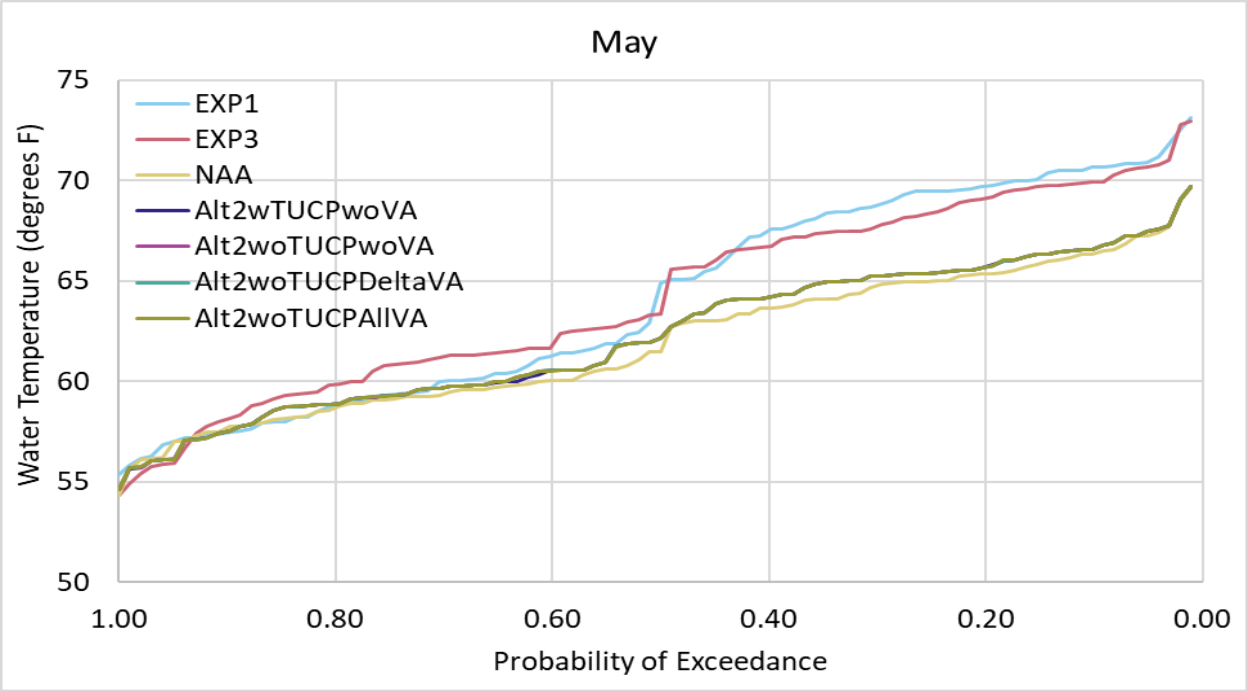

Figure N.1-19. Exceedance plot of modeled water temperatures, Stanislaus River above confluence with San Joaquin River, May.

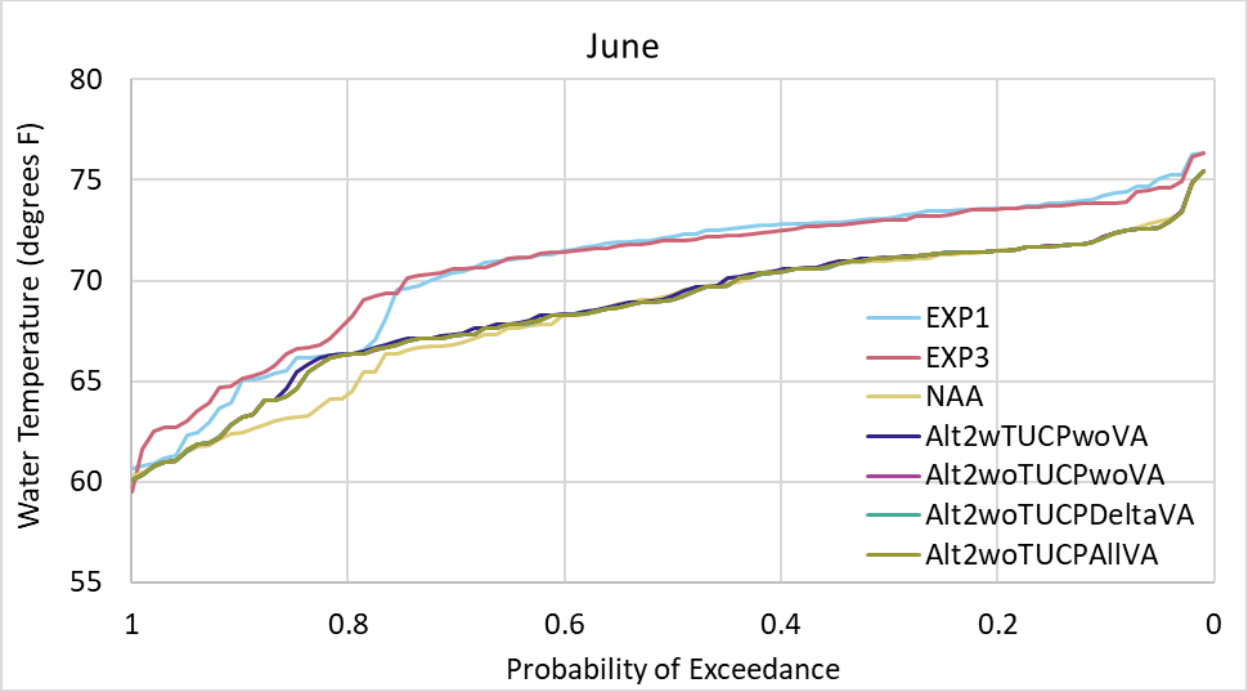

Figure N.1-20. Exceedance plot of modeled water temperatures, Stanislaus River above confluence with San Joaquin River, June.

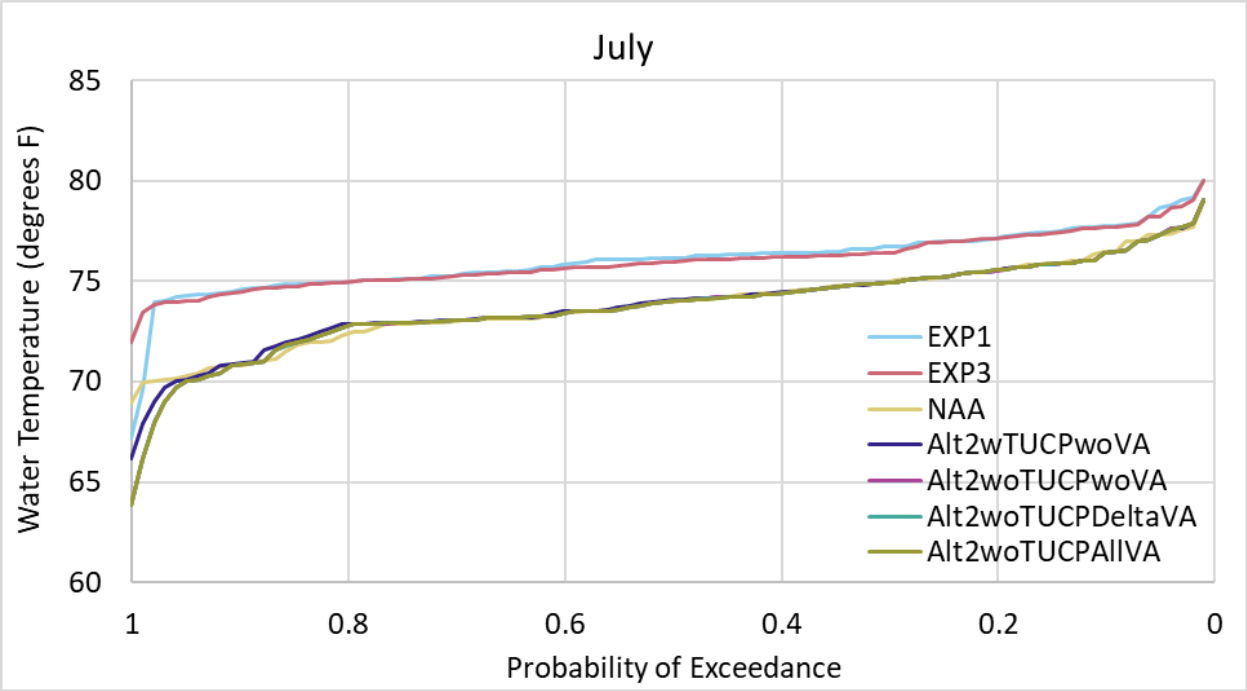

Figure N.1-21. Exceedance plot of modeled water temperatures, Stanislaus River above confluence with San Joaquin River, July.

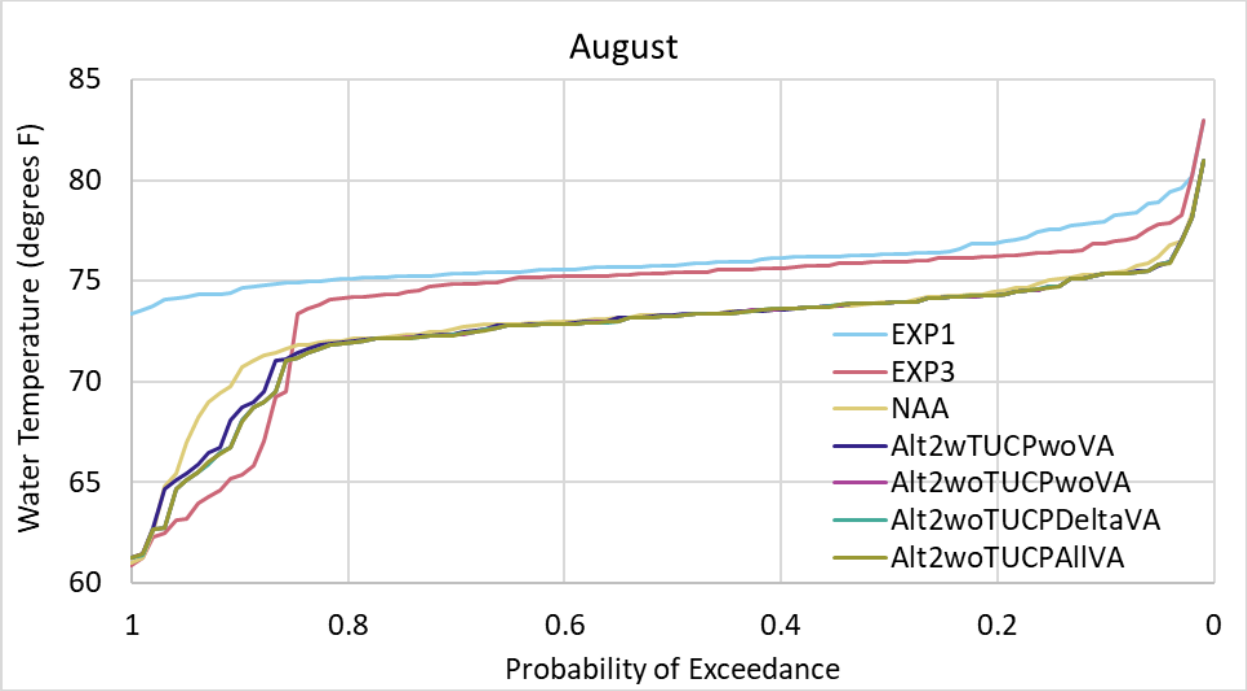

Figure N.1-22. Exceedance plot of modeled water temperatures, Stanislaus River above confluence with San Joaquin River, August.

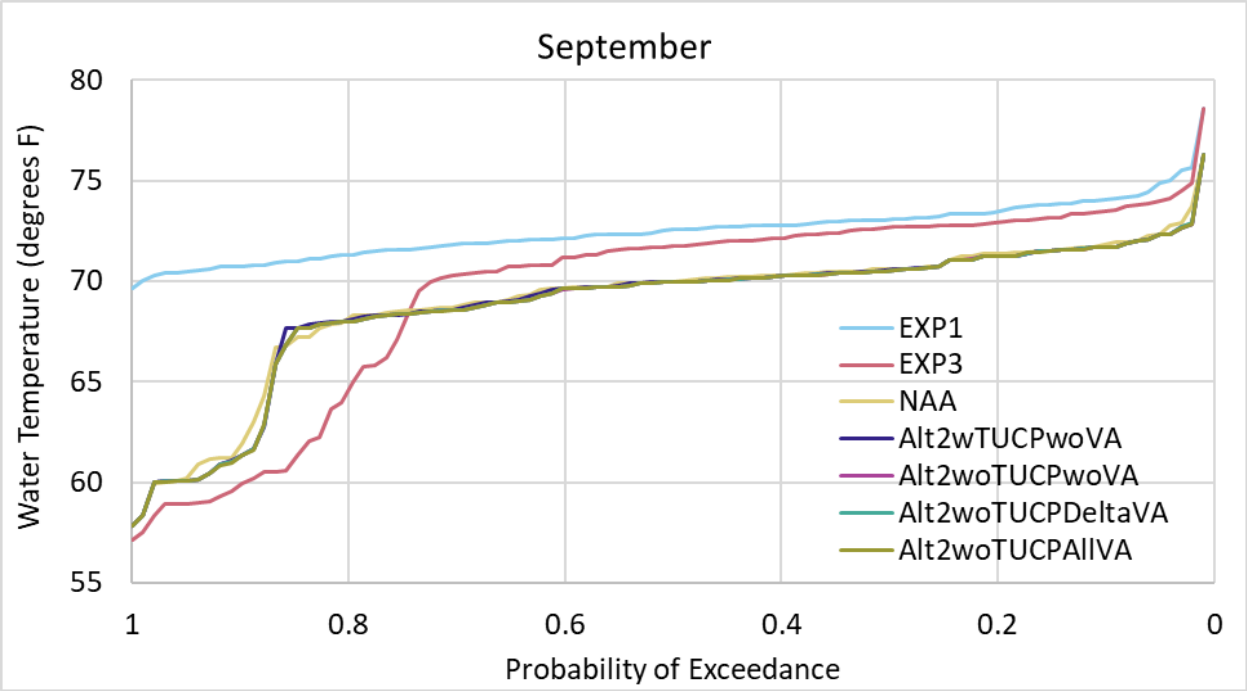

Figure N.1-23. Exceedance plot of modeled water temperatures, Stanislaus River above confluence with San Joaquin River, September.

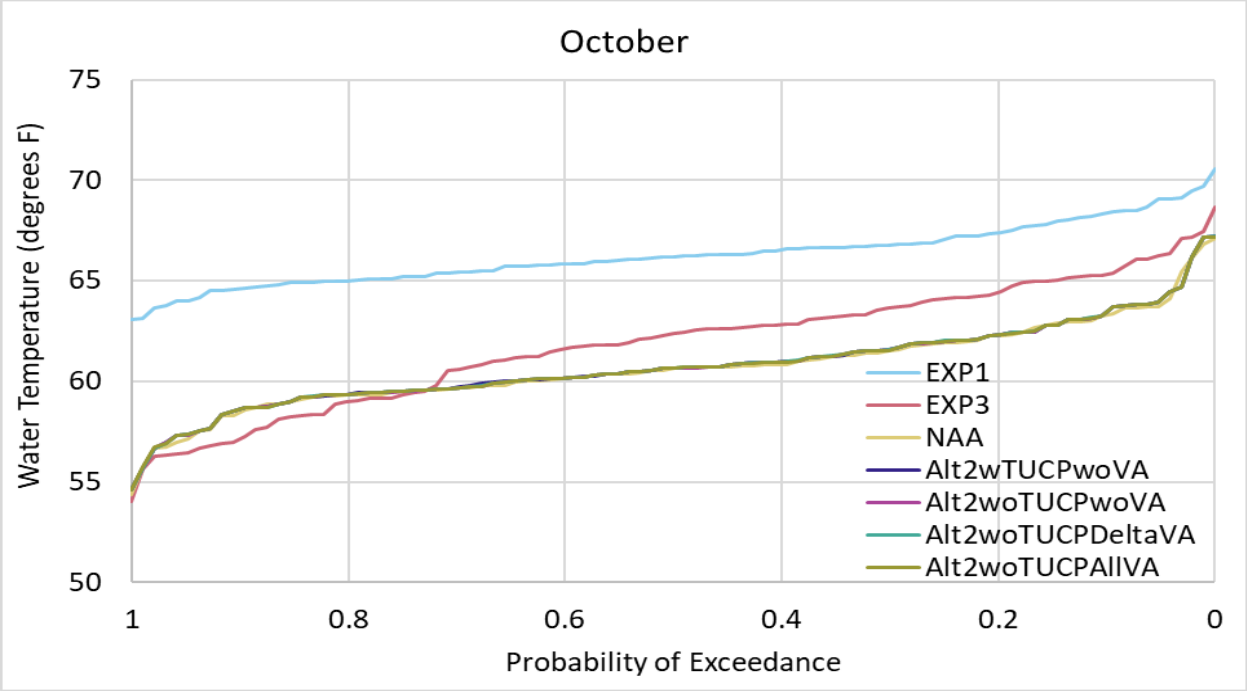

Figure N.1-24. Exceedance plot of modeled water temperatures, Stanislaus River above confluence with San Joaquin River, October.

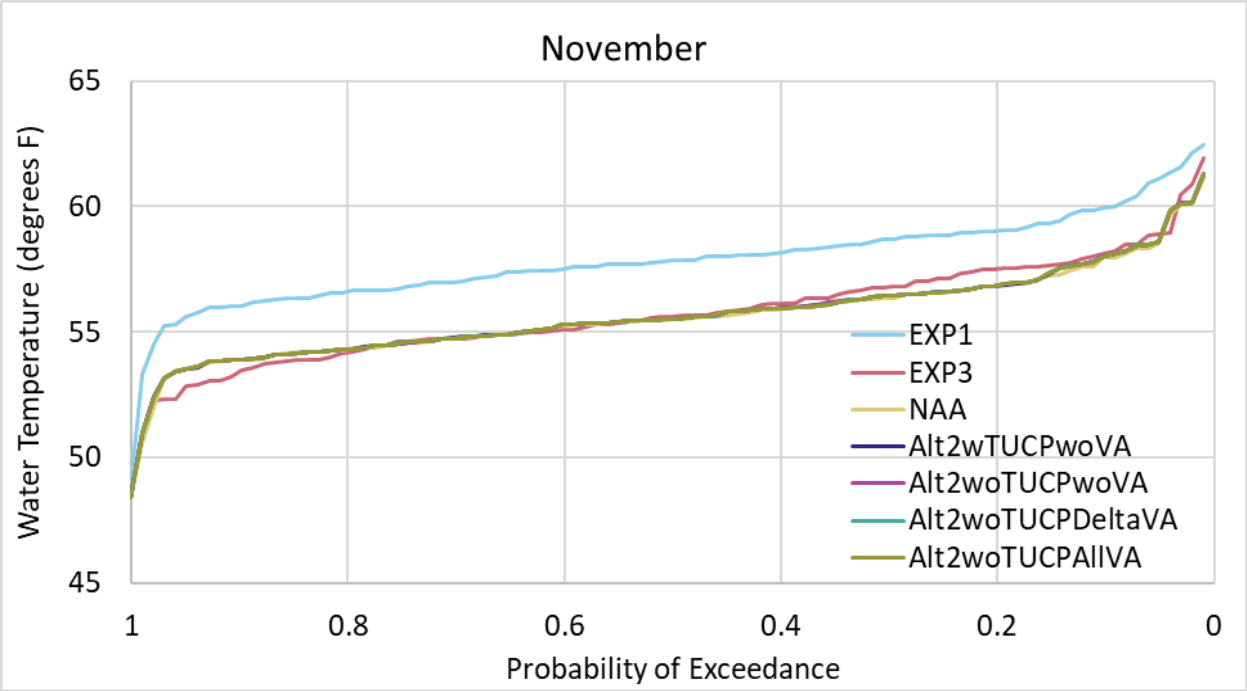

Figure N.1-25. Exceedance plot of modeled water temperatures, Stanislaus River above confluence with San Joaquin River, November.

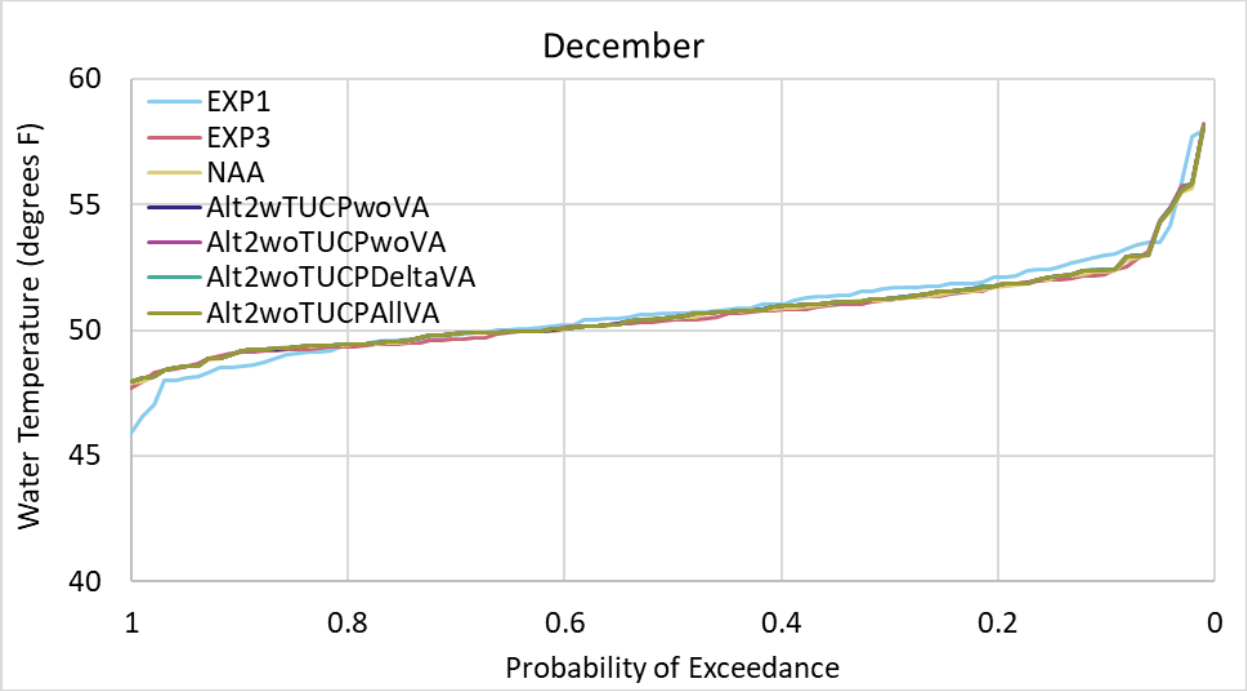

Figure N.1-26. Exceedance plot of modeled water temperatures, Stanislaus River above confluence with San Joaquin River, December.

N.1.3.2 Central Valley Steelhead

N.1.3.2.1 Adult Migration and Holding

Water temperature-related effects on steelhead adult migration and holding in the Stanislaus River were evaluated by assessing: (1) the percent of months with water temperature outside the 41°F to 66.2°F range of minimal migration impairment (Keefer et al. 2009); (2) the percent of months with water temperature above the 69.8°F upper lethal limit to adult migrants (Coutant 1970); and (3) the percent of months with water temperature above the 59.9°F pathogen virulence threshold (McCullough 1999) at Orange Blossom Bridge and above the confluence with the San Joaquin River (Table N.1-1).

Results for the 41°F to 66.2°F range are presented in Table N.1-3 and Table N.1-4 for Orange Blossom Bridge and Table N.1-5 and Table N.1-6 for the confluence.

- At Orange Blossom Bridge, the percent of months outside the range was ≤9.1% for the NAA and Alternatives 1 through 4 in all month and water year type combinations (Table N.1-3 and Table N.1-4). The highest percent of months outside the range was 9.1% and occurred in July of critical water years for the NAA, Alternative 1, and Alternative 3. The lowest percent of months outside the range was 0% and occurred in the majority of months and water year types for the NAA and all alternatives. All occurrences of temperatures outside the temperature range occurred during July through October, whereas there were no months with temperatures outside the range during November through March for the NAA and all alternatives. Warmer air temperatures during July through October increased water temperatures above the upper limit of the temperature range. Nearly all months with temperatures outside the range occurred in critical water years and there were no months with temperatures outside the range in wet, above normal, and dry water years. Increased flows during wetter water year types contributed to temperatures within the range.
- At the confluence, the percent of months outside the 41°F to 66.2°F water temperature range varied from 0% to 100% for the NAA and Alternatives 1 through 4 in all month and water year type combinations (Table N.1-5 and Table N.1-6). The highest percent of months outside the range was 100% and occurred exclusively in July, August and September for the NAA and all alternatives. The lowest percent of months outside the range was 0% and occurred exclusively during October through March in all water year types for the NAA and all alternatives. All occurrences of temperatures outside the temperature range occurred during July through October, whereas there were no months with temperatures outside the range during November through March. Combining all water years, there was a decreasing percent of months outside the range from July (98% to 100% outside the range) to October (1% to 12.4%), after which all remaining months (November through March) had occurrences outside the range. This reflects warmer air temperatures during earlier months followed by a decline through late summer and fall. The four components of Alternative 2 had identical results for except for critical years in July and August. Water year type had a smaller influence on occurrences outside the water temperature range than month.

Results for the 69.8°F upper limit of steelhead migration and holding are presented in Table N.1-7 and Table N.1-8 for Orange Blossom Bridge and Table N.1-9 and Table N.1-10 for the confluence.

- At Orange Blossom Bridge, there were no exceedances above the 69.8°F upper limit in any month or water year type under the NAA and all alternatives (Table N.1-7 and Table N.1-8).
- At the confluence, the percent of months above the 69.8°F upper limit ranged from 0% to 100% depending on month and water year type for the NAA and all alternatives (Table N.1-9 and Table N.1-10). The highest percent of months above the 69.8°F upper limit was 100% and occurred in July and August of all water year types except wet years for the NAA and all alternatives. The lowest percent of months above the 69.8°F upper limit was 0% and occurred in all water year types from October through March for the NAA and all alternatives. All occurrences above the limit were during July through September, whereas there were no occurrences above the limit during October through March. Warmer air temperatures during July through September increased water temperatures above the limit. There were occurrences above the limit in all water year types.

Results for the 59.9°F pathogen virulence water temperature threshold are presented in Table N.1-11 and Table N.1-12 for Orange Blossom Bridge and Table N.1-13 and Table N.1-14 for the confluence with the San Joaquin River.

- At Orange Blossom Bridge, the percent of months above the 59.9°F virulence threshold ranged from 0% to 100% depending on month and water year type for the NAA and all alternatives (Table N.1-11 and Table N.1-12). The highest percent of months above the 59.9°F virulence threshold was 100% and occurred in July and August of multiple water year types for the NAA and all alternatives. The lowest percent of months above the 59.9°F virulence threshold was 0% and occurred in multiple water year types from October through March for the NAA and all alternatives. Most occurrences above the virulence threshold were during July through September. Warmer air temperatures during these months increased water temperatures above the virulence threshold. There were occurrences above the virulence threshold in all water year types under the NAA and all alternatives.
- At the confluence with the San Joaquin River, the percent of months above the 59.9°F pathogen virulence water temperature threshold ranged from 0% to 100% depending on month and water year type for the NAA and all alternatives (Table N.1-13 and Table N.1-14). The highest percent of months above the 59.9°F virulence threshold was 100% and occurred in July through September of one or more water year types for the NAA and all alternative and in October of one or more water year types for the NAA, Alt 1, Alt 2 with TUCP without VA, Alt 3, and Alt 4. The lowest percent of months above the 59.9°F virulence threshold was 0% and occurred in multiple water year types during November, December, and March and in all water year types during January and February for the NAA and all alternatives. Air temperatures drove the exceedance above the virulence threshold in warmer months. There were occurrences above the virulence threshold in all water year types under the NAA and all alternatives.

Table N.1-3. Percent of months outside the 41°F to 66.2°F water temperature range for minimal adult steelhead migration impairment by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, July through March.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCPwoVA	Alt2woTUCPwoVA	Alt2woTUCPDeltaVA	Alt2woTUCPAllVA
W	7	90.9	95.5	0.0	0.0	0.0	0.0	0.0
W	8	100.0	4.5	0.0	0.0	0.0	0.0	0.0
W	9	100.0	0.0	0.0	0.0	0.0	0.0	0.0
W	10	31.8	0.0	0.0	0.0	0.0	0.0	0.0
W	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	7	100.0	91.7	0.0	0.0	0.0	0.0	0.0
AN	8	100.0	8.3	0.0	0.0	0.0	0.0	0.0
AN	9	100.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	10	50.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	7	100.0	78.6	0.0	7.1	7.1	7.1	7.1
BN	8	100.0	14.3	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
BN	9	100.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	10	28.6	0.0	0.0	0.0	0.0	0.0	0.0
BN	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	7	100.0	11.8	0.0	0.0	0.0	0.0	0.0
D	8	100.0	70.6	0.0	0.0	0.0	0.0	0.0
D	9	94.1	0.0	0.0	0.0	0.0	0.0	0.0
D	10	52.9	0.0	0.0	0.0	0.0	0.0	0.0
D	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	7	97.0	3.0	9.1	6.1	6.1	6.1	6.1
C	8	100.0	75.8	3.0	6.1	6.1	6.1	6.1
C	9	87.9	24.2	3.0	6.1	6.1	6.1	3.0
C	10	68.8	0.0	3.1	3.1	3.1	3.1	3.1
C	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
C	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	7	96.9	46.9	3.1	3.1	3.1	3.1	3.1
All	8	100.0	41.8	1.0	2.0	2.0	2.0	2.0
All	9	94.9	8.2	1.0	2.0	2.0	2.0	1.0
All	10	49.5	0.0	1.0	1.0	1.0	1.0	1.0
All	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	All	35.9	11.1	0.0	0.0	0.0	0.0	0.0
AN	All	38.9	11.1	0.0	0.0	0.0	0.0	0.0
BN	All	35.9	10.2	0.0	0.8	0.8	0.8	0.8
D	All	38.6	9.2	0.0	0.0	0.0	0.0	0.0
C	All	39.5	11.6	2.0	1.4	2.4	2.4	2.4
All	All	37.9	10.8	0.7	0.6	0.9	0.9	0.9

Table N.1-4. Percent (difference in percent relative to NAA) of months outside the 41°F to 66.2°F water temperature range for minimal adult steelhead migration impairment by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, July through March.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	7	0.0	7.1 (7.1%)	7.1 (7.1%)	7.1 (7.1%)	7.1 (7.1%)	7.1 (7.1%)	7.1 (7.1%)	7.1 (7.1%)
BN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
BN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	7	9.1	9.1 (0.0%)	6.1 (-3.0%)	6.1 (-3.0%)	6.1 (-3.0%)	6.1 (-3.0%)	9.1 (0.0%)	6.1 (-3.0%)
C	8	3.0	3.0 (0.0%)	6.1 (3.0%)	6.1 (3.0%)	6.1 (3.0%)	6.1 (3.0%)	3.0 (0.0%)	6.1 (3.0%)
C	9	3.0	0.0 (-3.0%)	6.1 (3.0%)	6.1 (3.0%)	6.1 (3.0%)	3.0 (0.0%)	0.0 (-3.0%)	6.1 (3.0%)
C	10	3.1	0.0 (-3.1%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	0.0 (-3.1%)	3.1 (0.0%)
C	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	7	3.1	4.1 (1.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	4.1 (1.0%)	3.1 (0.0%)
All	8	1.0	1.0 (0.0%)	2.0 (1.0%)	2.0 (1.0%)	2.0 (1.0%)	2.0 (1.0%)	1.0 (0.0%)	2.0 (1.0%)
All	9	1.0	0.0 (-1.0%)	2.0 (1.0%)	2.0 (1.0%)	2.0 (1.0%)	1.0 (0.0%)	0.0 (-1.0%)	2.0 (1.0%)
All	10	1.0	0.0 (-1.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	0.0 (-1.0%)	1.0 (0.0%)
All	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	All	0.0	0.8 (0.8%)	0.8 (0.8%)	0.8 (0.8%)	0.8 (0.8%)	0.8 (0.8%)	0.8 (0.8%)	0.8 (0.8%)
D	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	All	2.0	1.4 (-0.7%)	2.4 (0.3%)	2.4 (0.3%)	2.4 (0.3%)	2.0 (0.0%)	1.4 (-0.7%)	2.4 (0.3%)
All	All	0.7	0.6 (-0.1%)	0.9 (0.2%)	0.9 (0.2%)	0.9 (0.2%)	0.8 (0.1%)	0.6 (-0.1%)	0.9 (0.2%)

Table N.1-5. Percent of months outside the 41°F to 66.2°F water temperature range for minimal adult steelhead migration impairment by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, July through March.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
W	8	100.0	45.5	77.3	72.7	72.7	72.7	72.7
W	9	100.0	18.2	40.9	40.9	40.9	40.9	40.9
W	10	54.5	0.0	0.0	0.0	0.0	0.0	0.0
W	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
AN	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
AN	9	100.0	75.0	100.0	91.7	91.7	91.7	91.7
AN	10	50.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BN	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
BN	9	100.0	78.6	100.0	100.0	100.0	100.0	100.0
BN	10	50.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	9	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	10	35.3	5.9	0.0	0.0	0.0	0.0	0.0
D	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	7	100.0	100.0	100.0	97.0	93.9	93.9	93.9
C	8	100.0	100.0	100.0	97.0	93.9	93.9	93.9
C	9	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C	10	56.3	15.6	6.3	6.3	6.3	6.3	6.3
C	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
C	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	7	100.0	100.0	100.0	99.0	98.0	98.0	98.0
All	8	100.0	87.8	94.9	92.9	91.8	91.8	91.8
All	9	100.0	75.5	86.7	85.7	85.7	85.7	85.7
All	10	50.5	6.2	2.1	2.1	2.1	2.1	2.1
All	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	All	39.4	18.2	24.2	25.3	23.7	23.7	23.7
AN	All	38.9	30.6	33.3	34.3	32.4	32.4	32.4
BN	All	38.3	30.5	32.8	33.6	32.8	32.8	32.8
D	All	37.3	34.0	33.3	34.6	33.3	33.3	33.3
C	All	39.8	35.4	34.4	36.1	33.7	33.0	33.0
All	All	38.9	30.0	31.6	32.8	31.1	30.9	30.9

Table N.1-6. Percent (difference in percent relative to NAA) of months outside the 41°F to 66.2°F water temperature range for minimal adult steelhead migration impairment by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, July through March.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	8	77.3	81.8 (4.5%)	72.7 (-4.5%)	72.7 (-4.5%)	72.7 (-4.5%)	72.7 (-4.5%)	86.4 (9.1%)	72.7 (-4.5%)
W	9	40.9	40.9 (0.0%)	40.9 (0.0%)	40.9 (0.0%)	40.9 (0.0%)	40.9 (0.0%)	54.5 (13.6%)	40.9 (0.0%)
W	10	0.0	4.5 (4.5%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	9	100.0	100.0 (0.0%)	91.7 (-8.3%)	91.7 (-8.3%)	91.7 (-8.3%)	91.7 (-8.3%)	100.0 (0.0%)	91.7 (-8.3%)
AN	10	0.0	8.3 (8.3%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
BN	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	10	0.0	7.1 (7.1%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	10	0.0	11.8 (11.8%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	7	100.0	100.0 (0.0%)	97.0 (-3.0%)	93.9 (-6.1%)	93.9 (-6.1%)	93.9 (-6.1%)	100.0 (0.0%)	97.0 (-3.0%)
C	8	100.0	100.0 (0.0%)	97.0 (-3.0%)	93.9 (-6.1%)	93.9 (-6.1%)	93.9 (-6.1%)	100.0 (0.0%)	97.0 (-3.0%)
C	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	10	6.3	21.9 (15.6%)	6.3 (0.0%)	6.3 (0.0%)	6.3 (0.0%)	6.3 (0.0%)	3.1 (-3.1%)	6.3 (0.0%)
C	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	7	100.0	100.0 (0.0%)	99.0 (-1.0%)	98.0 (-2.0%)	98.0 (-2.0%)	98.0 (-2.0%)	100.0 (0.0%)	99.0 (-1.0%)
All	8	94.9	95.9 (1.0%)	92.9 (-2.0%)	91.8 (-3.1%)	91.8 (-3.1%)	91.8 (-3.1%)	96.9 (2.0%)	92.9 (-2.0%)
All	9	86.7	86.7 (0.0%)	85.7 (-1.0%)	85.7 (-1.0%)	85.7 (-1.0%)	85.7 (-1.0%)	89.8 (3.1%)	85.7 (-1.0%)
All	10	2.1	12.4 (10.3%)	2.1 (0.0%)	2.1 (0.0%)	2.1 (0.0%)	2.1 (0.0%)	1.0 (-1.0%)	2.1 (0.0%)
All	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	24.2	25.3 (1.0%)	23.7 (-0.5%)	23.7 (-0.5%)	23.7 (-0.5%)	23.7 (-0.5%)	26.8 (2.5%)	23.7 (-0.5%)
AN	All	33.3	34.3 (0.9%)	32.4 (-0.9%)	32.4 (-0.9%)	32.4 (-0.9%)	32.4 (-0.9%)	33.3 (0.0%)	32.4 (-0.9%)
BN	All	32.8	33.6 (0.8%)	32.8 (0.0%)	32.8 (0.0%)	32.8 (0.0%)	32.8 (0.0%)	32.8 (0.0%)	32.8 (0.0%)
D	All	33.3	34.6 (1.3%)	33.3 (0.0%)	33.3 (0.0%)	33.3 (0.0%)	33.3 (0.0%)	33.3 (0.0%)	33.3 (0.0%)
C	All	34.4	36.1 (1.7%)	33.7 (-0.7%)	33.0 (-1.4%)	33.0 (-1.4%)	33.0 (-1.4%)	34.0 (-0.3%)	33.7 (-0.7%)
All	All	31.6	32.8 (1.2%)	31.1 (-0.5%)	30.9 (-0.7%)	30.9 (-0.7%)	30.9 (-0.7%)	32.0 (0.5%)	31.1 (-0.5%)

Table N.1-7. Percent of months above the 69.8°F lethal water temperature limit for adult steelhead migration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, July through March.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2 woTUCP AllVA
W	7	90.9	95.5	0.0	0.0	0.0	0.0	0.0
W	8	95.5	0.0	0.0	0.0	0.0	0.0	0.0
W	9	81.8	0.0	0.0	0.0	0.0	0.0	0.0
W	10	4.5	0.0	0.0	0.0	0.0	0.0	0.0
W	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	7	100.0	41.7	0.0	0.0	0.0	0.0	0.0
AN	8	91.7	0.0	0.0	0.0	0.0	0.0	0.0
AN	9	66.7	0.0	0.0	0.0	0.0	0.0	0.0
AN	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	7	85.7	42.9	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2 woTUCP AllVA
BN	8	78.6	0.0	0.0	0.0	0.0	0.0	0.0
BN	9	64.3	0.0	0.0	0.0	0.0	0.0	0.0
BN	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	7	70.6	0.0	0.0	0.0	0.0	0.0	0.0
D	8	58.8	5.9	0.0	0.0	0.0	0.0	0.0
D	9	70.6	0.0	0.0	0.0	0.0	0.0	0.0
D	10	5.9	0.0	0.0	0.0	0.0	0.0	0.0
D	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	7	72.7	0.0	0.0	0.0	0.0	0.0	0.0
C	8	48.5	3.0	0.0	0.0	0.0	0.0	0.0
C	9	51.5	3.0	0.0	0.0	0.0	0.0	0.0
C	10	3.1	0.0	0.0	0.0	0.0	0.0	0.0
C	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2 woTUCP AllVA
C	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	7	81.6	32.7	0.0	0.0	0.0	0.0	0.0
All	8	70.4	2.0	0.0	0.0	0.0	0.0	0.0
All	9	65.3	1.0	0.0	0.0	0.0	0.0	0.0
All	10	3.1	0.0	0.0	0.0	0.0	0.0	0.0
All	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	All	30.3	10.6	0.0	0.0	0.0	0.0	0.0
AN	All	28.7	4.6	0.0	0.0	0.0	0.0	0.0
BN	All	25.0	4.7	0.0	0.0	0.0	0.0	0.0
D	All	22.9	0.7	0.0	0.0	0.0	0.0	0.0
C	All	19.7	0.7	0.0	0.0	0.0	0.0	0.0
All	All	24.5	4.0	0.0	0.0	0.0	0.0	0.0

Table N.1-8. Percent (difference in percent relative to NAA) of months above the 69.8°F lethal water temperature limit for adult steelhead migration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, July through March.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
BN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

Table N.1-9. Percent of months above the 69.8°F lethal water temperature limit for adult steelhead migration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, July through March.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	7	90.9	100.0	95.5	90.9	90.9	90.9	90.9
W	8	100.0	36.4	54.5	50.0	50.0	50.0	50.0
W	9	100.0	18.2	9.1	9.1	9.1	9.1	9.1
W	10	4.5	0.0	0.0	0.0	0.0	0.0	0.0
W	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
AN	8	100.0	91.7	100.0	100.0	100.0	100.0	100.0
AN	9	100.0	58.3	75.0	75.0	75.0	75.0	75.0
AN	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BN	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
BN	9	100.0	78.6	64.3	64.3	64.3	64.3	64.3
BN	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	9	94.1	94.1	58.8	58.8	58.8	58.8	58.8
D	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	7	100.0	100.0	100.0	93.9	90.9	90.9	90.9
C	8	100.0	100.0	100.0	93.9	90.9	90.9	90.9
C	9	100.0	100.0	72.7	69.7	66.7	66.7	66.7
C	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
C	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	7	98.0	100.0	99.0	95.9	94.9	94.9	94.9
All	8	100.0	84.7	89.8	86.7	85.7	85.7	85.7
All	9	99.0	72.4	55.1	54.1	53.1	53.1	53.1
All	10	1.0	0.0	0.0	0.0	0.0	0.0	0.0
All	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	All	32.8	17.2	17.7	16.2	16.7	16.7	16.7
AN	All	33.3	27.8	30.6	27.8	30.6	30.6	30.6
BN	All	32.8	30.5	28.9	26.6	28.9	28.9	28.9
D	All	32.7	32.7	28.8	28.8	28.8	28.8	28.8
C	All	33.7	33.7	30.6	29.3	28.9	27.9	27.9
All	All	33.1	28.6	27.1	25.7	26.3	26.0	26.0

Table N.1-10. Percent (difference in percent relative to NAA) of months above the 69.8°F lethal water temperature limit for adult steelhead migration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, July through March.

WYT	Month	NAA	Alt1	Alt2w TUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	7	95.5	77.3 (-18.2%)	90.9 (-4.5%)	90.9 (-4.5%)	90.9 (-4.5%)	90.9 (-4.5%)	77.3 (-18.2%)	90.9 (-4.5%)
W	8	54.5	63.6 (9.1%)	50.0 (-4.5%)	50.0 (-4.5%)	50.0 (-4.5%)	50.0 (-4.5%)	86.4 (31.8%)	50.0 (-4.5%)
W	9	9.1	4.5 (-4.5%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)
W	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	9	75.0	50.0 (-25.0%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)	91.7 (16.7%)	75.0 (0.0%)
AN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2w TUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
BN	9	64.3	42.9 (-21.4%)	64.3 (0.0%)	64.3 (0.0%)	64.3 (0.0%)	64.3 (0.0%)	71.4 (7.1%)	64.3 (0.0%)
BN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	9	58.8	58.8 (0.0%)	58.8 (0.0%)	58.8 (0.0%)	58.8 (0.0%)	58.8 (0.0%)	58.8 (0.0%)	58.8 (0.0%)
D	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	7	100.0	100.0 (0.0%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	100.0 (0.0%)	93.9 (-6.1%)
C	8	100.0	100.0 (0.0%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	100.0 (0.0%)	93.9 (-6.1%)
C	9	72.7	60.6 (-12.1%)	69.7 (-3.0%)	66.7 (-6.1%)	66.7 (-6.1%)	66.7 (-6.1%)	75.8 (3.0%)	69.7 (-3.0%)
C	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2w TUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	7	99.0	94.9 (-4.1%)	95.9 (-3.1%)	94.9 (-4.1%)	94.9 (-4.1%)	94.9 (-4.1%)	94.9 (-4.1%)	95.9 (-3.1%)
All	8	89.8	91.8 (2.0%)	86.7 (-3.1%)	85.7 (-4.1%)	85.7 (-4.1%)	85.7 (-4.1%)	96.9 (7.1%)	86.7 (-3.1%)
All	9	55.1	43.9 (-11.2%)	54.1 (-1.0%)	53.1 (-2.0%)	53.1 (-2.0%)	53.1 (-2.0%)	59.2 (4.1%)	54.1 (-1.0%)
All	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	17.7	16.2 (-1.5%)	16.7 (-1.0%)	16.7 (-1.0%)	16.7 (-1.0%)	16.7 (-1.0%)	19.2 (1.5%)	16.7 (-1.0%)
AN	All	30.6	27.8 (-2.8%)	30.6 (0.0%)	30.6 (0.0%)	30.6 (0.0%)	30.6 (0.0%)	32.4 (1.9%)	30.6 (0.0%)
BN	All	28.9	26.6 (-2.3%)	28.9 (0.0%)	28.9 (0.0%)	28.9 (0.0%)	28.9 (0.0%)	29.7 (0.8%)	28.9 (0.0%)
D	All	28.8	28.8 (0.0%)	28.8 (0.0%)	28.8 (0.0%)	28.8 (0.0%)	28.8 (0.0%)	28.8 (0.0%)	28.8 (0.0%)
C	All	30.6	29.3 (-1.4%)	28.9 (-1.7%)	27.9 (-2.7%)	27.9 (-2.7%)	27.9 (-2.7%)	31.0 (0.3%)	28.9 (-1.7%)
All	All	27.1	25.7 (-1.5%)	26.3 (-0.8%)	26.0 (-1.1%)	26.0 (-1.1%)	26.0 (-1.1%)	27.9 (0.8%)	26.3 (-0.8%)

Table N.1-11. Percent of months above the 59.9°F pathogen virulence water temperature threshold for adult steelhead migration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, July through March.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCPwoVA	Alt2woTUCPwoVA	Alt2woTUCPDeltaVA	Alt2woTUCPAllVA
W	7	100.0	100.0	95.5	100.0	100.0	100.0	100.0
W	8	100.0	31.8	54.5	50.0	50.0	50.0	50.0
W	9	100.0	18.2	4.5	9.1	9.1	9.1	9.1
W	10	100.0	0.0	0.0	0.0	0.0	0.0	0.0
W	11	13.6	0.0	0.0	0.0	0.0	0.0	0.0
W	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
AN	8	100.0	91.7	100.0	100.0	100.0	100.0	100.0
AN	9	100.0	50.0	66.7	66.7	66.7	66.7	66.7
AN	10	100.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BN	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
BN	9	100.0	71.4	50.0	50.0	50.0	50.0	50.0
BN	10	100.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	11	13.3	0.0	0.0	0.0	0.0	0.0	0.0
BN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	9	100.0	94.1	82.4	82.4	82.4	82.4	82.4
D	10	100.0	0.0	0.0	0.0	0.0	0.0	0.0
D	11	5.9	0.0	0.0	0.0	0.0	0.0	0.0
D	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	3	0.0	5.9	0.0	0.0	0.0	0.0	0.0
C	7	100.0	100.0	100.0	93.9	90.9	90.9	90.9
C	8	100.0	100.0	100.0	93.9	90.9	90.9	90.9
C	9	100.0	100.0	97.0	97.0	97.0	97.0	97.0
C	10	100.0	3.1	9.4	9.4	9.4	9.4	9.4
C	11	28.1	0.0	3.1	3.1	3.1	3.1	3.1
C	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
C	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	3	3.0	12.1	3.0	3.0	3.0	3.0	3.0
All	7	100.0	100.0	99.0	98.0	96.9	96.9	96.9
All	8	100.0	83.7	89.8	86.7	85.7	85.7	85.7
All	9	100.0	70.4	63.3	64.3	64.3	64.3	64.3
All	10	100.0	1.0	3.1	3.1	3.1	3.1	3.1
All	11	15.3	0.0	1.0	1.0	1.0	1.0	1.0
All	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	3	1.0	5.1	1.0	1.0	1.0	1.0	1.0
W	All	46.0	16.7	17.2	18.7	17.7	17.7	17.7
AN	All	44.4	26.9	29.6	27.8	29.6	29.6	29.6
BN	All	45.3	29.7	27.3	30.5	27.3	27.3	27.3
D	All	45.1	33.3	31.4	33.3	31.4	31.4	31.4
C	All	48.0	35.4	35.0	39.5	33.7	33.0	33.0
All	All	46.2	28.9	28.6	31.0	28.3	28.0	28.0

Table N.1-12. Percent (difference in percent relative to NAA) of months above the 59.9°F pathogen virulence water temperature threshold for adult steelhead migration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, July through March.

WYT	Month	NAA	Alt1	Alt2wTUCPwoVA	Alt2woTUCPwoVA	Alt2woTUCPDeltaVA	Alt2woTUCPAllVA	Alt3	Alt4
W	7	95.5	90.9 (-4.5%)	100.0 (4.5%)	100.0 (4.5%)	100.0 (4.5%)	100.0 (4.5%)	95.5 (0.0%)	100.0 (4.5%)
W	8	54.5	59.1 (4.5%)	50.0 (-4.5%)	50.0 (-4.5%)	50.0 (-4.5%)	50.0 (-4.5%)	72.7 (18.2%)	50.0 (-4.5%)
W	9	4.5	9.1 (4.5%)	9.1 (4.5%)	9.1 (4.5%)	9.1 (4.5%)	9.1 (4.5%)	9.1 (4.5%)	9.1 (4.5%)
W	10	0.0	9.1 (9.1%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	9	66.7	41.7 (-25.0%)	66.7 (0.0%)	66.7 (0.0%)	66.7 (0.0%)	66.7 (0.0%)	66.7 (0.0%)	66.7 (0.0%)
AN	10	0.0	8.3 (8.3%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
BN	9	50.0	64.3 (14.3%)	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	64.3 (14.3%)	50.0 (0.0%)
BN	10	0.0	14.3 (14.3%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	9	82.4	76.5 (-5.9%)	82.4 (0.0%)	82.4 (0.0%)	82.4 (0.0%)	82.4 (0.0%)	94.1 (11.8%)	82.4 (0.0%)
D	10	0.0	17.6 (17.6%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	5.9 (5.9%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	7	100.0	100.0 (0.0%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	100.0 (0.0%)	93.9 (-6.1%)
C	8	100.0	100.0 (0.0%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	100.0 (0.0%)	93.9 (-6.1%)
C	9	97.0	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	100.0 (3.0%)	97.0 (0.0%)
C	10	9.4	50.0 (40.6%)	9.4 (0.0%)	9.4 (0.0%)	9.4 (0.0%)	9.4 (0.0%)	6.3 (-3.1%)	9.4 (0.0%)
C	11	3.1	0.0 (-3.1%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	0.0 (-3.1%)	3.1 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	2	0.0	3.0 (3.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	3.0	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)
All	7	99.0	98.0 (-1.0%)	98.0 (-1.0%)	96.9 (-2.0%)	96.9 (-2.0%)	96.9 (-2.0%)	99.0 (0.0%)	98.0 (-1.0%)
All	8	89.8	90.8 (1.0%)	86.7 (-3.1%)	85.7 (-4.1%)	85.7 (-4.1%)	85.7 (-4.1%)	93.9 (4.1%)	86.7 (-3.1%)
All	9	63.3	62.2 (-1.0%)	64.3 (1.0%)	64.3 (1.0%)	64.3 (1.0%)	64.3 (1.0%)	69.4 (6.1%)	64.3 (1.0%)
All	10	3.1	24.7 (21.6%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	2.1 (-1.0%)	3.1 (0.0%)
All	11	1.0	0.0 (-1.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	0.0 (-1.0%)	1.0 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	0.0	1.0 (1.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	1.0	2.0 (1.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
W	All	17.2	18.7 (1.5%)	17.7 (0.5%)	17.7 (0.5%)	17.7 (0.5%)	17.7 (0.5%)	19.7 (2.5%)	17.7 (0.5%)
AN	All	29.6	27.8 (-1.9%)	29.6 (0.0%)	29.6 (0.0%)	29.6 (0.0%)	29.6 (0.0%)	29.6 (0.0%)	29.6 (0.0%)
BN	All	27.3	30.5 (3.1%)	27.3 (0.0%)	27.3 (0.0%)	27.3 (0.0%)	27.3 (0.0%)	28.9 (1.6%)	27.3 (0.0%)
D	All	31.4	33.3 (2.0%)	31.4 (0.0%)	31.4 (0.0%)	31.4 (0.0%)	31.4 (0.0%)	32.7 (1.3%)	31.4 (0.0%)
C	All	35.0	39.5 (4.4%)	33.7 (-1.4%)	33.0 (-2.0%)	33.0 (-2.0%)	33.0 (-2.0%)	34.7 (-0.3%)	33.7 (-1.4%)
All	All	28.6	31.0 (2.4%)	28.3 (-0.3%)	28.0 (-0.6%)	28.0 (-0.6%)	28.0 (-0.6%)	29.5 (0.9%)	28.3 (-0.3%)

Table N.1-13. Percent of months above the 59.9°F pathogen virulence water temperature threshold for adult steelhead migration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, July through March.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
W	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
W	9	100.0	59.1	90.9	90.9	90.9	90.9	90.9
W	10	100.0	18.2	18.2	22.7	22.7	22.7	22.7
W	11	18.2	0.0	0.0	0.0	0.0	0.0	0.0
W	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	9.1	4.5	4.5	4.5	4.5	4.5
AN	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
AN	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
AN	9	100.0	91.7	100.0	100.0	100.0	100.0	100.0
AN	10	100.0	50.0	50.0	58.3	58.3	58.3	58.3
AN	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	8.3	0.0	0.0	0.0	0.0	0.0
BN	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BN	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
BN	9	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BN	10	100.0	78.6	50.0	50.0	50.0	50.0	50.0
BN	11	6.7	0.0	0.0	0.0	0.0	0.0	0.0
BN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	14.3	0.0	0.0	0.0	0.0	0.0
D	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	9	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	10	100.0	94.1	82.4	88.2	88.2	88.2	88.2
D	11	17.6	11.8	5.9	5.9	5.9	5.9	5.9
D	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	3	0.0	35.3	29.4	23.5	23.5	23.5	23.5
C	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C	9	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C	10	100.0	100.0	100.0	100.0	96.9	96.9	96.9
C	11	6.3	3.1	6.3	6.3	6.3	6.3	6.3
C	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
C	2	0.0	3.0	3.0	3.0	3.0	3.0	3.0
C	3	24.2	72.7	60.6	51.5	51.5	51.5	51.5
All	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
All	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
All	9	100.0	89.8	98.0	98.0	98.0	98.0	98.0
All	10	100.0	71.1	64.9	68.0	67.0	67.0	67.0
All	11	10.2	3.1	3.1	3.1	3.1	3.1	3.1
All	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	2	0.0	1.0	1.0	1.0	1.0	1.0	1.0
All	3	8.2	35.7	26.5	22.4	22.4	22.4	22.4
W	All	46.5	31.8	34.8	37.9	35.4	35.4	35.4
AN	All	44.4	38.9	38.9	44.4	39.8	39.8	39.8
BN	All	44.5	43.0	38.3	44.5	38.3	38.3	38.3
D	All	46.4	49.0	46.4	48.4	46.4	46.4	46.4
C	All	48.0	53.4	52.4	50.7	51.4	51.0	51.0
All	All	46.4	44.5	43.7	45.7	43.6	43.5	43.5

Table N.1-14. Percent (difference in percent relative to NAA) of months above the 59.9°F pathogen virulence water temperature threshold for adult steelhead migration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, July through March.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	9	90.9	86.4 (-4.5%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)
W	10	18.2	50.0 (31.8%)	22.7 (4.5%)	22.7 (4.5%)	22.7 (4.5%)	22.7 (4.5%)	31.8 (13.6%)	22.7 (4.5%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	4.5	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)
AN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	10	50.0	100.0 (50.0%)	58.3 (8.3%)	58.3 (8.3%)	58.3 (8.3%)	58.3 (8.3%)	58.3 (8.3%)	58.3 (8.3%)
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	16.7 (16.7%)	0.0 (0.0%)
BN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
BN	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	10	50.0	100.0 (50.0%)	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	64.3 (14.3%)	50.0 (0.0%)
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	7.1 (7.1%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	10	82.4	100.0 (17.6%)	88.2 (5.9%)	88.2 (5.9%)	88.2 (5.9%)	88.2 (5.9%)	82.4 (0.0%)	88.2 (5.9%)
D	11	5.9	11.8 (5.9%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	29.4	23.5 (-5.9%)	23.5 (-5.9%)	23.5 (-5.9%)	23.5 (-5.9%)	23.5 (-5.9%)	11.8 (-17.6%)	23.5 (-5.9%)
C	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	10	100.0	100.0 (0.0%)	100.0 (0.0%)	96.9 (-3.1%)	96.9 (-3.1%)	96.9 (-3.1%)	100.0 (0.0%)	100.0 (0.0%)
C	11	6.3	3.1 (-3.1%)	6.3 (0.0%)	6.3 (0.0%)	6.3 (0.0%)	6.3 (0.0%)	3.1 (-3.1%)	6.3 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	2	3.0	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)
C	3	60.6	48.5 (-12.1%)	51.5 (-9.1%)	51.5 (-9.1%)	51.5 (-9.1%)	51.5 (-9.1%)	60.6 (0.0%)	51.5 (-9.1%)
All	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	9	98.0	96.9 (-1.0%)	98.0 (0.0%)	98.0 (0.0%)	98.0 (0.0%)	98.0 (0.0%)	98.0 (0.0%)	98.0 (0.0%)
All	10	64.9	88.7 (23.7%)	68.0 (3.1%)	67.0 (2.1%)	67.0 (2.1%)	67.0 (2.1%)	71.1 (6.2%)	68.0 (3.1%)
All	11	3.1	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	2.0 (-1.0%)	3.1 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	1.0	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
All	3	26.5	22.4 (-4.1%)	22.4 (-4.1%)	22.4 (-4.1%)	22.4 (-4.1%)	22.4 (-4.1%)	25.5 (-1.0%)	22.4 (-4.1%)
W	All	34.8	37.9 (3.0%)	35.4 (0.5%)	35.4 (0.5%)	35.4 (0.5%)	35.4 (0.5%)	36.4 (1.5%)	35.4 (0.5%)
AN	All	38.9	44.4 (5.6%)	39.8 (0.9%)	39.8 (0.9%)	39.8 (0.9%)	39.8 (0.9%)	41.7 (2.8%)	39.8 (0.9%)
BN	All	38.3	44.5 (6.3%)	38.3 (0.0%)	38.3 (0.0%)	38.3 (0.0%)	38.3 (0.0%)	39.8 (1.6%)	38.3 (0.0%)
D	All	46.4	48.4 (2.0%)	46.4 (0.0%)	46.4 (0.0%)	46.4 (0.0%)	46.4 (0.0%)	44.4 (-2.0%)	46.4 (0.0%)
C	All	52.4	50.7 (-1.7%)	51.4 (-1.0%)	51.0 (-1.4%)	51.0 (-1.4%)	51.0 (-1.4%)	52.0 (-0.3%)	51.4 (-1.0%)
All	All	43.7	45.7 (2.0%)	43.6 (-0.1%)	43.5 (-0.2%)	43.5 (-0.2%)	43.5 (-0.2%)	44.2 (0.5%)	43.6 (-0.1%)

N.1.3.2.2 Spawning

Water temperature-related effects on steelhead spawning in the Stanislaus River were evaluated by assessing: (1) the percent of months with water temperature outside the 45°F to 55°F range for successful spawning (Bell 1991, FERC 1993, Richter and Kolmes 2005); and (2) the percent of months with water temperature above the 59.9°F pathogen virulence threshold (McCullough 1999) at Orange Blossom Bridge (Table N.1-1).

Results for the 45°F to 55°F range for successful spawning are presented in Table N.1-15 and Table N.1-16 for Orange Blossom Bridge.

- The highest percent of months outside the range was 100% and occurred in May of critical water types under the NAA, all four components of Alt 2, and Alt 4. The lowest percent of months outside the range was 0% and occurred in wet, above normal, and below normal, and dry multiple water year types for the NAA and all alternatives. Air temperatures drove the exceedance above the upper limit of the range in warmer months. In addition, lower flows during drier water year types increased water temperatures above the range, particularly in March through June.

Results for the 59.9°F pathogen virulence water temperature limit for steelhead spawning are presented in Table N.1-17 and Table N.1-18 for Orange Blossom Bridge.

- The highest percent of months above the virulence limit was 9.1% and occurred in May of critical water types under the NAA, all four components of Alt 2, Alt 3, and Alt 4. The lowest percent of months exceeding the virulence threshold was 0% and occurred in the large majority of month and water year type combinations for the NAA and all alternatives. The highest percentage of months exceeding the virulence threshold when combining water year types occurred in May for the NAA, all components of Alt 2, Alt 3, and Alt 4; for Alt 1, both March and May had the highest percent of months exceeding the threshold.

Table N.1-15. Percent of months outside the 45°F to 55°F water temperature range for successful steelhead spawning by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, December through May.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCPwoVA	Alt2woTUCPwoVA	Alt2woTUCPDeltaVA	Alt2woTUCPAllVA
W	12	4.5	0.0	0.0	0.0	0.0	0.0	0.0
W	1	4.5	0.0	0.0	0.0	0.0	0.0	0.0
W	2	22.7	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	18.2	13.6	13.6	9.1	13.6	13.6
W	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	5	40.9	4.5	4.5	4.5	4.5	4.5	4.5
AN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	8.3	16.7	8.3	8.3	8.3	8.3
AN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	5	91.7	16.7	0.0	0.0	0.0	0.0	0.0
BN	12	6.7	0.0	0.0	0.0	0.0	0.0	0.0
BN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	2	7.1	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	35.7	0.0	0.0	0.0	0.0	0.0
BN	4	0.0	14.3	7.1	14.3	14.3	14.3	14.3
BN	5	92.9	21.4	14.3	14.3	14.3	14.3	14.3
D	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
D	2	0.0	5.9	5.9	0.0	0.0	0.0	0.0
D	3	0.0	58.8	47.1	47.1	47.1	47.1	47.1
D	4	29.4	70.6	41.2	64.7	64.7	64.7	64.7
D	5	94.1	100.0	88.2	94.1	94.1	94.1	94.1
C	12	3.1	3.1	3.1	3.1	3.1	3.1	3.1
C	1	3.0	3.0	3.0	6.1	6.1	6.1	6.1
C	2	3.0	6.1	6.1	9.1	9.1	9.1	9.1
C	3	24.2	90.9	69.7	69.7	69.7	69.7	69.7
C	4	87.9	97.0	78.8	81.8	81.8	81.8	81.8
C	5	100.0	100.0	100.0	100.0	100.0	100.0	100.0
All	12	3.1	1.0	1.0	1.0	1.0	1.0	1.0
All	1	2.0	1.0	1.0	2.0	2.0	2.0	2.0
All	2	7.1	3.1	3.1	3.1	3.1	3.1	3.1
All	3	8.2	51.0	36.7	35.7	34.7	35.7	35.7
All	4	34.7	46.9	34.7	40.8	40.8	40.8	40.8
All	5	83.7	57.1	52.0	53.1	53.1	53.1	53.1
W	All	12.1	3.8	3.0	4.5	3.0	2.3	3.0
AN	All	15.3	4.2	2.8	1.4	1.4	1.4	1.4
BN	All	17.6	11.8	3.5	7.1	4.7	4.7	4.7
D	All	20.6	39.2	30.4	15.7	34.3	34.3	34.3
C	All	37.1	50.3	43.7	35.0	45.2	45.2	45.2
All	All	23.1	26.7	21.4	16.7	22.6	22.4	22.6

Table N.1-16. Percent (difference in percent relative to NAA) of months outside the 45°F to 55°F water temperature range for successful steelhead spawning by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, December through May.

WYT	Month	NAA	Alt1	Alt2wTUCPwoVA	Alt2woTUCPwoVA	Alt2woTUCPDeltaVA	Alt2woTUCPAllVA	Alt3	Alt4
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	13.6	13.6 (0.0%)	13.6 (0.0%)	9.1 (-4.5%)	13.6 (0.0%)	13.6 (0.0%)	4.5 (-9.1%)	9.1 (-4.5%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	4.5	13.6 (9.1%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	16.7	8.3 (-8.3%)	8.3 (-8.3%)	8.3 (-8.3%)	8.3 (-8.3%)	8.3 (-8.3%)	16.7 (0.0%)	8.3 (-8.3%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	7.1 (7.1%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	7.1	7.1 (0.0%)	14.3 (7.1%)	14.3 (7.1%)	14.3 (7.1%)	14.3 (7.1%)	7.1 (0.0%)	14.3 (7.1%)
BN	5	14.3	28.6 (14.3%)	14.3 (0.0%)	14.3 (0.0%)	14.3 (0.0%)	14.3 (0.0%)	14.3 (0.0%)	14.3 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	2	5.9	5.9 (0.0%)	0.0 (-5.9%)	0.0 (-5.9%)	0.0 (-5.9%)	0.0 (-5.9%)	5.9 (0.0%)	0.0 (-5.9%)
D	3	47.1	29.4 (-17.6%)	47.1 (0.0%)	47.1 (0.0%)	47.1 (0.0%)	47.1 (0.0%)	23.5 (-23.5%)	47.1 (0.0%)
D	4	41.2	11.8 (-29.4%)	64.7 (23.5%)	64.7 (23.5%)	64.7 (23.5%)	64.7 (23.5%)	29.4 (-11.8%)	64.7 (23.5%)
D	5	88.2	47.1 (-41.2%)	94.1 (5.9%)	94.1 (5.9%)	94.1 (5.9%)	94.1 (5.9%)	52.9 (-35.3%)	94.1 (5.9%)
C	12	3.1	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)
C	1	3.0	3.0 (0.0%)	6.1 (3.0%)	6.1 (3.0%)	6.1 (3.0%)	6.1 (3.0%)	3.0 (0.0%)	6.1 (3.0%)
C	2	6.1	9.1 (3.0%)	9.1 (3.0%)	9.1 (3.0%)	9.1 (3.0%)	9.1 (3.0%)	6.1 (0.0%)	9.1 (3.0%)
C	3	69.7	60.6 (-9.1%)	69.7 (0.0%)	69.7 (0.0%)	69.7 (0.0%)	69.7 (0.0%)	66.7 (-3.0%)	69.7 (0.0%)
C	4	78.8	48.5 (-30.3%)	81.8 (3.0%)	81.8 (3.0%)	81.8 (3.0%)	81.8 (3.0%)	84.8 (6.1%)	81.8 (3.0%)
C	5	100.0	84.8 (-15.2%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	93.9 (-6.1%)	100.0 (0.0%)
All	12	1.0	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
All	1	1.0	1.0 (0.0%)	2.0 (1.0%)	2.0 (1.0%)	2.0 (1.0%)	2.0 (1.0%)	1.0 (0.0%)	2.0 (1.0%)
All	2	3.1	4.1 (1.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)
All	3	36.7	30.6 (-6.1%)	35.7 (-1.0%)	34.7 (-2.0%)	35.7 (-1.0%)	35.7 (-1.0%)	29.6 (-7.1%)	34.7 (-2.0%)
All	4	34.7	19.4 (-15.3%)	40.8 (6.1%)	40.8 (6.1%)	40.8 (6.1%)	40.8 (6.1%)	34.7 (0.0%)	40.8 (6.1%)
All	5	52.0	43.9 (-8.2%)	53.1 (1.0%)	53.1 (1.0%)	53.1 (1.0%)	53.1 (1.0%)	43.9 (-8.2%)	53.1 (1.0%)
W	All	3.0	4.5 (1.5%)	3.0 (0.0%)	2.3 (-0.8%)	3.0 (0.0%)	3.0 (0.0%)	1.5 (-1.5%)	2.3 (-0.8%)
AN	All	2.8	1.4 (-1.4%)	1.4 (-1.4%)	1.4 (-1.4%)	1.4 (-1.4%)	1.4 (-1.4%)	2.8 (0.0%)	1.4 (-1.4%)
BN	All	3.5	7.1 (3.5%)	4.7 (1.2%)	4.7 (1.2%)	4.7 (1.2%)	4.7 (1.2%)	3.5 (0.0%)	4.7 (1.2%)
D	All	30.4	15.7 (-14.7%)	34.3 (3.9%)	34.3 (3.9%)	34.3 (3.9%)	34.3 (3.9%)	18.6 (-11.8%)	34.3 (3.9%)
C	All	43.7	35.0 (-8.6%)	45.2 (1.5%)	45.2 (1.5%)	45.2 (1.5%)	45.2 (1.5%)	43.1 (-0.5%)	45.2 (1.5%)
All	All	21.4	16.7 (-4.8%)	22.6 (1.2%)	22.4 (1.0%)	22.6 (1.2%)	22.6 (1.2%)	18.9 (-2.6%)	22.4 (1.0%)

Table N.1-17. Percent of months above the 59.9°F pathogen virulence water temperature threshold for steelhead spawning by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, December through May.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	5.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0
AN	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	5.0	14.3	0.0	0.0	0.0	0.0	0.0	0.0
D	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
D	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	3.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0
D	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	5.0	58.8	11.8	0.0	0.0	0.0	0.0	0.0
C	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	3.0	3.0	12.1	3.0	3.0	3.0	3.0	3.0
C	4.0	51.5	6.1	0.0	0.0	0.0	0.0	0.0
C	5.0	87.9	93.9	9.1	9.1	9.1	9.1	9.1
All	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	3.0	1.0	5.1	1.0	1.0	1.0	1.0	1.0
All	4.0	17.3	2.0	0.0	0.0	0.0	0.0	0.0
All	5.0	42.9	33.7	3.1	3.1	3.1	3.1	3.1
W	All	8.2	7.3	0.9	2.7	4.5	4.5	4.5
AN	All	16.7	20.0	18.3	8.3	18.3	18.3	18.3
BN	All	21.4	20.0	18.6	10.0	20.0	20.0	20.0
D	All	31.8	35.3	20.0	17.6	24.7	24.7	24.7
C	All	42.4	45.5	26.7	24.8	27.3	26.7	26.7
All	All	26.7	28.4	17.6	14.5	19.6	19.4	19.4

Table N.1-18. Percent (difference in percent relative to NAA) of months above the 59.9°F pathogen virulence water temperature threshold for steelhead spawning by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, December through May.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	5.9 (5.9%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	2	0.0	3.0 (3.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	3.0	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)
C	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	9.1	6.1 (-3.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	0.0	1.0 (1.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	1.0	2.0 (1.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
All	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	5	3.1	2.0 (-1.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)
W	All	0.9	2.7 (1.8%)	4.5 (3.6%)	4.5 (3.6%)	4.5 (3.6%)	4.5 (3.6%)	1.8 (0.9%)	4.5 (3.6%)
AN	All	18.3	8.3 (-10.0%)	18.3 (0.0%)	18.3 (0.0%)	18.3 (0.0%)	18.3 (0.0%)	15.0 (-3.3%)	18.3 (0.0%)
BN	All	18.6	10.0 (-8.6%)	20.0 (1.4%)	20.0 (1.4%)	20.0 (1.4%)	20.0 (1.4%)	17.1 (-1.4%)	20.0 (1.4%)
D	All	20.0	17.6 (-2.4%)	24.7 (4.7%)	24.7 (4.7%)	24.7 (4.7%)	24.7 (4.7%)	22.4 (2.4%)	24.7 (4.7%)
C	All	26.7	24.8 (-1.8%)	27.3 (0.6%)	26.7 (0.0%)	26.7 (0.0%)	26.7 (0.0%)	26.7 (0.0%)	27.3 (0.6%)
All	All	17.6	14.5 (-3.1%)	19.6 (2.0%)	19.4 (1.8%)	19.4 (1.8%)	19.4 (1.8%)	17.6 (0.0%)	19.6 (2.0%)

N.1.3.2.3 Kelt Emigration

Water temperature-related effects on steelhead kelt emigration in the Stanislaus River were evaluated by assessing: (1) the percent of months with water temperature above the 66.2°F limit of migration impairment (Keefer et al. 2009); (2) the percent of months with water temperature above the 69.8°F lethal limit (Coutant 1970) and (3) the percent of months with water temperature above the 59.9°F pathogen virulence threshold (McCullough 1999) at Orange Blossom Bridge and above the confluence with the San Joaquin River (Table N.1-1).

Results for the 66.2°F migration impairment limit are presented in Table N.1-19 and Table N.1-20 for Orange Blossom Bridge and Table N.1-21 and Table N.1-22 for the confluence.

- At Orange Blossom Bridge, 3% of months exceeded the migration impairment limit in June of critical water years for the NAA and all alternatives (Table N.1-19 and Table N.1-20). There were no other exceedances above the limit for any alternative throughout the February to June period.
- Results for the for the 66.2°F steelhead migration impairment limit are presented in Table N.1-21 and Table N.1-22 for the confluence. The highest percent of months above the migration impairment limit was 100% and occurred in June of at least one water type under the NAA, Alt 1, all four components of Alt 2, and Alt 4. The lowest percent of months exceeding the migration impairment limit was 0% and occurred in February, March, and April of all water year types for all alternatives, May of wet, above normal, and below normal water years for all alternatives, and in May of dry water years under the NAA. Air temperatures drove the exceedance above the migration impairment limit in late spring and early summer months. In addition, lower flows during drier water year types increased water temperatures above the limit.

Results for the 69.8°F lethal water temperature limit for steelhead kelt emigration at Orange Blossom Bridge are presented in Table N.1-23 and Table N.1-24.

- There were no exceedances of the limit under the NAA or any alternative throughout the kelt emigration period.

Results for the 69.8°F lethal water temperature limit for steelhead kelt emigration for the confluence are presented in Table N.1-25 and Table N.1-26.

- The highest percent of months above the lethal limit was 93.9% and occurred in June of critical years under the NAA and Alt 3. The lowest percent of months exceeding the lethal limit was 0% and occurred in February through April of all water year types for all alternatives, except Alt 1, for which 3% of months in May of dry years exceeded the limit. Air temperatures drove the exceedance above the lethal limit during May and June. In addition, lower flows during drier water year types increased water temperatures above the limit.

Results for the 59.9°F pathogen virulence water temperature threshold for kelt emigration are presented in Table N.1-27 and Table N.1-28 for Orange Blossom Bridge and Table N.1-29 and Table N.1-30 for the confluence.

- At Orange Blossom Bridge, the highest percent of months above the virulence threshold was 100% and occurred in June of dry water types under the NAA, all four components of Alt 2, and Alt 4 (Table N.1-27 and Table N.1-28). The lowest percent of months exceeding the virulence threshold was 0% and occurred in the large majority of month and water year type combinations for the NAA and all alternatives other than June. The highest percentage of months exceeding the virulence threshold when combining water year types occurred in June for the NAA and all alternatives. Air temperatures drove the exceedance above the threshold during June. In addition, lower flows during drier water year types increased water temperatures above the threshold.
- Above the confluence with the San Joaquin River, the highest percent of months above the virulence threshold was 100% and occurred in at least one water year type in May and June under the NAA and all alternatives (Table N.1-29 and Table N.1-30). The lowest percent of months exceeding the virulence threshold was 0% and occurred in at least one water year type during February, March, and April for the NAA and all alternatives. Exceedance above the virulence threshold increased from 1% in February to 91.8% to 100% in June under the NAA and all alternatives. Air temperatures drove this temporal pattern. In addition, lower flows during drier water year types increased water temperatures above the threshold.

Table N.1-19. Percent of months above the 66.2°F migration impairment water temperature limit for steelhead kelt emigration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, February through June.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	6	9.1	0.0	0.0	0.0	0.0	0.0	0.0
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	6	75.0	75.0	0.0	0.0	0.0	0.0	0.0
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	5	7.1	0.0	0.0	0.0	0.0	0.0	0.0
BN	6	92.9	78.6	0.0	0.0	0.0	0.0	0.0
D	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	5	41.2	0.0	0.0	0.0	0.0	0.0	0.0
D	6	100.0	88.2	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
C	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	4	12.1	0.0	0.0	0.0	0.0	0.0	0.0
C	5	66.7	6.1	0.0	0.0	0.0	0.0	0.0
C	6	81.8	21.2	3.0	3.0	3.0	3.0	3.0
All	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	4	4.1	0.0	0.0	0.0	0.0	0.0	0.0
All	5	30.6	2.0	0.0	0.0	0.0	0.0	0.0
All	6	69.4	42.9	1.0	1.0	1.0	1.0	1.0
W	All	1.8	0.0	0.0	0.0	0.0	0.0	0.0
AN	All	15.0	15.0	0.0	0.0	0.0	0.0	0.0
BN	All	20.0	15.7	0.0	0.0	0.0	0.0	0.0
D	All	28.2	17.6	0.0	0.0	0.0	0.0	0.0
C	All	32.1	5.5	0.6	0.0	0.6	0.6	0.6
All	All	20.8	9.0	0.2	0.0	0.2	0.2	0.2

Table N.1-20. Percent (difference in percent relative to NAA) of months above the migration impairment water temperature limit for steelhead kelt emigration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, February through June.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	6	3.0	0.0 (-3.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)
All	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	6	1.0	0.0 (-1.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
W	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	All	0.6	0.0 (-0.6%)	0.6 (0.0%)	0.6 (0.0%)	0.6 (0.0%)	0.6 (0.0%)	0.6 (0.0%)	0.6 (0.0%)
All	All	0.2	0.0 (-0.2%)	0.2 (0.0%)	0.2 (0.0%)	0.2 (0.0%)	0.2 (0.0%)	0.2 (0.0%)	0.2 (0.0%)

Table N.1-21. Percent of months above the 66.2°F migration impairment water temperature limit for steelhead kelt emigration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, February through June.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	5	4.5	0.0	0.0	0.0	0.0	0.0	0.0
W	6	36.4	36.4	4.5	22.7	22.7	22.7	22.7
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	6	83.3	100.0	91.7	91.7	91.7	91.7	91.7
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	5	14.3	0.0	0.0	0.0	0.0	0.0	0.0
BN	6	92.9	100.0	92.9	100.0	100.0	100.0	100.0
D	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	4	0.0	5.9	0.0	0.0	0.0	0.0	0.0
D	5	58.8	70.6	0.0	23.5	23.5	23.5	23.5
D	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
C	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	4	24.2	33.3	0.0	0.0	0.0	0.0	0.0
C	5	87.9	93.9	33.3	36.4	36.4	36.4	36.4
C	6	100.0	100.0	100.0	100.0	97.0	97.0	97.0
All	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	4	8.2	12.2	0.0	0.0	0.0	0.0	0.0
All	5	42.9	43.9	11.2	16.3	16.3	16.3	16.3
All	6	82.7	85.7	76.5	81.6	80.6	80.6	80.6
W	All	8.2	7.3	0.9	2.7	4.5	4.5	4.5
AN	All	16.7	20.0	18.3	8.3	18.3	18.3	18.3
BN	All	21.4	20.0	18.6	10.0	20.0	20.0	20.0
D	All	31.8	35.3	20.0	17.6	24.7	24.7	24.7
C	All	42.4	45.5	26.7	24.8	27.3	26.7	26.7
All	All	26.7	28.4	17.6	14.5	19.6	19.4	19.4

Table N.1-22. Percent (difference in percent relative to NAA) of months above the 66.2°F migration impairment water temperature limit for steelhead kelt emigration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above confluence with the San Joaquin River, February through June.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	6	4.5	13.6 (9.1%)	22.7 (18.2%)	22.7 (18.2%)	22.7 (18.2%)	22.7 (18.2%)	9.1 (4.5%)	22.7 (18.2%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	6	91.7	41.7 (-50.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	75.0 (-16.7%)	91.7 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	6	92.9	50.0 (-42.9%)	100.0 (7.1%)	100.0 (7.1%)	100.0 (7.1%)	100.0 (7.1%)	85.7 (-7.1%)	100.0 (7.1%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	5.9 (5.9%)	23.5 (23.5%)	23.5 (23.5%)	23.5 (23.5%)	23.5 (23.5%)	17.6 (17.6%)	23.5 (23.5%)
D	6	100.0	82.4 (-17.6%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	94.1 (-5.9%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	33.3	24.2 (-9.1%)	36.4 (3.0%)	36.4 (3.0%)	36.4 (3.0%)	36.4 (3.0%)	36.4 (3.0%)	36.4 (3.0%)
C	6	100.0	100.0 (0.0%)	100.0 (0.0%)	97.0 (-3.0%)	97.0 (-3.0%)	97.0 (-3.0%)	97.0 (-3.0%)	100.0 (0.0%)
All	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	5	11.2	9.2 (-2.0%)	16.3 (5.1%)	16.3 (5.1%)	16.3 (5.1%)	16.3 (5.1%)	15.3 (4.1%)	16.3 (5.1%)
All	6	76.5	63.3 (-13.3%)	81.6 (5.1%)	80.6 (4.1%)	80.6 (4.1%)	80.6 (4.1%)	72.4 (-4.1%)	81.6 (5.1%)
W	All	0.9	2.7 (1.8%)	4.5 (3.6%)	4.5 (3.6%)	4.5 (3.6%)	4.5 (3.6%)	1.8 (0.9%)	4.5 (3.6%)
AN	All	18.3	8.3 (-10.0%)	18.3 (0.0%)	18.3 (0.0%)	18.3 (0.0%)	18.3 (0.0%)	15.0 (-3.3%)	18.3 (0.0%)
BN	All	18.6	10.0 (-8.6%)	20.0 (1.4%)	20.0 (1.4%)	20.0 (1.4%)	20.0 (1.4%)	17.1 (-1.4%)	20.0 (1.4%)
D	All	20.0	17.6 (-2.4%)	24.7 (4.7%)	24.7 (4.7%)	24.7 (4.7%)	24.7 (4.7%)	22.4 (2.4%)	24.7 (4.7%)
C	All	26.7	24.8 (-1.8%)	27.3 (0.6%)	26.7 (0.0%)	26.7 (0.0%)	26.7 (0.0%)	26.7 (0.0%)	27.3 (0.6%)
All	All	17.6	14.5 (-3.1%)	19.6 (2.0%)	19.4 (1.8%)	19.4 (1.8%)	19.4 (1.8%)	17.6 (0.0%)	19.6 (2.0%)

Table N.1-23. Percent of months above the 69.8°F lethal water temperature limit for steelhead kelt emigration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, February through June.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	6	9.1	0.0	0.0	0.0	0.0	0.0	0.0
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	6	75.0	25.0	0.0	0.0	0.0	0.0	0.0
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	6	85.7	42.9	0.0	0.0	0.0	0.0	0.0
D	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	5	5.9	0.0	0.0	0.0	0.0	0.0	0.0
D	6	76.5	52.9	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
C	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	5	39.4	0.0	0.0	0.0	0.0	0.0	0.0
C	6	45.5	3.0	0.0	0.0	0.0	0.0	0.0
All	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	5	14.3	0.0	0.0	0.0	0.0	0.0	0.0
All	6	52.0	19.4	0.0	0.0	0.0	0.0	0.0
W	All	1.8	0.0	0.0	0.0	0.0	0.0	0.0
AN	All	15.0	5.0	0.0	0.0	0.0	0.0	0.0
BN	All	17.1	8.6	0.0	0.0	0.0	0.0	0.0
D	All	16.5	10.6	0.0	0.0	0.0	0.0	0.0
C	All	17.0	0.6	0.0	0.0	0.0	0.0	0.0
All	All	13.3	3.9	0.0	0.0	0.0	0.0	0.0

Table N.1-24. Percent (difference in percent relative to NAA) of months above the 69.8°F lethal water temperature limit for steelhead kelt emigration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, February through June.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

Table N.1-25. Percent of months above the 69.8°F lethal water temperature limit for steelhead kelt emigration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, February through June.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2 woTUCP DeltaVA	Alt2woTUCP AllVA
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	5	4.5	0.0	0.0	0.0	0.0	0.0	0.0
W	6	9.1	0.0	0.0	4.5	4.5	4.5	4.5
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	6	75.0	91.7	0.0	0.0	0.0	0.0	0.0
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	5	7.1	0.0	0.0	0.0	0.0	0.0	0.0
BN	6	78.6	85.7	14.3	14.3	14.3	14.3	14.3
D	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	5	5.9	0.0	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2 woTUCP DeltaVA	Alt2woTUCP AllVA
D	6	100.0	100.0	64.7	70.6	70.6	70.6	70.6
C	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	5	45.5	36.4	0.0	0.0	0.0	0.0	0.0
C	6	97.0	100.0	93.9	87.9	84.8	84.8	84.8
All	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	5	18.4	12.2	0.0	0.0	0.0	0.0	0.0
All	6	72.4	74.5	44.9	44.9	43.9	43.9	43.9
W	All	2.7	0.0	0.0	0.9	0.9	0.9	0.9
AN	All	15.0	18.3	0.0	0.0	0.0	0.0	0.0
BN	All	17.1	17.1	2.9	2.9	2.9	2.9	2.9
D	All	21.2	20.0	12.9	5.9	14.1	14.1	14.1
C	All	28.5	27.3	18.8	14.5	17.6	17.0	17.0
All	All	18.2	17.3	9.0	6.5	9.0	8.8	8.8

Table N.1-26. Percent (difference in percent relative to NAA) of months above the 69.8°F lethal water temperature limit for steelhead kelt emigration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, February through June.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	6	0.0	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	0.0 (0.0%)	4.5 (4.5%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	6	14.3	14.3 (0.0%)	14.3 (0.0%)	14.3 (0.0%)	14.3 (0.0%)	14.3 (0.0%)	14.3 (0.0%)	14.3 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	6	64.7	29.4 (-35.3%)	70.6 (5.9%)	70.6 (5.9%)	70.6 (5.9%)	70.6 (5.9%)	35.3 (-29.4%)	70.6 (5.9%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	0.0	3.0 (3.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	6	93.9	69.7 (-24.2%)	87.9 (-6.1%)	84.8 (-9.1%)	84.8 (-9.1%)	84.8 (-9.1%)	93.9 (0.0%)	87.9 (-6.1%)
All	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	5	0.0	1.0 (1.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	6	44.9	31.6 (-13.3%)	44.9 (0.0%)	43.9 (-1.0%)	43.9 (-1.0%)	43.9 (-1.0%)	39.8 (-5.1%)	44.9 (0.0%)
W	All	0.0	0.9 (0.9%)	0.9 (0.9%)	0.9 (0.9%)	0.9 (0.9%)	0.9 (0.9%)	0.0 (0.0%)	0.9 (0.9%)
AN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	All	2.9	2.9 (0.0%)	2.9 (0.0%)	2.9 (0.0%)	2.9 (0.0%)	2.9 (0.0%)	2.9 (0.0%)	2.9 (0.0%)
D	All	12.9	5.9 (-7.1%)	14.1 (1.2%)	14.1 (1.2%)	14.1 (1.2%)	14.1 (1.2%)	7.1 (-5.9%)	14.1 (1.2%)
C	All	18.8	14.5 (-4.2%)	17.6 (-1.2%)	17.0 (-1.8%)	17.0 (-1.8%)	17.0 (-1.8%)	18.8 (0.0%)	17.6 (-1.2%)
All	All	9.0	6.5 (-2.4%)	9.0 (0.0%)	8.8 (-0.2%)	8.8 (-0.2%)	8.8 (-0.2%)	8.0 (-1.0%)	9.0 (0.0%)

Table N.1-27. Percent of months above the 59.9°F pathogen virulence water temperature threshold for steelhead kelt emigration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, February through June.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	5	4.5	0.0	0.0	0.0	0.0	0.0	0.0
W	6	54.5	0.0	0.0	4.5	4.5	4.5	4.5
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	6	100.0	100.0	8.3	8.3	8.3	8.3	8.3
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	5	14.3	0.0	0.0	0.0	0.0	0.0	0.0
BN	6	100.0	100.0	14.3	28.6	28.6	28.6	28.6
D	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	3	0.0	5.9	0.0	0.0	0.0	0.0	0.0
D	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	5	58.8	11.8	0.0	0.0	0.0	0.0	0.0
D	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
C	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	3	3.0	12.1	3.0	3.0	3.0	3.0	3.0
C	4	51.5	6.1	0.0	0.0	0.0	0.0	0.0
C	5	87.9	93.9	9.1	9.1	9.1	9.1	9.1
C	6	100.0	97.0	100.0	93.9	90.9	90.9	90.9
All	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	3	1.0	5.1	1.0	1.0	1.0	1.0	1.0
All	4	17.3	2.0	0.0	0.0	0.0	0.0	0.0
All	5	42.9	33.7	3.1	3.1	3.1	3.1	3.1
All	6	89.8	76.5	54.1	55.1	54.1	54.1	54.1
W	All	11.8	0.0	0.0	0.9	0.9	0.9	0.9
AN	All	20.0	20.0	1.7	3.3	1.7	1.7	1.7
BN	All	22.9	20.0	2.9	7.1	5.7	5.7	5.7
D	All	31.8	23.5	20.0	14.1	20.0	20.0	20.0
C	All	48.5	41.8	22.4	20.6	21.2	20.6	20.6
All	All	30.2	23.5	11.6	11.0	11.8	11.6	11.6

Table N.1-28. Percent (difference in percent relative to NAA) of months above the 59.9°F pathogen virulence water temperature threshold for steelhead kelt emigration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, February through June.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	6	0.0	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	0.0 (0.0%)	4.5 (4.5%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	6	8.3	16.7 (8.3%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	6	14.3	35.7 (21.4%)	28.6 (14.3%)	28.6 (14.3%)	28.6 (14.3%)	28.6 (14.3%)	21.4 (7.1%)	28.6 (14.3%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	5.9 (5.9%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	6	100.0	64.7 (-35.3%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	70.6 (-29.4%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	2	0.0	3.0 (3.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	3.0	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)
C	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	9.1	6.1 (-3.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)
C	6	100.0	90.9 (-9.1%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	97.0 (-3.0%)	93.9 (-6.1%)
All	2	0.0	1.0 (1.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	1.0	2.0 (1.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
All	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	5	3.1	2.0 (-1.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)
All	6	54.1	50.0 (-4.1%)	55.1 (1.0%)	54.1 (0.0%)	54.1 (0.0%)	54.1 (0.0%)	49.0 (-5.1%)	55.1 (1.0%)
W	All	0.0	0.9 (0.9%)	0.9 (0.9%)	0.9 (0.9%)	0.9 (0.9%)	0.9 (0.9%)	0.0 (0.0%)	0.9 (0.9%)
AN	All	1.7	3.3 (1.7%)	1.7 (0.0%)	1.7 (0.0%)	1.7 (0.0%)	1.7 (0.0%)	1.7 (0.0%)	1.7 (0.0%)
BN	All	2.9	7.1 (4.3%)	5.7 (2.9%)	5.7 (2.9%)	5.7 (2.9%)	5.7 (2.9%)	4.3 (1.4%)	5.7 (2.9%)
D	All	20.0	14.1 (-5.9%)	20.0 (0.0%)	20.0 (0.0%)	20.0 (0.0%)	20.0 (0.0%)	14.1 (-5.9%)	20.0 (0.0%)
C	All	22.4	20.6 (-1.8%)	21.2 (-1.2%)	20.6 (-1.8%)	20.6 (-1.8%)	20.6 (-1.8%)	21.8 (-0.6%)	21.2 (-1.2%)
All	All	11.6	11.0 (-0.6%)	11.8 (0.2%)	11.6 (0.0%)	11.6 (0.0%)	11.6 (0.0%)	10.6 (-1.0%)	11.8 (0.2%)

Table N.1-29. Percent of months above the 59.9°F pathogen virulence water temperature threshold for steelhead kelt emigration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, February through June.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	9.1	4.5	4.5	4.5	4.5	4.5
W	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	5	9.1	13.6	9.1	4.5	4.5	4.5	4.5
W	6	100.0	95.5	100.0	100.0	100.0	100.0	100.0
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	8.3	0.0	0.0	0.0	0.0	0.0
AN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	5	75.0	91.7	25.0	41.7	41.7	41.7	41.7
AN	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	14.3	0.0	0.0	0.0	0.0	0.0
BN	4	0.0	28.6	7.1	21.4	21.4	21.4	21.4
BN	5	64.3	92.9	35.7	57.1	57.1	57.1	57.1
BN	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	3	0.0	35.3	29.4	23.5	23.5	23.5	23.5
D	4	47.1	76.5	70.6	70.6	70.6	70.6	70.6
D	5	94.1	100.0	100.0	100.0	100.0	100.0	100.0
D	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
C	2	0.0	3.0	3.0	3.0	3.0	3.0	3.0
C	3	24.2	72.7	60.6	51.5	51.5	51.5	51.5
C	4	90.9	100.0	93.9	93.9	93.9	93.9	93.9
C	5	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
All	2	0.0	1.0	1.0	1.0	1.0	1.0	1.0
All	3	8.2	35.7	26.5	22.4	22.4	22.4	22.4
All	4	38.8	51.0	44.9	46.9	46.9	46.9	46.9
All	5	70.4	78.6	61.2	65.3	65.3	65.3	65.3
All	6	100.0	99.0	100.0	100.0	100.0	100.0	100.0
W	All	21.8	23.6	22.7	21.8	21.8	21.8	21.8
AN	All	35.0	40.0	25.0	25.0	28.3	28.3	28.3
BN	All	32.9	47.1	28.6	31.4	35.7	35.7	35.7
D	All	48.2	62.4	60.0	47.1	58.8	58.8	58.8
C	All	63.0	75.2	71.5	63.6	69.7	69.7	69.7
All	All	43.5	53.1	46.7	42.0	47.1	47.1	47.1

Table N.1-30. Percent (difference in percent relative to NAA) of months above the 59.9°F pathogen virulence water temperature threshold for steelhead kelt emigration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, February through June.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	4.5	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	9.1	18.2 (9.1%)	4.5 (-4.5%)	4.5 (-4.5%)	4.5 (-4.5%)	4.5 (-4.5%)	4.5 (-4.5%)	4.5 (-4.5%)
W	6	100.0	86.4 (-13.6%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	63.6 (-36.4%)	100.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	16.7 (16.7%)	0.0 (0.0%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	25.0	25.0 (0.0%)	41.7 (16.7%)	41.7 (16.7%)	41.7 (16.7%)	41.7 (16.7%)	16.7 (-8.3%)	41.7 (16.7%)
AN	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	7.1 (7.1%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	7.1	14.3 (7.1%)	21.4 (14.3%)	21.4 (14.3%)	21.4 (14.3%)	21.4 (14.3%)	14.3 (7.1%)	21.4 (14.3%)
BN	5	35.7	35.7 (0.0%)	57.1 (21.4%)	57.1 (21.4%)	57.1 (21.4%)	57.1 (21.4%)	42.9 (7.1%)	57.1 (21.4%)
BN	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	29.4	23.5 (-5.9%)	23.5 (-5.9%)	23.5 (-5.9%)	23.5 (-5.9%)	23.5 (-5.9%)	11.8 (-17.6%)	23.5 (-5.9%)
D	4	70.6	41.2 (-29.4%)	70.6 (0.0%)	70.6 (0.0%)	70.6 (0.0%)	70.6 (0.0%)	29.4 (-41.2%)	70.6 (0.0%)
D	5	100.0	70.6 (-29.4%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	64.7 (-35.3%)	100.0 (0.0%)
D	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCPwoVA	Alt2woTUCPwoVA	Alt2woTUCPDeltaVA	Alt2woTUCPAllVA	Alt3	Alt4
C	2	3.0	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)
C	3	60.6	48.5 (-12.1%)	51.5 (-9.1%)	51.5 (-9.1%)	51.5 (-9.1%)	51.5 (-9.1%)	60.6 (0.0%)	51.5 (-9.1%)
C	4	93.9	69.7 (-24.2%)	93.9 (0.0%)	93.9 (0.0%)	93.9 (0.0%)	93.9 (0.0%)	93.9 (0.0%)	93.9 (0.0%)
C	5	100.0	97.0 (-3.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	97.0 (-3.0%)	100.0 (0.0%)
C	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	2	1.0	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
All	3	26.5	22.4 (-4.1%)	22.4 (-4.1%)	22.4 (-4.1%)	22.4 (-4.1%)	22.4 (-4.1%)	25.5 (-1.0%)	22.4 (-4.1%)
All	4	44.9	32.7 (-12.2%)	46.9 (2.0%)	46.9 (2.0%)	46.9 (2.0%)	46.9 (2.0%)	38.8 (-6.1%)	46.9 (2.0%)
All	5	61.2	57.1 (-4.1%)	65.3 (4.1%)	65.3 (4.1%)	65.3 (4.1%)	65.3 (4.1%)	53.1 (-8.2%)	65.3 (4.1%)
All	6	100.0	96.9 (-3.1%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	91.8 (-8.2%)	100.0 (0.0%)
W	All	22.7	21.8 (-0.9%)	21.8 (-0.9%)	21.8 (-0.9%)	21.8 (-0.9%)	21.8 (-0.9%)	14.5 (-8.2%)	21.8 (-0.9%)
AN	All	25.0	25.0 (0.0%)	28.3 (3.3%)	28.3 (3.3%)	28.3 (3.3%)	28.3 (3.3%)	26.7 (1.7%)	28.3 (3.3%)
BN	All	28.6	31.4 (2.9%)	35.7 (7.1%)	35.7 (7.1%)	35.7 (7.1%)	35.7 (7.1%)	31.4 (2.9%)	35.7 (7.1%)
D	All	60.0	47.1 (-12.9%)	58.8 (-1.2%)	58.8 (-1.2%)	58.8 (-1.2%)	58.8 (-1.2%)	41.2 (-18.8%)	58.8 (-1.2%)
C	All	71.5	63.6 (-7.9%)	69.7 (-1.8%)	69.7 (-1.8%)	69.7 (-1.8%)	69.7 (-1.8%)	70.9 (-0.6%)	69.7 (-1.8%)
All	All	46.7	42.0 (-4.7%)	47.1 (0.4%)	47.1 (0.4%)	47.1 (0.4%)	47.1 (0.4%)	42.0 (-4.7%)	47.1 (0.4%)

N.1.3.2.4 Egg Incubation and Fry Emergence

Water temperature-related effects on steelhead egg incubation and fry emergence in the Stanislaus River were evaluated by assessing: (1) the percent of months with water temperature outside the 45°F to 52°F range for optimal egg incubation (McCullough et al. 2001); (2) the percent of months with water temperatures above the 54°F index value for egg incubation (Appendix AB-N); and (3) the percent of months with water temperature above the 59.9°F pathogen virulence threshold (McCullough 1999) at Orange Blossom Bridge (Table N.1-1).

Results for the 45°F to 52°F optimal egg incubation range are presented in Table N.1-31 and Table N.1-32 for Orange Blossom Bridge.

- The highest percent of months outside the range was 100% and occurred in March through July in at least one water year type under the NAA, Alt 1, all four components of Alt 2, and Alt 4 and from May through July in at least one water year type under Alt 3 (Table N.1-31 and Table N.1-32). The lowest percent of months outside the range was 0% and occurred in at least one month and water year type combination under the NAA and all alternatives, particularly in December and January in above normal and below normal water years. Air temperatures drove the exceedance above the upper limit of the range in warmer months. In addition, lower flows during drier water year types increased water temperatures above the range.

Results for the 54°F egg incubation value are presented in Table N.1-33 and Table N.1-34.

- Above the confluence with the San Joaquin River, the highest percent of months above the value was 100% and occurred in May of dry and critical years under the NAA, Alt 1, all components of Alt 2, and Alt 4. The lowest percent of months exceeding the value was 0% and occurred in December through February of at least one water year type under the NAA and all alternatives. Combining water year types, the lowest percent of months exceeding the 54°F egg incubation value was during January and the highest percent of months exceeding the value was during May for the NAA and all alternatives. Air temperatures drove this temporal pattern. In addition, lower flows during drier water year types increased water temperatures above the value.

Results for the 59.9°F pathogen virulence water temperature threshold at Orange Blossom Bridge are presented in Table N.1-35 and Table N.1-36.

- The highest percent of months above the pathogen virulence threshold was 100% and occurred in July of most water year types under the NAA and all alternatives. The lowest percent of months exceeding the virulence threshold was 0% and occurred in December through May of most water year types under the NAA and all alternatives. Combining water year types, the lowest percent of months exceeding the virulence threshold was during December, January, and April for the NAA and all alternatives and the highest percent of months exceeding the virulence threshold was during July for the NAA and all alternatives. Air temperatures drove this temporal pattern. In addition, lower flows during drier water year types increased water temperatures above the virulence threshold.

Table N.1-31. Percent of months outside the 45°F to 52°F optimal egg incubation water temperature range steelhead by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, December through July.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCPwoVA	Alt2woTUCPwoVA	Alt2woTUCPDeltaVA	Alt2woTUCPAllVA
W	12	81.8	9.1	13.6	13.6	13.6	13.6	13.6
W	1	4.5	4.5	4.5	4.5	4.5	4.5	4.5
W	2	22.7	9.1	0.0	4.5	4.5	4.5	4.5
W	3	0.0	22.7	31.8	45.5	45.5	45.5	45.5
W	4	18.2	31.8	22.7	22.7	22.7	22.7	22.7
W	5	100.0	86.4	81.8	72.7	72.7	77.3	77.3
W	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
W	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
AN	12	41.7	0.0	0.0	8.3	8.3	8.3	8.3
AN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	2	0.0	8.3	8.3	8.3	8.3	8.3	8.3
AN	3	0.0	33.3	50.0	50.0	50.0	50.0	50.0
AN	4	66.7	50.0	41.7	50.0	50.0	50.0	50.0
AN	5	100.0	100.0	100.0	100.0	100.0	100.0	100.0
AN	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
AN	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BN	12	46.7	20.0	20.0	20.0	20.0	20.0	20.0
BN	1	0.0	7.1	0.0	0.0	0.0	0.0	0.0
BN	2	7.1	14.3	14.3	7.1	7.1	7.1	7.1
BN	3	7.1	57.1	57.1	57.1	64.3	64.3	64.3
BN	4	71.4	64.3	42.9	71.4	71.4	71.4	71.4
BN	5	100.0	100.0	100.0	100.0	100.0	100.0	100.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
BN	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BN	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	12	41.2	29.4	29.4	29.4	29.4	29.4	29.4
D	1	0.0	11.8	11.8	11.8	11.8	11.8	11.8
D	2	0.0	23.5	35.3	35.3	35.3	35.3	35.3
D	3	5.9	82.4	94.1	88.2	88.2	88.2	88.2
D	4	76.5	100.0	100.0	100.0	100.0	100.0	100.0
D	5	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C	12	50.0	37.5	40.6	43.8	43.8	43.8	43.8
C	1	3.0	9.1	9.1	9.1	9.1	9.1	9.1
C	2	6.1	45.5	45.5	33.3	33.3	33.3	33.3
C	3	45.5	100.0	100.0	100.0	100.0	100.0	100.0
C	4	97.0	100.0	100.0	100.0	100.0	100.0	100.0
C	5	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
All	12	54.1	22.4	24.5	26.5	26.5	26.5	26.5
All	1	2.0	7.1	6.1	6.1	6.1	6.1	6.1
All	2	8.2	24.5	24.5	20.4	20.4	20.4	20.4
All	3	17.3	65.3	71.4	73.5	74.5	74.5	74.5
All	4	68.4	73.5	67.3	72.4	72.4	72.4	72.4
All	5	100.0	96.9	95.9	93.9	93.9	94.9	94.9
All	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
All	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	All	53.4	45.5	44.3	47.7	45.5	45.5	46.0
AN	All	51.0	49.0	50.0	52.1	52.1	52.1	52.1
BN	All	54.0	57.5	54.0	54.9	56.6	57.5	57.5
D	All	52.9	68.4	71.3	68.4	70.6	70.6	70.6
C	All	62.7	74.1	74.5	74.5	73.4	73.4	73.4
All	All	56.3	61.2	61.2	61.9	61.6	61.7	61.9

Table N.1-32. Percent of months outside the 45°F to 52°F optimal egg incubation water temperature range steelhead (difference in percent of months between each alternative and NAA) by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, December through July.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	12	13.6	4.5 (-9.1%)	13.6 (0.0%)	13.6 (0.0%)	13.6 (0.0%)	13.6 (0.0%)	13.6 (0.0%)	13.6 (0.0%)
W	1	4.5	9.1 (4.5%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)
W	2	0.0	9.1 (9.1%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)
W	3	31.8	36.4 (4.5%)	45.5 (13.6%)	45.5 (13.6%)	45.5 (13.6%)	45.5 (13.6%)	9.1 (-22.7%)	45.5 (13.6%)
W	4	22.7	31.8 (9.1%)	22.7 (0.0%)	22.7 (0.0%)	22.7 (0.0%)	22.7 (0.0%)	13.6 (-9.1%)	22.7 (0.0%)
W	5	81.8	90.9 (9.1%)	72.7 (-9.1%)	72.7 (-9.1%)	77.3 (-4.5%)	77.3 (-4.5%)	72.7 (-9.1%)	72.7 (-9.1%)
W	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	12	0.0	8.3 (8.3%)	8.3 (8.3%)	8.3 (8.3%)	8.3 (8.3%)	8.3 (8.3%)	8.3 (8.3%)	8.3 (8.3%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	8.3	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)
AN	3	50.0	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	41.7 (-8.3%)	50.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
AN	4	41.7	50.0 (8.3%)	50.0 (8.3%)	50.0 (8.3%)	50.0 (8.3%)	50.0 (8.3%)	50.0 (8.3%)	50.0 (8.3%)
AN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	12	20.0	26.7 (6.7%)	20.0 (0.0%)	20.0 (0.0%)	20.0 (0.0%)	20.0 (0.0%)	20.0 (0.0%)	20.0 (0.0%)
BN	1	0.0	7.1 (7.1%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	14.3 (14.3%)	0.0 (0.0%)
BN	2	14.3	14.3 (0.0%)	7.1 (-7.1%)	7.1 (-7.1%)	7.1 (-7.1%)	7.1 (-7.1%)	7.1 (-7.1%)	7.1 (-7.1%)
BN	3	57.1	50.0 (-7.1%)	57.1 (0.0%)	64.3 (7.1%)	64.3 (7.1%)	64.3 (7.1%)	50.0 (-7.1%)	57.1 (0.0%)
BN	4	42.9	42.9 (0.0%)	71.4 (28.6%)	71.4 (28.6%)	71.4 (28.6%)	71.4 (28.6%)	57.1 (14.3%)	71.4 (28.6%)
BN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	12	29.4	29.4 (0.0%)	29.4 (0.0%)	29.4 (0.0%)	29.4 (0.0%)	29.4 (0.0%)	29.4 (0.0%)	29.4 (0.0%)
D	1	11.8	11.8 (0.0%)	11.8 (0.0%)	11.8 (0.0%)	11.8 (0.0%)	11.8 (0.0%)	11.8 (0.0%)	11.8 (0.0%)
D	2	35.3	29.4 (-5.9%)	35.3 (0.0%)	35.3 (0.0%)	35.3 (0.0%)	35.3 (0.0%)	17.6 (-17.6%)	35.3 (0.0%)
D	3	94.1	82.4 (-11.8%)	88.2 (-5.9%)	88.2 (-5.9%)	88.2 (-5.9%)	88.2 (-5.9%)	58.8 (-35.3%)	88.2 (-5.9%)
D	4	100.0	94.1 (-5.9%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	82.4 (-17.6%)	100.0 (0.0%)
D	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	12	40.6	40.6 (0.0%)	43.8 (3.1%)	43.8 (3.1%)	43.8 (3.1%)	43.8 (3.1%)	40.6 (0.0%)	43.8 (3.1%)
C	1	9.1	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)
C	2	45.5	45.5 (0.0%)	33.3 (-12.1%)	33.3 (-12.1%)	33.3 (-12.1%)	33.3 (-12.1%)	45.5 (0.0%)	33.3 (-12.1%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	97.0 (-3.0%)	100.0 (0.0%)
C	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	97.0 (-3.0%)	100.0 (0.0%)
C	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	12	24.5	24.5 (0.0%)	26.5 (2.0%)	26.5 (2.0%)	26.5 (2.0%)	26.5 (2.0%)	25.5 (1.0%)	26.5 (2.0%)
All	1	6.1	8.2 (2.0%)	6.1 (0.0%)	6.1 (0.0%)	6.1 (0.0%)	6.1 (0.0%)	8.2 (2.0%)	6.1 (0.0%)
All	2	24.5	25.5 (1.0%)	20.4 (-4.1%)	20.4 (-4.1%)	20.4 (-4.1%)	20.4 (-4.1%)	21.4 (-3.1%)	20.4 (-4.1%)
All	3	71.4	69.4 (-2.0%)	73.5 (2.0%)	74.5 (3.1%)	74.5 (3.1%)	74.5 (3.1%)	57.1 (-14.3%)	73.5 (2.0%)
All	4	67.3	69.4 (2.0%)	72.4 (5.1%)	72.4 (5.1%)	72.4 (5.1%)	72.4 (5.1%)	64.3 (-3.1%)	72.4 (5.1%)
All	5	95.9	98.0 (2.0%)	93.9 (-2.0%)	93.9 (-2.0%)	94.9 (-1.0%)	94.9 (-1.0%)	93.9 (-2.0%)	93.9 (-2.0%)
All	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	All	44.3	47.7 (3.4%)	45.5 (1.1%)	45.5 (1.1%)	46.0 (1.7%)	46.0 (1.7%)	39.8 (-4.5%)	45.5 (1.1%)
AN	All	50.0	52.1 (2.1%)	52.1 (2.1%)	52.1 (2.1%)	52.1 (2.1%)	52.1 (2.1%)	51.0 (1.0%)	52.1 (2.1%)
BN	All	54.0	54.9 (0.9%)	56.6 (2.7%)	57.5 (3.5%)	57.5 (3.5%)	57.5 (3.5%)	55.8 (1.8%)	56.6 (2.7%)
D	All	71.3	68.4 (-2.9%)	70.6 (-0.7%)	70.6 (-0.7%)	70.6 (-0.7%)	70.6 (-0.7%)	62.5 (-8.8%)	70.6 (-0.7%)
C	All	74.5	74.5 (0.0%)	73.4 (-1.1%)	73.4 (-1.1%)	73.4 (-1.1%)	73.4 (-1.1%)	73.8 (-0.8%)	73.4 (-1.1%)
All	All	61.2	61.9 (0.6%)	61.6 (0.4%)	61.7 (0.5%)	61.9 (0.6%)	61.9 (0.6%)	58.8 (-2.4%)	61.6 (0.4%)

Table N.1-33. Percent of months above the 54°F value for steelhead egg incubation by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, December through May.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCPwoVA	Alt2woTUCPwoVA	Alt2woTUCPDeltaVA	Alt2woTUCPAllVA
W	12	13.6	4.5	4.5	4.5	4.5	4.5	4.5
W	1	0.0	0.0	4.5	4.5	4.5	4.5	4.5
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	18.2	13.6	18.2	18.2	18.2	18.2
W	4	0.0	4.5	4.5	4.5	4.5	4.5	4.5
W	5	81.8	13.6	9.1	9.1	9.1	9.1	9.1
AN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	16.7	25.0	25.0	25.0	25.0	25.0
AN	4	16.7	0.0	0.0	8.3	8.3	8.3	8.3
AN	5	100.0	75.0	33.3	41.7	41.7	41.7	41.7
BN	12	13.3	6.7	6.7	6.7	6.7	6.7	6.7
BN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	35.7	28.6	28.6	35.7	35.7	35.7
BN	4	35.7	28.6	7.1	14.3	14.3	14.3	14.3
BN	5	100.0	64.3	21.4	35.7	35.7	35.7	35.7
D	12	0.0	11.8	11.8	11.8	11.8	11.8	11.8
D	1	0.0	5.9	0.0	5.9	5.9	5.9	5.9
D	2	0.0	5.9	5.9	5.9	5.9	5.9	5.9

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
D	3	0.0	70.6	64.7	58.8	58.8	58.8	58.8
D	4	47.1	82.4	58.8	76.5	76.5	76.5	76.5
D	5	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C	12	6.3	6.3	12.5	12.5	12.5	12.5	12.5
C	1	0.0	6.1	6.1	6.1	6.1	6.1	6.1
C	2	3.0	18.2	18.2	9.1	9.1	9.1	9.1
C	3	30.3	100.0	93.9	90.9	90.9	90.9	90.9
C	4	97.0	100.0	97.0	97.0	97.0	97.0	97.0
C	5	100.0	100.0	100.0	100.0	100.0	100.0	100.0
All	12	7.1	6.1	8.2	8.2	8.2	8.2	8.2
All	1	0.0	3.1	3.1	4.1	4.1	4.1	4.1
All	2	1.0	7.1	7.1	4.1	4.1	4.1	4.1
All	3	10.2	57.1	53.1	52.0	53.1	53.1	53.1
All	4	48.0	53.1	44.9	50.0	50.0	50.0	50.0
All	5	95.9	72.4	60.2	63.3	63.3	63.3	63.3
W	All	15.9	6.8	6.1	8.3	6.8	6.8	6.8
AN	All	19.4	15.3	9.7	8.3	12.5	12.5	12.5
BN	All	24.7	22.4	10.6	11.8	14.1	15.3	15.3
D	All	24.5	46.1	40.2	30.4	43.1	43.1	43.1
C	All	39.6	55.3	54.8	48.2	52.8	52.8	52.8

Table N.1-34. Percent (difference in percent relative to NAA) of months above the 54°F value for steelhead egg incubation by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, December through May.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	12	4.5	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)
W	1	4.5	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	13.6	18.2 (4.5%)	18.2 (4.5%)	18.2 (4.5%)	18.2 (4.5%)	18.2 (4.5%)	4.5 (-9.1%)	18.2 (4.5%)
W	4	4.5	9.1 (4.5%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)
W	5	9.1	13.6 (4.5%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	4.5 (-4.5%)	9.1 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	25.0	25.0 (0.0%)	25.0 (0.0%)	25.0 (0.0%)	25.0 (0.0%)	25.0 (0.0%)	25.0 (0.0%)	25.0 (0.0%)
AN	4	0.0	8.3 (8.3%)	8.3 (8.3%)	8.3 (8.3%)	8.3 (8.3%)	8.3 (8.3%)	0.0 (0.0%)	8.3 (8.3%)
AN	5	33.3	16.7 (-16.7%)	41.7 (8.3%)	41.7 (8.3%)	41.7 (8.3%)	41.7 (8.3%)	16.7 (-16.7%)	41.7 (8.3%)
BN	12	6.7	6.7 (0.0%)	6.7 (0.0%)	6.7 (0.0%)	6.7 (0.0%)	6.7 (0.0%)	6.7 (0.0%)	6.7 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	7.1 (7.1%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	28.6	14.3 (-14.3%)	28.6 (0.0%)	35.7 (7.1%)	35.7 (7.1%)	35.7 (7.1%)	7.1 (-21.4%)	28.6 (0.0%)
BN	4	7.1	7.1 (0.0%)	14.3 (7.1%)	14.3 (7.1%)	14.3 (7.1%)	14.3 (7.1%)	14.3 (7.1%)	14.3 (7.1%)
BN	5	21.4	35.7 (14.3%)	35.7 (14.3%)	35.7 (14.3%)	35.7 (14.3%)	35.7 (14.3%)	28.6 (7.1%)	35.7 (14.3%)
D	12	11.8	11.8 (0.0%)	11.8 (0.0%)	11.8 (0.0%)	11.8 (0.0%)	11.8 (0.0%)	11.8 (0.0%)	11.8 (0.0%)
D	1	0.0	5.9 (5.9%)	5.9 (5.9%)	5.9 (5.9%)	5.9 (5.9%)	5.9 (5.9%)	0.0 (0.0%)	5.9 (5.9%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	2	5.9	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)
D	3	64.7	47.1 (-17.6%)	58.8 (-5.9%)	58.8 (-5.9%)	58.8 (-5.9%)	58.8 (-5.9%)	35.3 (-29.4%)	58.8 (-5.9%)
D	4	58.8	41.2 (-17.6%)	76.5 (17.6%)	76.5 (17.6%)	76.5 (17.6%)	76.5 (17.6%)	29.4 (-29.4%)	76.5 (17.6%)
D	5	100.0	70.6 (-29.4%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	76.5 (-23.5%)	100.0 (0.0%)
C	12	12.5	6.3 (-6.3%)	12.5 (0.0%)	12.5 (0.0%)	12.5 (0.0%)	12.5 (0.0%)	6.3 (-6.3%)	12.5 (0.0%)
C	1	6.1	6.1 (0.0%)	6.1 (0.0%)	6.1 (0.0%)	6.1 (0.0%)	6.1 (0.0%)	6.1 (0.0%)	6.1 (0.0%)
C	2	18.2	15.2 (-3.0%)	9.1 (-9.1%)	9.1 (-9.1%)	9.1 (-9.1%)	9.1 (-9.1%)	15.2 (-3.0%)	9.1 (-9.1%)
C	3	93.9	90.9 (-3.0%)	90.9 (-3.0%)	90.9 (-3.0%)	90.9 (-3.0%)	90.9 (-3.0%)	90.9 (-3.0%)	90.9 (-3.0%)
C	4	97.0	69.7 (-27.3%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	93.9 (-3.0%)	97.0 (0.0%)
C	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	97.0 (-3.0%)	100.0 (0.0%)
All	12	8.2	6.1 (-2.0%)	8.2 (0.0%)	8.2 (0.0%)	8.2 (0.0%)	8.2 (0.0%)	6.1 (-2.0%)	8.2 (0.0%)
All	1	3.1	4.1 (1.0%)	4.1 (1.0%)	4.1 (1.0%)	4.1 (1.0%)	4.1 (1.0%)	3.1 (0.0%)	4.1 (1.0%)
All	2	7.1	7.1 (0.0%)	4.1 (-3.1%)	4.1 (-3.1%)	4.1 (-3.1%)	4.1 (-3.1%)	6.1 (-1.0%)	4.1 (-3.1%)
All	3	53.1	48.0 (-5.1%)	52.0 (-1.0%)	53.1 (0.0%)	53.1 (0.0%)	53.1 (0.0%)	41.8 (-11.2%)	52.0 (-1.0%)
All	4	44.9	34.7 (-10.2%)	50.0 (5.1%)	50.0 (5.1%)	50.0 (5.1%)	50.0 (5.1%)	39.8 (-5.1%)	50.0 (5.1%)
All	5	60.2	56.1 (-4.1%)	63.3 (3.1%)	63.3 (3.1%)	63.3 (3.1%)	63.3 (3.1%)	53.1 (-7.1%)	63.3 (3.1%)
W	All	6.1	8.3 (2.3%)	6.8 (0.8%)	6.8 (0.8%)	6.8 (0.8%)	6.8 (0.8%)	3.8 (-2.3%)	6.8 (0.8%)
AN	All	9.7	8.3 (-1.4%)	12.5 (2.8%)	12.5 (2.8%)	12.5 (2.8%)	12.5 (2.8%)	6.9 (-2.8%)	12.5 (2.8%)
BN	All	10.6	11.8 (1.2%)	14.1 (3.5%)	15.3 (4.7%)	15.3 (4.7%)	15.3 (4.7%)	9.4 (-1.2%)	14.1 (3.5%)
D	All	40.2	30.4 (-9.8%)	43.1 (2.9%)	43.1 (2.9%)	43.1 (2.9%)	43.1 (2.9%)	26.5 (-13.7%)	43.1 (2.9%)
C	All	54.8	48.2 (-6.6%)	52.8 (-2.0%)	52.8 (-2.0%)	52.8 (-2.0%)	52.8 (-2.0%)	51.8 (-3.0%)	52.8 (-2.0%)
All	All	29.4	26.0 (-3.4%)	30.3 (0.9%)	30.4 (1.0%)	30.4 (1.0%)	30.4 (1.0%)	25.0 (-4.4%)	30.3 (0.9%)

Table N.1-35. Percent of months above the 59.9°F pathogen virulence water temperature threshold for steelhead egg incubation and fry emergence by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, December through July.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	5	4.5	0.0	0.0	0.0	0.0	0.0	0.0
W	6	54.5	0.0	0.0	4.5	4.5	4.5	4.5
W	7	100.0	100.0	95.5	100.0	100.0	100.0	100.0
AN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	6	100.0	100.0	8.3	8.3	8.3	8.3	8.3
AN	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	5	14.3	0.0	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
BN	6	100.0	100.0	14.3	28.6	28.6	28.6	28.6
BN	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	3	0.0	5.9	0.0	0.0	0.0	0.0	0.0
D	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	5	58.8	11.8	0.0	0.0	0.0	0.0	0.0
D	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	3	3.0	12.1	3.0	3.0	3.0	3.0	3.0
C	4	51.5	6.1	0.0	0.0	0.0	0.0	0.0
C	5	87.9	93.9	9.1	9.1	9.1	9.1	9.1
C	6	100.0	97.0	100.0	93.9	90.9	90.9	90.9
C	7	100.0	100.0	100.0	93.9	90.9	90.9	90.9
All	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	3	1.0	5.1	1.0	1.0	1.0	1.0	1.0
All	4	17.3	2.0	0.0	0.0	0.0	0.0	0.0
All	5	42.9	33.7	3.1	3.1	3.1	3.1	3.1
All	6	89.8	76.5	54.1	55.1	54.1	54.1	54.1
All	7	100.0	100.0	99.0	98.0	96.9	96.9	96.9

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	All	19.9	12.5	11.9	11.9	13.1	13.1	13.1
AN	All	25.0	25.0	13.5	14.6	13.5	13.5	13.5
BN	All	26.5	24.8	14.2	16.8	15.9	15.9	15.9
D	All	32.4	27.2	25.0	21.3	25.0	25.0	25.0
C	All	43.0	38.8	26.6	25.5	25.1	24.3	24.3
All	All	31.4	27.2	19.6	19.1	19.6	19.4	19.4

Table N.1-36. Percent (difference in percent relative to NAA) of months above the 59.9°F pathogen virulence water temperature threshold for steelhead egg incubation and fry emergence by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, December through July.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	6	0.0	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	0.0 (0.0%)	4.5 (4.5%)
W	7	95.5	90.9 (-4.5%)	100.0 (4.5%)	100.0 (4.5%)	100.0 (4.5%)	100.0 (4.5%)	95.5 (0.0%)	100.0 (4.5%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	6	8.3	16.7 (8.3%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)
AN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	6	14.3	35.7 (21.4%)	28.6 (14.3%)	28.6 (14.3%)	28.6 (14.3%)	28.6 (14.3%)	21.4 (7.1%)	28.6 (14.3%)
BN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	5.9 (5.9%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	6	100.0	64.7 (-35.3%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	70.6 (-29.4%)	100.0 (0.0%)
D	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	2	0.0	3.0 (3.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	3	3.0	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)
C	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	9.1	6.1 (-3.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)
C	6	100.0	90.9 (-9.1%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	97.0 (-3.0%)	93.9 (-6.1%)
C	7	100.0	100.0 (0.0%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	100.0 (0.0%)	93.9 (-6.1%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	0.0	1.0 (1.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	1.0	2.0 (1.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
All	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	5	3.1	2.0 (-1.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)
All	6	54.1	50.0 (-4.1%)	55.1 (1.0%)	54.1 (0.0%)	54.1 (0.0%)	54.1 (0.0%)	49.0 (-5.1%)	55.1 (1.0%)
All	7	99.0	98.0 (-1.0%)	98.0 (-1.0%)	96.9 (-2.0%)	96.9 (-2.0%)	96.9 (-2.0%)	99.0 (0.0%)	98.0 (-1.0%)
W	All	11.9	11.9 (0.0%)	13.1 (1.1%)	13.1 (1.1%)	13.1 (1.1%)	13.1 (1.1%)	11.9 (0.0%)	13.1 (1.1%)
AN	All	13.5	14.6 (1.0%)	13.5 (0.0%)	13.5 (0.0%)	13.5 (0.0%)	13.5 (0.0%)	13.5 (0.0%)	13.5 (0.0%)
BN	All	14.2	16.8 (2.7%)	15.9 (1.8%)	15.9 (1.8%)	15.9 (1.8%)	15.9 (1.8%)	15.0 (0.9%)	15.9 (1.8%)
D	All	25.0	21.3 (-3.7%)	25.0 (0.0%)	25.0 (0.0%)	25.0 (0.0%)	25.0 (0.0%)	21.3 (-3.7%)	25.0 (0.0%)
C	All	26.6	25.5 (-1.1%)	25.1 (-1.5%)	24.3 (-2.3%)	24.3 (-2.3%)	24.3 (-2.3%)	26.2 (-0.4%)	25.1 (-1.5%)
All	All	19.6	19.1 (-0.5%)	19.6 (0.0%)	19.4 (-0.3%)	19.4 (-0.3%)	19.4 (-0.3%)	19.0 (-0.6%)	19.6 (0.0%)

N.1.3.2.5 Juvenile Rearing and Outmigration

Water temperature-related effects on juvenile steelhead rearing and outmigration in the Stanislaus River were evaluated by assessing: (1) the percent of months with water temperature above the 66.2°F upper limit of optimal growth without food limitation (Myrick 1998; Myrick and Cech 2001); (2) the percent of months with water temperature above the 59.9°F pathogen virulence threshold (McCullough 1999); (3) the percent of months with water temperatures above the 68°F index value for juvenile rearing (Appendix AB-N); and (4) the percent of months with water temperatures above the 55°F limit of successful smoltification at Orange Blossom Bridge and above the confluence with the San Joaquin River (Table N.1-1).

Results for the 66.2°F upper limit of optimal growth without food limitation for juvenile steelhead are presented in Table N.1-37 and Table N.1-38 for Orange Blossom Bridge and Table N.1-39 and Table N.1-40 for above the confluence.

- At Orange Blossom Bridge, the highest percent of months above the limit was 9.1% and occurred in July of critical water years under the NAA, Alt 1, and Alt 3 (Table N.1-37 and Table N.1-38). The lowest percent of months exceeding the limit was 0% and occurred in the majority of month and water year type combinations for the NAA and all alternatives. Combining water year types, the only month in which temperatures exceeded the limit were June through October, with a peak in July for the NAA and all alternatives. Air temperatures drove this temporal pattern. In addition, lower flows during drier water year types increased water temperatures above the limit more often than in wetter water year types.
- Above the confluence, the highest percent of months above the upper limit of optimal growth without food limitation for juvenile steelhead was 100% and occurred in June through September of most water year types under the NAA and all alternatives (Table N.1-39 and Table N.1-40). The lowest percent of months exceeding the limit was 0% and occurred in October through April of most water year types under the NAA and all alternatives. Combining water year types, the only months in which temperatures exceeded the limit were May through October, with a peak in July for the NAA and all alternatives. Air temperatures drove this temporal pattern. In addition, lower flows during drier water year types increased water temperatures above the upper limit more often than in wetter water year types.

Results for the 59.9°F pathogen virulence threshold for juvenile steelhead rearing and outmigration are presented in Table N.1-41 and Table N.1-42 for Orange Blossom Bridge and Table N.1-43 and Table N.1-44 for the confluence.

- At Orange Blossom Bridge, the highest percent of months above the virulence threshold was 100% and occurred in June through August of multiple water year types under the NAA and all alternatives (Table N.1-41 and Table N.1-42). The lowest percent of months exceeding the virulence threshold was 0% and occurred in October through May of most water year types under the NAA and all alternatives. Combining water year types, exceedances above the virulence threshold were at or near 0% between November and May for the NAA and all alternatives. Exceedance of the virulence threshold peaked in July for the NAA and all alternatives. Air temperatures drove this temporal pattern. In addition, lower flows during drier water year types increased water temperatures above the virulence threshold more often than in wetter water year types.

- Above the confluence, the highest percent of months above the 59.9°F pathogen virulence threshold for juvenile steelhead rearing and outmigration was 100% and occurred in May through October of at least one water year type under the NAA and all alternatives (Table N.1-43 and Table N.1-44). The lowest percent of months exceeding virulence threshold limit was 0% and occurred in November through April at least one water year type under the NAA and all alternatives. Combining water year types, exceedances above the virulence threshold were at or near 0% between December and February. Exceedance of the virulence threshold peaked in July and August for the NAA and all alternatives. Air temperatures drove this temporal pattern. In addition, lower flows during drier water year types increased water temperatures above the virulence threshold more often than in wetter water year types.

Results for the 68°F juvenile steelhead rearing index value are presented in Table N.1-45 and Table N.1-46 for Orange Blossom Bridge.

- The highest percent of months above the index value was 3.0% and occurred in August of critical water years under the NAA and all alternatives. The lowest percent of months exceeding the index value was 0% and occurred in the remainder of month and water year type combinations under the NAA and all alternatives. Combining water year types, exceedances above the index value were 0% for all months except August, in which the percent exceedance was 1.0%. Air temperatures drove this temporal pattern. In addition, lower flows during critical years increased water temperatures above the upper limit.

Results for the 55°F successful steelhead smoltification limit are presented in Table N.1-47 and Table N.1-48 for Orange Blossom Bridge and Table N.1-49 and Table N.1-50 for the confluence.

- At Orange Blossom Bridge, the highest percent of months above the limit was 100% and occurred in May of critical water years under the NAA, all components of Alt 2, and Alt 4 (Table N.1-47 and Table N.1-48). The lowest percent of months exceeding the limit was 0% and occurred in January through April in at least one water year type under the NAA and all alternatives except Alt 1, in which there were no 0% results in any water year type for March. Combining water year types, exceedances above the limit were lowest (1% to 2%) during January and highest during May (34.9% to 53.1%) for the NAA and all alternatives. Air temperatures drove this temporal pattern. In addition, lower flows during drier water year types increased water temperatures above the limit more often than in wetter water year types.
- At the confluence, the highest percent of months above the successful steelhead smoltification limit was 100% and occurred in March, April, and May of at least one water year type under the NAA and all alternatives (Table N.1-49 and Table N.1-50). The lowest percent of months exceeding the limit was 0% and occurred in January of above normal, below normal, and dry water years under the NAA and all alternatives. Combining water year types, exceedances above the limit were lowest (3%) during January and highest during March through May (100%) for the NAA and all alternatives. Air temperatures drove this temporal pattern. In addition, lower flows during drier water year types increased water temperatures above the limit more often than in wetter water year types.

Table N.1-37. Percent of months above the 66.2°F upper limit of optimal growth without food limitation for rearing steelhead juveniles by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, Year-round.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	6	9.1	0.0	0.0	0.0	0.0	0.0	0.0
W	7	90.9	95.5	0.0	0.0	0.0	0.0	0.0
W	8	100.0	4.5	0.0	0.0	0.0	0.0	0.0
W	9	100.0	0.0	0.0	0.0	0.0	0.0	0.0
W	10	31.8	0.0	0.0	0.0	0.0	0.0	0.0
W	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	6	75.0	75.0	0.0	0.0	0.0	0.0	0.0
AN	7	100.0	91.7	0.0	0.0	0.0	0.0	0.0
AN	8	100.0	8.3	0.0	0.0	0.0	0.0	0.0
AN	9	100.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	10	50.0	0.0	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
AN	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	5	7.1	0.0	0.0	0.0	0.0	0.0	0.0
BN	6	92.9	78.6	0.0	0.0	0.0	0.0	0.0
BN	7	100.0	78.6	0.0	7.1	7.1	7.1	7.1
BN	8	100.0	14.3	0.0	0.0	0.0	0.0	0.0
BN	9	100.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	10	28.6	0.0	0.0	0.0	0.0	0.0	0.0
BN	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	5	41.2	0.0	0.0	0.0	0.0	0.0	0.0
D	6	100.0	88.2	0.0	0.0	0.0	0.0	0.0
D	7	100.0	11.8	0.0	0.0	0.0	0.0	0.0
D	8	100.0	70.6	0.0	0.0	0.0	0.0	0.0
D	9	94.1	0.0	0.0	0.0	0.0	0.0	0.0
D	10	52.9	0.0	0.0	0.0	0.0	0.0	0.0
D	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
C	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	4	12.1	0.0	0.0	0.0	0.0	0.0	0.0
C	5	66.7	6.1	0.0	0.0	0.0	0.0	0.0
C	6	81.8	21.2	3.0	3.0	3.0	3.0	3.0
C	7	97.0	3.0	9.1	6.1	6.1	6.1	6.1
C	8	100.0	75.8	3.0	6.1	6.1	6.1	6.1
C	9	87.9	24.2	3.0	6.1	6.1	6.1	3.0
C	10	68.8	0.0	3.1	3.1	3.1	3.1	3.1
C	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	4	4.1	0.0	0.0	0.0	0.0	0.0	0.0
All	5	30.6	2.0	0.0	0.0	0.0	0.0	0.0
All	6	69.4	42.9	1.0	1.0	1.0	1.0	1.0
All	7	96.9	46.9	3.1	3.1	3.1	3.1	3.1
All	8	100.0	41.8	1.0	2.0	2.0	2.0	2.0
All	9	94.9	8.2	1.0	2.0	2.0	2.0	1.0
All	10	49.5	0.0	1.0	1.0	1.0	1.0	1.0
All	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	All	27.7	8.3	0.0	0.0	0.0	0.0	0.0
AN	All	35.4	14.6	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
BN	All	35.3	14.1	0.0	0.6	0.6	0.6	0.6
D	All	40.7	14.2	0.0	0.0	0.0	0.0	0.0
C	All	43.0	10.9	1.8	1.0	2.0	2.0	2.0
All	All	37.1	11.8	0.6	0.4	0.8	0.8	0.8

Table N.1-38. Percent (difference in percent relative to NAA) of months above the 66.2°F upper limit of optimal growth without food limitation for rearing steelhead juveniles by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, Year-round.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	7	0.0	7.1 (7.1%)	7.1 (7.1%)	7.1 (7.1%)	7.1 (7.1%)	7.1 (7.1%)	7.1 (7.1%)	7.1 (7.1%)
BN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	6	3.0	0.0 (-3.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)
C	7	9.1	9.1 (0.0%)	6.1 (-3.0%)	6.1 (-3.0%)	6.1 (-3.0%)	6.1 (-3.0%)	9.1 (0.0%)	6.1 (-3.0%)
C	8	3.0	3.0 (0.0%)	6.1 (3.0%)	6.1 (3.0%)	6.1 (3.0%)	6.1 (3.0%)	3.0 (0.0%)	6.1 (3.0%)
C	9	3.0	0.0 (-3.0%)	6.1 (3.0%)	6.1 (3.0%)	6.1 (3.0%)	3.0 (0.0%)	0.0 (-3.0%)	6.1 (3.0%)
C	10	3.1	0.0 (-3.1%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	0.0 (-3.1%)	3.1 (0.0%)
C	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	6	1.0	0.0 (-1.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
All	7	3.1	4.1 (1.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	4.1 (1.0%)	3.1 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
All	8	1.0	1.0 (0.0%)	2.0 (1.0%)	2.0 (1.0%)	2.0 (1.0%)	2.0 (1.0%)	1.0 (0.0%)	2.0 (1.0%)
All	9	1.0	0.0 (-1.0%)	2.0 (1.0%)	2.0 (1.0%)	2.0 (1.0%)	1.0 (0.0%)	0.0 (-1.0%)	2.0 (1.0%)
All	10	1.0	0.0 (-1.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	0.0 (-1.0%)	1.0 (0.0%)
All	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	All	0.0	0.6 (0.6%)	0.6 (0.6%)	0.6 (0.6%)	0.6 (0.6%)	0.6 (0.6%)	0.6 (0.6%)	0.6 (0.6%)
D	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	All	1.8	1.0 (-0.8%)	2.0 (0.3%)	2.0 (0.3%)	2.0 (0.3%)	1.8 (0.0%)	1.3 (-0.5%)	2.0 (0.3%)
All	All	0.6	0.4 (-0.2%)	0.8 (0.2%)	0.8 (0.2%)	0.8 (0.2%)	0.7 (0.1%)	0.5 (-0.1%)	0.8 (0.2%)

Table N.1-39. Percent of months above the 66.2°F upper limit of optimal growth without food limitation for rearing steelhead juveniles by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above the confluence with the San Joaquin River, Year-round.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	5	4.5	0.0	0.0	0.0	0.0	0.0	0.0
W	6	36.4	36.4	4.5	22.7	22.7	22.7	22.7
W	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
W	8	100.0	45.5	77.3	72.7	72.7	72.7	72.7

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	9	100.0	18.2	40.9	40.9	40.9	40.9	40.9
W	10	54.5	0.0	0.0	0.0	0.0	0.0	0.0
W	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	6	83.3	100.0	91.7	91.7	91.7	91.7	91.7
AN	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
AN	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
AN	9	100.0	75.0	100.0	91.7	91.7	91.7	91.7
AN	10	50.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	5	14.3	0.0	0.0	0.0	0.0	0.0	0.0
BN	6	92.9	100.0	92.9	100.0	100.0	100.0	100.0
BN	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BN	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BN	9	100.0	78.6	100.0	100.0	100.0	100.0	100.0
BN	10	50.0	0.0	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
BN	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	4	0.0	5.9	0.0	0.0	0.0	0.0	0.0
D	5	58.8	70.6	0.0	23.5	23.5	23.5	23.5
D	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	9	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	10	35.3	5.9	0.0	0.0	0.0	0.0	0.0
D	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	4	24.2	33.3	0.0	0.0	0.0	0.0	0.0
C	5	87.9	93.9	33.3	36.4	36.4	36.4	36.4
C	6	100.0	100.0	100.0	100.0	97.0	97.0	97.0
C	7	100.0	100.0	100.0	97.0	93.9	93.9	93.9
C	8	100.0	100.0	100.0	97.0	93.9	93.9	93.9
C	9	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C	10	56.3	15.6	6.3	6.3	6.3	6.3	6.3
C	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
All	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	4	8.2	12.2	0.0	0.0	0.0	0.0	0.0
All	5	42.9	43.9	11.2	16.3	16.3	16.3	16.3
All	6	82.7	85.7	76.5	81.6	80.6	80.6	80.6
All	7	100.0	100.0	100.0	99.0	98.0	98.0	98.0
All	8	100.0	87.8	94.9	92.9	91.8	91.8	91.8
All	9	100.0	75.5	86.7	85.7	85.7	85.7	85.7
All	10	50.5	6.2	2.1	2.1	2.1	2.1	2.1
All	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	All	33.0	16.7	18.6	20.1	19.7	19.7	19.7
AN	All	36.1	31.3	32.6	29.2	31.9	31.9	31.9
BN	All	37.6	31.2	32.4	29.4	32.9	32.9	32.9
D	All	41.2	40.2	33.3	33.3	35.3	35.3	35.3
C	All	47.6	45.5	36.9	37.4	36.6	35.9	35.9
All	All	40.3	34.3	31.0	30.6	31.5	31.2	31.2

Table N.1-40. Percent (difference in percent relative to NAA) of months above the 66.2°F upper limit of optimal growth without food limitation for rearing steelhead juveniles by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, Year-round.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	6	4.5	13.6 (9.1%)	22.7 (18.2%)	22.7 (18.2%)	22.7 (18.2%)	22.7 (18.2%)	9.1 (4.5%)	22.7 (18.2%)
W	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	8	77.3	81.8 (4.5%)	72.7 (-4.5%)	72.7 (-4.5%)	72.7 (-4.5%)	72.7 (-4.5%)	86.4 (9.1%)	72.7 (-4.5%)
W	9	40.9	40.9 (0.0%)	40.9 (0.0%)	40.9 (0.0%)	40.9 (0.0%)	40.9 (0.0%)	54.5 (13.6%)	40.9 (0.0%)
W	10	0.0	4.5 (4.5%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	6	91.7	41.7 (-50.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	75.0 (-16.7%)	91.7 (0.0%)
AN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	9	100.0	100.0 (0.0%)	91.7 (-8.3%)	91.7 (-8.3%)	91.7 (-8.3%)	91.7 (-8.3%)	100.0 (0.0%)	91.7 (-8.3%)
AN	10	0.0	8.3 (8.3%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	6	92.9	50.0 (-42.9%)	100.0 (7.1%)	100.0 (7.1%)	100.0 (7.1%)	100.0 (7.1%)	85.7 (-7.1%)	100.0 (7.1%)
BN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	10	0.0	7.1 (7.1%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	5.9 (5.9%)	23.5 (23.5%)	23.5 (23.5%)	23.5 (23.5%)	23.5 (23.5%)	17.6 (17.6%)	23.5 (23.5%)
D	6	100.0	82.4 (-17.6%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	94.1 (-5.9%)	100.0 (0.0%)
D	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	10	0.0	11.8 (11.8%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	33.3	24.2 (-9.1%)	36.4 (3.0%)	36.4 (3.0%)	36.4 (3.0%)	36.4 (3.0%)	36.4 (3.0%)	36.4 (3.0%)
C	6	100.0	100.0 (0.0%)	100.0 (0.0%)	97.0 (-3.0%)	97.0 (-3.0%)	97.0 (-3.0%)	97.0 (-3.0%)	100.0 (0.0%)
C	7	100.0	100.0 (0.0%)	97.0 (-3.0%)	93.9 (-6.1%)	93.9 (-6.1%)	93.9 (-6.1%)	100.0 (0.0%)	97.0 (-3.0%)
C	8	100.0	100.0 (0.0%)	97.0 (-3.0%)	93.9 (-6.1%)	93.9 (-6.1%)	93.9 (-6.1%)	100.0 (0.0%)	97.0 (-3.0%)
C	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	10	6.3	21.9 (15.6%)	6.3 (0.0%)	6.3 (0.0%)	6.3 (0.0%)	6.3 (0.0%)	3.1 (-3.1%)	6.3 (0.0%)
C	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	5	11.2	9.2 (-2.0%)	16.3 (5.1%)	16.3 (5.1%)	16.3 (5.1%)	16.3 (5.1%)	15.3 (4.1%)	16.3 (5.1%)
All	6	76.5	63.3 (-13.3%)	81.6 (5.1%)	80.6 (4.1%)	80.6 (4.1%)	80.6 (4.1%)	72.4 (-4.1%)	81.6 (5.1%)
All	7	100.0	100.0 (0.0%)	99.0 (-1.0%)	98.0 (-2.0%)	98.0 (-2.0%)	98.0 (-2.0%)	100.0 (0.0%)	99.0 (-1.0%)
All	8	94.9	95.9 (1.0%)	92.9 (-2.0%)	91.8 (-3.1%)	91.8 (-3.1%)	91.8 (-3.1%)	96.9 (2.0%)	92.9 (-2.0%)
All	9	86.7	86.7 (0.0%)	85.7 (-1.0%)	85.7 (-1.0%)	85.7 (-1.0%)	85.7 (-1.0%)	89.8 (3.1%)	85.7 (-1.0%)
All	10	2.1	12.4 (10.3%)	2.1 (0.0%)	2.1 (0.0%)	2.1 (0.0%)	2.1 (0.0%)	1.0 (-1.0%)	2.1 (0.0%)
All	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	18.6	20.1 (1.5%)	19.7 (1.1%)	19.7 (1.1%)	19.7 (1.1%)	19.7 (1.1%)	20.8 (2.3%)	19.7 (1.1%)
AN	All	32.6	29.2 (-3.5%)	31.9 (-0.7%)	31.9 (-0.7%)	31.9 (-0.7%)	31.9 (-0.7%)	31.3 (-1.4%)	31.9 (-0.7%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
BN	All	32.4	29.4 (-2.9%)	32.9 (0.6%)	32.9 (0.6%)	32.9 (0.6%)	32.9 (0.6%)	31.8 (-0.6%)	32.9 (0.6%)
D	All	33.3	33.3 (0.0%)	35.3 (2.0%)	35.3 (2.0%)	35.3 (2.0%)	35.3 (2.0%)	34.3 (1.0%)	35.3 (2.0%)
C	All	36.9	37.4 (0.5%)	36.6 (-0.3%)	35.9 (-1.0%)	35.9 (-1.0%)	35.9 (-1.0%)	36.6 (-0.3%)	36.6 (-0.3%)
All	All	31.0	30.6 (-0.3%)	31.5 (0.5%)	31.2 (0.3%)	31.2 (0.3%)	31.2 (0.3%)	31.3 (0.3%)	31.5 (0.5%)

Table N.1-41. Percent of months above the 59.9°F pathogen virulence water temperature threshold for juvenile steelhead rearing and outmigration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, Year-round.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	5	4.5	0.0	0.0	0.0	0.0	0.0	0.0
W	6	54.5	0.0	0.0	4.5	4.5	4.5	4.5
W	7	100.0	100.0	95.5	100.0	100.0	100.0	100.0
W	8	100.0	31.8	54.5	50.0	50.0	50.0	50.0
W	9	100.0	18.2	4.5	9.1	9.1	9.1	9.1
W	10	100.0	0.0	0.0	0.0	0.0	0.0	0.0
W	11	13.6	0.0	0.0	0.0	0.0	0.0	0.0
W	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
AN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	6	100.0	100.0	8.3	8.3	8.3	8.3	8.3
AN	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
AN	8	100.0	91.7	100.0	100.0	100.0	100.0	100.0
AN	9	100.0	50.0	66.7	66.7	66.7	66.7	66.7
AN	10	100.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	5	14.3	0.0	0.0	0.0	0.0	0.0	0.0
BN	6	100.0	100.0	14.3	28.6	28.6	28.6	28.6
BN	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BN	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BN	9	100.0	71.4	50.0	50.0	50.0	50.0	50.0
BN	10	100.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	11	13.3	0.0	0.0	0.0	0.0	0.0	0.0
BN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	3	0.0	5.9	0.0	0.0	0.0	0.0	0.0
D	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	5	58.8	11.8	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
D	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	9	100.0	94.1	82.4	82.4	82.4	82.4	82.4
D	10	100.0	0.0	0.0	0.0	0.0	0.0	0.0
D	11	5.9	0.0	0.0	0.0	0.0	0.0	0.0
D	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	3	3.0	12.1	3.0	3.0	3.0	3.0	3.0
C	4	51.5	6.1	0.0	0.0	0.0	0.0	0.0
C	5	87.9	93.9	9.1	9.1	9.1	9.1	9.1
C	6	100.0	97.0	100.0	93.9	90.9	90.9	90.9
C	7	100.0	100.0	100.0	93.9	90.9	90.9	90.9
C	8	100.0	100.0	100.0	93.9	90.9	90.9	90.9
C	9	100.0	100.0	97.0	97.0	97.0	97.0	97.0
C	10	100.0	3.1	9.4	9.4	9.4	9.4	9.4
C	11	28.1	0.0	3.1	3.1	3.1	3.1	3.1
C	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	3	1.0	5.1	1.0	1.0	1.0	1.0	1.0
All	4	17.3	2.0	0.0	0.0	0.0	0.0	0.0
All	5	42.9	33.7	3.1	3.1	3.1	3.1	3.1
All	6	89.8	76.5	54.1	55.1	54.1	54.1	54.1
All	7	100.0	100.0	99.0	98.0	96.9	96.9	96.9

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
All	8	100.0	83.7	89.8	86.7	85.7	85.7	85.7
All	9	100.0	70.4	63.3	64.3	64.3	64.3	64.3
All	10	100.0	1.0	3.1	3.1	3.1	3.1	3.1
All	11	15.3	0.0	1.0	1.0	1.0	1.0	1.0
All	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	All	39.4	12.5	12.9	14.4	13.6	13.6	13.6
AN	All	41.7	28.5	22.9	22.2	22.9	22.9	22.9
BN	All	43.5	30.6	21.8	25.9	22.9	22.9	22.9
D	All	47.1	34.3	31.9	30.4	31.9	31.9	31.9
C	All	56.0	43.0	35.4	37.7	33.8	33.1	33.1
All	All	47.1	31.1	26.2	27.6	26.0	25.8	25.8

Table N.1-42. Percent (difference in percent relative to NAA) of months above the 59.9°F pathogen virulence water temperature threshold for juvenile steelhead rearing and outmigration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, Year-round.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	6	0.0	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	0.0 (0.0%)	4.5 (4.5%)
W	7	95.5	90.9 (-4.5%)	100.0 (4.5%)	100.0 (4.5%)	100.0 (4.5%)	100.0 (4.5%)	95.5 (0.0%)	100.0 (4.5%)
W	8	54.5	59.1 (4.5%)	50.0 (-4.5%)	50.0 (-4.5%)	50.0 (-4.5%)	50.0 (-4.5%)	72.7 (18.2%)	50.0 (-4.5%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	9	4.5	9.1 (4.5%)	9.1 (4.5%)	9.1 (4.5%)	9.1 (4.5%)	9.1 (4.5%)	9.1 (4.5%)	9.1 (4.5%)
W	10	0.0	9.1 (9.1%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	6	8.3	16.7 (8.3%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)
AN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	9	66.7	41.7 (-25.0%)	66.7 (0.0%)	66.7 (0.0%)	66.7 (0.0%)	66.7 (0.0%)	66.7 (0.0%)	66.7 (0.0%)
AN	10	0.0	8.3 (8.3%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	6	14.3	35.7 (21.4%)	28.6 (14.3%)	28.6 (14.3%)	28.6 (14.3%)	28.6 (14.3%)	21.4 (7.1%)	28.6 (14.3%)
BN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	9	50.0	64.3 (14.3%)	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	64.3 (14.3%)	50.0 (0.0%)
BN	10	0.0	14.3 (14.3%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	5.9 (5.9%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	6	100.0	64.7 (-35.3%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	70.6 (-29.4%)	100.0 (0.0%)
D	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	9	82.4	76.5 (-5.9%)	82.4 (0.0%)	82.4 (0.0%)	82.4 (0.0%)	82.4 (0.0%)	94.1 (11.8%)	82.4 (0.0%)
D	10	0.0	17.6 (17.6%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	2	0.0	3.0 (3.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	3.0	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)
C	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	9.1	6.1 (-3.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)
C	6	100.0	90.9 (-9.1%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	97.0 (-3.0%)	93.9 (-6.1%)
C	7	100.0	100.0 (0.0%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	100.0 (0.0%)	93.9 (-6.1%)
C	8	100.0	100.0 (0.0%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	100.0 (0.0%)	93.9 (-6.1%)
C	9	97.0	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	100.0 (3.0%)	97.0 (0.0%)
C	10	9.4	50.0 (40.6%)	9.4 (0.0%)	9.4 (0.0%)	9.4 (0.0%)	9.4 (0.0%)	6.3 (-3.1%)	9.4 (0.0%)
C	11	3.1	0.0 (-3.1%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	0.0 (-3.1%)	3.1 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	0.0	1.0 (1.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	1.0	2.0 (1.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
All	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	5	3.1	2.0 (-1.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)
All	6	54.1	50.0 (-4.1%)	55.1 (1.0%)	54.1 (0.0%)	54.1 (0.0%)	54.1 (0.0%)	49.0 (-5.1%)	55.1 (1.0%)
All	7	99.0	98.0 (-1.0%)	98.0 (-1.0%)	96.9 (-2.0%)	96.9 (-2.0%)	96.9 (-2.0%)	99.0 (0.0%)	98.0 (-1.0%)
All	8	89.8	90.8 (1.0%)	86.7 (-3.1%)	85.7 (-4.1%)	85.7 (-4.1%)	85.7 (-4.1%)	93.9 (4.1%)	86.7 (-3.1%)
All	9	63.3	62.2 (-1.0%)	64.3 (1.0%)	64.3 (1.0%)	64.3 (1.0%)	64.3 (1.0%)	69.4 (6.1%)	64.3 (1.0%)
All	10	3.1	24.7 (21.6%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	2.1 (-1.0%)	3.1 (0.0%)
All	11	1.0	0.0 (-1.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	0.0 (-1.0%)	1.0 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	12.9	14.4 (1.5%)	13.6 (0.8%)	13.6 (0.8%)	13.6 (0.8%)	13.6 (0.8%)	14.8 (1.9%)	13.6 (0.8%)
AN	All	22.9	22.2 (-0.7%)	22.9 (0.0%)	22.9 (0.0%)	22.9 (0.0%)	22.9 (0.0%)	22.9 (0.0%)	22.9 (0.0%)
BN	All	21.8	25.9 (4.1%)	22.9 (1.2%)	22.9 (1.2%)	22.9 (1.2%)	22.9 (1.2%)	23.5 (1.8%)	22.9 (1.2%)
D	All	31.9	30.4 (-1.5%)	31.9 (0.0%)	31.9 (0.0%)	31.9 (0.0%)	31.9 (0.0%)	30.4 (-1.5%)	31.9 (0.0%)
C	All	35.4	37.7 (2.3%)	33.8 (-1.5%)	33.1 (-2.3%)	33.1 (-2.3%)	33.1 (-2.3%)	34.9 (-0.5%)	33.8 (-1.5%)
All	All	26.2	27.6 (1.4%)	26.0 (-0.2%)	25.8 (-0.4%)	25.8 (-0.4%)	25.8 (-0.4%)	26.5 (0.3%)	26.0 (-0.2%)

Table N.1-43. Percent of months above the 59.9°F pathogen virulence water temperature threshold for juvenile steelhead rearing and outmigration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above the confluence with the San Joaquin River, Year-round.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	9.1	4.5	4.5	4.5	4.5	4.5
W	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	5	9.1	13.6	9.1	4.5	4.5	4.5	4.5
W	6	100.0	95.5	100.0	100.0	100.0	100.0	100.0
W	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
W	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
W	9	100.0	59.1	90.9	90.9	90.9	90.9	90.9
W	10	100.0	18.2	18.2	22.7	22.7	22.7	22.7
W	11	18.2	0.0	0.0	0.0	0.0	0.0	0.0
W	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	8.3	0.0	0.0	0.0	0.0	0.0
AN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	5	75.0	91.7	25.0	41.7	41.7	41.7	41.7
AN	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
AN	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
AN	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
AN	9	100.0	91.7	100.0	100.0	100.0	100.0	100.0
AN	10	100.0	50.0	50.0	58.3	58.3	58.3	58.3

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
AN	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	14.3	0.0	0.0	0.0	0.0	0.0
BN	4	0.0	28.6	7.1	21.4	21.4	21.4	21.4
BN	5	64.3	92.9	35.7	57.1	57.1	57.1	57.1
BN	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BN	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BN	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BN	9	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BN	10	100.0	78.6	50.0	50.0	50.0	50.0	50.0
BN	11	6.7	0.0	0.0	0.0	0.0	0.0	0.0
BN	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	3	0.0	35.3	29.4	23.5	23.5	23.5	23.5
D	4	47.1	76.5	70.6	70.6	70.6	70.6	70.6
D	5	94.1	100.0	100.0	100.0	100.0	100.0	100.0
D	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	9	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	10	100.0	94.1	82.4	88.2	88.2	88.2	88.2
D	11	17.6	11.8	5.9	5.9	5.9	5.9	5.9
D	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
C	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	2	0.0	3.0	3.0	3.0	3.0	3.0	3.0
C	3	24.2	72.7	60.6	51.5	51.5	51.5	51.5
C	4	90.9	100.0	93.9	93.9	93.9	93.9	93.9
C	5	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C	6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C	9	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C	10	100.0	100.0	100.0	100.0	96.9	96.9	96.9
C	11	6.3	3.1	6.3	6.3	6.3	6.3	6.3
C	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All	2	0.0	1.0	1.0	1.0	1.0	1.0	1.0
All	3	8.2	35.7	26.5	22.4	22.4	22.4	22.4
All	4	38.8	51.0	44.9	46.9	46.9	46.9	46.9
All	5	70.4	78.6	61.2	65.3	65.3	65.3	65.3
All	6	100.0	99.0	100.0	100.0	100.0	100.0	100.0
All	7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
All	8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
All	9	100.0	89.8	98.0	98.0	98.0	98.0	98.0
All	10	100.0	71.1	64.9	68.0	67.0	67.0	67.0
All	11	10.2	3.1	3.1	3.1	3.1	3.1	3.1
All	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	All	43.9	33.0	35.2	37.1	35.2	35.2	35.2
AN	All	47.9	45.1	39.6	43.8	41.7	41.7	41.7

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
BN	All	47.1	50.6	40.6	45.9	43.5	43.5	43.5
D	All	54.9	59.8	57.4	53.9	57.4	57.4	57.4
C	All	60.3	65.1	63.9	60.3	63.1	62.8	62.8
All	All	52.3	52.4	50.0	49.9	50.4	50.3	50.3

Table N.1-44. Percent (difference in percent relative to NAA) of months above the 59.9°F pathogen virulence water temperature threshold for juvenile steelhead rearing and outmigration by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above the confluence with the San Joaquin River, Year-round.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	4.5	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	9.1	18.2 (9.1%)	4.5 (-4.5%)	4.5 (-4.5%)	4.5 (-4.5%)	4.5 (-4.5%)	4.5 (-4.5%)	4.5 (-4.5%)
W	6	100.0	86.4 (-13.6%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	63.6 (-36.4%)	100.0 (0.0%)
W	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	9	90.9	86.4 (-4.5%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)
W	10	18.2	50.0 (31.8%)	22.7 (4.5%)	22.7 (4.5%)	22.7 (4.5%)	22.7 (4.5%)	31.8 (13.6%)	22.7 (4.5%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	16.7 (16.7%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	25.0	25.0 (0.0%)	41.7 (16.7%)	41.7 (16.7%)	41.7 (16.7%)	41.7 (16.7%)	16.7 (-8.3%)	41.7 (16.7%)
AN	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	10	50.0	100.0 (50.0%)	58.3 (8.3%)	58.3 (8.3%)	58.3 (8.3%)	58.3 (8.3%)	58.3 (8.3%)	58.3 (8.3%)
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	7.1 (7.1%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	7.1	14.3 (7.1%)	21.4 (14.3%)	21.4 (14.3%)	21.4 (14.3%)	21.4 (14.3%)	14.3 (7.1%)	21.4 (14.3%)
BN	5	35.7	35.7 (0.0%)	57.1 (21.4%)	57.1 (21.4%)	57.1 (21.4%)	57.1 (21.4%)	42.9 (7.1%)	57.1 (21.4%)
BN	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	10	50.0	100.0 (50.0%)	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	64.3 (14.3%)	50.0 (0.0%)
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	29.4	23.5 (-5.9%)	23.5 (-5.9%)	23.5 (-5.9%)	23.5 (-5.9%)	23.5 (-5.9%)	11.8 (-17.6%)	23.5 (-5.9%)
D	4	70.6	41.2 (-29.4%)	70.6 (0.0%)	70.6 (0.0%)	70.6 (0.0%)	70.6 (0.0%)	29.4 (-41.2%)	70.6 (0.0%)
D	5	100.0	70.6 (-29.4%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	64.7 (-35.3%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	10	82.4	100.0 (17.6%)	88.2 (5.9%)	88.2 (5.9%)	88.2 (5.9%)	88.2 (5.9%)	82.4 (0.0%)	88.2 (5.9%)
D	11	5.9	11.8 (5.9%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	2	3.0	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)
C	3	60.6	48.5 (-12.1%)	51.5 (-9.1%)	51.5 (-9.1%)	51.5 (-9.1%)	51.5 (-9.1%)	60.6 (0.0%)	51.5 (-9.1%)
C	4	93.9	69.7 (-24.2%)	93.9 (0.0%)	93.9 (0.0%)	93.9 (0.0%)	93.9 (0.0%)	93.9 (0.0%)	93.9 (0.0%)
C	5	100.0	97.0 (-3.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	97.0 (-3.0%)	100.0 (0.0%)
C	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	10	100.0	100.0 (0.0%)	100.0 (0.0%)	96.9 (-3.1%)	96.9 (-3.1%)	96.9 (-3.1%)	100.0 (0.0%)	100.0 (0.0%)
C	11	6.3	3.1 (-3.1%)	6.3 (0.0%)	6.3 (0.0%)	6.3 (0.0%)	6.3 (0.0%)	3.1 (-3.1%)	6.3 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	1.0	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
All	3	26.5	22.4 (-4.1%)	22.4 (-4.1%)	22.4 (-4.1%)	22.4 (-4.1%)	22.4 (-4.1%)	25.5 (-1.0%)	22.4 (-4.1%)
All	4	44.9	32.7 (-12.2%)	46.9 (2.0%)	46.9 (2.0%)	46.9 (2.0%)	46.9 (2.0%)	38.8 (-6.1%)	46.9 (2.0%)
All	5	61.2	57.1 (-4.1%)	65.3 (4.1%)	65.3 (4.1%)	65.3 (4.1%)	65.3 (4.1%)	53.1 (-8.2%)	65.3 (4.1%)
All	6	100.0	96.9 (-3.1%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	91.8 (-8.2%)	100.0 (0.0%)
All	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
All	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	9	98.0	96.9 (-1.0%)	98.0 (0.0%)	98.0 (0.0%)	98.0 (0.0%)	98.0 (0.0%)	98.0 (0.0%)	98.0 (0.0%)
All	10	64.9	88.7 (23.7%)	68.0 (3.1%)	67.0 (2.1%)	67.0 (2.1%)	67.0 (2.1%)	71.1 (6.2%)	68.0 (3.1%)
All	11	3.1	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	2.0 (-1.0%)	3.1 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	35.2	37.1 (1.9%)	35.2 (0.0%)	35.2 (0.0%)	35.2 (0.0%)	35.2 (0.0%)	33.0 (-2.3%)	35.2 (0.0%)
AN	All	39.6	43.8 (4.2%)	41.7 (2.1%)	41.7 (2.1%)	41.7 (2.1%)	41.7 (2.1%)	41.0 (1.4%)	41.7 (2.1%)
BN	All	40.6	45.9 (5.3%)	43.5 (2.9%)	43.5 (2.9%)	43.5 (2.9%)	43.5 (2.9%)	42.9 (2.4%)	43.5 (2.9%)
D	All	57.4	53.9 (-3.4%)	57.4 (0.0%)	57.4 (0.0%)	57.4 (0.0%)	57.4 (0.0%)	49.5 (-7.8%)	57.4 (0.0%)
C	All	63.9	60.3 (-3.6%)	63.1 (-0.8%)	62.8 (-1.0%)	62.8 (-1.0%)	62.8 (-1.0%)	63.4 (-0.5%)	63.1 (-0.8%)
All	All	50.0	49.9 (-0.1%)	50.4 (0.4%)	50.3 (0.3%)	50.3 (0.3%)	50.3 (0.3%)	48.4 (-1.5%)	50.4 (0.4%)

Table N.1-45. Percent of months above the 68°F juvenile steelhead rearing index value by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, May through October.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	6	9.1	0.0	0.0	0.0	0.0	0.0	0.0
W	7	90.9	95.5	0.0	0.0	0.0	0.0	0.0
W	8	95.5	0.0	0.0	0.0	0.0	0.0	0.0
W	9	95.5	0.0	0.0	0.0	0.0	0.0	0.0
W	10	13.6	0.0	0.0	0.0	0.0	0.0	0.0
AN	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	6	75.0	50.0	0.0	0.0	0.0	0.0	0.0
AN	7	100.0	66.7	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
AN	8	100.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	9	100.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	5	7.1	0.0	0.0	0.0	0.0	0.0	0.0
BN	6	85.7	64.3	0.0	0.0	0.0	0.0	0.0
BN	7	92.9	71.4	0.0	0.0	0.0	0.0	0.0
BN	8	92.9	0.0	0.0	0.0	0.0	0.0	0.0
BN	9	92.9	0.0	0.0	0.0	0.0	0.0	0.0
BN	10	7.1	0.0	0.0	0.0	0.0	0.0	0.0
D	5	41.2	0.0	0.0	0.0	0.0	0.0	0.0
D	6	88.2	76.5	0.0	0.0	0.0	0.0	0.0
D	7	100.0	5.9	0.0	0.0	0.0	0.0	0.0
D	8	88.2	5.9	0.0	0.0	0.0	0.0	0.0
D	9	88.2	0.0	0.0	0.0	0.0	0.0	0.0
D	10	17.6	0.0	0.0	0.0	0.0	0.0	0.0
C	5	51.5	0.0	0.0	0.0	0.0	0.0	0.0
C	6	69.7	12.1	0.0	0.0	0.0	0.0	0.0
C	7	84.8	0.0	0.0	0.0	0.0	0.0	0.0
C	8	75.8	9.1	3.0	3.0	3.0	3.0	3.0
C	9	63.6	3.0	0.0	0.0	0.0	0.0	0.0
C	10	15.6	0.0	0.0	0.0	0.0	0.0	0.0
All	5	25.5	0.0	0.0	0.0	0.0	0.0	0.0
All	6	62.2	32.7	0.0	0.0	0.0	0.0	0.0
All	7	91.8	40.8	0.0	0.0	0.0	0.0	0.0
All	8	87.8	4.1	1.0	1.0	1.0	1.0	1.0
All	9	83.7	1.0	0.0	0.0	0.0	0.0	0.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
All	10	12.4	0.0	0.0	0.0	0.0	0.0	0.0
W	All	50.8	15.9	0.0	0.0	0.0	0.0	0.0
AN	All	62.5	19.4	0.0	0.0	0.0	0.0	0.0
BN	All	63.1	22.6	0.0	0.0	0.0	0.0	0.0
D	All	70.6	14.7	0.0	0.0	0.0	0.0	0.0
C	All	60.4	4.1	0.5	0.5	0.5	0.5	0.5
All	All	60.6	13.1	0.2	0.2	0.2	0.2	0.2

Table N.1-46. Percent (difference in percent relative to NAA) of months above the 68°F juvenile steelhead rearing index value by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, Year-round.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	8	3.0	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)
C	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	8	1.0	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
All	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
BN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	All	0.5	0.5 (0.0%)	0.5 (0.0%)	0.5 (0.0%)	0.5 (0.0%)	0.5 (0.0%)	0.5 (0.0%)	0.5 (0.0%)
All	All	0.2	0.2 (0.0%)	0.2 (0.0%)	0.2 (0.0%)	0.2 (0.0%)	0.2 (0.0%)	0.2 (0.0%)	0.2 (0.0%)

Table N.1-47. Percent of months above the 55°F successful smoltification water temperature limit for steelhead by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, January through May.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	3	0.0	18.2	13.6	13.6	9.1	13.6	13.6
W	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	5	40.9	4.5	4.5	4.5	4.5	4.5	4.5
AN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	3	0.0	8.3	16.7	8.3	8.3	8.3	8.3
AN	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	5	91.7	16.7	0.0	0.0	0.0	0.0	0.0
BN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	3	0.0	35.7	0.0	0.0	0.0	0.0	0.0
BN	4	0.0	14.3	7.1	14.3	14.3	14.3	14.3

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
BN	5	92.9	21.4	14.3	14.3	14.3	14.3	14.3
D	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	2	0.0	5.9	5.9	0.0	0.0	0.0	0.0
D	3	0.0	58.8	47.1	47.1	47.1	47.1	47.1
D	4	29.4	70.6	41.2	64.7	64.7	64.7	64.7
D	5	94.1	100.0	88.2	94.1	94.1	94.1	94.1
C	1	0.0	3.0	3.0	6.1	6.1	6.1	6.1
C	2	3.0	6.1	6.1	9.1	9.1	9.1	9.1
C	3	24.2	90.9	69.7	69.7	69.7	69.7	69.7
C	4	87.9	97.0	78.8	81.8	81.8	81.8	81.8
C	5	100.0	100.0	100.0	100.0	100.0	100.0	100.0
All	1	0.0	1.0	1.0	2.0	2.0	2.0	2.0
All	2	1.0	3.1	3.1	3.1	3.1	3.1	3.1
All	3	8.2	51.0	36.7	35.7	34.7	35.7	35.7
All	4	34.7	46.9	34.7	40.8	40.8	40.8	40.8
All	5	83.7	57.1	52.0	53.1	53.1	53.1	53.1
W	All	8.2	4.5	3.6	5.5	3.6	2.7	3.6
AN	All	18.3	5.0	3.3	1.7	1.7	1.7	1.7
BN	All	18.6	14.3	4.3	8.6	5.7	5.7	5.7
D	All	24.7	47.1	36.5	18.8	41.2	41.2	41.2
C	All	43.0	59.4	51.5	41.2	53.3	53.3	53.3
All	All	25.5	31.8	25.5	19.8	26.9	26.7	26.9

Table N.1-48. Percent (difference in percent relative to NAA) of months above the 55°F successful smoltification water temperature limit for steelhead by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, January through May.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	13.6	13.6 (0.0%)	13.6 (0.0%)	9.1 (-4.5%)	13.6 (0.0%)	13.6 (0.0%)	4.5 (-9.1%)	9.1 (-4.5%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	4.5	13.6 (9.1%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	16.7	8.3 (-8.3%)	8.3 (-8.3%)	8.3 (-8.3%)	8.3 (-8.3%)	8.3 (-8.3%)	16.7 (0.0%)	8.3 (-8.3%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	7.1 (7.1%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	7.1	7.1 (0.0%)	14.3 (7.1%)	14.3 (7.1%)	14.3 (7.1%)	14.3 (7.1%)	7.1 (0.0%)	14.3 (7.1%)
BN	5	14.3	28.6 (14.3%)	14.3 (0.0%)	14.3 (0.0%)	14.3 (0.0%)	14.3 (0.0%)	14.3 (0.0%)	14.3 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	5.9	5.9 (0.0%)	0.0 (-5.9%)	0.0 (-5.9%)	0.0 (-5.9%)	0.0 (-5.9%)	5.9 (0.0%)	0.0 (-5.9%)
D	3	47.1	29.4 (-17.6%)	47.1 (0.0%)	47.1 (0.0%)	47.1 (0.0%)	47.1 (0.0%)	23.5 (-23.5%)	47.1 (0.0%)
D	4	41.2	11.8 (-29.4%)	64.7 (23.5%)	64.7 (23.5%)	64.7 (23.5%)	64.7 (23.5%)	29.4 (-11.8%)	64.7 (23.5%)
D	5	88.2	47.1 (-41.2%)	94.1 (5.9%)	94.1 (5.9%)	94.1 (5.9%)	94.1 (5.9%)	52.9 (-35.3%)	94.1 (5.9%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	1	3.0	3.0 (0.0%)	6.1 (3.0%)	6.1 (3.0%)	6.1 (3.0%)	6.1 (3.0%)	3.0 (0.0%)	6.1 (3.0%)
C	2	6.1	9.1 (3.0%)	9.1 (3.0%)	9.1 (3.0%)	9.1 (3.0%)	9.1 (3.0%)	6.1 (0.0%)	9.1 (3.0%)
C	3	69.7	60.6 (-9.1%)	69.7 (0.0%)	69.7 (0.0%)	69.7 (0.0%)	69.7 (0.0%)	66.7 (-3.0%)	69.7 (0.0%)
C	4	78.8	48.5 (-30.3%)	81.8 (3.0%)	81.8 (3.0%)	81.8 (3.0%)	81.8 (3.0%)	84.8 (6.1%)	81.8 (3.0%)
C	5	100.0	84.8 (-15.2%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	93.9 (-6.1%)	100.0 (0.0%)
All	1	1.0	1.0 (0.0%)	2.0 (1.0%)	2.0 (1.0%)	2.0 (1.0%)	2.0 (1.0%)	1.0 (0.0%)	2.0 (1.0%)
All	2	3.1	4.1 (1.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)
All	3	36.7	30.6 (-6.1%)	35.7 (-1.0%)	34.7 (-2.0%)	35.7 (-1.0%)	35.7 (-1.0%)	29.6 (-7.1%)	34.7 (-2.0%)
All	4	34.7	19.4 (-15.3%)	40.8 (6.1%)	40.8 (6.1%)	40.8 (6.1%)	40.8 (6.1%)	34.7 (0.0%)	40.8 (6.1%)
All	5	52.0	43.9 (-8.2%)	53.1 (1.0%)	53.1 (1.0%)	53.1 (1.0%)	53.1 (1.0%)	43.9 (-8.2%)	53.1 (1.0%)
W	All	3.6	5.5 (1.8%)	3.6 (0.0%)	2.7 (-0.9%)	3.6 (0.0%)	3.6 (0.0%)	1.8 (-1.8%)	2.7 (-0.9%)
AN	All	3.3	1.7 (-1.7%)	1.7 (-1.7%)	1.7 (-1.7%)	1.7 (-1.7%)	1.7 (-1.7%)	3.3 (0.0%)	1.7 (-1.7%)
BN	All	4.3	8.6 (4.3%)	5.7 (1.4%)	5.7 (1.4%)	5.7 (1.4%)	5.7 (1.4%)	4.3 (0.0%)	5.7 (1.4%)
D	All	36.5	18.8 (-17.6%)	41.2 (4.7%)	41.2 (4.7%)	41.2 (4.7%)	41.2 (4.7%)	22.4 (-14.1%)	41.2 (4.7%)
C	All	51.5	41.2 (-10.3%)	53.3 (1.8%)	53.3 (1.8%)	53.3 (1.8%)	53.3 (1.8%)	50.9 (-0.6%)	53.3 (1.8%)
All	All	25.5	19.8 (-5.7%)	26.9 (1.4%)	26.7 (1.2%)	26.9 (1.4%)	26.9 (1.4%)	22.4 (-3.1%)	26.7 (1.2%)

Table N.1-49. Percent of months above the 55°F successful smoltification water temperature limit for steelhead by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, January through May.

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
W	1	0.0	0.0	4.5	4.5	4.5	4.5	4.5
W	2	0.0	4.5	4.5	0.0	0.0	0.0	0.0
W	3	0.0	18.2	36.4	40.9	40.9	40.9	40.9
W	4	22.7	72.7	72.7	68.2	68.2	68.2	68.2
W	5	100.0	90.9	95.5	95.5	95.5	95.5	95.5
AN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	2	0.0	8.3	8.3	8.3	8.3	8.3	8.3
AN	3	0.0	41.7	50.0	50.0	50.0	50.0	50.0
AN	4	58.3	91.7	83.3	83.3	83.3	83.3	83.3
AN	5	100.0	100.0	100.0	100.0	100.0	100.0	100.0
BN	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	2	0.0	14.3	14.3	7.1	7.1	7.1	7.1
BN	3	7.1	57.1	64.3	64.3	71.4	71.4	71.4
BN	4	78.6	100.0	92.9	92.9	92.9	92.9	92.9
BN	5	100.0	100.0	100.0	100.0	100.0	100.0	100.0
D	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	2	0.0	17.6	17.6	11.8	11.8	11.8	11.8
D	3	23.5	94.1	94.1	94.1	94.1	94.1	94.1
D	4	88.2	100.0	100.0	100.0	100.0	100.0	100.0
D	5	100.0	100.0	100.0	100.0	100.0	100.0	100.0

WYT	Month	EXP1	EXP3	NAA	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA
C	1	0.0	3.0	3.0	3.0	3.0	3.0	3.0
C	2	15.2	33.3	30.3	21.2	21.2	21.2	21.2
C	3	84.8	100.0	100.0	100.0	100.0	100.0	100.0
C	4	100.0	100.0	100.0	100.0	100.0	100.0	100.0
C	5	100.0	100.0	100.0	100.0	100.0	100.0	100.0
All	1	0.0	1.0	2.0	2.0	2.0	2.0	2.0
All	2	5.1	18.4	17.3	11.2	11.2	11.2	11.2
All	3	33.7	67.3	73.5	74.5	75.5	75.5	75.5
All	4	72.4	92.9	90.8	89.8	89.8	89.8	89.8
All	5	100.0	98.0	99.0	99.0	99.0	99.0	99.0
W	All	24.5	37.3	42.7	43.6	41.8	41.8	41.8
AN	All	31.7	48.3	48.3	48.3	48.3	48.3	48.3
BN	All	37.1	54.3	54.3	57.1	52.9	54.3	54.3
D	All	42.4	62.4	62.4	60.0	61.2	61.2	61.2
C	All	60.0	67.3	66.7	66.1	64.8	64.8	64.8
All	All	42.2	55.5	56.5	56.5	55.3	55.5	55.5

Table N.1-50. Percent (difference in percent relative to NAA) of months above the 55°F successful smoltification water temperature limit for steelhead by water year type (San Joaquin Valley Index) and month, and for all years combined, Stanislaus River above the confluence with the San Joaquin River, January through May.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	1	4.5	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)
W	2	4.5	4.5 (0.0%)	0.0 (-4.5%)	0.0 (-4.5%)	0.0 (-4.5%)	0.0 (-4.5%)	4.5 (0.0%)	0.0 (-4.5%)
W	3	36.4	45.5 (9.1%)	40.9 (4.5%)	40.9 (4.5%)	40.9 (4.5%)	40.9 (4.5%)	9.1 (-27.3%)	40.9 (4.5%)
W	4	72.7	68.2 (-4.5%)	68.2 (-4.5%)	68.2 (-4.5%)	68.2 (-4.5%)	68.2 (-4.5%)	27.3 (-45.5%)	68.2 (-4.5%)
W	5	95.5	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	8.3	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)
AN	3	50.0	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)
AN	4	83.3	83.3 (0.0%)	83.3 (0.0%)	83.3 (0.0%)	83.3 (0.0%)	83.3 (0.0%)	58.3 (-25.0%)	83.3 (0.0%)
AN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	14.3	14.3 (0.0%)	7.1 (-7.1%)	7.1 (-7.1%)	7.1 (-7.1%)	7.1 (-7.1%)	7.1 (-7.1%)	7.1 (-7.1%)
BN	3	64.3	71.4 (7.1%)	64.3 (0.0%)	71.4 (7.1%)	71.4 (7.1%)	71.4 (7.1%)	57.1 (-7.1%)	64.3 (0.0%)
BN	4	92.9	100.0 (7.1%)	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)	85.7 (-7.1%)	92.9 (0.0%)
BN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	17.6	5.9 (-11.8%)	11.8 (-5.9%)	11.8 (-5.9%)	11.8 (-5.9%)	11.8 (-5.9%)	11.8 (-5.9%)	11.8 (-5.9%)
D	3	94.1	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	58.8 (-35.3%)	94.1 (0.0%)
D	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	88.2 (-11.8%)	100.0 (0.0%)
D	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	1	3.0	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)
C	2	30.3	27.3 (-3.0%)	21.2 (-9.1%)	21.2 (-9.1%)	21.2 (-9.1%)	21.2 (-9.1%)	30.3 (0.0%)	21.2 (-9.1%)
C	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	1	2.0	2.0 (0.0%)	2.0 (0.0%)	2.0 (0.0%)	2.0 (0.0%)	2.0 (0.0%)	2.0 (0.0%)	2.0 (0.0%)
All	2	17.3	14.3 (-3.1%)	11.2 (-6.1%)	11.2 (-6.1%)	11.2 (-6.1%)	11.2 (-6.1%)	15.3 (-2.0%)	11.2 (-6.1%)
All	3	73.5	76.5 (3.1%)	74.5 (1.0%)	75.5 (2.0%)	75.5 (2.0%)	75.5 (2.0%)	60.2 (-13.3%)	74.5 (1.0%)
All	4	90.8	90.8 (0.0%)	89.8 (-1.0%)	89.8 (-1.0%)	89.8 (-1.0%)	89.8 (-1.0%)	74.5 (-16.3%)	89.8 (-1.0%)
All	5	99.0	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)
W	All	42.7	43.6 (0.9%)	41.8 (-0.9%)	41.8 (-0.9%)	41.8 (-0.9%)	41.8 (-0.9%)	28.2 (-14.5%)	41.8 (-0.9%)
AN	All	48.3	48.3 (0.0%)	48.3 (0.0%)	48.3 (0.0%)	48.3 (0.0%)	48.3 (0.0%)	43.3 (-5.0%)	48.3 (0.0%)
BN	All	54.3	57.1 (2.9%)	52.9 (-1.4%)	54.3 (0.0%)	54.3 (0.0%)	54.3 (0.0%)	50.0 (-4.3%)	52.9 (-1.4%)
D	All	62.4	60.0 (-2.4%)	61.2 (-1.2%)	61.2 (-1.2%)	61.2 (-1.2%)	61.2 (-1.2%)	51.8 (-10.6%)	61.2 (-1.2%)
C	All	66.7	66.1 (-0.6%)	64.8 (-1.8%)	64.8 (-1.8%)	64.8 (-1.8%)	64.8 (-1.8%)	66.7 (0.0%)	64.8 (-1.8%)
All	All	56.5	56.5 (0.0%)	55.3 (-1.2%)	55.5 (-1.0%)	55.5 (-1.0%)	55.5 (-1.0%)	50.2 (-6.3%)	55.3 (-1.2%)

N.1.3.3 Fall-Run Chinook Salmon

N.1.3.3.1 Adult Migration

Water temperature-related effects on adult fall-run Chinook salmon migration in the Stanislaus River were evaluated by assessing: (1) the percent of months with water temperature outside the 37.9°F to 68.0°F successful migration upper limit (Reiser and Bjornn 1979, Goniea et al. 2006); and (2) the percent of months with water temperature above the 59.9°F pathogen virulence threshold (McCullough 1999) at Orange Blossom Bridge and above the confluence with the San Joaquin River (Table N.1-2).

Results for the 37.9°F to 68°F water temperature range for successful migration of adult fall-run Chinook salmon are presented in Table N.1-51 for Orange Blossom Bridge, and Table N.1-52 for above confluence with the San Joaquin River.

- At Orange Blossom Bridge, the highest percent of months outside the range was 3% and occurred during August of a critical water year type under the NAA and all alternatives (Table N.1-51). The lowest percent of months outside the range was 0% and occurred during all other months, except August of critical water year type, under the NAA and all project alternatives. Combining water year types, the highest percentage of months outside the range occurred in August, in all other months the percentage was 0% under the NAA and all project alternatives.
- Above the confluence of the San Joaquin River, the highest percent of months outside the range was 100% and occurred during July and August in at least one water year type under the NAA and all alternatives (Table N.1-52). The lowest percentage of months outside the range was 0% and occurred October through December under most water year types under the NAA and all alternatives. Combining water year types, the highest percentage of months outside the range occurred during July and the lowest percentage was during November and December under the NAA and all project alternatives.

At Orange Blossom Bridge, the highest percentage of months above the threshold was 100% and occurred during July and August in at least one water year type under the NAA and all alternatives (Table N.1-53). The lowest percentage of months exceeding the threshold was 0% and occurred in November and December under most water type years under the NAA and all alternatives. Combining water type years, the highest percentage of months above the limit was in July and lowest was in December under the NAA and all alternatives.

Above the confluence with the San Joaquin River, the highest percent of months above the threshold was 100% and occurred during July and August in at least one water year type under the NAA and all alternatives (Table N.1-54). The lowest percentage of months above the threshold was 0% and occurred during November and December in at least one water year type under the NAA and all alternatives. Combining water year types, the highest percentage of months above the limit was in July and August and the lowest percentage occurred in December under the NAA and all alternatives.

Table N.1-51. Percent (difference in percent relative to NAA) of months outside the 37.9°F to 68°F water temperature range for successful migration upper limit of adult fall-run Chinook salmon by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, July through December.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2wo TUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2wo TUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	8	3.0	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)
C	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	8	1.0	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
All	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	All	0.5	0.5 (0.0%)	0.5 (0.0%)	0.5 (0.0%)	0.5 (0.0%)	0.5 (0.0%)	0.5 (0.0%)	0.5 (0.0%)
All	All	0.2	0.2 (0.0%)	0.2 (0.0%)	0.2 (0.0%)	0.2 (0.0%)	0.2 (0.0%)	0.2 (0.0%)	0.2 (0.0%)

Table N.1-52. Percent (difference in percent relative to NAA) of months outside the 37.9°F to 68°F water temperature range for successful migration upper limit of adult fall-run Chinook salmon by water year type and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, July through December.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	95.5 (-4.5%)	100.0 (0.0%)
W	8	72.7	77.3 (4.5%)	68.2 (-4.5%)	68.2 (-4.5%)	68.2 (-4.5%)	68.2 (-4.5%)	86.4 (13.6%)	68.2 (-4.5%)
W	9	18.2	18.2 (0.0%)	22.7 (4.5%)	22.7 (4.5%)	22.7 (4.5%)	22.7 (4.5%)	36.4 (18.2%)	22.7 (4.5%)
W	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	9	91.7	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)
AN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	9	94.1	88.2 (-5.9%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)
D	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	7	100.0	100.0 (0.0%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	100.0 (0.0%)	93.9 (-6.1%)
C	8	100.0	100.0 (0.0%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	100.0 (0.0%)	93.9 (-6.1%)
C	9	100.0	93.9 (-6.1%)	100.0 (0.0%)	97.0 (-3.0%)	97.0 (-3.0%)	97.0 (-3.0%)	100.0 (0.0%)	100.0 (0.0%)
C	10	0.0	6.3 (6.3%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	7	100.0	100.0 (0.0%)	98.0 (-2.0%)	96.9 (-3.1%)	96.9 (-3.1%)	96.9 (-3.1%)	99.0 (-1.0%)	98.0 (-2.0%)
All	8	93.9	94.9 (1.0%)	90.8 (-3.1%)	89.8 (-4.1%)	89.8 (-4.1%)	89.8 (-4.1%)	96.9 (3.1%)	90.8 (-3.1%)
All	9	79.6	76.5 (-3.1%)	80.6 (1.0%)	79.6 (0.0%)	79.6 (0.0%)	79.6 (0.0%)	83.7 (4.1%)	80.6 (1.0%)
All	10	0.0	2.1 (2.1%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	31.8	32.6 (0.8%)	31.8 (0.0%)	31.8 (0.0%)	31.8 (0.0%)	31.8 (0.0%)	36.4 (4.5%)	31.8 (0.0%)
AN	All	48.6	48.6 (0.0%)	48.6 (0.0%)	48.6 (0.0%)	48.6 (0.0%)	48.6 (0.0%)	48.6 (0.0%)	48.6 (0.0%)
BN	All	48.8	48.8 (0.0%)	48.8 (0.0%)	48.8 (0.0%)	48.8 (0.0%)	48.8 (0.0%)	48.8 (0.0%)	48.8 (0.0%)
D	All	49.0	48.0 (-1.0%)	49.0 (0.0%)	49.0 (0.0%)	49.0 (0.0%)	49.0 (0.0%)	49.0 (0.0%)	49.0 (0.0%)
C	All	50.8	50.8 (0.0%)	48.7 (-2.1%)	47.2 (-3.6%)	47.2 (-3.6%)	47.2 (-3.6%)	50.8 (0.0%)	48.7 (-2.1%)
All	All	45.7	45.7 (0.0%)	45.0 (-0.7%)	44.5 (-1.2%)	44.5 (-1.2%)	44.5 (-1.2%)	46.7 (1.0%)	45.0 (-0.7%)

Table N.1-53. Percent (difference in percent relative to NAA) of months above the 59.9°F pathogen virulence water temperature threshold for adult fall-run Chinook salmon migration by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, July through December.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	7	95.5	90.9 (-4.5%)	100.0 (4.5%)	100.0 (4.5%)	100.0 (4.5%)	100.0 (4.5%)	95.5 (0.0%)	100.0 (4.5%)
W	8	54.5	59.1 (4.5%)	50.0 (-4.5%)	50.0 (-4.5%)	50.0 (-4.5%)	50.0 (-4.5%)	72.7 (18.2%)	50.0 (-4.5%)
W	9	4.5	9.1 (4.5%)	9.1 (4.5%)	9.1 (4.5%)	9.1 (4.5%)	9.1 (4.5%)	9.1 (4.5%)	9.1 (4.5%)
W	10	0.0	9.1 (9.1%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	9	66.7	41.7 (-25.0%)	66.7 (0.0%)	66.7 (0.0%)	66.7 (0.0%)	66.7 (0.0%)	66.7 (0.0%)	66.7 (0.0%)
AN	10	0.0	8.3 (8.3%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	9	50.0	64.3 (14.3%)	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	64.3 (14.3%)	50.0 (0.0%)
BN	10	0.0	14.3 (14.3%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	9	82.4	76.5 (-5.9%)	82.4 (0.0%)	82.4 (0.0%)	82.4 (0.0%)	82.4 (0.0%)	94.1 (11.8%)	82.4 (0.0%)
D	10	0.0	17.6 (17.6%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	7	100.0	100.0 (0.0%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	100.0 (0.0%)	93.9 (-6.1%)
C	8	100.0	100.0 (0.0%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	100.0 (0.0%)	93.9 (-6.1%)
C	9	97.0	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	100.0 (3.0%)	97.0 (0.0%)
C	10	9.4	50.0 (40.6%)	9.4 (0.0%)	9.4 (0.0%)	9.4 (0.0%)	9.4 (0.0%)	6.3 (-3.1%)	9.4 (0.0%)
C	11	3.1	0.0 (-3.1%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	0.0 (-3.1%)	3.1 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	7	99.0	98.0 (-1.0%)	98.0 (-1.0%)	96.9 (-2.0%)	96.9 (-2.0%)	96.9 (-2.0%)	99.0 (0.0%)	98.0 (-1.0%)
All	8	89.8	90.8 (1.0%)	86.7 (-3.1%)	85.7 (-4.1%)	85.7 (-4.1%)	85.7 (-4.1%)	93.9 (4.1%)	86.7 (-3.1%)
All	9	63.3	62.2 (-1.0%)	64.3 (1.0%)	64.3 (1.0%)	64.3 (1.0%)	64.3 (1.0%)	69.4 (6.1%)	64.3 (1.0%)
All	10	3.1	24.7 (21.6%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	2.1 (-1.0%)	3.1 (0.0%)
All	11	1.0	0.0 (-1.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	0.0 (-1.0%)	1.0 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	25.8	28.0 (2.3%)	26.5 (0.8%)	26.5 (0.8%)	26.5 (0.8%)	26.5 (0.8%)	29.5 (3.8%)	26.5 (0.8%)
AN	All	44.4	41.7 (-2.8%)	44.4 (0.0%)	44.4 (0.0%)	44.4 (0.0%)	44.4 (0.0%)	44.4 (0.0%)	44.4 (0.0%)
BN	All	40.7	45.3 (4.7%)	40.7 (0.0%)	40.7 (0.0%)	40.7 (0.0%)	40.7 (0.0%)	43.0 (2.3%)	40.7 (0.0%)
D	All	47.1	49.0 (2.0%)	47.1 (0.0%)	47.1 (0.0%)	47.1 (0.0%)	47.1 (0.0%)	49.0 (2.0%)	47.1 (0.0%)
C	All	52.3	58.5 (6.2%)	50.3 (-2.1%)	49.2 (-3.1%)	49.2 (-3.1%)	49.2 (-3.1%)	51.8 (-0.5%)	50.3 (-2.1%)
All	All	42.8	46.0 (3.2%)	42.2 (-0.5%)	41.9 (-0.9%)	41.9 (-0.9%)	41.9 (-0.9%)	44.1 (1.4%)	42.2 (-0.5%)

Table N.1-54. Percent (difference in percent relative to NAA) of months above the 59.9°F pathogen virulence water temperature threshold for adult fall-run Chinook salmon migration by water year type and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, July through December.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	9	90.9	86.4 (-4.5%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)
W	10	18.2	50.0 (31.8%)	22.7 (4.5%)	22.7 (4.5%)	22.7 (4.5%)	22.7 (4.5%)	31.8 (13.6%)	22.7 (4.5%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	10	50.0	100.0 (50.0%)	58.3 (8.3%)	58.3 (8.3%)	58.3 (8.3%)	58.3 (8.3%)	58.3 (8.3%)	58.3 (8.3%)
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	10	50.0	100.0 (50.0%)	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	50.0 (0.0%)	64.3 (14.3%)	50.0 (0.0%)
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	10	82.4	100.0 (17.6%)	88.2 (5.9%)	88.2 (5.9%)	88.2 (5.9%)	88.2 (5.9%)	82.4 (0.0%)	88.2 (5.9%)
D	11	5.9	11.8 (5.9%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	10	100.0	100.0 (0.0%)	100.0 (0.0%)	96.9 (-3.1%)	96.9 (-3.1%)	96.9 (-3.1%)	100.0 (0.0%)	100.0 (0.0%)
C	11	6.3	3.1 (-3.1%)	6.3 (0.0%)	6.3 (0.0%)	6.3 (0.0%)	6.3 (0.0%)	3.1 (-3.1%)	6.3 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	9	98.0	96.9 (-1.0%)	98.0 (0.0%)	98.0 (0.0%)	98.0 (0.0%)	98.0 (0.0%)	98.0 (0.0%)	98.0 (0.0%)
All	10	64.9	88.7 (23.7%)	68.0 (3.1%)	67.0 (2.1%)	67.0 (2.1%)	67.0 (2.1%)	71.1 (6.2%)	68.0 (3.1%)
All	11	3.1	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	2.0 (-1.0%)	3.1 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	51.5	56.1 (4.5%)	52.3 (0.8%)	52.3 (0.8%)	52.3 (0.8%)	52.3 (0.8%)	53.8 (2.3%)	52.3 (0.8%)
AN	All	58.3	66.7 (8.3%)	59.7 (1.4%)	59.7 (1.4%)	59.7 (1.4%)	59.7 (1.4%)	59.7 (1.4%)	59.7 (1.4%)
BN	All	57.0	65.1 (8.1%)	57.0 (0.0%)	57.0 (0.0%)	57.0 (0.0%)	57.0 (0.0%)	59.3 (2.3%)	57.0 (0.0%)
D	All	64.7	68.6 (3.9%)	65.7 (1.0%)	65.7 (1.0%)	65.7 (1.0%)	65.7 (1.0%)	64.7 (0.0%)	65.7 (1.0%)
C	All	68.2	67.7 (-0.5%)	68.2 (0.0%)	67.7 (-0.5%)	67.7 (-0.5%)	67.7 (-0.5%)	67.7 (-0.5%)	68.2 (0.0%)
All	All	61.0	64.7 (3.7%)	61.5 (0.5%)	61.3 (0.3%)	61.3 (0.3%)	61.3 (0.3%)	61.8 (0.9%)	61.5 (0.5%)

N.1.3.3.2 Adult Holding and Spawning

Water temperature-related effects on fall-run Chinook salmon adult holding and spawning in the Stanislaus River were evaluated by assessing: (1) the percent of months with water temperature outside the 42.1°F to 55°F range for spawning initiation (McCullough 1999); and (2) the percent of months with water temperature above the 59.9°F pathogen virulence threshold (McCullough 1999) in the Stanislaus River at Orange Blossom Bridge (Table N.1-2).

Results evaluating the 42.1°F to 55°F water temperature range for spawning initiation are presented in Table N.1-55 for Orange Blossom Bridge.

- At Orange Blossom Bridge, the highest percentage of months outside the range for spawning was 100% and occurred during October in a critical water year type under the NAA and all alternatives (Table N.1-55). The lowest percent of months outside the range was 0% and occurred in December and January of at least one water year type, under the NAA and most alternatives. Combining water year types, the highest percentage of months outside the range occurred during October and the lowest percentage occurred in December under the NAA and all project alternatives.

Results for the 59.9°F pathogen virulence water temperature threshold for adult fall-run Chinook salmon migration are presented in Table N.1-56 for Orange Blossom Bridge.

- The highest percent of months exceeding the pathogen virulence threshold was 50% and occurred during October in a critical water year under Alternative 1 (Table N.1-56). The lowest percent of months was 0%, and occurred during November and December in all water year types, under the NAA and all alternatives, except critical water years. Combining water year types, the highest percent of months above the threshold occurred in October under Alternative 1, and the lowest percent was in December and January under the NAA and all alternatives.

Table N.1-55. Percent (difference in percent relative to NAA) of months outside the 42.1°F to 55°F water temperature range for spawning initiation of fall-run Chinook salmon by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, October through January.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	10	13.6	36.4 (22.7%)	13.6 (0.0%)	13.6 (0.0%)	13.6 (0.0%)	13.6 (0.0%)	18.2 (4.5%)	13.6 (0.0%)
W	11	9.1	4.5 (-4.5%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	4.5 (-4.5%)	9.1 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	10	33.3	100.0 (66.7%)	41.7 (8.3%)	41.7 (8.3%)	41.7 (8.3%)	41.7 (8.3%)	41.7 (8.3%)	41.7 (8.3%)
AN	11	8.3	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	10	35.7	100.0 (64.3%)	28.6 (-7.1%)	28.6 (-7.1%)	28.6 (-7.1%)	28.6 (-7.1%)	42.9 (7.1%)	28.6 (-7.1%)
BN	11	20.0	20.0 (0.0%)	20.0 (0.0%)	20.0 (0.0%)	20.0 (0.0%)	20.0 (0.0%)	20.0 (0.0%)	20.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	10	70.6	100.0 (29.4%)	70.6 (0.0%)	70.6 (0.0%)	70.6 (0.0%)	70.6 (0.0%)	88.2 (17.6%)	70.6 (0.0%)
D	11	23.5	29.4 (5.9%)	23.5 (0.0%)	23.5 (0.0%)	23.5 (0.0%)	23.5 (0.0%)	29.4 (5.9%)	23.5 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	11	59.4	65.6 (6.3%)	56.3 (-3.1%)	53.1 (-6.3%)	53.1 (-6.3%)	53.1 (-6.3%)	59.4 (0.0%)	56.3 (-3.1%)
C	12	3.1	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)
C	1	3.0	3.0 (0.0%)	6.1 (3.0%)	6.1 (3.0%)	6.1 (3.0%)	6.1 (3.0%)	3.0 (0.0%)	6.1 (3.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
All	10	57.7	85.6 (27.8%)	57.7 (0.0%)	57.7 (0.0%)	57.7 (0.0%)	57.7 (0.0%)	63.9 (6.2%)	57.7 (0.0%)
All	11	29.6	31.6 (2.0%)	28.6 (-1.0%)	27.6 (-2.0%)	27.6 (-2.0%)	27.6 (-2.0%)	29.6 (0.0%)	28.6 (-1.0%)
All	12	1.0	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
All	1	1.0	1.0 (0.0%)	2.0 (1.0%)	2.0 (1.0%)	2.0 (1.0%)	2.0 (1.0%)	1.0 (0.0%)	2.0 (1.0%)
W	All	5.7	10.2 (4.5%)	5.7 (0.0%)	5.7 (0.0%)	5.7 (0.0%)	5.7 (0.0%)	5.7 (0.0%)	5.7 (0.0%)
AN	All	10.4	27.1 (16.7%)	12.5 (2.1%)	12.5 (2.1%)	12.5 (2.1%)	12.5 (2.1%)	12.5 (2.1%)	12.5 (2.1%)
BN	All	13.8	29.3 (15.5%)	12.1 (-1.7%)	12.1 (-1.7%)	12.1 (-1.7%)	12.1 (-1.7%)	15.5 (1.7%)	12.1 (-1.7%)
D	All	23.5	32.4 (8.8%)	23.5 (0.0%)	23.5 (0.0%)	23.5 (0.0%)	23.5 (0.0%)	29.4 (5.9%)	23.5 (0.0%)
C	All	41.1	42.6 (1.6%)	41.1 (0.0%)	40.3 (-0.8%)	40.3 (-0.8%)	40.3 (-0.8%)	41.1 (0.0%)	41.1 (0.0%)
All	All	22.3	29.7 (7.4%)	22.3 (0.0%)	22.0 (-0.3%)	22.0 (-0.3%)	22.0 (-0.3%)	23.8 (1.5%)	22.3 (0.0%)

Table N.1-56. Percent (difference in percent relative to NAA) of months above the 59.9°F pathogen virulence water temperature threshold for adult fall-run Chinook salmon migration by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, October through January.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaV A	Alt2woTUCP AllVA	Alt3	Alt4
W	10	0.0	9.1 (9.1%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	10	0.0	8.3 (8.3%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaV A	Alt2woTUCP AllVA	Alt3	Alt4
BN	10	0.0	14.3 (14.3%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	10	0.0	17.6 (17.6%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0. 0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	10	9.4	50.0 (40.6%)	9.4 (0.0%)	9.4 (0.0%)	9.4 (0.0%)	9.4 (0.0%)	6.3 (-3.1%)	9.4 (0.0%)
C	11	3.1	0.0 (-3.1%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	0.0 (-3.1%)	3.1 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	10	3.1	24.7 (21.6%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	2.1 (-1.0%)	3.1 (0.0%)
All	11	1.0	0.0 (-1.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	0.0 (-1.0%)	1.0 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	0.0	2.3 (2.3%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	All	0.0	2.1 (2.1%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	All	0.0	3.4 (3.4%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	All	0.0	4.4 (4.4%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	All	3.1	12.4 (9.3%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	1.6 (-1.6%)	3.1 (0.0%)
All	All	1.0	6.1 (5.1%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	0.5 (-0.5%)	1.0 (0.0%)

N.1.3.3.3 Egg Incubation and Fry Emergence

Water temperature-related effects on fall-run Chinook salmon egg incubation and fry emergence in the Stanislaus River were evaluated by assessing (1) the percent of months with water temperature outside the 42.8°F to 56°F range (Slater 1963, USFWS 1999, Myrick and Cech 2004, Bratovich et al. 2012, Martin et al. 2017); and (2) the percent of months with water temperature above the 59°F pathogen virulence threshold for fall-run Chinook salmon fry (McCullough 1999) in the Stanislaus River at Orange Blossom Bridge (Table N.1-2).

Results evaluating the 42.8°F to 56°F water temperature range for fall-run Chinook salmon egg incubation and fry emergence for Orange Blossom Bridge are presented in Table N.1-57.

- The highest percent of months with water temperature outside the range was 54.5% and occurred during March of a critically dry water year type under Alternative 1 (Table N.1-57). The lowest percent of months outside the range was 0% and occurred in December and February in at least one water year type under the NAA and all alternatives. Combining water year types, the highest percent of months outside the range was 23.5% in March under Alternative 1, the lowest percent was 0% in January for the NAA and all alternatives.

Results for the 59.9°F pathogen virulence water temperature threshold for fall-run Chinook salmon egg incubation and fry emergence are presented in Table N.1-58 for Orange Blossom Bridge.

- The highest percent of months exceeding the water temperature threshold was 5.9% and occurred during March in a dry water year type under Alternative 1 (Table N.1-58). The only other conditions which exceeded the water temperature threshold were in February and March in critical water year types. All other water year types were below the threshold under the NAA and all alternatives. Combining water year types, the highest percent of months above the threshold occurred in February and March (1-2%), all other months were below the threshold.

Table N.1-57. Percent (difference in percent relative to NAA) of months outside the 42.8°F to 56°F water temperature range for fall-run Chinook salmon egg incubation and fry emergence by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, December through March.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	9.1 (9.1%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	4.5 (4.5%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	8.3	0.0 (-8.3%)	0.0 (-8.3%)	0.0 (-8.3%)	0.0 (-8.3%)	0.0 (-8.3%)	8.3 (0.0%)	0.0 (-8.3%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	7.1 (7.1%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	5.9 (5.9%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	17.6	11.8 (-5.9%)	17.6 (0.0%)	17.6 (0.0%)	17.6 (0.0%)	17.6 (0.0%)	5.9 (-11.8%)	17.6 (0.0%)
C	12	3.1	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	2	3.0	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)
C	3	45.5	54.5 (9.1%)	39.4 (-6.1%)	39.4 (-6.1%)	39.4 (-6.1%)	39.4 (-6.1%)	42.4 (-3.0%)	39.4 (-6.1%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
All	12	1.0	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	1.0	2.0 (1.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
All	3	19.4	23.5 (4.1%)	16.3 (-3.1%)	16.3 (-3.1%)	16.3 (-3.1%)	16.3 (-3.1%)	17.3 (-2.0%)	16.3 (-3.1%)
W	All	0.0	2.3 (2.3%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	1.1 (1.1%)	0.0 (0.0%)
AN	All	2.1	0.0 (-2.1%)	0.0 (-2.1%)	0.0 (-2.1%)	0.0 (-2.1%)	0.0 (-2.1%)	2.1 (0.0%)	0.0 (-2.1%)
BN	All	0.0	1.8 (1.8%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	All	4.4	4.4 (0.0%)	4.4 (0.0%)	4.4 (0.0%)	4.4 (0.0%)	4.4 (0.0%)	1.5 (-2.9%)	4.4 (0.0%)
C	All	13.0	15.3 (2.3%)	11.5 (-1.5%)	11.5 (-1.5%)	11.5 (-1.5%)	11.5 (-1.5%)	12.2 (-0.8%)	11.5 (-1.5%)
All	All	5.4	6.6 (1.3%)	4.6 (-0.8%)	4.6 (-0.8%)	4.6 (-0.8%)	4.6 (-0.8%)	4.8 (-0.5%)	4.6 (-0.8%)

Table N.1-58. Percent (difference in percent relative to NAA) of months above the 59.9°F pathogen virulence water temperature threshold for fall-run Chinook salmon egg incubation and fry emergence by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, December through March.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	5.9 (5.9%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	2	0.0	3.0 (3.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	3.0	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	0.0	1.0 (1.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	1.0	2.0 (1.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
W	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	All	0.0	1.5 (1.5%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	All	0.8	1.5 (0.8%)	0.8 (0.0%)	0.8 (0.0%)	0.8 (0.0%)	0.8 (0.0%)	0.8 (0.0%)	0.8 (0.0%)
All	All	0.3	0.8 (0.5%)	0.3 (0.0%)	0.3 (0.0%)	0.3 (0.0%)	0.3 (0.0%)	0.3 (0.0%)	0.3 (0.0%)

N.1.3.3.4 Juvenile Rearing and Outmigration

Water temperature-related effects on fall-run Chinook salmon juvenile rearing and outmigration in the Stanislaus were evaluated by assessing: (1) the percent of months with water temperature outside the 55.4°F to 68°F optimum temperature for juvenile growth, smoltification, and predation vulnerability (Myrick and Cech 2002, Marine and Cech 2004); (2) the percent of months with water temperature above the 75.2°F upper incipient lethal temperature (UILT) for juvenile rearing and outmigration (Brett 1952, Brett et al. 1982, Myrick and Cech 2004); and (3) the percent of months with water temperature above the 59.9°F pathogen virulence threshold (McCullough 1999) for juvenile outmigration in the Stanislaus River at Orange Blossom Bridge (Table N.1-2).

Results evaluating the 55.4°F to 68°F optimum temperature for fall-run Chinook salmon juvenile rearing for Orange Blossom Bridge are presented in Table N.1-59.

- The highest percent of months with water temperature outside the range was 100% and occurred during April and May in a wet and above normal water year type under the NAA and all alternatives (Table N.1-59). The lowest percent of months outside the range was 0% and occurred during June in below normal, dry, and critical water years under the NAA and all alternatives. Combining water year types, the highest percent of months outside the range occurred in April under Alternative 1 and the lowest occurred in June under Alternative 2 with TUCP woVA and Alternative 4.

Results above the 75.2°F UILT for fall-run Chinook salmon juvenile rearing for Orange Blossom Bridge are presented in Table N.1-60.

- All months and water year types under the NAA and all alternatives were below the threshold for upper incipient lethal temperatures at Orange Blossom Bridge (Table N.1-60).

Results for the 59.9°F pathogen virulence water temperature threshold for fall-run Chinook salmon juvenile outmigration for Orange Blossom Bridge are presented in Table N.1-61.

- The highest percent of months exceeding the water temperature threshold was 100% and occurred in June during dry and critical water year types under the NAA, all Alternative 2 components and Alternative 4 (Table N.1-61). The lowest percent of months exceeding water temperature threshold was 0% and occurred March through May in at least one water year type under the NAA and all alternatives. Combining water year types, the highest percent of months exceeding the water temperature threshold occurred in June under Alternative 2 with TUCP woVA and Alternative 4. The lowest percent of months below the threshold occurred in April under the NAA and all alternatives.

Table N.1-59. Percent (difference in percent relative to NAA) of months outside the 55.4°F to 68°F water temperature range for fall-run Chinook salmon juvenile rearing by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, March through June.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	3	90.9	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	95.5 (4.5%)	90.9 (0.0%)
W	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	5	100.0	95.5 (-4.5%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	6	81.8	63.6 (-18.2%)	50.0 (-31.8%)	50.0 (-31.8%)	50.0 (-31.8%)	50.0 (-31.8%)	81.8 (0.0%)	50.0 (-31.8%)
AN	3	91.7	100.0 (8.3%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)
AN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	6	0.0	25.0 (25.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	8.3 (8.3%)	0.0 (0.0%)
BN	3	100.0	92.9 (-7.1%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	4	92.9	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)	100.0 (7.1%)	92.9 (0.0%)
BN	5	92.9	78.6 (-14.3%)	85.7 (-7.1%)	85.7 (-7.1%)	85.7 (-7.1%)	85.7 (-7.1%)	92.9 (0.0%)	85.7 (-7.1%)
BN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	76.5	82.4 (5.9%)	76.5 (0.0%)	76.5 (0.0%)	76.5 (0.0%)	76.5 (0.0%)	88.2 (11.8%)	76.5 (0.0%)
D	4	64.7	94.1 (29.4%)	58.8 (-5.9%)	58.8 (-5.9%)	58.8 (-5.9%)	58.8 (-5.9%)	76.5 (11.8%)	58.8 (-5.9%)
D	5	23.5	52.9 (29.4%)	11.8 (-11.8%)	11.8 (-11.8%)	11.8 (-11.8%)	11.8 (-11.8%)	52.9 (29.4%)	11.8 (-11.8%)
D	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	45.5	45.5 (0.0%)	45.5 (0.0%)	45.5 (0.0%)	45.5 (0.0%)	45.5 (0.0%)	45.5 (0.0%)	45.5 (0.0%)
C	4	36.4	54.5 (18.2%)	36.4 (0.0%)	36.4 (0.0%)	36.4 (0.0%)	36.4 (0.0%)	36.4 (0.0%)	36.4 (0.0%)
C	5	0.0	24.2 (24.2%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	6.1 (6.1%)	0.0 (0.0%)
C	6	0.0	0.0 (0.0%)	0.0 (0.0%)	3.0 (3.0%)	3.0 (3.0%)	3.0 (3.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
All	3	74.5	75.5 (1.0%)	74.5 (0.0%)	74.5 (0.0%)	74.5 (0.0%)	74.5 (0.0%)	77.6 (3.1%)	74.5 (0.0%)
All	4	71.4	82.7 (11.2%)	70.4 (-1.0%)	70.4 (-1.0%)	70.4 (-1.0%)	70.4 (-1.0%)	74.5 (3.1%)	70.4 (-1.0%)
All	5	52.0	62.2 (10.2%)	49.0 (-3.1%)	49.0 (-3.1%)	49.0 (-3.1%)	49.0 (-3.1%)	59.2 (7.1%)	49.0 (-3.1%)
All	6	18.4	17.3 (-1.0%)	11.2 (-7.1%)	12.2 (-6.1%)	12.2 (-6.1%)	12.2 (-6.1%)	19.4 (1.0%)	11.2 (-7.1%)
W	All	93.2	87.5 (-5.7%)	85.2 (-8.0%)	85.2 (-8.0%)	85.2 (-8.0%)	85.2 (-8.0%)	94.3 (1.1%)	85.2 (-8.0%)
AN	All	72.9	81.3 (8.3%)	72.9 (0.0%)	72.9 (0.0%)	72.9 (0.0%)	72.9 (0.0%)	75.0 (2.1%)	72.9 (0.0%)
BN	All	71.4	66.1 (-5.4%)	69.6 (-1.8%)	69.6 (-1.8%)	69.6 (-1.8%)	69.6 (-1.8%)	73.2 (1.8%)	69.6 (-1.8%)
D	All	41.2	57.4 (16.2%)	36.8 (-4.4%)	36.8 (-4.4%)	36.8 (-4.4%)	36.8 (-4.4%)	54.4 (13.2%)	36.8 (-4.4%)
C	All	20.5	31.1 (10.6%)	20.5 (0.0%)	21.2 (0.8%)	21.2 (0.8%)	21.2 (0.8%)	22.0 (1.5%)	20.5 (0.0%)
All	All	54.1	59.4 (5.4%)	51.3 (-2.8%)	51.5 (-2.6%)	51.5 (-2.6%)	51.5 (-2.6%)	57.7 (3.6%)	51.3 (-2.8%)

Table N.1-60. Percent (difference in percent relative to NAA) of months above the 75.2°F upper incipient lethal temperature for juvenile fall-run Chinook salmon rearing and outmigration by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, March through June.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
All	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

Table N.1-61. Percent (difference in percent relative to NAA) of months above the 59.9°F pathogen virulence water temperature threshold for fall-run Chinook salmon juvenile outmigration by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, March through June.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	6	0.0	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	0.0 (0.0%)	4.5 (4.5%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	6	8.3	16.7 (8.3%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	6	14.3	35.7 (21.4%)	28.6 (14.3%)	28.6 (14.3%)	28.6 (14.3%)	28.6 (14.3%)	21.4 (7.1%)	28.6 (14.3%)
D	3	0.0	5.9 (5.9%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	6	100.0	64.7 (-35.3%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	70.6 (-29.4%)	100.0 (0.0%)
C	3	3.0	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)	3.0 (0.0%)
C	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	9.1	6.1 (-3.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)	9.1 (0.0%)
C	6	100.0	90.9 (-9.1%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	97.0 (-3.0%)	93.9 (-6.1%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
All	3	1.0	2.0 (1.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
All	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	5	3.1	2.0 (-1.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)	3.1 (0.0%)
All	6	54.1	50.0 (-4.1%)	55.1 (1.0%)	54.1 (0.0%)	54.1 (0.0%)	54.1 (0.0%)	49.0 (-5.1%)	55.1 (1.0%)
W	All	0.0	1.1 (1.1%)	1.1 (1.1%)	1.1 (1.1%)	1.1 (1.1%)	1.1 (1.1%)	0.0 (0.0%)	1.1 (1.1%)
AN	All	2.1	4.2 (2.1%)	2.1 (0.0%)	2.1 (0.0%)	2.1 (0.0%)	2.1 (0.0%)	2.1 (0.0%)	2.1 (0.0%)
BN	All	3.6	8.9 (5.4%)	7.1 (3.6%)	7.1 (3.6%)	7.1 (3.6%)	7.1 (3.6%)	5.4 (1.8%)	7.1 (3.6%)
D	All	25.0	17.6 (-7.4%)	25.0 (0.0%)	25.0 (0.0%)	25.0 (0.0%)	25.0 (0.0%)	17.6 (-7.4%)	25.0 (0.0%)
C	All	28.0	25.0 (-3.0%)	26.5 (-1.5%)	25.8 (-2.3%)	25.8 (-2.3%)	25.8 (-2.3%)	27.3 (-0.8%)	26.5 (-1.5%)
All	All	14.5	13.5 (-1.0%)	14.8 (0.3%)	14.5 (0.0%)	14.5 (0.0%)	14.5 (0.0%)	13.3 (-1.3%)	14.8 (0.3%)

N.1.3.4 Pacific Lamprey

N.1.3.4.1 Spawning and Egg Incubation

Water temperature related effects on Pacific lamprey spawning and egg incubation in the Stanislaus River were evaluated by assessing the percent of months with water temperature outside the 50°F - 64°F observed range for high survival and low occurrences of embryonic developmental abnormalities (Meeuwig et al. 2003, 2005) at Orange Blossom Bridge (Table N.1-2).

Results outside the 50°F - 64°F observed range of high survival and low occurrences of embryonic developmental abnormalities in Pacific lamprey are presented in Table N.1-62 for Orange Blossom Bridge.

- The highest percent of months with water temperature outside the range was 51.5% and occurred in July of a critical water year under the NAA (Table N.1-62). The lowest percent of months with water temperature outside the range was 0% and occurred in May, June, and August in at least one water year type, all months in above normal water year types, April through June in below normal and dry water years, and April and May of critical years, under the NAA and all alternatives. Combining water year types, the highest percent of months outside the range occurred in July and the lowest percent of months outside the range was in May under the NAA and all alternatives.

Table N.1-62. Percent (difference in percent relative to NAA) of months outside the 50°F - 64°F water temperature for the observed range for high survival and low occurrences of embryonic developmental abnormalities of Pacific lamprey by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, April through August.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	4	4.5	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	7	0.0	0.0 (0.0%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)
W	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	7	7.1	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)
BN	8	7.1	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)
D	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	7	29.4	17.6 (-11.8%)	35.3 (5.9%)	35.3 (5.9%)	35.3 (5.9%)	35.3 (5.9%)	35.3 (5.9%)	35.3 (5.9%)
D	8	5.9	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	6	12.1	15.2 (3.0%)	9.1 (-3.0%)	9.1 (-3.0%)	9.1 (-3.0%)	9.1 (-3.0%)	9.1 (-3.0%)	9.1 (-3.0%)
C	7	51.5	45.5 (-6.1%)	48.5 (-3.0%)	48.5 (-3.0%)	48.5 (-3.0%)	48.5 (-3.0%)	48.5 (-3.0%)	48.5 (-3.0%)
C	8	18.2	18.2 (0.0%)	21.2 (3.0%)	21.2 (3.0%)	21.2 (3.0%)	21.2 (3.0%)	24.2 (6.1%)	21.2 (3.0%)
All	4	1.0	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
All	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	6	4.1	5.1 (1.0%)	3.1 (-1.0%)	3.1 (-1.0%)	3.1 (-1.0%)	3.1 (-1.0%)	3.1 (-1.0%)	3.1 (-1.0%)
All	7	23.5	19.4 (-4.1%)	24.5 (1.0%)	24.5 (1.0%)	24.5 (1.0%)	24.5 (1.0%)	24.5 (1.0%)	24.5 (1.0%)
All	8	8.2	8.2 (0.0%)	9.2 (1.0%)	9.2 (1.0%)	9.2 (1.0%)	9.2 (1.0%)	10.2 (2.0%)	9.2 (1.0%)
W	All	0.9	0.9 (0.0%)	1.8 (0.9%)	1.8 (0.9%)	1.8 (0.9%)	1.8 (0.9%)	1.8 (0.9%)	1.8 (0.9%)
AN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	All	2.9	2.9 (0.0%)	2.9 (0.0%)	2.9 (0.0%)	2.9 (0.0%)	2.9 (0.0%)	2.9 (0.0%)	2.9 (0.0%)
D	All	7.1	4.7 (-2.4%)	8.2 (1.2%)	8.2 (1.2%)	8.2 (1.2%)	8.2 (1.2%)	8.2 (1.2%)	8.2 (1.2%)
C	All	16.4	15.8 (-0.6%)	15.8 (-0.6%)	15.8 (-0.6%)	15.8 (-0.6%)	15.8 (-0.6%)	16.4 (0.0%)	15.8 (-0.6%)
All	All	7.3	6.7 (-0.6%)	7.6 (0.2%)	7.6 (0.2%)	7.6 (0.2%)	7.6 (0.2%)	7.8 (0.4%)	7.6 (0.2%)

N.1.3.4.2 Ammocoete Rearing and Emigration

Water temperature related effects on Pacific lamprey ammocoete rearing and emigration in the Stanislaus River were evaluated by assessing the percent of months with water temperature was above the 72°F upper limit for high survival and low occurrence of developmental abnormalities (Meeuwig et al. 2003, 2005) at Orange Blossom Bridge and above the confluence with the San Joaquin River (Table N.1-2).

Results for water temperatures above the 72°F upper limit for high survival and low occurrence of developmental abnormalities of Pacific lamprey are presented in Table N.1-63 for Orange Blossom Bridge and Table N.1-64 for above the confluence with San Joaquin River.

- At Orange Blossom Bridge, all months in all water year types were below the limit under the NAA and all alternatives (Table N.1-63).
- Above the confluence of the San Joaquin River, the highest percent of months with water temperatures exceeding the limit was 100% and occurred in August during dry water year types under the NAA and all alternatives (Table N.1-64). The lowest percent of months above the limit was 0% and occurred during all months except June through September in all water year types under the NAA and all alternatives. Combining water year types, the highest percent of months with water temperature above the limit was in August, and the lowest percent of months above the limit was 0% in all months except June through September under the NAA and all alternatives.

Table N.1-63. Percent (difference in percent relative to NAA) of months above the 72°F upper limit for high survival and low occurrences of embryonic developmental abnormalities of Pacific lamprey ammocoete rearing and emigration by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, year-round.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
AN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
All	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

Table N.1-64. Percent (difference in percent relative to NAA) of months above the 72°F upper limit for high survival and low occurrences of embryonic developmental abnormalities of Pacific lamprey ammocoete rearing and emigration by water year type and month, and for all years combined, Stanislaus River above confluence with the San Joaquin River, year-round.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	7	22.7	36.4 (13.6%)	45.5 (22.7%)	45.5 (22.7%)	45.5 (22.7%)	45.5 (22.7%)	27.3 (4.5%)	45.5 (22.7%)
W	8	22.7	31.8 (9.1%)	27.3 (4.5%)	27.3 (4.5%)	27.3 (4.5%)	27.3 (4.5%)	50.0 (27.3%)	27.3 (4.5%)
W	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	7	91.7	66.7 (-25.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	83.3 (-8.3%)	91.7 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
AN	8	91.7	66.7 (-25.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	83.3 (-8.3%)	91.7 (0.0%)
AN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	6	0.0	0.0 (0.0%)	7.1 (7.1%)	7.1 (7.1%)	7.1 (7.1%)	7.1 (7.1%)	7.1 (7.1%)	7.1 (7.1%)
BN	7	100.0	78.6 (-21.4%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	8	92.9	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)	100.0 (7.1%)	92.9 (0.0%)
BN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	6	5.9	5.9 (0.0%)	11.8 (5.9%)	11.8 (5.9%)	11.8 (5.9%)	11.8 (5.9%)	11.8 (5.9%)	11.8 (5.9%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	7	100.0	88.2 (-11.8%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	94.1 (-5.9%)	100.0 (0.0%)
D	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	9	5.9	5.9 (0.0%)	11.8 (5.9%)	11.8 (5.9%)	11.8 (5.9%)	11.8 (5.9%)	11.8 (5.9%)	11.8 (5.9%)
D	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	6	27.3	24.2 (-3.0%)	21.2 (-6.1%)	21.2 (-6.1%)	21.2 (-6.1%)	21.2 (-6.1%)	27.3 (0.0%)	21.2 (-6.1%)
C	7	100.0	100.0 (0.0%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	97.0 (-3.0%)	93.9 (-6.1%)
C	8	100.0	93.9 (-6.1%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	97.0 (-3.0%)	93.9 (-6.1%)
C	9	15.2	6.1 (-9.1%)	12.1 (-3.0%)	12.1 (-3.0%)	12.1 (-3.0%)	12.1 (-3.0%)	24.2 (9.1%)	12.1 (-3.0%)
C	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
All	6	10.2	9.2 (-1.0%)	10.2 (0.0%)	10.2 (0.0%)	10.2 (0.0%)	10.2 (0.0%)	12.2 (2.0%)	10.2 (0.0%)
All	7	81.6	76.5 (-5.1%)	84.7 (3.1%)	83.7 (2.0%)	83.7 (2.0%)	83.7 (2.0%)	79.6 (-2.0%)	84.7 (3.1%)
All	8	80.6	77.6 (-3.1%)	79.6 (-1.0%)	78.6 (-2.0%)	78.6 (-2.0%)	78.6 (-2.0%)	85.7 (5.1%)	79.6 (-1.0%)
All	9	6.1	3.1 (-3.1%)	6.1 (0.0%)	6.1 (0.0%)	6.1 (0.0%)	6.1 (0.0%)	10.2 (4.1%)	6.1 (0.0%)
All	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	3.8	5.7 (1.9%)	6.1 (2.3%)	6.1 (2.3%)	6.1 (2.3%)	6.1 (2.3%)	6.4 (2.7%)	6.1 (2.3%)
AN	All	15.3	11.1 (-4.2%)	15.3 (0.0%)	15.3 (0.0%)	15.3 (0.0%)	15.3 (0.0%)	13.9 (-1.4%)	15.3 (0.0%)
BN	All	15.9	14.1 (-1.8%)	16.5 (0.6%)	16.5 (0.6%)	16.5 (0.6%)	16.5 (0.6%)	17.1 (1.2%)	16.5 (0.6%)
D	All	17.6	16.7 (-1.0%)	18.6 (1.0%)	18.6 (1.0%)	18.6 (1.0%)	18.6 (1.0%)	18.1 (0.5%)	18.6 (1.0%)
C	All	20.4	18.8 (-1.5%)	18.6 (-1.8%)	18.1 (-2.3%)	18.1 (-2.3%)	18.1 (-2.3%)	20.6 (0.3%)	18.6 (-1.8%)
All	All	14.9	13.9 (-1.0%)	15.1 (0.2%)	14.9 (0.0%)	14.9 (0.0%)	14.9 (0.0%)	15.7 (0.8%)	15.1 (0.2%)

N.1.3.5 Western River Lamprey

N.1.3.5.1 Spawning and Egg Incubation

Water temperature related effects on western river lamprey spawning and egg incubation in the Stanislaus River were evaluated by assessing the percent of months with water temperature outside the 50°F - 64°F observed range for high survival and low occurrences of embryonic developmental abnormalities (Meeuwig et al. 2003, 2005) at Orange Blossom Bridge (Table N.1-2).

Results outside the 50°F - 64°F observed water temperature range of high survival and low occurrences of embryonic developmental abnormalities in western river lamprey are presented in Table N.1-65 for Orange Blossom Bridge.

- The highest percent of months outside the water temperature range was 77.3% and occurred in February of a wet water year type under Alternative 3 (Table N.1-65). The lowest percent of months outside the water temperature range was 0% and occurred in May of all water year types under the NAA and all alternatives. Combining water year types, the highest percent of months outside the range occurred in February under Alternative 3, the lowest percent of months outside the range occurred in May under the NAA and all alternatives.

Table N.1-65. Percent (difference in percent relative to NAA) of months outside the 50°F - 64°F water temperature range observed for high survival and low occurrences of embryonic developmental abnormalities of western river lamprey spawning and egg incubation by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, February through July.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	2	59.1	72.7 (13.6%)	54.5 (-4.5%)	54.5 (-4.5%)	54.5 (-4.5%)	54.5 (-4.5%)	77.3 (18.2%)	54.5 (-4.5%)
W	3	36.4	31.8 (-4.5%)	31.8 (-4.5%)	31.8 (-4.5%)	31.8 (-4.5%)	31.8 (-4.5%)	40.9 (4.5%)	31.8 (-4.5%)
W	4	4.5	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)	4.5 (0.0%)
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	7	0.0	0.0 (0.0%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)	4.5 (4.5%)
AN	2	75.0	58.3 (-16.7%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)	66.7 (-8.3%)	75.0 (0.0%)
AN	3	8.3	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	16.7 (8.3%)	8.3 (0.0%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	35.7	35.7 (0.0%)	35.7 (0.0%)	35.7 (0.0%)	35.7 (0.0%)	35.7 (0.0%)	57.1 (21.4%)	35.7 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	7	7.1	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)
D	2	5.9	23.5 (17.6%)	29.4 (23.5%)	29.4 (23.5%)	29.4 (23.5%)	29.4 (23.5%)	17.6 (11.8%)	29.4 (23.5%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	7	29.4	17.6 (-11.8%)	35.3 (5.9%)	35.3 (5.9%)	35.3 (5.9%)	35.3 (5.9%)	35.3 (5.9%)	35.3 (5.9%)
C	2	6.1	6.1 (0.0%)	12.1 (6.1%)	12.1 (6.1%)	12.1 (6.1%)	12.1 (6.1%)	6.1 (0.0%)	12.1 (6.1%)
C	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	6	12.1	15.2 (3.0%)	9.1 (-3.0%)	9.1 (-3.0%)	9.1 (-3.0%)	9.1 (-3.0%)	9.1 (-3.0%)	9.1 (-3.0%)
C	7	51.5	45.5 (-6.1%)	48.5 (-3.0%)	48.5 (-3.0%)	48.5 (-3.0%)	48.5 (-3.0%)	48.5 (-3.0%)	48.5 (-3.0%)
All	2	30.6	34.7 (4.1%)	35.7 (5.1%)	35.7 (5.1%)	35.7 (5.1%)	35.7 (5.1%)	38.8 (8.2%)	35.7 (5.1%)
All	3	9.2	8.2 (-1.0%)	8.2 (-1.0%)	8.2 (-1.0%)	8.2 (-1.0%)	8.2 (-1.0%)	11.2 (2.0%)	8.2 (-1.0%)
All	4	1.0	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)	1.0 (0.0%)
All	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	6	4.1	5.1 (1.0%)	3.1 (-1.0%)	3.1 (-1.0%)	3.1 (-1.0%)	3.1 (-1.0%)	3.1 (-1.0%)	3.1 (-1.0%)
All	7	23.5	19.4 (-4.1%)	24.5 (1.0%)	24.5 (1.0%)	24.5 (1.0%)	24.5 (1.0%)	24.5 (1.0%)	24.5 (1.0%)
W	All	33.3	34.8 (1.5%)	31.8 (-1.5%)	31.8 (-1.5%)	31.8 (-1.5%)	31.8 (-1.5%)	37.1 (3.8%)	31.8 (-1.5%)
AN	All	30.6	27.8 (-2.8%)	30.6 (0.0%)	30.6 (0.0%)	30.6 (0.0%)	30.6 (0.0%)	30.6 (0.0%)	30.6 (0.0%)
BN	All	22.6	22.6 (0.0%)	22.6 (0.0%)	22.6 (0.0%)	22.6 (0.0%)	22.6 (0.0%)	26.2 (3.6%)	22.6 (0.0%)
D	All	17.6	20.6 (2.9%)	21.6 (3.9%)	21.6 (3.9%)	21.6 (3.9%)	21.6 (3.9%)	19.6 (2.0%)	21.6 (3.9%)
C	All	19.7	20.2 (0.5%)	20.2 (0.5%)	20.2 (0.5%)	20.2 (0.5%)	20.2 (0.5%)	19.2 (-0.5%)	20.2 (0.5%)
All	All	11.4	11.4 (0.0%)	12.1 (0.7%)	12.1 (0.7%)	12.1 (0.7%)	12.1 (0.7%)	13.1 (1.7%)	12.1 (0.7%)

N.1.3.5.2 Ammocoete Rearing and Emigration

Water temperature related effects on western river lamprey ammocoete rearing and emigration in the Stanislaus River were evaluated by assessing the percent of months with water temperature was above the 72°F upper limit for high survival and low occurrence of developmental abnormalities (Meeuwig et al. 2003, 2005) at Orange Blossom Bridge and above the confluence with the San Joaquin River (Table N.1-2).

Results above the 72°F water temperature upper limit for high survival and low occurrence of developmental abnormalities of western river lamprey are presented in Table N.1-66 for Orange Blossom Bridge and Table N.1-67 for above confluence with San Joaquin River.

- At Orange Blossom Bridge, all months were below the water temperature limit for high survival and low occurrence of developmental abnormalities under the NAA and all alternatives (Table N.1-66).
- Above the confluence of the San Joaquin River, the highest percent of months with water temperatures above the upper limit was 100% which occurred in August in dry water year type under the NAA and all alternatives (Table N.1-67). The lowest percent of months above the upper limit was 0% which predominantly occurred in all months except June through September in all water year types under the NAA and all alternatives. Combining water year types, the highest percent of months above the water temperature limit was in August under Alternative 3, the lowest percent of months above the water temperature limit was 0%, which generally occurred in all months excluding June through September under the NAA and all alternatives.

Table N.1-66. Percent (difference in percent relative to NAA) of months above the 72°F water temperature upper limit for high survival and low occurrences of embryonic developmental abnormalities of western river lamprey ammocoete rearing and emigration by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, year-round.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
AN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
All	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	All	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

Table N.1-67. Percent (difference in percent relative to NAA) of months above the 72°F water temperature upper limit for high survival and low occurrences of embryonic developmental abnormalities of western river lamprey ammocoete rearing and emigration by water year type and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, year-round.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	7	22.7	36.4 (13.6%)	45.5 (22.7%)	45.5 (22.7%)	45.5 (22.7%)	45.5 (22.7%)	27.3 (4.5%)	45.5 (22.7%)
W	8	22.7	31.8 (9.1%)	27.3 (4.5%)	27.3 (4.5%)	27.3 (4.5%)	27.3 (4.5%)	50.0 (27.3%)	27.3 (4.5%)
W	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	7	91.7	66.7 (-25.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	83.3 (-8.3%)	91.7 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
AN	8	91.7	66.7 (-25.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	83.3 (-8.3%)	91.7 (0.0%)
AN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	6	0.0	0.0 (0.0%)	7.1 (7.1%)	7.1 (7.1%)	7.1 (7.1%)	7.1 (7.1%)	7.1 (7.1%)	7.1 (7.1%)
BN	7	100.0	78.6 (-21.4%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	8	92.9	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)	100.0 (7.1%)	92.9 (0.0%)
BN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	6	5.9	5.9 (0.0%)	11.8 (5.9%)	11.8 (5.9%)	11.8 (5.9%)	11.8 (5.9%)	11.8 (5.9%)	11.8 (5.9%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	7	100.0	88.2 (-11.8%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	94.1 (-5.9%)	100.0 (0.0%)
D	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	9	5.9	5.9 (0.0%)	11.8 (5.9%)	11.8 (5.9%)	11.8 (5.9%)	11.8 (5.9%)	11.8 (5.9%)	11.8 (5.9%)
D	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	6	27.3	24.2 (-3.0%)	21.2 (-6.1%)	21.2 (-6.1%)	21.2 (-6.1%)	21.2 (-6.1%)	27.3 (0.0%)	21.2 (-6.1%)
C	7	100.0	100.0 (0.0%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	97.0 (-3.0%)	93.9 (-6.1%)
C	8	100.0	93.9 (-6.1%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	97.0 (-3.0%)	93.9 (-6.1%)
C	9	15.2	6.1 (-9.1%)	12.1 (-3.0%)	12.1 (-3.0%)	12.1 (-3.0%)	12.1 (-3.0%)	24.2 (9.1%)	12.1 (-3.0%)
C	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	1	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	2	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	3	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	4	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
All	6	10.2	9.2 (-1.0%)	10.2 (0.0%)	10.2 (0.0%)	10.2 (0.0%)	10.2 (0.0%)	12.2 (2.0%)	10.2 (0.0%)
All	7	81.6	76.5 (-5.1%)	84.7 (3.1%)	83.7 (2.0%)	83.7 (2.0%)	83.7 (2.0%)	79.6 (-2.0%)	84.7 (3.1%)
All	8	80.6	77.6 (-3.1%)	79.6 (-1.0%)	78.6 (-2.0%)	78.6 (-2.0%)	78.6 (-2.0%)	85.7 (5.1%)	79.6 (-1.0%)
All	9	6.1	3.1 (-3.1%)	6.1 (0.0%)	6.1 (0.0%)	6.1 (0.0%)	6.1 (0.0%)	10.2 (4.1%)	6.1 (0.0%)
All	10	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	11	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	12	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	All	3.8	5.7 (1.9%)	6.1 (2.3%)	6.1 (2.3%)	6.1 (2.3%)	6.1 (2.3%)	6.4 (2.7%)	6.1 (2.3%)
AN	All	13.3	9.7 (-3.6%)	13.3 (0.0%)	13.3 (0.0%)	13.3 (0.0%)	13.3 (0.0%)	12.1 (-1.2%)	13.3 (0.0%)
BN	All	15.9	14.1 (-1.8%)	16.5 (0.6%)	16.5 (0.6%)	16.5 (0.6%)	16.5 (0.6%)	17.1 (1.2%)	16.5 (0.6%)
D	All	17.6	16.7 (-1.0%)	18.6 (1.0%)	18.6 (1.0%)	18.6 (1.0%)	18.6 (1.0%)	18.1 (0.5%)	18.6 (1.0%)
C	All	20.4	18.8 (-1.5%)	18.6 (-1.8%)	18.1 (-2.3%)	18.1 (-2.3%)	18.1 (-2.3%)	20.6 (0.3%)	18.6 (-1.8%)
All	All	14.9	13.9 (-1.0%)	15.1 (0.2%)	14.9 (0.0%)	14.9 (0.0%)	14.9 (0.0%)	15.7 (0.8%)	15.1 (0.2%)

N.1.3.6 Hardhead

N.1.3.6.1 Spawning

Water temperature related effects on hardhead spawning in the Stanislaus River were evaluated by assessing the percent of months with water temperature outside the 59°F - 64°F optimal range (Wang 1986) at Orange Blossom Bridge (Table N.1-2).

Results outside the outside the 59°F - 64°F water temperature optimal range for hardhead are presented in Table N.1-68 for Orange Blossom Bridge.

- At Orange Blossom Bridge, the highest percent of months with water temperature outside the range was 100% and occurred during April and May of wet, above normal, and below normal water years under the NAA and all alternatives (Table N.1-68). April of dry water years was also 100% outside the water temperature range under the NAA and all alternatives. The lowest percent of months with water temperature outside the range was 0% and occurred in June of a dry water year type under the NAA, all Alternative 2 components and Alternative 4. Combining water year types, the highest percent of months outside the water temperature range occurred in April and the lowest was in June under the NAA and all alternatives.

Table N.1-68. Percent (difference in percent relative to NAA) of months outside the 59°F - 64°F water temperature optimal range for hardhead spawning by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, April through June.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2wo TUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	6	100.0	90.9 (-9.1%)	95.5 (-4.5%)	95.5 (-4.5%)	95.5 (-4.5%)	95.5 (-4.5%)	100.0 (0.0%)	95.5 (-4.5%)
AN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	6	66.7	83.3 (16.7%)	66.7 (0.0%)	66.7 (0.0%)	66.7 (0.0%)	66.7 (0.0%)	75.0 (8.3%)	66.7 (0.0%)
BN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	6	78.6	64.3 (-14.3%)	71.4 (-7.1%)	71.4 (-7.1%)	71.4 (-7.1%)	71.4 (-7.1%)	78.6 (0.0%)	71.4 (-7.1%)
D	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	5	100.0	94.1 (-5.9%)	88.2 (-11.8%)	88.2 (-11.8%)	88.2 (-11.8%)	88.2 (-11.8%)	88.2 (-11.8%)	88.2 (-11.8%)
D	6	0.0	35.3 (35.3%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	17.6 (17.6%)	0.0 (0.0%)
C	4	97.0	100.0 (3.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)
C	5	81.8	84.8 (3.0%)	81.8 (0.0%)	81.8 (0.0%)	81.8 (0.0%)	81.8 (0.0%)	81.8 (0.0%)	81.8 (0.0%)
C	6	12.1	18.2 (6.1%)	15.2 (3.0%)	18.2 (6.1%)	18.2 (6.1%)	18.2 (6.1%)	12.1 (0.0%)	15.2 (3.0%)
All	4	99.0	100.0 (1.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)
All	5	93.9	93.9 (0.0%)	91.8 (-2.0%)	91.8 (-2.0%)	91.8 (-2.0%)	91.8 (-2.0%)	91.8 (-2.0%)	91.8 (-2.0%)
All	6	45.9	52.0 (6.1%)	44.9 (-1.0%)	45.9 (0.0%)	45.9 (0.0%)	45.9 (0.0%)	50.0 (4.1%)	44.9 (-1.0%)
W	All	100.0	97.0 (-3.0%)	98.5 (-1.5%)	98.5 (-1.5%)	98.5 (-1.5%)	98.5 (-1.5%)	100.0 (0.0%)	98.5 (-1.5%)
AN	All	88.9	94.4 (5.6%)	88.9 (0.0%)	88.9 (0.0%)	88.9 (0.0%)	88.9 (0.0%)	91.7 (2.8%)	88.9 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2wo TUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
BN	All	92.9	88.1 (-4.8%)	90.5 (-2.4%)	90.5 (-2.4%)	90.5 (-2.4%)	90.5 (-2.4%)	92.9 (0.0%)	90.5 (-2.4%)
D	All	66.7	76.5 (9.8%)	62.7 (-3.9%)	62.7 (-3.9%)	62.7 (-3.9%)	62.7 (-3.9%)	68.6 (2.0%)	62.7 (-3.9%)
C	All	63.6	67.7 (4.0%)	64.6 (1.0%)	65.7 (2.0%)	65.7 (2.0%)	65.7 (2.0%)	63.6 (0.0%)	64.6 (1.0%)
All	All	79.6	82.0 (2.4%)	78.6 (-1.0%)	78.9 (-0.7%)	78.9 (-0.7%)	78.9 (-0.7%)	80.3 (0.7%)	78.6 (-1.0%)

N.1.3.6.2 Non-spawning Adults

Water temperature related effects on non-spawning adult hardhead in the Stanislaus River were evaluated by assessing the percent of months with water temperature outside the 57.2°F – 78.8°F commonly observed range (Thompson et al. 2012) at Orange Blossom Bridge (Table N.1-2).

Results outside the outside the 59°F - 64°F water temperature commonly observed range for hardhead are presented in Table N.1-69 for Orange Blossom Bridge.

- At Orange Blossom Bridge, the highest percent of months with water temperature outside the range was 100% and generally occurred in January through May, November and December in at least one water year type under the NAA and all alternatives (Table N.1-69). The lowest percent of months with water temperature outside the range was 0% which occurred in July of at least one water year type under the NAA and all alternatives. Combining water year types, the highest percent of months with water temperature outside the range was 100% in January under the NAA and all alternatives. The lowest percent of months with water temperature outside the range was 0% under the NAA, Alternative 1, Alternative 2 with TUCP, Alternative 3 and Alternative 4.

Table N.1-69. Percent (difference in percent relative to NAA) of months outside the 57.2°F – 78.8°F water temperature commonly observed range for non-spawning adult hardhead by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, year-round.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	3	100.0	95.5 (-4.5%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	6	95.5	86.4 (-9.1%)	72.7 (-22.7%)	72.7 (-22.7%)	72.7 (-22.7%)	72.7 (-22.7%)	90.9 (-4.5%)	72.7 (-22.7%)
W	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	8	27.3	22.7 (-4.5%)	36.4 (9.1%)	36.4 (9.1%)	36.4 (9.1%)	36.4 (9.1%)	13.6 (-13.6%)	36.4 (9.1%)
W	9	59.1	59.1 (0.0%)	59.1 (0.0%)	59.1 (0.0%)	59.1 (0.0%)	59.1 (0.0%)	45.5 (-13.6%)	59.1 (0.0%)
W	10	100.0	90.9 (-9.1%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	6	0.0	75.0 (75.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	16.7 (16.7%)	0.0 (0.0%)
AN	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
AN	9	0.0	0.0 (0.0%)	8.3 (8.3%)	8.3 (8.3%)	8.3 (8.3%)	8.3 (8.3%)	0.0 (0.0%)	8.3 (8.3%)
AN	10	100.0	75.0 (-25.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	5	100.0	100.0 (0.0%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)
BN	6	7.1	50.0 (42.9%)	0.0 (-7.1%)	0.0 (-7.1%)	0.0 (-7.1%)	0.0 (-7.1%)	14.3 (7.1%)	0.0 (-7.1%)
BN	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	10	100.0	57.1 (-42.9%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)
BN	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	3	88.2	94.1 (5.9%)	88.2 (0.0%)	88.2 (0.0%)	88.2 (0.0%)	88.2 (0.0%)	94.1 (5.9%)	88.2 (0.0%)
D	4	100.0	94.1 (-5.9%)	94.1 (-5.9%)	94.1 (-5.9%)	94.1 (-5.9%)	94.1 (-5.9%)	100.0 (0.0%)	94.1 (-5.9%)
D	5	88.2	94.1 (5.9%)	52.9 (-35.3%)	52.9 (-35.3%)	52.9 (-35.3%)	52.9 (-35.3%)	76.5 (-11.8%)	52.9 (-35.3%)
D	6	0.0	11.8 (11.8%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	5.9 (5.9%)	0.0 (0.0%)
D	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	10	88.2	29.4 (-58.8%)	82.4 (-5.9%)	82.4 (-5.9%)	82.4 (-5.9%)	82.4 (-5.9%)	82.4 (-5.9%)	82.4 (-5.9%)
D	11	88.2	88.2 (0.0%)	88.2 (0.0%)	88.2 (0.0%)	88.2 (0.0%)	88.2 (0.0%)	88.2 (0.0%)	88.2 (0.0%)
D	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	2	97.0	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)
C	3	90.9	72.7 (-18.2%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	87.9 (-3.0%)	90.9 (0.0%)
C	4	90.9	84.8 (-6.1%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)
C	5	18.2	60.6 (42.4%)	15.2 (-3.0%)	15.2 (-3.0%)	15.2 (-3.0%)	15.2 (-3.0%)	18.2 (0.0%)	15.2 (-3.0%)
C	6	0.0	0.0 (0.0%)	0.0 (0.0%)	3.0 (3.0%)	3.0 (3.0%)	3.0 (3.0%)	3.0 (3.0%)	0.0 (0.0%)
C	7	0.0	0.0 (0.0%)	0.0 (0.0%)	3.0 (3.0%)	3.0 (3.0%)	3.0 (3.0%)	0.0 (0.0%)	0.0 (0.0%)
C	8	0.0	0.0 (0.0%)	0.0 (0.0%)	3.0 (3.0%)	3.0 (3.0%)	3.0 (3.0%)	0.0 (0.0%)	0.0 (0.0%)
C	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	10	68.8	0.0 (-68.8%)	62.5 (-6.3%)	62.5 (-6.3%)	62.5 (-6.3%)	62.5 (-6.3%)	62.5 (-6.3%)	62.5 (-6.3%)
C	11	90.6	87.5 (-3.1%)	87.5 (-3.1%)	87.5 (-3.1%)	87.5 (-3.1%)	87.5 (-3.1%)	90.6 (0.0%)	87.5 (-3.1%)
C	12	100.0	96.9 (-3.1%)	96.9 (-3.1%)	96.9 (-3.1%)	96.9 (-3.1%)	96.9 (-3.1%)	100.0 (0.0%)	96.9 (-3.1%)
All	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	2	99.0	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)
All	3	94.9	88.8 (-6.1%)	94.9 (0.0%)	94.9 (0.0%)	94.9 (0.0%)	94.9 (0.0%)	94.9 (0.0%)	94.9 (0.0%)
All	4	96.9	93.9 (-3.1%)	95.9 (-1.0%)	95.9 (-1.0%)	95.9 (-1.0%)	95.9 (-1.0%)	96.9 (0.0%)	95.9 (-1.0%)
All	5	70.4	85.7 (15.3%)	62.2 (-8.2%)	62.2 (-8.2%)	62.2 (-8.2%)	62.2 (-8.2%)	67.3 (-3.1%)	62.2 (-8.2%)
All	6	22.4	37.8 (15.3%)	16.3 (-6.1%)	17.3 (-5.1%)	17.3 (-5.1%)	17.3 (-5.1%)	26.5 (4.1%)	16.3 (-6.1%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
All	7	0.0	0.0 (0.0%)	0.0 (0.0%)	1.0 (1.0%)	1.0 (1.0%)	1.0 (1.0%)	0.0 (0.0%)	0.0 (0.0%)
All	8	6.1	5.1 (-1.0%)	8.2 (2.0%)	9.2 (3.1%)	9.2 (3.1%)	9.2 (3.1%)	3.1 (-3.1%)	8.2 (2.0%)
All	9	13.3	13.3 (0.0%)	14.3 (1.0%)	14.3 (1.0%)	14.3 (1.0%)	14.3 (1.0%)	10.2 (-3.1%)	14.3 (1.0%)
All	10	87.6	43.3 (-44.3%)	83.5 (-4.1%)	83.5 (-4.1%)	83.5 (-4.1%)	83.5 (-4.1%)	83.5 (-4.1%)	83.5 (-4.1%)
All	11	94.9	93.9 (-1.0%)	93.9 (-1.0%)	93.9 (-1.0%)	93.9 (-1.0%)	93.9 (-1.0%)	94.9 (0.0%)	93.9 (-1.0%)
All	12	100.0	99.0 (-1.0%)	99.0 (-1.0%)	99.0 (-1.0%)	99.0 (-1.0%)	99.0 (-1.0%)	100.0 (0.0%)	99.0 (-1.0%)
W	All	81.8	79.5 (-2.3%)	80.7 (-1.1%)	80.7 (-1.1%)	80.7 (-1.1%)	80.7 (-1.1%)	79.2 (-2.7%)	80.7 (-1.1%)
AN	All	66.7	70.8 (4.2%)	67.4 (0.7%)	67.4 (0.7%)	67.4 (0.7%)	67.4 (0.7%)	68.1 (1.4%)	67.4 (0.7%)
BN	All	67.6	67.6 (0.0%)	65.9 (-1.8%)	65.9 (-1.8%)	65.9 (-1.8%)	65.9 (-1.8%)	67.1 (-0.6%)	65.9 (-1.8%)
D	All	62.7	59.3 (-3.4%)	58.8 (-3.9%)	58.8 (-3.9%)	58.8 (-3.9%)	58.8 (-3.9%)	62.3 (-0.5%)	58.8 (-3.9%)
C	All	54.5	49.9 (-4.6%)	53.2 (-1.3%)	53.9 (-0.5%)	53.9 (-0.5%)	53.9 (-0.5%)	53.9 (-0.5%)	53.2 (-1.3%)
All	All	65.4	63.3 (-2.1%)	63.9 (-1.5%)	64.2 (-1.3%)	64.2 (-1.3%)	64.2 (-1.3%)	64.7 (-0.8%)	63.9 (-1.5%)

N.1.3.7 Striped Bass

N.1.3.7.1 Spawning, Embryo Incubation, and Initial Rearing

Water temperature related effects on striped bass spawning, embryo incubation, and initial rearing in the Stanislaus River were evaluated by assessing the percent of months with water temperature outside the 59°F - 68°F optimal range (Moyle 2002) at Orange Blossom Bridge (Table N.1-2).

Results outside the 59°F - 68°F water temperature optimal range observed for spawning, embryo incubation, and initial rearing of striped bass are presented in Table N.1-70 for Orange Blossom Bridge.

- At Orange Blossom Bridge, the highest percent of months with water temperature outside the range was 100% and occurred during April and May in wet, above normal, and below normal water year types under the NAA and all alternatives (Table N.1-70). The lowest percent of months with water temperature outside the range was 0% and occurred in June of a dry water year type under the NAA, all Alternative 2 components, and Alternative 4. Combining water year types, the highest percent of months with water temperature outside the range was in April and the lowest was in June.

Table N.1-70. Percent (difference in percent relative to NAA) of months outside the 59°F - 68°F water temperature optimal range for spawning, embryo incubation, and initial rearing of striped bass by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, April through June.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	6	100.0	90.9 (-9.1%)	95.5 (-4.5%)	95.5 (-4.5%)	95.5 (-4.5%)	95.5 (-4.5%)	100.0 (0.0%)	95.5 (-4.5%)
AN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	6	66.7	83.3 (16.7%)	66.7 (0.0%)	66.7 (0.0%)	66.7 (0.0%)	66.7 (0.0%)	75.0 (8.3%)	66.7 (0.0%)
BN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	6	78.6	64.3 (-14.3%)	71.4 (-7.1%)	71.4 (-7.1%)	71.4 (-7.1%)	71.4 (-7.1%)	78.6 (0.0%)	71.4 (-7.1%)
D	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	5	100.0	94.1 (-5.9%)	88.2 (-11.8%)	88.2 (-11.8%)	88.2 (-11.8%)	88.2 (-11.8%)	88.2 (-11.8%)	88.2 (-11.8%)
D	6	0.0	35.3 (35.3%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	17.6 (17.6%)	0.0 (0.0%)
C	4	97.0	100.0 (3.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)
C	5	81.8	84.8 (3.0%)	81.8 (0.0%)	81.8 (0.0%)	81.8 (0.0%)	81.8 (0.0%)	81.8 (0.0%)	81.8 (0.0%)
C	6	0.0	3.0 (3.0%)	6.1 (6.1%)	9.1 (9.1%)	9.1 (9.1%)	9.1 (9.1%)	3.0 (3.0%)	6.1 (6.1%)
All	4	99.0	100.0 (1.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)
All	5	93.9	93.9 (0.0%)	91.8 (-2.0%)	91.8 (-2.0%)	91.8 (-2.0%)	91.8 (-2.0%)	91.8 (-2.0%)	91.8 (-2.0%)
All	6	41.8	46.9 (5.1%)	41.8 (0.0%)	42.9 (1.0%)	42.9 (1.0%)	42.9 (1.0%)	46.9 (5.1%)	41.8 (0.0%)
W	All	100.0	97.0 (-3.0%)	98.5 (-1.5%)	98.5 (-1.5%)	98.5 (-1.5%)	98.5 (-1.5%)	100.0 (0.0%)	98.5 (-1.5%)
AN	All	88.9	94.4 (5.6%)	88.9 (0.0%)	88.9 (0.0%)	88.9 (0.0%)	88.9 (0.0%)	91.7 (2.8%)	88.9 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
BN	All	92.9	88.1 (-4.8%)	90.5 (-2.4%)	90.5 (-2.4%)	90.5 (-2.4%)	90.5 (-2.4%)	92.9 (0.0%)	90.5 (-2.4%)
D	All	66.7	76.5 (9.8%)	62.7 (-3.9%)	62.7 (-3.9%)	62.7 (-3.9%)	62.7 (-3.9%)	68.6 (2.0%)	62.7 (-3.9%)
C	All	59.6	62.6 (3.0%)	61.6 (2.0%)	62.6 (3.0%)	62.6 (3.0%)	62.6 (3.0%)	60.6 (1.0%)	61.6 (2.0%)
All	All	78.2	80.3 (2.0%)	77.6 (-0.7%)	77.9 (-0.3%)	77.9 (-0.3%)	77.9 (-0.3%)	79.3 (1.0%)	77.6 (-0.7%)

N.1.3.7.2 Larvae, Fry, and Juvenile Rearing and Emigration

Water temperature related effects on striped bass larvae, fry, and juvenile rearing and emigration in the Stanislaus River were evaluated by assessing the percent of months with water temperature outside the 61°F - 71°F optimal range (Faye et al. 1983) at Orange Blossom Bridge and above confluence with the San Joaquin River (Table N.1-2).

Results outside the 61°F - 71°F water temperature optimal range for striped bass larvae, fry, and juvenile rearing and emigration are presented in Table N.1-71 for Orange Blossom Bridge and Table N.1-72 for above confluence with the San Joaquin River.

- At Orange Blossom Bridge, the highest percent of months with water temperature outside the range was 100% and occurred in October through May in at least one water year type under the NAA and all alternatives (Table N.1-71). The lowest percent of months with water temperature outside the range was 0% in July and August during a dry water year type under the NAA and all alternatives. Combing water year types, the highest percent of months with water temperature outside the range was 100% in December through February, and April under the NAA and all alternatives. The lowest percent was in July.
- Above the confluence of the San Joaquin River, the highest percent of months with water temperature outside the range was 100% and occurred in December for all water year types under the NAA and all alternatives (Table N.1-72). The lowest percent of months with water temperature outside the range was 0% and occurred in June of above normal water year type under the NAA and all alternatives (except Alternative 3), and May of a critical water year type under the NAA, all Alternative 2 components and Alternative 4. Combining water year types, the highest percent of months with water temperature outside the range was 100% in January and December under the NAA and all alternatives, the lowest percent was 17.5% which occurred in October under Alternative 1.

Table N.1-71. Percent (difference in percent relative to NAA) of months outside the 61°F - 71°F water temperature optimal range for striped bass larvae, fry, and juvenile rearing and emigration by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, year-round.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	6	100.0	95.5 (-4.5%)	95.5 (-4.5%)	95.5 (-4.5%)	95.5 (-4.5%)	95.5 (-4.5%)	100.0 (0.0%)	95.5 (-4.5%)
W	7	50.0	40.9 (-9.1%)	40.9 (-9.1%)	40.9 (-9.1%)	40.9 (-9.1%)	40.9 (-9.1%)	50.0 (0.0%)	40.9 (-9.1%)
W	8	81.8	72.7 (-9.1%)	86.4 (4.5%)	86.4 (4.5%)	86.4 (4.5%)	86.4 (4.5%)	63.6 (-18.2%)	86.4 (4.5%)
W	9	100.0	100.0 (0.0%)	95.5 (-4.5%)	95.5 (-4.5%)	95.5 (-4.5%)	95.5 (-4.5%)	100.0 (0.0%)	95.5 (-4.5%)
W	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	6	100.0	91.7 (-8.3%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	7	0.0	16.7 (16.7%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	8	16.7	25.0 (8.3%)	16.7 (0.0%)	16.7 (0.0%)	16.7 (0.0%)	16.7 (0.0%)	16.7 (0.0%)	16.7 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
AN	9	75.0	91.7 (16.7%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)
AN	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	6	85.7	92.9 (7.1%)	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)
BN	7	0.0	7.1 (7.1%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	8	21.4	35.7 (14.3%)	21.4 (0.0%)	21.4 (0.0%)	21.4 (0.0%)	21.4 (0.0%)	14.3 (-7.1%)	21.4 (0.0%)
BN	9	78.6	92.9 (14.3%)	78.6 (0.0%)	78.6 (0.0%)	78.6 (0.0%)	78.6 (0.0%)	78.6 (0.0%)	78.6 (0.0%)
BN	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	6	29.4	52.9 (23.5%)	29.4 (0.0%)	29.4 (0.0%)	29.4 (0.0%)	29.4 (0.0%)	47.1 (17.6%)	29.4 (0.0%)
D	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	9	52.9	52.9 (0.0%)	52.9 (0.0%)	52.9 (0.0%)	52.9 (0.0%)	52.9 (0.0%)	52.9 (0.0%)	52.9 (0.0%)
D	10	100.0	88.2 (-11.8%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	3	100.0	97.0 (-3.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	5	97.0	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)	97.0 (0.0%)
C	6	6.1	18.2 (12.1%)	12.1 (6.1%)	15.2 (9.1%)	15.2 (9.1%)	15.2 (9.1%)	6.1 (0.0%)	12.1 (6.1%)
C	7	0.0	0.0 (0.0%)	6.1 (6.1%)	9.1 (9.1%)	9.1 (9.1%)	9.1 (9.1%)	0.0 (0.0%)	6.1 (6.1%)
C	8	0.0	0.0 (0.0%)	6.1 (6.1%)	9.1 (9.1%)	9.1 (9.1%)	9.1 (9.1%)	0.0 (0.0%)	6.1 (6.1%)
C	9	33.3	33.3 (0.0%)	30.3 (-3.0%)	36.4 (3.0%)	36.4 (3.0%)	36.4 (3.0%)	33.3 (0.0%)	30.3 (-3.0%)
C	10	93.8	68.8 (-25.0%)	90.6 (-3.1%)	90.6 (-3.1%)	90.6 (-3.1%)	90.6 (-3.1%)	100.0 (6.3%)	90.6 (-3.1%)
C	11	96.9	100.0 (3.1%)	96.9 (0.0%)	96.9 (0.0%)	96.9 (0.0%)	96.9 (0.0%)	100.0 (3.1%)	96.9 (0.0%)
C	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	3	100.0	99.0 (-1.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	5	99.0	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)
All	6	54.1	61.2 (7.1%)	55.1 (1.0%)	56.1 (2.0%)	56.1 (2.0%)	56.1 (2.0%)	57.1 (3.1%)	55.1 (1.0%)

WYT	Month	NAA	Alt1	Alt2wTUCPwoVA	Alt2woTUCPwoVA	Alt2woTUCPDeltaVA	Alt2woTUCPAllVA	Alt3	Alt4
All	7	11.2	12.2 (1.0%)	11.2 (0.0%)	12.2 (1.0%)	12.2 (1.0%)	12.2 (1.0%)	11.2 (0.0%)	11.2 (0.0%)
All	8	23.5	24.5 (1.0%)	26.5 (3.1%)	27.6 (4.1%)	27.6 (4.1%)	27.6 (4.1%)	18.4 (-5.1%)	26.5 (3.1%)
All	9	63.3	67.3 (4.1%)	61.2 (-2.0%)	63.3 (0.0%)	63.3 (0.0%)	63.3 (0.0%)	63.3 (0.0%)	61.2 (-2.0%)
All	10	97.9	87.6 (-10.3%)	96.9 (-1.0%)	96.9 (-1.0%)	96.9 (-1.0%)	96.9 (-1.0%)	100.0 (2.1%)	96.9 (-1.0%)
All	11	99.0	100.0 (1.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	100.0 (1.0%)	99.0 (0.0%)
All	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	All	94.3	92.4 (-1.9%)	93.2 (-1.1%)	93.2 (-1.1%)	93.2 (-1.1%)	93.2 (-1.1%)	92.8 (-1.5%)	93.2 (-1.1%)
AN	All	82.6	85.4 (2.8%)	82.6 (0.0%)	82.6 (0.0%)	82.6 (0.0%)	82.6 (0.0%)	82.6 (0.0%)	82.6 (0.0%)
BN	All	82.4	85.9 (3.5%)	82.4 (0.0%)	82.4 (0.0%)	82.4 (0.0%)	82.4 (0.0%)	81.8 (-0.6%)	82.4 (0.0%)
D	All	73.5	74.5 (1.0%)	73.5 (0.0%)	73.5 (0.0%)	73.5 (0.0%)	73.5 (0.0%)	75.0 (1.5%)	73.5 (0.0%)
C	All	68.7	67.7 (-1.0%)	69.7 (1.0%)	71.0 (2.3%)	71.0 (2.3%)	71.0 (2.3%)	69.5 (0.8%)	69.7 (1.0%)
All	All	79.0	79.2 (0.3%)	79.1 (0.1%)	79.5 (0.5%)	79.5 (0.5%)	79.5 (0.5%)	79.1 (0.1%)	79.1 (0.1%)

Table N.1-72. Percent (difference in percent relative to NAA) of months outside the 61°F - 71°F water temperature optimal range for striped bass larvae, fry, and juvenile rearing and emigration by water year type and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, year-round.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	3	100.0	95.5 (-4.5%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	5	100.0	86.4 (-13.6%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	6	18.2	31.8 (13.6%)	18.2 (0.0%)	18.2 (0.0%)	18.2 (0.0%)	18.2 (0.0%)	59.1 (40.9%)	18.2 (0.0%)
W	7	45.5	50.0 (4.5%)	54.5 (9.1%)	59.1 (13.6%)	54.5 (9.1%)	54.5 (9.1%)	40.9 (-4.5%)	59.1 (13.6%)
W	8	54.5	50.0 (-4.5%)	50.0 (-4.5%)	50.0 (-4.5%)	50.0 (-4.5%)	50.0 (-4.5%)	68.2 (13.6%)	50.0 (-4.5%)
W	9	31.8	40.9 (9.1%)	50.0 (18.2%)	50.0 (18.2%)	50.0 (18.2%)	54.5 (22.7%)	31.8 (0.0%)	50.0 (18.2%)
W	10	90.9	72.7 (-18.2%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	90.9 (0.0%)	86.4 (-4.5%)	90.9 (0.0%)
W	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	8.3 (8.3%)	0.0 (0.0%)
AN	7	100.0	66.7 (-33.3%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	91.7 (-8.3%)	100.0 (0.0%)
AN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
AN	9	16.7	0.0 (-16.7%)	16.7 (0.0%)	16.7 (0.0%)	16.7 (0.0%)	16.7 (0.0%)	25.0 (8.3%)	16.7 (0.0%)
AN	10	91.7	0.0 (-91.7%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	91.7 (0.0%)	83.3 (-8.3%)	91.7 (0.0%)
AN	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	4	92.9	100.0 (7.1%)	85.7 (-7.1%)	85.7 (-7.1%)	85.7 (-7.1%)	85.7 (-7.1%)	92.9 (0.0%)	85.7 (-7.1%)
BN	5	85.7	78.6 (-7.1%)	71.4 (-14.3%)	71.4 (-14.3%)	71.4 (-14.3%)	71.4 (-14.3%)	78.6 (-7.1%)	71.4 (-14.3%)
BN	6	0.0	7.1 (7.1%)	14.3 (14.3%)	14.3 (14.3%)	14.3 (14.3%)	14.3 (14.3%)	14.3 (14.3%)	14.3 (14.3%)
BN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	9	28.6	14.3 (-14.3%)	28.6 (0.0%)	28.6 (0.0%)	28.6 (0.0%)	28.6 (0.0%)	28.6 (0.0%)	28.6 (0.0%)
BN	10	71.4	0.0 (-71.4%)	71.4 (0.0%)	71.4 (0.0%)	71.4 (0.0%)	71.4 (0.0%)	71.4 (0.0%)	71.4 (0.0%)
BN	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	3	82.4	94.1 (11.8%)	82.4 (0.0%)	82.4 (0.0%)	82.4 (0.0%)	82.4 (0.0%)	94.1 (11.8%)	82.4 (0.0%)
D	4	47.1	88.2 (41.2%)	35.3 (-11.8%)	35.3 (-11.8%)	35.3 (-11.8%)	35.3 (-11.8%)	76.5 (29.4%)	35.3 (-11.8%)
D	5	5.9	41.2 (35.3%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	47.1 (41.2%)	5.9 (0.0%)
D	6	29.4	11.8 (-17.6%)	47.1 (17.6%)	47.1 (17.6%)	47.1 (17.6%)	47.1 (17.6%)	23.5 (-5.9%)	47.1 (17.6%)
D	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	9	35.3	23.5 (-11.8%)	35.3 (0.0%)	35.3 (0.0%)	35.3 (0.0%)	35.3 (0.0%)	35.3 (0.0%)	35.3 (0.0%)
D	10	64.7	5.9 (-58.8%)	58.8 (-5.9%)	58.8 (-5.9%)	58.8 (-5.9%)	58.8 (-5.9%)	52.9 (-11.8%)	58.8 (-5.9%)
D	11	94.1	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)
D	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	2	100.0	97.0 (-3.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	3	66.7	69.7 (3.0%)	72.7 (6.1%)	72.7 (6.1%)	72.7 (6.1%)	72.7 (6.1%)	63.6 (-3.0%)	72.7 (6.1%)
C	4	12.1	42.4 (30.3%)	12.1 (0.0%)	12.1 (0.0%)	12.1 (0.0%)	12.1 (0.0%)	15.2 (3.0%)	12.1 (0.0%)
C	5	0.0	18.2 (18.2%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	6.1 (6.1%)	0.0 (0.0%)
C	6	72.7	36.4 (-36.4%)	66.7 (-6.1%)	63.6 (-9.1%)	63.6 (-9.1%)	63.6 (-9.1%)	75.8 (3.0%)	66.7 (-6.1%)
C	7	100.0	100.0 (0.0%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	100.0 (0.0%)	93.9 (-6.1%)
C	8	100.0	100.0 (0.0%)	93.9 (-6.1%)	90.9 (-9.1%)	90.9 (-9.1%)	90.9 (-9.1%)	100.0 (0.0%)	93.9 (-6.1%)
C	9	36.4	21.2 (-15.2%)	30.3 (-6.1%)	30.3 (-6.1%)	30.3 (-6.1%)	30.3 (-6.1%)	36.4 (0.0%)	30.3 (-6.1%)
C	10	25.0	0.0 (-25.0%)	25.0 (0.0%)	25.0 (0.0%)	25.0 (0.0%)	25.0 (0.0%)	21.9 (-3.1%)	25.0 (0.0%)
C	11	100.0	96.9 (-3.1%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	2	100.0	99.0 (-1.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	3	85.7	87.8 (2.0%)	87.8 (2.0%)	87.8 (2.0%)	87.8 (2.0%)	87.8 (2.0%)	86.7 (1.0%)	87.8 (2.0%)
All	4	60.2	78.6 (18.4%)	57.1 (-3.1%)	57.1 (-3.1%)	57.1 (-3.1%)	57.1 (-3.1%)	66.3 (6.1%)	57.1 (-3.1%)
All	5	48.0	56.1 (8.2%)	45.9 (-2.0%)	45.9 (-2.0%)	45.9 (-2.0%)	45.9 (-2.0%)	56.1 (8.2%)	45.9 (-2.0%)
All	6	33.7	22.4 (-11.2%)	36.7 (3.1%)	35.7 (2.0%)	35.7 (2.0%)	35.7 (2.0%)	45.9 (12.2%)	36.7 (3.1%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
All	7	87.8	84.7 (-3.1%)	87.8 (0.0%)	87.8 (0.0%)	86.7 (-1.0%)	86.7 (-1.0%)	85.7 (-2.0%)	88.8 (1.0%)
All	8	89.8	88.8 (-1.0%)	86.7 (-3.1%)	85.7 (-4.1%)	85.7 (-4.1%)	85.7 (-4.1%)	92.9 (3.1%)	86.7 (-3.1%)
All	9	31.6	22.4 (-9.2%)	33.7 (2.0%)	33.7 (2.0%)	33.7 (2.0%)	34.7 (3.1%)	32.7 (1.0%)	33.7 (2.0%)
All	10	61.9	17.5 (-44.3%)	60.8 (-1.0%)	60.8 (-1.0%)	60.8 (-1.0%)	60.8 (-1.0%)	56.7 (-5.2%)	60.8 (-1.0%)
All	11	99.0	98.0 (-1.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)
All	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	All	78.4	77.3 (-1.1%)	80.3 (1.9%)	80.7 (2.3%)	80.3 (1.9%)	80.7 (2.3%)	82.2 (3.8%)	80.7 (2.3%)
AN	All	84.0	72.2 (-11.8%)	84.0 (0.0%)	84.0 (0.0%)	84.0 (0.0%)	84.0 (0.0%)	84.0 (0.0%)	84.0 (0.0%)
BN	All	81.8	75.3 (-6.5%)	81.2 (-0.6%)	81.2 (-0.6%)	81.2 (-0.6%)	81.2 (-0.6%)	82.4 (0.6%)	81.2 (-0.6%)
D	All	71.6	71.6 (0.0%)	71.6 (0.0%)	71.6 (0.0%)	71.6 (0.0%)	71.6 (0.0%)	77.0 (5.4%)	71.6 (0.0%)
C	All	67.7	65.1 (-2.5%)	66.2 (-1.5%)	65.4 (-2.3%)	65.4 (-2.3%)	65.4 (-2.3%)	68.2 (0.5%)	66.2 (-1.5%)
All	All	74.8	71.3 (-3.5%)	74.6 (-0.2%)	74.5 (-0.3%)	74.4 (-0.4%)	74.5 (-0.3%)	76.9 (2.0%)	74.7 (-0.1%)

N.1.3.8 American Shad

N.1.3.8.1 Spawning and Larval Rearing

Water temperature related effects on American shad spawning and larval rearing in the Stanislaus River were evaluated by assessing the percent of months with water temperature outside the 62°F - 75°F optimal range (Moyle 2002) at Orange Blossom Bridge (Table N.1-2).

Results outside the 62°F - 75°F water temperature optimal range for American shad spawning larval rearing are presented in Table N.1-73 for Orange Blossom Bridge.

- The highest percent of months with water temperature outside the range was 100% in April and May in all water year types under the NAA and all alternatives (Table N.1-73). The lowest percent of months with water temperature outside the range was 39.4% in June of a critical water year under the NAA. Combining water year types, the highest percent of months was in April and May, the lowest was in June under the NAA and all alternatives.

Table N.1-73. Percent (difference in percent relative to NAA) of months outside the 62°F - 75°F water temperature optimal range for American shad spawning larval rearing by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, April through June.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	6	100.0	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)
D	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	6	58.8	70.6 (11.8%)	47.1 (-11.8%)	47.1 (-11.8%)	47.1 (-11.8%)	47.1 (-11.8%)	64.7 (5.9%)	47.1 (-11.8%)
C	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	6	39.4	57.6 (18.2%)	45.5 (6.1%)	45.5 (6.1%)	45.5 (6.1%)	45.5 (6.1%)	42.4 (3.0%)	45.5 (6.1%)
All	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	6	72.4	79.6 (7.1%)	71.4 (-1.0%)	71.4 (-1.0%)	71.4 (-1.0%)	71.4 (-1.0%)	73.5 (1.0%)	71.4 (-1.0%)
W	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
BN	All	100.0	97.6 (-2.4%)	97.6 (-2.4%)	97.6 (-2.4%)	97.6 (-2.4%)	97.6 (-2.4%)	97.6 (-2.4%)	97.6 (-2.4%)
D	All	86.3	90.2 (3.9%)	82.4 (-3.9%)	82.4 (-3.9%)	82.4 (-3.9%)	82.4 (-3.9%)	88.2 (2.0%)	82.4 (-3.9%)
C	All	79.8	85.9 (6.1%)	81.8 (2.0%)	81.8 (2.0%)	81.8 (2.0%)	81.8 (2.0%)	80.8 (1.0%)	81.8 (2.0%)
All	All	90.8	93.2 (2.4%)	90.5 (-0.3%)	90.5 (-0.3%)	90.5 (-0.3%)	90.5 (-0.3%)	91.2 (0.3%)	90.5 (-0.3%)

N.1.3.8.2 Juvenile Rearing and Emigration

Water temperature related effects on American shad juvenile rearing and emigration in the Stanislaus River were evaluated by assessing the percent of months with water temperature outside the 63°F - 77°F optimal range (Moyle 2002) at Orange Blossom Bridge and above the confluence with the San Joaquin River (Table N.1-2).

Results outside the 63°F - 77°F water temperature optimal range for American shad juvenile rearing and emigration are presented in Table N.1-74 for Orange Blossom Bridge and Table N.1-75 for above the confluence with the San Joaquin River.

- At Orange Blossom Bridge, the highest percent of months with water temperatures outside the range was 100% and occurred in October for all water year types under the NAA and all alternatives (Table N.1-74). The lowest percent of months with water temperatures outside the range was 21.2% and occurred during July in a critical water year under the NAA and Alternative 3. Combining water year types, the highest percent was in November the lowest was in July under the NAA and all alternatives.
- Above the confluence with the San Joaquin River, the highest percent of months with water temperature outside the range was 100% and occurred in November for all water year types under the NAA and all alternatives (Table N.1-75). The lowest percent of months with water temperature outside the range was 0% and occurred in July of a wet, above normal, and dry water year type under the NAA and all alternatives. August and September in above normal and below normal water year types were also completely within the water temperature range under the NAA and all alternatives. Combining water years, the highest percent was in November the lowest was in July under the NAA and all alternatives.

Table N.1-74. Percent (difference in percent relative to NAA) of months outside the 63°F - 77°F water temperature optimal range for American shad juvenile rearing and emigration by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, July through November.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	7	95.5	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)
W	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	7	75.0	91.7 (16.7%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)
AN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	7	78.6	92.9 (14.3%)	78.6 (0.0%)	78.6 (0.0%)	78.6 (0.0%)	78.6 (0.0%)	78.6 (0.0%)	78.6 (0.0%)
BN	8	85.7	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)
BN	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	7	35.3	41.2 (5.9%)	35.3 (0.0%)	35.3 (0.0%)	35.3 (0.0%)	35.3 (0.0%)	35.3 (0.0%)	35.3 (0.0%)
D	8	76.5	76.5 (0.0%)	70.6 (-5.9%)	70.6 (-5.9%)	70.6 (-5.9%)	70.6 (-5.9%)	70.6 (-5.9%)	70.6 (-5.9%)
D	9	94.1	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)
D	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	7	21.2	27.3 (6.1%)	27.3 (6.1%)	30.3 (9.1%)	30.3 (9.1%)	30.3 (9.1%)	21.2 (0.0%)	27.3 (6.1%)
C	8	60.6	57.6 (-3.0%)	60.6 (0.0%)	60.6 (0.0%)	60.6 (0.0%)	60.6 (0.0%)	57.6 (-3.0%)	60.6 (0.0%)
C	9	84.8	84.8 (0.0%)	81.8 (-3.0%)	81.8 (-3.0%)	81.8 (-3.0%)	81.8 (-3.0%)	84.8 (0.0%)	81.8 (-3.0%)
C	10	96.9	87.5 (-9.4%)	96.9 (0.0%)	96.9 (0.0%)	96.9 (0.0%)	96.9 (0.0%)	100.0 (3.1%)	96.9 (0.0%)
C	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	7	55.1	62.2 (7.1%)	57.1 (2.0%)	58.2 (3.1%)	58.2 (3.1%)	58.2 (3.1%)	55.1 (0.0%)	57.1 (2.0%)
All	8	80.6	79.6 (-1.0%)	79.6 (-1.0%)	79.6 (-1.0%)	79.6 (-1.0%)	79.6 (-1.0%)	78.6 (-2.0%)	79.6 (-1.0%)
All	9	93.9	93.9 (0.0%)	92.9 (-1.0%)	92.9 (-1.0%)	92.9 (-1.0%)	92.9 (-1.0%)	93.9 (0.0%)	92.9 (-1.0%)
All	10	99.0	95.9 (-3.1%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	100.0 (1.0%)	99.0 (0.0%)
All	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	All	99.1	99.1 (0.0%)	99.1 (0.0%)	99.1 (0.0%)	99.1 (0.0%)	99.1 (0.0%)	99.1 (0.0%)	99.1 (0.0%)
AN	All	95.0	98.3 (3.3%)	95.0 (0.0%)	95.0 (0.0%)	95.0 (0.0%)	95.0 (0.0%)	95.0 (0.0%)	95.0 (0.0%)
BN	All	93.0	95.8 (2.8%)	93.0 (0.0%)	93.0 (0.0%)	93.0 (0.0%)	93.0 (0.0%)	93.0 (0.0%)	93.0 (0.0%)
D	All	81.2	82.4 (1.2%)	80.0 (-1.2%)	80.0 (-1.2%)	80.0 (-1.2%)	80.0 (-1.2%)	80.0 (-1.2%)	80.0 (-1.2%)
C	All	72.4	71.2 (-1.2%)	73.0 (0.6%)	73.6 (1.2%)	73.6 (1.2%)	73.6 (1.2%)	72.4 (0.0%)	73.0 (0.6%)
All	All	85.7	86.3 (0.6%)	85.7 (0.0%)	85.9 (0.2%)	85.9 (0.2%)	85.9 (0.2%)	85.5 (-0.2%)	85.7 (0.0%)

Table N.1-75. Percent (difference in percent relative to NAA) of months outside the 63°F - 77°F water temperature optimal range for American shad juvenile rearing and emigration by water year type and month, and for all years combined, Stanislaus River above confluence with San Joaquin River, July through November.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
W	8	13.6	13.6 (0.0%)	13.6 (0.0%)	13.6 (0.0%)	13.6 (0.0%)	13.6 (0.0%)	4.5 (-9.1%)	13.6 (0.0%)
W	9	50.0	54.5 (4.5%)	59.1 (9.1%)	59.1 (9.1%)	59.1 (9.1%)	59.1 (9.1%)	36.4 (-13.6%)	59.1 (9.1%)
W	10	100.0	90.9 (-9.1%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
AN	10	100.0	66.7 (-33.3%)	91.7 (-8.3%)	91.7 (-8.3%)	91.7 (-8.3%)	91.7 (-8.3%)	91.7 (-8.3%)	91.7 (-8.3%)
AN	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	7	7.1	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)	7.1 (0.0%)
BN	8	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	10	92.9	71.4 (-21.4%)	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)
BN	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	7	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	8	5.9	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)	5.9 (0.0%)
D	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	10	88.2	47.1 (-41.2%)	76.5 (-11.8%)	76.5 (-11.8%)	76.5 (-11.8%)	76.5 (-11.8%)	76.5 (-11.8%)	76.5 (-11.8%)
D	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	7	18.2	6.1 (-12.1%)	15.2 (-3.0%)	15.2 (-3.0%)	15.2 (-3.0%)	15.2 (-3.0%)	21.2 (3.0%)	15.2 (-3.0%)
C	8	3.0	3.0 (0.0%)	6.1 (3.0%)	6.1 (3.0%)	6.1 (3.0%)	6.1 (3.0%)	9.1 (6.1%)	3.0 (0.0%)
C	9	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	10	71.9	18.8 (-53.1%)	75.0 (3.1%)	75.0 (3.1%)	75.0 (3.1%)	75.0 (3.1%)	71.9 (0.0%)	75.0 (3.1%)
C	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	7	7.1	3.1 (-4.1%)	6.1 (-1.0%)	6.1 (-1.0%)	6.1 (-1.0%)	6.1 (-1.0%)	8.2 (1.0%)	6.1 (-1.0%)
All	8	5.1	5.1 (0.0%)	6.1 (1.0%)	6.1 (1.0%)	6.1 (1.0%)	6.1 (1.0%)	5.1 (0.0%)	5.1 (0.0%)
All	9	11.2	12.2 (1.0%)	13.3 (2.0%)	13.3 (2.0%)	13.3 (2.0%)	13.3 (2.0%)	8.2 (-3.1%)	13.3 (2.0%)
All	10	87.6	53.6 (-34.0%)	85.6 (-2.1%)	85.6 (-2.1%)	85.6 (-2.1%)	85.6 (-2.1%)	84.5 (-3.1%)	85.6 (-2.1%)
All	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	All	52.7	51.8 (-0.9%)	54.5 (1.8%)	54.5 (1.8%)	54.5 (1.8%)	54.5 (1.8%)	48.2 (-4.5%)	54.5 (1.8%)
AN	All	40.0	33.3 (-6.7%)	38.3 (-1.7%)	38.3 (-1.7%)	38.3 (-1.7%)	38.3 (-1.7%)	38.3 (-1.7%)	38.3 (-1.7%)
BN	All	40.8	36.6 (-4.2%)	40.8 (0.0%)	40.8 (0.0%)	40.8 (0.0%)	40.8 (0.0%)	40.8 (0.0%)	40.8 (0.0%)
D	All	38.8	30.6 (-8.2%)	36.5 (-2.4%)	36.5 (-2.4%)	36.5 (-2.4%)	36.5 (-2.4%)	36.5 (-2.4%)	36.5 (-2.4%)
C	All	38.0	25.2 (-12.9%)	38.7 (0.6%)	38.7 (0.6%)	38.7 (0.6%)	38.7 (0.6%)	39.9 (1.8%)	38.0 (0.0%)
All	All	42.1	34.8 (-7.4%)	42.1 (0.0%)	42.1 (0.0%)	42.1 (0.0%)	42.1 (0.0%)	41.1 (-1.0%)	41.9 (-0.2%)

N.1.3.9 Threadfin Shad

N.1.3.9.1 Spawning

Water temperature related effects on threadfin shad spawning in the Stanislaus River were evaluated by assessing the percent of months with water temperature outside the 63°F - 77°F optimal range (Moyle 2002) at Orange Blossom Bridge (Table N.1-2).

Results outside the 63°F - 77°F water temperature optimal range for threadfin shad spawning are presented in Table N.1-76 for Orange Blossom Bridge.

- At Orange Blossom Bridge, the highest percent of months with water temperature outside the range was 100% and occurred in April and May for all water year types under the NAA and all alternatives (Table N.1-76). The lowest percent of months outside the range was 21.2% which occurred in July of a critical water year under the NAA and Alternative 3. Combining water year types, the highest percent of months with water temperature outside the range was in April and May, the lowest was July under the NAA and all alternatives.

Table N.1-76. Percent (difference in percent relative to NAA) of months outside the 63°F - 77°F water temperature optimal range for threadfin shad spawning by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, April through August.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	7	95.5	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)
W	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	7	75.0	91.7 (16.7%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)
AN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	6	100.0	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)
BN	7	78.6	92.9 (14.3%)	78.6 (0.0%)	78.6 (0.0%)	78.6 (0.0%)	78.6 (0.0%)	78.6 (0.0%)	78.6 (0.0%)
BN	8	85.7	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)
D	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	6	94.1	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)
D	7	35.3	41.2 (5.9%)	35.3 (0.0%)	35.3 (0.0%)	35.3 (0.0%)	35.3 (0.0%)	35.3 (0.0%)	35.3 (0.0%)
D	8	76.5	76.5 (0.0%)	70.6 (-5.9%)	70.6 (-5.9%)	70.6 (-5.9%)	70.6 (-5.9%)	70.6 (-5.9%)	70.6 (-5.9%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
C	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	6	78.8	81.8 (3.0%)	84.8 (6.1%)	84.8 (6.1%)	84.8 (6.1%)	84.8 (6.1%)	78.8 (0.0%)	84.8 (6.1%)
C	7	21.2	27.3 (6.1%)	27.3 (6.1%)	30.3 (9.1%)	30.3 (9.1%)	30.3 (9.1%)	21.2 (0.0%)	27.3 (6.1%)
C	8	60.6	57.6 (-3.0%)	60.6 (0.0%)	60.6 (0.0%)	60.6 (0.0%)	60.6 (0.0%)	57.6 (-3.0%)	60.6 (0.0%)
All	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	6	91.8	91.8 (0.0%)	92.9 (1.0%)	92.9 (1.0%)	92.9 (1.0%)	92.9 (1.0%)	90.8 (-1.0%)	92.9 (1.0%)
All	7	55.1	62.2 (7.1%)	57.1 (2.0%)	58.2 (3.1%)	58.2 (3.1%)	58.2 (3.1%)	55.1 (0.0%)	57.1 (2.0%)
All	8	80.6	79.6 (-1.0%)	79.6 (-1.0%)	79.6 (-1.0%)	79.6 (-1.0%)	79.6 (-1.0%)	78.6 (-2.0%)	79.6 (-1.0%)
W	All	99.1	99.1 (0.0%)	99.1 (0.0%)	99.1 (0.0%)	99.1 (0.0%)	99.1 (0.0%)	99.1 (0.0%)	99.1 (0.0%)
AN	All	95.0	98.3 (3.3%)	95.0 (0.0%)	95.0 (0.0%)	95.0 (0.0%)	95.0 (0.0%)	95.0 (0.0%)	95.0 (0.0%)
BN	All	92.9	94.3 (1.4%)	91.4 (-1.4%)	91.4 (-1.4%)	91.4 (-1.4%)	91.4 (-1.4%)	91.4 (-1.4%)	91.4 (-1.4%)
D	All	81.2	82.4 (1.2%)	80.0 (-1.2%)	80.0 (-1.2%)	80.0 (-1.2%)	80.0 (-1.2%)	80.0 (-1.2%)	80.0 (-1.2%)
C	All	72.1	73.3 (1.2%)	74.5 (2.4%)	75.2 (3.0%)	75.2 (3.0%)	75.2 (3.0%)	71.5 (-0.6%)	74.5 (2.4%)
All	All	85.5	86.7 (1.2%)	85.9 (0.4%)	86.1 (0.6%)	86.1 (0.6%)	86.1 (0.6%)	84.9 (-0.6%)	85.9 (0.4%)

N.1.3.9.2 Non-spawning Adult

Water temperature related effects on non-spawning adult threadfin shad in the Stanislaus River were evaluated by assessing the percent of months with water temperature outside the 63°F - 77°F optimal range (Moyle 2002) at Orange Blossom Bridge (Table N.1-2).

Results outside the 63°F - 77°F water temperature optimal range for non-spawning adult threadfin shad are presented in Table N.1-77 for Orange Blossom Bridge.

- At Orange Blossom Bridge, the highest percent of months with water temperatures outside the range was 100% which occurred in January through May, and November and December for each water year type under the NAA and all alternatives (Table N.1-77). The lowest percent of months with water temperature outside the range was 21.2%, which occurred in July in a critical water year type under the NAA and Alternative 3. Combining water year types, the highest percent of months with water temperature outside the range occurred January through May, as well as November and December under the NAA and all alternatives. The lowest percent was in July under the NAA and Alternative 3.

Table N.1-77. Percent (difference in percent relative to NAA) of months outside the 63°F - 77°F water temperature optimal range for on-spawning adult threadfin shad by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, year-round.

WYT	Month	NAA	Alt1	Alt2wTUCPwoVA	Alt2woTUCPwoVA	Alt2woTUCPDeltaVA	Alt2woTUCPAllVA	Alt3	Alt4
W	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	7	95.5	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)
W	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	7	75.0	91.7 (16.7%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)
AN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
AN	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	6	100.0	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)	92.9 (-7.1%)
BN	7	78.6	92.9 (14.3%)	78.6 (0.0%)	78.6 (0.0%)	78.6 (0.0%)	78.6 (0.0%)	78.6 (0.0%)	78.6 (0.0%)
BN	8	85.7	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)	85.7 (0.0%)
BN	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	6	94.1	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)
D	7	35.3	41.2 (5.9%)	35.3 (0.0%)	35.3 (0.0%)	35.3 (0.0%)	35.3 (0.0%)	35.3 (0.0%)	35.3 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	8	76.5	76.5 (0.0%)	70.6 (-5.9%)	70.6 (-5.9%)	70.6 (-5.9%)	70.6 (-5.9%)	70.6 (-5.9%)	70.6 (-5.9%)
D	9	94.1	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)	94.1 (0.0%)
D	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	6	78.8	81.8 (3.0%)	84.8 (6.1%)	84.8 (6.1%)	84.8 (6.1%)	84.8 (6.1%)	78.8 (0.0%)	84.8 (6.1%)
C	7	21.2	27.3 (6.1%)	27.3 (6.1%)	30.3 (9.1%)	30.3 (9.1%)	30.3 (9.1%)	21.2 (0.0%)	27.3 (6.1%)
C	8	60.6	57.6 (-3.0%)	60.6 (0.0%)	60.6 (0.0%)	60.6 (0.0%)	60.6 (0.0%)	57.6 (-3.0%)	60.6 (0.0%)
C	9	84.8	84.8 (0.0%)	81.8 (-3.0%)	81.8 (-3.0%)	81.8 (-3.0%)	81.8 (-3.0%)	84.8 (0.0%)	81.8 (-3.0%)
C	10	96.9	87.5 (-9.4%)	96.9 (0.0%)	96.9 (0.0%)	96.9 (0.0%)	96.9 (0.0%)	100.0 (3.1%)	96.9 (0.0%)
C	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	6	91.8	91.8 (0.0%)	92.9 (1.0%)	92.9 (1.0%)	92.9 (1.0%)	92.9 (1.0%)	90.8 (-1.0%)	92.9 (1.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
All	7	55.1	62.2 (7.1%)	57.1 (2.0%)	58.2 (3.1%)	58.2 (3.1%)	58.2 (3.1%)	55.1 (0.0%)	57.1 (2.0%)
All	8	80.6	79.6 (-1.0%)	79.6 (-1.0%)	79.6 (-1.0%)	79.6 (-1.0%)	79.6 (-1.0%)	78.6 (-2.0%)	79.6 (-1.0%)
All	9	93.9	93.9 (0.0%)	92.9 (-1.0%)	92.9 (-1.0%)	92.9 (-1.0%)	92.9 (-1.0%)	93.9 (0.0%)	92.9 (-1.0%)
All	10	99.0	95.9 (-3.1%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	99.0 (0.0%)	100.0 (1.0%)	99.0 (0.0%)
All	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	All	99.6	99.6 (0.0%)	99.6 (0.0%)	99.6 (0.0%)	99.6 (0.0%)	99.6 (0.0%)	99.6 (0.0%)	99.6 (0.0%)
AN	All	97.9	99.3 (1.4%)	97.9 (0.0%)	97.9 (0.0%)	97.9 (0.0%)	97.9 (0.0%)	97.9 (0.0%)	97.9 (0.0%)
BN	All	97.1	97.6 (0.6%)	96.5 (-0.6%)	96.5 (-0.6%)	96.5 (-0.6%)	96.5 (-0.6%)	96.5 (-0.6%)	96.5 (-0.6%)
D	All	91.7	92.2 (0.5%)	91.2 (-0.5%)	91.2 (-0.5%)	91.2 (-0.5%)	91.2 (-0.5%)	91.2 (-0.5%)	91.2 (-0.5%)
C	All	86.8	86.5 (-0.3%)	87.5 (0.8%)	87.8 (1.0%)	87.8 (1.0%)	87.8 (1.0%)	86.8 (0.0%)	87.5 (0.8%)
All	All	93.4	93.6 (0.3%)	93.4 (0.1%)	93.5 (0.2%)	93.5 (0.2%)	93.5 (0.2%)	93.2 (-0.2%)	93.4 (0.1%)

N.1.3.10 Largemouth Bass

N.1.3.10.1 Spawning

Water temperature related effects on largemouth bass spawning in the Stanislaus River were evaluated by assessing the percent of months with water temperature outside the 52.7°F – 84.2°F observed range (Stuber et al. 1982) at Orange Blossom Bridge (Table N.1-2).

Results outside the 52.7°F – 84.2°F water temperature optimal range for largemouth bass spawning are presented in Table N.1-78 for Orange Blossom Bridge.

- At Orange Blossom Bridge, the highest percent of months with water temperature outside the range was 95.5% and occurred in May of a wet water year type under the NAA, all Alternative 2 components, Alternative 3, and Alternative 4 (Table N.1-78). The lowest percent of months with water temperatures outside the limit was 0% and occurred in June of at least one water year type under the NAA and all alternatives. Combining water year types, the highest percent outside the range was in April, the lowest was in June.

Table N.1-78. Percent (difference in percent relative to NAA) of months outside the 52.7°F – 84.5°F water temperature observed range for largemouth bass spawning by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, April through June.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	4	95.5	86.4 (-9.1%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)	95.5 (0.0%)
W	5	63.6	50.0 (-13.6%)	63.6 (0.0%)	63.6 (0.0%)	63.6 (0.0%)	63.6 (0.0%)	63.6 (0.0%)	63.6 (0.0%)
W	6	0.0	4.5 (4.5%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	9.1 (9.1%)	0.0 (0.0%)
AN	4	83.3	83.3 (0.0%)	75.0 (-8.3%)	75.0 (-8.3%)	75.0 (-8.3%)	75.0 (-8.3%)	83.3 (0.0%)	75.0 (-8.3%)
AN	5	8.3	16.7 (8.3%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)	8.3 (0.0%)
AN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
BN	4	64.3	64.3 (0.0%)	50.0 (-14.3%)	42.9 (-21.4%)	42.9 (-21.4%)	42.9 (-21.4%)	64.3 (0.0%)	50.0 (-14.3%)
BN	5	7.1	0.0 (-7.1%)	0.0 (-7.1%)	0.0 (-7.1%)	0.0 (-7.1%)	0.0 (-7.1%)	7.1 (0.0%)	0.0 (-7.1%)
BN	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
D	4	0.0	29.4 (29.4%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	29.4 (29.4%)	0.0 (0.0%)
D	5	0.0	5.9 (5.9%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	5.9 (5.9%)	0.0 (0.0%)
D	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	4	0.0	3.0 (3.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	3.0 (3.0%)	0.0 (0.0%)
C	5	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
C	6	0.0	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)
All	4	40.8	44.9 (4.1%)	37.8 (-3.1%)	36.7 (-4.1%)	36.7 (-4.1%)	36.7 (-4.1%)	46.9 (6.1%)	37.8 (-3.1%)
All	5	16.3	14.3 (-2.0%)	15.3 (-1.0%)	15.3 (-1.0%)	15.3 (-1.0%)	15.3 (-1.0%)	17.3 (1.0%)	15.3 (-1.0%)
All	6	0.0	1.0 (1.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	2.0 (2.0%)	0.0 (0.0%)
W	All	53.0	47.0 (-6.1%)	53.0 (0.0%)	53.0 (0.0%)	53.0 (0.0%)	53.0 (0.0%)	56.1 (3.0%)	53.0 (0.0%)
AN	All	30.6	33.3 (2.8%)	27.8 (-2.8%)	27.8 (-2.8%)	27.8 (-2.8%)	27.8 (-2.8%)	30.6 (0.0%)	27.8 (-2.8%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
BN	All	23.8	21.4 (-2.4%)	16.7 (-7.1%)	14.3 (-9.5%)	14.3 (-9.5%)	14.3 (-9.5%)	23.8 (0.0%)	16.7 (-7.1%)
D	All	0.0	11.8 (11.8%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	11.8 (11.8%)	0.0 (0.0%)
C	All	0.0	1.0 (1.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	1.0 (1.0%)	0.0 (0.0%)
All	All	19.0	20.1 (1.0%)	17.7 (-1.4%)	17.3 (-1.7%)	17.3 (-1.7%)	17.3 (-1.7%)	22.1 (3.1%)	17.7 (-1.4%)

N.1.3.10.2 Non-spawning Adult

Water temperature related effects on non-spawning adult largemouth bass in the Stanislaus River were evaluated by assessing the percent of months with water temperature outside the 77°F - 86°F optimal range for growth (Moyle 2002) at Orange Blossom Bridge (Table N.1-2).

Results outside the 77°F - 86°F water temperature optimal range for growth of non-spawning adult largemouth bass are presented in Table N.1-79 for Orange Blossom Bridge.

- At Orange Blossom Bridge, all months, under all water year types had water temperatures outside the optimal temperature range for growth of non-spawning adult largemouth bass under the NAA and all alternatives (Table N.1-79).

Table N.1-79. Percent (difference in percent relative to NAA) of months outside the 77°F - 86°F water temperature optimal range for growth of non-spawning adult largemouth bass by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, year-round.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
AN	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
All	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

N.1.3.11 Smallmouth Bass

N.1.3.11.1 Non-spawning Adult

Water temperature related effects on non-spawning adult smallmouth bass in the Stanislaus River were evaluated by assessing: (1) the percent of months with water temperature above the 66°F lower end of observed summer-time range (Moyle 2002); and (2) the percent of months with water temperature outside the 77°F - 80°F optimal range for growth (Moyle 2002) at Orange Blossom Bridge (Table N.1-2).

Results above the 66°F water temperature lower end of observed summer-time range of non-spawning adult smallmouth bass are presented in Table N.1-80 for Orange Blossom Bridge.

- At Orange Blossom Bridge, the highest percent of months with water temperatures above the lower end of observed summer-time range of non-spawning adult smallmouth bass was 100% and occurred in June through August of at least one water year type under the NAA and all alternatives (Table N.1-80). The lowest percent of months with water temperatures above the lower end was 90.9% in July of a critical water year under the NAA, Alternative 1, and Alternative 3. Combining water year types, the highest percent of months above the lower end was 100% in June under Alternative 3, the lowest percent was 95.9% in July under the NAA, Alternative 1 and Alternative 3.

Results outside the 77°F - 80°F water temperature optimal range for growth of non-spawning adult smallmouth bass are presented in Table N.1-81 for Orange Blossom Bridge.

- At Orange Blossom Bridge, all months and water year types were outside the optimal water temperature range under the NAA and all alternatives (Table N.1-81).

Table N.1-80. Percent (difference in percent relative to NAA) of months above the 66°F water temperature lower end of observed summer-time range of non-spawning adult smallmouth bass by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, June through August.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	7	92.9	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)	92.9 (0.0%)
BN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	6	97.0	100.0 (3.0%)	93.9 (-3.0%)	93.9 (-3.0%)	93.9 (-3.0%)	93.9 (-3.0%)	97.0 (0.0%)	93.9 (-3.0%)
C	7	90.9	90.9 (0.0%)	93.9 (3.0%)	93.9 (3.0%)	93.9 (3.0%)	93.9 (3.0%)	90.9 (0.0%)	93.9 (3.0%)
C	8	97.0	97.0 (0.0%)	93.9 (-3.0%)	93.9 (-3.0%)	93.9 (-3.0%)	93.9 (-3.0%)	97.0 (0.0%)	93.9 (-3.0%)
All	6	99.0	100.0 (1.0%)	98.0 (-1.0%)	98.0 (-1.0%)	98.0 (-1.0%)	98.0 (-1.0%)	99.0 (0.0%)	98.0 (-1.0%)
All	7	95.9	95.9 (0.0%)	96.9 (1.0%)	96.9 (1.0%)	96.9 (1.0%)	96.9 (1.0%)	95.9 (0.0%)	96.9 (1.0%)
All	8	99.0	99.0 (0.0%)	98.0 (-1.0%)	98.0 (-1.0%)	98.0 (-1.0%)	98.0 (-1.0%)	99.0 (0.0%)	98.0 (-1.0%)
W	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
BN	All	97.6	97.6 (0.0%)	97.6 (0.0%)	97.6 (0.0%)	97.6 (0.0%)	97.6 (0.0%)	97.6 (0.0%)	97.6 (0.0%)
D	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	All	94.9	96.0 (1.0%)	93.9 (-1.0%)	93.9 (-1.0%)	93.9 (-1.0%)	93.9 (-1.0%)	94.9 (0.0%)	93.9 (-1.0%)
All	All	98.0	98.3 (0.3%)	97.6 (-0.3%)	97.6 (-0.3%)	97.6 (-0.3%)	97.6 (-0.3%)	98.0 (0.0%)	97.6 (-0.3%)

Table N.1-81. Percent (difference in percent relative to NAA) of months outside the 77°F - 80°F water temperature optimal range for growth of non-spawning adult smallmouth bass by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, year-round.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
AN	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
D	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
All	1	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	2	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	3	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	9	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	10	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	11	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	12	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

N.1.3.12 Spotted Bass

N.1.3.12.1 Spawning

Water temperature related effects on spotted bass spawning in the Stanislaus River were evaluated by assessing the percent of months with water temperature outside the 58.1°F – 73.4°F (Aasen and Henry 1981) at Orange Blossom Bridge (Table N.1-2).

Results outside the 58.1°F – 73.4°F water temperature optimal range for spotted bass spawning are presented in Table N.1-82 for Orange Blossom Bridge.

- At Orange Blossom Bridge, the highest percent of months with water temperature outside the range was 100% and occurred in April and May of at least one water year type under the NAA and all alternatives (Table N.1-82). The lowest percent of months outside the range was 0% which occurred June of a dry water year type under the NAA, all Alternative 2 components, and Alternative 4. Combining water year types, the highest percentage of months outside the water temperature range was in April and the lowest was in May.

Table N.1-82. Percent (difference in percent relative to NAA) of months outside the 58.1°F – 73.4°F water temperature for spotted bass spawning by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, April through June.

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	6	100.0	86.4 (-13.6%)	77.3 (-22.7%)	77.3 (-22.7%)	77.3 (-22.7%)	77.3 (-22.7%)	90.9 (-9.1%)	77.3 (-22.7%)
AN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	6	25.0	75.0 (50.0%)	25.0 (0.0%)	25.0 (0.0%)	25.0 (0.0%)	25.0 (0.0%)	58.3 (33.3%)	25.0 (0.0%)
BN	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	5	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	6	14.3	57.1 (42.9%)	7.1 (-7.1%)	7.1 (-7.1%)	7.1 (-7.1%)	7.1 (-7.1%)	21.4 (7.1%)	7.1 (-7.1%)
D	4	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	5	100.0	94.1 (-5.9%)	76.5 (-23.5%)	76.5 (-23.5%)	76.5 (-23.5%)	76.5 (-23.5%)	82.4 (-17.6%)	76.5 (-23.5%)
D	6	0.0	23.5 (23.5%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	0.0 (0.0%)	5.9 (5.9%)	0.0 (0.0%)
C	4	93.9	93.9 (0.0%)	93.9 (0.0%)	93.9 (0.0%)	93.9 (0.0%)	93.9 (0.0%)	93.9 (0.0%)	93.9 (0.0%)
C	5	60.6	69.7 (9.1%)	57.6 (-3.0%)	57.6 (-3.0%)	57.6 (-3.0%)	57.6 (-3.0%)	60.6 (0.0%)	57.6 (-3.0%)
C	6	0.0	0.0 (0.0%)	6.1 (6.1%)	9.1 (9.1%)	9.1 (9.1%)	9.1 (9.1%)	3.0 (3.0%)	6.1 (6.1%)
All	4	98.0	98.0 (0.0%)	98.0 (0.0%)	98.0 (0.0%)	98.0 (0.0%)	98.0 (0.0%)	98.0 (0.0%)	98.0 (0.0%)
All	5	86.7	88.8 (2.0%)	81.6 (-5.1%)	81.6 (-5.1%)	81.6 (-5.1%)	81.6 (-5.1%)	83.7 (-3.1%)	81.6 (-5.1%)
All	6	27.6	40.8 (13.3%)	23.5 (-4.1%)	24.5 (-3.1%)	24.5 (-3.1%)	24.5 (-3.1%)	32.7 (5.1%)	23.5 (-4.1%)
W	All	100.0	95.5 (-4.5%)	92.4 (-7.6%)	92.4 (-7.6%)	92.4 (-7.6%)	92.4 (-7.6%)	97.0 (-3.0%)	92.4 (-7.6%)
AN	All	75.0	91.7 (16.7%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)	75.0 (0.0%)	86.1 (11.1%)	75.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
BN	All	71.4	85.7 (14.3%)	69.0 (-2.4%)	69.0 (-2.4%)	69.0 (-2.4%)	69.0 (-2.4%)	73.8 (2.4%)	69.0 (-2.4%)
D	All	66.7	72.5 (5.9%)	58.8 (-7.8%)	58.8 (-7.8%)	58.8 (-7.8%)	58.8 (-7.8%)	62.7 (-3.9%)	58.8 (-7.8%)
C	All	51.5	54.5 (3.0%)	52.5 (1.0%)	53.5 (2.0%)	53.5 (2.0%)	53.5 (2.0%)	52.5 (1.0%)	52.5 (1.0%)
All	All	70.7	75.9 (5.1%)	67.7 (-3.1%)	68.0 (-2.7%)	68.0 (-2.7%)	68.0 (-2.7%)	71.4 (0.7%)	67.7 (-3.1%)

N.1.3.12.2 Non-spawning Adult

Water temperature related effects on non-spawning adult spotted bass in the Stanislaus River were evaluated by assessing the percent of months with water temperature outside the 75°F - 87°F preferred summer-time range (Moyle 2002) at Orange Blossom Bridge (Table N.1-2).

Results outside the 75°F - 87°F water temperature preferred summertime range for non-spawning adult spotted bass are presented in Table N.1-83 for Orange Blossom Bridge.

- At Orange Blossom Bridge, all months in all water year types had water temperatures outside the preferred summertime range for non-spawning adult spotted bass under the NAA and all alternatives.

Table N.1-83. Percent (difference in percent relative to NAA) of months outside the 75°F - 87°F water temperature preferred summer-time range for non-spawning adult spotted bass by water year type and month, and for all years combined, Stanislaus River at Orange Blossom Bridge, June through August

WYT	Month	NAA	Alt1	Alt2wTUCP woVA	Alt2woTUCP woVA	Alt2woTUCP DeltaVA	Alt2woTUCP AllVA	Alt3	Alt4
W	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
BN	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	6	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	7	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	8	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
W	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
AN	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

WYT	Month	NAA	Alt1	Alt2wTUCPwoVA	Alt2woTUCPwoVA	Alt2woTUCPDeltaVA	Alt2woTUCPAllVA	Alt3	Alt4
BN	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
D	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
C	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)
All	All	100.0	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)	100.0 (0.0%)

N.1.4 References

Aasen, K.D., and F.D. Henry, JR. 1981. Spawning behavior and requirements of Alabama spotted bass, *Micropterus punctulatus henshalli*, in Lake Perris, Riverside Country, California. *California. Calif. Fish Game* 67(1):118-125.

Bell, M. C. 1991. F*isheries Handbook of Engineering Requirements & Biological Criteria.* Portland, OR. Fish Passage Development and Evaluation Program, Corps of Engineers, North Pacific Division.

Bratovich, P., Addley, C., Simodynes, D., & Bowen, H. 2012. *Water Temperature Considerations for Yuba River Basin Anadromous Salmonid Reintroduction Evaluations.* Prepared for Yuba Salmon Forum Technical Working Group.

California Department of Fish and Game (CDFG). 1980. *California Trout, Salmon, and Warmwater Fish Production and Costs, 1978-79.* Inland Fisheries Administrative Report No. 80-1. Inland Fisheries.

Coutant, C. C. 1970. *Thermal Resistance of Adult Coho (*Oncorhynchus kisutch*) and Jack Chinook (*O. tshawytscha*) Salmon, and Adult Steelhead Trout (*Salmo gairdneri*) from the Columbia River.* Richland, Washington.

Fay, C. W., R. J. Neves, and G. B. Pardue. 1983. *Species profiles: Life histories and environmental requirements of coastal fishes and invertebrates (Mid-Atlantic): Striped bass.* U. S. Fish and Wildlife Service, Division of Biological Services Report No. FWS/OBS-82/11.8, and U. S. Army Corps of Engineers Report No. TR EL-82-4, Washington, D.C.

Federal Energy Regulatory Commission (FERC). 1993. *Proposed modifications to the Lower Mokelumne River Project, California: FERC Project No. 2916-004.* Washington, DC.

Keefer, M.L., C.A. Peery, B. High. 2009. Behavioral thermoregulation and associated mortality trade-offs in migrating adult steelhead (*Oncorhynchus mykiss*): variability among sympatric populations. *Canadian Journal of Fisheries and Aquatic Science* 66: 1734–1747.

McCullough, D.A. 1999. *A review and synthesis of effects of alterations to the water temperature regime on freshwater life stages of salmonids, with special reference to Chinook Salmon.* Seattle, Washington. U.S. Environmental Protection Agency, Region 10. 291p.

McCullough D. A., S. Spalding, D. Sturdevant, M. Hicks. 2001. *EPA Issue Paper 5: Summary of Technical Literature Examining the Physiological Effects of Temperature on Salmonids.* EPA-910-D-01-005.

Meeuwig, M., J. Bayer, J. Seele, and R. Reiche. 2002. *Identification of Larval Pacific Lampreys (*Lampetra tridentata*), River Lampreys (*L. ayresi*) and Western Brook Lampreys (*L. richardsoni*) and Thermal Requirements of Early Life History Stages of Lampreys: Annual Report 2002.* 10.2172/821798.

Meeuwig, M.H., Bayer, J.M. and Seelye, J.G., 2005. Effects of temperature on survival and development of early life stage Pacific and western brook lampreys. *Transactions of the American Fisheries Society*, 134(1), pp.19-27.

Moyle, P.B. 2002. *Inland Fishes of California*, 2nd Edition. Berkeley, CA: University of California Press.

Myrick, C.A. and Cech Jr., J.J. 2001. *Temperature Effects on Chinook Salmon and Steelhead: a Review Focusing on California's Central Valley Populations.* Calif. Water Environ. Model. Forum.

Myrick, C.A., 1998. *Temperature, genetic, and ration effects on juvenile rainbow trout (*Oncorhynchus mykiss*) bioenergetics.* University of California, Davis.

Myrick, CA., and Cech Jr., J.J.C. 2004. Temperature effects on juvenile anadromous salmonids in California's central valley: what don't we know? *Reviews in Fish Biology and Fisheries* 14: 113-123.

Painter, R. L., L. Wixom, and L. Meinz. 1980. *American Shad Management Plan for the Sacramento River Drainage.* Anadromous Fish Conservation Act Project AFS-17, Job 5. Sacramento, CA: California Department of Fish and Game.

Richter A. and S. A. Kolmes. 2005. Maximum Temperature Limits for Chinook, Coho, and Chum Salmon, and Steelhead Trout in the Pacific Northwest. *Reviews in Fisheries Science* 13(1):23–49.

Thompson, L. C., N. A. Fangue, J. J. Cech, Jr., D. E. Cocherell, and R. C. Kaufman. 2012. *Juvenile and Adult Hardhead Thermal Tolerances and Preferences: Temperature Preference, Critical Thermal Limits, Active and Resting Metabolism, and Blood-Oxygen Equilibria.* Center for Aquatic Biology and Aquaculture Technical Report, University of California, Davis. Davis, CA.

U.S. Environmental Protection Agency. 2003. *EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards.* EPA 910-B-03-002. Region 10 Office of Water, Seattle, WA. 49 pp.

Wang, J. C. 1986. *Fishes of the Sacramento-San Joaquin estuary and adjacent waters, California: A guide to the early life histories* (Vol. 9). U.S. Department of Interior, Bureau of Reclamation.

Washington State Department of Ecology (WDOE). 2002. *Evaluating Standards for Protecting Aquatic Life in Washington's Surface Water Quality Standards: Temperature Criteria.* Draft Discussion Paper and Literature Summary. Publication Number 00-10-070. 83pp.

Wedemeyer G.A., Saunders R.L., and Clarke W.C. 1980. Environmental factors affecting smoltification and early marine survival of anadromous salmonids. *Mar. Fish. Rev.* 42(6): 1–14.

Zaugg, W.S. and H.H. Wagner. 1973. Gill ATPase activity related to parr-smolt transformation and migration in steelhead trout (*Salmo gairdneri*): Influence of photo-period and temperature. *Comparative Biochemistry and Physiology Part B: Comparative Biochemistry* 45:955–965.