

Appendix K Feather River Water Temperature Model Results

Introduction

The Oroville Facilities Relicensing DEIR included evaluation of modeling output from two alternatives; the Existing Conditions, and the Proposed Project. Operations under OCAP Study 7.0 include the same flow and water temperature requirements as the Existing Conditions alternative. The Proposed Project simulation utilized flow requirements and water temperature targets from the Settlement Agreement, as evaluated in OCAP Study 7.1. The primary difference, from a water temperature perspective, between OCAP Study 7.1 and 8.0 would be the construction of a facility modification to improve DWR's ability to manage water temperatures. The configuration of a facility modification will be examined in a separate environmental process, so no water temperature modeling of a facility modification was completed. While none of the previously conducted water temperature modeling is directly applicable to OCAP Study 8.0, water temperatures at the Feather River Fish Hatchery and Robinson Riffle would be expected to be similar.

Feather River Fish Hatchery

Water temperature requirements used in simulation of the Feather River Fish Hatchery (FRFH) for the Existing Conditions is based on operators' experience in working with the Feather River Fish Hatchery staff, and do not explicitly follow the water temperatures defined in the 1983 Agreement Concerning the Operation of the Oroville Division of the State Water Project for Management of Fish and Wildlife between DWR and DFG (1983 Agreement). The FRFH water requirements used in simulation of the Proposed Project are from the March 2006 Settlement Agreement for Licensing of the Oroville Facilities (Settlement Agreement), Table 107A. Table 1 shows the water temperature requirements at the Feather River Fish Hatchery as evaluated in the Oroville Facilities Relicensing DEIR Existing Condition and Proposed Project simulations and the corresponding 2008 OCAP studies.

Table 1. Feather River Fish Hatchery water temperature requirements used in modeling

Date	DEIR Existing Conditions and OCAP Study 7.0 (°F)	DEIR Proposed Project and OCAP Study 7.1 (°F)
October 1-May 31	55	55
June 1- August 31	60	60
September 1- September 30	56	56

Figure 2 and Figure 3 shows the simulated seasonal water temperature exceedences at the Feather River Fish Hatchery for the Oroville Facilities Relicensing DEIR Existing Conditions and Proposed Project. Water temperature conditions under OCAP Studies 7.0 and 7.1 would be expected to be similar to those from the corresponding Oroville Facilities Relicensing DEIR alternatives due to operating for the corresponding same water temperature requirements. Figure 3 shows a comparison of the mean daily water temperatures from the Oroville Facilities Relicensing DEIR Existing Conditions and Proposed Project. Water temperatures at the FRFH under 2008 OCAP Study 8.0 would be expected to be similar to the Oroville Facilities Relicensing DEIR Proposed Project simulation since any facility modifications are not likely to noticeably change the access to cold water in Oroville Reservoir compared to OCAP Studies 7.0 or 7.1.

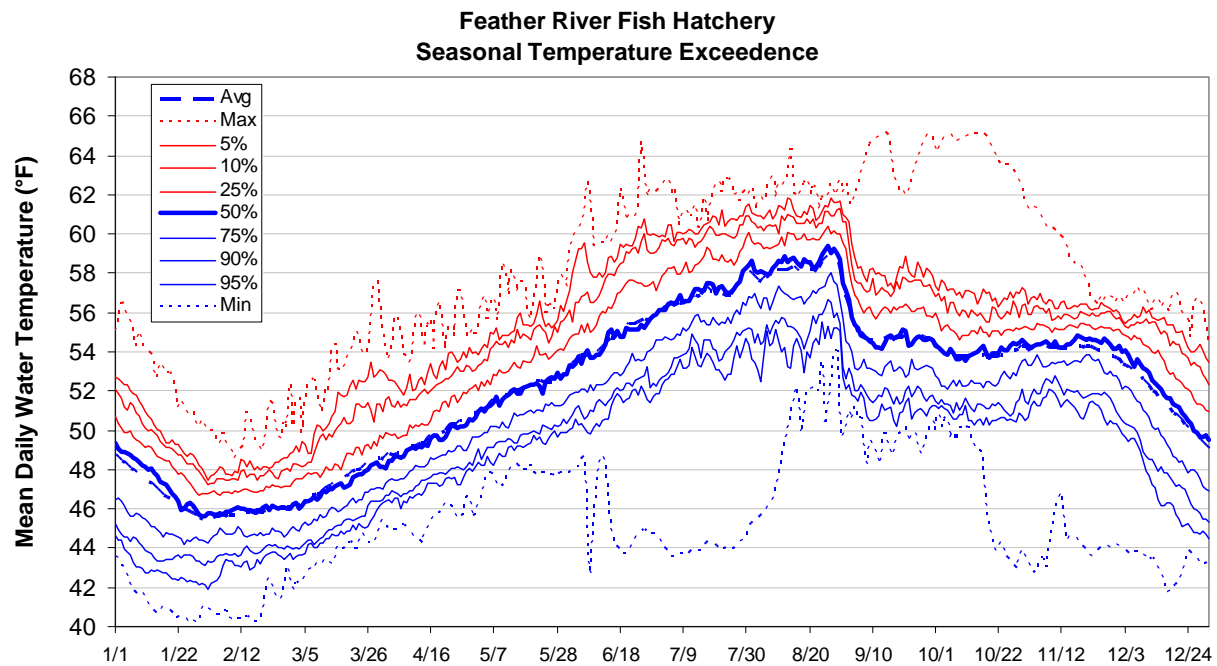


Figure 1. Simulated Seasonal Water Temperature Exceedences at the Feather River Fish Hatchery for the DEIR Existing Conditions (1922-1994)

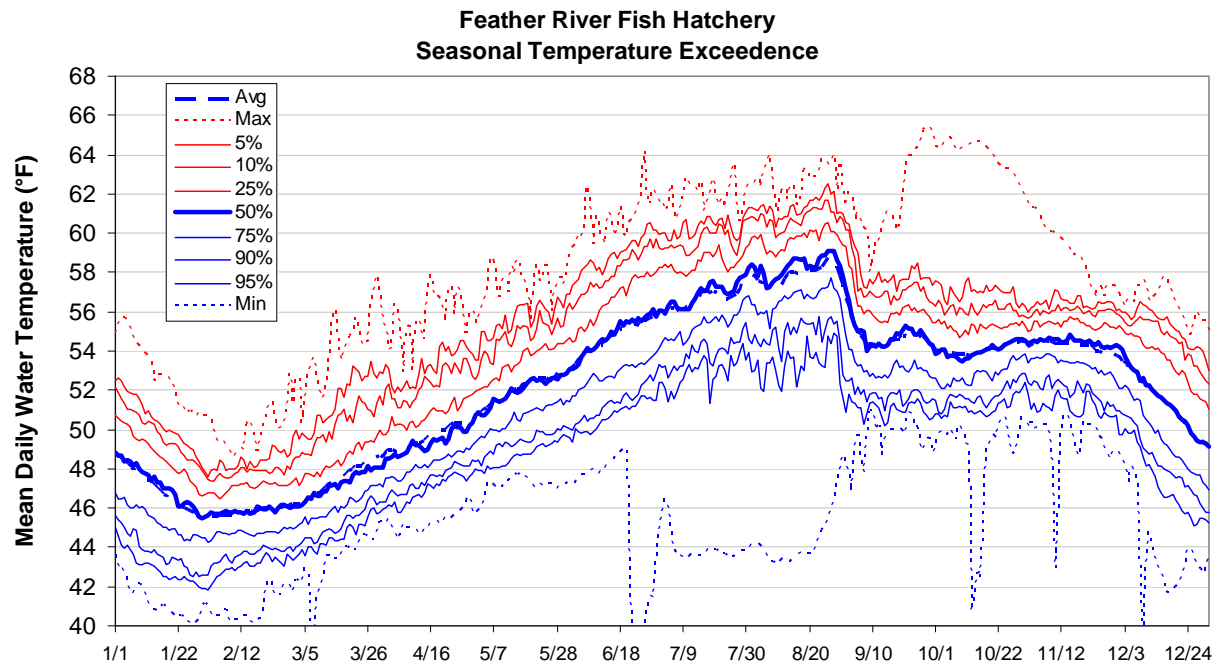


Figure 2. Simulated Seasonal Water Temperature Exceedences at the Feather River Fish Hatchery for the DEIR Proposed Project (1922-1994)

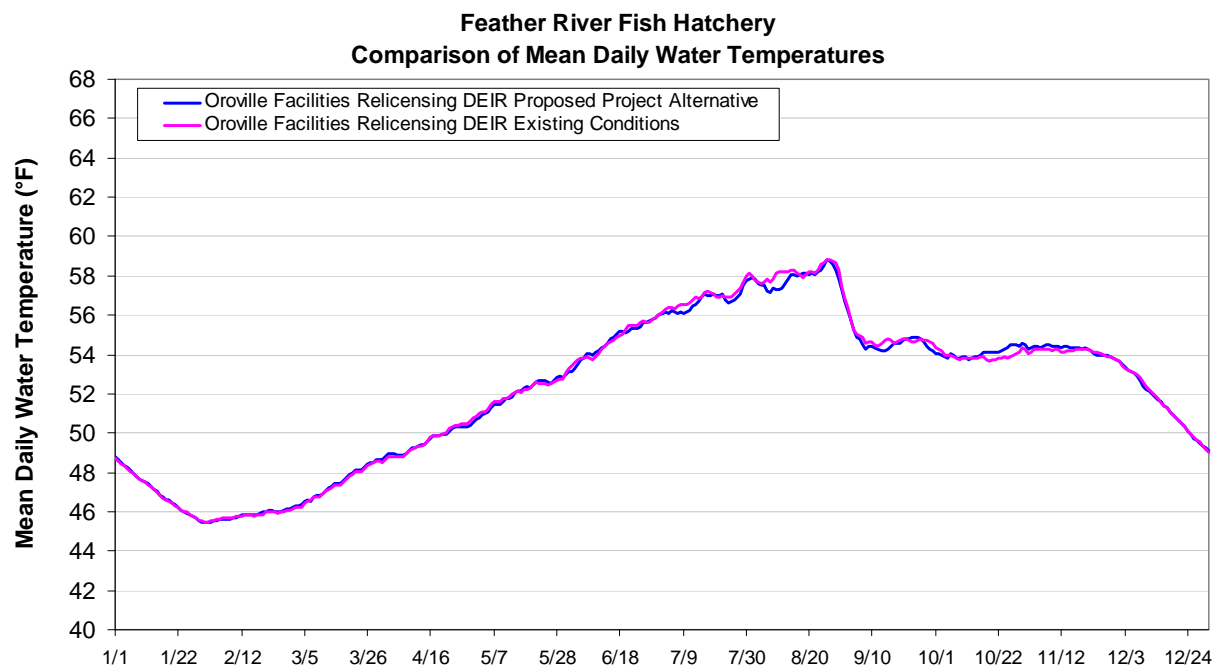


Figure 3. Comparison of Simulated Mean Daily Seasonal Water Temperature at the Feather River Fish Hatchery (1922-1994)

Robinson Riffle

Water temperature requirements used in simulation of Robinson Riffle for the Existing Conditions are from the 1983 Agreement. The Robinson Riffle water temperature objectives used in simulation of the Proposed Project are from Table 1 in the Settlement Agreement. Table 2 shows the water temperature requirements at Robinson Riffle as evaluated in the Oroville Facilities Relicensing DEIR Existing Condition and Proposed Project simulations and the corresponding 2008 OCAP studies.

Table 2. Robinson Riffle water temperature objectives used in modeling

Date	DEIR Existing Conditions and OCAP Study 7.0 (°F)	DEIR Proposed Project and OCAP Study 7.1 (°F)
December 1 – April 30		56
May 1 – May 15		56-63*
May 16 - May 31		63
June 1 – June 15	65	63
June 16 – August 31	65	63
September 1 – September 8	65	63-58*
September 9 – September 30	65	58
October 1 – October 15		56
October 16 – November 30		56
December 1 – April 30		56

**Assumes linear interpolation*

Figure 4 and Figure 5 show simulated water temperature exceedences at Robinson Riffle for the Oroville Facilities Relicensing DEIR Existing Conditions and Proposed Project simulations. Water temperatures under 2008 OCAP Studies 7.0 and 7.1 would be expected to be similar to their respective Oroville Facilities Relicensing DEIR alternatives due to operating for the same objectives, and the use of similar temperature management actions. Figure 6 shows the simulated mean daily water temperatures at Robinson Riffle for the Oroville Facilities Relicensing DEIR Existing Conditions and Proposed Project simulations. Differences between the Oroville Facilities Relicensing DEIR Existing Condition and Proposed Project mean daily water temperatures are relatively small due to water temperatures at Robinson Riffle typically being controlled by operations for the FRFH. Water temperatures under 2008 OCAP Study 8.0 would be expected to be slightly lower, due to the likely inclusion of facility modifications allowing

for water temperature management. The configuration of the potential facility modification is currently unknown, so it is not reflected in current modeling.

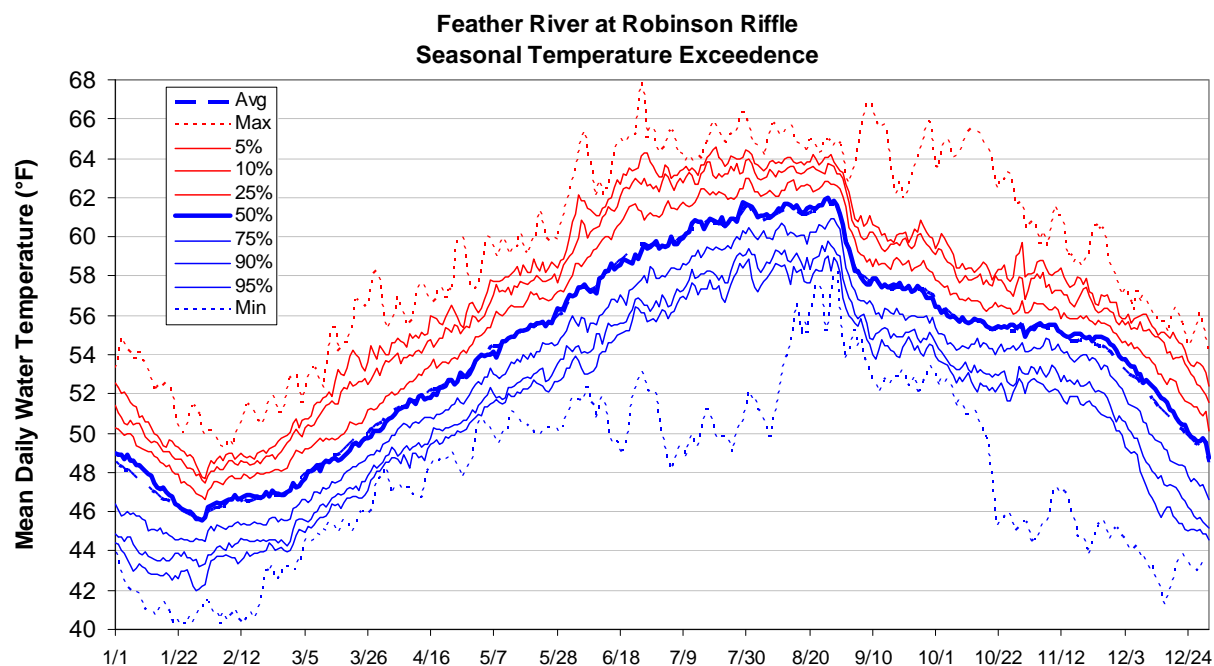


Figure 4. Simulated Seasonal Water Temperature Exceedences at Robinson Riffle for the DEIR Existing Conditions (1922-1994)

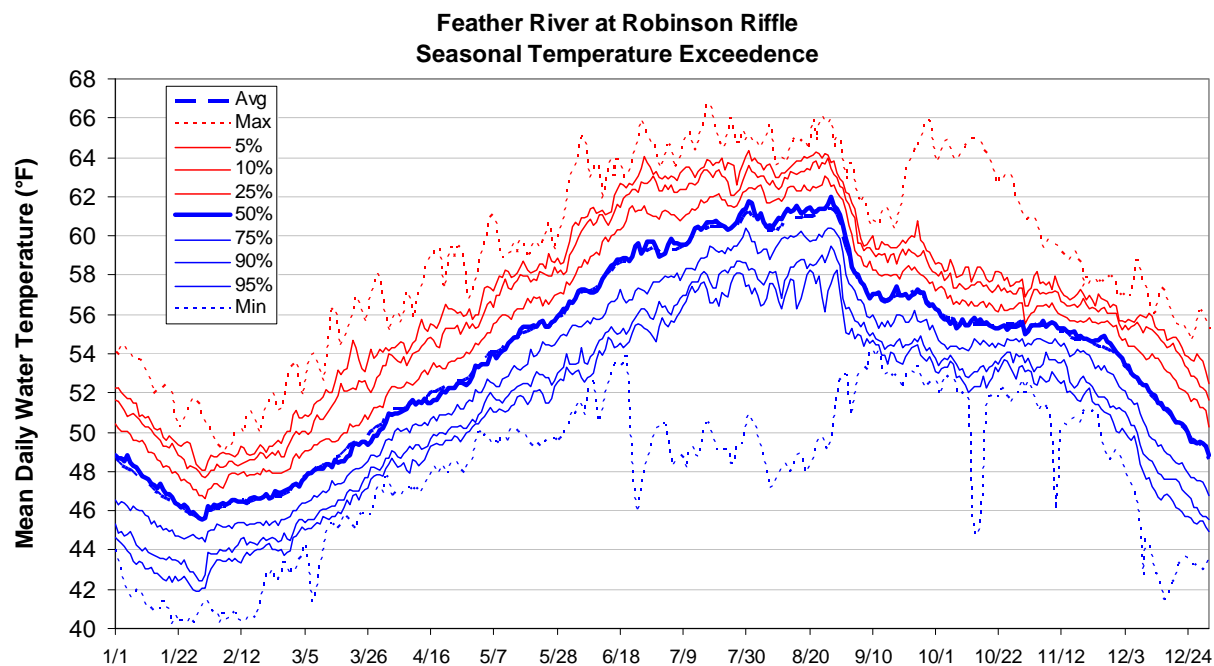


Figure 5. Simulated Seasonal Water Temperature Exceedences at Robinson Riffle for the DEIR Proposed Project (1922-1994)

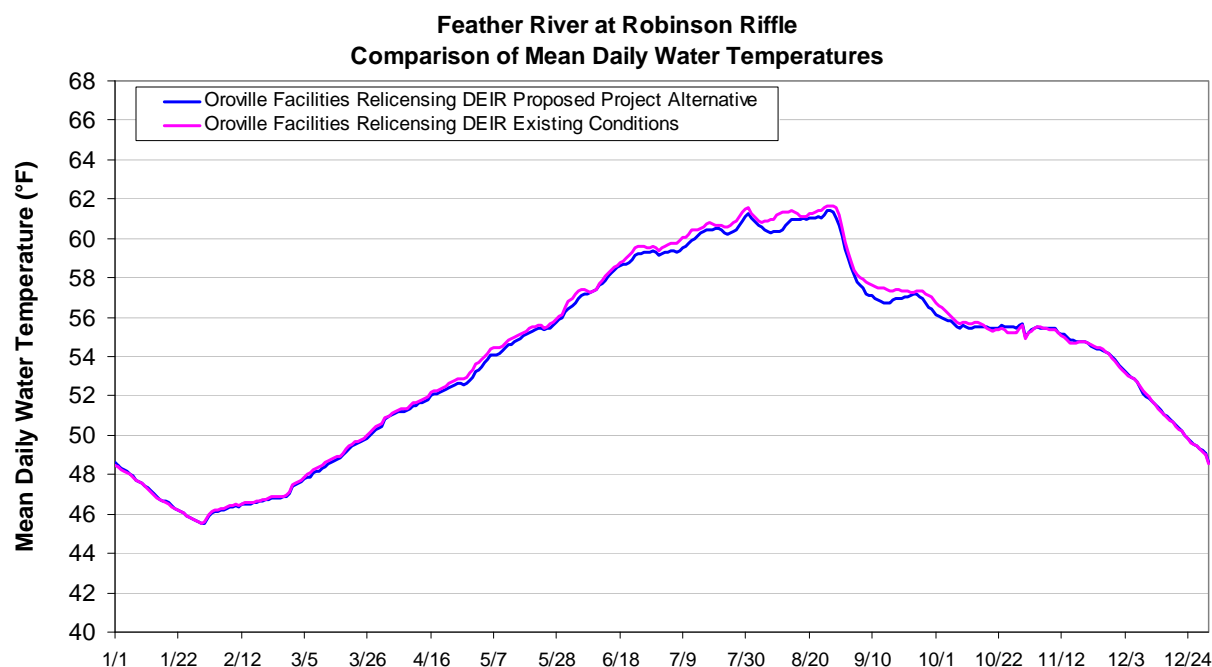


Figure 6. Comparison of Simulated Mean Daily Seasonal Water Temperature at Robinson Riffle (1922-1994)

Lower Project Boundary

While no water temperature objective currently exists on the Feather River below Robinson Riffle, the Settlement Agreement specifies a water temperature requirement below the Thermalito Afterbay Outlet, in the High Flow Channel (HFC) after DWR completes any facility modification. While the specific water temperature requirement and compliance location will be determined in a testing phase after the facility modification completion, Table 2 in the Settlement Agreement specifies water temperature objectives at the Lower FERC Project Boundary. A water temperature objective similar to the Settlement Agreement Table 2 objective would be included as part of a simulation of OCAP Study 8.0. Neither OCAP Study 7.0 or 7.1 include a Feather River water temperature objective below Robinson Riffle. Table 3 shows the Settlement Agreement water temperature objective at the Lower Project Boundary.

Table 3. Settlement Agreement Water Temperature Objective at the Lower Project Boundary

Date	OCAP Study 8.0 (°F)
January 1-March 31	56
April 1- April 30	61
May 1-August 31	64
September 1-September 30	61
October 1-October 3	60
November 1-December 31	56

Since neither the Oroville Facilities Relicensing DEIR Existing Condition nor Proposed Project included a water temperature objective at the Lower Project Boundary, no simulation includes operations to meet a downstream water temperature objective. Figure 7 and Figure 8 show the resulting simulated water temperatures at the Lower Project Boundary after operations for the FRFH and Robinson Riffle water temperature objectives for the respective Oroville Facilities Relicensing DEIR Existing Condition and Proposed Project simulations. Figure 9 shows a comparison of the Oroville Facilities Relicensing DEIR Existing Conditions and Proposed Project simulated mean daily water temperatures at the Lower Project Boundary. Operations under OCAP Study 8.0 would be expected to have cooler water temperatures due to the construction of facility modifications allowing for an improved ability to manage Feather River water temperatures. Since the configuration of a facility modification is currently unknown, none of the current modeling reflects any modification.

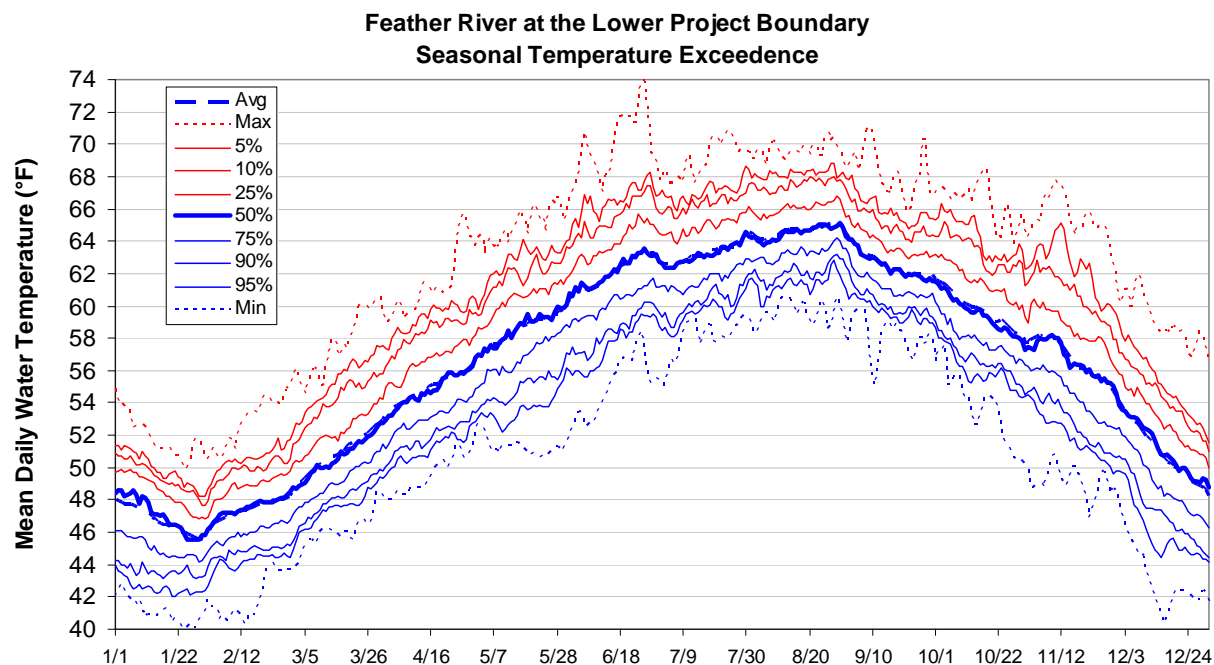


Figure 7. Simulated Seasonal Water Temperature Exceedences at the Lower Project Boundary for the DEIR Existing Conditions (1922-1994)

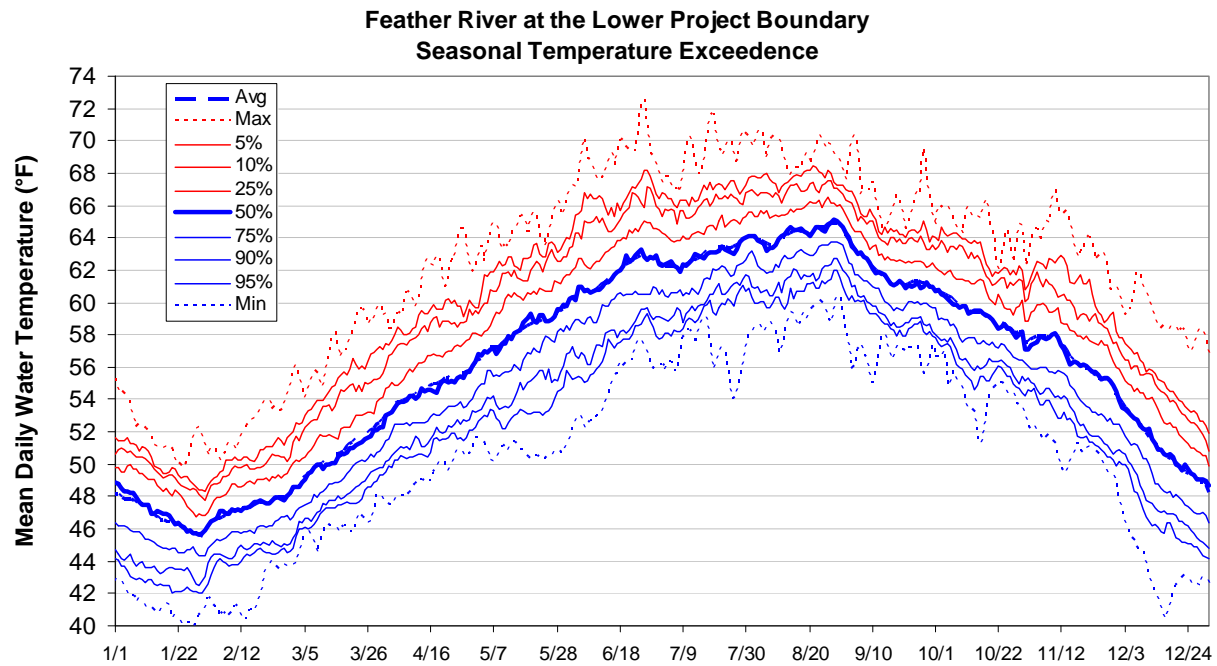


Figure 8. Simulated Seasonal Water Temperature Exceedences at the Lower Project Boundary for the DEIR Proposed Project (1922-1994)

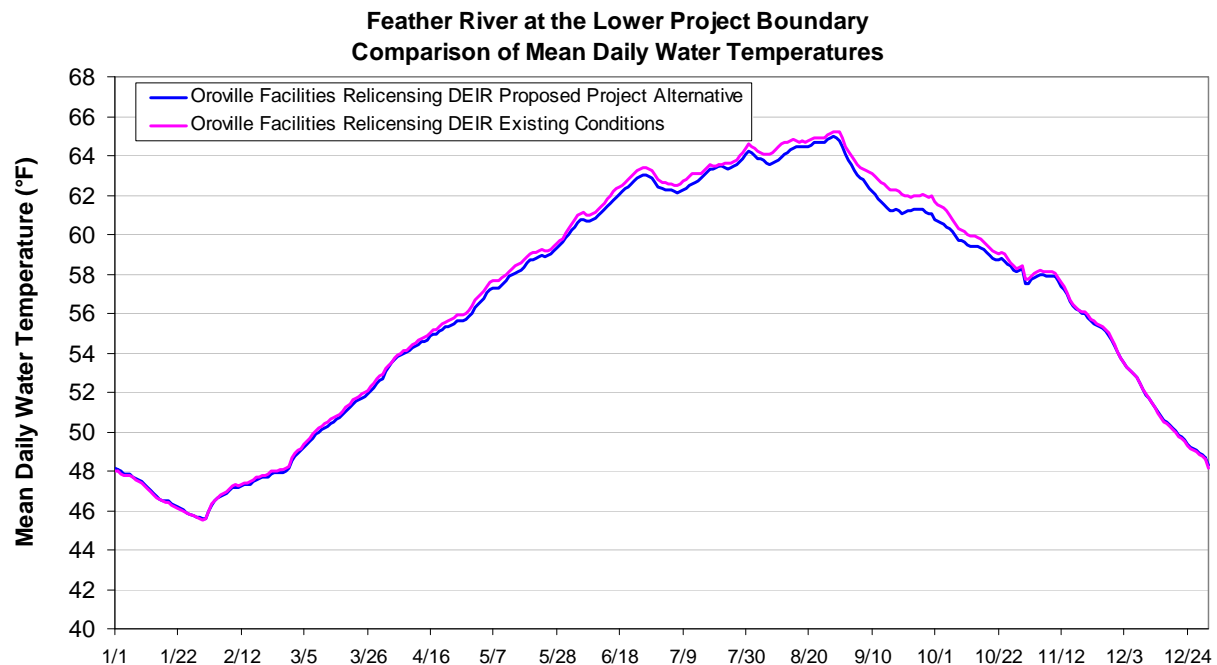


Figure 9. Comparison of Simulated Mean Daily Seasonal Water Temperature at the Lower Project Boundary (1922-1994)